From Ephemerality to Delicacy: Applying Delicacy in the Design Space of Digital Gifting

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Abstract

We encounter uncountable ephemeral phenomena in everyday life. Some of them are particularly appreciated for their ungraspable beauty and limited availability. From the outset, one strand of computing technology has evolved to encapsulate and preserve this transient experience. A myriad of digital devices has been developed to capture the fleeting moments and to store as digital files for later use, edit, share, and distribute. On the other hand, a portion of Human-Computer Interaction (HCI) research has engaged in adopting the transience of temporal phenomena in the design of interactive computing systems. Some computer and mobile applications metaphorically adopt the ephemerality in graphical elements or functions that resemble our real world experiences such as, forgetting and real-time conversation that naturally fades away immediately. Interactive artefacts or installations often incorporate ephemeral materials for abstract and artistic expression. Therefore, ephemeral artefacts or phenomena are often employed as a passive design element in ambient and peripheral interactions rather than in applications for practical purpose. However, ephemeral materials also engender experiences of a non-ambient nature. Some materials are physically fragile, only lasting for a brief moment, and therefore require constant care to retain their status, which might lead to highly focused attention, delicate interaction, and even a tense experience. This thesis aims to investigate how to harness the fleeting and irreversible feature of ephemeral artefacts in the design of practical products and services.

This PhD builds on the methods of design-oriented HCI research. Thus, this thesis will present a research process that involves a series of challenges to initially frame a design problem in a fertile area for exploration; speculate a preferred situation; develop proof-of-concept prototypes to demonstrate the potential solution; and evaluate the prototypes through a user study.

Contributions of this PhD have visualised by the outputs from multiple design studies. First, this thesis illustrates how the concept of ephemerality is currently

understood in HCI. Then proposes a different approach to the use of ephemeral materials by shifting the focus to delicacy. The first design study introduces FugaciousFilm, a soap film based interactive touch display that shifted ephemerality from a user's periphery to the focal point of interaction. The prototype is a platform for manifesting ephemeral interactions by inducing subtly delicate experiences. By demonstrating that ephemeral interactions reinforce user's attention, delicacy was noticed as an attribute of user experience. By understanding of the use of delicacy, the research focus has moved from exploring how an individual ephemeral material can be utilised in interaction design, to harnessing delicacy of such materials in experience design that benefits Human-Computer Interaction. Thus, this thesis recaptures *digital gift wrapping* as a context by reviewing the current state of affairs in digital gifting in the field of HCI and design. A 5-stage gifting framework has been synthesised from the literature review and guided this PhD throughout the studies. The framework ought to be seen as a significant contribution in its own right. Based on this framework, a series of interviews was conducted to identify any weaknesses that reside in current media platforms, digital devices, and different modes of interaction. Hence, 'unwrapping a digital gift' has captured as a gap in the design space that could be reinforced by a delicate, ephemeral interaction. Therefore, this PhD proposes *Hybrid Gift*, a series of proof-of-concept prototypes that demonstrates digital gift wrappings. Hybrid Gift has been probed in a semi-structured design workshop to examine the use of delicacy and ephemerality in the design of digital gifting practices. The prototypes were designed to retrieve not only the unwrapping experience but also rituals around gift exchange. Therefore, this thesis discusses design implications of the findings that emerged throughout the study. Digital gifting is still an under-explored research area that is worthwhile to investigate through field works. Thus, the design implications and the framework are proposed to researchers and designers who wish to engage in the arena of digital gifting, also broadly in social user experience, and communication service and system design.

From a macroscopic perspective, we are experiencing fleeting moments every second, minute, and day. However, they are rarely noticed unless we recognise that time passes irreversibly. This thesis extracted delicacy as a feature of ephemeral interactions and argued that it holds the potential to augment and enhance mundane experiences mediated by digital technology. In so doing, the series of design studies has conceptually influenced the design perspective to be shifted from material-oriented design to experience-focused design research. The design space of digital gifting would not have been recognised without the hands-on design practices in the process of this PhD. Finally, the proof-of-concept prototypes, framework, and design implications are thought to be of significance and value to the design students, researchers, and designers who want to employ similar methods and approaches in design research.

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Lexicon of Concepts

Terms below are defined as they are relevant to this thesis, and some are redefined specifically for this thesis.

Ephemeral: Adjective describing things lasting for a very short time. (Adopted from Oxford English Dictionary)

***Ephemeral User Interface*:** A user interface designed with a limited lifespan of ephemeral materials. (Adopted from Döring et al. 2013)

***Ephemeral Interaction*:** A class of Human-Computer Interaction focused on creating user experiences with a limited duration. Ephemeral User Interfaces (EUIs) demonstrate the material aspect of the ephemeral interaction. This thesis expands the term to encompass experiential qualities entailed upon interacting with ephemeral media.

***Ephemeral Experience*:** A class of user-experience (UX) in HCI that has following characteristics. An experience should last for a short period; the experience is often bound to disappearance or transition of materials; and importantly, it is irreversible and non-replicable as in other digital interface design.

Delicacy: A term usually describes fineness of a surface, texture, and quality. In this thesis, the term 'delicacy' is mostly used in two ways: i) to describe the quality of being easy to damage or looking very easy to damage; ii) to describe the quality of an experience being done carefully and gently (Adopted from Cambridge English Dictionary).

***Material*:** The material is known as a matter or a thing that can be used for a certain purpose or activity, which often indicates a physical matter. In this thesis, the term 'material' refers to 'physical/tangible material.'

***Digital Material*:** 'Digital material' relates to virtual computing materials, such as files, images, apps, which have the potential to be transformed into physical equivalents but remaining in digital format.

***Hybrid Material*:** A class of composite materials that embeds an ability to augment a user experience by the interaction between digital and physical materials. In HCI, the term 'hybrid' has been introduced to refer to digital devices, such as Mp3 players, DVD, and mobile devices (Golsteijn et al., 2012). Electronic devices that we encounter in daily life have the hybrid nature, which operates in a combination of both digital and physical materials. However, this thesis attempts to go beyond mere attachment of the two materials and suggest a material category that performs a unique user experience.

Hybrid Gift: A type of gift that integrates digital (gift artefact) and physical (wrapping) materials. In this thesis, this term has particularly defined to emphasise the distinction between digital materials conveyed by a plain physical container, such as USB sticks or CDs. Hybridity is engendered by a meaningful assembly of digital and physical materials that a user interaction with one material triggers the other.

***Ephemeral Media*:** A type of media embedded and conveyed by tangible materials, so it has a characteristic of a hybrid material. Both digital and physical materials are designed to last for a short time or to be consumed at an instance. Therefore, ephemeral media engenders irreversible, temporal experiences. In this thesis, an 'Ephemeral Media' has introduced as an exemplar of the hybrid material.

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Publications

The studies and design explorations comprised in this thesis have been peer-reviewed and published in conference proceedings in various HCI and design venues.

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   ---------- Introduced in Section 4.1 of Chapter 4

Chapter 1

1. Introduction

1.1. Motivation

We are now living in a world of digital ubiquity, where a range of everyday activities are performed in the space between digital and physical materials. HCI research in this intersection has shown various attempts in; designing digital-augmented physical materials (Ishii & Ullmer 1997; Holman & Vertegaal 2008); understanding the user experience with both digital and physical materials that permeates everyday life (Kirk and Sellen, 2010; Petrelli and Whittaker, 2010); and also grounding methodological foundations of materiality in interaction design (Wiberg, 2014). Recently emerging smart mobile devices and Internet of Things applications show that digital and physical materials no longer need to be constrained to static and passive interfaces. User interfaces are increasingly becoming organic, malleable, and even disappearing (Lim, 2012), which is designed to surface only on user's demand, but remain otherwise hidden in the devices or in the environment where the devices are situated. We can observe the changes in the traditional Window, Icon, Menu, and Pointing device (WIMP) interfaces by the adoption of touch interfaces (e.g. smart phone), voice and gesture recognition (e.g. Amazon echo), and virtual or augmented reality technology (e.g. VR headset). These recent movements in the interface and interaction design show that are computing systems become more flexible and responsive in the user experience. From the inception, the adaptable interfaces that are temporarily available on user's demand influenced the motivation of this PhD to focus on the 'ephemerality' as a characteristic, feature, or an attribute of Human-Computer Interaction design.

Interaction design is a distinctive discipline in HCI that focuses on building responsive, flexible, and temporal forms of interfaces (Vallgårda et al., 2015). Since the early ages of interaction design, the temporal aspect of interactions has been a concern for researchers who deal with interruptions and attention (Hudson

et al., 2003), for example how to call a user's attention by temporarily showing a message in the corner of the screen. Moreover, adaptive and animated aspects of the graphical user interface have also been concerned with designing temporal Input/Output of adaptable systems (Höök, 2000). However, due to the usability and transparency of the system, the temporal GUIs have remained as platform-dependent adaptations (Vallgårda et al., 2015). Thus, ephemerality or temporal concerns of interaction design gained less attention from the traditional HCI perspective, which aims to design robust and functional applications that often require highly focused user attention in direct manipulation (Shneiderman, 1997).

In the physical domain, Ambient Displays, Organic User Interface (Holman and Vertegaal, 2008), and Shape-Changing Interface (Coelho and Zigelbaum, 2010) have demonstrated responsive interfaces that adjust physical forms in association with functions, in real-time, on demand. Such physical interfaces do not entirely disappear but perform status transitions that temporally present a certain function. Döring et al. (2013) proposed Ephemeral User Interfaces (EUIs) as a class of user interfaces that possess at least one UI element designed to last for a limited duration. EUIs often incorporate tangible materials such as soap bubbles that degrade naturally by environmental factors, therefore, retain imperfect user control over materials. Thus, such ephemeral interfaces have generally been explored in the design of artistic and playful tangible interactions, which are suitable to convey multi-sensory experiences. Therefore, interactions become ambiguous and material performances rely more on user's own interpretation than designer's intention. Since many ephemeral materials have fragile and delicate characteristics, they have often been overlooked in HCI due to the difficulties in controlling and manipulating them. Although remaining as an artistic installation, some applications of EUIs are designed for HCI as peripheral or ambient interfaces. Thus, I see there is an under explored area in HCI and design where the ephemeral materials and ephemeral interactions to be employed for practical use in the development of everyday services and products.

In systems design, designers and researchers adopted the concept of ephemerality in user experience for digital and ubiquitous computing devices.

HCI research has begun to examine and resolve dilemmas of users who confront with the persistence of information and data that are digitally stored online. Bannon (2006) articulated the needs for ephemeral technologies that employ *forgetting* as a feature of design in ubiquitous computing. Moreover, Mayer-Schönberger (2009) introduced how deleting digital data is becoming significant in social communication through digital means such as social media and messaging apps. More recently, Sas and Whittaker (2013) explored the negative role of digital possessions when people want to forget some parts of their lives. Disposal of personal digital possessions in the context of bereavement and breakups, or other circumstances is drawing attention to the problems of retention of digital materials (Gulotta et al., 2016; Massimi and Baecker, 2011; Odom et al., 2010). In this regard, ephemerality needs recognition not only as an innate feature of physical materials, but also as a 'materiality' of digital interfaces that can shape user experience of interactive systems.

Previous works related to the concept of ephemerality shown that researchers have investigated ephemerality with a focus on the effect of disappearance; disappearance of materials (Döring et al. 2013), temporal existence of form or status (Coelho and Zigelbaum, 2010), and disappearance of data (Sas & Whittaker 2013). What has been overlooked in the mainstream of HCI is the user's emotional experience and reflection before, during and after the disappearance occurs. Also missing is an account of how the ephemeral user interaction might reinforce the user experience. We should further ask in which context such user experience would benefit our everyday interaction with digital technology. Figure 1 depicts the scope of this PhD in comparison to the previous works in HCI around ephemeral interaction design.

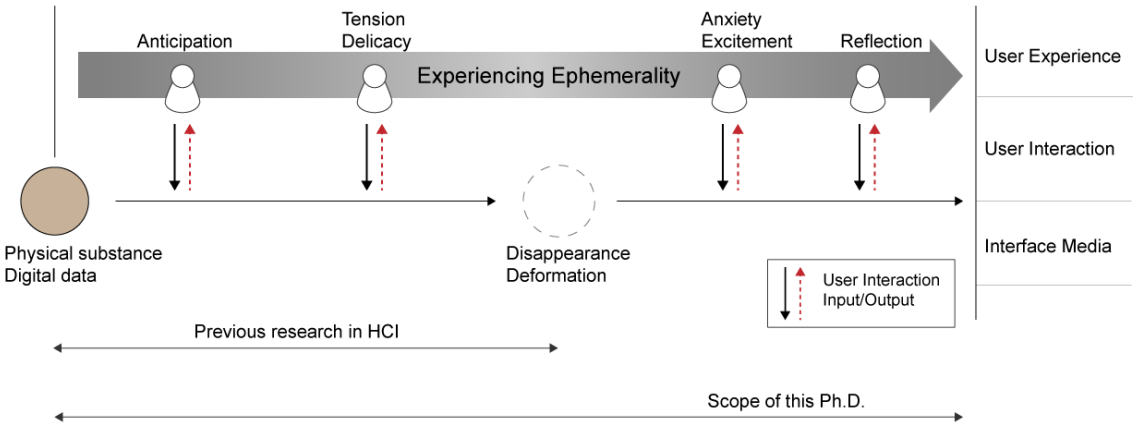


Figure 1. The illustration depicts the scope of this PhD. Previous works mainly investigated the ephemerality by focusing on the interface and interaction methods to design the disappearance of material or data. This PhD aims to extend the boundary of inquiry to encompass the user experience. How users might; anticipate the disappearance; delicately interact with an ephemeral material; experience excitement or anxiety; and how the course of experience is reflected back.

This PhD aims to investigate the practical value of ephemeral materials and expands our understanding of ephemerality in the context of HCI and user experience design. In addition to a material-centric approach, which can be seen from related works of EUIs (e.g. Suzuki et al. 2008; Sylvester et al. 2010), this thesis focuses on the significance of the temporal interaction and an experience that entails it. Through a design-oriented approach, this PhD explores a novel user experience at the intersection of the physical and digital realm by blending ephemeral tangible materials with digital materials.

1.2. Research Question and Objective

Based on the literature introduced above, one might argue that EUIs a part of a strand of HCI research that deals with ambient and peripheral applications. This thesis wants to extend the boundary of the design space of ephemerality by incorporating ***delicacy*** in experience (as illustrated in Figure 2). Some ephemeral materials are highly fragile and weak that require attentive and focused

manipulation in the user interaction. 'Delicacy' is a term describes one's emotional experience that emerges while interacting with highly fragile and subtle things. Throughout this PhD, I examine delicacy in the use of ephemeral materials and validate the design concept by applying the materials in common user interaction context.

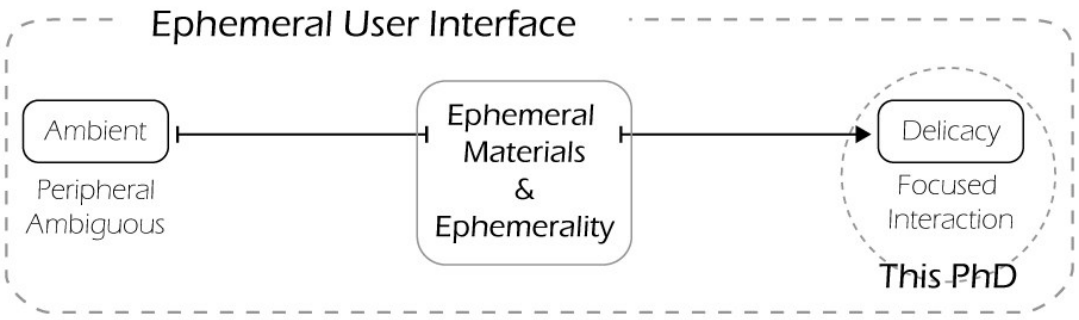


Figure 2. The position of this PhD is in opposite end of the previous approach of an Ephemeral User Interface (EUI). EUI has focused on ambient, peripheral, and ambiguous nature of ephemeral materials, whereas this PhD pursues designing attentive, focused interactions with delicacy and subtlety generated from ephemeral materials.

1.2.1. Research Question

This thesis aims to expand the use of ephemeral materials and associated interaction in the mainstream of practice based HCI. Thus, this PhD explores the following research question,

"How can ephemeral materials be harnessed in the design of products and services to enhance our ordinary experience?"

In order to respond to the question, it is necessary to divide the inquiry into two parts, which may require different types of research and design approaches.

- How can ephemeral materials be implemented in a controllable and functional manner?
- In which context, might an ephemeral artefact be usefully integrated into a common experience that we encounter in ordinary life?

The first part of the research question will focus on designing *ephemeral interfaces* while expecting to identify an interaction modality that brings the user's focus to the foreground. Here, delicacy has been noticed as an interaction modality from the first design study, which then associated with the design of an interactive media application. The latter part of the research question has an intention to explore the context where ephemerality would enhance our regular and common experiences with computing artefacts. An empirical research approach will be applied to investigate the problem space that is grounded in our ordinary life. Furthermore, this thesis aims to propose a specific design application that responds to the research question.

1.2.2. Objective

While responding to the research questions, this PhD intends to achieve the following objectives;

1. **Understand** ephemerality and delicacy.

   The literature review will reveal the gap in the knowledge regarding ephemeral interaction design in the field of HCI and frame the research question. Moreover, design practices and a user study will focus on the tangible exploration of the delicacy of both ephemeral materials and interaction design.

2. **Study** an identified design space.

   This PhD aims to establish a domain to validate the practical value of ephemerality and delicacy. Therefore, an ethnographic interview study was conducted to identify a real-world context for ephemeral interactions to occur, as well as design gaps in user experience that would benefit from the delicacy of ephemeral interactions. The study is also being supported by an additional literature review of the domain area, which leads to propose a framework that will guide the research throughout the interviews and design workshops.

3. **Design** and **evaluate** the concept and framework.

This PhD lies broadly at the boundary of design-oriented HCI research. Thus, the outcome of my research contains tangible prototypes, findings from the studies, and design implications derived from the design process and evaluations.

In summary, this PhD comprises various methods – a practical design process and an ethnographic interview study – employed in design-oriented HCI research, in order to answer the research question from multi-dimensional perspectives. Thus, while pursuing the objectives, the contributions emerging from this approach are described in the following section.

1.3. Contributions

This PhD aims to achieve following three contributions through a series of design activities: exploration, prototyping, study, and evaluation.

1. Foremost contribution of this thesis is the recognition of "delicacy" as an interaction modality of an ephemeral interface, which led all research presented in this thesis. "FugaciousFilm" (detailed in Chapter 4) was developed to implement an ephemeral interface in a controllable and functional manner. This thesis advocates the value of, not only the design activities involved in due course of research process but also the artefact that enabled the probe of the concept. Moreover, this user study demonstrated that a partially controllable ephemeral material generates delicate user input that reinforces a common and ordinary experience by elevating tension and driving anxiety but also excitement during the interaction.

2. In response to the second research question – *"In which context, might an ephemeral artefact be usefully integrated into a common experience that we encounter in ordinary life?"* – gift unwrapping has been framed as a domain that can be seen as a temporal experience we encounter in daily life which entails delicate interaction. One's social communication pervasively involves explicit gifting of digital materials, such as photos and music tracks. However,

it has barely been investigated in HCI. Moreover, the unwrapping experience, also wrapping, in digital gifting has often been overlooked compared to how physical gifts are exchanged by being wrapped. Although digital gifting has previously been covered in HCI (Grimes and Harper, 2008; Håkansson et al., 2007; Taylor and Harper, 2003), this thesis studied the exchange of wide-ranging digital gifts through state of the art digital platforms. Also, investigated the design space of 'wrapping' with ephemeral materials. Digital gift 'unwrapping' has been explored within the frame of ephemeral and delicate experience, which led to drawing out the concept of "Hybrid Gift". Hybrid Gift depicts the novel design approach of digital gifting, by integrating an ephemeral physical wrapping with a persistent digital gift. The proposed designs are to enhance forgotten parts of the digital gifting experience such as the emergence of tension and anticipation while tangibly unwrapping the gift.

3. In addition to the concept and physical prototypes of Hybrid Gift, the study established a conceptual framework of the gifting process. The framework has been a useful tool throughout the research: identifying gaps in the design space of gifting; analysing the study findings; proposing design implications for future work. Therefore, I claim that the framework is a significant output of this thesis. The framework also enables researchers in other subject disciplines to investigate the design space of gifting in the contexts where our communication is augmented by ubiquitous computing technology and IoT.

1.4. Thesis Structure

First of all, in order to justify the originality of this work, Chapter 2 scrutinises the state of the art of HCI research that incorporates ephemeral materials in Interaction Design. It also investigates temporal user experience design using digital technology. I begin with reviewing related works and literature in a lineage of Tangible Interaction Design that employs an ephemeral material as an interface medium. The first part of the literature review (Section 2.1) classifies

related works into two sub-sections, according to the focus of the material usage: ephemerality (Section 2.1.1.1), and other physical properties of ephemeral materials (Section 2.1.1.2) such as transparency (e.g. fog), pass-through-ability (e.g. soap film), and intangibility (e.g. air flow). The section shows a general overview of interaction design research involving ephemeral materials. Section 2.2 reviews previous works in the mainstream of HCI that focus on designing time-limited user experiences in the digital realm. In digital interface design, ephemerality has been gained attention in HCI through investigation of ambient interaction, Calm Technology (Section 2.2.1), and Slow Technology (Section 2.2.2). Moreover, Sustainable Interaction Design (Section 2.2.3) has concerned about the obsolescence of digital materials that engender limited availability in using computational devices due to advancement in software and infrastructure. The section also reviews more recent research, which investigates implications for the design of digital media and interfaces that embody ephemerality of memory, in short, forgetting (Section 2.2.4). Finally, the chapter addresses a gap in the knowledge of ephemeral interaction design which has been focused on ambient and peripheral interaction design. The gap sets up the basis of the research question, which will be discussed in detail in section 2.3.

Chapter 3 elaborates the research methodology that applied in this PhD. The overarching method of this PhD is Research through Design (RtD) approach combined with standard HCI research methods (e.g. user study, evaluation). RtD exhibits how designers have engaged with practice-led HCI research and how the design process can be seen as generalizable principles that comprise HCI theories. A series of design activities constitute this research, from sketching ideas into 2D or 3Ds to crafting specific artefacts, and evaluating them through user studies. One of the objectives of this PhD is to design tangible artefacts that feature ephemeral interfaces. Artefacts are substantial elements in this research. These artefacts are intended to communicate the research questions and provoke the ideal state of the problem space that leads to further investigation.

The first part of the thesis is an exploratory design-oriented research that focuses on examining an ephemeral material for delicate and focused interaction. Then,

the design space of ephemeral interaction with delicacy has been extended to a real world context, in order to apply the research outcome from the exploratory study. A formal set of research consisting of literature review, interviews, and empirical analysis has been conducted to identify knowledge gaps in the domain area. The diversity of design practices undertaken in this PhD underpins what RtD pursues, namely provisional, accountable, and aspirational research methods (Gaver. 2012).

Chapter 4 illustrates curiosity-driven and exploratory design research, demonstrated by *FugaciousFilm*, a soap film based touchable projection screen. This chapter contributes in realising delicacy as an attribute of ephemeral interaction. The design research comprises of iterative prototyping and a user study that explicates how ephemeral materials can be harnessed into the design of partially controllable delicate user interfaces. The prototype demonstrated how the fragile and ephemeral nature of a material not only brings user attention to the foreground but also intensifies user experience while interacting with ephemeral media. However, the chapter also discusses the limitation of the material (soap film) to be integrated into interactive digital devices that are more relevant to our common social interaction and experience.

Therefore, having learned that ephemerality is a powerful driver of focused and delicate experience, I began to explore contexts where interactive technology and digital ubiquity have not managed to offer delicate experiences. The second design study of this PhD, described in Chapter 5 and Chapter 6, investigates ephemeral experience that we frequently confront in common settings: *digital gifting*. Digital gifting is a part of the pervasive social interaction. However, in contrast to the large volumes of literature on gifting from a variety of disciplines, digital gifting has only insufficiently covered in the literature and design, which directed this thesis to deeply investigate the topic, especially from an interaction design perspective. Chapter 5 delineates a research process that grounds the notion of ephemerality and validates the practicality of ephemeral materials with delicate and focused interactions in the context of digital gifting. Semi-structured interviews were conducted and analysed to verify the gaps in current digital

gifting, and also to derive insights for design and evaluation. An aim of the gifting study was to reinforce the unwrapping experience in digital gifting. Chapter 6 introduces four design exemplars depicting the concept of 'Hybrid Gift', which integrates ephemeral physical materials as wrappings to convey digital contents as gifts. Hybrid Gifts were presented in a design workshop to probe delicacy when unwrapping the digital gifts. The workshop was held with volunteers among the interviewees from the previous study, with an assumption that those participants who already understand the idea of digital gifting in the study would respond based on their prior experience of digital gifting. Feedback from the workshop highlighted the value of *Hybrid Gift*, which might overcome drawbacks of the digital gifting experience that had identified in the interview. Moreover, the workshop results encouraged an extension of the research beyond wrapping to the broader process of *digital gifting* in the wild for future work.

Chapter 7 discusses the contribution of each study illustrated in the previous two chapters. Both design studies answered the research question: *"How can ephemeral materials be harnessed in the design of products and services to enhance our ordinary experience?"* Firstly, 7.1 discusses the contribution in the design of FugaciousFilm (in Chapter 4) and how it expanded the concept of ephemeral interaction in HCI. Particularly, FugaciousFilm (prototype) has a contribution in how materials and technology have synthesised in the design of novel interaction techniques to explicate the notion of ephemerality. The user study revealed how the ephemeral materials are efficient and valuable in creating a focused experience and intensified excitement. However, FugaciousFilm has limited potential to be integrated as an artefact that would enhance our ordinary experience. The material (soap film) and technology (projection) used in FugaciousFilm are less acceptable to be installed in our everyday settings than in curated events or exhibitions. Therefore, the second contribution of this thesis lies in the application of the delicate and focused interaction into the domain that is closer to our ordinary life. Thus, 7.2.1 will discuss the design contribution of this PhD Hybrid Gift brought the ephemeral materials into the design of practical HCI applications by incorporating delicate and subtle user interaction. The

design workshops demonstrated delicacy and ephemerality could offer not only aesthetic value of the interaction but also the practical value of non-robust and vulnerable materials that exist temporarily. While investigating the digital gift unwrapping experience, many other significant findings and considerations have arisen. 7.2.2 will discuss the relation between the digital gifts and valuable possessions; why some digital gifts are not included in one's possessions; what interaction designers need to focus on in this arena. 7.2.3 expands the discussion of design implications for digital gifting towards social user experience. This section revisits the gifting framework and proposes design implications for digital gifting as a ritualistic user experience.

Chapter 8 concludes this thesis by proposing future works and summarising the research and contributions. 8.1 elaborates potential future works beyond this PhD research. The digital gifting study illustrated in Chapter 6 pinpoints some further research opportunities. First, the 5-stage gifting framework can be applied in the research with another perspective to the digital gifting experience. While this PhD focused on the positive side of the experience, one might investigate negative aspects of gifting. Moreover, gifting generally occurs in a specific setting, which often framed by a context and relationship between giver and receiver. Hybrid Gift prototypes were designed for specific contexts such as a dining place and a home. These are the settings best explored outside a research laboratory. Therefore, a field study might offer rich data to validate the concept of Hybrid Gift and its effectiveness in the gift exchange. Finally, this thesis proposes a further study in building and grounding rituals for digital gifting, which can be extended to a wider range of computer supported communications. Section 8.2 concludes this thesis with summaries of contributions.

Prior to delving into the practical design case studies, I review the background of the Ephemeral Interaction Design in HCI and relevant works previously covered by other researchers in the field. The literature review in the next chapter will show the gap in the knowledge and justify the research approach of this PhD.

Chapter 2

2. Background and Literature Review

The origin of the term "ephemeral" is from the Greek "ephémer(os)" meaning "lasting for a very short time."[1]. Ephemerality has been seen as a typical characteristic of nature, such as a solar eclipse or rainbow, as well as the lifespan of living creatures (e.g. a Mayfly). The beauty of the natural moment is often unable to be duplicated or repeated in the same manner by humans. Therefore, the temporal limitedness intensifies the value of the aesthetical instance. The notion of ephemerality has been widely employed metaphorically across disciplines, such as literature, philosophy, and arts. In modern arts, explicitly named as Ephemeral Art, the concept has been used to describe an artwork that occurs only for a moment and cannot be retained physically in a museum or gallery[2]. Figure 3, an example that falls into Ephemeral Art, shows a line of a path made by walking on the grass. The art piece is a temporary exhibition since other environmental factors such as wind and rain cause the path to fade out. Likewise, ephemerality is usually manifested as a performance of aesthetic movements (e.g. Dance), which involves a passage of time, rather than a static tangible artefact. Moreover, artists and researchers are now extending the application domain of ephemerality to challenge the public concepts of sustainability, environmental fragility, and consumerism[3]. In turn, ephemerality has been seen and investigated from diverse perspectives: materiality, phenomenal, and experiential, which also permeated into the field of HCI and influenced the wide range of interaction and experience design. HCI designers and researchers have attempted to expand the concept by incorporating ephemeral materials in the design of physical interactive systems.

[1] Oxford Dictionary. https://en.oxforddictionaries.com/definition/ephemeral
[2] Ephemeral art. http://www.tate.org.uk/learn/online-resources/glossary/e/ephemeral-art
[3] http://www.thatcreativefeeling.com/ephemeral-art-what-a-beautiful-thing/



Figure 3. A Line Made by Walking 1967. An example of ephemeral art by Richard Long.
(© Richard Long. Image retrieved from http://www.tate.org. uk/art/artists/richard-long-1525)

Increased interest in the design of Tangible User Interfaces (TUIs) and transformable interfaces encouraged interaction designers to explore a wider repertoire of methods and practices in HCI through a material lens (Wiberg, 2014). Previous works in "Organic User Interfaces" (OUIs) (Holman and Vertegaal, 2008) and "Shape-changing Interfaces" (Coelho and Zigelbaum, 2010) have attempted to embed computational techniques into tangible materials. Materials utilised in those interface designs are programmed to adapt, deform, and reform in a responsive manner, which operates a selected function temporarily and dynamically, to fit the user's demand. Such material-centred design approach expanded the range of materials involved in HCI, from robust and static to soft and malleable, and even disappearing ones. The most demonstrative research area that considers ephemeral materials as a class of the design element is Ephemeral User Interfaces (EUIs), introduced by Döring et al. (2013), who defined EUIs as follows:

> *Ephemeral user interfaces are a class of user interfaces that contain at least one UI element that is intentionally created to last for a limited time only. The durability of the UI element is determined by its intrinsic material properties in combination with its surrounding*

> *ecosystem. While their ephemeral UI element(s) exist(s), ephemeral user interfaces provide a rich and multisensory user experience. They may deliberately be designed to offer only partial or imperfect user control.*

Döring et al. applied various perspectives to classify EUIs; the purpose of the material selection; the state of matter; types of interaction; causes of disappearance; the durability of materials. Their proposal of EUI expanded the viewpoint on material-centred user interface design, but a too broad classification resulted in the vague distinction between EUIs and TUIs incorporating naturally decaying materials for sensory experience.

This chapter offers a general overview of the topic of ephemeral interaction design in HCI, ranging from physical materials to digital information and also to experiences. As a conclusion of the literature review, the last section of the chapter will illustrate the gap in knowledge in the area of ephemeral interaction design and reiterate the research question.

2.1. Ephemerality in HCI

In the following, I aim to contrast 'ephemeral interaction design' with 'interaction design that employs ephemeral materials'. The former focuses on the transient nature of materials, which integrates partially predictable and vague accuracy of the material performance into the design of ambient displays and media that resides in the user's periphery. The latter introduces previous works focused on other physical properties of ephemeral materials such as transparency and intangibility (touch through-able) to design multi sensory and playful experiences.

2.1.1. Ephemeral Materials

2.1.1.1. Transiency of the materials

Soap bubbles are one of the popular ephemeral materials that we can easily gain a general knowledge about its characteristics – highly fragile, unstable, and ungraspable. It is a useful material to demonstrate the concept of ephemerality and the ephemeral interactions. Bubble Cosmos (Nakamura et al., 2006) and Soap Bubble Interface (Sylvester et al. 2010) demonstrate multi sensory, tangible, and ephemeral interfaces with smoke-filled soap bubbles. Both utilise ultra-thin soap bubbles to seize the ungraspable smoke as a visual effect of interaction. Bubble Cosmos enhanced the sensory experience with free-floating bubbles while projecting an image onto the bubbles and smoke, while Soap Bubble Interface demonstrated the potential of tangible interfaces with an extremely vulnerable material. Sylvester et al. implemented Soap Bubble Interface to broaden the "inquiry of materials" for tangible user interfaces in the playful interactions, where accurate manipulation is unnecessary. Soap bubbles and smoke are created for the sake of their short lifespan, unable to be retained naturally, and the behaviour is vaguely predictable. Therefore, those materials are widely applied in artistic, performative expressions rather than in practical applications that require a planned manipulation.

An exceptional example is SensaBubble (Seah et al. 2014), a mid-air display system. Information is presented both temporally and multimodally. The system generates smoke filled scented bubbles with an image or a text projection to convey information via multi-sensory modalities. Seah et al. illustrated a systematic exploration of the multimodal interaction and introduced a range of contexts such as in education and entertainment where an information projected bubbles can effectively be implemented as an ambient display. Ephemeral materials such as soap bubbles are very efficient to heighten user engagement at the instance of the experience. However, the partially predictable and uncontrollable nature of the material gently pushes its applicable area into ambient and peripheral settings or in the field of arts.

In the field of Ephemeral Art, artists have endeavoured to unveil the beauty of nature and to craft natural materials into sculptures that grow and decay within a given period of time. Typically, materials from nature, such as earth (Jim Denevan – Ephemeral Land Drawings[4]) and snow (Simon Beck – Snow Art) have been employed for artistic expressions that last no longer than few days and are eventually disappear by environmental factors over time. Moreover, in ephemeral interface design, the range of materials is broader that includes semantic meanings (Döring et al. 2013). It focuses on the material usage in a certain historical, cultural, environmental context. ThanatoFenestra (Uriu and Okude, 2010) demonstrated the ensoulment of deceased family members into semantic meaning of an ephemeral material – in this case, candle wax – and ritualistic behaviour around it. The system is derived from Japanese traditional Buddhist rituals, a family altar designed for people to remember and pray for their ancestors. It incorporates a projection screen and candle wax. Vulnerable candle flames and decaying candle wax are design elements that affect both temperature and duration of the experience. The system senses the movement of candlelight using two light sensors and senses temperature with a thermocouple sensor. The sensor data affects the stability and transparency of a projected image. The unstable candle flame and volatile candle wax resonate with the

[4] http://www.featherofme.com/jim-denevan-ephemeral-land-drawings/

projected photo of the deceased family member, illustrating that it is a representation of transient imagination. This work efficiently combined the concept of ephemeral spirits with traditional physical rituals by incorporating digital technology.

On the other end of the spectrum of ephemeral materials, the deduction of some materials comes from the user's intentional use. Food and consumable goods are in this class of materials that are made for the sake of eating and consumption. HCI has also recognised food as a material for an edible interface design, which is usually utilised for short lasting experiences. LOLL*io* (Murer et al., 2013) is an interactive lollipop that changes the flavour of the candy dynamically while playing games. The LOLL*io* is a prototype composed of a candy and a handle that contains an edible taste compound, i.e. high concentrations of a sour liquid. It was developed to explore the possibilities of the taste in enhancing playful game experiences. However, I would argue that this work also shows the potential that an edible material can be designed in the form of a disappearing interface when the act of eating is intended for a specific user experience.

Grimes and Harper (2008) proposed an existing and prospective design space for HCI in the area of human-food interaction. They focused on positive and celebratory aspects of food in our social, cultural life – eating, sharing, gifting – that can be enhanced by digital technologies. Foods and consumable goods are closely related to our everyday context. Thus, interactive devices and services are more likely to emerge from and permeate into daily use. It is notable that HCI researchers recognised food and cooking as a domain where digital technology could bring a new design space for gastronomy (Zoran and Coelho, 2011). Zoran and Coelho presented Cornucopia, a new concept of digital gastronomy. They introduced three conceptual machines for the digital fabrication of food to discuss how to control the essential elements of cooking: *mixing* the ingredients, *modelling* food shapes, and *transforming* the status of one food to another. HCI has expanded its viewpoint towards food, considering its potential beyond a design material. Recent research shows that food has gained focus as a medium that triggers social interaction throughout the process

from preparing to consuming. Following this, Wei et al. (2014) recognised food as a social communication medium and investigated the uniqueness of edible social messaging, which had a positive influence on social bonding.

2.1.1.2. Other physical qualities of the ephemeral material

There is another design approach in HCI which sees the value of the ephemeral material not in its transiency but in other physical qualities. This design perspective focuses on maximising the intangibility or transparency of the materials while resisting the ephemerality. In this manner, the materials have been incorporated in the design of robust and functional applications. As in the previous section, soap bubbles had frequently been used in playful and ambient interaction systems. However, an alternative form of the soap bubble enables different interactivity. Colloidal Display (Ochiai et al., 2013) incorporates soap film as a display surface that whose fragile nature of a thin membrane has been complemented by focused ultrasound and a structure design that keeps the soap film alive by dropping the liquid like a waterfall. The focused ultrasonic wave deforms the reflection and deformation of the display that enhances the stability of the soap film and the visibility of the projected image.

Air or air flow (e.g. wind) is a design element that has the property of both ephemerality and intangibility. Aerial Tune (Alrøe et al., 2012) is a physical collaborative interface employing a series of air flow installations to lift balls in mid-air that can be individually manipulated as an interface medium. Each ball has been assigned to a different sound, which can be tuned by the height of the ball. The system creates an ambient soundscape with a series of levitating balls in mid-air. The invisible and intangible air flow generates a new musical experience through *non-immediately-graspable* tangible interfaces.

Similar to the air stream, fog is also a useful design medium, especially for interactive screens. Fog is a cluster of moisture particles that diffuse light, which is a useful feature that makes a penetrable display. Interactive FogScreen (Rakkolainen et al., 2005) illustrates how thin air with a little humidity becomes a projection screen that visualises images in mid-air. Users can touch and walk

through the screen that offers a novel interaction for the artistic and aesthetic experience. As in FogScreen, soft and malleable properties of ephemeral materials have been widely used in designing performative and artistic experience, as well as playful interaction. Koleva et al. (2001) presented Desert Rain, an art installation featuring a water curtain, designed for mixing virtual and physical reality space. It is similar to FogScreen in the sense that users encounter a virtual world projected onto a screen made from a thin water spray. A similar but more pragmatic application is MisTable (Martinez Plasencia et al., 2014), a multi-touch mist display for multiple users. It is a table-top system that incorporates a see-through-able and reach-through-able (vertical) fog screen at each side of the table, with a conventional (horizontal) touch display at the centre. In each side of the table, a vertical fog curtain forms a personal interaction screen. A user interacts with the projected content on the fog and being able to push through and drop down onto the touch display to make it visible to other users. The fog screen also has the capability of visualising 3D contents with direct 3D gesture interactions. It seems that physicality of ephemeral materials is useful in creating traversable interfaces (Koleva et al., 2000), which generates the impression that virtual and physical worlds are mixed and joined.

Related works introduced in this category have utilised the physical quality of ephemeral materials – i.e. transparent, traversable, non-graspable – rather than ephemerality, in the design of novel interaction techniques and systems.

2.1.2. Ephemeral Phenomena

This section will review related works on how 'the quality or condition being ephemeral' has seen from and incorporated into HCI. Some ephemeral design elements cause a controversy in the classification of materiality. Sunlight, temperature, and wind are, strictly speaking, not in the material category. But they are considered as design elements that derive ephemerality in interaction and experience. Ephemerality is not only the characteristic of material but also recognised as a feature of phenomena or environmental conditions that change

over time. Responsive architecture which refers to a class of architectural structures that can dynamically transform their shapes and/or appearance (Takeuchi, 2014), explicitly incorporate ephemeral phenomena, such as climate change, the wind, and temperature. Such interactive structure embeds functions that associated with the passage of time. For example, a building architecture that utilises the movement of the sun is designed to adapt to the intensity or angle of the sun for certain functionality or to express a momentary beauty by dynamically transforming the building facades in response to the state of the sun (Figure 4).

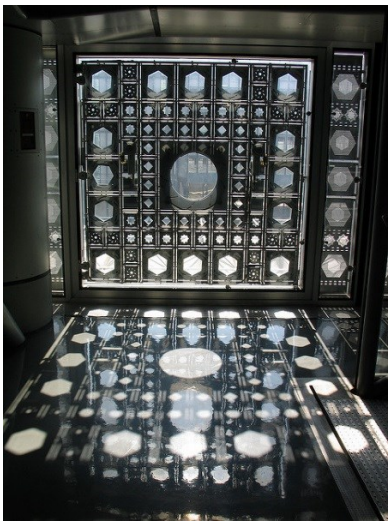


Figure 4. Jean Nouvel's L'Institut du Monde Arabe in Paris, France. The mechanical irises are open and close in response to different light conditions during the day. (Image from https://www.flickr.com/photos/batigolix/455820463)

SolaColor (Hashida et al., 2011) demonstrates a scheme for space design that utilises sunlight and photochromic material to visualise time-varying patterns evolving with the movement of the sun. Sunlight is not a material and rather seen as a temporary state of the sun that shapes user experience. Likewise, the temperature is the temporal quality of a material that can be easily affected and altered by environmental conditions. Thermal Interactive Media (Mine et al., 2011) presents a new form of tangible user interfaces that enables manipulation of the video stream by physically mixing water at different temperatures.

Also, growing or evolving artefacts and living creatures visualise a physical status that changes through time. Therefore, entailed interaction becomes available only at a certain stage. For example, the height of a plant or colour of leaves can be mapped to the computing system (e.g. computer vision) that extends user interaction with plants. Plantio (Kuribayashi et al., 2007) and plant interaction (Steer et al., 2015) depict the interaction between humans and living plants. The interaction has been designed not only for the growth of the plants (physically increased size) but also increasing emotional attachment in the relationship between humans and plants. Plants have been introduced in HCI to investigate ambient and peripheral interaction. The activity around plant growing is already a common domestic practice that is often routinely conducted. However, the growth of the plant is unrecognizable, often because it is slow and steady. But plants can be employed in the design of highly expressive interactive technology. For example, Poupyrev et al. (2012) introduced 'Botanicus Interacticus', an interactive plant that recognises a precise and comprehensive set of gestures by a camera-based device (e.g. Kinect) and is designed to exhibit unique interaction constraints and affordances. Therefore, the living plant becomes responsive to human presence, touch, and gestures. In contrast to the plants for ambient displays, Botanicus Interacticus requires constant user engagement, care, and focus on the growth of the plant.

Furthermore, the ephemerality of a design element gets reinforced when the alteration occurs at an instance, rather than through a gradual change. Bit.Fall (Popp, J. 2004) is a network-based installation that physically visualised words using falling water droplets. Individual droplets are designed to fall directly to the floor in a precise configuration, which displays a word in mid-air only for a second. Within the Bit.Fall installation, the experience becomes ephemeral due to the mechanism of the system and natural environmental conditions such as gravity and the properties of water.

So far, I have reviewed literature that incorporated ephemerality in HCI, expressed by materials or by phenomena. In the following, I will consider HCI literature that focuses on designing temporal experiences and shaping short-

lasting but impactful experiences. Also, I will concentrate on the association between the concept ephemerality and the experience of practically functional systems and robust interactive applications.

2.2. Ephemeral Experiences in HCI

It is not only materials or physical phenomena that fleet within in a range of time but also our experience with products and systems can be deliberately designed to last for a given period. The temporal existence of an artefact or a function may result in 'ephemeral user experience'. HCI researchers have begun to investigate short lasting user engagement with digital devices (Odom et al. 2009), obsolescence of digital materials, and suggested implications for the design of durable digital possessions (Sellen et al. 2009). A considerable proportion of current ephemeral UIs is regarded as interfaces that operate in an ambient or peripheral mode. From its inception, the field of ubiquitous computing has been concerned with removing the computer from the direct focus of the users' attention, by instead embedding it into the surrounding environment (Weiser, 1999). At first glance, the transitory and somewhat immaterial nature of ephemeral interfaces – information being present on demand and fade away – appears to align with this notion of ambient experience. This has led to a surge of interest in HCI in new forms of interfaces that are variously described as, 'calm' (Weiser and Brown, 1997), 'invisible' (Weiser, 1999), 'unremarkable' (Tolmie et al., 2002) or 'slow technology' (Odom et al., 2012a). These terms imply that interactions are becoming less explicit to the users. Moreover, these themes might not have encompassed the ephemerality from the inception of design. However, I see the information being present on demand and otherwise disappear, aligns with the concept that information (digital material) being ephemeral. Presentation of ephemerality can be varied, ranging from milliseconds to few minutes, or days (Döring et al. 2013).

In following sections, I speculate ubiquitous computing through the lens of ephemeral interaction design. To begin, I will review Calm Technology (section 2.2.1) and its implications for ambient and peripheral interactions facilitate a short lasting experience with practical systems.

2.2.1. Calm Technology

Calm technology aims to operate at both the centre and periphery of our attention by moving information back and forth of our cognition (Weiser and Brown, 1997). Calm technology and ambient media (Ishii and Ullmer, 1997) have been proposed and developed as a potential resolution to the surge of interactive media operating in our surroundings such as PCs, mobile phones, and TVs that simultaneously and continuously demand our attention. It proposes interactive media to reside at our peripheral environment and constantly feed contextual information but without the constant demand of cognition (Hallnäs and Redström, 2001). A portion of work in Tangible User Interfaces (Ishii and Ullmer, 1997) have successfully established and facilitated the calm interaction beyond screen and mouse based functional computing. AmbientRoom (Ishii et al., 1998) has shown a clear vision of calm technology incorporating tangible UIs. It explores the seamless integration of users, digital information, and physical space. Users engage with the ambient media while their awareness of information moves back and forth of their cognition, but unconsciously. Ambient interaction in ubiquitous computing environment demonstrates a design approach towards 'unremarkable computing' (Tolmie et al., 2002). It attempts to make a computing *perceptually* disappear when not in use. Previous works explored that ephemeral and immaterial properties of tangible materials efficiently provide information in our peripheral environment. The Information Percolator (Heiner et al., 1999) demonstrates an ambient display that has been designed to present information with air bubbles floating up tubes of water, installed in the periphery of the user's attention. Information explicated by the air bubbles comes forward, recognised by the user, when appropriate and desired. Otherwise, it stands as an ambient installation. Ephemeral representation of data is efficient for an ambient sensory experience that does not last, which aligns

with the design approach of calm interaction. Physically visualised information that fleets to the background when not demanded would enrich ambient interaction in a tangible manner.

2.2.2. Slow Technology

We are surrounded by a myriad of interactive devices that are being created, consumed, and replaced faster than ever before. HCI communities have begun to concern themselves with how the varying presence of interactive technologies shapes people's everyday values and experience, as well as lives in the future (Odom et al. 2012). Hallnäs & Redström (2001) argued that technology could become part of our everyday environment by embedding *slowness*, solitude, and mental rest. They propose design guidelines for slow technology: *(i) focus on the slow pace of appearance and presence*; *(ii) focus on aesthetics of materials*. They argue that the design should allow users to have time to reflect on the material expression of the technology. In this regard, 'slow technology' takes a different perspective towards the computer, which was previously regarded as a task-oriented tool. Longevity transformation of the material quality of a classic design object may derive a series of different temporal experiences. Also with an interactive product, Mazé and Redström (2005) argued that designers needed to understand each object as a composition of both spatial and temporal form. However, it is not only about the mere integration of digital information with our peripheral surroundings in a spatial manner. Slow Technology also has a value in promoting aesthetics of interaction while allowing critical reflection towards the value of the technology and essence of human-computer interaction (Odom et al. 2012).

The general research agenda in the lineage of Slow Technology has attempted to investigate issues of designing interactive systems to support long-term usage for slower and less consumptive lifestyles (Odom, 2015). However, this PhD views Slow Technology from another angle that features a semantic implication of ephemerality. Focusing on how the user attachment grows towards technology in accordance with the tear, wear, and ageing of the device, designers

may explore how to employ the 'patina' in the design of digital interfaces and devices. Interactive artefacts that change its temporal presence, for example, employing growing plants in an interaction (Kuribayashi and Wakita, 2006; Steer et al., 2015), might generate a series of different temporal experiences throughout the plant's lifespan. Related works that employed ephemeral qualities of the environment or materials might also enable slow and reflective tangible experiences, while the interaction lasts for a short duration.

2.2.3. Sustainable Interaction Design

In accordance with Slow Technology, Sustainable Interaction Design concerns itself with the obsoleteness of information appliances as a design challenge (Blevis, 2007). Blevis argues that invention of new software demands premature disposal or obsolescence of physical devices. Similarly, Odom and Pierce (2009) point out that interactive technological artefacts are often discarded well before the functional lifetime of the devices. The researchers examined the difference in the user's attachment towards digital and non-digital artefacts at home, as well as their perception of quality over time. The focus of the study has been put on developing a novel approach to extend the usage of digital artefacts and achieve durable user interaction. Moreover, HCI researchers often responded to the discourse of sustainability with the concept of reducing consumption (Huang and Truong, 2008) or prolonging the lifespan of digital artefacts (Odom et al., 2009; Odom and Pierce, 2009).

However, obsolescence can be observed from a different perspective. Materials that explicitly transform their quality during the time of usage might enable designers to deliberately program the lifespan of the tangible form to match the expected functional obsolescence. Tsaknaki et al. (2016) recently opened a workshop to build a rich lexicon for the material and temporal qualities of ageing, decay, degradation, and obsolescence with researchers from the fields of design, HCI and anthropology. It is noteworthy that impermanence of technology is being considered as a resource for design, use, and maintenance of computing artefacts. Within such an approach, the interrelation between physical artefacts

and digital functionality might engender attachment to the artefacts that provoke care and apprehension (Lomas et al., 2013).

2.2.4. Designing Ephemeral Media and Interfaces

Ephemerality has also gained prominence as a feature of interaction that expanded the design space of ubiquitous computing technologies in our everyday life (Bannon, 2006). Recently, HCI researchers have begun to challenge the persistence of digital data by incorporating the concept of 'forgetting' in interactive computing (Sas & Whittaker 2013). The conventional task-oriented design approach in HCI has led to a considerable engagement in developing interfaces that elicit cognitive attention while interacting with digital contents. HCI is replete with studies of and frameworks for managing attention and distraction intending to support particular tasks, multitasking, and managing distraction and workload (Carroll, 2003; Monk and Gilbert, 1995). In this vein, HCI scholars paid attention to the ephemerality of human communication, emotion, and memory alongside interactive computer systems. In the early days of developing user interfaces for social communication systems, emotions such as confidence, confusion, pleasure, and dependency in human-to-human interaction had been taken as kinds of a reference (Tsukahara and Ward, 2001). Tsukahara and Ward developed a semi-automated tutoring-type spoken dialogue system to investigate whether the human ability to pick up and respond to the other's subtle and fleeting internal state is worthwhile for human-computer interfaces. CSCW communities have focused on supporting collaboration across time and space. At the beginning of the last decade, the flexibility of work and mobile office spaces became a new design challenge in CSCW. Bødker and Christiansen (2004) recognised a gap in the knowledge of the 'ephemeral and prototypical social life', and 'pervasive formal structure of industrial workspaces'. They acknowledged that one's experience of the workspace is temporary and social encounters are also ephemeral, which is an increasing trend due to the design and research of mobile devices such as mobile phones. It is notable that the ephemerality is not only a characteristic of physical materials

but also a conceptual framework that is often used to interpret user experience in a certain context.

Visual disappearance is relatively easy to implement in computer screens, so-called GUIs (with responsive pixels). Findlater et al. (2009) introduced ephemeral adaptation interfaces that employ an abrupt and gradual onset to predicted menus, which then gradually fade away. The aim of the system is to draw user's attention to predicted menu items and improve menu selection performance. Findlater et al.'s work reflects that the ephemeral interface has been considered in building interactive systems to induce the user's focus which aligns with the design approach of this thesis.

More recently, the concept of 'ephemeral data' (Shein, 2013) has been adopted in the design of social interactions on mobile phone communication. Snapchat is a demonstrative example of ephemeral messaging apps that make data ephemeral through default deletion. Forgetting, deleting, and ephemerality of digital data has gained serious attention, in terms of privacy, against some popular Social Networking Services (e.g. Facebook, Instagram, and Twitter), where persistence of data is the default (Mayer-Schönberger, 2009). Xu et al. (2016) investigated how people perceive the affordance of default deletion in Snapchat, their motivation of using the app, and how they reflect on their own experiences. Xu et al. employed Snapchat as a lens through which ephemerality might benefit the design of interactive communication systems. This led the authors to propose three dimensions of ephemerality: mechanisms of implementing ephemerality (interface or content), degrees of ephemerality (range of time), and ephemerality of network tie (contacts). The research highlights that it is not only contents that might benefit from ephemerality, but also undesired personal networks might efficiently fade away with time.

So far in this chapter, ephemerality in HCI has been scrutinised from both angles, tangible and digital interface design. The literature revealed that ephemerality is not a new concept in HCI, and it has been interpreted in many, subtly different ways (Xu et al., 2016). Background review inspired a deliberate design choice

of ephemerality – in the duration of interface, content, and experience. I believe that the deeper investigation into the field will engender new design opportunities across the field of HCI. In the next chapter, I will pinpoint a gap in the knowledge identified from the literature review and explain the research question that will be investigated throughout this thesis.

2.3. Gap in knowledge

The literature review offered an overview of the research in ephemerality that has been inclined towards the design of ambient and peripheral interactions. Moreover, design artefacts employing ephemeral materials tend to show artistic expressions rather than conveying practical functions. HCI researchers have invested considerable efforts in the design of functionally robust and durable systems. In this regard, the notion of ephemerality and ephemeral materials has been considered less useful in task-oriented applications. Thus, its positive implications have surfaced only recently.

At the beginning of this PhD research, I was inspired not only by the visual performance of ephemeral things such as disappearance of mist and soap bubbles. I have also assumed that transiency and time limitedness of physical materials or digital data might engender heightened user experience with interactive media. Ephemerality can be judged by the inherent structural weakness that causes fragility and delicacy. When interacting with ephemeral interfaces directly, for example, trying to peer into them or touch and manipulate them, might, in fact, command a significant amount of attention. In short, ephemerality could become a driver of highly focused and possibly even suspenseful interactions. From the literature review, I find that this aspect of user experience with ephemerality has not been investigated in HCI and interaction design in a comprehensive manner.

Ephemerality enables the user to engage in highly attentive forms of interaction, in which they become intensely focused on an ongoing experience. As in ThanatoFenestra (Uriu and Okude, 2010), which employs candle light as an interface medium, the feeble candle flame might attract the user's focus to maintain the system in operation. Beyond attentive experience, this might lead users to experience tension and suspense as explored in previous breath-controlled interfaces (Marshall et al., 2011), or perhaps even anxiety that might generate thrill (Walker et al., 2007). Furthermore, it would even lead to a design strategy that deliberately incorporates uncomfortable interaction as a driver of powerful social user experiences (Benford et al., 2012).

The literature review so far has unveiled that HCI employed ephemerality to reside in the background of interactions as an ambient display or peripheral interaction. Little has been investigated on interaction techniques or contexts that utilise ephemeral materials in the foreground of the interaction. Moreover, in TUIs, or even Ephemeral UIs have not yet explored about delicacy and fragility of ephemeral materials as a modality of user interaction. Furthermore, while the specific physicality (e.g. transparency) of ephemeral materials has been employed in the design of practical, interactive applications, ephemerality (e.g. short lasting feature) has not been exploited for practical means of HCI that could permeate into our everyday life.

Therefore, this thesis investigates the following research question – *"How can ephemeral materials be harnessed in the design of products and services to enhance our ordinary experience?"* Firstly, it is still doubtful which interaction modality might be captured and be useful to employed with ephemeral materials if they are not considered ambient and/or peripheral? Might such materials be usefully integrated into robust applications beyond artistic representations? In this respect, this thesis attempts to investigate; *1) how can ephemeral materials be applied in a controllable manner when designing interactive artefacts;* and *2) in which context might ephemeral materials be useful to enhance an interaction entailed in common and ordinary experiences*. The former inquiry will be elaborated in Chapter 4 by an exploratory design study that focuses on the manipulation of a fragile material, which suggests delicacy as an interaction modality to be exploited in designing ephemeral media. The latter will be explored in the second design study (Chapter 5 and 6), which grounds the findings from the first study and proposes a design application that benefits a context close to our ordinary experiences. In prior to describing the details of each design study, the next chapter will describe research methods employed throughout this PhD.

Chapter 3

3. Methodology

> *"... Designers focus on the creation of artefacts through a process of disciplined imagination, because artefacts they make both reveal and become embodiments of possible futures..."* (Zimmerman and Forlizzi 2008)

The overarching methodological approach of this PhD is Research through Design. Formalised research methods that involve a structured user study or interview, have been adopted in parallel to design practices. Interdisciplinary nature of contemporary HCI and *complexity of design* (Stolterman (2008) defined the term as the "*complexity a designer experiences when faced with a design situation"*) suggests mixed method as an appropriate approach towards a problem situation (Koskinen et al., 2012; van Turnhout et al., 2014). In what follows, Research through Design is outlined in regard to the research approach adopted in this thesis and details of the specific methods applied in each design study are explained in the later sections.

3.1. Approach

Christopher Frayling (1993), in his paper 'Research in art & design', made the three categories of research in art and design: Research into art and design, Research through art and design, and Research for art and design. In respect to this thesis, 'Research through art and design' accounts for which design (or art) becomes the means of the research and communicating ideas and results. HCI has recognised the *Research through Design* (RtD) as a method of inquiry in interaction design research that involves practice-led design activities (Zimmerman et al., 2010). Although the validity of RtD as a formalised research method is the subject of an ongoing debate among HCI researchers, it is widely practised as a research method in both design and HCI communities. RtD has yet to be established as a generalizable principle that brings generative research

method, it does, however, put design practice at the centre of the research process (Koskinen et al., 2012). Zimmerman et al. (2007) followed by Gaver (2012) noted that RtD has widened to encompass a diverse set of practices. Zimmerman et al. regard it as a model for interaction design research in which experienced designers attempt to make the *'right thing'* to change the world to an ideal state. Therefore, designers in diverse disciplines explored RtD as a process of ideating, iterating, and critiquing. Gaver discusses this diversity of practices and notes how, in contrast to some accounts of the scientific process, RtD may produce theories that are provisional, contingent and aspirational. He suggests that the outcomes of RtD may take the form of portfolios of artefacts and systems annotated with 'topical, pragmatic or conceptual' insights. Gaver argues that RtD has the ability to manifest the desired outcomes in the form of conceptually rich artefacts.

Design research often lacks formalised research methods and a unified vision of how designers can contribute to HCI research (Zimmerman et al., 2007). Hence, design researchers often borrow methods and theories from other science-oriented disciplines to validate thought-provoking perspectives within broader academic communities (Rogers, 2004). For example, Gibson's ecological psychology influenced some researchers within HCI who investigate the interaction between human and artefacts, or the environment that the artefacts are situated in. This encompasses notions such as affordances (Gaver, 1991; Norman, 1988), contexts (Kirsh, 2001), and situatedness (Rogers, 2004). Interaction design researchers often engage in RtD through conceptual works that highlight important design considerations, dimensions of similarity, and design guidelines (Gaver, 2012). Other researchers put the design artefact forward to demonstrate their philosophy of the preferred state. This, in turn, opens up a new design space within the research domain (Gaver and Martin, 2000). This approach has been adopted by many practice-based design researchers (Pierce & Paulos 2015; Odom 2015).

This thesis also builds on and contributes to the RtD approach by introducing frameworks and artefacts to demonstrate various concepts. Furthermore, this

PhD adopts standard HCI research methods, such as user study, interviews, prototyping, and evaluation, to envisage the outcome of RtD in real use cases. While drawing on an industrial design background, the design activities carried out in this PhD fall under the domain of 'form-giving'. Form-giving is concerned with the external appearance of products, while also factoring in functionality, ergonomics, and usability in order to meet the user requirements, which also makes relevant for computer interfaces (Smets et al., 1994).

In this PhD, ephemerality has realised by incorporating delicacy into a physical interaction media. The process of designing a physical prototype thus constitutes a substantial portion of my research. Not only does this process visualise and communicates ideas, but it also allows me to propose a concrete design problem that matters to the wider research community. Thus, the artefacts designed and employed in RtD, are embodiments of concepts and technical opportunities (Zimmerman et al., 2007). Thus, the design outcome speaks for itself and encourages other design researchers to engage in the new design space, both conceptually and practically.

In respect to design in HCI, Fallman, D. (2003) argues;

"Design is a matter of making: it is an attitude to research that involves the researcher in creating and giving form to something not previously there."

The resulting artefacts of this PhD embody the design process, addresses my research question and partially verifies the proposal of the preferred future. Design activities were involved at every stage of this PhD, in different forms. *'Sketching'* has initiated the provocation of the concept in the identified design space. *'Prototyping'* was employed as a method of synthesising materials and generating forms, and '*Iterative Development'* process was conducted to refine selected design elements of the desired experience, which finally lead to *'Evaluation'* of the designed artefacts and frameworks. Especially, sketching and prototyping are not necessarily planned research activities that often expressed as an intervention in due course of idea provocation. Throughout this

PhD, conventional research methods that pivoted on the user-centred design have conducted in parallel with design practices (see Figure 5).

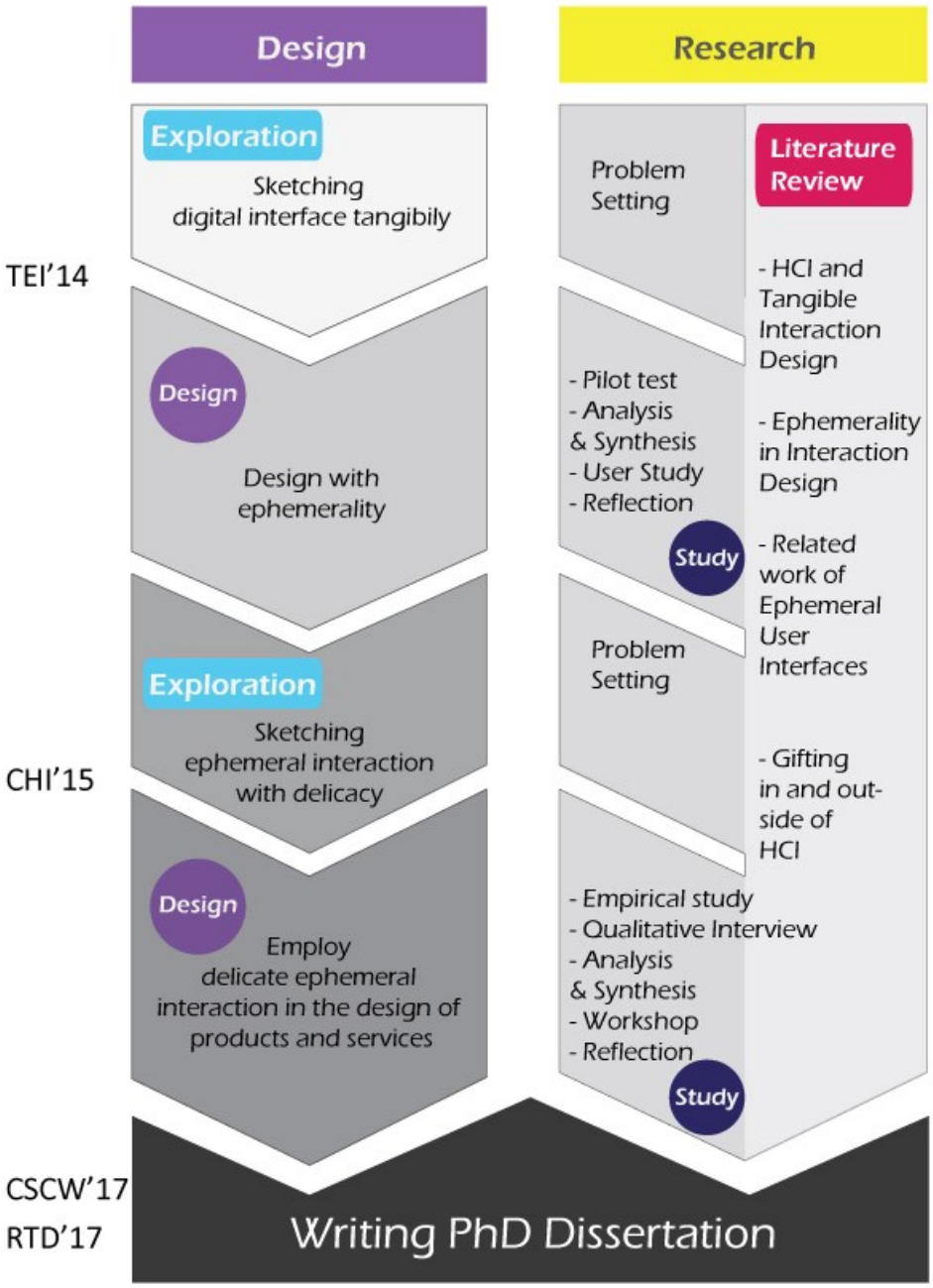


Figure 5. The flow of research and design process undertaken during this PhD.

Following Fallman's account of HCI as a design discipline that promotes prototypes as a contribution, this thesis also emphasises the resulting artefacts as

a contribution of this PhD. In the following sections, I will delineate important features that constitute the design-oriented nature of this PhD.

3.2. Methods for Design-Oriented Research

3.2.1. Problem Setting

Following Schon's (1984) articulation, problem setting is *"a process in which, interactively, we 'name' the thing to which we will attend and 'frame' the context in which we will attend to them."* In this section, I particularly emphasise the importance of 'problem setting' as a part of the research method. In RtD, framing a problem situation and the related research question is a necessary and important part of the research process. Fallman (2003) emphasised the importance of 'problem setting' in design-oriented research, in which the problem should pose possibilities beyond current paradigm (Schon, 1984). Zimmerman et al. (2007) distinguished the problems in RtD, which broadly consider the human experiences with designed artefacts or systems, from scientific research that concerns efficiency and performance of task completion. The transition in the scope of the investigation shifted the focus of HCI research away from users and usability towards a variety of social contexts that introduce *"Wicked Problems"*[5] (Rittel & Webber 1973), or a 'messy' situation (Schon 1984) in real-world. Researchers agree that the key to solving wicked problems lie not in the scientific principles, but rather in understanding and informing current problem situation and moving to the preferred state by proposing optimal solutions (Binder & Redström 2006). Therefore, RtD approach should put greater emphasis on problem 'setting' than problem 'solving' (Schön 1984). According to Schön, people put the effort in using technical rationality to solve problems that are either not solvable, or not even problems (retrieved from Stolterman 2008).

[5] Rittel and Webber (1973) specified ten characteristics of wicked problems in social policy planning.

This thesis was initially inspired by an attempt to fill the existing knowledge gap in ephemeral interaction design. Design novelty comes from an effort to create an artefact that did not exist before (Nelson and Stolterman, 2012). The creative process of synthesising materials, form factors, and interfaces are intertwined into resulting artefacts that express delicacy through ephemeral interfaces. Moreover, to further illuminate the practicality of ephemeral interactions in the real world, it is vital to find a context that currently matters and can potentially be enhanced by the artefact that entails an ephemeral and delicate experience. In this PhD, the research questions have continuously been redesigned and refined along with the design process.

3.2.2. Building a novel interactive system combined with user study

Chapter 4 illustrates the explorative design process by building a novel interactive system. The aim of the first design research was two-folds: designing ephemeral media with applications that would benefit from the fleeting quality of the material; and via a formalised user study, explore 'delicacy' as an interaction modality that has the potential to reinforce user experience. Through the design practice, the ephemeral interaction has tangibly implemented through an iterative process of design and study. The purpose of the study is in investigating whether ephemeral materials have potential in expanding the design space of HCI by incorporating delicacy in the user experience. More specifically, the objective of the research is to extend the use of ephemeral materials in a controllable manner so that it could be utilised in practical applications.

In design research, the prototyping process, as well as the prototype itself embody theories or "physical hypothesis" (Koskinen et al., 2012) to be tested with users. Also, in some disciplines that investigate human sensory motor skills, physical prototypes are often built so that participants could perform simple tasks. However, little has been said about sensory features of prototypes that are

important to designers such as, colour, shape, and texture of materials, which often generated from designer's intuition and skills. In this PhD, physical prototypes are of particular importance as they are the carriers of provocative ideas, thematic, and practical insights, and also influencing the research process. In this regard, the prototype designed in Chapter 4 constitutes the research question, method, and as well as the hypothesis that is to be evaluated in the course of the user study. In the study, as in other design-oriented research in HCI, the prototype served as a means through which to gain the knowledge (Fallman, 2007) about how people engage with the artefacts within the given frame of the ephemeral interaction. The focus of the user study was put on observing how people perceive and experience the augmented ephemeral materials. This, in turn, allowed me to propose design implications that expanded the scope of use of ephemerality in building practical applications. In so doing, instead of a structured usability test, a setting that resembles realistic situation was regarded more appropriate to observe how users confront interactive artefacts.

3.2.3. Design explorations combined with qualitative research

In the second design case study, the research perspective had widened to ingrain the concept of ephemerality with delicate interaction in our common experiences. Also, framing a specific design space in which the delicacy and ephemerality will attend is the process that narrows down the research focus into a domain of *"digital gifting"*. In this section, I will introduce the outline of the methodology applied in the second design research.

Design research in Chapter 5 demonstrates a mixed method in a series of qualitative interview study, design (prototyping), followed by a design workshop (for evaluation/probe). During the interview study, quantitative data were also collected that annotated by participants. The quantitative data underwent an empirical analysis to gain statistical reasons that firmly ground the problem space. Additionally, qualitative interview data enables rich understanding of the design space in the realm of digital gifting.

Additional background and literature review was necessary to gain an extensive understanding of the topic: Gift Exchange. In turn, this led to propose a conceptual framework, which was employed as an essential research tool throughout the study, from data collection to analysis. Chapter 5 unveils how digital gifting was experienced among general smart device (e.g. smart phone, tablet, and computer) users. In RtD, the prototypes should synthesise the research findings and realign existing technology and materials that no one had examined before (Frayling 1993). After gaining a comprehensive understanding of the design space, I argue that designer's creativity should be involved in materialising the findings and insights as a 'physical hypothesis'. Therefore, based on the study findings, I delivered prototypes that were designed to tackle one area of gifting, *wrapping*, among many others. The prototypes were probed in a design workshop to catalyse discussions about the topic of wrapping in digital gifting.

So far, I have emphasised the importance of design practice and artefacts as a part of research methods also, as a research tool, in this PhD. In the rest of this thesis, I will illustrate how the artefacts have been emerged and applied in the research to investigate the problem spaces.

Chapter 4

4. Design with Ephemerality

This chapter illustrates a design-oriented research that exploits the concept of ephemerality from a material-centred design approach. The following section elaborates the design intervention showing how the concept evolved to the design of FugaciousFilm.

4.1. Conceptual Intervention

In HCI, especially in Tangible User Interfaces (TUIs), ephemerality has been initially explored from a material-centred design perspective. The importance of material has been increasingly taken into account in interaction design (Ishii, H. et al. 2012; Wiberd 2013). In respect to material-centred approach, the design intention lies in exposing the physical attributes – texture, form, structure – that tailored in the interface design. Materiality gained significance in the design-oriented HCI research, as it shapes the experience in how users might physically encounter the designed artefact (Kwon et al., 2013) .

In conducting this PhD, I took a similar position with Fallman. D (2003) (see Methodology), which regards design as an act of making or assembling in order to build something that did not exist before. Thus, I began with a conceptual intervention, an imaginative speculation on futuristic interaction design. The aim of the intervention practice is to get inspirational ideas on novel interactive media, rather than to generate a critical discourse about the design from a future scenario (Dunne and Raby, 2013). It was done through physical prototypes of visionary ideas, not just conceptually.

At the inception of TUI, the interface design was often based on the background knowledge of the physical world that we are already familiar with. For example, when a user flips the pages of an e-book by sliding a fingertip on a touch-screen, the relevant graphical user interfaces (GUIs) had been provided to emulate the physicality of a real book. However, the conceptual ‘convention’ may largely depend on regional location and time that it emerged and grounded. Hence, I

began to speculate about the conventions that future generations might have, whose most familiar tools might be smart devices and interactive touch screens. Regarding the interactive digital artefacts are already permeating into every aspect of our daily life, I find that the TUI design approach needs to be carefully contemplated for the development of digital interfaces, which physical equivalents have not existed originally. Thus, I scrutinised digital interfaces that their physical equivalents does not exist, which arbitrarily introduced with digital media. I proposed the physical prototypes of such digital interfaces as a conceptual design practice and workshop. The early exploration had published at TEI 2014, Doctoral Consortium, *"Proposing reverse tangible interaction design",* and discussed at CHI 2014, Workshop - Alternate Endings: Using Fiction to Explore Design Futures.

The initial idea was to design a display, which functions as normal projection screen but also able to be physically disappear when required. Figure 6 shows the idea sketch that opened a design journey with ephemerality.

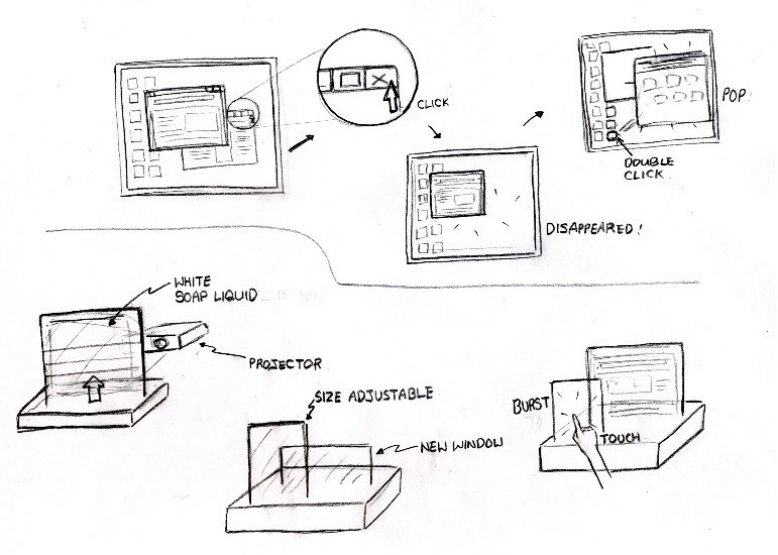


Figure 6. Idea sketch illustrating a tangible equivalent of a pop-up screen GUI. Upper illustration shows the conventional GUI of a pop-up window. By clicking a mouse button, the window screen appears and disappears instantly. Below, an idea sketch illustrates the concept of a physical pop-up screen. Frames in a bowl of soap liquid

rise up to create thin films, which become a projection screens. The window interface on the soap film will disappear on user's demand.

In addition to its fleeting nature as a film state, the soap liquid has many characteristics to materialise the tangible pop-up window illustrated in Figure 6. Soap liquid has colloidal feature, which enables the soap film to be used as a projection screen by defusing an image. The duration of the material is easily modified by changing the portion of ingredient materials in the mixture, which we can easily obtain in ordinary life. Presumably, using commonly encountered material reduces the burden when users form a mental model of the interaction, which makes instruction unnecessary.

In the early stage of the research, sketches and prototypes were designed to look at the technical feasibility of the soap liquid as a design material in developing interactive media. An initial attempt was to get an image clear enough to be identified on the soap film. In order to get a clear image on a liquid film, it is inevitable to mix a small portion of colloidal liquid (e.g. milk). As

Figure 7 illustrates an image projected to the soap-film made of a mixture of washing up liquid, water, and milk. While iteratively producing and interacting with the film, I could notice that the soap film remains intact when touched with a wet finger (

Figure 7– Right) – unlike a dry finger. This experimental finding contributed to a rich repertoire of delicate interaction design with FugaciousFilm, to be introduced later.



Figure 7. (Left) An image of butterfly projected on the colloidal liquid film made of soap liquid. (Right) A finger pushing through the film while keeping it intact.

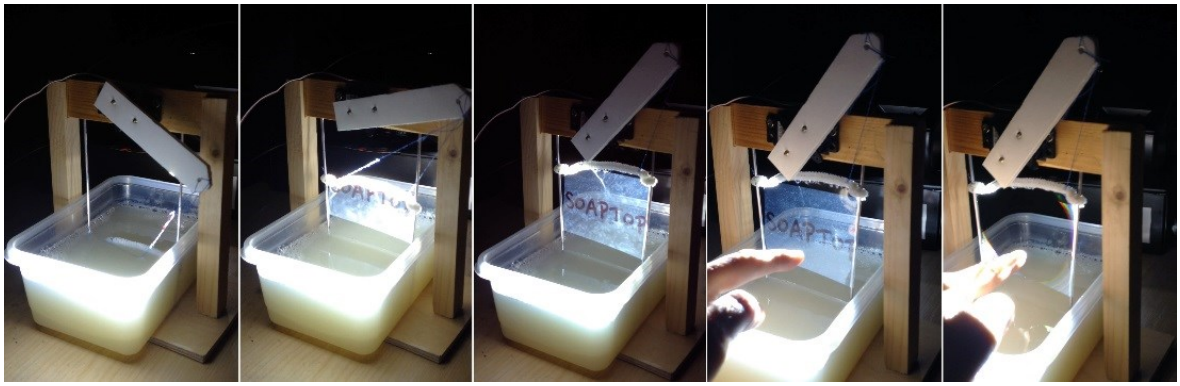


Figure 8. Proof-of-concept prototype demonstrating a tangible equivalent of a digital pop-up window. A screen pops up from the liquid container while an image is projected from the back. When the user touches the screen with a dry finger, the screen bursts and also the image disappears.

As a manifestation of the early idea sketch (Figure 6), I designed a prototype of the tangible pop-up screen with a soap film (Figure 8). Proof-of-concept prototype demonstrates a series of interaction process that shows the practicality of an ephemeral interaction design. The screen can be easily created in any enclosed frames; rear projection reduces interference between the contents displayed on the film and a direct touch interface. The vulnerability of the film can be either incorporated as a design element of ephemeral interaction design or as an obstruction that shapes a challenging experience (e.g., Dominos, Jenga). The proof-of-concept prototype exploited ephemerality from the material-centred attitude and examined a potential of a soap film to be implemented into a robust interface of interactive media.

4.2. FugaciousFilm

After the iterative process of making soap film and prototyping the interactive demo, I moved on to develop a prototype dubbed, FugaciousFilm, a soap film

based ephemeral interactive media. This work was developed in collaboration with Shashank Jaiswal from Computer Vision Lab in School of Computer Science, University of Nottingham, Sue Ann Seah and Peter Bennett from BIG group in School of Computer Science, University of Bristol. The project was originated from the conceptual design explorations that I illustrated in Figure 7 and Figure 8. I suggested the collaboration since colleagues from BIG group had an experience working with soap bubble interaction (Seah et al., 2014). I led and managed the meeting and schedule, designed the assembly of hardware devices, interaction, the graphical interface of applications. Pilot and user study were also conducted by myself. Shashank Jaiswal worked on the part implementing soap film detection and finger detection, and Sue Ann Seah and Peter Bennett contributed in concept development as well as opinions throughout the project. This work has been published as a full paper entitled, *"FugaciousFilm: Exploring Attentive Interaction with Ephemeral Material"* at CHI 2015 in Seoul, Korea. All of the co-workers contributed in paper writing and revising iteratively one after the other. Therefore, throughout this chapter, I will use the term 'we' and 'I' interchangeably to report the research process.

The term 'fugacious' is a synonym of 'ephemeral' defined as, 'tending to disappear' or 'fleeting'. FugaciousFilm builds upon the work on Ephemeral UIs, which 'employ transient materials for tangible interaction with the digital world' (Döring et al., 2013a), takes a stance counter to the conventional computing norm of interface stability, reliability and efficiency. Perhaps due to this conflict between stability and ephemerality, the majority of Ephemeral UIs have tended towards ambient and artistic use scenarios where the fragility is embraced in the design of the emotional experience. Hence, task-based functionality takes a background role. Therefore, in this research, we attempted to focus on finding a design space for non-ambient and more attention driving experience with the ephemeral material.

4.2.1. Prototype Design

Inspired by a previous soap film display, Colloidal Display (Ochiai et al. 2013), we developed a soap film based ephemeral interaction artefact – FugaciousFilm, which took a design approach opposite to that of Colloidal Display. FugaciousFilm exploited vulnerability, fragility, and ephemerality of a soap film in implementing touch interfaces, while Ochiai et al. focused on fluidity, deformability, and reflectivity of the material and conquered vulnerability to support a number of functions as a display. FugaciousFilm system setup is illustrated in Figure 9. The system is technically composed of projection part and a detection part.

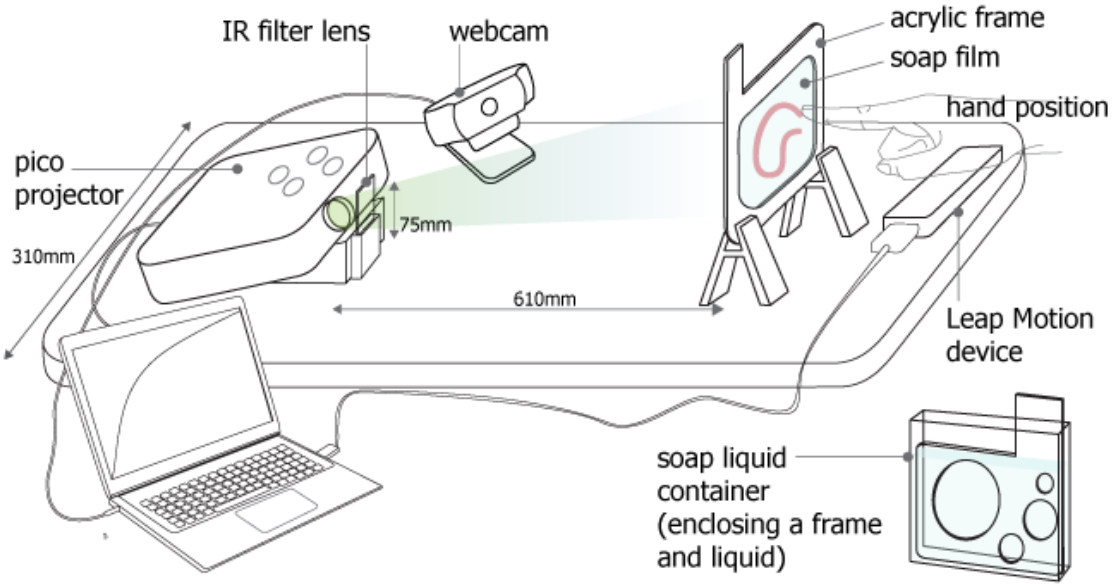


Figure 9. FugaciousFilm system setup.

4.2.1.1. Soap Film

This section describes the property of the soap film; how the projection image becomes visible on the film; and implementation details about interfaces. All of the applications that have been developed in this work were programmed in *Processing*® development platform.

The film is formed of a custom-mixed liquid soap. When the image is projected onto the film, since the liquid contains a fair amount of surfactant particles, the

particles scatter the projected light that enabling the image to be viewed. We created our soap film liquid by mixing white solid soap and glycerine with distilled water. The stability and duration of the soap films can be affected by the evaporation of water from the surface. Glycerine reduces this evaporation so that the lifetime of the soap film increases. The durability increases from seconds to many minutes for solutions with just an additional 5% glycerine and up to hours when the solution contains 50% glycerine (Isenberg, 1978). Although adding more glycerine enhances the strength of the film, it affects visual impact when the film breaks. The film no longer 'breaks' but slowly 'tears'. One of the sensory effects that the soap bubble inherently has is an unpredictable and sudden disappearance. In order to utilize the ephemerality of the soap film in the design of a replicable and functional system, a trade-off had to be considered between the durability of a user experience and a clean 'popping' effect. For the dramatic and abrupt experience, we attempted to balance between the duration and 'popping' effect. We found the solution of 2 parts soap, 20 parts distilled water, and a part of glycerine produces a thin membrane that exists temporarily and destroys with a clean 'burst'– the desired effect for a popping interface. Additionally, the durability of the soap film can also be controlled by changing the size of the aperture in the frame. From our experience with FugaciousFilm, the film formed in a larger aperture destroys in a shorter time than the smaller ones.

4.1.1.2. Projection

We used the AAXA® P4-X Pico Projector (141×71×31mm, 95 Lumens) to keep the entire system in a compact size. As the shape of the film is determined by the aperture in the acrylic frame, the design and size of the frame may vary depending on the application as shown in Figure 10– (a). When interacting with a projection image on the soap film by directly touching it, one needs to consider locus of user's perspective to be compatible with the projection direction. From observation, clarity of the image projected from front and back of the film was

similar. Therefore, in order to hinder the interference caused by finger movement at the front of the soap film, we decided to apply back projection.

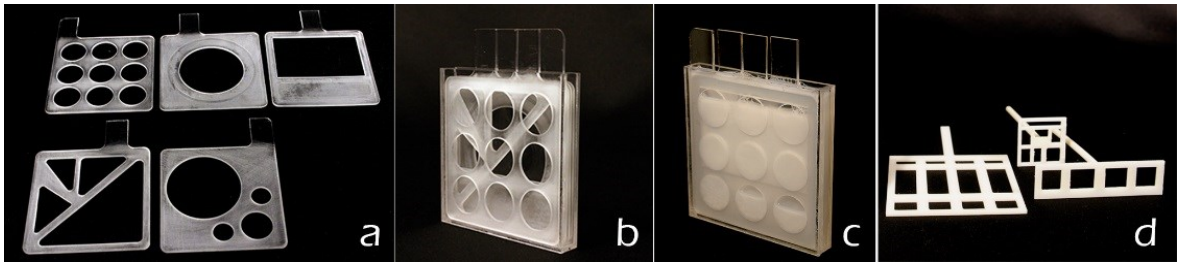


Figure 10. (a) Acrylic frames (80mm × 80mm), (b) frames kept in one container, (c) the container filled with soap liquid, and (d) sliders to create the soap-film on the frames.

Moreover, in order to see the projection image clearly, we set up the system in a dark room with a dim light. In this way, we could also reduce the interference in the camera vision when detecting fingertip movement. Even with a normal, low-cost webcam, highlighted fingertip was contrasted with other areas in the dark.

4.1.1.3. Interface

In addition to breaking (popping) the soap film, the fluidity of the surface allows three interfaces with a finger gesture – touch, push, and pull (Figure 11).

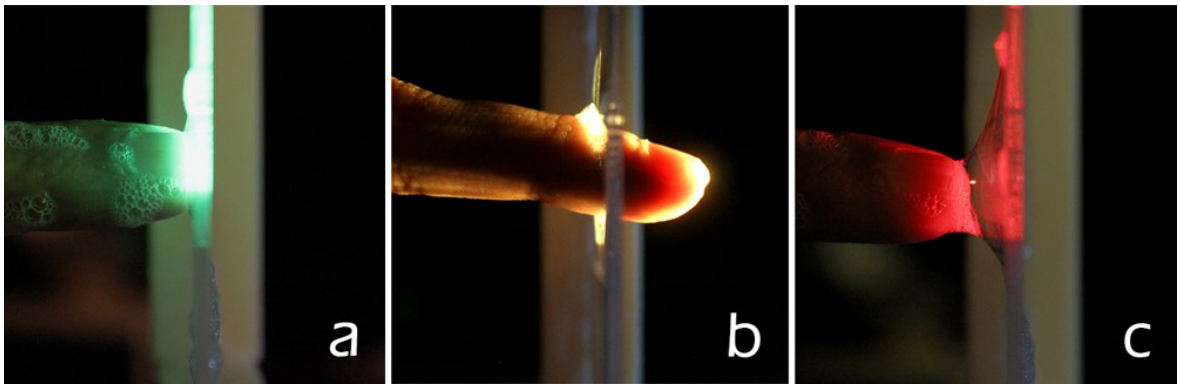


Figure 11.Three identifiable z-depth of finger interacting on the soap-film visualised by three different colours. A user's finger is (a) touching (green), (b) pushing (yellow), and (c) pulling (red) the soap-film.

Breakage of the film has identified using the Webcam placed on the front of the film. Due to the light diffused by the film, the contrast between the two states (film on /off) was clearly visible from the camera vision. In order to implement the three other interfaces, we used a Leap Motion® device to accurately track the position of a user's fingertips in 3D space. We place the device in front of the soap-film stand, where the user's fingers approach (see Figure 9). The device uses infrared LEDs and camera sensors to track the motion of the user's fingers up to an accuracy of 1/100th of a millimetre. The x, y, z coordinates of the fingertips returned by the device were employed to detect the fingertip position in relation to the soap film frame – for 'touch' interface (x, y coordinates) – and to determine the depth of the finger through the soap film – for 'push' interface (z coordinate). We used the open-source LeapMotionP5, Processing library to build our applications.

4.2.2. Application Design

We have developed three demonstrations with FugaciousFilm to exhibit technical feasibility of an ephemeral material with focused and delicate interaction. Through these cases, we explored three different aspects of interacting with an ephemeral interface: suspense in handling fragile materials; ephemeral material in entertainment; and harnessing randomness in a controlled manner.

The listed cases were designed to visualise especially, the undiscovered potential of direct interaction techniques on soap film, and how those features can be embedded in the system to create a robust and rich user experience. To achieve this in a controllable manner, we have concentrated on static, or captive, soap-film membranes rather than free-floating bubbles.

4.2.2.1. Passcode: Reinforcing Suspense in Handling Fragile Material

This example demonstrates how the skill of handling fragile material can be harnessed as a means for security in ephemeral interaction. The benefit is that the user holds not only the passcode but also the fine skill to manipulate the film in the correct way. This application demonstrates how fragility can be employed in as a functional, practical means for security.

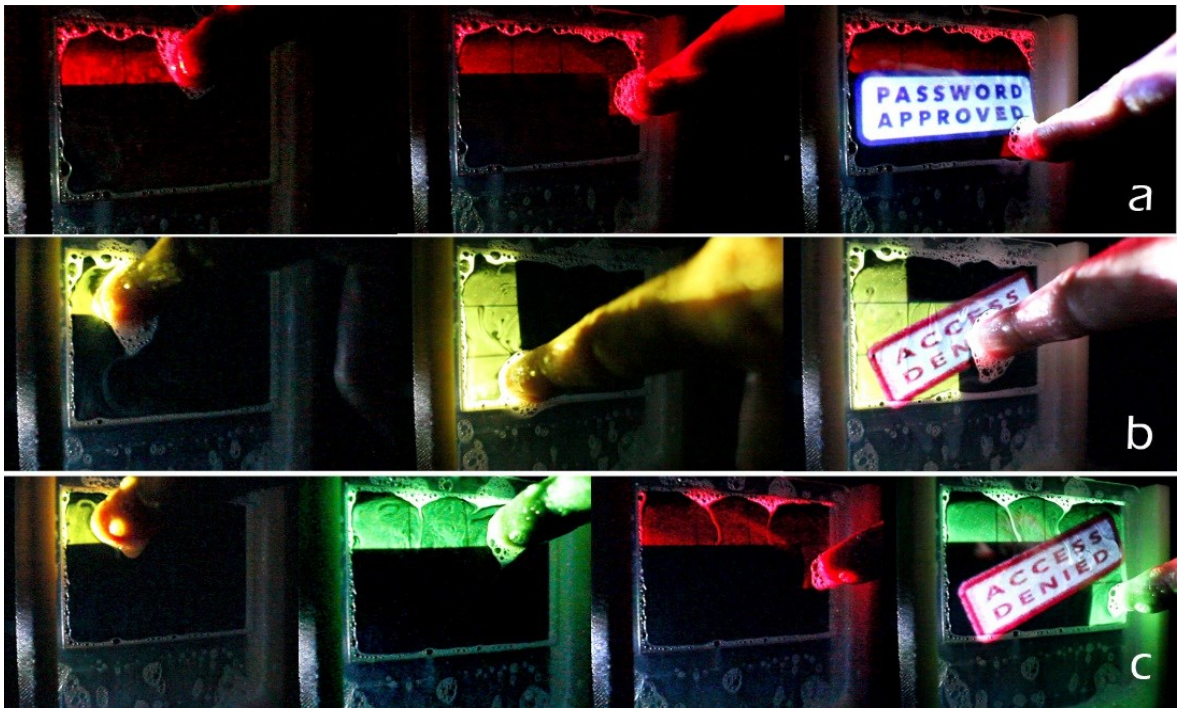


Figure 12. (a): A user unlocks the passcode by drawing a correct pattern on the film. Red indicates the pattern has drawn by the pulling interface. (b): Access denied by drawing a wrong pattern. Yellow indicates it is the push interface. (c): Access denied with the correct pattern but incorrect depth, shown by the three different colours, of the fingertip.

We implemented a passcode entry application on FugaciousFilm using finger tracking. Initially, the user needs to create a soap-film on the frame to unlock the passcode. Then the user touches the film with a wet fingertip to draw the pattern code. However, it is not only touching the film without breaking that makes the interaction difficult but also the z-depth of the finger position detected by Leap Motion® device. Thus, we could identify that the suspense in the interaction is

emerged not only while touching the surface but also pushing and pulling the film. In some cases of the passcode entry application, the user's finger needs to penetrate the film deeper than just touching to start drawing the passcode or contrarily; the film needs to be pulled slightly backwards while attached to the fingertip. The experience could become more attentive and anxious if there are a limited number of opportunities give to the users. This demonstrates how practical applications might accommodate the ephemeral interaction with an intense user attention.

4.2.2.2. Tic-Tac-Toe Game: Ephemeral Interaction Design for Entertainment

As an attempt to envisage the practicality of an ephemeral material based interactive media, we investigated more mundane applications. The game is one of the broadest domain in entertainment that pervades in daily life through a range of different technical fidelities – from high-tech computer games to paper-based board games. We designed a Tic-Tac-Toe game application to demonstrate time-critical constraints and the volatile feature of a shared ephemeral material in multi-user interaction. Although the game is originally designed for two players, the surrounding environment could act as an invisible player who always helps the player with nought.

The nature of vulnerable soap film, temporal existence, imposes time-criticality in the application. Although the player has a skill handling the soap-film, there is plenty of chance that the game can be interrupted by air or break down by itself after the surface has been dried. The strength of the soap-film solution directly equates to the difficulty of a game. As illustrated in Figure 13, even though the player who places crosses on the soap-film has successfully executed his task, the air or time could always break the film that had been occupied by the cross (Figure 13-(d)).

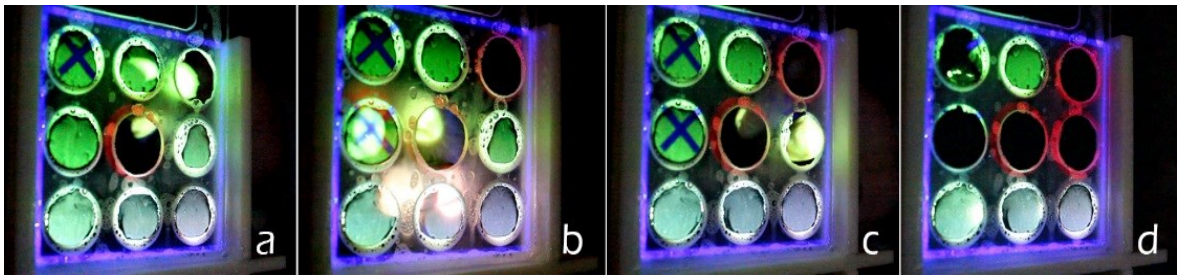


Figure 13. Two players are taking turns (a) noughts to (c) noughts and before a player puts a cross, upper and middle left films that had been occupied by cross burst (d), which made the player with nought won the game.

The instability of one fragile ephemeral interface has been examined through the accidental (or not) breaking of the soap film by two player application (Figure 14). Unintended action forces the game to move forward (Figure 14 – (c), (d)). This game experience with fickleness demonstrated that the player's anxious anticipation about unintended popping gains more attention in the interaction and establishes tension in the game experience. In this match, as the two features described here cannot be separated with each other, we anticipate that the ephemeral material provides extra suspense in the game experience upon the enjoyment of the original game Tic-Tac-Toe.

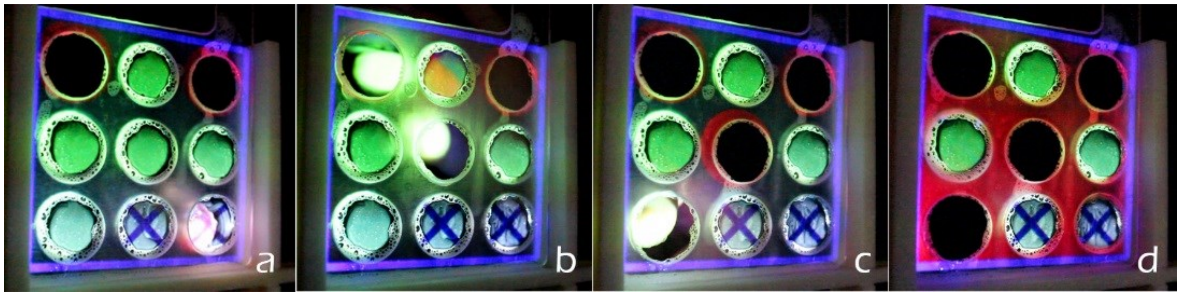


Figure 14. (a) One player is preserving the film while (b) the other player pops the film. (c) When the user playing the cross accidentally breaks the film (d) then a nought is placed, and the game finishes.

4.2.2.3. Ephemeral Music Composer: Utilising Randomness in Musical Experience

One of the remarkable features of soap film display is its aesthetic quality. In addition to visual effect, music adds visceral experience. We implemented a

music player application to see how serendipity can be created, controlled and maintained in an ephemeral interface. Moreover, how coincidental feature can be utilised in music playing experience.

The acrylic frame represents a single music track (Figure 15). We split the music into several parts and assigned each part to a different soap film formed in an aperture. When the soap film bursts, the allocated musical part for that circle starts playing. The soap film can either be popped by the user's finger, or by air blown by the user. Consequently, when all of the films have broken, it creates the completed music track but always in a different manner. Although the lifetime of the soap film depends on the size of the aperture and environmental conditions, same sized soap films have different durability dependent their location. Therefore, the films located in the bottom row usually last longer than the ones in the top row, since the soap liquid is flowing to the bottom – feeding the moisture to the bottom ones. Through this application, we aimed to demonstrate how randomness can be integrated into designing interaction to achieve positive musical goals and moreover, an aesthetic experience.

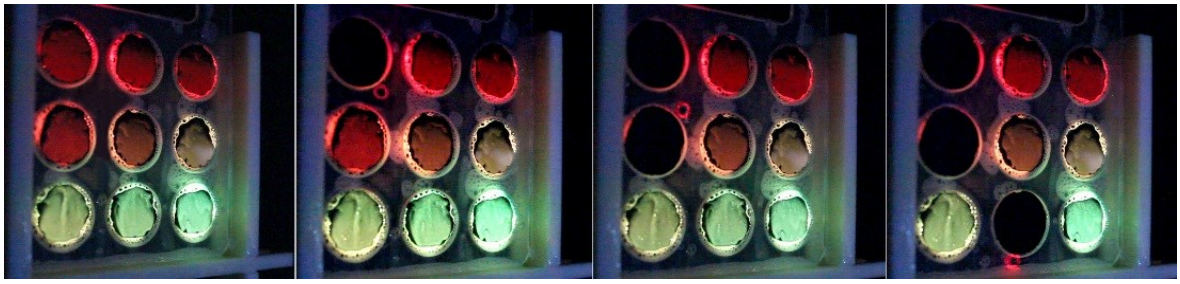


Figure 15.Snapshot of the music player video. Each circle contains a musical loop that is played when the film in the circle is burst. A spinning circle indicates the last circle to have burst.

In the example below (Figure 16), we added 'replay' mode in addition to various methods of 'play'. We designed re-swiping interface to refresh the soap film in order to stop the music – by returning to the original state. Then when popped again, the music replays. 'Refresh-ability' of the soap film constrains its temporary nature and endures the experience. However, a fine grained control is required for the swiping interaction in order not to affect adjacent fragile films.



Figure 16. (a) A frame with two replay functions. (b) Music starts when the films burst, and (c) the user reforms the soap-film with a slider on the top-left corner. (d) The music mapped on the recreated film has been stopped (identifiable by the spinning circle disappeared).

This application introduced further design explorations in how to enhance the sensory experience when merging the physical ephemerality of soap film with the intangible or digital ephemerality of the music/sound.

4.2.3. Focused and Delicate Interaction

The series of design demonstrations suggest 'Focused Interaction' or 'Delicate Interaction', counter to ambient and peripheral modes of interaction, being in a situation where the user is paying full attention to a particular task. I would make this distinction to position FugaciousFilm within a less explored design space of ephemeral interaction design.

The demonstrations explored with FugaciousFilm raised some design challenges as well as implications that ephemeral and attentive interactions would bring in HCI. As the time parameter plays its critical role in designing ephemeral interfaces, it could be more explicitly embedded in the interaction. Either by improvement in material property or interaction techniques, ability to design the 'correct' level of the ephemerality of the soap film would afford more freedom in the user interaction. In addition to current binary state based interface, this would extend interaction features by detecting the continuous transition of moisture level that occurs on the surface of the soap film until the instance just before it breaks. Three design examples partially imply the benefits of suspense

and emotional tension (Benford et al., 2012) emerging while handling the vulnerable material. In the real use scenario, one could imagine that anxious anticipation at soap film breaking moment would affect user interaction, especially in games. The visceral impact of the physical disappearance is incomparable to that of digital pixels on the screen. It implies that designing a physical cue for 'deleting' digital information would introduce a design opportunity for focused interaction in HCI. In this regard, FugaciousFilm demonstrates the first step towards exploring a new 'design space of robust interaction with ephemeral material'.

Three applications have shown potential implications of the ephemeral material and interaction. Thus, to further investigate the impact of ephemerality in a more realistic setting, I will focus on one of the applications – Tic-Tac-Toe game. Following chapters will delineate the design improvement and a user study with a series of enhanced Tic-Tac-Toe games on FugaciousFilm.

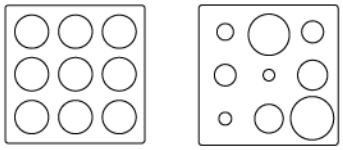
4.3 Design Iteration

Tension, attentiveness, and suspense are generally considered to be a useful tactic in designing a game experience. FugaciousFilm exhibits a large potential that interaction modality driven by the delicate material would enhance the Tic-Tac-Toe game experience. Tic-Tac-Toe game originated and played since Ancient Rome (Bolon, 2013). The game tactic has been widely studied and investigated by mathematicians that the theory has established to win the game (Butler, 2005). However, in FugaciousFilm, direct manipulation of the fragile material would bring an unexpected result. Moreover, partially controllable durability that would affect the outcome – win or lose – are anticipated to enhance the user experience of the original game. Among the key characteristics listed above, I planned to conduct an in-depth user study on the Ephemeral Tic-Tac-Toe game with an aim to investigate what manner of interaction is engendered from the integration of material, interface, and context. In so doing,

I attempted to disclose full potential of the interaction that can be designed with the materiality of the soap film.

4.3.1. Pilot Study

A pilot study was aimed to find out in which conditions the participants get engaged most with the Tic-Tac-Toe game and also how to extend the game further by making a slight alteration to the original rules. Tic-Tac-Toe game on FugaciousFilm prototype has relatively high novelty regarding the material and interaction technique compared to the ones played on other media (e.g. paper, touch screen). Therefore, the pilot study was a necessary to step to find out how affordable both material and interfaces are to design the games at an acceptable level. We invited 10 participants among university students and researchers. Each study lasted for 30 minutes including experience and interview. In the pilot test, each participant played the four different types of Tic-Tac-Toe game (Table 1) with the moderator, consecutively. The anticipated difficulty had set the sequence of the games: a - b - c - d. I focused on observing verbal expressions and finger gestures such as speed, movement, and cautiousness. while participants performed assigned interfaces on the soap film display. Interview was done in an informal type of debriefing, asking participant's overall impression on each of the four game designs. Each and every participant's experience was video recorded in a full length.

Frame Design & Interface	Rules
a Uniform Apertures c Non-Uniform Apertures  Touch / Pop	- Touch = Cross / Pop = Nought - Two players take alternative turns. - Accidental popping made by the player with Cross counted as a Nought.

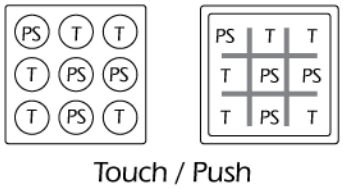
	- Unexpected popping (by air, breath) also counted as a Nought.
b Uniform Apertures d Single Aperture  Touch / Push - Letters (PS/T) are projected visually on the film. - Lines dividing the sections on the frame 'd' have projected on the film.	- Each of the nine sections is assigned with either Touch or Push. - Two players take alternative turns. - The first player starts from anywhere with a Nought. - Whoever pops the soap film loses the game. - Unexpected popping also makes the player, whose turn it is, lose the game.

Table 1. Summary of game design and rules employed in the pilot study.

In summary, pilot study has following purposes;

- Explore how people understand the ephemerality within an interactive media.
- Observe how people experience various types (touch, push, and break) of delicate soap film interface.
- Understand the role of ephemeral material in enhancing the typical game experience.
- Based on the feedback, consolidate design criteria and suggest one game design that elicits focused and delicate interaction for user study.

4.3.1.1. Findings from Pilot Study

In this section, I will illustrate findings from the pilot study that applied in improving the prototype for later user study.

a. Uniform Apertures with Touch and Pop

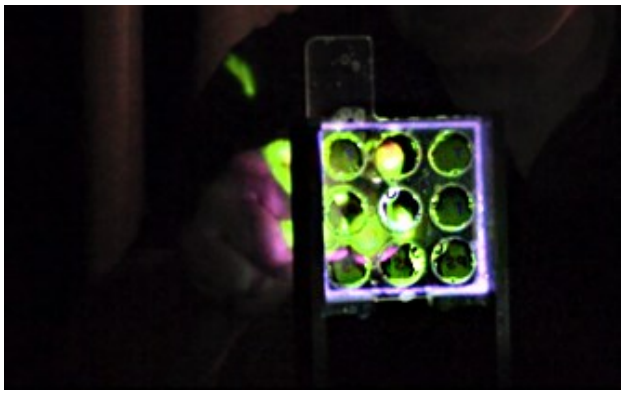


Figure 17. A participant is trying to touch the soap film on uniform aperture.

The game on a uniform aperture with touch and break interface was anticipated to be the simplest example for participants to understand the material and how its vulnerability affects the dynamics of game experience. Some participants noticed the fact that they can actually touch the soap film while keeping it intact.

> P6 responded, *"Touching this medium was an actually different experience to just playing Tic-Tac-Toe game."*

But since this version of the game is biased to the cross that degraded the interest of the game.

> P1 stated, *"The first game was not very enjoyable because it's so much biased to the cross."*

b. Uniform Apertures with Touch and Push

In the second design, which incorporates touch and push interface that delicate hand movement was required to both players. After experiencing the first design, participants better understood the materiality of the soap film and could make sense of the interface that led to generate some tactics by themselves.

> P4 grasped the sense of 'ephemerality' by stating, *"You get the sense of urgency as the time flows during the game"* and *"I tried to put my cross regarding the rule of Tic-Tac-Toe, then actually putting it without destroying the bubble becomes fun of the game."*

Moreover, some people expressed anxiety while playing the game, as P2 said, *"It feels annoying when I just had to lose because it popped, regardless of how good I am at Tic-Tac-Toe."* This kind of apprehension driven by tangible interaction augments an experience of the original game.

c. Non-Uniform Apertures with Touch and Pop

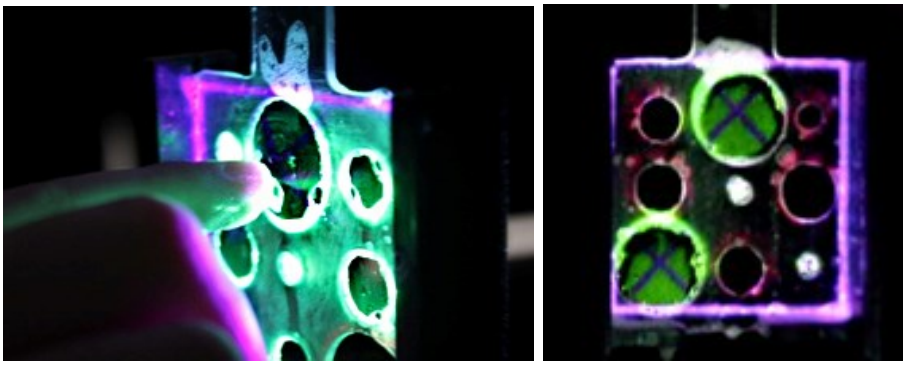


Figure 18. Players are engaging with the game on the frame with non-uniform apertures.

Non-uniform apertures were intended to present the sense of different duration between the soap films and to see how the user builds own tactics within the range of ephemerality. However, when participants started to play the game, difficulty has arisen from popping the soap-film from in smaller apertures. When they touched a film that is smaller than their fingertips, the film constantly re-formed in the hole.

> P9: *"The different sized ones were more interesting than the regular ones, because it was harder to pop the smaller ones."*

So that, participants had to make sure they have a dry fingertip when popping the films. Various sized holes were more appealing in terms of design than to trigger the sense of ephemerality. Accordingly, further design suggestions emerged; *"It could make people use different fingers according to the size of the bubbles."*

d. Single Aperture with Touch and Push

Among the four different designs, the single aperture with touch and push interaction (*d* frame) was considered to be the most exciting experience to play the Tic-Tac-Toe game. Within the *d* frame, the risk of breaking the film increases due to various factors. A film in a larger frame is more vulnerable. Also, since the soap liquid flows to the bottom, top section dries faster and becomes thinner. Therefore, participants focused much on executing proper interaction while keeping the film intact than playing (winning) the game based on the rules.

> P3 said, *"The tactile experience happened to make me focus on what I'm doing (touching the bubble properly) than just winning the game."*
>
> Also, as P8 described his experience shown in Figure 19, *"With the normal Tic-Tac-Toe, you would clearly lost because you made a mistake. But with this one, because it's so fragile, there was still a possibility me loose. (Moving to the middle row) it was actually my defensive move."*

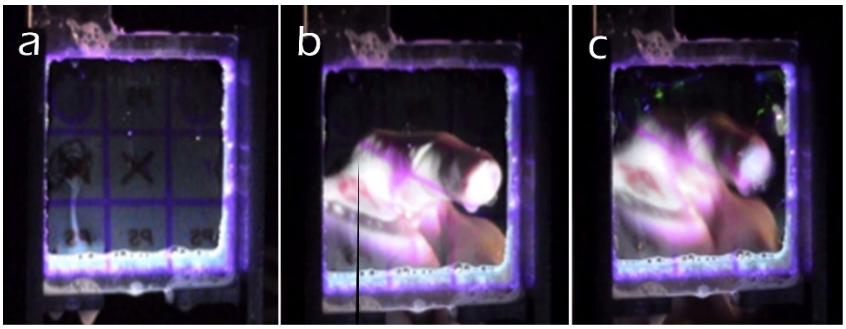


Figure 19. (a) A player with a cross made a mistake by putting a cross in the middle row rather than putting on the first row to defend against the nought. (b) P8 (nought) did not take the risk of breaking the film by pushing the section in the top row, but tries to block the nought on the middle row. (c) However, the film breaks and P8 lost the game.

Many participants expressed more about their emotion in contrast to the same input method executed in the *b* frame design.

> P5: *"Single framed game feels more devastating than the small-separated holes";*

P7: *"I like this one (the last game) most, it adds so much more tension during the interaction."*

Some feedbacks were about visual impact.

P8 said, *"When it pops, it just feels better […] actually visually looks better […] and it's nice to see the whole film swinging when I pull my finger back out."*

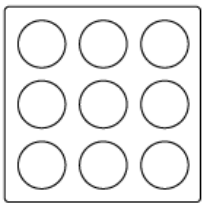
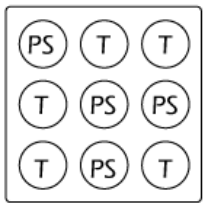
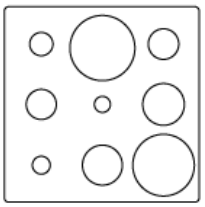
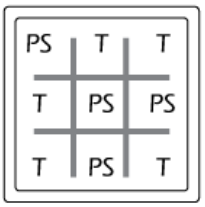
In addition to cautious execution of pushing interface, suspense comes later when they pull out the finger from the film.

P7 stated, *"Pushing through is fine, but pulling back out feels it's gonna burst."* Similar feedbacks offered a hint that pulling interaction would engender richer experience.

Also, I observed that integration of material and interaction was generating visceral experience beyond the game context.

P10 stated, *"When you put your finger through and bring it out, still doesn't break the film then it feels just great… It feels more visceral, you can see the bubble moving (swaying) a lot and seems a lot more fragile. Even though the outcome (win/lose) is the same (with the separated frame Table 1-(b))."*

The table below summarises findings from the pilot study.

Design of the frames				
Interface	a. Touch / Pop	b. Touch / Push	c. Touch / Pop	d. Touch / Push

Feature	Easy to grasp the idea of game and interface.	Fragile film demanding skilful interactions interfered the original game tactics.	Various sized holes generate a range of different duration of soap films. (Larger holes – shorter / Smaller holes – longer)	Increased risk of breaking the film adds more challenge to interaction.
Findings	The least preferred version since the rule is biased to Cross.	Participants grasped the sense of ephemerality and urgency.	Soap film formed in a smaller hole (smaller than a fingertip) puts the challenge to Nought.	Visceral experience enhanced the excitement of the game.
			Asymmetrical design causes confusion.	Intensified focus and concentration.
				Original Tic-Tac-Toe game rules became less critical.

Table 2. Summary of findings from the pilot study.

4.3.1.2. Feedforward

In the pilot, we examined three interactions that could be applied on the soap-film; breaking, touching, and pushing. Each of the interaction techniques presented subtle sensation that gained from integration of visual-tactile feedback. Feedbacks and observation show that material and interaction implemented on FugaciousFilm derive attentive and visceral experience. We found out that the frame with single aperture was most effective to derive attentiveness. There were some distinctive gestures performed during the game, which implied that they are carefully executing the interaction and concentrating on the task (Figure 20).

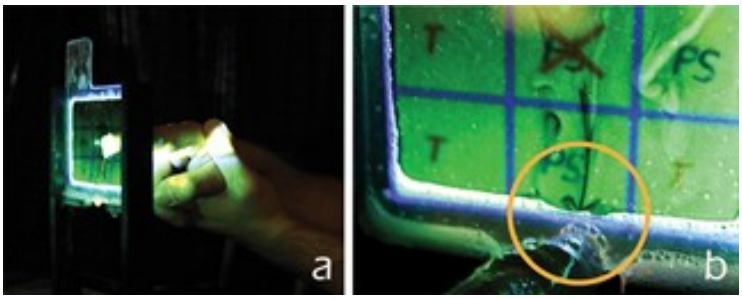


Figure 20. (a) A user is holding his hand with the other hand. (b) After putting a cross, rather than pulling his finger out from the film, the user drags his finger to the edge of the frame in order to keep the film stable.

Also, learnability influenced participants' behaviour throughout the pilot test that participants were able to gain more sense of how to 'carefully' manipulate the soap film. The pilot study was conducted based on an interview format and observations were mainly focused on the hand movement. Therefore, it was worthwhile to examine whether and how 'hyper-attentiveness' emerges and plays its role in real situations. I planned a user study in a more realistic situation. Moreover, in order to explore every possible touch interactions that are applicable to the soap film, I decided to include pulling interface in the final sets of game design.

4.3.2. Refining the Prototype

In preparation of user study, we refined and reformulated the prototype according to the feedbacks from the pilot study. There were many suggestions about pulling interaction on the soap film which naturally occurred when people pull their fingers back out from the film. We added this feature to the prototype for the user test.

4.3.2.1. Pulling Interface

When the user interacts with the display, the finger is coming from the front of the soap-film to beyond the film, moves in one forward direction. Therefore, hovering, touching and pushing can be easily differentiated with z-depth detection. However, for 'pulling', hovering gesture causes a problem because the camera needs to detect not only the presence of the soap film, but also if it is in contact with the fingertip. Therefore, we took advantage of an optical phenomenon called Specular Highlight. A specular highlight is a bright spot of light that is usually seen on shiny curved surfaces when they are illuminated by light. In our setup, when the soap film is being pulled, the surface of the film near its point of contact with the fingertip becomes slightly curved, and therefore specular highlight appears as a reflection of light from the projector towards the camera (Figure 21). The presence of this spot in the camera view indicates that the film is being pulled. In order to detect this spot, we employed an image processing based method, blob detection. The image of the frame captured by the camera is first converted into a grayscale image, and then a threshold filter is applied to the image to produce a binary image having 1s where the intensity is greater than the threshold value and 0s elsewhere. We used the publicly available Blobscanner library[6] for processing programming environment to detect these blobs.

[6] Blobscanner. https://sites.google.com/site/blobscanner/home/

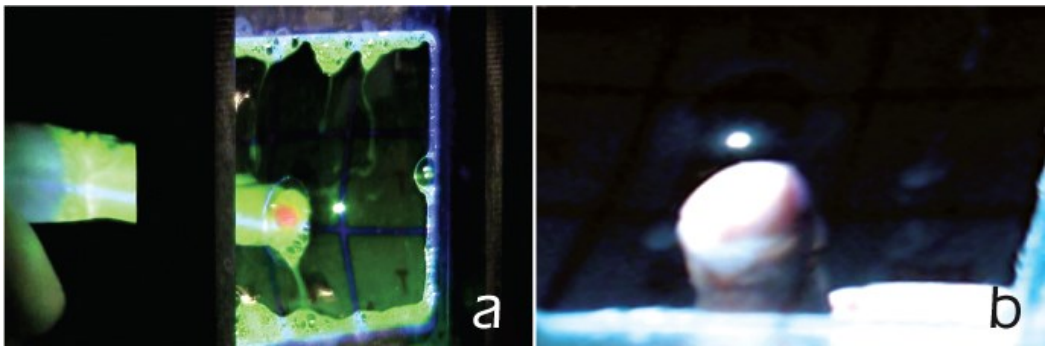


Figure 21. (a) Specular Highlight appears on the film near the finger when it's pulled. (b) Screen shots of the camera view, identifying a blob near the fingertip.

4.3.2.2. Improve Flexibility of the Soap-Film

When the user pushes the soap-film, although the film is being pushed a little, the user's finger is actually 'passing through' the film. Thus, how far the finger passing through does not depend on the area within the frame as long as the finger is wet enough. However, for pulling interface, the flexibility of the film differs according to the location of the film. From our experiment, although it has shown the very subtle difference, the centre section was pulled furthest and the corner the shortest (Figure 22).

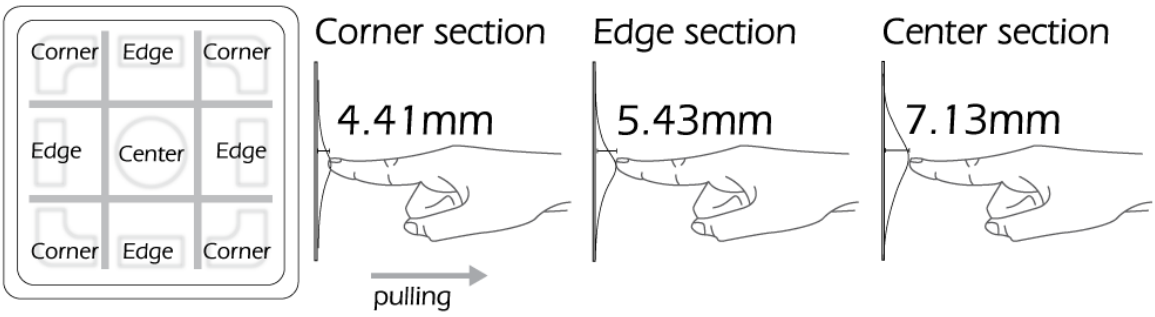


Figure 22. Diagram shows division of the frame (Left) and an average distance from the baseline in each section that the stable soap-film can reach (Right).

Thus, we have programmed the pulling interaction to cover the whole range of the distance from the baseline that gained from the entire area of the soap-film:

from 1.5mm to 10.2mm[7]. Between touch (from -160 to -145 in Leap Motion unit) and pull, we set the threshold value to 5 (1.5mm) where nothing happens while shifting between the two interfaces. Also, between touch and push we set the larger value (18 Leap Motion unit, 5.4mm) in order to distinguish push from touch clearly. The specific range of each interface has illustrated in Figure 23.

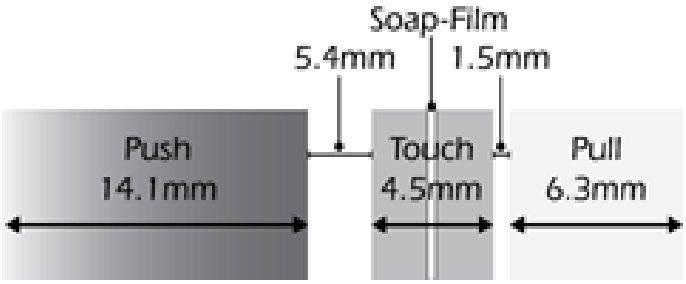


Figure 23. The range of distance programmed for each of the interfaces.

4.4. User Study

Main user study took the form of a tournament where participants played our Tic-Tac-Toe game on a single soap film aperture. The ground rules were:

• Players alternated who goes first between games.

• The first player always starts with a 'nought.'

• When it is their turn, a player can choose to put their mark in any position but must do so using the specified interaction type (push, pull or touch) which is visibly projected onto that section of the soap film screen.

• If a player breaks the film, then she/he loses the game.

• Otherwise, the normal rules of Tic-Tac-Toe apply.

[7] When reading the data ranges of finger movement in the Processing software, length was shown in its own unit rather than millimetres. We translated 1 unit of Leap Motion to 0.3mm in our setup. The baseline was approximately on -153. The whole interaction area had been programmed from -140 to -119 in Leap Motion unit.

4.4.1. Study Design

I created three versions of the game, varying them according to which interactions were mapped to which of the nine cells of the Tic-Tac-Toe board (Figure 24-a). We designed the study in the form of a tournament that comprised three rounds: group stages, semi-finals and a final. In each round, the two participants involved played all 3 variants of our Tic-Tac-Toe game. After the group stages, the top 2 players in each group progressed to the semi-finals, with two players eventually progressing to the final. In total, 26 games were played since the eventual champion only required 2 games to win the final. I recruited six participants from our university network, 4 students and 2 staff (2 females and 4 males). Participants received a $13 gift voucher for participating while the overall champion and runner-up received additional $25 and $8 gift vouchers. Figure 24-b summarises the tournament format and the progressions of the different participants who are labelled P11-P16 (P1-P10 were the participants in the pilot).

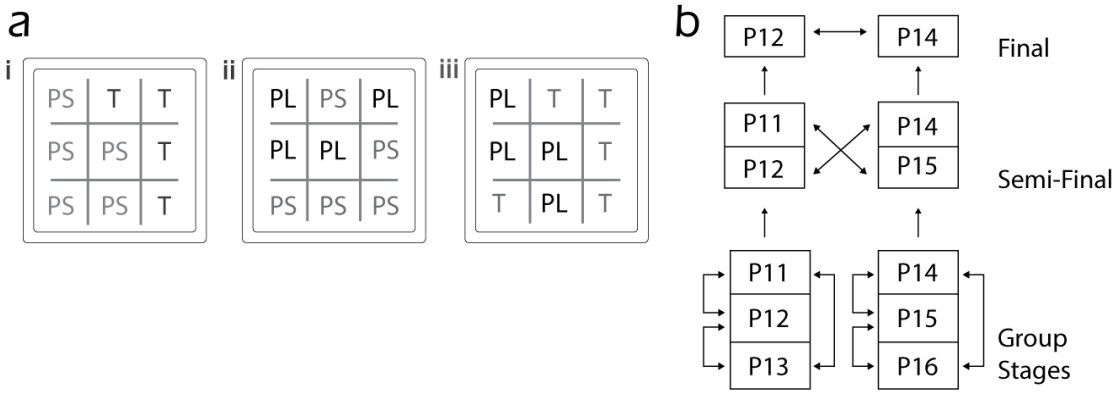


Figure 24. (a) A set of the game consists of 3 versions of Tic-Tac-Toe. PS: push, PL: pull, T: touch. (b) The format of the tournament held in the user study.

The tournament lasted for 60 minutes, and it was held in the empty lab space. Participants were watching and cheering as spectators while the others were playing their rounds. The tournament was video recorded, and there was a final

debriefing session with the whole group afterwards. Figure 25 shows the setting of the user study.

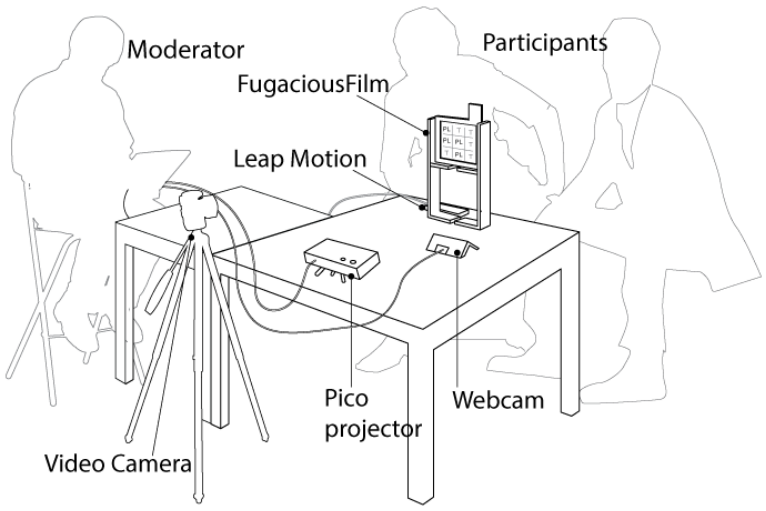


Figure 25. Study setup. The illustration shows how the study has been conducted and recorded. When two participants were playing a game, all the other participants were watching them while sitting around in the room.

4.5. Findings

I will begin with some general observations. The average game duration was 52.6 seconds (n=26, SD 31.8) and most of the games ended by the film bursting during user interaction. Overall, participants appeared to be highly engaged in the experience, displayed a high level of attentiveness to the interface when playing, demonstrated and verbalised signs of tension and were able to develop a variety of tactics. The visceral nature of the interface affected many participants' decisions when making a finger movement, and some participants developed their own tactics. In addition to putting their marks in the correct position, the fragile material clearly forced participants to be cautious in their motor control. This reflects the result that only 7 games in total were completed before the soap film had burst and out of those only 2 games finished in the draw, with the players succeeding to execute an interaction in every section of the film. I conducted a video analysis to draw out meaningful user experiences performed during the study inductively. While analysing the video, I focused on the finger

movements and verbal expressions that constantly repeated by a number of different participants.

4.5.1. Intense Awareness of Material and Interaction

During the game, players made repeated verbal and behavioural expressions to suggest that they were very focused on handling the soap film material. Often times, not only players but also spectators said, *"This is tense,"* while executing or watching the interactions. After P11 played the first round of a tournament, he replied: *"It's tense, but this is only round one."* In one instance, P12 sighed deeply as he visibly relaxed after he succeeded to put his cross in the right place. This kind of reaction revealed that the intensity arising from having to exert fine motor control over an unstable surface. Moreover, having learned that their fingers need to be wet enough in order not to break the film, participants tended to dip their fingers into the soap solution each and every time before their turn, even it's already wet. I recognised that participants were intensely aware of the fragility of the film when some players did not concentrate on the overall game tactics of Tic-Tac-Toe but instead focused entirely on executing the interaction successfully.

> After P15 won the game and before the film had burst, he said to P14, *"You also need to play Tic-Tac-Toe in this thing."*

4.5.2. Ephemerality Rules the Game

I had anticipated that the ephemerality of the interface (i.e., the sense that it might pop at any moment) will create pressure for players to move on quickly. However, I could observe the opposite in many cases. For example, P16 spent too much time at his turn hesitating where would be the 'safest' and 'correct' place to put his mark with the result that film broke before he could make any meaningful move. In a different vein, P15 used this feature of the material as one of the tactics to win the game.

In one of the rounds, P15 was intentionally wasting time on his turn while commenting that, *"I'm waiting for it to be breakable when it's your (P12) turn."*

Both cases illustrate how intensity arises from not knowing for how long the surface will remain available or stable for a given interaction, but also how this may be exploited in various ways.

4.5.2.1. Easy Touch

Participants found 'touch' interface the easiest, initially tried to occupy the sections with 'touch' first, sometimes regardless of whether this was a good logical move in Tic-Tac-Toe. Later on, however, they figured out that touch was usually the 'safest' interaction, causing least movement to the film. This realisation led to unexpected actions and reactions between the players. In the semi-final, for example, although it was evident for P11 to defend himself and also occupy a definite chance to win by putting his cross in the centre, he instead went for a touch interaction in bottom-right corner (Figure 26-a). Then P14 managed to put a winning 'nought' in the centre by pulling the film (Figure 26-b).

P11 responded, *"I was more concerning getting you (P14) to pull,"* suggesting that he was trying to avoid the risk of breaking the film by pulling it back.

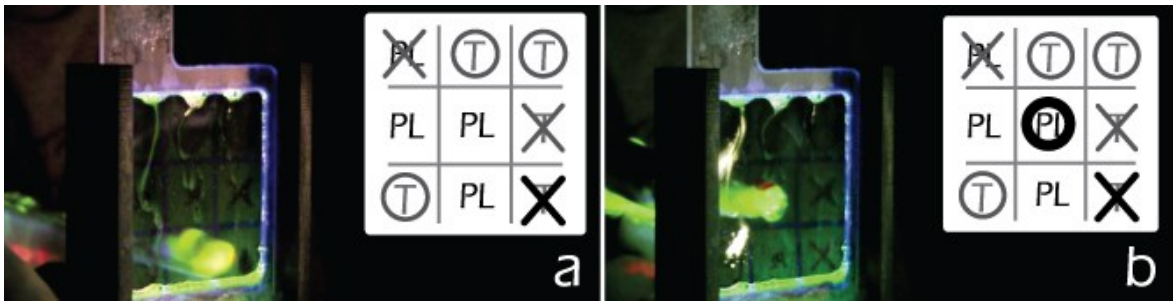


Figure 26. (a) P11 puts a cross in the bottom-left corner although he had to block the centre section. (b) P14 pulls the centre section successfully and wins the game.

In some instances, participants made a precise decision according to their growing knowledge of how the fragility varied across the surface and also changed over time. In Figure 27-a, P16 was trying to put a cross by pushing the top left section in order to avoid the nought winning the game. But after several trials, the film became already thinner as some of the liquid had evaporated while some had flowed to bottom. Then P16 changed his mind to safely put a cross on the top right corner (Figure 27-b) by 'touching'. In spite of this tactic, P15 managed to push the upper left corner and won the game.

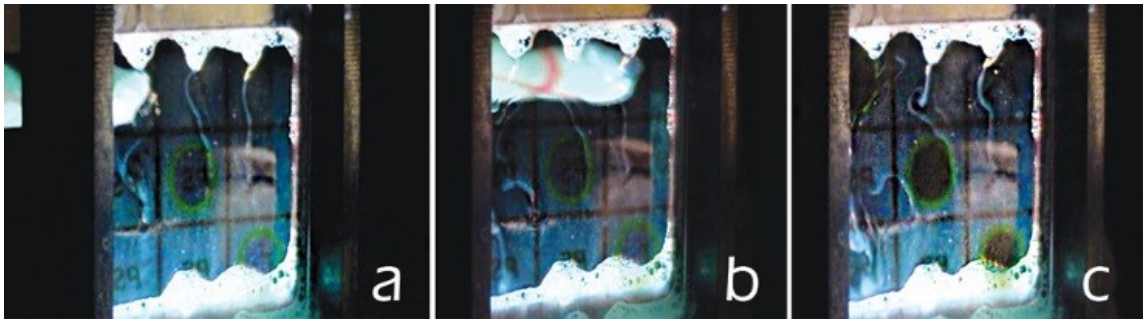


Figure 27. (a) P16 attempts to put a cross in the top-left corner to block nought, (b) But finding it difficult to succeed, decides to make a safer move by touching the top-right corner. (c) However, P15 manages to push through the top-left section and wins the game.

4.5.2.2. Challenging Push and Pull

The variant of the match involving both push and pull interactions was found to be the most demanding. Interestingly, they held opposing opinions about the difficulty of each case.

> P14 recalled that the vulnerability of the soap film was reinforced when it fluctuated after he pushed, *"When I push, I need to push quite further but then I also need to pull back out, and it feels dangerous to burst the bubble."*

Reflecting this, although participants grasped the fact that they could push a wet finger relatively far through the film, they remained especially focused, cautious

and tense when performing this particular interaction compared to other interactions. One participant yelled, “I can’t put my finger anymore through”, although he knew that he could push further and ultimately did so.

This tension that participants felt on such occasions could also be seen from variations in the speed of their finger movements as players cautiously slowed down when they pulled back after pushing the film. However, some participants reported the opposite feeling. Later in the debriefing session, P11 recalled that ‘pushing’ was easier than ‘pulling’, *“If you need to pull you need to push anyway.”* This feedback reflected the observation that although they had to push the film to a sufficient depth to properly engage it with their finger, some participants tended to touch slightly and then pull back.

4.6. Summary

While individual tactics and experiences varied to some extent, it was clear from the study that, in general, players:

• Were able to perform all three interfaces: pushing, pulling and touching.

• Quickly learned the delicacy of both material and interaction.

• Also learned how the interactional properties of the soap film varied over its surface area and over time.

• Were able to exploit all of above knowledge tactically.

• Paid very close attention to the interface.

• Found the whole experience to be absorbing, tense and often suspenseful.

Regarding the nature of ephemeral materials – fragile and transitory – the ephemeral interface has often been explored to assist ambient interaction (Seah et al., 2014) or peripheral computing (Heiner et al., 1999) in the realm of HCI. However, design exploration conducted with FugaciousFilm revealed that ephemeral interfaces could deliver highly attentive and even suspenseful experiences, in addition to pervasive ambient and calm interactions that covered by many related works in Chapter 2. While the first study focused on soap film interfaces so far – extending their repertoire of interaction techniques, the findings show potential to replicate this general approach with other ephemeral materials and interface technologies, especially if their properties allow for the flexible control and partial predictability of both vulnerability and delicacy. Informed by Tic-Tac-Toe application, a directly related domain is a game sector. There are many games that require fine motor control and focused attention during the game experience. A widely known example is ‘Jenga’ that also has mentioned several times during the study. Fine-grained motor control is also

widely applied in digital games on touch screen based devices, including digital versions of the Jenga[8].

From the experience of designing the FugaciousFilm prototypes, I envision that physically delicate ephemeral materials can be employed in building functionally reliable interactive systems when applied in an appropriate context of user experience. Therefore, I propose FugaciousFilm as a first step towards exploring the design space of 'delicate and focused interaction with ephemeral materials'.

[8] http://www.moregameslike.com/jenga/

Chapter 5

5. Ephemerality in Ordinary Experience

FugaciousFilm was a curiosity-driven, and an explorative approach focused on demonstrating delicacy as a modality of ephemeral interactions. During this PhD, the focus of research inquiry has shifted after the study of FugaciousFilm. I began to seek for a design space where the ephemeral materials might be meaningfully integrated into a general context by employing 'delicacy' in interaction design. Thus, this chapter expands a discussion of ephemerality within a context that is closer to our real-world problems. Rest of this thesis takes on the following research question: *In which context, might an ephemeral artefact be usefully integrated into ordinary experiences?*

Instead of exploring how each ephemeral material can be incorporated into the interaction design, investigating what users might experience when interacting with such materials was seen as a more significant point of inquiry. Therefore, the aim of the research has focused on the user experience, rather than exploring every different kind of materials. In this chapter, I elaborate a design study to broaden the praxis of attentive and delicate interaction beyond a specific material and unique application area, and towards a universal domain.

In our daily life, cautiousness and delicacy come forth when handling invaluable and priceless things. Moreover, limitedness of an experience in term of both duration and opportunity heightens a desire to possess an object or an event longer, which turns into anxiety when it is lost. In the study of FugaciousFilm, I could see the tension and anxiety being reinforced at the instance when the soap film breaks. Observing how users experience the ephemeral material and unrepeatable consequence of the interaction such as breaking, I took a conceptual leap and conceived an idea that gift wrapping can be seen from the perspective of the 'functional ephemerality'. Gift wrappings are designed to be taken apart, but they are an essential part of the gift exchange context that is appreciated for various reasons, such as design and method of wrapping, special

wrapping material, and visualised time and effort put on wrapping by the giver. Many factors including the above enhance the gifting experience especially when the gift is thoughtfully prepared. I could see the functional transiency in the wrappings, once it is unwrapped it is irreversible, in the real gifting context. Ripped off or broken wrapping materials are unrecoverable and therefore, some of the wrappings require delicate handling. Gifting is a universal context that effects of ephemerality might naturally arise in the unwrapping experience. Therefore, in the rest of this thesis, I will delve into the gifting context to apply one experiential aspect of ephemeral interaction – "delicacy".

Mainly, this chapter introduces digital gifting as a design space by focusing on *'unwrapping'* moments, which have previously been overlooked in the computer-mediated gift exchange. In order to validate the value of the delicate interaction captured in the previous chapter, digital gifting has been framed as a domain that would benefit from delicate and vulnerable ephemeral materials. In the following sub-section, I will begin with a design exploration by tailoring solid materials in the design of delicate interaction. Gift exchange happens in a broad context of our ordinary life such as dining, home, or parties, so I began to seek for common materials to augment the unwrapping experience.

5.1. Exploration: Sketching with Prototypes

To begin with, I focused on the duration of certain experiences that people appreciate because they only last for a short time. For example, we adore the beauty of the moment when the sun rises and falls or the movement and shape of clouds. We see natural phenomena are inherently transient not only because it lasts for a limited time, but also it is non-duplicable and irreversible. Ephemerality gains its significance when something is expected to last temporarily and be irreversible so that it is unlikely to reproduce the same resulting effect.

In following, I will illustrate two design explorations that utilise common physical materials to design delicacy, transient function, and irreversibility that might potentially enhance gifting experience.

5.1.1. Dancing Sphere

The Dancing Sphere prototype operates by Bernoulli's Principle to lift and retain a foam ball in mid-air. The ball should have a shape of a perfect sphere and be the right size – neither bigger nor smaller than the fan – in order for the principle to operate. Aerial Tunes (Alrøe et al., 2012) is a directly related example, a tangible interface prototype based on balls hovering in mid-air that creates an ambient soundscape. While Aerial Tunes was designed for interactive musical experience, I explored Dancing Sphere for the delicate and focused experience that engendered by unusual movement of a ball. Therefore, I designed the fan body to be moveable while keeping the ball floating. Figure 28 shows a sketch of the Dancing Sphere, which has a shape of a roly-poly toy. The form factor generates unstable movement of the fan body that also affects the movement of the ball and duration of the ball to remain in mid-air. Cautious manipulation is necessary to keep the ball in the air.

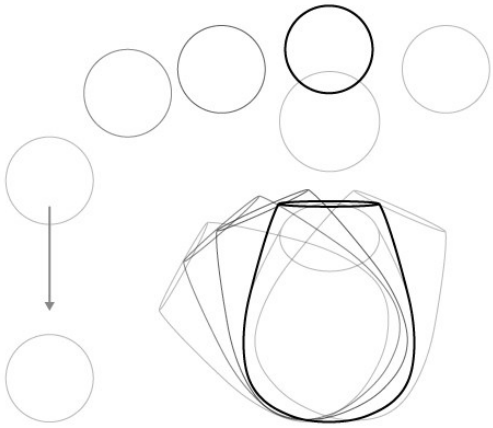


Figure 28. Illustration of the Dancing Sphere.

Figure 29 is a proof-of-concept prototype of the Dancing Sphere. In order to keep the prototype to be compact and mobile, a fan used in the prototype was

also compact (ARX CeraDyna FAN, DC 12V, 0.24A) that was not powerful enough to lift the ball as high as envisaged in Figure 28.

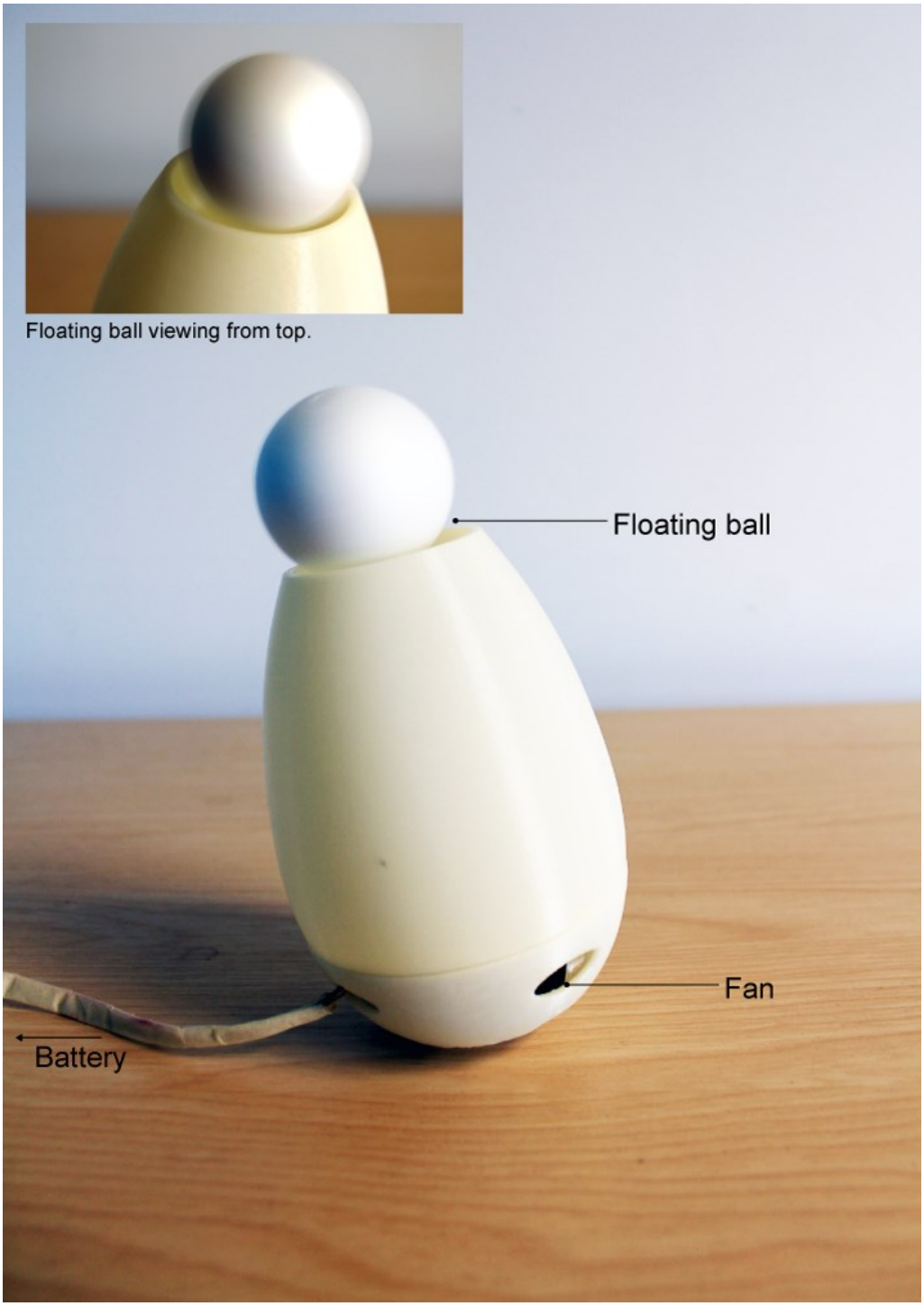


Figure 29. A proof-of-concept prototype of Dancing Sphere.



Figure 30. Movement of the fan body and the floating ball.

shows snap shots of the prototype in operation. Hemispherical bottom surface generates unstable swaying motion of the prototype. Movement of the ball is very subtle that even a little alteration to either an air flow or the fan body drops the ball. Although the material is neither fragile nor ephemerally existing,

interaction requires a substantial range of attention in order to maintain the ball in the air.

With a more powerful fan, a user can directly interact with an air flow – if a user interrupts/blocks an air flow by waving his/her hand through the path, the ball would repetitively drop down and rise (Figure 31).

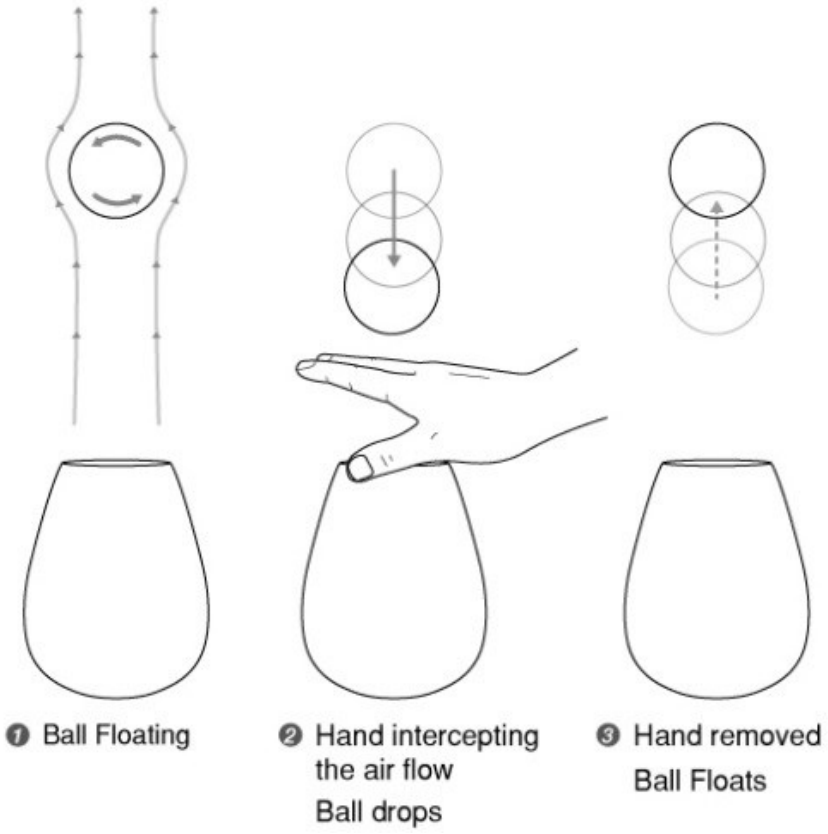


Figure 31. An illustration of how the dancing sphere works. (1) A ball floats while being lifted by an air stream. (2) A user may interact with the ball by in intercepting the air that causes the ball to fall down. (3) When the user's hand is removed, the ball floats again to its original position.

One could imagine an array of prototype units that perform a wave of balls dancing in the air. I envisage the prototype or arrays of the prototype with floating balls will present a novel and intriguing experience when installed in a public event. However, it will again move far from common human-computer interaction and experience that we can encounter in our ordinary life. Therefore,

I paused the exploration and moved on to find more pervasive and common area of experience and materials.

5.1.2. Ephemeral Music Player

Sound is produced when something vibrates, and the vibrations in the air are called travelling longitudinal waves, which we can hear[9]. Sound dissipates away through a stabilisation of the waves. Sound is inherently ephemeral, without any recording equipment, it is a 'one-at-a-time' phenomenon. Some live music performances are valued for the limitedness to the time and space, which can hardly be replicated in the same manner. In following design intervention, I will illustrate a design exploration that utilizes ephemerality of sound into a normal music listening experience.

Ephemeral Music Player or EMP (Figure 32) is a box that consists of a webcam and a paper shredder. A webcam is connected to a PC for a demo purpose. A card has a QR code printed on it which links to an URL of a music track. In order to play the music, the user puts the card into a slot of the box. The webcam reads a QR code, then start to shred the card. After the card has shredded, the box plays the music track. The main idea of the EMP lies in the limitedness of the experience – resembling the concept of "self-destructing cassette player" in the TV series, Mission Impossible[10] – which allows the user to play the music only once. The initial concept of EMP has evolved from an idea that the self-destructing cassette can be applied in our daily music sharing practices but in a more tangible and personal manner than online music sharing. QR code has been a useful tool to transform text based URL into a visual marker, which empowered augmentation of tangible materials. Costanza and Huang (2009) created systems that enable users to set up their own visual markers, which already have shown the feasibility of the EMP prototype. Moreover, deployment study of the customised visual markers (Benford et al., 2016) shown the potential use of EMP in a broader real-world context.

[9] Physics of Sound. https://method-behind-the-music.com/mechanics/physics/
[10] Tribute to Peter Graves from Season 5 Episode 8 "Decoy" https://youtu.be/MA2KmJMKFrQ

One could imagine a scenario of gifting a music track for a special occasion or a musician releasing a limited-edition track for their fans. Several factors might affect a user experience with the EMP: the delicacy of the paper due to thickness and quality of the card; personalised design; the occasion of gifting; and the message attached to the card or music. All of these might influence a user's decision and experience when putting the card into the player. Precious wrapping paper used for a gift exchange gives an impression that the giver cares the recipient and the gift (Porublev et al., 2006). Likewise, I envision that a personalized card might play a similar role of gift wrappings when exchanging a music track for EMP. Hesitance or anxiety would emerge when the card should be destroyed. How the card has been designed – material, decoration, messages – would bring a tension on user interaction as it needs to be destroyed in order to reveal the digital content (in this case, a music track) mapped onto it.

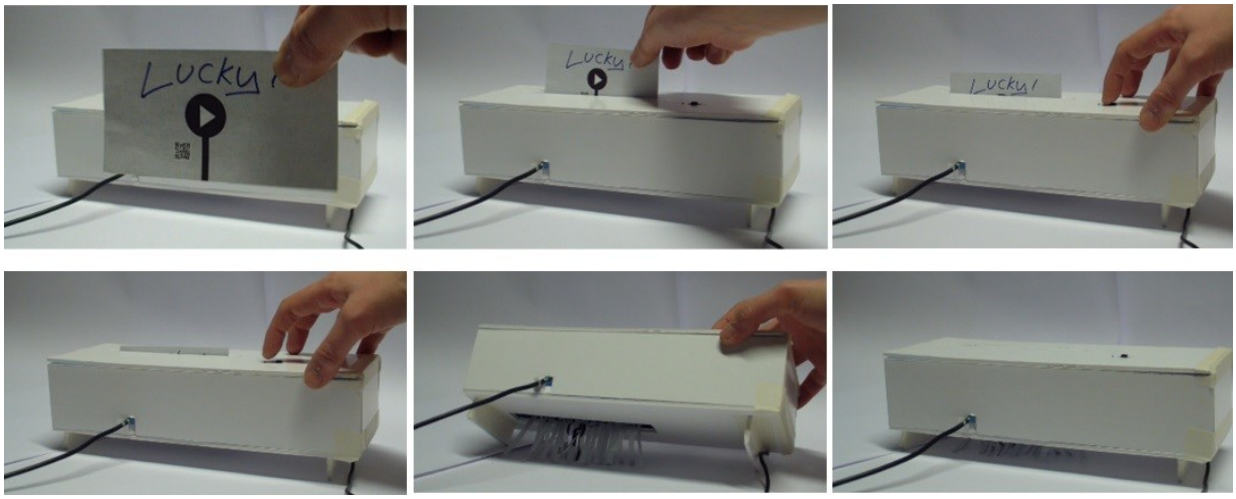


Figure 32. Demonstration of Ephemeral Music Player prototype. When the card has been shredded, the music starts.

A demonstration video of EMP can be found at *https://vimeo.com/158745660*. Design exploration for EMP has given a hint in bridging the findings from FugaciousFilm with the rest of this thesis. Both Dancing Sphere and EMP were sketched out as an attempt to weave subtle tension into an experience of interactive tangible artefacts. Especially, EMP suggests a concept of exchanging digital contents through destroyable physical materials. Moreover, EMP

incorporates an intentional removal of the tangible material as a way to receive digital content. A series of experiences involved in EMP has shown a glimpse of gift exchange with concern in wrapping. Therefore, before I start to branch out into developing EMP or related concepts, I began to review the area of gift exchange, specifically in HCI and Interaction Design. In the following section, I will reflect on the two design investigations and delineate the path of this PhD arrived to explore *Digital Gifting*.

5.1.3. Feedforward

5.1.3.1. Subtle and Delicate Interaction with Solid Materials

Two design investigations illustrated so far have depicted subtle and delicate interaction with a notion of ephemerality in the user experience. The focus of interest in designing an ephemeral interaction has been shifted from 'material' to 'experience'. Contrast to the FugaciousFilm, tailoring a fragile material into a specific setting, two prototypes (Dancing Sphere and Ephemeral Music Player) employed common tangible materials to shape an experience to be delicate or non-replicable. FugaciousFilm exploited ephemerality from the material to heighten a game experience by designing delicate interactions. Whereas, prototypes explored in the previous two sections focused on empowering experiences by incorporating irreversibility in the process. Table 3 compares the two prototypes according to the features that captured from ephemeral interactions entailed in FugaciousFilm.

Feature	Dancing Sphere	Ephemeral Music Player
Delicacy	Interaction	Card (Material)
Risk and uncertainty	Interaction	Non-applicable
Ephemerality of Material	Non-applicable	Card (Material), Music
Irreversibility/ Nonreplicable	Experience	Card (Material), Music

Table 3. Comparison of features between the two prototypes. The table shows how each feature is applied to the user interaction/experience or to the materials.

Whilst exploring the Dancing Sphere, I could already identify a limitation in terms of the application area. Although the prototype draws subtle and delicate tangible interactions, it shows similar approach to FugaciousFilm which could hardly be applied in a context closer to experiences that people might encounter in daily lives. However, EMP offered an inspirational design inquiry on how the concept ephemerality and ephemeral music can be harnessed in an ordinary context. Music has long been considered and exchanged as a gift in our social life. HCI researchers have investigated implications of mobile devices in music sharing (Brown & Sellen 2006) and social interaction when music is exchanged as a gift (Håkansson et al., 2007; Odom et al., 2011). I would argue, in the context of gifting, music sharing needs to be treated in a different manner to that of mundane file exchange. Moreover, not only the music contents but also other digital materials such as photo, illustration, and e-cards may need thoughtful ways being of exchanged as a gift in social relationships. I envisage a potential in ephemeral materials to reformulate a user experience in consuming/exchanging digital contents (e.g. music) beyond a series of normal digital interfaces, (e.g. search a music track – click on a selection – download/buy – listen and share) into a more rare and valued experience.

In the following study, I elaborate a research through design to broaden the use of subtlety and delicacy in practical, interactive applications. Inspired by the EPM, the context of ***gifting*** was concerned as a domain area where tangible interaction, focus, subtlety, and delicacy would emerge throughout the experience. Gifting embodies shared understanding that givers put additional time and effort into, which in turn constructs increased value to the gift object. This extra value is visualised through many factors, for example, when a gift item is hard to find (rare), and created by the giver (customised), beautifully wrapped (thoughtfully prepared). Referring to gift-exchange occasions in general, an action of ‘wrapping and unwrapping’ has an explicit tangible attribute in a way how we handle the gift artefact as well as how the gift mediates

social interaction. From a sociocultural perspective, the role of wrapping has recognised to be significant that conveys various functions and messages (Hendry, 1995). The wrapping turns an object into a gift and shapes the unwrapping moment. Gift exchange often features a moment of a surprise especially when the gift is revealed (Hassenzahl et al., 2012). Unwrapping experiences entail heightened attention, pleasure, or sometimes anxiety to both a giver and a recipient. It is notably short and a one-off experience, but sometimes encapsulates the whole gifting experience to be memorable.

In following, I will describe how the research focus has pointed to the context of the 'gift exchange' to answer the second part of the research question: *"In which context, might an ephemeral artefact be usefully integrated into a common experience that we encounter in ordinary life?"*

5.1.3.2. Turning to Digital Gifting as a Design Space of Ephemeral Interaction with Delicacy

Gift exchanges are one of the pervasive communication methods across various cultures and generations. Building on the widely practised physical gift exchange in social communication, digital gifting has increasingly emerged with advanced computing technology. From explicit gifts like gift cards and gift vouchers to implicit gifts such as music, movies, in-game money, and digital gifts are already ubiquitously used in many aspects of our everyday life. However, due to the inherent feature of devices (e.g. smart phones) and interfaces (e.g. touch screen or button interfaces) that are employed in the remote transition of the intangible materials, digital gifts often fail to convey the ritualistic experiences of the physical gift exchange. Most relevant to this thesis, wrapping has notably gained little attention in digital gifting context.

In this PhD, I weigh on the role of ***wrapping*** in the context of gifting to frame the asymmetrical experience between the gift give and receiver. '*Unwrapping*' a gift is an ephemeral experience regarding its irreversibility. Excitement and tension emerge at the instance of unwrapping are spontaneous and very brief. However, its impact is significant in the context. Therefore, I will investigate the

design spaced – digital gifting – and suggest a design approach to tangibly reinforce the gifting experience by tailoring delicate and focused interaction in the act of unwrapping.

Sections from 5.2 to 5.5, which delineate the interview study, have reformatted as a conference paper that has been presented at the ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2017).

5.2. Review of Gift Giving

General understanding on the topic of gift exchange is necessary to find a gap in the knowledge of digital gifting. Thus, this section offers an overview of a broad social science background of gift exchange. However, in order to view gifting from HCI and Interaction Design perspective, literature review does not cover the deeper historical and philosophical accounts of gift giving in detail.

5.2.1. General Background

Gifts and gift giving have been a frequently emerging topic of research in diverse disciplines across anthropology (Sherry, Jr., 1983), social sciences (Komter, 2007), philosophy (Derrida, 1992; Mauss, 1954) and psychology (Larsen and Watson, 2001). Therefore, the topic had been widely discussed as a part of human interaction for its variety of functions in communication, economic exchange, and socialisation (Belk, 1977).

Gifts are realised in many different forms – as artefacts, food, or hospitality – and they shape our social relationships to some extent. Hence, an importance of gift exchange lies beyond mere transactions of economic profits. The exchange of goods can be 'vehicles and instruments for realities of influence, power, sympathy, status, emotion' (Lévi-Strauss 1996). In this regard, a gift embodies multiple layers of functions and meanings that frame a variety of features of our

social interaction. Gifts are proclaimed to play an essential role in creating, maintaining, and enhancing relationships (Cheal, 1987). Reciprocity is an important mechanism that maintains the relationships. Reciprocity is an area of fundamental work done by Malinowski and Mauss about gifting system in primitive societies. An anthropologist Bronislaw Malinowski first described Kula exchange or Kula ring, a ceremonial exchange system conducted in the Trobriand Isles at the off the east coast of New Guinea (Malinowski, 1978). Malinowski considered the exchange of Kula to be non-utilitarian, they are kept for the sake of possessions and traded to establish strong relationships. In a similar vein, Marcel Mauss describes potlatch as an example of a total reciprocal system of giving in primitive societies. In his book *The Gift*, he presents the potlatch system that functions as competitive gift exchange among American Indians, Melanesians, and Polynesians (Mauss, 1954).

Gift giving literature could be identified either from a lens of utilitarian or an anti-utilitarian (Komter, 2007). Belk and Coon (1993) distinguished two different models of gift exchange in a dating context: an "exchange model" and "agapic love model". The exchange model focuses on the pragmatic nature of gifts. It concerns reciprocal exchanges of goods or services, in which gifts act as economic signals and symbols (Camerer, 1988) that bind 'human solidarity' (Mauss, 1954). The latter perspective emphasises gift giving as an act of pure altruism that enables 'genuine gifts' (Derrida, 1992). More brozadly, a range of motivations in giving and reciprocation (Belk and Coon, 1993; Gouldner, 1960; Sherry, Jr., 1983) have been investigated to better understand consumer behaviour (Banks, 1979; Belk, 2013). In addition, the principles of gift giving offer a lens to view our social communication (Cheal, 1988; Hassenzahl et al., 2012), which now increasingly occurs online (Schwarz, 2010; Skågeby, 2010).

Gifting is one of the oldest social communication methods that has deeply ingrained in our daily life. In the digital era, it is inevitable that the format of a gift and the manner of its exchange should undergo some adjustments depending on the media that shapes the fundamental nature of our daily communication. However, compared to the broad range of different gift objects are developed

from physical to digital, how the different methods and channels of gift exchange influence both the giver and receiver's experience has only merely investigated. As a first step to engage with a novel interaction for digital gifting, it is essential to scrutinise how digital materials are treated and perceived in the context of gift exchange.

5.2.2. Review of Digital Gifting

Csikszentmihalyi and Halton (1981) conducted an anthropological study into the significance of material possessions in contemporary urban life. In their study, we can identify 'gift' is one of the categories that people classify amongst other possessions that they acquired through various routes. However, the researchers did not take digital gifts into account when the study was conducted more than three decades ago from now (This thesis wrote between year 2016 and 2017). Therefore, I will review literature in digital possessions to understand the reasons of why some digital things are valued and treasured and how they are preserved.

5.5.2.1. Digital Possessions

Understanding how digital materials are possessed and treasured as one's belongings would benefit this study investigating digital gifting. Researchers have investigated how people acquire and treat virtual possessions. Belk (2013) argued that distinction between physical and virtual should be noted whether we can regard the possessions as parts of ourselves. The rapid emergence of dematerialized and digitalized artefacts evoked researchers to question whether the immaterial possessions are possible to foster attachment, self-extension, one-of-a-kindness, and fear of loss that often arise from material possessions (Belk, 2013). Kirk and Sellen (2010) sought to explore the home archives that people intentionally had chosen to keep, rather than just accumulate. Understanding the archiving practices and values, they proposed implications for the design of future forms of domestic archiving technology. Moreover, Denegri-Knott et al. (2010) suggest that virtual materials are different from our experience of having material consumptions. On the other hand, Lehdonvirta (2012) argues an

opposing view to the separation by blurring tangible and intangibleness in consumption. He claims that virtual things such as services or information are bought to satisfy one's pleasure and they are similarly as significant as material goods. But a constraint applies to the usage of virtual goods that it can only be used in certain condition – on the Internet. This restriction makes the digital goods very 'real' to their owners (Lehdonvirta 2012). The most representative context where virtual goods are regarded as meaningful as real objects is a virtual game environment. In online games such as *The Sims* or *Second Life* players try to acquire virtual goods like they do with material objects (Anon 2013; Martin 2008). Players become attached to the virtual possessions in the games (Martin 2008) and equally treat the value of the goods. Nonetheless, the digital aspect of the possessions makes it easy to replicate effortlessly. Therefore, the idea of 'limited edition' applies to game items that producers adopt in order to purposely raise the value of items (Lehdonvirta 2009). In a similar vein, Belk (1988 and 2013) argue that consumers singularize[11] or de-commoditize virtual possessions. They are kinds of consumer rituals that transform virtual goods into meaningful or cherished possessions (Denegri-Knott, J. et al. 2012). Such rituals are centralised on purposeful investment while adapting, crafting, storing, and re-materializing the goods. Exchanging virtual goods as ***gifts*** is one of the rituals that enables a recipient to singularize the virtual commodity (Belk 2013).

Other researchers also have explored what virtual possessions lack compared to non-digital counterparts. Siddiqui and Turley (2006) found that there are imbalances in the sense of control and ownership that cause users to replicate files and copy originals, which leads to them feeling less authentic. Also, people may become less reluctant in deleting an e-card than disposing of a physical card, and the same applies to music preference of physical CDs or vinyls (Styvén, 2010). The intangibility of digital files defeats the ability to display (Brown and Sellen 2006) so less actively reflected upon the memories attached to the files.

[11] Belk had not defined the term "singularize" in his own words. But he used the term to describe consumers' ritualistic behaviour around personalising their possessions. Efforts put on to commersialised materials to make them conspicuous was to describe the term singularize (Belk, 2013).

These studies show that digital possessions are regarded almost, but not quite, the same as material possessions. Singularization, de-commoditization, and dematerialization have been considered as methods to enhance our attachment to immaterial possessions as we do with material possessions. Despite the convenience in exchanging digital cards, photos, e-books, and e-mails, as Siddiqui and Turley (2006) examined, users feel the uncertainty about the ownership and management of the digital materials that encourage people to duplicate the same files. Duplicability was recognized as a feature that dilutes the originality. In Siddiqui and Turley's study, they learned that music without the physical presence such as discs or covers became less regarded as a part of the user's extended self. However, for those active users of various digital services (e.g. blogs, games, or social media), digital contents are still critical for their social life, virtual identity, and so forth (Belk 2013). People who own a large collection of digital music files were strongly hesitant in deleting files even though they no longer listen to them (Odom et al. 2011). Sharing digital music files, in particular, were important to be a member of a virtual community (Born 2011). However, there was controversy about music in that although digital music files are personally valued, they are still not as attractive as CDs and vinyl when exchanged as gifts (Brown and Sellen 2006). Not only immateriality but also a lack of explicitly visualised effort in personalization diminishes the characteristic of "the perfect gift" (Belk 1996). It is presumable that weakened attachment would also apply when receiving other virtual (digital) gift artefacts. Despite no loss of quality in digital files and convenience in giving and receiving, regardless of distance, there is still a lack of certain features that are also missing in virtual possessions. However, gift exchanges involve two parties (giver and recipient) and this existing research on digital possessions has not addressed the gifting process itself.

Therefore, in the following section, I will scrutinise how digital gifts have been practised and also to review which aspects of the research topic had previously been investigated. This literature review is purposely attempting to find a gap in

gift giving study in the field of HCI, with an aim to design for an ephemeral experience: ***gift unwrapping***.

5.2.2.2. Gift Giving in HCI

In this PhD, 'digital gifts' covers a broad range of virtual objects that are intentionally exchanged as gifts online and in other digital formats, without a means of physical embodiment involved. To this end, digital devices are not in the scope of this research, nor are physical material gifts ordered and sent through an online order.

As noted earlier, gifts involve non-material forms such as knowledge, services, and events (Sherry, Jr., 1983). Also, digital files like digital photos, music tracks, and illustrations are often exchanged as gifts (Belk, 2013). So far in HCI and related fields, digital gifts have been investigated as a part of digital possessions with a focus on how immaterial things gain meaning and how they become cherished over time (Mihaly Csikszentmihalyi & Halton 1981; Denegri-Knott, J., R.D. Watkins 2012; Watkins & Molesworth 2012; Golsteijn et al. 2012; Belk 2013). Given that gift giving is one of the strategies to foster social intimacy (Hassenzahl et al., 2012), it has been incorporated into communication technologies. Taylor and Harper investigated teenagers' text messaging with a frame of ritualistic gift exchange, arguing that occasions, when they offer texts ceremoniously, can express symbolised meaning (Taylor and Harper, 2003). Extending this to public communication, Schwarz (Schwarz, 2010) argues that in the case of social networking sites (e.g. Facebook), publicised compliments or tags give a sense of 'gift receiving' as they draw public recognition. Yang et al. demonstrated virtual currency systems in Chinese online communities with an idea of *guanxi*, a tradition that makes ties based on gift exchange (Yang et al., 2011). So it seems that messages and artefacts used in maintaining intimacy are being seen as a gift regardless of materiality.

Arguably, for personally exchanged digital photos or crafted digital artefacts (e.g. videos), which often lack an explicit framing of gift and are often seen as supplementary to communication, it is more ambiguous to what extent the

concept of gift giving applies. There has been a commercial digital gift exchange service that a user can creat or order digital gifts and send them through email. A digital gifting service called *Delightfully*[12] introduced a new way to 'wrap' electronic gift cards with photos, messages, and other memorabilia. The service basically offers unwrapping experience. A giver hides a redemption code or e-card under photos that recipient must sift through with their mouse or wipe on a tablet screen; going through all the past memories and messages lead up to reveal the gift at the end, or the gift appears when the recipient completes a puzzle made by their memorable photo.

In the context of digital technologies being seen as an experience that deeply embedded in everyday life (Wright and McCarthy, 2004), mobile devices enable us to exchange not only digital materials but also experiences as gifts. Interactive capabilities of the mobile devices support not only the transaction of digital files but also the presentation of a particular experience as a gift. In this regard, Fosh et al. (2014) studied how a personalised interpretation of visiting experiences can be seen as a gift. Experiences with unique interactions in the museum were considered as gifts when personally curated for the recipient. Furthermore, Frohlich and Murphy (2000) illustrated how stories attached to souvenirs become shared memorabilia and enhanced the sense of personalised gifts. Experiential gifts may be extended to more general contexts through augmented objects and interfaces. However, in the exchange of more common forms of digital gifts, such as gift vouchers, music tracks, and software, associated experiences have barely been investigated.

Brown and Sellen (2006) noted that although digital music files are personally valued, they are not as attractive as CDs and vinyl when exchanged as gifts. The study highlights that intangibility of digital files influences the lack of visible efforts entailed in preparing the gift. However, Odom et al. (2011) found how teenagers exchange personalised musical playlists and albums, showing that the

[12] It is an online gift giving (wrapping) service founded in January 2012. The website (www.delightfully.com) seems no longer available, but an information can be found here: http://www.cloud9living.com/blog/gift-wrapping-delightfully/

immaterial music track can also be especially appreciated as a gift. Accordingly, the emergence of ICT broadened the context where digital forms of gifts would benefit common and ordinary online gifting practice (Skågeby, 2010). In this regard, digital gifts need to be re-examined beyond their mere immateriality to illuminate further the status quo user experience of gifting services and applications. In the light of ubiquitous mobile devices and IoT applications, digital gifts are no longer constrained to a static format or a robust device. Related research has recognised food as a medium for social communication and gift giving (Barden et al., 2012; Grimes and Harper, 2008), as the experience of food has many characteristics that resemble the gifting process (Shuman, 2000). As in the recent study by Wei et al. (2014), one might, for example, consider preparing gifts by using food (e.g. biscuits) as a vessel that conveys a digital payload, which can be any forms of digital gifts. With currently available digital technologies, it is now timely to consider alternative modes of the exchange of digital gifts.

Having reviewed previous research in the field of HCI and CSCW that addressed gifting, I could recognise that gifting has been a lens to view people's general social behaviour around using or communicating through digital media. Although previous research attempted to illuminate the universally recognised process of gift exchange in the context of HCI and CSCW, relatively little has been explored about explicit acts of giving and receiving digital materials that have deliberately selected for gifts. I find that a more systematic exploration is necessary at the junction between existing social customs in gifting and emerging digital gifting services.

In the remainder of this chapter, I will explore status quo 'digital gifting', discuss its benefits and challenges with current digital media, and envision future of digital gifting by embedding ephemerality and delicacy in the gifting experience.Thus, I aim to deliver several research outcomes as follows:

(1). A five-stage conceptual framework of the gifting process that reflects broad knowledge from outside computing (Section 5.3).

(2). Interview study to explore how people experience digital gifting by employing the framework (Section 5.4) and also, identified key weaknesses throughout current digital gifting experiences (Section 5.5).

(3). Prototypes reflecting the design implications derived from the study that proposes a novel approach towards digital gifting, which points back to the ephemeral experience of gift unwrapping (Chapter 6, Section 6.1).

(4). A design workshop discussing validity and extensibility of the prototypes with potential user groups (Chapter 6, Section 6.2).

5.3. Framework for Gift Exchange Process

5.3.1. Background

Although gift giving has been widely studied, there is a lack of systematic analysis of digital gifting and associated interaction. I draw on related works of gift giving particularly from social science, in which studies concerned the broader dynamics of social interaction around the gift exchange.

The preeminent theoretical model employed in gifting literature is Mauss's three types of obligations: to give, to receive, and to reciprocate (Mauss, 1954). Literature in a lineage of Mauss's model concerns reciprocity as one of the powerful motivations that drive gifting as a self-perpetuating system (Belk 1976; Komter 2007). On the other hand, Belk and Coon's (1993) romantic love model introduces gift giving as an expression of altruistic behaviour that distinct from economic and social exchange paradigms. Moreover, beyond a general emphasis on 'giving' that illustrated in many kinds of literature, Sherry et al. (1993) and Sunwolf (2006) introduced receiver-centred models and showed the potential negativity and ambivalence in the gift exchange.

In consumer research, Banks (1979) articulated the gifting process through four stages; purchase, interaction/exchange, consumption, communication/feedback.

The model provides an overview of gift exchange of consumer goods by expressing inter-personal behaviour of both the giver and receiver. Sherry illustrated the process with more psychological precision using a three-stage model; Gestation (preparation), Prestation [13] (exchange), and Reformulation (disposition) of the gift (Sherry, Jr., 1983). The model illustrates not only explicit behaviours in gift exchange but also implicit communication that affects the subsequent stages. Both models offer general overviews of the gift exchange process with associated intentions and behaviours. In particular, Sherry's model describes a broad spectrum of the gifting process in detail and is widely cited by scholars in adjacent disciplines. However, too many variables and concepts add complexity that may become a limitation for analytic studies. It is notable that there is a need for a framework that supports systematic analysis on gift exchange.

In the following, I will introduce a *five-stage model* that offers an analytic overview of experiences taking place during the gifting process to underpin this study.

5.3.2. Developing Five-Stage Gift Exchange Model

I propose a Five-Stage Gift Exchange Model (Figure 33) by synthesising the previous literature to ground my analysis of digital gifting and inspire the design of future gifting services. 'Interactive Paradigm of Gift Giving' (Banks, 1979) and 'A model of gift giving behaviour' (Sherry, Jr., 1983) inspired and influenced me to generate a simpler model for the process that illustrates core aspects of gifting behaviour. Particularly, I highlighted the Reveal stage as a separate process. Previous models mostly addressed gift exchanges that giver and receiver are presenting at the same location. Therefore, they described a range of interactions including presentation, unwrapping, and response, all as

[13] [Anthroplogy] A gift, payment, or service that forms part of some traditional function in a society, given or due either to a specific person or to a group; the giving or performance of such a gift or service. (source: https://en.oxforddictionaries.com/definition/prestation)

typical parts of ‘exchange’ (Banks, 1979; Russell W. Belk, 1976; Sherry, Jr., 1983; Sunwolf, 2006). Especially, when unwrapping the gift, a recipient responds to both gift and giver by interpreting the content, inferring intent, and conferring judgement (Sherry, Jr., 1983), which is crucial to a giver. Therefore, gift-wrapping is widely recognised as an important symbolic interaction ritual that is intentionally added by a giver, with a focus on “response induction” (Sherry, Jr., 1983). However, in digital gifting, “exchange” and “reveal” are often spatially and temporally apart, since the two activities are done remotely through media. Therefore, it is not clear how much the giver can be involved in all aspects of the exchange – present, unwrapping, and seeing response – and how does it influence the receiver in subsequent stages, both “use” and “reflection”. In addition, the social significance of wrapping and unwrapping has not been addressed in digital gifting so far. Therefore, the model separates the “Reveal” stage from “Exchange” to be able to probe the influence of interaction rituals in digital gifting, as it is not just the gift itself, but the manner of exchange that matters (Cheal 1988).

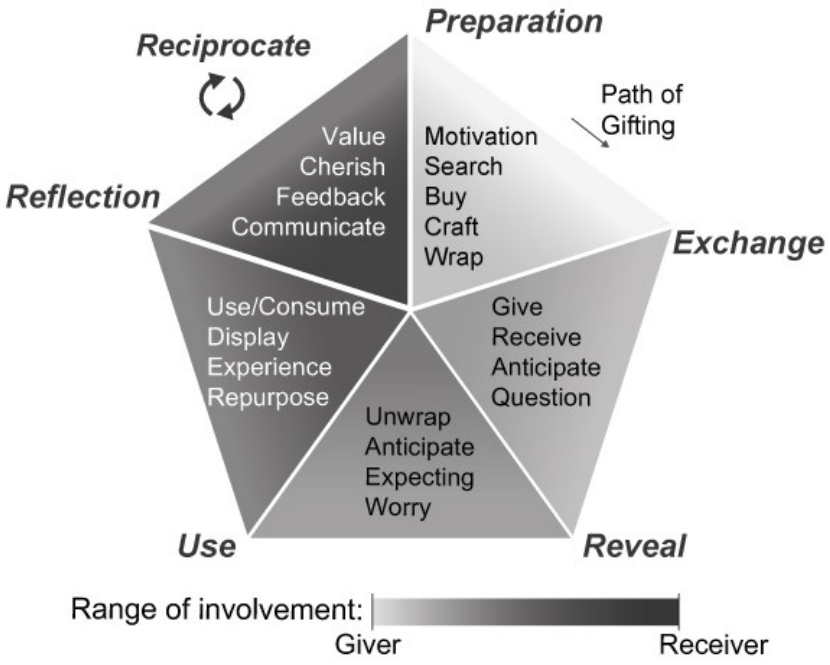


Figure 33. Five-stage gifting framework. This model explicated the Reveal stage from the Exchange stage in previous research.

The listed terms in the diagram encapsulate the experience in each stage that have extracted from the literature. I assume that interactions between giver and receiver might occur in all stages, either directly or implicitly (Sherry, Jr., 1983). Hence, the model illustrates the range of involvement of the two parties through the brightness of the grey scale shading.

A table below describes each stage of the process in detail.

Preparation	At the beginning of gift exchanges, giver and receiver communicate implicitly and explicitly (Sherry, Jr., 1983), depending on their relationship and the occasion. However, in both cases, the preparation is predominantly handled by the giver, which involves searching, purchasing or crafting. The process incorporates personalization through the selection of wrapping paper, decoration and messages, for example.
Exchange	Giving and receiving take place at this stage. Interaction between the two parties influence time, place, and mode of transaction (Sherry, Jr., 1983). Greetings, conversation, and anticipation of the gift occur during the exchange.
Reveal	This stage incorporates unwrapping and the encounter with the actual gift. Excitement and suspense emerge simultaneously during the reveal stage to both giver and recipient. It is then that recipients make an affective response to the gift and the giver (Sherry, Jr., 1983).

Use	Experiencing the gift occurs at the use stage. Usage may vary depending on the content of the gift. Receivers might display, wear, experience, utilise, or repurpose gifts. Usage may alter the value of the gift they perceived initially. The reflective conversation may also arise between the two parties while using the gift.
Reflection	For the term 'reflection', we follow Lindley et al. (2011) who accounts for self-awareness and making sense of personal experiences as a general process of reflection. We believe it is not only the gift object that affects positive reflection. The experience entailed in earlier stages might also affirm stronger relationship to both gift and giver and this may lead to reciprocation

Table 4. Description of the experience involved in the five-stage gifting process.

In some occasions, the process may be interrupted or overlapped by various factors, which will cause some delays in-between the stages. But by rendering the process in the typical process of exchange, I envision that the framework would become a useful tool for designers and researchers to effectively compare and capture some disregarded features in digital gifting with current communication technology and interaction design. In what follows, I describe the interview study employing the framework. As I will demonstrate, it has supported the formation of a detailed understanding of the gifting process that utilises digital technology. Also, during the analysis of the study data, the model underpins the proposal of specific design implications for future digital gifting services.

5.4. Interview Study

Throughout the interview I aim to: *1) gain a general understanding of the digital gift exchange in practice*; and *2) disclose gaps in the engagement of the digital gift exchange process.* In order to highlight some characteristics of digital gifting, the interview also encompassed physical gifting experiences. From the beginning, two hypotheses inspired digital gifting research as a design space to explore ephemeral experience with delicate interaction.

Hypotheses

In compare digital to the physical material gift exchange, the hypotheses are as follows:

[h1]. Receiver's excitement diminishes when revealing the digital gifts.

[h2]. Giver's excitement also diminishes in the giving process (prepare – exchange – reveal), but especially in the reveal stage.

Both assumptions derived from the fact that 'wrapping' is absent in the digital gift. From the inception of this study, *gift unwrapping* has been framed as an ephemeral experience, which has a significant effect in gifting but hardly supported by current digital communication methods. Therefore, while anchoring on the particular aim of this thesis, the interviews were conducted to gain an extensive understanding on digital gifting in practice.

5.4.1. Recruiting Participants

From pilot interviews, I could grasp that people had difficulty in recalling an experience of exchanging digital gifts at the first instance. Therefore, for the actual study, one requirement had been announced to take part in the interview – 'people who have had experienced receiving any digital gifts'. Participants were recruited through various channels. Emails were sent out via several university networks, the local hacker community, and hard copies of a poster were also posted across the university campus. In total, there were 25 participants (9 males 16 females, mean age 29.92) from various ethnic and

academic backgrounds, marital status, and age ranges (the youngest participant was 20, and the oldest was 49). 13 participants were single, 8 were in relationship, and 4 were married, living with family and child(ren). Those people who are in a relationship or married participated individually (not in pairs or groups). The variety in participants' background and status would cover a wide range of gift exchange experience in daily life. Brief information about each participants are listed below.

P1	P2	P3	P4	P5
Age: 21 Occupation: Student (Engineering) Gender: F	Age: 42 Occupation: PhD student (CS) Gender: M	Age: 25 Occupation: PhD student (CS) Gender: F	Age: 22 Occupation: PhD Student (CS) Gender: M	Age: 35 Occupation: PhD student (Art&Design) Gender: M
P6	P7	P8	P9	P10
Age: 49 Occupation: Scientist Gender: M	Age: 34 Occupation: Research Fellow Gender: F	Age: 30 Occupation: PhD student (CS) Gender: F	Age: 43 Occupation: Designer Gender: F	Age: 48 Occupation: PhD student (Design) Gender: F
P11	P12	P13	P14	P15
Age: 27 Occupation: Research Associate (CS) Gender: F	Age: 32 Occupation: PhD student (Media technology and Design) Gender: M	Age: 35 Occupation: Lecturer (Design) Gender: M	Age: 28 Occupation: PhD student (CS) Gender: M	Age: 33 Occupation: PhD student (CS) Gender: F
P16	P17	P18	P19	P20
Age: 28 Occupation: PhD student (CS) Gender: F	Age: 28 Occupation: Business Gender: F	Age: 27 Occupation: Researcher (Physics) Gender: M	Age: 19 Occupation: Student (HCI) Gender: M	Age: 24 Occupation: Student Gender: F

P21	P22	P23	P24	P25
Age: 24 Occupation: Student Gender: F	Age: 20 Occupation: Student Gender: F	Age: 25 Occupation: RA Gender: F	Age: 24 Occupation: PhD student (HCI) Gender: F	Age: 25 Occupation: PhD student (HCI) Gender: F

Table 5. Demographic characteristics of interviewees

5.4.2. Interview Structure

Interviews were semi-structured conversations focusing on participants' digital gifting experiences. Interviews were held individually by appointment, face-to-face, mostly in the university meeting room and alternatively via Skype call. The average duration of interviews was 50 – 60 minutes and each participant was remunerated with £10 (Amazon voucher) per hour. I continued recruiting participants and collecting data until it felt that similar issues were constantly repeating among them and total duration of data collection took 5 months. Timeline of the study is as follows.

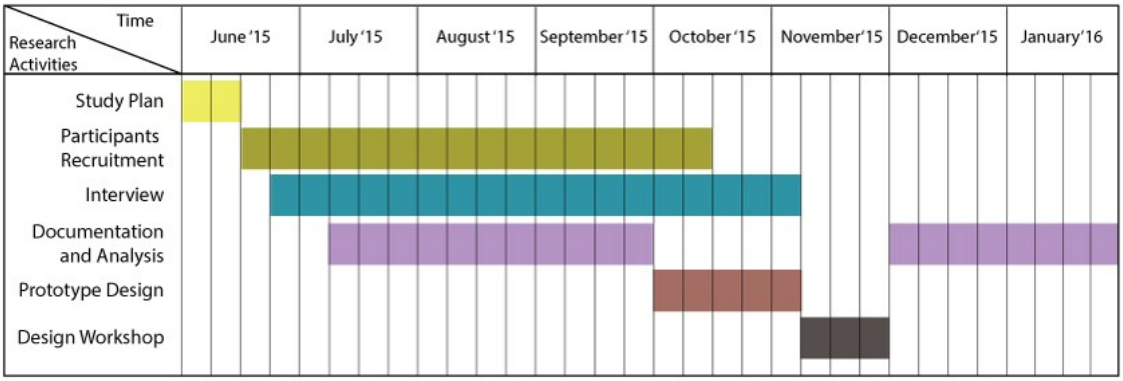


Figure 34. Timeline of the digital gifting study. Whole duration of the study, from planning to analysis, took over 8 months. Interview study lasted 5 months and conducted in parallel with analysis and design phase.

5.4.2.1. Disclosing past gifting experience

Gouldner argued that appreciation and attachment towards a gift differ according to the participant's role (Gouldner, 1960). In the pilot tests, I could identify that participants applied different values to the same digital artefact, depending on whether they were the giver or the receiver. Hence, the interview was split into two overall parts, focusing on giving and receiving, respectively. However, because the physical gift 'giving' experience is already covered by a wealth of literature, I did not include it in the interviews. Therefore, in order to focus the inquiry, the interview was split into three topics: 1) Receipt of a physical gift, 2) Receipt of digital gifts, and 3) Giving digital gifts (see Table 6 for details).

Although the interview was focusing on digital gifting, for comparative analysis, I had begun by asking about their physical gifts. In this way, participants could reframe their own ideas about gifts; what it means for giving and receiving something as a ***gift***. Also, since the aim of the research was to find a gap in recipient's experience of digital gifting, giving a physical gift was not included in the interview. From the pilot interview, I could notice that participants are having difficulty in evoking examples and reasons to the questions. Therefore, for some questions asking details of specific experience (e.g. "types of the digital gift received"), examples were provided like a survey questionnaire but only as a reference for the interview. In this way, participants could easily prompt reasons other than the given examples. Table 6 below shows the outline of the interview and details can be found in the Appendix .

Content	Duration	Summary of Interview Questions
Receipt of a physical gift	approx. 10min	▪ About a cherished physical gift: What was the occasion? Who gave it? How/ why did you liked it? What did you do after (with/to the gift)?

Receipt of (a) digital gift(s)	approx. 30min	▪ Types of the digital gift received. ▪ How was the gift kept (e.g. displayed, stored, used)? ▪ Any experience of receiving digital contents, which have not been signified as gifts by the giver but that are cherished and valued as a gift? ▪ Any experience of receiving digital gifts that did not make sense as a gift? ▪ Any experience of reciprocating for digital gifts?
Giving digital gifts	approx. 20min	▪ Types of the digital gift given? ▪ Methods to symbolise the digital material as a gift? ▪ Any experience of offering digital artefact but denoting them as gifts?

Table 6. The structure of interview with a summary of questions.

In prior to interview, participants were asked to bring their most cherished physical gift, if they wished to, and the interviews naturally disclosed stories around the gift. With given examples, such as design (material, form factor, aesthetic quality), utility, and story/meaning, participants described which aspect of the gift they particularly valued. Finally, the interview also disclosed whether they display, keep safe (passive curation), carry, show to other people (active curation), or use the gift in a certain way, to express that they cherish the gift. This first part of the interview assisted participants to set a personal perception about the gift. Also, I identified which of the material significances (e.g. mobility, physically displayable) are considered as important factors to recipients.

The main part of the interview began with listing the virtual digital gifts that participants have received. Participants were given examples of digital gifts that picked out from pilot test and literature: photos, music, movies, gift vouchers, greetings cards, software, mobile apps, voice/text messages. Other types of gifts were also stated by participants, from their own experience. The rest of the interview focused on gathering ***interpretations about digital gifting***. Above all,

I attempted to comprehend what factors influenced the acceptance or disapproval of digital virtual materials as gifts. Likewise how people treat their cherished physical gifts, it was useful to know how they care for the immaterial gifts when there is no physical signification. Lastly, the interview also unveiled digital gift ***giving*** experience. In the pilot test, in the case of digital gifting, it was interesting to notice that participants were making sense of gift differently when giving and receiving. Although the same gift had given and received, some regarded as a gift when they were a giver but disapproved otherwise. Accordingly, the same list of examples for the received digital contents was shown, followed by questions asking if there were anything added to the gift to embellish, like we decorate physical gift objects.

Interview comprised of open-ended questions was aimed to grasp rich arrays of an idea how people perceive and distinguish the concept of gift with other mundane digital materials.

5.4.2.2. Rating the gifting experience

Belk (1976) extracted 40 adjectives used in his study, to measure giver's self-concept and recipient's perception on gifts. Referring to Belk's listing, I focused on the terms that one would use when expressing the positive emotion arise while gifting, such as Attractive, Calm, Emotional, Friendly, Fun-loving, Interesting, and Tactful. I selected an adjective, 'Excitement' as an antonym of 'Calm' (from Belk's adjectives). The term 'Excitement' (or Exciting) was chosen mostly because it often describes the emotional status while unwrapping. However, the term has many positive connotations, so I expected it to be used in the interview to express an emotional (positive) attachment throughout the journey of gifting. I have redesigned the framework as a graph shown in Figure 35 to rate excitement during the process of gifting. I applied a 5-point rating scale as illustrated in Figure 35, which depicts how the rating had been conducted in the interview.

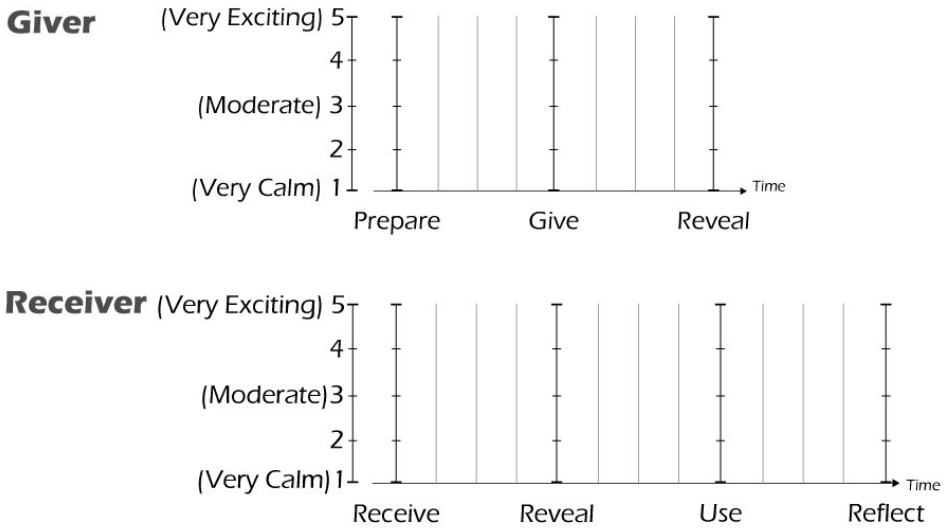


Figure 35. Rating graph for the gifting process of both giver and recipient. Segments in between the stages signify time scale, rather than for rating.

In the interview, I have fully explained what each stage is referring to, especially for digital gifts; "For digital, 'Receive' is when you got the notification of an email or text arrival and 'Reveal' is when you actually opened your inbox." Since the interview was focusing on positive aspects of the gifting process, when disclosing their experience, participants tended to associate the term 'exciting' with other expressions. For example, often stated was, "I was 'pleased' to receive […]", "I 'felt an attachment' to the gift while using it […]," or "I was not much 'engaged' at the reflection stage". Therefore, I would use the terms interchangeably throughout this thesis, where necessary.

5.5. Findings

First, I present general results from the interviews to categorise the attributes of gifts and unveil the types of digital gifts that had exchanged. Then I compare both givers' and receivers' experiences of digital gift exchange in comparison to physical ones. In addition to drawing on the interview transcripts, I will illustrate the findings with the excitement ratings. Although the research focus is on the digital aspect of gifting, the interview also covered cherished (physical) material gifts. The intention here was not to gain information about the gifts, but to

understand what aspects of the gift construct their appreciation. Moreover, the aim was to examine whether such aspects cohere with digital gifts they received.

5.5.1. Types of Digital Gifts Exchanged

I have pre-listed nine kinds of digital gifts (photos, music, movies, gift vouchers, greetings cards, software, mobile apps, and voice or text messages) that anticipated from a pilot test and literature review, for participants to easily recall and also to prompt other items they can associate with. A total of 21 item categories were listed as gifts that had either been received, have offered, or both. Figure 36 shows the number of responses for each item for giving and receiving. Some participants recalled multiple items whereas some people only had one. Among the examples of digital gifts listed, some examples were disapproved to be regarded as a gift. This shows that participants had their own concrete view on the digital gift that their judgments were not affected and biased by examples.

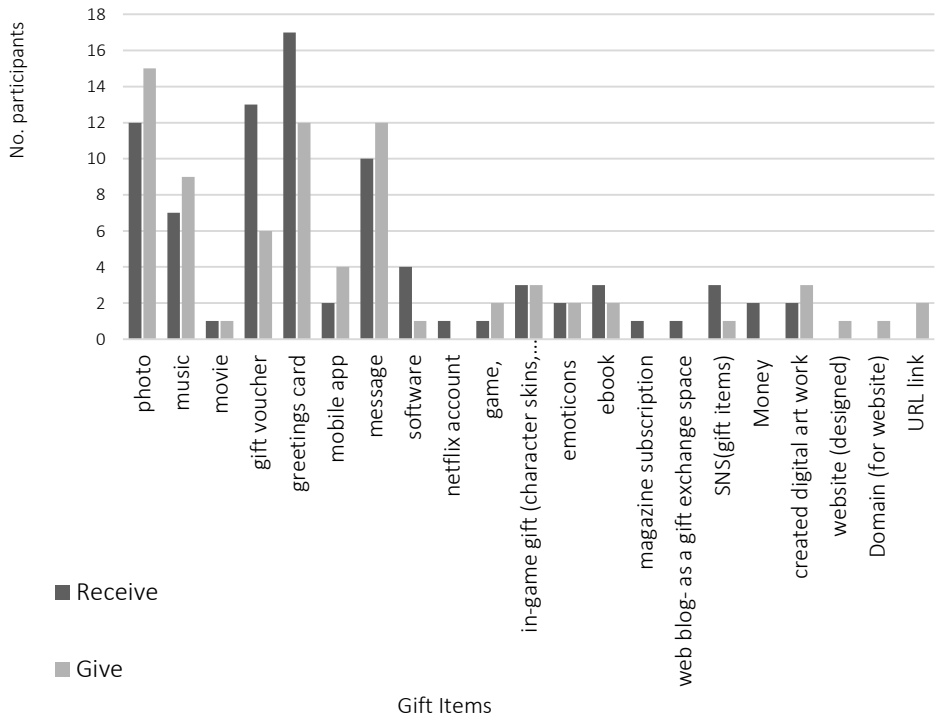


Figure 36. A number of participants sorted by types of gift items received or given.

68% of participants have included digital greetings cards as one of the gifts that they received: followed by gift vouchers (52%), photos (48%), messages (40%),

music (28%), software (16%), and in-game gifts (12%). When it comes to giving, 60% of the participants have offered a digital photo as a gift, followed by greetings cards (48%), messages (48%), music (36%), gift vouchers (24%), mobile apps (16%), and in-game gifts (12%). Additionally, there were other types of digital materials that participants exchanged as a gift. Self-created digital art works, E-books, emoticons, games, URL links, and money were mentioned multiple times. It was notable that some mundane digital things such as URL links were possible to be exchanged as gifts.

5.5.2. Attributes of Digital Gifts

5.5.2.1. Notable Attributes of Received Digital Gifts

Although I focused on a digital aspect of gifting, the interview began with cherished physical gifts.

Figure 37 shows some of the physical gifts presented by participants. Primarily, the gifts defined as "most cherished" were objects that people always wear (e.g. jewellery, watch) or frequently carry (e.g. wallet, tablet, diary) with them. The main reasons that made the object special were stories and meanings attached to the gift, as well as the relationship with the giver, rather than the monetary value or functionality. Good-bye gifts, the first gift in their relationships, or gifts for special occasions were included in this "most cherished" category. Thus, the gifts have been used or kept for an extended period of time.



Figure 37. Examples of cherished physical gifts. a: leather wallet, b: bracelet, c: ring, d: iPad, e: diary kept between a couple, f: watch, g: doll on a key ring.

The intention here was not to gain information about the gifts, but to understand which aspects of gift construct result in appreciation. More importantly, I could examine which cherished aspects of physical gifts might affect participants making value judgments around digital gifts. As Kirk and Sellen (2010) investigated in existing practices and values of home archiving to derive implications for the design of future domestic archiving technology, the formation of the interview also aimed to gain a general understanding of traditional forms of gifting and gifts and to project onto relatively novel types of gift, digital gifting.

In the second part of the interview, it was notable to see many participants were re-examining whether digital artefacts were given as gifts and whether they as the receiver had perceived them as gifts. When a digital file, which was not given as a gift, became useful (P3, P5, P6, P8, P13, P14), as P5 reflected: *"Some image files contain information that was very useful for me, they later felt like a gift,"* were regarded as a gift.

It also applied for the things that are not particularly useful but sentimental and emotionally charged (P3, P9, P15, P16).

P15 stated: *"Some pictures, photos (feel like a gift). Some nice messages, emoticons […] something that's emotionally charged."*

Photos or messages received in certain contexts can become mementoes and turn into a special gift (P7, P17, P18):

P18 explained: *"[…] When I accidently see something in daily life that a person (friend) would like, then I take a photo of it, and send to her as a gift."*

Thus, digital gifts were regarded as an effective tool to deliver an experience:

(P17): *"[…] a gift voucher for specific restaurant feels like I received an event, something like experience, and it becomes special."*

This illustrates that vouchers are a useful digital token to offer an experience when it meets the recipient's specific preference. However, as in general gift exchange, digital gift vouchers require mindful concerns about their relationship between the giver and receiver.

P23: "*Now the convenience of the digital gift fits into my life style. But it depends on who they are from too. If I had received an Amazon voucher from my mum for a birthday, I would be really happy, but if that was from my boyfriend, that would be horrible."*

P23's opinion highlights the conflict between the convenience and the appropriateness of the digital gift. The giver should pay more attention to the selection of the gift regarding the relationship with the recipient.

5.5.2.2. Missing Attributes from Digital Gifts

Reflections on individual experience with physical gifts naturally opened an in-depth discourse about what makes an object as a gift and which aspects are currently missing from digital gifts.

All of the Participants frequently noted that time and effort were rarely recognised in digital gifts, whereas these are easily noticed in physical gifts.

> (P1): *"Effort and time create the gift. Not only the expense but also, how meaningful."*

Therefore, the personal touch and purposefulness also were felt to be missing (P2, P4, P7, P11, P12, P18, P19, P23, P25):

> P12 points out: *"One thing about the gift is, […] I tend to value the fact that people have got out of their way, tried to make it personal"* and
>
> P7: *"Association with gift giving is about purposefully going to find something."*

Sharable and duplicable digital files (e.g. music tracks, movies, photos) made it difficult to perceive the contents as a gift (Golsteijn et al., 2012),

> P7: *"A gift is something that is for somebody and you don't have access to it."*

Such features also affect the sense of originality of the gift,

> P18: *"[…] digital gift, it can always be copied, everyone can have it, and the concept of 'limited edition' feels less."*

In this regard, duplicable and shareable aspects of digital materials were the main reasons why participants did not concern SNS postings as a gift. It was notable that participants rarely recognised publicised comments or tags on SNS in the boundary of gifts. Messages and shared contents on SNS were still regarded as a gesture of a good relationship, and they were pleasant to receive, but people would value them less than a personal gift. This demonstrates that digital gifts lie beyond publicised compliments that distinguish this thesis with other literature on social media (Schwarz, 2010). Exchange of the digital material is increasingly prevalent with personal smart devices.

> As P9 reflects: *"My husband bought me an app from my phone. […] If it were for a special occasion then I would (have considered it as a gift)."*

Occasions and associated meanings became an important factor that shifts a mundane 'give and take' activity to 'gift exchange'. Moreover, text messages, as well as photos and even files are now conveniently exchanged through smartphones, which was identified that many participants would classify as mundane communication method rather than a gift. Collocated exchange and wrapping were rarely mentioned when describing digital gifts.

> P12 pointed out wrapping is missing in digital: *"Digital aspect of it makes even harder what's gift and not because sometimes you don't even have wrapping."*

A few participants (P5, P6, P12, P16) mentioned Zip files, passcode locked contents, and USB sticks, in contrast to wrapping, as a mere method of enclosing and conveying digital contents. The categorization of gift attributes (Table 7) provides a general overview of captured expectations towards digital gifts as well as their limitations. These attributes will be revisited and discussed in more detail to generate design proposals in next chapter.

Attributes of Digital Gift	
a. Notable Attributes of Received Digital Gifts	*b. Frequently Missed Attributes from the Digital Gifts*
• Emotionally Charged, Sentimental • Useful • Memento • Appropriateness (Fits context and occasion) • Experiential	• Time and Effort • Personal • Passing Ownership • Purposefulness • One of a kind-ness (e.g. Limited Edition) • Face-to-Face Exchange • Wrapped

Table 7. Attributes of gift emerged from the interview. (a): Attributes particularly used to describe digital gifts that participants have received, (b): missing attributes from the digital gifts.

5.5.3. Excitement During the Gifting Process

In this section, I will demonstrate participants' engagement throughout the gifting process using the framework in Figure 33. In the interview, participants rated excitement during each stage of the gifting process. Figure 38 plots mean values of collected data into two radar graphs, which helps to capture the overall tendency as well as notable gaps throughout the process.

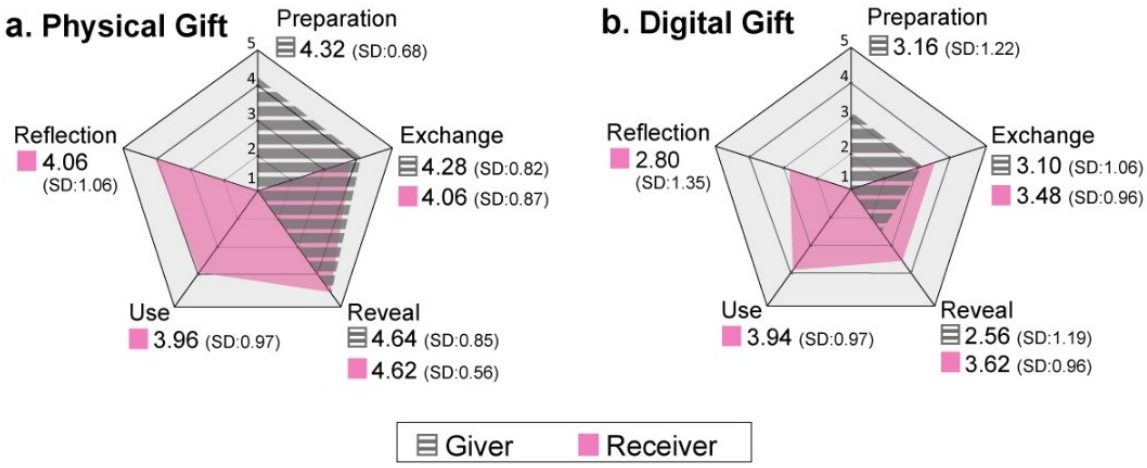


Figure 38. The mean value of excitement rated (N=25) in both a: physical and b: digital gift exchange process plotted in radar graphs.

The physical gifting plot (Figure 38-a) illustrates what we would agree as a balanced experience. The graph shows strong emotional attachment at all stages. Especially, at the Exchange and Reveal stages, both giver and receiver share an equivalent level of excitement. In contrast, the graph for digital gifting seems to be exposing weaknesses of the experience (Figure 38-b). At all stages, except Use, excitement was rated significantly lower compared to that associated with physical gifting.

Moreover, it seems that giver and receiver undergo asymmetric experiences in digital gifting, with the giver's excitement being generally lower than receiver's. A Wilcoxon signed-rank test was performed to identify the significance of the difference between the two types of gift. The analysis determined the

significance of *givers'* decreased excitement at every stage of digital gifting. (Preparation: Z = -3.366, $p<0.05$; Exchange: Z=-3.770, $p<0.05$; Reveal: Z=-4.126, $p<0.05$) For *receivers*, the analysis determined the significance of diminished excitement in digital gift receiving apart from 'Use' stage. (Exchange: Z=-2.497, $p<0.05$; Reveal: Z=-3.22, $p<0.05$; Reflection: Z=-3.063, $p<0.05$) Thus, the digital gift does not seem to extend the receiver's engagement to the reflection stage as much as physical gifts. This data evidently visualises gaps in digital gifting, and it is appealing to frame the problem space by the absence of the wrapping.

In the following sections, I will delineate the details of various aspects of user behaviours and attitudes in each of the stages of digital gifting that substantiate the data illustrated in Figure 38.

5.5.4. Details of Digital Gifting

5.5.4.1. Preparation

When preparing digital gifts, searching for the right gift online or creating something with digital resources reduces the needs for people to move beyond their homes or workplaces physically. Even though this might save time and physical burden, it can also diminish excitement, as P16 explains: *"[...] in digital gifts, [...] it's probably easier to find, so less of that kind of walking around, trying to find... but then it's not quite exciting"*. In this context, it was notable that participants rated the preparation stage neutral (3 – the lowest in the category) or higher for *physical gifting*, whereas that stage was rated much lower for *digital gifting*. The relatively easy and effortless preparation also reduced the giver's excitement at the point when the recipient reveals the gift, as P11 states: "*It's not exciting as much as when they reveal physical ones because I didn't go through all the troubles of preparing it like physical ones."*

- ***Labour fosters pleasure in giving***

Gift giving has generally been regarded as an active and voluntary investment of the giver's time and effort (Otnes and Beltramini, 1996). Given that 'to obtain pleasure' was identified as the highest priority reason for giving (material gifts) (Banks, 1979), there is an implication that such investment in preparation – making and personalising digital music playlist (Odom et al., 2011) – fosters pleasure. There were some participants (P8, P12, P18, P19, P20, P25) who have given digital gifts that they created by themselves, such as short video clip, photo collage, and illustrations. These participants rated their excitement as high (4 or 5) as that of physical gift preparation. It implies that people also tend to build attachment to digital artefacts due to the amount of time spent in acquiring them - *virtual labour* (Belk, 2013). But for many other participants (P3, P5, P7, P10, P14, and P23), such personalised digital gifts required specific skills (e.g. accessing software). This was seen as more laborious than the preparation of physical gifts (e.g. go out to search, wrapping). There are also mobile apps and web agent services that facilitate people to create digital gifts, such as photo collages and video clips. Some participants have experienced such applications but reflected that they were not very much engaged with the experience offered by the apps.

5.5.4.2. Exchange

At the Exchange stage, excitement is significantly decreased for both giving and receiving of digital gifts (Figure 38). The main reason was that the two parties are usually remotely located so that each givers often miss an immediate feedback.

- ***Givers are concerned with 'response induction'***

Givers often missed recipients' immediate expression or feedback about the gift when they are apart. In fact, feedback was highly desired and also valued for the pleasure of giving digital gifts, as much as in physical gifting (Sherry, Jr., 1983); (P10) *"For exchange and reveal, it's quite low because I'm not there. Then when I get feedback from them, I feel quite happy. […],"* (P15): *"[…] But when I get*

the notification that they opened, it's exciting. It makes me expect how they took it. But I don't always get the feedback". It was notable that some of the participants (P8, P13, P19) who have given a self-produced digital gift also experienced the absence of feedback. So even for personalised digital gifts that givers find enjoyable to give, feedback of their appreciation is not always available.

Physical gifts can also be delivered remotely. P9 recalled her experience of using an online service to deliver a physical gift to her family: *"[…] so you don't have any contact with the physical object […] I often wondered if that is actually as personal as something I go out and buy and post it to them."* This implies that the way a gift is exchanged is a matter of concern and in this respect, digital gifting has some weakness. P20 was making use of video calls to achieve collocated-ness in digital gifting, *"I always do the video call to say that I have sent the gift, and also I can see how they react."* Overall, we gained an impression that the design of computing systems for collaborative experience between giver and recipient in a gifting context is underexplored.

5.5.4.3. Reveal

During the interview, I intended not to make questions that are directly compared the effect of the presence of wrapping in physical and digital cases. But instead, the interview structure ('receipt of a physical gift' followed by 'receipt of digital gifts') led the conversation for participants to unpack their personal opinion about digital gifting that implies effect of 'wrapping' and 'unwrapping'.

- ***Wrapping matters***

When offering digital gifts, the absence of explicit wrapping creates ambiguity in judging what is a gift and what is not,

> as P12 remarks: *"Digital aspect of it makes even harder to say what's gift and not, because sometimes you don't even have wrapping."*

The moment of unwrapping is when the two parties share an experience, and this is what we are accustomed to about the ritual of the gift exchange. People are

still looking for this experience, even though digital technology reshaped elements in gift-giving. Most of the digital gifts came through participants' e-mail inboxes or message apps, with instant notifications of message arrival. Although I didn't explicitly address interface attributes, participants addressed that digital interfaces designed for opening the inbox are quite inadequate in the gifting context. In many cases, a short title in the header of an Email or a message discloses a clue about the content.

> P4's statement implies that unwrapping is irrelevant to be concerned in the digital domain: *"Revealing wouldn't be viable for something you do know you will receive. […] Receive and reveal would be sort of together. Because there's no unwrapping stage for sort of digital gifts."*

Apparently, wrapping was an important feature in how gifts are perceived. P6 stated that he usually becomes attentive and cautious at the moment of unwrapping, and especially valued the wrapping itself. For P6, the unwrapping experience was more than just removing the wrapping paper.

> *"The excitement of receiving experience doesn't go to the maximum as like physical ones. With the physical gift, there are other things implied in the features of the gift such as wrapping. Because it's a token of somebody else's effort as well when they wrapped the gift. It's not just the gift they are giving, but it's… they put in something else on top of the gift. They put some effort into presenting it, spend some time […] There is the sense that you going through different stages of giving, a person has chosen, bought, wrapped, there're lots of things embodied in that."*

Some participants, including P6, highly appreciated the wrapping itself, were careful in uncovering the wrapping paper, and also kept it. However, not everyone clearly stated the precise reasons why they are keeping it. Presumably, it is that people perceive the wrapping as a part of the gift, which had been thoughtfully selected by the giver, as P6 described above. Each participant might have a personal habit in unwrapping a gift depending on their relationship with the giver and their cultural background. Hendry (1995) noted that gift

wrapping and unwrapping differ widely in style and manner across cultures, which matters to both giver and receiver.

During the interviews, it was notable that besides a variety of personal preference in unwrapping, the act of 'unwrapping' offers positive, momentous experience in gift receiving:

> P13: *"I'm one of the guys who tear off the wrapping papers. I never kept the wrapping paper, but I enjoy the moment when I tearing it."*
>
> P18: *"Anticipating what's inside is really exciting."*

- ***Digital gift removes anxiety in receiving***

As a giver, participants often referred to apprehensiveness that they had felt when the receipent unwrapping physical gifts;

> P8: *"I keep worry if she likes it or not"*;
>
> P15: *"I doubt a bit, worrying if they will like it"*;
>
> P16: *"When they open it, it's exciting, but also, it's… a bit nervous as well to see how they respond to it."*

It was not only positive excitement that givers went through, but also subtle tension and suspense, simultaneously, to face the recipient's reaction. Likewise, participants reported that they underwent a similar sort of anxious excitement as a recipient. Unwrapping a gift while confronting the giver puts pressure on the recipient to show an appropriate reaction that matches the giver's expectation.

However, in digital gifting, such tension seems to be partially removed (see Figure 38-b) as the gifts are transferred remotely. There were different habitual ways of unwrapping a physical gift depending on occasions, relationship with the giver, or personal preference. But in common, it is notable that unwrapping offers positive and momentous experience in gift receiving. Creating anxiety, tension, and suspense is a widely employed strategy in heightening the excitement of experience in HCI (Benford et al. 2012), which has also depicted in this thesis by FugaciousFilm in Chapter 4. Reinforcing such uncomfortable,

yet, not always negative, emotion during the 'Reveal' stage poses a design challenge in digital gifting.

5.5.4.4. Use

One of the most notable features of digital gifts was their usefulness. Gift vouchers, software, e-books, and articles were noted as cherished digital gifts. In fact, usefulness was one of the key factors that shifted a digital 'thing' to a 'gift', in addition to sentimental memories (See Table 7). Accordingly, digital gifts that fit the receiver's specific purpose were exceptionally cherished.

> P20 particularly favoured Photoshop software that was given as a gift; *"Of course, if I'm giving something digital, it should be useful. Otherwise, you can't even use, you can't even display it, there's no point, there's no value. […]"*

Such useful gifts are often exchanged in close relationships. For example, in addition to specific software (P1, P8, P14, and P20), gift vouchers for special events (P3, P17), and even money transactions for holiday or birthday (P14, P16) have been given by parents or very close friends. In non-intimate social relationships, such gifts are often regarded as inappropriate.

> P11 reflects on a goodbye gift that she received from a former colleague; *"Gift vouchers are like that. It feels impersonal. […] I would have preferred physical things for that situation. Like books? It doesn't matter whether I like the book or not, it would have felt more appropriate."*

Pragmatic digital artefacts can become effective personal gifts in intimate relationships since the giver might know well the receiver's needs, desires, and preferences.

- ***Effective Use of Shared Gifts***

Duplicable and shareable features were what made people class some digital gifts as 'not-yet-a-gift'. However, some shared digital gifts distinctively noticed in a family context. P10 described her use of Whatsapp with her sisters. The

concept of gifting was metaphorically embedded in the description of a private chatroom:

> *"I have a group chatting room in Whatsapp. It's for me and my three other sisters. […] All of us live in different cities and the images sent through Whatsapp become quite personal […] Chatroom itself is the thing I value like a gift."*

In addition to a text message becoming a cherished gift by itself (Taylor and Harper, 2003), the interface design of messaging apps can engender the notion of co-presence by allowing multiple participants to be involved in one chatroom. Co-presence then enables personal exchange in real time that offers a sense of gifting. In romantic relationships, digital gifts were rarely exchanged or appreciated. But when the gifts were used to create a live experience, they became distinctive and valued. For example, P12 was using the Tumblr app as a private journal and his partner started adding personalised content documenting special events. Since then, they have been using it as a gifting space; *"We uploaded photos, music, video clips, and messages only for us. Sometimes there are surprises there."* The use of digital technology can also add value in the gifting context, by enabling people to personalize, archive, and share gifts in a collaborative manner.

5.5.4.5. Reflection

For receivers, the reflection stage shows the clearest distinction between receipt of physical and digital gifts (Figure 38). P13 recalled his experience of reflecting back on digital gifts;

> *"I think we never reflect (talk) back for digital gifts."*

This statement resonates with the majority of participants' responses; *"it is easily forgotten."* However, at the same time, none of the participants have said that they would discard or delete the gifts. This was noticed to be affecting the delayed use/consumption of some digital gifts. Also, some physical gifts are not used immediately after being unwrapped, but *"they are often placed in our*

periphery" (for example, P24) so that, they constantly remind the receiver of the past experience with the giver. The fact that intangible digital gifts are only noticeable while they are in-use influenced recipients' responses in the reflection stage, even when the gifts were useful or evoked sentimental emotion while using them. Digital files can be retained without loss of quality; however, the user-experience with the digital content is transient. Nonetheless, we would argue that intangibility is not the sole reason for digital gifts to be hidden from our perception. A personally selected digital gift, an event voucher, was particularly cherished by the recipient (P17) and a strong attachment to the gift and to the relationship was formed while using it. Thus, not only the gift artefact, but also the experience entailed in the Exchange, Reveal, and Use stages contribute to creating the sense of a memorable digital gift.

5.5.4.6. Reciprocation

Most of the digital gifts were passively kept in their inbox or hard drives that they rarely revisit. Furthermore, it was noticeable that rarely reflected gifts tended to foster a weaker obligation to reciprocate. P11 acknowledged that digital gifts were more valuable in terms of usage as she listens to music or reads e-book frequently, but she felt less obliged to reciprocate;

> *"I feel some pressure but less than the physical ones. I might value and use it every day than the physical ones but not the same obligation."*

The fact that digital content is noticeable while it is in use and intangible nature of digital gifts led to less commitment to reciprocate the gift. Although the digital file itself can be durable without loss of quality, the experience that user encounters with the digital content is transient;

> P12: *"The thing with the physical gift, it's always there and reminds you that you need to reciprocate. With digital, it's a bit fuzzier, and you don't tend to remember every digital gift you received, and you forget. There's still an obligation, but it's lighter (than the physical gifts)"*.

Reciprocation had been widely debated in gifting research (Mauss 1954; Belk 1977; Derrida 1992). Previous literature opened the discourse about reciprocation of the physical material gift regarding ethics, philosophy, or sociology. However, in the ordinary gift exchange, reciprocation seemed innate in our social interaction, to a certain extent.

The interview study shows that recipients of digital gifts are less committed to returning. It proposes to researchers who wish to engage in digital gifting may consider reciprocation as a design opportunity to enhance overall engagement.

5.5.5. Summary of Findings

Interview findings unveiled the circumstances when digital gifting is effective, why they are cherished, and how they are treated and treasured. At the same time, the weaknesses of digital materials, in the context of gifting, have been uncovered. The main findings can be summarised as follows:

- Givers enjoy crafting/making digital gifts that require some level of labour more than the use of simple apps or web services.

- The giver and recipient appear to experience asymmetric levels of excitement during the process, especially during the *Exchange* and *Reveal* stages.

- Pragmatic digital gifts are particularly cherished and valued when exchanged in intimate relationships.

- The collaborative use of smart devices/applications for families and romantic couples to share digital artefacts can effectively build a sense of gift exchange.

- The actual ‘value of goods’ or ‘messages’ was considered more important than the presentation method or the manner of exchange among family members.

- Digital gifts often fail to be appreciated as gifts by the recipient and are easily forgotten, rarely reflected on and reciprocated.

Literature review and interview study offered extensive knowledge on general gift exchange that underpins design exploration of digital gifting that illustrated in Chapter 6.

Chapter 6

6. Applying Delicacy in Digital Gifting with Ephemeral Materials

The interview revealed that the givers' excitement during the exchange and reveal stages were often associated with the amount of work and time endeavoured during preparation. Furthermore, for receivers, memorable experiences at the exchange and reveal stages lead to a prolonged emotional charge in the reflection stage. While this tendency was generally realised in the physical gift exchange, it was doubtful whether it is also achieved in digital gifting. Pleasure in gift exchange was engendered not only from the artefact exchanged but also from experience associated with it: context, rituals, social interaction and presentation of the gift (Belk 1976). Such aspects need to be more critically considered in digital gifting in order to perceive and accept a transacted digital material as a gift since the digital gift lacks ritualistic exchange or explicit wrapping. In this regard, Richard Harper (2010) described misled technological development for human expression in the age of communications overload. Harper argues that communication is not just the exchange of information, how the payload is expressed matters more in some occasions and in different social relationships. This aligns in parallel with my argument of this thesis about digital gifting, which lacks ritualistic exchange. Previously, Harper also described text-messaging is a form of 'gift exchange' from the study on teenagers' mobile phone usage (Taylor and Harper, 2003). I agree with their basic concept that the gifting is a part of our communication and some messages are thoughtfully exchanged like a gift. However, in this thesis, I have focused on actual 'gift' exchange by broadening the categories of digital gift, from the mundane message and file exchange to explicit gifts such as vouchers and cards. In so doing, I focus on one of the rituals in gifting - **'wrapping'**.

My interviews unveiled that what is regarded as a gift depends greatly on the ritualistic behaviour that surrounds it – ***relationships, means, the manner of exchange, occasions, reciprocation, codes, and etiquettes*** – perhaps more so

than on its form. This finding mirrors the wider sociological, psychological and marketing literature on gifting that argues a gift gains its meaning through *ritual exchange* (Berking, 1999) and that conventional gifting is rooted in a rich repertoire of rituals that are deeply ingrained in our human-to-human social interactions (Banks, 1979; Schwartz, 1967; Sherry, Jr., 1983). Regarding the fact that our expectation about gift exchange is strongly bounded by the cultural rituals that both giver and receiver agree (Hendry, 1995), digital gifting seems to be lacking common rituals, manners, or etiquettes. Previous literature in HCI and social science placed gifting as a filter to interpret people's communication through digital technology, where alternative interaction rituals are emerging. It is also interesting to see how the concept of gift giving and associated rituals have applied or emerged in social behaviours within online networks and communities that involve file sharing or quantified attention in SNS (e.g. hits, likes, views) (Skågeby, 2010). Futhermore, Belk (1988) found that consumers singularize or decommoditize virtual possessions to transform these into a meaningful possession. In this regard, the interview study in Chapter 5 unveiled that customised digital gifts were especially appreciated when bound up with 'singularized exchange rituals' (Denegri-Knott, J., R.D. Watkins, 2012). Given this alternative framing, it is not only what has been exchanged but also how it has been given or received must be carefully considered in the design of digital gifting services that support rituals of exchange, when intangible things are remotely exchanged. Ironically, it had been currently overlooked in the field of HCI, which poses design opportunities in reformulating ritualistic exchange to frame a richer digital gifting culture.

Analysis of the interview study identified existing gaps in digital gifting. Additionally, individual experiences and opinions justified the significant difference between the two types of the gift as well as the different engagement in between each stage of gifting process (Figure 33). Two initial hypothesis:

[h1]. Receiver's excitement will diminish when revealing the digital gifts.

[h2]. Giver's excitement also diminishes in the giving process (prepare – exchange – reveal), but especially in the reveal stage.

have been partially observed in the study. In fact, the study unpacked multiple aspects of digital gifting that reflects reasons and effects of dispelled excitement in digital gifting which goes beyond the two inquiries associated with the revealing stage. What has been learned from the study is important and valuable to open the design space of gifting, not only digital but general gifting experience, in the field of HCI and CSCW. Among many other invaluable design implications engendered from the study, I will narrow the focus to the scope where it aligns with the overarching aim of this PhD: *"How can ephemeral materials be harnessed in the design of products and services to enhance our common experience closer to ordinary life?"*

Despite many drawbacks of the digital gift, it is widely acknowledged that there is a great convenience in exchange as well as flexibility in usage of ubiquitous mobile devices. Although functionally advanced interactive devices have enhanced the availability of digital gifts (e.g. usage, efficiency), it is still uncertain whether the technological advancement has benefited other parts of digital gifting. Digital gifting is already a wealthy area that has been incorporated into many aspects of our daily life. However, whether we share common awareness about its value and social rituals is yet to be answered. In the following section, I describe design implications drawing on the interview findings with the intention of harnessing ephemerality and delicacy in the design of digital gifting experience.

6.1. Explore Wrappings for Digital Gifts

In this part of the research, prototypes are importantly treated to realise the design concept in tangible forms and also to utilise them as a research tool to probe the concept inspired from the earlier studies in previous chapters. As detailed in Chapter 3, this PhD has taken a method that widely used in practical design-oriented HCI research. In design research, "things" that are designed in

the process of research are regarded as indispensable tools as they transform designer's intuitions, hunches, and small discoveries realised as a prototype, product, or system (Seago and Dunne, 1999). Moreover, Bruno Latour (1987) examines science and technology in action and emphasises that design things turn suspicious ideas into strong claims. In this PhD, the design things emerged from the intuitive sketches, mock-ups, prototypes have been the tools that assisted me to ground the conceptual ideas.

The design practice at the beginning of Chapter 5 inspired that it is not only the inherently fragile materials but also interaction attributes such as breaking, tearing, or disappearing would reinforce tension in user experience. Designing things, the prototypes that I will introduce in this chapter are a means of conveying an experience that engendered from the assembly of materials, mode of interaction, contextual settings. Therefore, the prototypes will be probed with potential users in a qualitative manner rather than a structured set of user tests.

As stated in the introduction of this chapter, I will lead the design approach to reflect on the Reveal stage of digital gifting in the rest of this chapter. Wrapping is an important part of rituals in the gift exchange. Not only the findings from the study in Chapter 5 but also a large volume of literature had shown that wrapping plays a crucial role in gifting process to both giver and recipient. Therefore, in the following sections, I would remark its importance and suggest potential implications of wrapping to enhance our experience of digital gift exchange.

6.1.1. Importance of Wrapping in Gifting

Regarding that the gift can involve any assets whether tangible or intangible (Sherry 1983), the manner in which it is exchanged would signify if something is a gift or an 'exchange' of equivalent values. In actual practice of gift exchange, concerns in selecting a gift are dependent on occasions, rituals, and relationships relating to cultural backgrounds as well as the giver and recipient's status (Komter, 2007). Moreover, such considerations also affect the giver's decision

when ***wrapping*** a gift. Gift wrapping is one of the valued rituals of gift exchange. However, although existing gift literature is focussing on the socio-functional and economic role of the gift (Belk 1977; Sherry, Jr. 1983), little has explored about gift wrapping in a substantive manner (Porublev et al., 2006). The significance of wrapping has been widely acknowledged in the gifting practice. According to Cheal (1988), "The wrapping emphasises that it is not the object itself but the act of giving a gift that matters." Gifts are assigned the symbolic meaning of gifts by being wrapped (Komter, 2007). Cultural differences may pose contrasting approach to wrapping gifts. Hendry (1995) investigated how a western perception towards 'wrapping' differs from that of Japanese. The former regards wrapping as a means to hide the object inside – allows an aspect of surprise so that it strengthens the emotion when the gift being revealed (Wooton & Wood 2004). Whereas, the latter appropriates the presentation of the gift object by explicitly adding efforts and meaning on to it. Moreover, Hendry (1995) illustrates how various kinds of wrappings and knots have delicately designed for different events and occasions in Japan. In that specific cultural context, wrapping is interpreted as an expression of giver's politeness and care for the recipient. Likewise, in western cultures, the choice of wrapping papers may be different for occasions such as birthday, Christmas, or weddings. Regardless of cultural distinction, wrapping implies messages regarding the relationship between the giver and recipient. Not only the unwrapped gift itself but also the presentation of wrapping may connote how the giver values the relationship (Larsen and Watson, 2001).

Literature shows that importance of the gift wrapping has taken into account in our gifting practice. While the subject of the previous gifting research was mostly tangible gifts and its wrapping, it is still sceptical to envision similar notion and interaction with gift giving and wrapping that would apply to digital formats of gifts. Digital gift lacks material substance (Denegri-Knott and Molesworth, 2010) and in this respect, presumably, (digital) gift wrapping would also lose its significance compare to tangible gift wrapping.

The interview study and literature in gifting tells that wrapping is significant at every stage of the gifting process (Belk 1976; Hendry 1995; Komter 2007). It is one of the methods to show effort in the preparation; it is an explicit sign that content is a gift by adding a layer of personalization with wrapping and messages. It offers an opportunity for conversation, while physically touching and feeling, and anticipating the object inside. Therefore it enhances the excitement when revealing. Also, it leaves a residue that the recipient can keep and display, which prolongs emotional charge in reflection. In the interview, Zip files, passcode locked contents, and USB sticks were mentioned as a transferring method in relevance to the wrappings but did not gain similar recognition. It implies that wrapping plays more than a functional role of protecting the contents inside. Moreover, the systematic analysis in digital gifting process, illustrated in Figure 38, depicts a gap in revealing experience for both giver and receiver.

Wrapping is a vehicle that conveys giver's effort and thoughts as well as an object. Unwrapping/Reveal is an instance when receiving experience is reinforced by a mixture of elements embodied by a giver during the preparation and presentation of the gift. Regarding how wrapping has been distinctively noted in gifting, we might consider reshaping the rituals around wrapping for the digital gift, which lacks material entity.

6.1.2. Wrapping Digital Gifts

Drawing on the importance of wrapping in gifting culture, it should be reconsidered in digital gifting. The distinctly important characteristic of digital gifts, on the surface, is that they are digital in form, which is intangible. Returning to the purpose of wrapping, gifts are also wrapped to hide their contents for the sake of mystery and surprise, as the recipient's reaction is essential to the giver (Schwartz, 1967). In the interviews, Zip files, passcode locked contents, and USB sticks have not seen as delivering this aspect of wrapping. A radical extension of the mere container of the content is to enhance the experiential qualities of opening a digital gift for the first time, transforming

the first ever ‘play’ into a memorable moment. Here, designers might draw on the idea of ‘rematerialization’ in which the functionality and experience of digital materials are enhanced by connecting them to collateral physical materials (Belk, 2013). This suggests a design approach to recent developments in tangible and embedded computing to create digitally-augmented physical wrappings for digital gifts. In other words, a digital gift would come wrapped in an interactive physical material that would temporarily extend its functionality to create a moment of rich experience. This refers to new kinds of augmented experiences beyond today’s mundane physical containers for digital contents such as CDs or USB sticks. Pervasive ubiquitous computing freed digital contents from one dedicated medium, and enabled the contents to be interactively embedded in everyday objects. This might potentially involve augmenting traditional wrapping materials such as paper or perhaps drawing on recent research into consumable and ephemeral materials such as food that has previously been augmented to become a vehicle to convey digital contents (Grimes and Harper, 2008; Wei et al., 2014). Indeed, food has long been considered as a gift both literally and symbolically in various cultures (Shuman, 2000), which suggests that it is not an arbitrary design approach to employ food as a wrapping material for digital gifts. Delicate and ephemeral nature of the food might successfully incorporate as a wrapping medium which will be discussed in detail below.

6.1.3. Employing Delicate and Ephemeral Materials for Wrapping

In Chapter 4, *FugaciousFilm* demonstrated that fragility and delicacy of the soap film – ephemeral material – reinforced the impact of transient experiences, which were previously treated as mundane and indistinct. Reflecting on this finding, I propose ephemeral materials are an effective wrapping medium that strengthens the transitory Reveal stage in multiple dimensions. It effectively hides the gift and presents surprise when revealed; delicate ephemeral materials

may foster subtle and focused interaction when tangibly unwrapping; the temporal existence of wrapping might reinforce the momentary receiving experience, and the embedded digital gift becomes a keepsake that recalls the revealing experience.

HCI has recognised food as a medium that it is not only critical for nutrition and survival, but also for social communication (Grimes and Harper, 2008; Wei et al., 2014). Even without a frame of gift, an act of offering food has many characteristics that are identical to gifting process (Shuman, 2000). Preparation and presentation of food also involve purposefulness, and consideration of recipient's taste that shows a sense of care. Moreover, eating experience allows a recipient to disclose how the food has been prepared and enjoy the taste as well as the visual presentation that potentially lead to reflection. However, rather than employing food as a gift itself or offer a digital gift (e.g. snap photos) as a souvenir of the dining experience, I propose a digital gift to be integrated as an ingredient of food preparation. Gastronomic dining practitioners[14] are already attempting to blend food with interactive technology to create multisensory experiences. This involves employing the chemical reaction between the food ingredients, using a vision technique to identify shape, colour, and location of food, and sensing scent to fuse with other sensory experience. Multisensory interaction comprised of fleeting features such as taste, scent, visual, and audio would generate aesthetic and emotional experience (Barden et al., 2012). Food is a familiar ephemeral material that already permeated in our daily life and also in gifting context. Increasing number of food photos posted in social media fostered a trend called 'Food Porn' that reflects people cherish the delicacy and are also aware of that its appearance will no longer be available in the next moment. A myriad of food types, methods of eating (e.g. cutleries), delicacy, and ephemerality of the food align with the design approach towards gift wrapping – many methods and types of wrapping, which engenders impactful transitory experience in the gift exchange.

[14] Understory. http://understory.co.uk

Furthermore, candles are one other ephemeral material that resides in our domestic surroundings, which are also exchanged pervasively as a means of a gift. Fleeting materials such as candles (Uriu and Okude, 2010) or a burning material (e.g. match stick) (Chi et al., 2009) have been used in tangible interaction design. Either metaphorically or physically, such materials are an effective demonstrator to address one-time use, a very brief experience. Candles are used in various contexts that promote social behaviour such as gathering and talking. Also, the delicacy of the flame may become a design element in that its fragility might cause a more focused interaction.

In the next chapter, I will describe the specifications of the hybrid gift prototypes that incorporated the delicate and ephemeral materials: food and candle.

6.2. Design and Workshop

The methodological orientation of this thesis lies broadly in '*Research Through Design'(RtD)* approach (Frayling, 1993; Zimmerman et al., 2007), which takes design activities (e.g. sketching, designing, prototyping) as important parts of research. In RtD, the prototypes are the embodiment of designer's ideas, existing as a *'physical hypothesis'*. In the rest of this chapter, I will propose design exemplars that take up the design implications derived from the interviews, followed by a design workshop conducted to ground the five-stage gifting framework, validate the findings, and suggest the practicality of the *'Hybrid Gifts'*.

6.2.1. Hybrid Gift

Four design exemplars germinated from the exploration of ephemeral materials to create artefacts through *disciplined imagination* as a method of Research through Design (Koskinen et al., 2012). The main design objective here is to propose novel forms of digital gifting experiences that have the potential to permeate into our everyday lives, where gift exchange would typically occur. For the first set of prototypes, food has been taken into account as an ephemeral wrapping medium. The dining context is a typical occasion when one might plan and prepare gift exchange. From archaic society's potlach festivals (Mauss, 1954) to events and parties in modern society, food has been employed not only as a gift but also as a means to offer a space for maintaining and renegotiating social relationships (Shuman, 2000). On the other hand, the second set focuses on the tangibility of wrapping that people tends to keep and display it like the gift, even it is not necessarily usable or functional for any purpose. In the following section, I will delineate how each prototype has been designed to accomplish embedding 'giftness' in digital gifts by wrapping what were previously regarded as plain digital files.

6.2.1.1. Edible Digital Gifts in Dining Setting

- **Gifting Table**

In this proposal, food becomes the wrapper of the digital gift. I have particularly employed delicate and fragile desserts produced by a spherification technique[15] (See Figure 39).

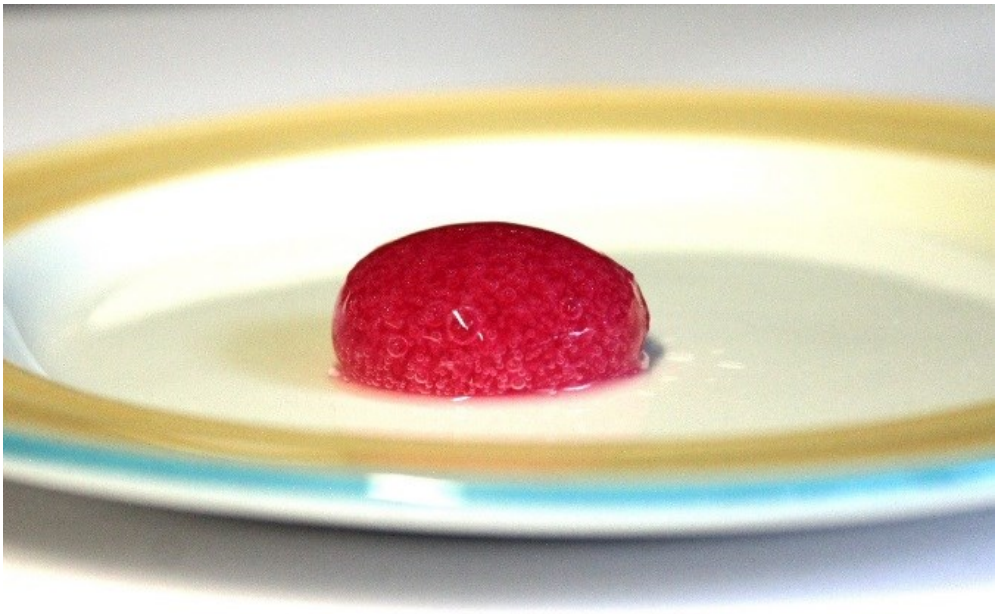


Figure 39. Spherified juice produced from an experiment.

The purpose of using the spherified liquid dessert is to present fragility both visually and tangibly. The dessert is formed of juice enwrapped by a very thin film that can be maintained in a spherical shape. Even a slight touch shakes the dessert subtly so that its delicacy is easily noticeable. In addition to its tangible delicacy, the material was an efficient tool to deliver a multisensory experience in receiving the digital gift, since the dessert is completely edible and has a flavour that corresponds with the colour.

[15] For recipes: *http://www.molecularrecipes.com/spherification-class/reverse-spherification/*



Figure 40. A participant demonstrates poking the blob dessert. (taken from design workshop)

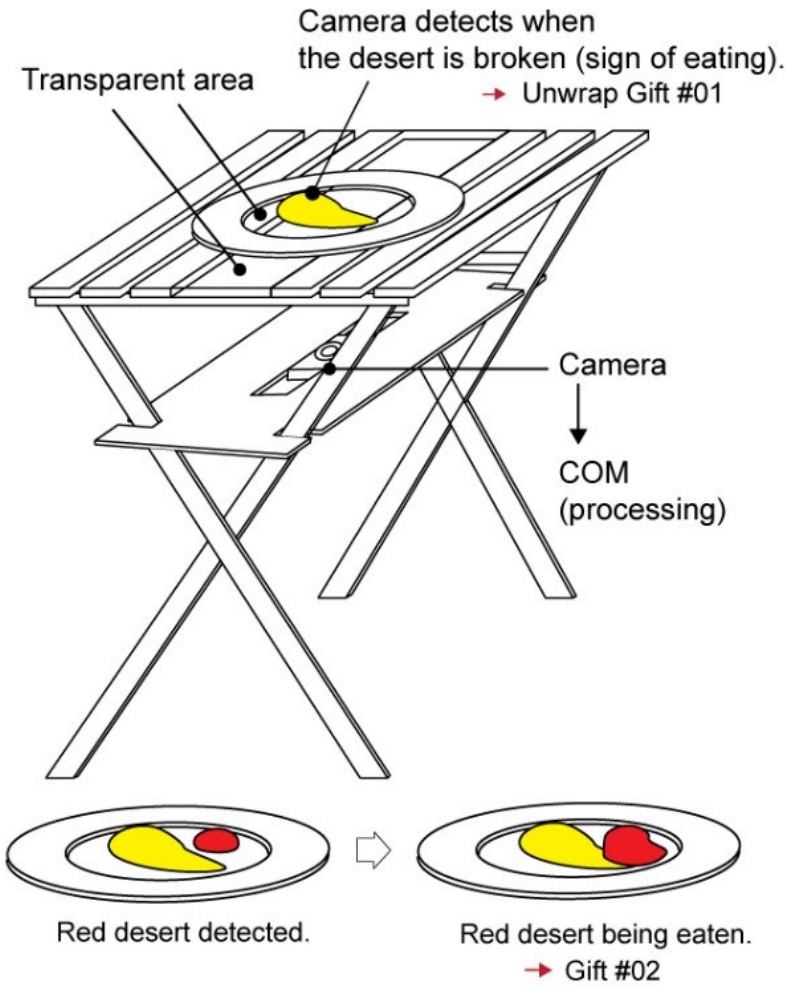


Figure 41. Schematic of the Gifting Table illustrating how it is implemented.

Gifting Table (Figure 41) consists of a table of a camera mounted underneath the table surface, and a transparent plate. When a blob has placed on the plate (give and receive) the camera identifies the colour of the blob. Then, when the receiver breaks the blob (reveal), the camera detects the changed state of the blob. At this instance, digital gifts (a music track and a gift voucher) were presented to the recipient. For the purpose of the workshop, we played a music track and sent a gift voucher to the participants' email, which they could check directly via their mobile phones. Each of the two gifts was set for different purposes: the music track plays only once during dining, i.e. embedding the idea of ephemerality to the digital gift; and the voucher can be kept and consumed later. Thus, at the end of the dining experience, the physical wrapper (dessert blob) is

no longer present, but the digital gift (voucher) remains in the receiver's inbox. We implemented the blob detection in Processing® software and for the Gifting Table prototype, an email was sent manually by the moderator (Wizard-of-Oz) in the workshop.

- **Gifting Plate**

Gifting Plate (Figure 42) is an interactive plate that senses the presence of food and cutleries through conductivity. The plate consists of capacitive sensors, embedded on the bottom of the plate (Figure 43). It senses the capacity of the dessert when placed on top of the sensor and sends the gifts. For the purpose of the workshop, sensors are wired to an Arduino Yun to send the voucher through email wirelessly and to play music simultaneously. Both Gifting Table and Plate were deliberately designed to seamlessly integrate digital gift exchanges into everyday interaction in dining settings – placing food on the plate, using cutleries, and eating. The prototypes offer enjoyment in curating a multisensory experience in the gift exchange and unwrapping by matching the types of food (colour and flavour) with digital gifts. Types of cutlery, ways of handling and eating the food varies widely across a range of food, which may lead to open various design opportunities in creating tangible wrappings for digital gifts.

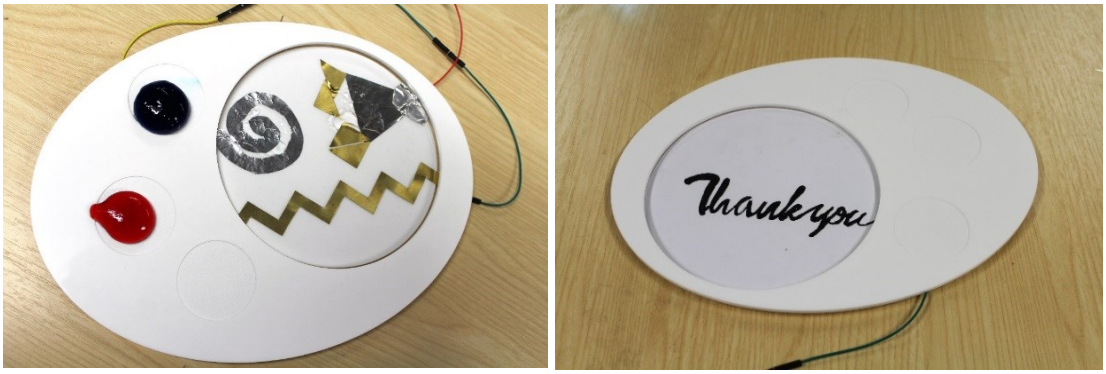


Figure 42. (Left) Gifting Plate with the blob desserts. Conductive films are attached under the transparent acrylic for participants to see where to put the dessert on. (Right)

Customised design that replaced conductive films with a message written by conductive ink.

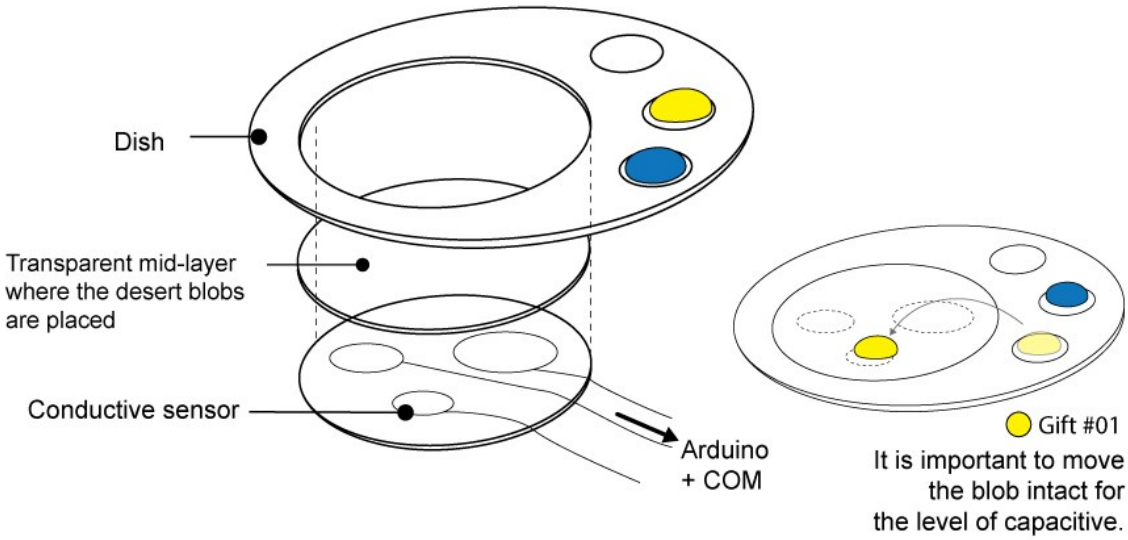


Figure 43. Schematic diagram of Gifting Plate.

6.2.1.2. IoT Wrapper for Home Setting

In addition to the temporal and impactful unwrapping experience, I grasped that many interview participants associate special meaning with the wrapping. Wrapping has recognised as, the giver's thoughtful gesture; the embodiment of time and effort that it is also purposefully selected and personalised as much as the gift. Therefore, the receivers often wish to retain the wrappings and display in their ambient surroundings. I propose following two prototypes for the home setting.

- **IoT Gifting Candle**

The candle is one of the most familiar ephemeral objects that we use both at the home settings or in ritualistic events to enjoy the atmosphere it creates. Also, candles are frequently exchanged as gifts. Thus, I propose IoT Gift Candle (Figure 44) as a digital gifting platform between family members. I employed

the same implementation method as Gifting Plate, but the trigger has changed from capacitive to temperature. The gifts (a music track and a gift voucher) are mapped onto a specific range of temperature that would be reached as the candle burns. The giver may personalise the arrangement, type, and a number of the digital gifts along with the temperature.



Figure 44. IoT Gifting Candle

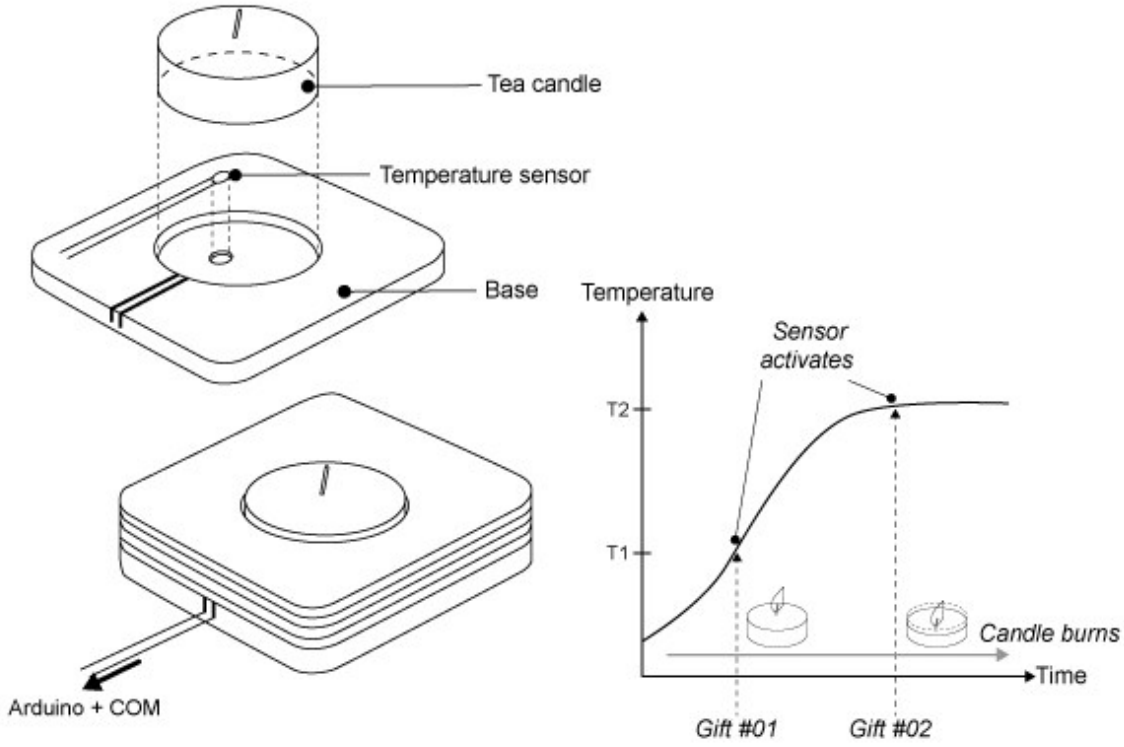


Figure 45. Schematic diagram of the IoT Gifting Candle with a graph illustrating how it works.

IoT Gifting Candle consists of two parts: a tea candle and a holder. The holder is a base that embeds a temperature sensor wired to an Arduino Yun that sends a voucher and plays music. Within this proposal, I purposefully integrated unexpectedness to heighten the experience at the moment of receiving. For the demonstration, I embedded two gifts at different temperature ranges, so that the flame needs to be maintained in order to keep the heat up. After the candle 'unwraps all the gifts', the holder can be reused just as an ordinary candle holder that remains as a keepsake.

- **Ephemeral Lamp**

We often see some people carefully unwrap the cover in order not to damage the wrapping paper. But, some others actively tear off the wrapping to enjoy the moment of the interaction available only once. In this PhD, 'wrapping' has seen

as one of the tactics to heighten the diminished pleasure at the revealing stage as well as the reflection stage in digital gifting. Ephemeral Lamp (Figure 46) is a mood lamp that consists of a glass vase with water absorbing crystals and a base with LEDs wired to Arduino Yun board. The user activates the lamp by breaking a spherified water blob on the top of the vase. The water blob has created by using the same technique as the spherified dessert used for the previous two edible digital gifts. Therefore, the blob is also fragile and delicate that requires focused attention in manipulation. When the blob breaks, water drops into the vase and the conductive string connected to the Arduino senses the water and lits up the LEDs. At the same time, a digital gift is sent to the receiver. While the water is in the vase, the crystals absorb water and grow bigger for few days. Thus, the state of the lamp changes over time until all the moisture dries out from the crystals.

With Ephemeral Lamp, I attempted to apply direct manipulation of the delicate material in gift unwrapping. As in FugaciousFilm, the fragile material might generate a great deal of attention, even anxiety, to correctly execute the interaction that turns into a pleasure when successfully activated the lamp heightens the momentary experience. Moreover, the lamp becomes a keepsake of the experience in addition to the digital gift.



Figure 46. Ephemeral Lamp. (Left) The lamp turned on as the conductive thread senses the water dropped into the vase. (Right) Crystals grow bigger by observing water that presents visual effect as a lamp.

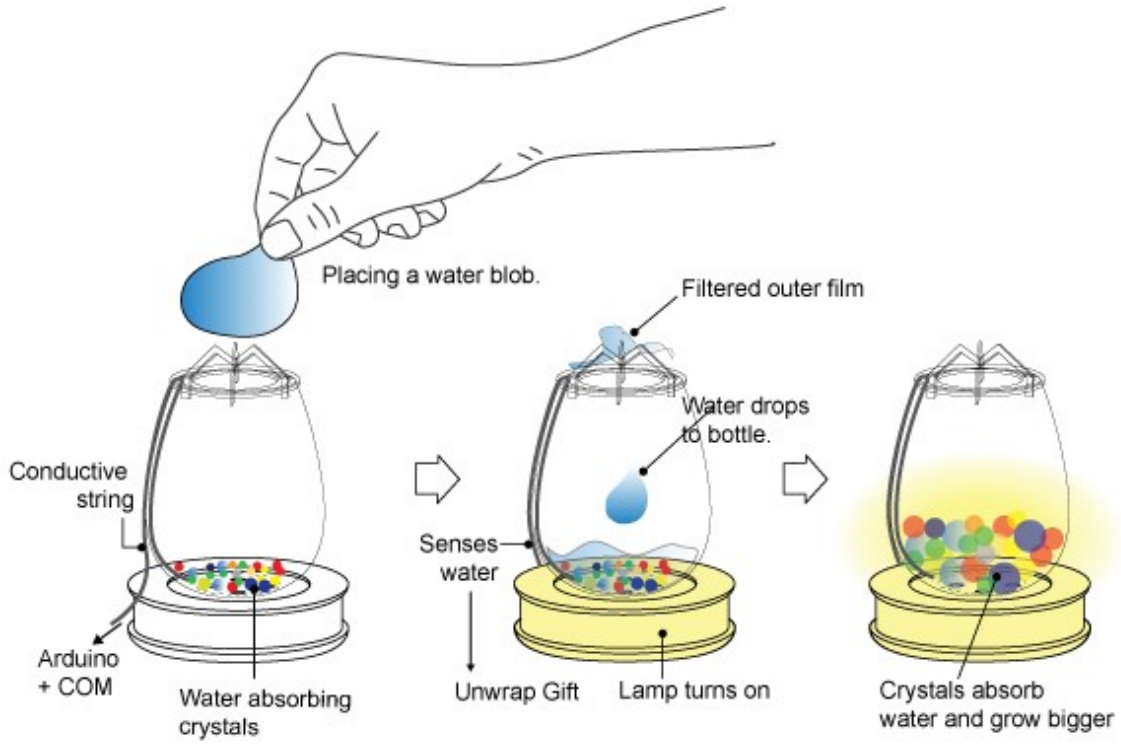


Figure 47. Schematic illustrating the operation process of Ephemeral Lamp

6.2.2. Workshop

With the four 'physical hypotheses', I conducted a design workshop with a purpose to capture how potential users make sense of the gifting experience.

6.2.2.1. Participants

11 participants were recruited among the previous interviewees (Table 8). From the interview, I could notice that people were not yet familiar with the concept of a digital gift. Therefore, I intentionally recruited the previous interview participants who already had experienced and understood what it meant by a digital gift in this study. The assumption was that these participants would raise contingent opinions on the prototypes by reflecting their own experiences and thoughts around conventional digital gifts. The workshop held in a lab space where tools and materials are widely available. Participants were divided into three groups (4, 3, 4) and each group was invited to the different session (Figure 49).

P4	P7	P10	P11	P12	P13
Age: 22 Occupation: PhD Student (CS) Gender: M	Age: 34 Occupation: Research Fellow Gender: F	Age: 48 Occupation: PhD student (Design) Gender: F	Age: 27 Occupation: Research Associate (CS) Gender: F	Age: 32 Occupation: PhD student (Media technology and Design) Gender: M	Age: 35 Occupation: Lecturer (Design) Gender: M
	P14	P20	P22	P24	P25
	Age: 28 Occupation: PhD student (CS) Gender: M	Age: 24 Occupation: Student Gender: F	Age: 20 Occupation: Student Gender: F	Age: 24 Occupation: PhD student (HCI) Gender: F	Age: 25 Occupation: PhD student (HCI) Gender: F

Table 8. Returned participants from the earlier interview for a design workshop.

6.2.2.2. Workshop Structure

The duration of the workshop was 90-100 minutes, and each participant had £15 worth of Amazon voucher per hour for compensation. All of the sessions had been video recorded with audio. Below Figure 48 summarises the structure of the workshop.

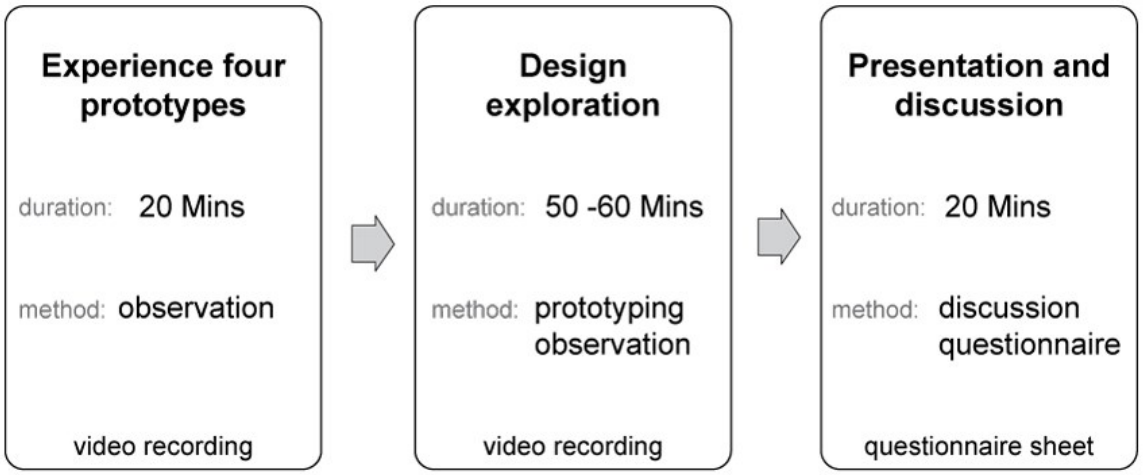


Figure 48. Structure of the Gifting Design Workshop

After a short introduction to the workshop, I presented the prototypes to participants. Each prototype was assigned to each different participant, except one group with 3 participants – in this case, one prototype was demonstrated by the moderator (author). Each participant was given digital gifts as they interacted with the prototype – music played at the time of interaction and a gift voucher (compensation) was sent to their email. Due to the research ethics regarding food safety, I did not let the participants taste the dessert in Gifting Table and Gifting Plate prototypes. However, I have intentionally created a vividly coloured dessert with an associated scent (e.g. red – strawberry, yellow – mango) for the participants to be able to imagine the flavour (Shepherd, 2006). In the workshop, I was interested in seeing that the potential users are convinced with the meaning of wrapping in digital gifting. Also, probing whether the ephemeral materials promote participants' engagement with the wrapping becomes greater. The

workshop was less focused on evaluating the usability or technical feasibility of the prototypes.

	Gifting Table	Gifting Plate	IoT Candle	Ephemeral Lamp
Workshop 01	P10	P24	P7	P14
Workshop 02	P13	P25		P20
Workshop 03	P12	P11	P22	P4

Figure 49. Allocation of participants for different prototypes in each workshop.



Figure 50. Participants are experiencing the prototypes. (a) Ephemeral Lamp, (b) Gifting Table, (c) Gifting Plate.

The second session was hands-on design practice. Based on the ideas of prototypes, participants began to generate wrapping ideas of digital gifts for their family or friends. A variety of crafting materials including materials used in prototypes have provided, and also pen and papers. We encouraged participants to explore in any forms, by crafting, sketches, and also by verbal discussion. Although we did not restrict the design practice to develop our prototypes, we guided them to apply ephemerality in the design of unwrapping. Through this design exploration, I initially aimed to see in which setting people envision the use of interactive gift wrapping in their daily life.

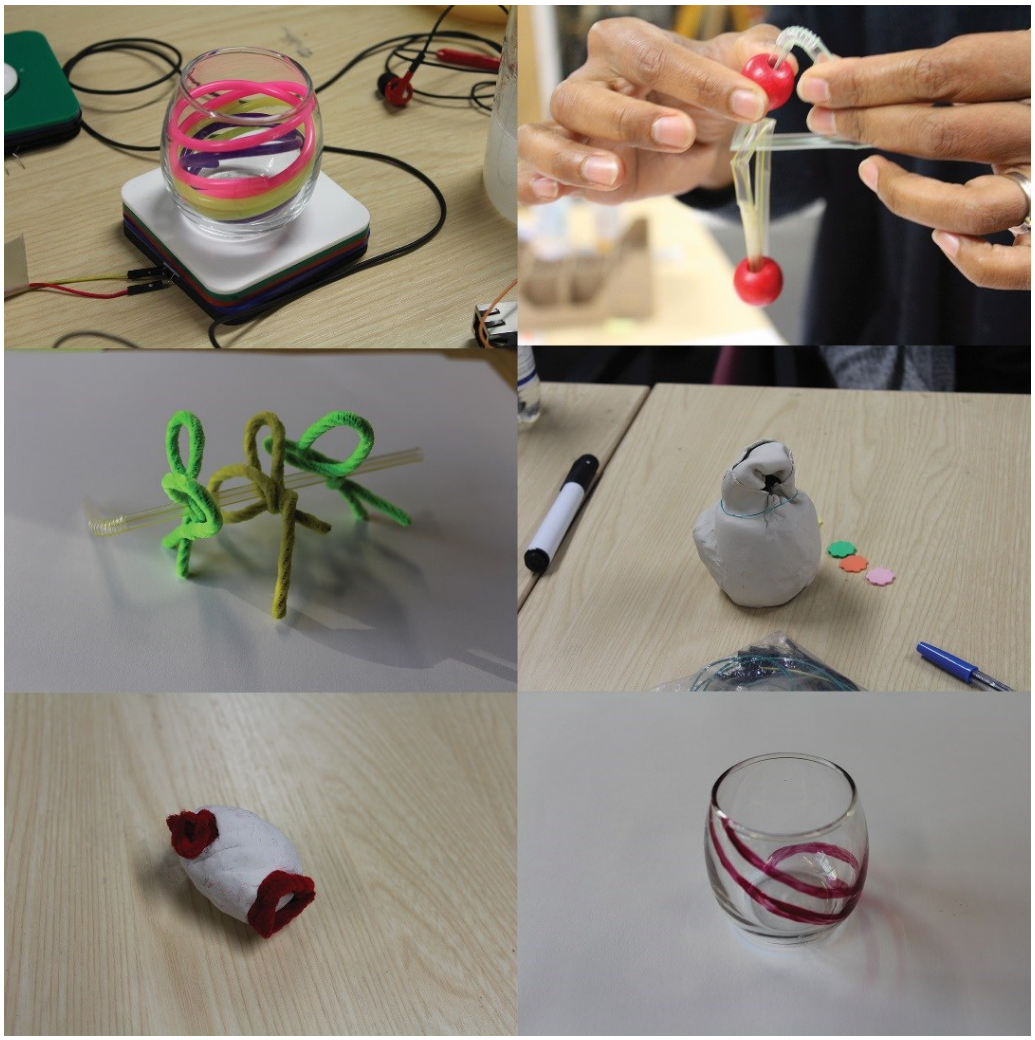


Figure 51. Examples of physical wrappings for digital gifting designed by participants during the workshop.

Finally, in the debriefing session, each participant presented their designs which led to a group discussion about the impact of unwrapping experiences in receiving the digital gift. Then, a sheet containing two inquiries had been handed out. The same graph for rating the excitement that was used in the interview had given out to rate receiving and revealing experience for the prototypes. Also, regarding the research goal, it was important to convince the participants that the ephemeral materials actually function as wrappings. Therefore, one question was asked, *"Which of the two, physical prototype or digital gifts, or both, regarded more as a gift?"* This question had opened the discussion about gift and wrapping at the end of the workshop.

The workshop had some limitations regarding its evaluation setting. First, it was conducted in the lab and planned that the participants would receive gifts. This might have diminished excitement (surprising effect) that would have emerged in real gifting situation. Secondly, the gift was given by moderator (myself) who has no social intimacy with participants. It is assumable that the gift unwrapping experience would bring different impact with their intimate social partners. However, in order to complement the limitations, I have designed the workshop in groups, and each participant experienced different prototypes. Therefore, as one participant reflected after the workshop (P7), when other participants focusing on each other's unwrapping moment had evoked an emotion (e.g. pressure) of a real gift receiving moment. Next, I will disclose findings from the workshop.

6.2.3. Findings from Workshop

The workshop offered many disciplined insights on a design approach that would reshape the concept of digital gifting. All three sessions were video recorded, 90 – 100 minutes each. The workshop was semi-structured, and I focused on observing participants' open-ended exploration of digital gift wrapping with ephemerality. Feedbacks on the prototypes and discussion about the ephemeral wrapping have been transcribed. I have applied thematic analysis with a focus on the user experience related to the effects of wrapping.

6.2.3.1. A delicate and ephemeral material plays its role as a wrapping

First of all, the delicacy of the spherified dessert wrapping enhanced the excitement when unwrapping the gift as participants had to manipulate the blob to receive the gift tangibly. P11 and P24 reflected on the delicacy of the wrapping actually enhancing their excitement:

(P11) *"There was a suspense when I handled it that adds more excitement when I got it right."*

Furthermore, a participant produced an idea of narrative gifts that can be mapped onto a series of different foods shared in the dining process, i.e. starter, mains, and dessert. P13 envisioned that a set of wrappings would offer an interactive narrative, which would become a multi sensory dining experience. *"It's a narrative gift with interaction. […] This type of prototype and interaction actually makes the totally different approach in getting the digital gifts."* Likewise, P12 proposed a pattern drawing as an interaction that unwraps a digital gift between romantic couples (Figure 52 – Right). P12 envisioned a natural behaviour in real dining settings to become an interaction associated with the gifting along the process.

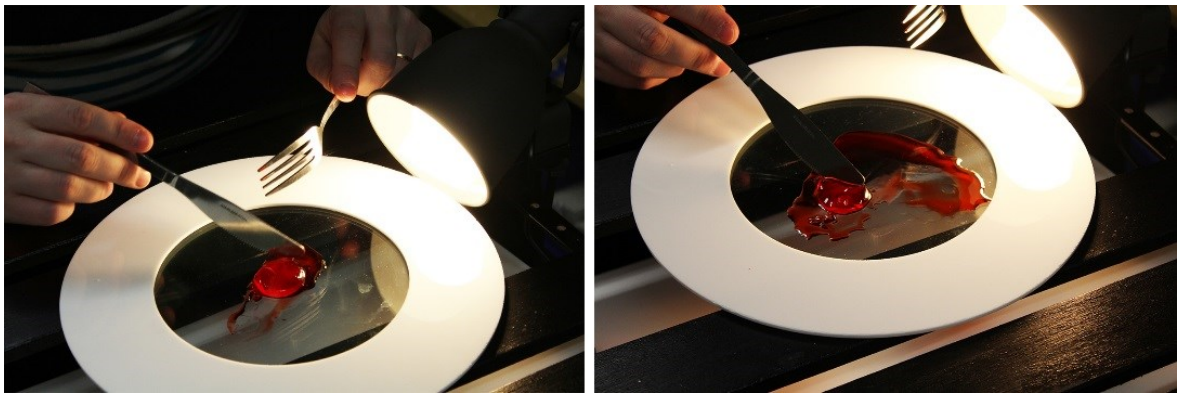


Figure 52. (Left) A participant is cutting the blob (Right) and drawing a heart symbol with the blob.

Moreover, the unpredictable result from the interaction seemed to had enhanced the tension and curiosity while unwrapping the gift: (P4) *"You don't know what's inside and it gives more curiosity in handling the physical thing."*

- ***Wrapping generates surprise***

In the earlier interview study, many participants inquired as to the difference between receiving and revealing in terms of digital gifting. The two stages were often regarded as the same or recognised as a simultaneous event.

By wrapping the digital gifts physically, the prototypes were intentionally designed to separate the receiving and revealing stages. In so doing, I attempted to retrieve experiences such as curiosity, conversation, and anticipation, leading to surprise when unwrapping the gift.

Participants who experienced the edible gifts particularly reflected about their emotion when unwrapped the gift. P24 appreciated the unexpectedness in encountering the actual digital gift.

> *"When received this, I wasn't quite sure what (will) happen. It is exciting but slightly less because not sure what's going to happen. Then we I saw what it's doing, it was really exciting. The moment and interaction were really nice."*

P22 also enjoyed the clueless form of wrapping, *"I think when I received the blob (dessert), I was more excited (than when I popped it)."*

P12 also cherished the experience presented in a "surprise": *"What was the most exciting was that not exactly knowing what will happen, and it happens just at the time when I put the knife - this kind of things were exciting."*

In the earlier interview, current digital communication interfaces, such as emails and SMS noticed to have some shortfalls in offering surprising pleasure during the exchange. Emails are usually sent with a giver's notification in advance, to make sure that the receiver checks their inbox. Otherwise, receivers are likely to miss the gift, and this may cause a delay in giving and receiving. This creates somewhat of a contradiction. However, in order to exchange correctly, a prior notification is necessary, which can then reduce or eliminate the enjoyment of surprise or curiosity from the recipient.

Food has a rich cultural, historical background that engenders a variety of recipes in preparing, sharing, exchanging, and eating. Food has long been recognised as a medium for social communication and gift giving (Barden et al., 2012; Grimes and Harper, 2008), as the experience of food has many characteristics that resemble the gifting process (Mauss 1954; Shuman 2000). Edible gift prototypes attempted to retrieve direct (face-to-face) exchange in digital gifting.

6.2.3.2. Wrapping enhances digital gifting experience

The four prototypes were initially aimed at the exchange and reveal stages. At the end of the workshop, I presented the framework that had been used in the interview (Figure 33) to rate excitement for the exchange and reveal stages.

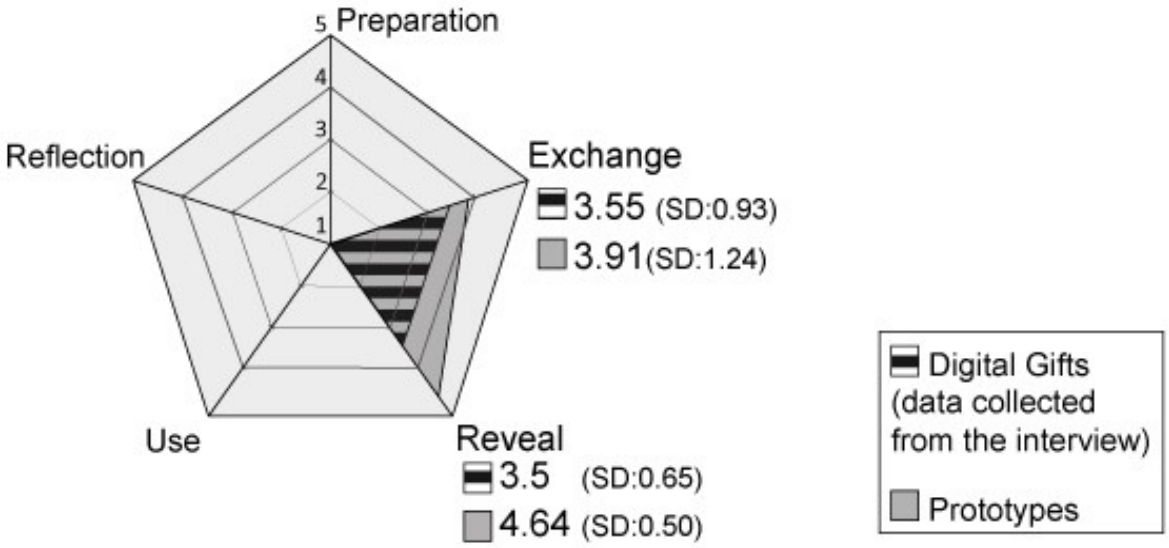


Figure 53. The comparison of excitement levels between previous digital gift receiving (collected in the interview) and experience of the prototypes (n=11).

Figure 53 illustrates that the level of excitement in experiencing the hybrid gift prototypes increased almost to that of the physical gift exchange in both stages among the participants. One might argue that participants might have regarded the tangible prototypes as gifts too and digital gifts are more like a supplementation. However, it was clear to participants that the prototypes were wrappers that delivered gifts in different forms.

> As P25 reflected, *"[…] although the experience was fun and novel, the digital thing was from it. These prototypes are the trigger, what makes it (digital gift) feel like a gift. Like wrapping (in physical gifts) makes something a gift,"*

P20: *"For me, digital (was) more (like a gift) than the physical. The tangible (here) is no more tangible after a certain period of time. […] The experience you face remains longer. But if we receive a digital gift via email, there's no excitement. But when you receive a song with this, it's a different feeling of the experience."*

At least, many participants reflected that both prototype and digital gifts were perceived as one experiential gift. Participants who received digital gifts from the edible materials expressed that the multisensory experience – involving scent, colour, and music – enhanced their perception of music and vouchers as gifts (P11, P13, P24, P25).

P24 particularly cherished the whole receiving experience: *"The tangible interaction and the music played out from it, was an experience itself […] the whole experience was like a gift."*

(P11): *"One of them (physical) makes me really happy when the moment I opened it, but the other (digital voucher) also, I know it will last in few days but it will have more impact. At the end, it will be equal(ly) feel like a gift. Whatever I spent on it, whenever I look at it, it will remind me this experience (from the study)."*

P22 stressed that the physical wrapping (IoT Candle) made a contrasting effect in receipt of the digital gifts.

"If I had received the music or voucher only via email, it will be less exciting than the experience triggered by this."

P22 gained the sense of "gift-ness" in the digital gifts by the physical prototype (wrapping).

In the workshop, the music track played only at the instance of unwrapping and had not been sent or saved otherwise. P12 commented on the ephemerality of the experience and how this would bring attentiveness in the experience. *"If you know that you are not going to listen to this music again, then you probably will pay more attention, but […] if you don't know you will hear the music again then*

you will be frustrated." Ephemerality engenders focused experience, but also tension, or even frustration. Opening an email that delivers a digital gift can also be regarded as a temporal experience to some extent (short interval between clicking a button and verifying the content). However, current interface designs of communication systems have some shortfalls regarding what is expected in the context of gift exchange from both giver and receiver.

6.2.3.3. Gift should remain

There were few participants who valued the physical prototype as a gift, more so or equal to the digitals. Especially with the prototypes for home settings, participants appreciated the fact that they can keep it (in a real situation).

P4: *"It leaves a residue, so that both (wrapping and gift) feels like a gift."*

In the interview, digital gifts were noticed to be mostly forgotten, whereas the physical ones reside at one's ambient settings. Therefore, the recipients reflect back to the (physical) gifting moment more frequently and build stronger emotional attachment to the giver or to the gift itself.

The prototypes were designed with a purpose to give the impression of mere wrappings. While edible wrappings were successful in achieving the goal, non-edible, tangible wrappers derived opposite results, in that wrapping also gains 'gift-ness' as it can be retained. However, the feedbacks propose an alternative design approach for the tangible wrappings, for example, the physical container can be used as a gift exchange platform, for example, domestic appliance for remote peers or family groups.

Specifically, the IoT candle inspired participants the notion of 'gifting platform'

(P7): *"[…] you can give an array of gifts paylessly, and not necessarily saying "you've got a gift". Next day, when they turn the candle on, they get a gift without knowing in advance."*

As can be seen with Slow Technology (Hallnäs and Redström, 2001), the design approach proposed for the IoT gifting candle is focused on the slowness of interaction and aesthetics of the material that is a part of the environment, adding ambient support to various activities taking place around it. Rather than the fast and convenient emails or messages, it would better ingrain the notion of gifting in digital communication. In particular, domestic technologies are critically concerned with the design that enables users to manage everyday life better, beyond just easier manipulation (Crabtree et al., 2012). Recently, ritualised activities between distant family members around phatic communication have

gained interest in HCI (Kirk et al., 2016). Perhaps, tangible wrappings introduced in this thesis might introduce new rituals for digital gifting with existing communication infrastructure.

In this research through the design phase, I have illustrated new ways of exchanging a gift with prototypes that have been employed not only to see people's behaviour in the given situations but also to provoke thoughts that require critical reflection in the field of interest. Arguably, the design proposals are implying a promising method of reinforcing not only how the digital gifts are perceived, but also our engagement in receiving the gifts. HCI has recognised the aesthetic and emotional user experience as an important feature of interaction design, not only easier and faster performance, especially for those technologies that permeate our everyday lives (Crabtree et al., 2012). Therefore, I would argue that digital gifting is an area where technology should be embedded while concerning the aesthetical user experience from its inception.

6.3. Summary of Digital Gifting Study

The gifting study was started with the aim to design an ephemeral experience in a common and ordinary context, with materials that are designed to possess delicacy. Gift-giving is one of the most pervasive interpersonal communication methods, and wrapping/unwrapping is something we can easily associate with an experience entailed in delicate interactions. I had become curious about how people associate the notion of gifting with the exchange of digital artefacts. I found that digital materials are controversial in being approved as a gift when there is no signification, such as wrapping.

The interview study revealed that the concept of gift giving in a digital context is still limited to the non-interactive materials, which are hardly cherished as gifts. Furthermore, interaction media or applications that support such gift exchanges are underexplored and confined to emails and mobile messaging apps. Within this context, online services or mobile applications that accommodate digital gifting have failed to gain interest in HCI and interaction design. As a contribution to this study, I proposed a framework for systematic investigation through the gifting journey. I have explored underlying issues and causes through the interview and identified weaker and asymmetric engagements in the digital gifting process. Prototypes demonstrated novel ways of exchanging digital materials in the context of gifting, with an aim to transform online transaction into a delicate meaningful experience.

Drawing on the study, I argue that digital gifting needs a more considerate approach regarding rituals, relationships, contexts, and manner, which are not yet prepared or discussed rigorously. I hope the questions generated in this study and its design ideas can benefit HCI researchers and designers who wish to explore the design space of digital gifting as a new dimension of social interaction and culture more broadly.

Chapter 7

7. Discussion

This chapter reflects on the design journey taken through this PhD and draw out three key contributions that have emerged from this research. I suggest that the design implications from each study and from the conceptual framework may be of significance and value to researchers and designers who want to engage with ephemerality and delicate interaction in the realm of HCI.

7.1. Focusing on Delicacy in Ephemeral Interaction

In what follows, I will describe how the prototype, FugaciousFilm, contributed to the design of ephemeral interfaces that operate at the foreground of the user experience.

7.1.1. Prototype has a novelty in assembling design elements

FugaciousFilm embodies the results of 'design inquiries' – how to tangibly manifest ephemerality; what is it useful for? Also, it is a part of 'design process' – sketching and prototyping various possible design ideas; it explicates 'design solutions' – suggesting a promising context where ephemeral interaction might potentially enhance the user experience. Thus, the prototype is a physical form of the research method as well as the design knowledge (Buxton, 2007). The design study is not trying to emphasise the invention of a specific technology, but rather a design contribution has been made in terms of how synthesising and re-purposing existing materials for the purpose of the inquiry. Designers are not necessarily the inventors, but they actively give forms to ideas and synthesise materials with concepts to propose *"physical hypothesis"* (Koskinen et al., 2012). FugaciousFilm materialised delicacy on the extremely fragile soap film in order to examine how *ephemeral materials become useful in a controllable and functional manner*. One of the contributions of the prototype lies in its novelty, how it appropriated the material (soap film) to explore delicate interaction. I have designed a rich repertoire of tangible interactions: touching, pushing, pulling and

popping, each with its own distinct ‘feel’, by implementing them within a subtlely different range of distance from the soap film (See Figure 23 in section 4.3.2.2). I would argue that it is the partial predictability of both vulnerability and delicacy (having a general but somewhat imprecise sense of how it varies) that is especially effective for generating suspense when direct interactions are applied to such fragile materials. When compared to the more random behavior of free-floating bubbles introduced in previous works (Nakamura et al., 2006; Seah et al., 2014; Sylvester et al., 2010), the use of static soap film with controlled durability opens a potentially new area of ephemeral interaction design that has not previously been covered by research in ambient and calm interactions. FugaciousFilm repurposed the inherent vulnerability of soap film into a design feature that requires delicacy in interaction, in turn demanding the user’s focus as critical aspects of the experience.

Moreover, as the soap suspension flows under gravity and the moisture dries out over time, it forms a stable ‘black film’, where the thickness became shorter than the wavelength of light so that it appears black (Isenberg, 1978). The tension of the surface also gradually increases until this status, directly equating to the vulnerability of interface. Users in the study recognised that this black film was the weakest area of the surface and were able to grasp how the film might be destroyed and exploited, this became a part of their own strategies in the tic-tac-toe game. The study revealed how users also tried to anticipate the vulnerability of the interface to a degree, further reinforcing feelings of suspense. In turn, vulnerability demands a certain level of delicacy in interaction. Users have to manipulate the interface carefully, concentrating closely to exert fine-grained motor control over their movements.

Furthermore, I also endeavoured to design a practical application – the game – while maintaining aesthetic quality of the material. The games sector is a major domain of interactive technologies. Beyond the Tic-Tac-Toe game application, I envision that the prototype can be applied to a wider range of games that can benefit from a variety of skilful touch interactions. There might be other potential areas of application such as serendipitous music interfaces, demonstrated in one of the early prototypes. I also envisage potential applications in museums and

galleries where visitors may benefit from an intense focus on delicate things. Science museums are likely to exhibit this kind of new media where hands-on experiences on various materials are appreciated. Creative applications can be proposed with increasingly ephemeral social media such as tweets and Snapchat photos. A physical cue generated by the disappearing material would enhance the tension while viewing the image, before it is lost.

Designers may enjoy considerable flexibility with regard to how they influence durability, most notably by varying the strength of the soap solution and size and shape of the aperture, as well as by tuning software in order to control delicacy in a wide range of interfaces. In the study, the ability to refresh the soap film with the 'wiper' tool also gave the users a degree of direct control. Thus, FugaciousFilm is more than just a vulnerable material; it is an interface in which vulnerability is partially predictable and open to various forms of control by both designers and users. Soap film was something of a probing material to extend the boundary of ephemeral interaction design from ambient to delicate and focused interaction. Researchers who wish to develop other ephemeral interfaces based on different materials will need to ensure that they provide a similarly broad repertoire of characteristics and techniques specified in the study findings. For example, the fog was one of the substances frequently employed in designing an interactive display with 3D gesture inputs (e.g. Rakkolainen et al. 2005; Martinez Plasencia et al. 2014). Fog has similar features to the soap bubbles in the way how it had been operated for interactive displays. It is ephemeral in a natural setting, pass-through-able, visualises projections images. However, the substance has not yet investigated beyond the artistic and playful experience. Therefore, I encourage interaction designers to take away the range of delicate ephemeral interactions developed with the FugaciousFilm and employ them in the design of delicate fog screens in addition to ambient displays.

7.1.2. From Ephemerality to Delicacy

Throughout this PhD, I have endeavoured to place (physical) ephemeral materials at the *focal point* of interaction and incorporated ***"delicacy"*** in user interface design. This 'moving into focus' is accomplished not only by capturing the user's attention with visual digital media, but also by employing fleeting and fragile materials for tangible interaction.

My initial assumption before the user study of FugaciousFilm was mainly focused on the effects of fragility, anticipating that participants might execute the finger manipulations in haste due to the time constraint. However, the vulnerability and short life-span of the soap film could elicit the opposite result – conscious and hesitant movement that caused a delay in manipulation, which leads to the state when the interface (soap film) breaks. Tangibly reinforced experience with the delicate and breakable interface evoked not only a positive excitement but also a subtle anxiety. During the iterative design process prior to the user study, delicacy was noticed as an interaction modality that might enable highly attentive experiences. It is arguable that these attentive, sometimes even tense, interactions arise from a combination of the inherent vulnerability of the material and the resulting delicacy of various interactions with it. Emphasis on the consequence of material quality reflects discussions of visceral interactions (Levisohn et al., 2007) that explores the use of a novel tangible interface to provoke an instinctive, or even cathartic responses from the user. Moreover, anxiety and tension driving material feature also open a discussion in a lineage of uncomfortable interactions (Benford. et al. 2012) that have argued how the 'visceral' (i.e., material) qualities of interaction can enhance suspense.

Previous works in HCI has tended to consider ephemeral materials for the design of ambient interfaces and playful interactive artefacts that largely operate in our periphery, require minimal attention. This aligns with a wider surge of interest in HCI that has fostered various research areas that have applied the concept of ephemerality to interaction design, including 'ambient' (Ishii et al., 1998), 'calm'

(Weiser and Brown, 1997), 'invisible' (Weiser, 1994), and 'unremarkable' computing (Tolmie et al., 2002). From the outset, the transitory and immaterial nature of ephemeral interfaces appears to align with ambient experiences that reside in the background of the context. However, the study illustrated in Chapter 4 suggests an alternative view, one in which the concept of ephemerality is brought to the foreground in interaction by recognising delicacy as an interaction modality. Although the prototype exhibited ephemerality in an explicitly tangible manner, the study findings have wider implications, by shifting ephemeral interactions towards more conventional task-oriented HCI where managing and attracting focus during interaction is regarded as being significant. The task-driven focus of HCI has concerned on the nature of cognitive attention in interaction design (Norman, 1991). HCI is replete with studies of, and frameworks for, managing attention and distraction with a view to supporting particular tasks, multitasking, and managing distraction and workload (Carroll, 2003; Monk and Gilbert, 1995). In this respect, FugaciousFilm has explicitly materialised and visualised that ephemeral interfaces with delicacy and resulting intensely focused interaction might also benefit the design of task-oriented applications in HCI.

Furthermore, I would argue that another conceptual implication of FugaciousFilm is that the findings have opened up a design space in digital gifting (Chapter 5). This includes the incorporations of ephemeral interactions, suitably enhanced by delicacy, into the concept of hybrid gifts and gift wrap. In Chapter 5, I extended the concept of ephemerality from the 'duration of material existence' to the *'availability of function'*. Ephemerality may be associated with irreversible transitions in the function of an artefact. For example, gift 'unwrapping' has been reframed in this thesis as an ephemeral experience that involves a one-off and irreversible interaction with the wrapping. My investigation of digital gift wrapping has shown how an ephemeral artefact might be usefully integrated into a context closer to everyday experience, which leads me to the second part of the research question. Thus, in which follows, I will

outline the contribution that this thesis has brought into HCI by introducing ephemerality into a common experience we encounter in ordinary life.

7.2. Ephemerality and Delicacy in Ordinary Experience: Digital Gifting

The material-focused approach in ephemeral interaction design greatly concerned on the intrinsic properties of the materials such as, visual performance or duration of disappearance. Therefore, previous explorations of ephemeral interactions have tended to focus on artistic experiences, for good reasons. The artistic performance of a material typically embodies a rich sensory experience. A myriad of art installations utilises the impactful fleeting phenomena, such as sunrise and fall, fading fog, and water drops. Moreover, literature in tangible interaction design has shown that designers have attempted to expand and reinforce human senses - auditory, olfactory, tactile, vision, and gustatory - by incorporating digital interactivity with the ephemeral materials. Although such design attempts generate provocative (multi)sensory experiences, applications rarely sustain in our everyday settings.

Reflecting on the FugaciousFilm study, I had begun to explore a universal context in which to employ *'ephemerality'* and its entailed interaction attribute, *'delicacy'*. This involves reorienting my design focus to an appropriate form of more common experiences and delving into daily experiences with artefacts that might be approached with focused or even heightened attention. Thus, manifested as a focus on "gift-unwrapping" in Chapter 5. Also, I focused on the fact that some people become explicitly cautious in the unwrapping process (i.e., keeping the package undamaged) or become focused to see the gift hidden inside. Below in 7.2.1, I will delineate to what extent this thesis has contributed to HCI's knowledge of digital gifting through the concept of the hybrid gift, which brings ephemerality with delicacy in our common experience. Furthermore, 7.2.2 and 7.2.3 propose a promising design approach for digital gifting that arose from my

interview study. The findings suggest future work regarding the design of systems and artefacts to help retain the digital gift as a valuable possession.

7.2.1. Hybrid Gift with Delicate and Ephemeral Interaction

The study in Chapter 5 focused on the context of 'digital gifting', where, at first glance, the attentiveness caused by unwrapping behaviour seems to be eliminated due to the nature of media. Current computing interfaces employed in digital gifting appear to overlook the attributes of wrapping other than its functional role – securing the data and accurate delivery.

I have proposed the 'hybrid gift' as a novel concept to describe digital gift exchange that adopts some favoured ritualistic behaviours from physical gifting. My interview study and literature review in gifting informed me that wrapping is a significant concern throughout every stage of the gifting process, by both giver and receiver (Howard, 1992; Porublev et al., 2006). Wrapping is one of the methods to show an effort in the preparation; it is an explicit sign that a thing is a gift and adds a layer of personalization with wrapping paper, decoration, and messages. However, in most cases, wrapping is primarily useful because it leads to unwrapping, although it leaves a residue that the recipient can keep and display, which may prolong the emotional charge in reflection. Sometimes, the wrapping evokes ambivalence to the receiver when they need to damage the beauty of the wrapping in order to gain the gift. But generally, such emotional tension enhances the excitement and pleasure in gift receiving. Hybrid gifts developed in this PhD employed delicate and vulnerable materials to bring further suspense to the act of unwrapping, as an attempt to augment the mundane experience of receiving and opening digitally transacted gifts. In Chapter 6, I have tried to enhance the emotional tension in the process of receiving digital gifts with the aim of reinforcing the mundane interactions executed by digital devices. In the context of gifting, the disappearance of the digital gift (music) triggered the rise of tension but in a negative mode, as a light frustration in knowing that the music is associated with the ephemerality of the wrapping. However, on the other hand, the transiency of the wrapper reshaped perception

towards a digital gift. It attracted the receiver's focus in the moment and appreciation of the method through which it was given. Music tracks played automatically at the instance of unwrapping recaptured the moment of gift exchange as an experiential gift. Except for IoT Gifting Candle, 'breaking' interaction was intentionally incorporated as a design element for the unwrapping method. The aim was to convey an experience such as, *"There was a suspense when I handled it that adds more excitement when I got it right"* (reflection from one of the participants).

Furthermore, many participants argued that receiving and unwrapping happen simultaneously in digital gifting. That is, once they receive a gift through email or messaging app, the title and format already inform them that it is a gift as well as the content. The hybrid gift prototypes were hiding the gift "better" than how wrapping paper covers a physical gift that shows a silhouette of the gift object wrapped inside. In contrast, the form factor nor the material of the prototypes had given a clue of what digital gifts are hidden inside. However, the association between the unwrapping interaction and receiving should be precisely mapped and clearly noticed, since the resulting gift is not tangible.
The initial design intention was to reinforce the perception of the digital 'data' as a gift by wrapping it. It was interesting to see that there was controversy in considering which aspect of the experience constitutes the 'wrapping' and which is the actual 'gift'. However, my overall reflections show that the wrapper and the content are complementing each other to enhance the overall pleasure in the process, making it more akin to the physical gift exchange.

Overall, I attempted to incorporate notable features of tangible wrapping in digital gifting. Time for expectation, anticipation, and unexpectedness may be part of a promising design approach for digital gifting. Arguably, a series of studies conducted in this PhD about digital gifting has not only contributed in generating design ideas on 'digital-gift-unwrapping' but also opened a broader discussion about the whole process of gift exchange. Although the initial aim of the study was in reinforcing one specific stage (revealing) of gift exchange, the

findings drawn out throughout the interview study and design workshop have engendered a holistic perspective towards gift exchange within HCI.

7.2.2. Digital Gift as a Valuable Possession

In the workshop, it was noticeable that the unwrapping interaction and the associated musical gift enhanced the excitement at the Receive and Reveal stages of the digital gifting, from the comparison graph in Figure 53 (in Chapter 5). However, participants' responses when referring to gift vouchers were even more noteworthy to investigate.

As a result of the (unwrapping) interaction with the prototype (wrapping), the voucher sent to the recipient's inbox was distinctively noticed as a 'gift'. The vouchers were the compensation for their participation, but it had, indeed, evoked 'gift-ness' even in the study setting. This is a notable finding in response to, how the gift vouchers were disrespected and regarded as impersonal when exchanged through emails or messages. In distinction to the music that played at the time of unwrapping, the gift voucher remained in the participant's inbox. Thus, the digital gift (gift voucher) gained the sense of being a possession that can be kept, while the sensory experience with ephemeral wrapping reinforced the sense of gift-ness.

The interview study revealed that 'ownership' was a critical attribute of a gift, which influences people constructing the meaning of a gift that is cherished over time. Many digital gifts failed to be recognised as a gift as they were easily copied and shared. Thus, they give less sense of the 'one of a kind' thing. Also, digital gifts were seldom treasured as one's valuable possession compared to physical gifts. In response, the hybrid gift introduced in the workshop suggests the potential implications for ephemeral wrapping. Synthesising the temporally existing tangible wrapping with the long-lasting digital gift might further reinforce the sense of gift-ness, which might include in the repository of one's possessions.

It was noteworthy that digital gifts were rarely revisited, although the digital gift might retain without a loss of quality, therefore often forgotten. Digital gifts were not necessarily treasured as valuable possessions. This poses various design challenges in a wider realm of HCI, including data management, communication, interaction, and user experience design.

Csikszentmihalyi and Halton (1981) conducted a survey of eighty families in Chicago, interviewed on the subject of their feelings about common household objects, and analysed the reasons for cherishing objects (

Table 9). The authors categorised two aspects, 'nonperson' coding classes for reasons that are related to memories, objects, and experiences; and 'person' coding classes for reasons that are related to other people and self. As it has shown in the classification, 'gift' is one of the meaning categories of 'Associations' that reflecting some gifts are cherished as one's possessions while some may be discarded.

Nonperson codes	Person codes
- Memories *(memento; recollection; heirloom; sourvenir)* - Associations *(ethnic; religious; collections; gift)* - Experience *(enjoyment; on-going occasions; release)* - Intrinsic qualities of object *(craft; uniqueness; physical description)* - Style *(style)* - Utilitarian *(utilitarian)* - Personal values *(embodiment of an ideal; accomplishment; personification)*	- Self *(self)* - Immdiate family *(spouse; we; children; parents; siblings; grandparents/childern; whole family (nuclear))* - Kin *(relatives; ancestors; in-laws)* - Nonfamily *(friends; associates; role models; heroes and admired people)*

Table 9. Meaning codes of cherished objects retrieved from (Csikszentmihalyi and Halton, 1981) p.270-6.

Some of the meaning codes of cherished possessions overlap with attributes of the digital gifts that participants (in the interview) used to reflect on their treasured experiences and gifts. However, even when a digital gift was especially

meaningful, it was rarely recognised as one's 'possession' as a similar manner with the physical gifts treated as valuable possessions.

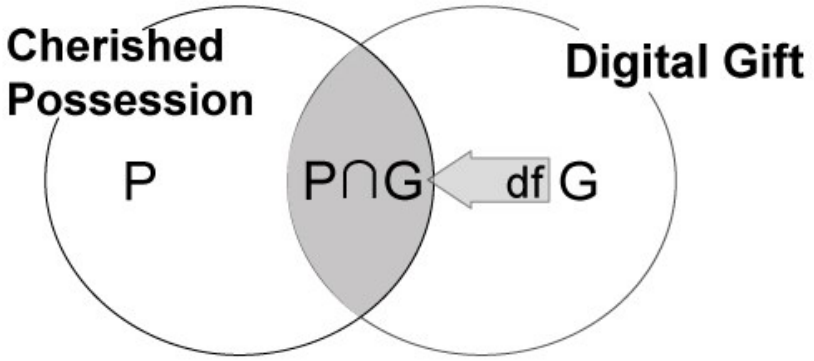


Figure 54. The association between the concept of 'cherished possession' and 'digital gift', some gifts are embraced in treasured possessions (PnG) while others merely noticed as gift objects (G) and there are some notable features that drive a 'gift object' into the 'cherished possession' category (df).

Attributes that described each category of Figure 54, which collected from the interview (in chapter 5), have re-categorised in Table 10.

PnG	G	df
Attributes of personally valued gifts	Attributes of less favoured digital gifts	Features driving digital gift to cherished possession
- Sentimental - Useful *(utilitarian)* - Memories - Appropriateness - Experiential	- Impersonal *(Explicit commercial value)* - Not preferred - Irrelevant occasion - Shared ownership	- Exchanged in-person (face-to-face) - Wrapped - Visible efforts - Purposefulness - Uniqueness

Table 10. Attributes and features describing PnG, G, and df illustrated in Figure 49.

P indicates the attributes of cherished possessions identified in Csikszentmihalyi & Halton's meaning codes (

Table 9). *PnG* implies attributes of digital gifts that treated as valuable possessions. These attributes can also be seen in the meaning codes of personal possessions (in

Table 9) as many characteristics overlapping. *G* indicates reasons for digital gifts that are excluded from valuable possessions. I would argue that attributes in *G* can also be applied to describe ill-favoured physical gifts, but 'shared ownership' may be the digital gift dominant feature, which defeats the 'gift-ness'. *df* is a list of features and reasons that were identified to enhance receiver's attachment towards the digital gift. Some features mentioned in *df* have not yet seen in digital gifting such as 'wrapped' or 'face-to-face' exchange. However, since these have established strong rituals in physical gifting, it is expected to enhance the gifting experience in digital domain – as examined by the workshop with hybrid gifts.

HCI has already investigated digital possessions from various perspectives: reasons why we perceive and discard some digital materials (Odom et al., 2009); teenagers behaviour with virtual possessions (Odom et al., 2011); and categories and reasons for the cherishing digital objects (Golsteijn et al., 2012). However, studies of digital materials given as gifts have not yet fully investigated about their journey after being exchanged. Questions of how a digital gift is kept; how it is revisited, reflected on; and what influences the reciprocation have not been fully addressed in the field of HCI or design.

Gift exchange has a profound history that permeated into and influenced broad aspects of society (Otnes and Beltramini, 1996). Digital gifting has been built on the basis of the (physical) material gifting tradition and culture that are pervasively practised in ordinary life. Having investigated the weakness of digital gifts, I would argue that digital services and artefacts for gifting should better support the reflective experiences that link the aesthetics of technology with the functions and cultural roles they are meant to support (Gaver and Martin, 2000). The concept of the ***Hybrid Gift*** is a preliminary attempt to retrieve the characteristics of cherished physical gifts that underlay broader social rituals and ceremonies, which may heighten the impact of the giving, or increase the value of the digital gift (Sherry, Jr., 1983). In conclusion, ubiquitous computing

technology and Internet of Things being already pervasive, it is timely to expand the design space of digital gifting. Potentially, the new rituals and cultures for digital gifting might reshape our social interactions.

7.2.3 Designing digital gifting as a social user experience.

In this thesis, I proposed a framework that recognises five distinct stages in the proceedings of gift exchange. I would argue that the framework is a significant contribution of this PhD as it offers a lens through which to examine interaction factors when intangible digital materials being exchanged as a gift.

Chapter 6 focused on employing delicate ephemeral materials to enhance the unwrapping experience in the digital gifting process. The design workshop conducted with the Hybrid Gift prototypes examined the experience of 'Exchange' and 'Reveal' stages only from the recipient's point of view, since it was not a real gifting situation. However, the discussion about the implications of the ephemeral wrappings and scenarios where participants would practice the similar medium in real digital gifting raised some valuable research opportunities to investigate other stages of gift exchange. Having identified the areas where digital gifting falls short (see Figure 38 in 5.5.3) and the implications of delicate ephemeral wrappings, it is worthwhile to revisit the framework and scrutinise the gifting process as a set of user experience. Therefore, in this section, I will expand the discussion of digital gift exchange beyond 'wrapping'. I will discuss how digital gifting may be reconsidered in the field of HCI and how can interaction designers may engage with the arena of digital gifting to enhance the user experience throughout the process.

Therefore, my study suggests an alternative framing of digital gifting, one that focuses more on supporting the rituals of gift giving than on the form of the gifts. Below, I will elaborate implications for the design of the digital gifting as a social user experience[16].

[16] Sections from 7.2.3.1 to 7.2.3.4 have been retrieved from the Rituals For Digital Gifting section in the paper published for the conference CSCW '17.

7.2.3.1. Preparation

I will begin with implications for the preparation of digital gifts.

- ***Personalization***

The effort to personalise a gift is widely appreciated as it implies that the giver cares greatly about the value of a social relationship (Hendry, 1995). Kelly and Gooch (2012) found that personalization was a central element in communication through postcards, even among random strangers. One strategy to apply delicate interaction on the giver's side is to expand the personalisation aspect in the preparation of digital gift. Preparing physical wrappings like Hybrid Gift might involve the giver's effort in deliberately selecting and designing the presentation method. In the interviews, I noticed that thoughtful preparation engendered giver's tension and suspense when the recipient unwraps the gift. Moreover, when the giver's effort and time have visualised in the personalisation, the recipient became more cautious and delicately removes the layers of wrapping.

I observed in the interviews that romantic couples in long-term relationships expect sentimental value through personalised gifts. In some social relationships, including romantic couples, the explicit monetary value attached to digital gifts (e.g. gift voucher, software pack) may feel uncomfortably impersonal, although our study reveals that this may not be problematic among family members. Among various methods to personalise a digital gift, in order to successfully apply in social relationships, I argue that designers may also consider supporting decommodification (Cheal, 1988) as part of the ritual of personalization. We take off the price tag before wrapping to show that the price is not a matter of concern. As an illustrative example, digital gift vouchers (frequently noted in the interview) were regarded as uncomfortable within social relationships because of their commodity feel that overlooked personalization options (e.g. hiding price and wrapping). Therefore, I anticipate that there would be a potential demand for a novel digital gift voucher type that allows a giver to purposefully

select a range of goods with reference to the intended recipient's preferences. Drawing on the previous study and findings, I advocate opportunities to personalising the design of the gift voucher would also offer a rich experience in preparation. Digital technologies might support the personalization of gifts in multiple ways. A giver might create digital gifts from scratch (e.g., editing a personal video) or might customise existing gifts by changing aspects of their appearance. The act of choosing an appropriate gift in the first place might become an act of personalization if thoughtfully conducted. The challenge here is for service designers to emphasise the personal aspects of hunting for gifts for others. Perhaps, online retail sites might offer recommendation services through interfaces that encourage givers to thoughtfully associate receiver's interests when choosing a gift, rather than an automated recommendation by harnessing so-called big data.

- ***Digital wrapping***

As one method of preparation, I have introduced several examples of wrapping digital gifts with ephemeral materials in Chapter 6. Hybrid Gifts were, literally, representing physical wrappings that reinforce the tangibility of unwrapping experience in the receipt of digital gifts. However, wrapping in the digital realm appears to be under-represented. Wrapping is an important ritual in everyday gifting (Cheal, 1988; Hendry, 1995) and adding a personalised wrapping may differentiate a gift from a mere business transaction (Cheal, 1988) or symbolise that something is a gift in the first place (Komter, 2007). The act of wrapping typically includes selecting the type of wrapper (paper or box, design, colour) according to the recipient's preference, deciding how to wrap (whether to give clues of the contents by revealing its outline), and adding personal messages and flourishes. In one chapter of the book, "*Wrapping Culture"*, Hendry delineated the significance of gift wrapping in Japanese culture. In Japan, wrapping papers, ribbons, and other adornments have specific meanings coded by colours or shapes that need to be carefully personalised regarding the relationship and occasion. Perhaps, gift wrapping is widely agreed sign of politeness and

precision that the giver personally cares the recipient, although the explicated format is widely diverse between the cultures (e.g. Eastern/Western).

Then one might raise a question how can digital technologies be factored into the wrapping of gifts? One idea might be to develop the concept of digital wrapping that can be chosen, personalised, associated with messages and applied to a digital gift. The interview findings showed that digital wrapping would need to demonstrate the effort and skills, as in physical gift wrappings. It should therefore not be (or appear to be) trivial or instantaneous to apply (e.g., through a single 'click') but should instead involve an element of creativity, for example selecting, applying and 'mashing up' digital media such as personal photo collage. Thus, even if the giver cannot directly modify the content, they can become a creative part of how it is wrapped or how it can be unwrapped.

The study has shown that digital gift giving is lacking emotional tension, suspense, or delicacy. Digital wrapping may include services to hide the gift until the specified time and occasion of its unwrapping, but notify when it will be opened so that receivers may build anticipation and suspense. This will be an alternative way to heighten the tension when unwrapping the gift, when there is no tangible substance. Moreover, the general concept of digital wrapping might be potentially broadened further to be applied to physical gifts. For example, virtual reality and augmented reality technologies might wrap a physical artefact in personalised digital contents such as video messages. A notable example might be the 'augmented reality advent calendar' developed by Artcode project team at the University of Nottingham. The calendar comes with 24 artcode[18] stickers that can be scanned using the Christmas with Artcodes app to open digital contents that either personally selected or crafted by the giver (Artcode can be customised into a unique visual code by following the instructions). The Artcode advent calendar allows a user to thoughtfully personalise either the physical calendar or the digital contents, or both. Regarding that the advent calendar is deeply grounded on the cultural bases (particularly, in western

[18] See http://artcodes.org.uk/christmas/

Europe), it embeds the rituals or rites of the specific occasion, Christmas. Especially, the proposal for digital gifting services that builds expectation and tension before the recipient opens the gift can be applied to the advent calendar that only reveals the 24 digital contents on each different day precisely. The challenge for interaction designers might lie in how both gift and wrapping (physical calendar with visual codes and digital contents) can be tied together to offer seamless interactions in receiving the gift.

7.2.3.2. Exchange and Reveal

Following the proposals on personalization, I now propose two strategies to enhance the rituals of exchanging and revealing digital gifts.

- ***Rematerialize digital gifts for a rich user experience***

Returning to the theme of wrapping, gifts are also wrapped to hide their contents for the sake of mystery and surprise, as the recipient's reaction is essential to the giver (Schwartz, 1967). In the interviews, Zip files, passcode locked contents, and USB sticks were not seen as delivering this aspect of wrapping. A radical extension of the mere container of the content is to enhance the experiential qualities of opening a digital gift for the first time, transforming the first ever 'play' into a memorable moment. Here, the design aim of the Hybrid Gifts was to enhance the moment of reveal, transforming 'click to open' into an exciting and memorable experience. The Hybrid Gift was mainly drawing on the idea of 'rematerialization' in which the functionality and experience of digital materials are enhanced by connecting them to collateral physical materials (Belk, 2013) such as CDs, DVDs, or personal mobile devices that allow the users to represent themselves in online. Magaudda (2011) emphasised the similar user experience in digital music consumption that material accessories such as an iPod, external hard drivers, and headphones that users select to express their identity. The design approach might potentially involve augmenting traditional wrapping materials such as a wrapping paper decorated with visual markers linked to supplementary gift, or perhaps, drawing on recent research into consumable and ephemeral materials such as food that has previously been augmented to become

a vehicle to convey digital contents (Grimes and Harper, 2008; Wei et al., 2014). Indeed, food has long been considered as a gift both literally and symbolically in various cultures (Grimes and Harper, 2008), suggesting that it could become a wrapping for digital gifts. Thus, I have applied the tangible and embedded computing in the design of Hybrid Gift (in Chapter 6) to create *digitally-augmented physical wrappings* that convey a rich user experience in receiving a digital file as a gift. Gifting Table and Gifting Plate illustrated a concrete example of food being a wrapping for a digital music track that played the music for the first time when it is eaten – providing an enhanced sensory experience – before adding it to the receiver's collection.

- ***Collocated exchange and reveal empower suspense***

The collocation of giver and recipient at key moments may serve to heighten excitement (and nervous tension) for both and, also provide opportunities to appreciate the gift and express gratitude. While of course, the physical posting of traditional gifts already challenges collocation, the spread of digital distribution further weakens this important facet of gifting rituals. One implication is to capture the recipient's reaction (e.g. video or audio) of these moments for later enjoyment by the giver. I speculate that the rematerialization of digital gifts to create enriched moments of experience as discussed above may be used to motivate them to experience them together. An example of this can be seen in the work of Fosh et al. (2014) who revealed how directly sharing gifted personalised museum tours generated strong mutual obligations between pairs. Fosh et al. revealed how these kinds of experiential gifts, while powerful and engaging, can also engender social awkwardness, which some of our interview participants also reported to experience while unwrapping gifts. The designers of future gifting services will need to accommodate potential moments of social disquiet, or perhaps even deliberately design them into gifting rituals to enhance social bonding, a strategy that has previously been proposed in research into 'uncomfortable interactions' (Benford et al., 2012).

7.2.3.3. Use

Regardless of which exchange mechanism for digital gifts was favoured by people, the pragmatic value of the gifts was seen as being crucially important. Digital gifts are exchanged in immaterial forms that are adaptable to various devices and enable extensive use in multiple contexts. The recipients can make unlimited copies and share them, if they wish to. Thus, in this section, I will discuss how digital gifts can enhance our social relationship as well as a design challenge, of which the intangible digital materials are still facing to gain the impression or significance of the 'gift-ness'.

- ***Gifts as social channels***

One of the powerful characteristics of the digital gifting noticed from the interviews was that it offers a live experience that involves both the giver and receiver as participants. Wright et al. (2003) have developed a framework to investigate how technology can be seen as an experience with technological artefacts. They recognised that the user experience extends across time and space to make sense of ourselves, culture, and lives (McCarthy and Wright, 2004). The concept of "sense making" in the use of digital technology was also found in the interviews. For example, family members (P10) and couples (P12) made use of chat-rooms and blogs as a private gifting space where personalised gifts could be shared, accumulated, but importantly, also discussed and reflected upon on an ongoing basis. It is a concrete example illustrating how people actively construct an experience, in a reflexive and recursive manner (McCarthy and Wright, 2004). This suggests that the designers of digital gifting services may benefit from rethinking gifts as being channels that supporting ongoing social dialogues between giver and recipient and that extend into active use of a gift, rather than as merely being a thing to be exchanged at a given moment.

- ***Giving instead of sharing***

Enhanced dialogue around gifts should not be confused with shared ownership of them. In the interview study, shared ownership seemed to prevent digital gifts from gaining significance in social relationships (Golsteijn et al., 2012). Digital

gifting services that transfer not only the digital materials but also ownership, may foster a strong sense of a gift. On the other hand, digital gifting through email, messaging and other general channels, where the giver is able to keep the original, may engender more of a sense of 'sharing' and potentially devalue the gift because it is not truly given away. Designers may wish to consider the strategies employed by ephemeral messaging apps (e.g. Snapchat), but in a reversed way. I propose an app for the digital gifting. When a giver sends a digital gift via this app, once the receiver accepts the gift, it gets removed from the giver's device. In this way, givers might more thoughtfully select and send the digital materials, and the system would convince receivers that the passed digital artefact is a gift, that has no other copies remaining in the sender's outbox. This strategy would also reinforce the giver's preparation and exchange experience by making them deliberately choose the gift.

7.2.3.4. Reflection and Reciprocation

Reciprocity has been a central concern when discussing the process of gift exchange as a subject of social science (Derrida, 1992; Gouldner, 1960; Komter, 2007; Mauss, 1954) and in computer supported communications specifically (Taylor and Harper, 2003; Yang et al., 2011). Interview study has uncovered how the immateriality of digital gifts often results in them being 'hidden' or 'forgotten'. They don't appear to receive much attention from recipients with regards to reflection and reciprocation, even though givers appear to value any feedback they receive. IoT Gifting Candle (in section *6.2.1.2*) is a proposal that gently imposed the notion of reciprocity by placing the candle holder as a gifting platform that ambiently reminding the receipt of gifts. In following, I will discuss what interaction designers may need to consider to design reciprocal experience in more common methods of digital gifting, such as through emails or online retailer's websites.

- ***Surfacing digital gifts***

Personally created and exchanged digital gifts require awareness of reciprocation. In the physical gifting context, I could notice that the sense of reciprocation naturally evolved from experience during multiple stages – Receive – Reveal – Use – which then influenced longer lasting reflections. The physical gifts were more likely to get noticed by recipients to reciprocate. Designers may consider making gifting services not only for fast and convenient interactions, but also to steadily inspire people to build long-term engagements with the gifts through the proceedings of gift receiving. This design approach aligns with proposals for *slow technology* (Hallnäs and Redström, 2001) that aims to introduce reflection and mental rest in the experience of technology: for example, a notification system in a music player that reminds the receiver of the occasion that the music track was given and offers a chance to feedback or reciprocate. Social networking sites such as Facebook has this kind of feature that notifies "what had happened in the same date last year or the years before". This allows the users to recall their memories and reminisces past events they had with their friends. In terms of gifting, similar services can be found in some of the online retailers (e.g. Amazon) that tailor recommendation systems. When a recipient receives a gift, they immediately get a recommendation list of products to reciprocate, which has been selected based on logs of the giver's past purchase history. This kind of strategy, however, would need to be balanced against the social pressure of needing to be seen to use and respond to a gift.

Design implications illustrated in this section are proposed to inspire designers and researchers to further develop products and services on the base of the deeply ingrained rituals of gift exchange. From a radical point of view, it might not yet a gift if the exchange of digital materials conducted without thoughtful considerations on rituals that consist of, ***relationships, means, the manner of exchange, occasions, reciprocation, codes, and etiquettes***. Thus, this particular section articulated design implications derived from the studies in Chapter 5 and 6 to shed light on the intangible digital gifts to reclaim the various elements in designing the ritualistic exchange of digital materials. To summarise, the interview and design studies on digital gifting examined the practicality of

delicacy in unwrapping experience; then discussed how digital gifts can be treated as one's valuable possessions, which is one of the major research topics in HCI.

7.3. Summary of Discussion

This chapter discussed contributions drawn out from this PhD. From FugaciouFilm to Hybrid Gift, I employed multiple research methods across HCI and design that can be claimed as Research through Design (Zimmerman et al., 2007). Therefore, the design artefacts, concepts, and most importantly, research findings are all worth recognition as contributions. In this regards, FugaciousFilm was a concrete design exemplary to understand ephemerality and delicacy in interaction design. Not only was this novel in terms of the design of the tangible user interfaces but it also widened the scope of ephemeral interaction from ambient and peripheral experience to delicate and focused experience. Having learned how to manipulate ephemeral materials in a controllable manner, I then sought out more everyday experiences to which I might apply these, specifically ones that could benefit from delicacy, suspense, and even a degree of tension, in user interaction. Thus, digital gift wrapping has been investigated as a domain, which became a key contribution of this thesis. In this thesis, gift unwrapping has been framed as a temporal, ephemeral experience that may benefit from delicacy in tangible manipulation. I proposed the concept Hybrid Gift with some of the proof-of-concept prototypes to enhance the digital gifting experience. However, this thesis has not only contributed in producing novel interactive artefacts and concepts but also, expanded the discussion on the overall process of digital gifting to bring the research arena into the mainstream of Human-Computer Interaction and design. Moreover, since the nature of the study on the gifting requires realistic settings with people in a real relationship the research has ample opportunities to be investigated in the wild. Thus, in next chapter, I will describe future works inspired by the gifting study and conclude this thesis with a summary of contributions.

Chapter 8

8. Future Work and Conclusion

Throughout this PhD I have scrutinised 'ephemerality' in two dimensions: 'material' and 'experience'. A sharpened view on the ephemerality in our ordinary experiences had opened an even wider design space in the realm of digital gifting. This thesis has demonstrated that our social interactions with ubiquitous mobile devices have rapidly adopted digital gifting but barely signified as an act of thoughtful exchange. Design implications driven by the series of studies unveiled some potential future works in the domain of gifting in HCI.

8.1. Future Work

Section 8.1.1 revisits the 'five-stage gifting framework' to suggest it as a field research tool in and outside of HCI to expand the understanding of digital gifting. Then 8.1.2 proposes an 'in the wild' study to promote further development of social rituals around digital gifting by researchers, designers, and the general public.

8.1.1. Framework as a research tool

The 'five-stage gifting framework' was developed as a lens to view the generic practice of the gift exchange. It was successfully integrated into the study, illustrated in chapter 5, as a filter to identify weaknesses relating to digital gifting within the whole process of gift exchange. Figure 55 below illustrates the framework as a research tool that would benefit the future empirical studies.

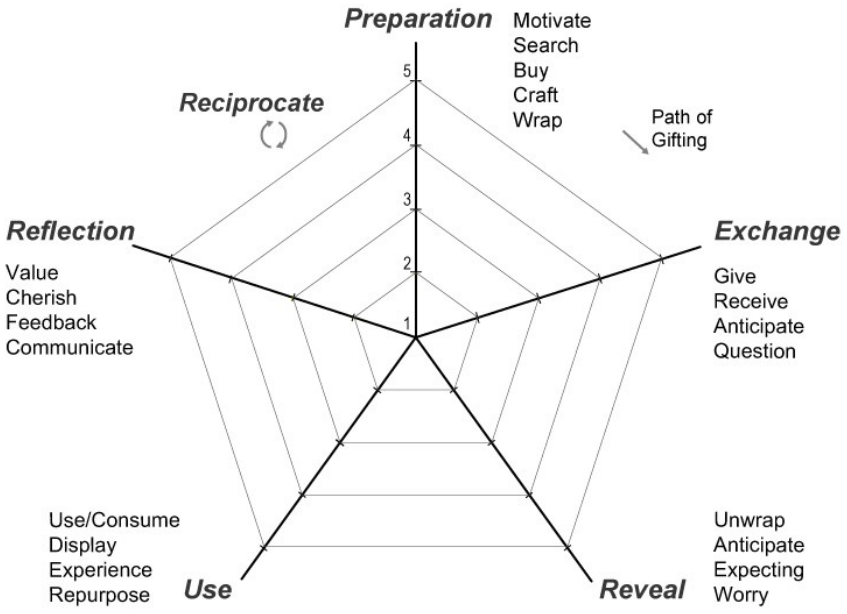


Figure 55. Five-stage gifting framework illustrated with a radar graph of five levels.

Arguably, the framework presents several advantages in its own right. Firstly, it summarises the complex process of gift exchange and offers a systematic overview. Secondly, it can be employed as a research tool. As described in section 5.2 that reviews studies about gift exchange in multiple other disciplines, research in gifting relied on a qualitative approach. However, as it had been used in this thesis, the framework supports an empirical analysis that would strengthen the qualitative data. Moreover, I have deliberately integrated a 'Reveal' stage in the framework in order to investigate an interaction quality that is associated with 'unwrapping'. In turn, the 'Reveal' stage performed a progressive role in unveiling a gap in digital gifting and presented a design opportunity in the scope.

Also, the framework has the flexibility to adapt to different purposes of studies. In the interview, I had adjusted the visualisation of the framework in order to better understand interaction quality (e.g. excitement) in a sequential manner. Thus, although the study focused on wrapping in digital gifting, findings from the interview and the workshop imply further design opportunities in other parts of the gifting process. Further investigation is expected in diminished excitement

and pleasure in giver's 'preparation' and receiver's 'reflection' stages in digital gifting (see Figure 38). Moreover, I have focused on positive emotions involved in gifting (excitement, pleasure) to induce drawbacks that hinder successful gifting experience. Thus, findings implied that there are negative implications of gifting (Sherry et al., 1993), thereby implying that it is worthwhile to probe the negative side of digital gifting, such as unwanted gifts, the un-favoured manner of exchange, uncomfortable gifting situations, and implications on relationships. The framework would be still useful by altering the parameter with negative adjectives such as uncomfortable or pessimistic.

The framework has many opportunities to be developed with more detail and facilitate studies in adjacent fields. Thus, I suppose the framework would benefit researchers and designers not only in HCI but in a wide range of disciplines.

8.1.2. 'In the Wild' study

In addition to the framework, prototypes probed in the digital gifting workshop embed many design inquiries to be investigated in a field study. Four prototypes fit two different settings, where gifting is likely to be naturally planned and performed with other activities in our everyday life – dining and home. Moreover, each of the two settings may involve participants in different relationships: friends or other social relationships for dining, and family and couples for home. One might propose an ad hoc restaurant that facilitates a gifting event. The design workshop in Chapter 5 offered a hint that the gastronomic food experience (Zoran and Coelho, 2011) might be a potential area to engage with interactive digital gifting. Moreover, home is an intriguing setting to investigate how digital gifting can impact family relationship and bonding, especially in increasing number of mobile families. In this regard, digital gifting has a potential to become a platform that supports establishing family rituals among mobile workers and distant family members (Kirk et al., 2016). Kirk et al. have developed Ritual Machines (I & II) to explore mobile workers' lives and practices. They focused on a need or role of phatic technologies (Vetere et al., 2009) to support intimate connection at a distance through digital technology at home. It is notable that a subset of related works in phatic communication centred around the notion of ritualised activities (Kirk et al., 2016), which can also be found in gift exchanges. In the interview study, I saw that digital gifting in intimate relationships such as families and couples was regarded more as a routinary gesture of good relationship, rather than a formalised behaviour. IoT Gifting Candle introduced in the section *6.2.1.2* is a concrete example that can be applied as a domestic technology for families. The candle prototype was intential designed to surprise a receiver even through remote exchange. For example, a member of a family who temporarily lives abroad can prepare a digital gift (secretly) in a web server that connected with the IoT Gifting Candle placed in his/her family home. The gift will be revealed when the other members are burning the candle. It is more likely for people to burn candles at occasions such as dinner or an evening family gathering rather than during lunch or while

doing house chores. Therefore, we might expect the sudden reveal of the digital gift from a burning candle will be caught by the recipients and foster surprise and pleasurable experience. Supposedly, conducting a study with the prototype in a more realistic setting might engender precise and rich data for the development of digital gifting systems and services. A field study in various family groups and expanding to cross-cultural studies would enable HCI researchers to understand the ritualistic interactions to be considered in developing user experience of digital gifting services, or more broadly, digital communication.

Furthermore, it is worthwhile to explore the formalities and ceremonial aspects of gift exchange that would help to establish the digital gifting as a pervasive social communication means. In addition to the aforementioned future work, I plan to develop a 'Ritual handbook for digital gifting' with an aim to conduct an ethnographic study. The handbook may address desired customs in computer-mediated gift exchange which might associate with general gifting rituals that are already pervasive. Similarly to Gaver's design workbooks (Gaver, 2011), I envision the collection of design proposals and related materials in the ritual handbook to become a method for design, a tool for people who wish to practice, and a design methodology for researchers who wish to engage with the topic of gift exchange.

8.2. Conclusion

Computers and digital devices were initially intended to facilitate certain tasks with precise functionality, which require user's constant attention. The capacity of the digital device has developed to overcome human limitations, and it is now even harder to forget or lose any information. As an opposite movement, HCI researchers have also endeavoured to offer mental rest to users by moving the interactive artefacts to the background of our everyday ambient settings (Weiser, 1999). In this regard, the notion of ephemerality gained attention in interaction design both in physical and digital computing. Temporal visualisation and ephemeral interfaces have been proposed for ambient displays that present

information on user's demand. Designing tangible ephemeral interfaces largely depends on intrinsic properties of the materials that transform along with time, such as the lifespan of materials, which are only partially controllable. Thus, the material-focused approach illustrated in related works often barely remains as an artistic expression of materials that enhances sensory experiences in Human-Computer Interaction. However, HCI literature that endeavoured in investigating consequences of the sensory experience or implications of the ephemeral interaction is very limited. Therefore, while focusing on the interaction attributes of ephemeral materials, this PhD explored how the notion of ephemerality and ephemeral materials can be harnessed in the design of everyday interactive products or systems.

This PhD followed a 'Research through Design' approach in combination with standard HCI user testing methods. The research involved of a series of challenges: to initially frame a design problem in a fertile area for exploration, speculate a preferred situation, develop proof-of-concept prototypes to demonstrate the potential solution, and evaluate the design both empirically and conceptually.

The first design study, FugaciousFilm (Chapter 4) intended to explore an unusual attribute of the ephemeral material: *"how can ephemeral materials be implemented in a controllable and functional manner?"* The prototype successfully synthesised the material, interaction, and an application to demonstrate the practicality of ephemeral materials. The fragile and fleeting nature of the soap film was recognised as a driver of highly focused and delicate interaction. The study showed that ephemeral materials have potential not only to bring user attention into the foreground, but also to generate intensified tension, delicacy, or even frustration during the interaction. However, such experiences are overlooked in the mainstream of HCI since the concept of ephemerality did not gain much attention in the design of tangible interactive systems that facilitate practical functionalities.

Therefore, reflecting on the findings, I began to explore *"in which context, might an ephemeral artefact be usefully integrated into a common experience that we encounter in ordinary life?"* This PhD started to delve into an experience in our everyday lives to employ 'ephemerality' with an aim to incorporate 'focus and delicacy' in the design of products and systems. Turning to an ordinary context, digital gifting is increasingly happening as a method of social communication with the advent of smart computational devices. Due to the nature of digital technology, 'gift wrapping and unwrapping' processes are missing in currently available modes of digital gifting, although 'wrapping' has many social implications in its style and manner of exchange. Gift 'unwrapping' is a meaningful process in the context of gifting, which can be seen as a brief, irreversible, and non-duplicable. These characteristics of gift unwrapping build up a sense of the ephemeral experience. The study delineated in Chapter 5 unveiled how digital gifting has been conducted and perceived in our everyday social communication, as well as the role of HCI in digital gifting up to date. The study started with an aim to apply 'delicate interaction' in digital gifting, to reinforce unwrapping experience. In Chapter 6, I introduced a series of prototypes that named Hybrid Gifts, which incorporate tangible-ephemeral materials for wrapping medium to convey digital gifts. The design intention of the prototype was to apply features of tangible wrapping in digital gifting such as time for expectation, anticipation, and unexpectedness.

Arguably, a series of studies conducted in this PhD on digital gifting has not only contributed in generating design ideas leading to 'digital-gift-unwrapping' and Hybrid Gift but also opened a broader discussion about the whole process of gift exchange through digital technology. Although the initial aim of the study was to reinforce one specific stage (unwrapping) of gift exchange in a tangible manner, findings gained from the interview study and design workshop have engendered a holistic perspective towards digital gift exchange.

As a conclusion, this PhD introduced 'delicacy' as an interaction modality of ephemeral materials that brings ephemeral media into the foreground of the user experience. The two design case studies have probed that ephemeral materials

and the notion of ephemerality are efficient in designing delicate interactive media. This research not only realised and implemented delicacy through one specific prototype or application but also contributed in grounding the concept of ephemerality in a general communication context, digital gifting. Although I focused specifically on the design space of wrapping within a frame of ephemeral interaction and delicacy, the study also outstretched the research realm of gifting to Internet of Things and rituals of gift exchange. Therefore, I hope this PhD attracts attention from researchers in design, HCI, and CSCW as well as other social science subject disciplines.

Chapter 9

9. Reference

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Appendix

1. Interviews of Digital Gifting Study

Interview record of P1

Gender: F

Age: 20

Job: UG Student (Electrical Engineering)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you.

What was the occasion?

Who gave it?

How did you liked it?

A) My mini iPad from my dad because I got good results. I've got windows phone that is for work and schedules, and I use iPad for games and play.

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☑ Utility

☐ Story/ Meaning

☐ Other

Answer) Utility, I can use it for all games and things, and I can sync with my family because all my family has Apple. So I can sync with them music but you can't do that with windows. It's my first gift after I grow up. This one was my dad surprised me.

- *The iPad screen was cracked. Does that somehow influence how you value it? No, no. I actually like it. As long as it works it's just same for me. And when it was new, I didn't normally take it out and use outside (in public) but now I use it anywhere because it's cracked and I think nobody would steel it. (feels safer)*

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☑ Carry

☐ Display

☑ Use

A) I always carry with me, so at home, everybody knows that this is mine. That's how I cherish it.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo
☑ Music/ Movie (itunes voucher)
☑ Gift Voucher
☑ Greetings Card
☑ Software (MS Windows, Office)
☐ Mobile App
☐ Message (Text or Voice)
☐ Else (Please specify below)

_____

_____

A) I like digital greetings card as much as physical ones. I value the message inside, the thing itself I value the same.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people
☐ Display
☐ Carry
☑ Use

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Game download offer.

6-1. Which feature of the content made you to cherish it overtime?

☑ Useful

☐ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

Message, text, voice messages.

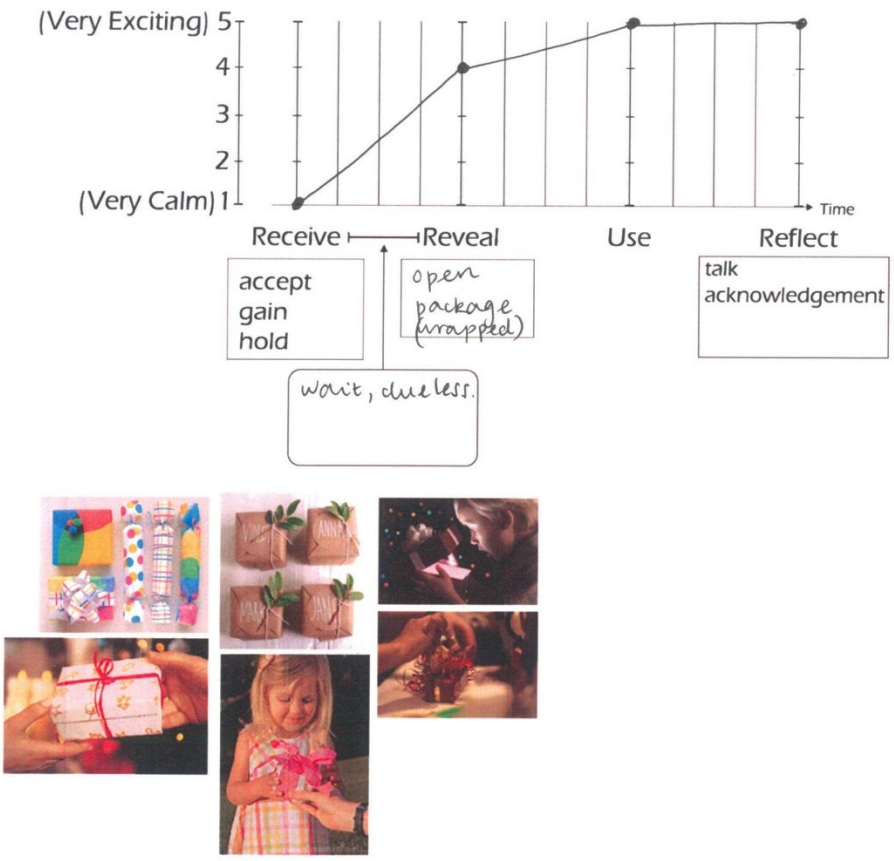
Because gift has to be something physical, like a card, that thought has to be put into.

Something specific to me, that's a gift. – example, my dad gave me a software that I specifically need.

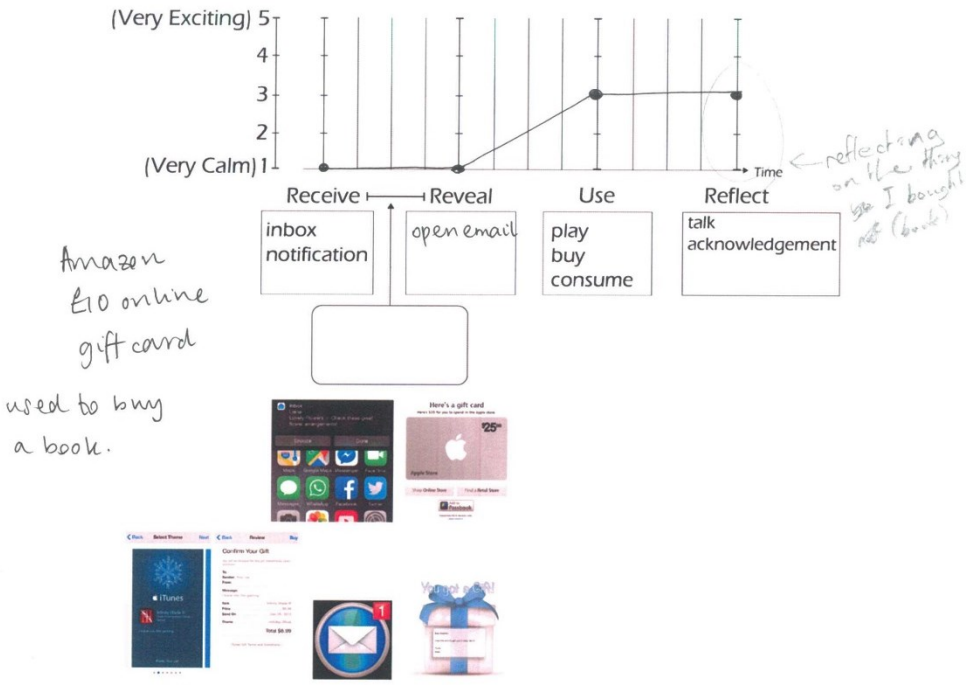
7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

If it's just a message, "Happy birthday and your name." it's still a small kind of gift, it's mainly from people who don't you know very well. It would be a gift from them but I wouldn't classify it as a gift for myself.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



9. Then, also draw another for a digital gift you have received before.



10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

Yes, if I know the person. Whatever the gift is.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo
☑ Gift Voucher
☐ Software (MS Windows, Office)
☑ Message (Text or Voice)
☑ Music/ Movie
☑ Greetings Card
☑ Mobile App
☐ Else (Please specify below)
__video_____
_
_____

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

A) You have options for greetings card of wrapping. Like you click it and it shows up.

I edited video

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

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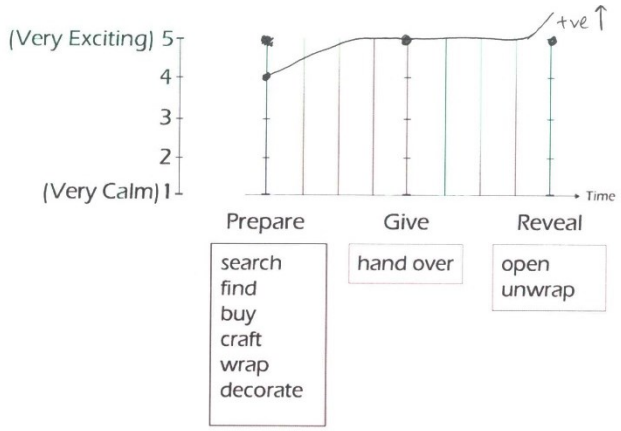
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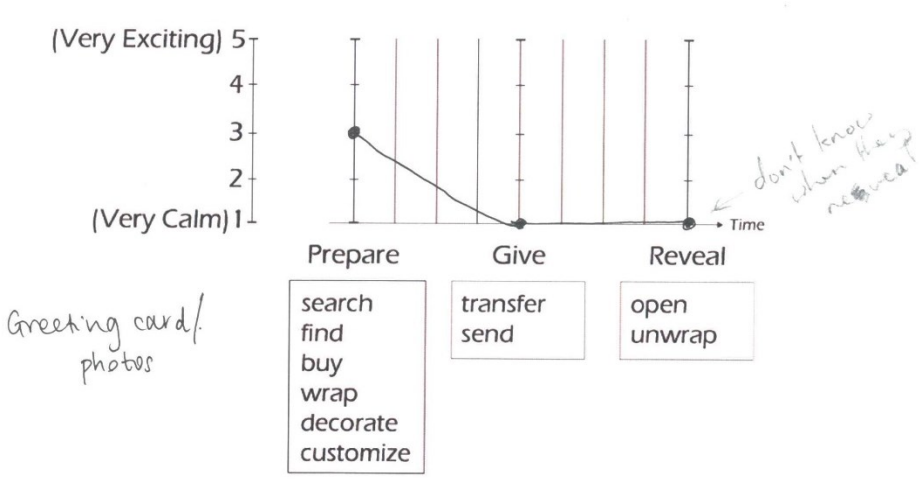
A) I just shared birthday photos. I just feel like it's just friendship exchange, you need to do that as duties of friends.

I feel the photo I sent to a friend who lives far away as a gift. Loads of photos. But not who lives near here and see often. Or videos.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



"I don't know when they reveal it."

Have you ever requested for a gift that is;

Physical

Digital: *Photo (I didn't feel that was a gift because I asked)*

Have you ever been asked to offer something?

Physical? *Yes, birthday gifts – phone, game, car, tickets to festival*

Digital? Photos – but still counts as a gift, I put them all together but I don't think they should reciprocate. It's just a small gift.

It's the effort that makes anything a gift.

Digital gift is exchanged with people whose not close in terms of both proximity and relationship.

Gift voucher feels above the message but below the physical gifts.

Interview record of P2

Gender: M

Age: 42

Job: PhD Student (CS)

(Questions for receiver)

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. Wallet

What was the occasion? Birthday

Who gave it? From wife

How did you liked it? I didn't have wallet at that time, actually had very very old one

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material) Real leather, Durable

☐ Utility Very usable, I used for 10 years. Even the UK notes are wider than my wallet, I don't want to change because I have some affection to it.

☐ Story/ Meaning

☐ Other I always use it (the wallet was quite worn out),

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☐ Use I use this daily.

Other gifts that I had received was not as impressive as this one. I've been receiving a perfume, or some food, but they lasts for limited time. So this (wallet) has more meaning to me because it lasts longer.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo

☐ Gift Voucher

☐ Software (MS Windows, Office)

☐ Message (Text or Voice)

☐ Music/ Movie

☑ Greetings Card for Christmas

☐ Mobile App

☐ Else (Please specify below)

_____

_____

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☐ Carry

☐ Use

For me digital ones and physical ones are quite the same. I think they have the same vale, because it is more relate with person who gave to me. I keep it personally, for the card I received from my relatives I only showed to my wife.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Music from my daughter. I had told her that I want to have that songs some time ago. And she cared for that and she said that she collected them and send to my iphone.

I don't necessarily listen to them as often as when I first received but I still have them and like it.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☐ Relationship with the giver

I like the content (song) itself. Especially rhythm and sound of the song.

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

Digital cards, like emoticons.

Maybe they were gifts but I don't consider it as a gift because when it's on Facebook, or Whatsapp.

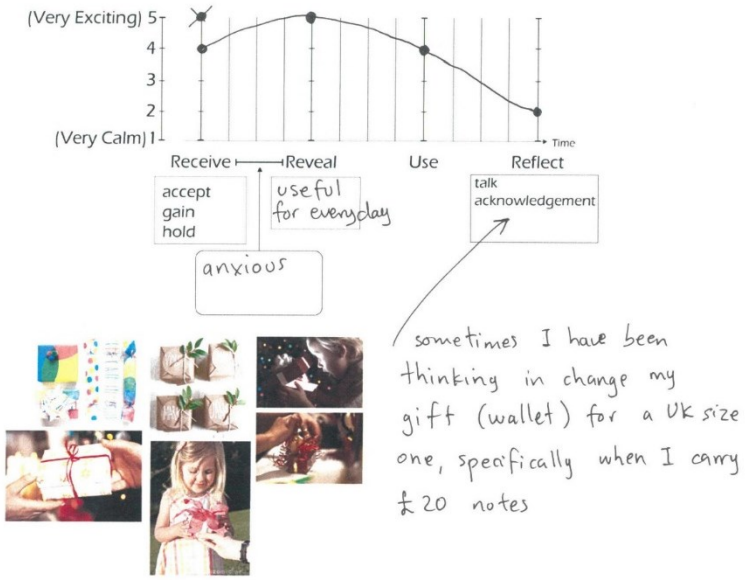
It is like a card but it's not made of ….patient(?) that is exclusively for me but the person who gave me would have considered (it as a gift).

So for example, my name is holy name for 24th of June. In Christian calendar, it's considered Saint John, so the cards that I received for that doesn't considered as a gift. It's for every John in the world.

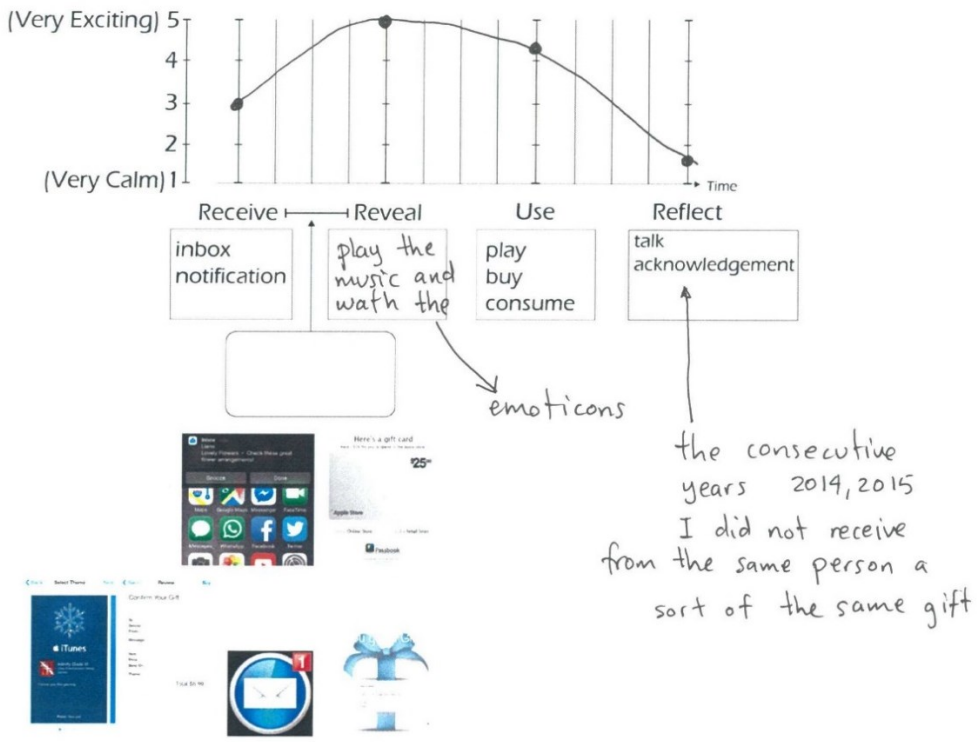
Like yesterday, if I had received a digital card for father's day, I wouldn't consider it as a gift because that's a gift for every father in the world.

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



9. Then, also draw another for a digital gift you have received before.



10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

In the very beginning (when I received), I feel like I need do something as a feedback or as a response or reply but I did nothing.

When there was the giver in a presence with me at that time, I would give back any thing I could get at that moment, but because the person is not there I don't/ can't.

If it is Christmas, it is common we would gather with all family and relatives then we exchange. I give one and I receive one.

The only thing I did was give "Thank you". But did not sent another (digital) card.

If someone sent me a tangible gift by post, it is more difficult for me to response with a tanble gift because the person is not there at that time. For digital contents in that case I think it's more practical, because I can answer back instantly.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☐ Photo

☑ Gift Voucher (Amazon voucher) A friend of my daughter

☐ Software (MS Windows, Office)

☐ Message (Text or Voice)

☑Music/ Movie For my daughter's One Direction album

☐ Greetings Card

☑ Mobile App Game app for my sun

☐ Else (Please specify below)

_____

_____

Buy the digital gifts for about twice a month.(for children)

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

No, just sent by text.

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

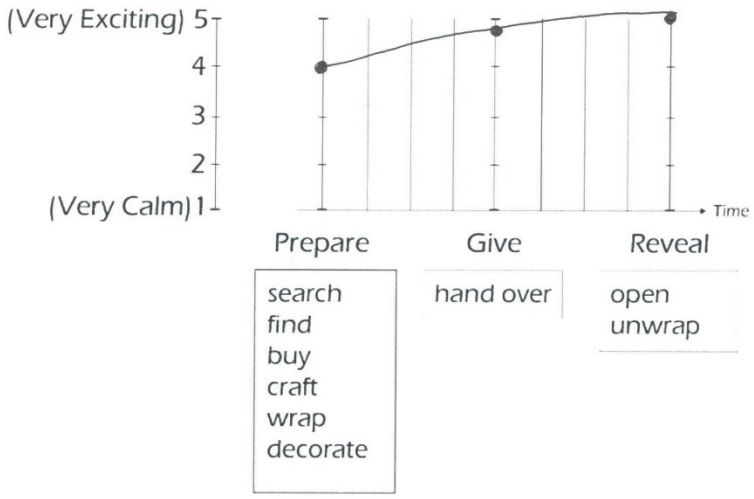
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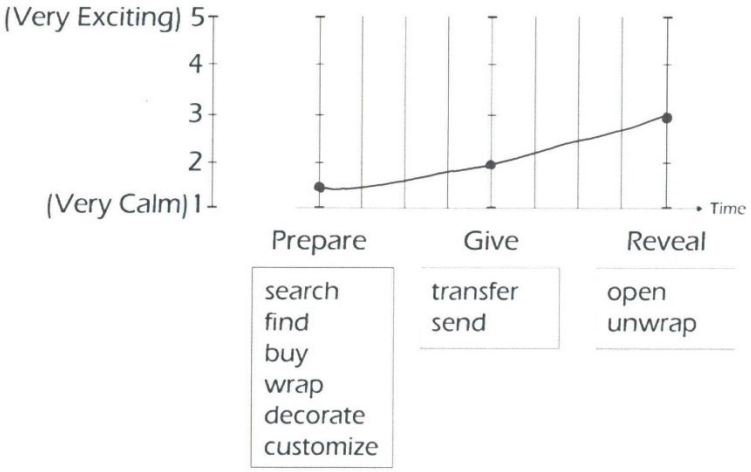
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I think I only exchange digital gifts with my children, and with wife more physically.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Have you ever requested for a gift that is;

Physical

Digital

No

Have you ever been asked to offer something? Mostly by my children

Physical? Bike, Scooter, Lego

Digital? iTunes credits, songs

Do you feel you should be reciprocated? No

My children give me the feedback of receiving the digital gifts (come and said "thank you").

I think it was more frequent that they ask me to buy digital gifts. Expect for special occasion, like my son's birthday I bought him a kind of game money.

I think I invested more money in digital gifts, because I buy it frequently. For example I spent £80 for a Lego bricks once in a year but maybe I have spent £15 10 times a year (← much more mundane thing).

For digital gift, they ask me more often.

Interview record of P3

Gender: Female

Age: 25

Job: PhD Student

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. Bracelet

What was the occasion? *First anniversary with boyfriend.*

Who gave it?

How did you liked it?

2. Which feature of the gift do you value particularly?

☑ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☐ Other

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☑ Carry

☐ Display

☑ Use

There was no digital gifts that my boyfriend gave me. Maybe the only digital gift that we exchanged was music, at the beginning of our relationship. That was the way of mapping common preferences and we don't do it anymore and I don't consider it as a gift anymore.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo

☑ Gift Voucher

☐ Software (MS Windows, Office)

☑ Message (Text or Voice)

☑ Music/ Movie *Netflix account*

☑ Greetings Card

☐ Mobile App

☐ Else (Please specify below)

_____

_____

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☑ Show to other people *(New music, new movie)*

☐ Display

☐ Carry

☐ Use

There's a little bit of unbalance here, for physical gift, it's so much easier to remember person who gave them and also come across them and use them in your everyday life. Whereas, for digital artefacts, they sometimes get forgotten in the list of tabs and in the list of bookmarks.

Digital ones are more dependent on the functionality of the medium that it carries. For example, digital photo clock, it displays digital photos only when there's battery. When it's ran out of battery, there's disconnection.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

1. About 10 years ago, back home at Romainia copyright and download laws were more laid back than here in UK. I used to have a friend sharing music albums in shared network system. And, at one point he dumped many albums into my files (folder). Among them, I came across 80s rock music that was quite overwhelming. Then whenever I come across that songs I associate with him and the time. Because that was also a kind of serendipitous moment as well, it was just a massive amount and listen through that play list, it was just few songs..(that you be come cherish).

2. A year ago, one of my colleagues send me a book review (link) that was relevant to my research area. (It was really useful one) I ended up buying the

6-1. Which feature of the content made you to cherish it overtime?

☑ Useful

☑ Reminding a specific event *Context, Situation (How people use technology) "Back then it was quite common among friends share actual files by dropping in Dropbox not just the Youtube links or by phone, (than even now)"*

☑ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

I think gift vouchers it applies. Because there's always another line conditions for you to use that, or sometimes you need to have subscription for longer period of time that the gift voucher applies to something like this.

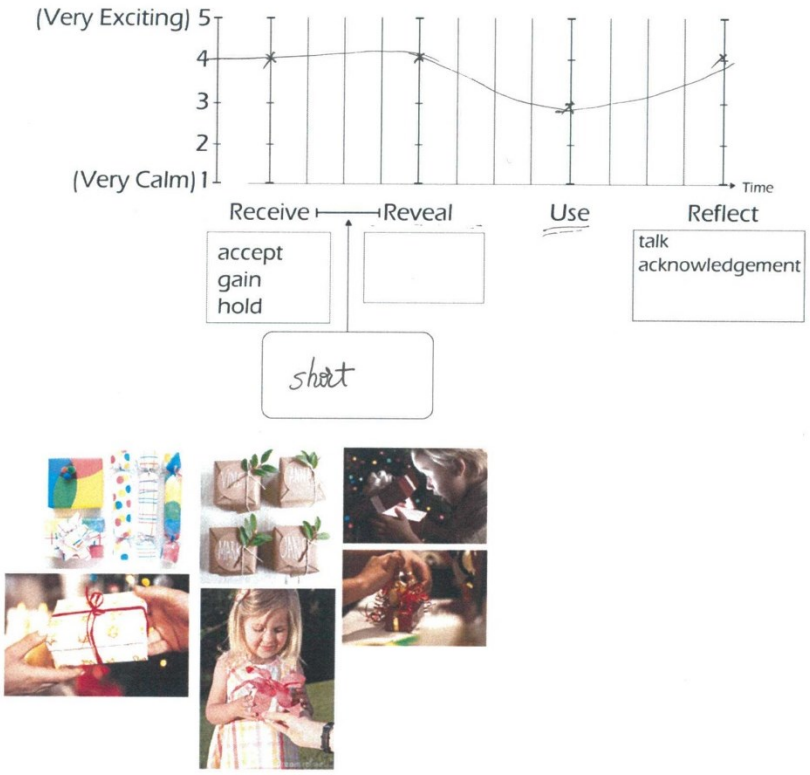
7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

Sometimes they are really flexible, then it is really useful. Then you can do whatever you want rather than confining yourself to certain option. But if it's for specific, then I find it less useful. In certain cases.

Vouchers for specific goods feels like a gift and useful only when it is given by someone who knows very well. So that it fits my taste.

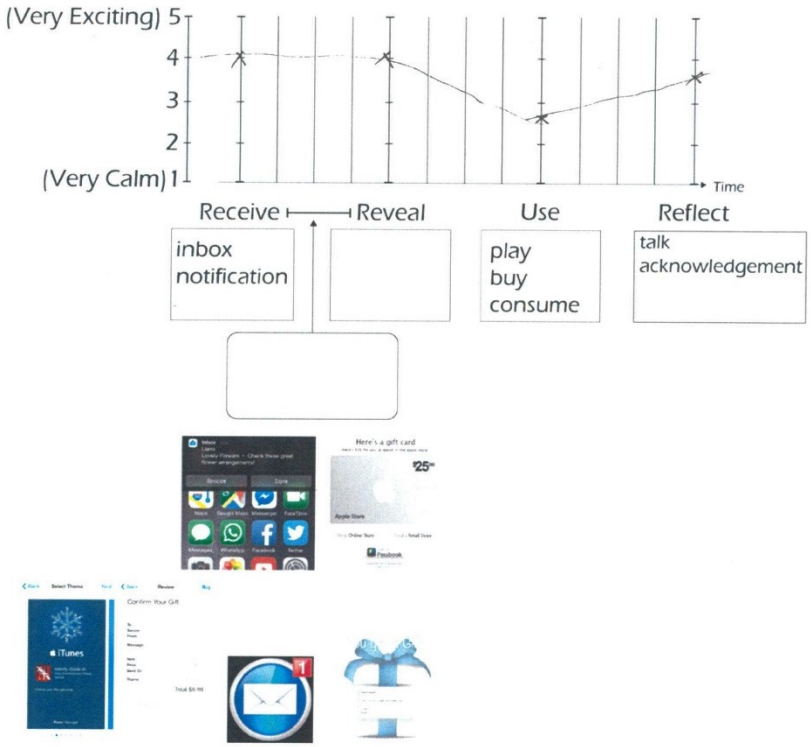
More flexible ones – money like voucher – they feel less like a gift but they are much more useful and handy.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



I keep the ribbons and message tags (they are beautiful and message). I try not to damage the package.

9. Then, also draw another for a digital gift you have received before.



10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

Yes,

It mostly happens with music, if someone sends me an mp3 file or Youtube link they I would reciprocate. But only when I perceived as a gift.

I reciprocated with greetings card (it's easy), but not with vouchers.

Back to the Netflix example, I did not reciprocated. I think I should reciprocate in a same way. For example, by another subscription or any software.

How do you think about the feeling of reciprocating to the gift comparing physical and digital.

There might be greater counterbility, for the physical ones. Longer usage leads to that person remembering that they have to reciprocate. (it keep reminds people of the person who gave them and have chance to think about reciprocated.)

But this happens less often with digital gifts, because of their transient nature, it is easily get forgotten.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo *(Digital/Physical Hybrid) – photo clock*

☐ Gift Voucher

☐ Software (MS Windows, Office)

☑ Message (Text or Voice)

☑ Music/ Movie

☑ Greetings Card *(Require a bit more efforts than just a text)*

☐ Mobile App

☐ Else (Please specify below)

_____

_____

3. What kind of special treatment did you do?

☑ Customize

☐ Decorate

Clustered relevant photos and basic edited, customize greetings cards

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

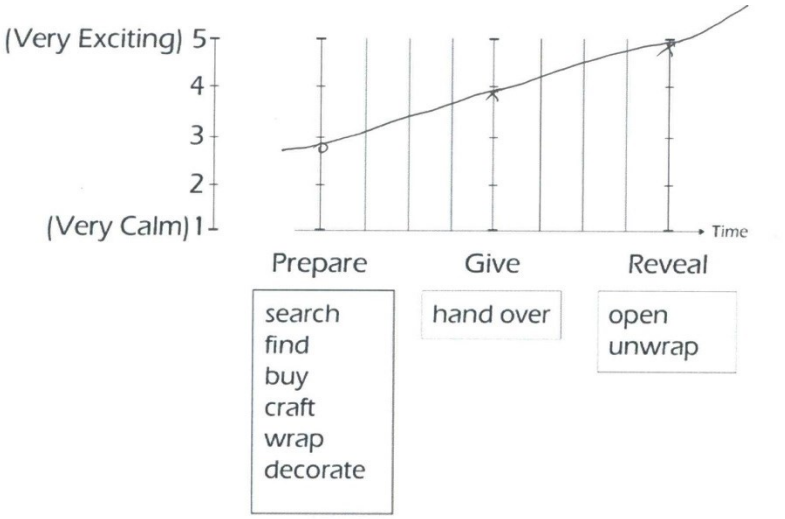
☑ Copied

☑ Easy to transfer

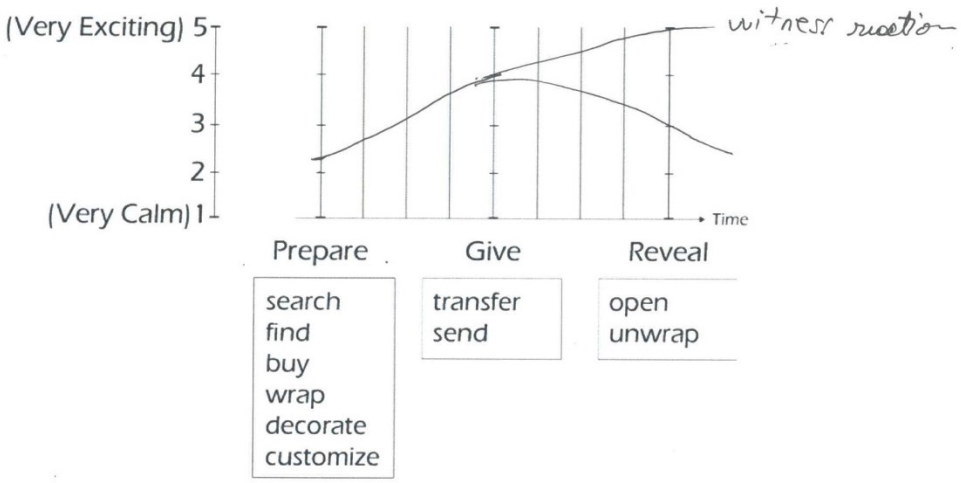
☑ Shared

Other than that particular photos for the device, I would say I shared on Facebook. Video Links,

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Have you ever requested for a gift that is;

Physical - yes

Digital

Have you ever been asked to offer something?

Physical?

Digital? Recommendation letter

Do you feel you should be reciprocated?

Interview record of P4

Gender: Male

Age: 22

Job: PhD Student

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Mandarin Textbook*

Who gave it? *Four of my friends pitched in to buy me this for my birthday.*

What was the occasion? *Two of them are Chinese and I actually have Chinese blood in me, I'm from Indonesia but technically I'm Chinese and my Mum is Mandarin teacher.*

How did you liked it? *I prefer practical gift like this. Utility.*

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☑ Utility

☑ Story/ Meaning

☐ Other

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☐ Use

(Interviewer) "It's looks quite new."

Oh, for books, I don't like writing on the books. When I buy books I go beyond special care in order not to damage the bindings and get it dirty..., especially for books. That's how I cherish things, keep it clean."

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo

☐ Gift Voucher

☐ Software (MS Windows, Office)

☐ Message (Text or Voice)

☐ Music/ Movie

☐ Greetings Card

☐ Mobile App

☑ Else (Please specify below)

_Games (from Steam),
Character skins_____
_____IAP_____

League of Legends

Steam

League of Legends (LOL), It's online game, it's free to play and you have characters you can choose. Only cash object you can get is if you want to customize your characters so look differently. So we call it skins. So if receive gifts in terms of skins, like I had from my sister, that's in-game gift.

The skin is not only the clothes or appearance of the character, it's also the character's ability to interact with the environment in the game.

I wouldn't consider messages as a gift.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☐ Carry

☑ Use

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

I think it's very difficult because when you say digital content I sort of visualize files. So if people send me a file through email or dropbox, I can't really treat the file as something I cherish. I can just copy and paste wherever I want, it's not unique, it's not really personal either, I would say. So I can't really treat the file itself as a gift. Unless the file represents sort of social context or a more.. that you can sort of emotionally relate to. But I can't really think of a case like that.

But something that might come close is that, … it's not something physical or digital gift but it's a digital 'gift' if you combine with like perception. So if someone links me a music, and I grew up with the music, so my brain associates that music with the person. So even technically, they don't give the music to me but in your head, "oh yeah, you introduced the music to me."

Personally, for me, the way I define a gift is one way of an exchange of objects or data. Basically, if I'm giving something to you, without expecting anything in return, or exchange, then that's a gift.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

That's very common. Based on my definition, if someone sends me a file and that's already a gift but I don't regard it as a gift because I don't see the file as personally valuable from my sense, perspective.

For example, document, report, etc. Technically, it could be considered as a gift but I don't… I don't know how to describe it… it is not meant for me. (Although that's sent "for you".)

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

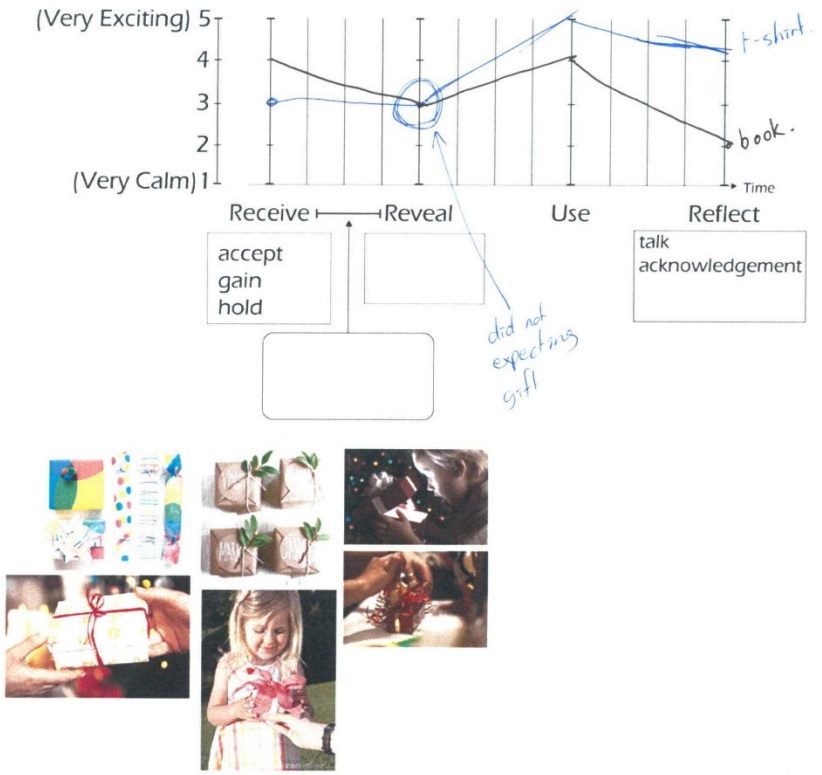
Digital things can be a gift but the things is, at the moment it's very limited. Most of the digital gifts I see the half obvious monetary value linked to it.

Let's say for example, my friends gave me this book I can't tell how much this book costs but most of the digital gifts I consider as a gift, let's say itunes gift card, they come in £20 value, so these are quite obvious that they are 20 pounds. Or for example, the skins as well,…, they have the number of points that how much they costs. Or music, digital downloads, they have obvious price tags. I think that what,.. , it's sort of limited. The digital content that meant to be a gift, it's sort of limited in that way.

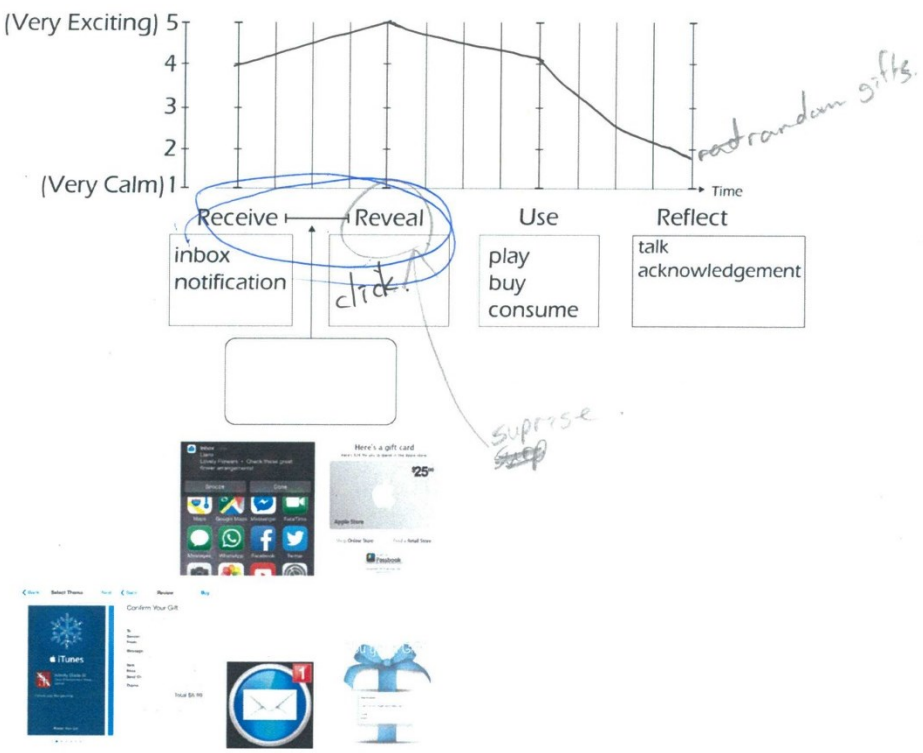
Those that are not, it requires talent, you can't just buy it. So for example, what I would consider more personal digital gift is, if someone draws a picture for me, digitally. Or someone composes a music for me. So these are more personal digital gifts but they are harder to come across. Because without the talent or capability to produce those, you can't just give them away.

I think that's what makes it gifts, it has no monetary value. When you giving a physical gift you take off the price tag, because that the social norm we all agree. Taking off the price tag means that.. trying say that the price isn't really matter. But when you give them digital gifts where there's obvious price tag, it makes it seem like it's solely for practical use. So for example, when I receive iTunes gift card, certainly I'm happy to get it but it wouldn't feel personal. It's like buying credit for you mobile phone.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



9. Then, also draw another for a digital gift you have received before.



Reveal wouldn't be viable for something do know you will receive. Because that would just be receive, you click on this. Receive and reveal would be sort of together. Because there's no unwrapping stage for sort of digital gifts.

I think this sort of mystery gifting is .. it's a very exciting behaviour that mobile game, game developers are exploring at the moment. … And this sort of system comes from the slot machine idea. So you put your money and you are excited to see what you get. So this is sort of pain mechanism that the developers are trying to spread.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

I did reciprocate, but in another game.

I easily reciprocate in physical gift.

I had received an "extra" copy (of a game) from one of my friends, but I didn't reciprocate that.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☐ Photo
☐ Gift Voucher
☐ Software (MS Windows, Office)
☐ Message (Text or Voice)
☐ Music/ Movie
☐ Greetings Card
☐ Mobile App
☑ Else (Please specify below)
_____Games_____
—
_____

3. What kind of special treatment did you do? *Nothing*

☐ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☑ Copied

☑ Easy to transfer

☑ Shared

Music, movie, etc.

They are some that I buy and some free.

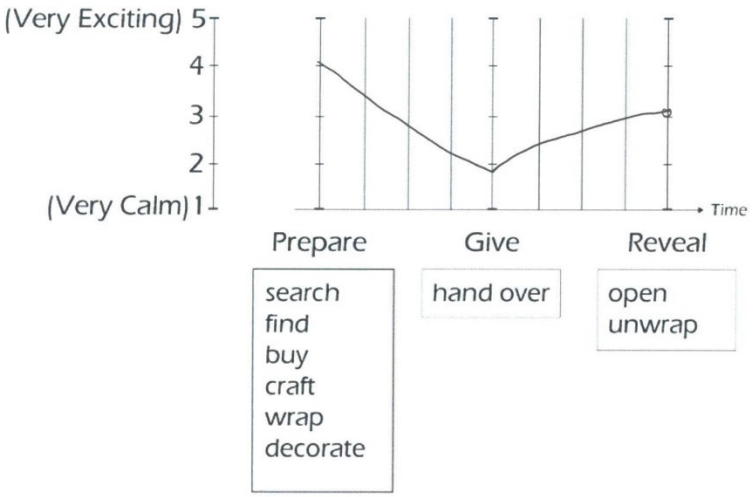
Do you have personal guide to judge something (digital) as a gift or not?

If it's movie, it would have to have (digitally) a concrete monetary value. So it would be link to one of the big movie subscribers. If it's a file of movie that's not a gift, but if it's Netflix, Netflix subscription something like that, that would be a gift.

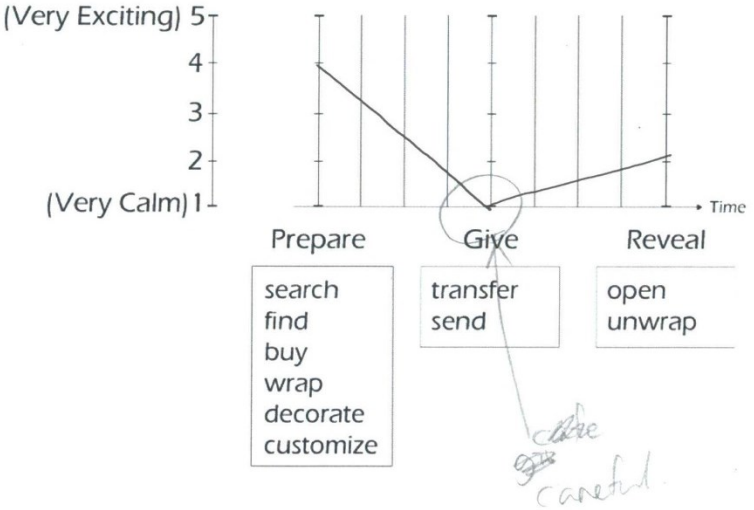
But physically, even if it is just one DVD disc, I would treat it as a gift.

Music and movie, if it's original content, then that's a gift. Giving the 'ownership' of the official file.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



When I do digital transaction, I need to be careful make sure everything is correct. It's like bank transaction.

Most of the time I'm not there when they reveal so I'm just not excited.

Have you ever requested for a gift that is;

Physical - yes

Digital Nothing seriously.

Have you ever been asked to offer something? Yes quite frequently.

Physical?

Digital? Search information,

When I was undergrad, when I'm 3rd year friend in 2nd year ask me for the things I've done in 2nd year.

Sometimes in my community ask me to make an app for an event. But if it takes more than a day, I wouldn't do it for free.

But generally, if it's just a simple help, yes I do.

Do you feel you should be reciprocated?

Yes, sometimes. Depends on the context. Like when searching for travel, I found flight so now you do the hotel.

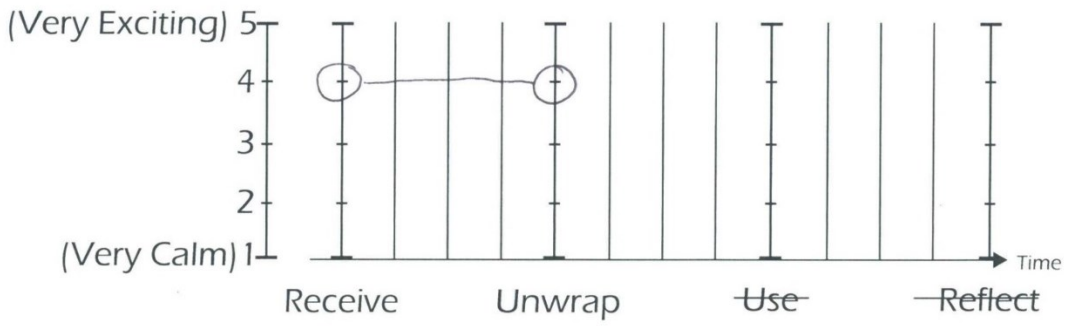
Workshop Debriefing

1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

(1)	Physical	>	Digital
(2)	Physical	<	Digital
(3)	Physical	=	Digital

"It leaves ~~red~~ residue, so the both feel like a gift."

2.When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.



"You don't know what's inside and it gives more curiousity ~~to~~ in handling the physical thing."

Interview record of P5

Gender: Male

Age: 35

Job: PhD Student (Art&Design)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Fridge magnet.*

Who gave it? *This is from one of my best colleagues who has just finished his PhD and going back to his country.*

What was the occasion? *We've been known each other for more than four years, we travelled together and he l bought it for me there.*

How did you liked it? *I like the memory we around this magnet, not the magnet itself. And he wrote his name in his language and date on this so I can recognize what it is. So it became quite special for me.*

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☐ Other

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☐ Use

I keep it in my personal place for myself, rather than show to other people.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☑ Photo ☐ Music/ Movie

☐ Gift Voucher ☑ Greetings Card

☐ Software (MS Windows, Office)

☐ Mobile App

☐ Message (Text or Voice)

☑ Else (Please specify below)

_Emoticon Stickers_____

I received a package of stickers that I can use in the chatting app, like WhatApp. It wasn't anything for special occasion.

Sometimes photos can be a gift because they can be edited. And then they become similar to the greetings card.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☐ Carry

☐ Use

I think I just keep it. I don't necessarily look at them again but I know they are there. (Different from physical ones.)

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Photos that recall events and people. – For photos I think it's not important whether it's digital or physical but the meaning behind it. The content of the photo.

Images that contain information that is very useful for me.

6-1. Which feature of the content made you to cherish it overtime?

☑ Useful

☑ Reminding a specific event

☑ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

Sometimes my friends send me emoticon stickers that they like which I don't prefer. Then I don't think that's a gift, a bad gift. (laugh)

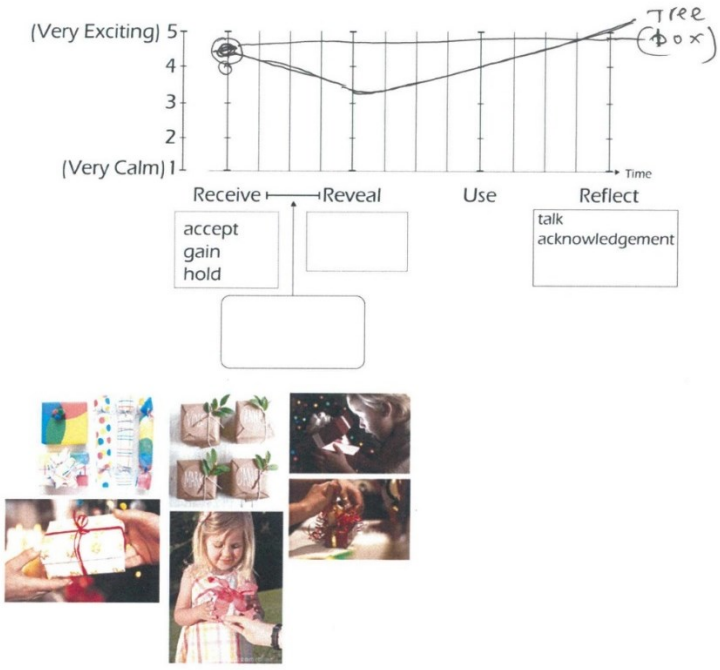
7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

I think the digital gifts are very convenient to get and send to a friend. I don't have to meet my friend in person. I can send through internet.

Sometimes we can buy virtually. (gift cards) So that recipients can buy whatever they want, connect to the physical things in real shop and I think that's very good.

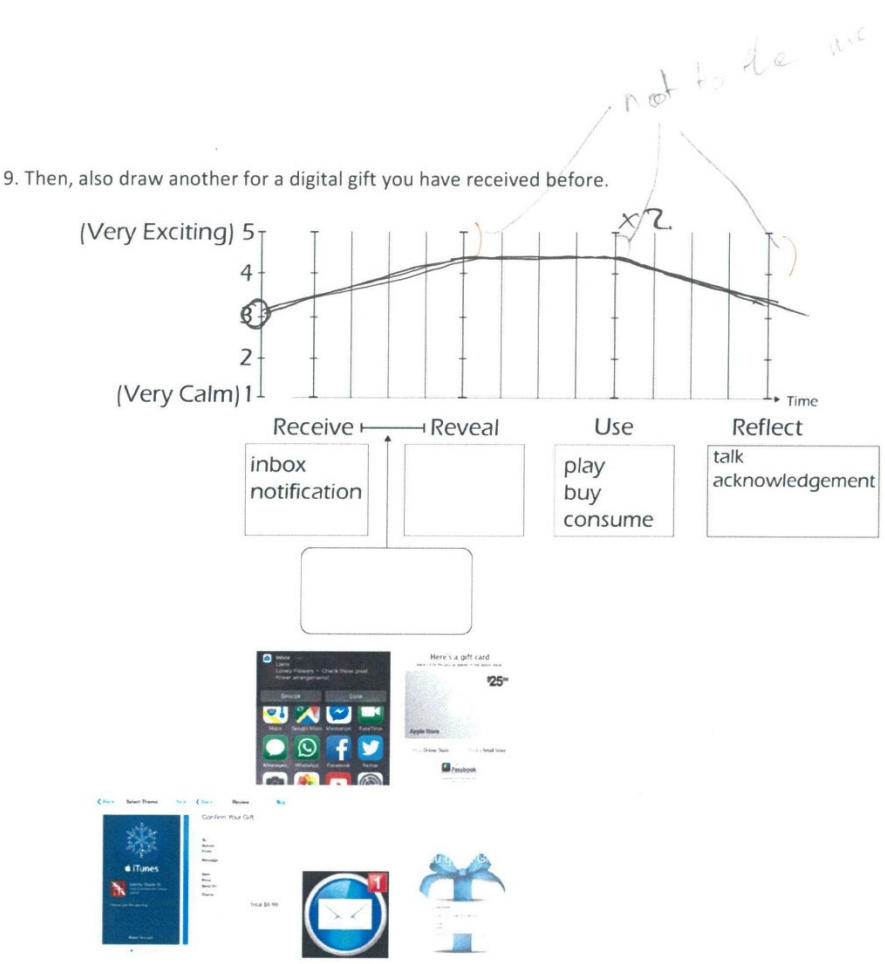
But I think the digital gifts are not like real gift. Because we normally give gifts in face-to-face so that we can feel and touch it. But we normally send digital gifts to friends not in face-to-face. (So it doesn't feel really like a gift.)

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



9. Then, also draw another for a digital gift you have received before.

9. Then, also draw another for a digital gift you have received before.



Some digital gifts comes with kind of animation like opening a box and feeling is totally different you just clicking a button. But for physical ones you open by your hand and it feels better.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

No, not really at the time. It depends on how big the digital gift is.

I didn't replied to the digital greetings card by another card, but by text. If I received physical card, I think I give back with another physical card.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo ☐ Music/ Movie

☑ Gift Voucher

☐ Software (MS Windows, Office)

☑ Message (Text or Voice) – *birthday messages,*

☑ Greetings Card

☐ Mobile App

☑ Else (Please specify below)

*IP address, Emoticons*____

Photos, greetings card, messages can be combine together.

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

For web address, I chose his name as the address to make it special for him.

I also did some editing for photos.

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

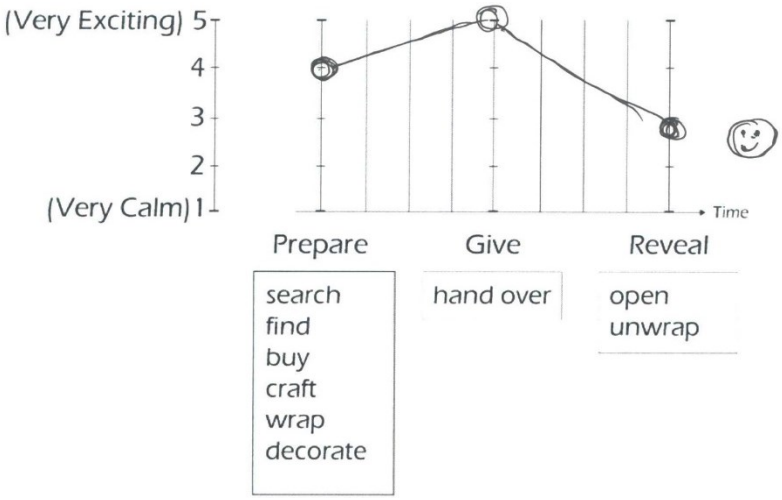
☑ Easy to transfer

☑ Shared

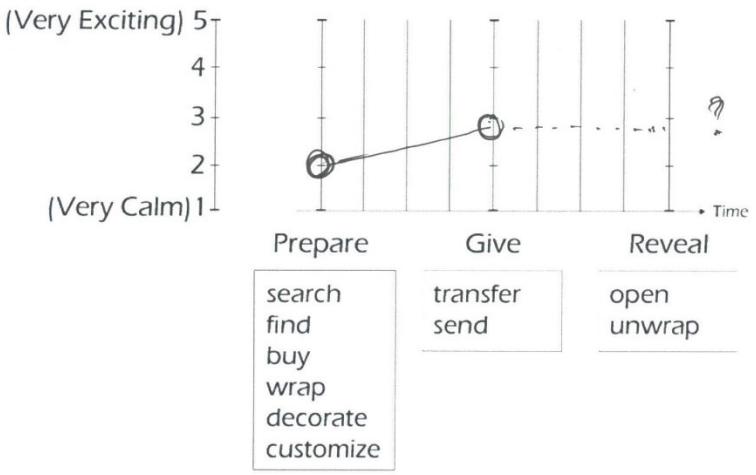
Photos of an event, like a package. Not one special photo.

I can just easily take photos with my smartphone and send it to friends.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



This interviewee plotted beyond revealing stage as the most exciting moment of the gift giving process. When people send photos or messages of how the gift voucher has been used, he feels quite pleasing than in other stages of giving (digital gifts).

Have you ever requested for a gift that is;

Physical – yes, many

Digital Software (something that they already have), Emoticon

Have you ever been asked to offer something?

Physical? Post card from trip

Digital? Software, Emoticons, Design (business logo, poster)

Do you feel you should be reciprocated?

Yes, but I (think people) don't think the digital things can be a gift.

For example, if somebody paint me a picture of a painting then that's a gift, but if some images are produced digitally, then it's not the same.

Digital things are regarded as knowledge.

Interview record of P6

Gender: Male

Age: 49

Job: Scientist

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. 1. *Tree 2. Wooden box*

Who gave it?

What was the occasion?

How did you liked it?

1. It was a tree that my girlfriend bought me for my birthday and we planted in her garden. Since she moved house, it's now been moved to my parent's house which has a bigger garden.

2. She gave me a beautiful wooden box shape of ellipse. It was made by a crafter.

2. Which feature of the gift do you value particularly?

☑ Aesthetical pleasure (Design, Material)

☐ Utility

☐ Story/ Meaning

☐ Other

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☑ Display

☐ Use

I put it in special position in my house. I don't use it very much. It's on my table. It has particular pleasure in opening and closing. There is definitely physical feedback there. I just place it on a table with lot's of other stuffs. It's just for me, that I want to see it daily.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☑ Photo

☐ Gift Voucher

☐ Software (MS Windows, Office)

☐ Message (Text or Voice)

☑ Music/ Movie

☑ Greetings Card

☐ Mobile App

☐ Else (Please specify below)

I don't use Instagram, Whatsapp kind of things so when I receive photos through multimedia messages, it feels quite something special. I've not had a smart phones for a long time. So that's sort of I'm starting to use those applications again.

If photos from members of my family that I haven't seen for long time, and some special photos like family occasions, new born babies, then if I get through email or even on facebook, yes it's like a very small tiny present.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☐ Carry

☐ Use

I always keep them.

I look at my digital greetings card couple of times. I wouldn't delete it.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

My uncle who lives in abroad sends me newsletters (PDF, word doc., photos, scanned document), by email. It's like a magazine.

Whatever he sends, I always keep them.

6-1. Which feature of the content made you to cherish it overtime?

☑ Useful

☐ Reminding a specific event

☑ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

No, I can't say that. That's never been my feeling.

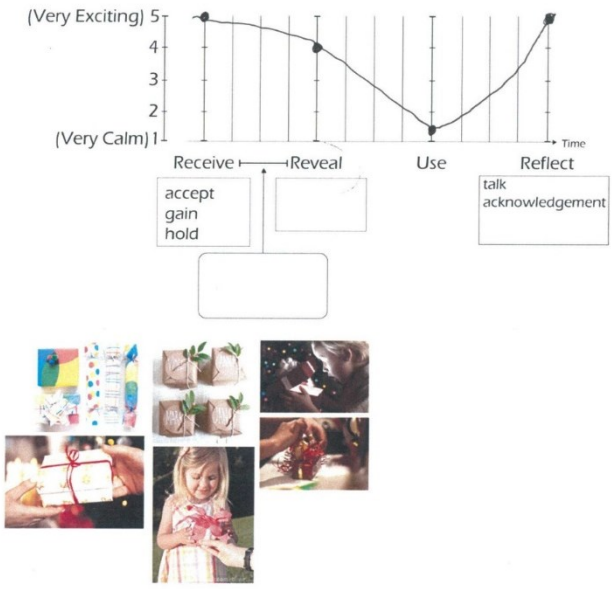
I have felt that kind of thing in the past with physical gift vouchers. But in the digital domain, it hasn't really happened.

I kind of over appreciate things that have sent to me digitally. When somebody sends me digital greetings card, "oh that's really neat, I really like it". I like both physical and digital. It's better than not receiving it.

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

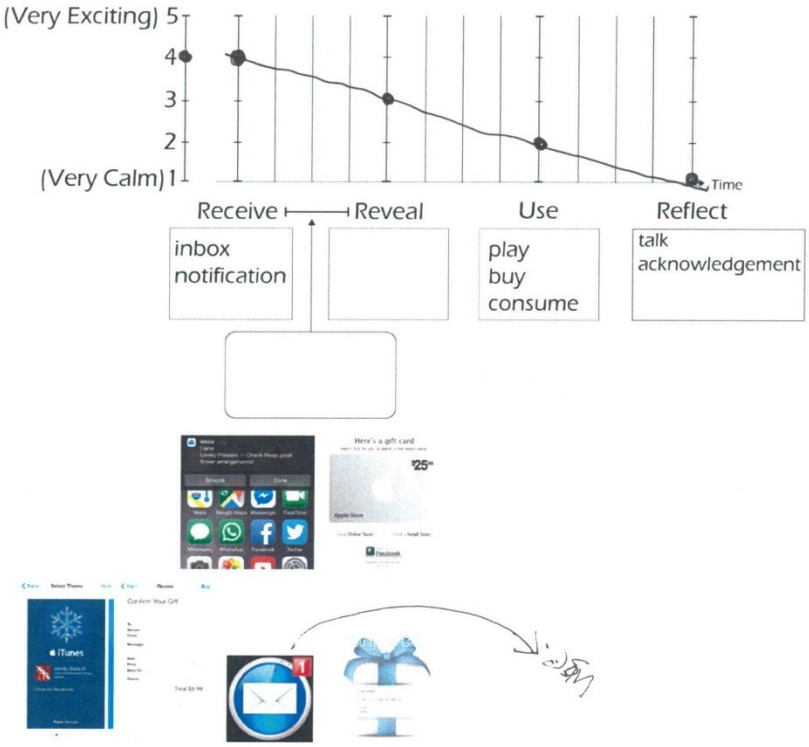
I have to say I prefer physical things but digitals are definitely ok.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



I'm somebody who's really careful when unwrapping.

9. Then, also draw another for a digital gift you have received before.



The excitement of receiving experience, doesn't go to the maximum as like physical ones.

With the physical gift, there are other things implied in the features of the gift such as wrapping. Because it's a token of somebody else's effort as well when they wrapped the gift. It not just the gift they giving, but it's… they put in something else on top of the gift. They put some effort into presenting it, spend some time… (…) There is the sense that you going through different stages of giving, a person has chosen, bought, wrapped,… there's lots of things embodied in that.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

No, I don't feel the same obligation but I do reply to say thank you.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo	☐ Music/ Movie
☐ Gift Voucher	☐ Greetings Card
☐ Software (MS Windows, Office)	☐ Mobile App
☑ Message (Text or Voice)	☑ Else (Please specify below)
	*Digital book (.PDF)*____

For some photographs, I worked on great deal of care in pre-processing, it's not just a snapshot. When I send them by email, I think of them as a gift. For me it's not very often (not a mundane thing), so it's special for me. Unlike people these days sending photos 50 times or 500 times a day, I do it once in every 6 months.

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☑ Copied

☑ Easy to transfer

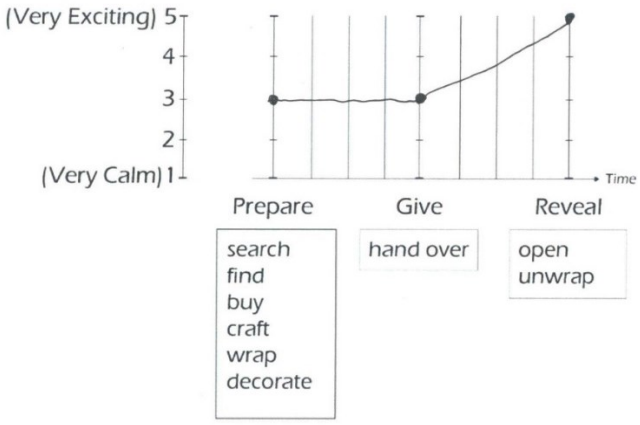
☑ Shared

Written articles, written articles with illustration, some music files – not popular ones,

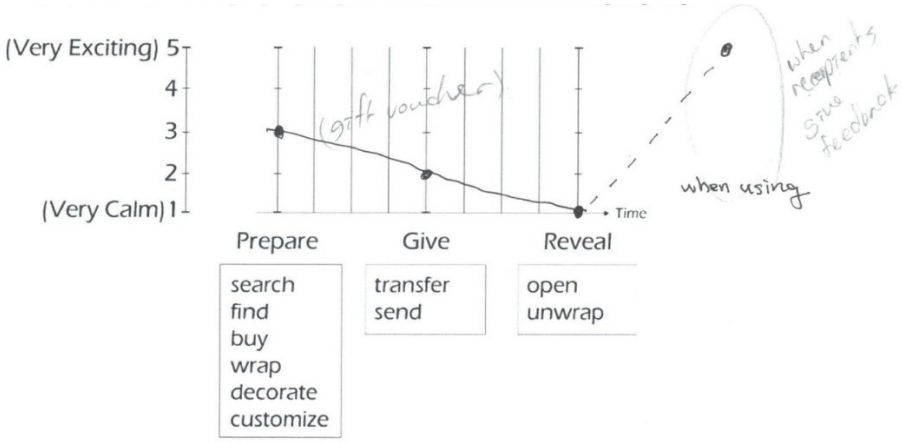
Photos on their own.

Sending the links.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Have you ever requested for a gift that is;

Physical – yes,

Digital (Can't really think of any…)

Have you ever been asked to offer something?

Physical? Yes

Digital? Writing static webpages for website. Web authoring,

Do you feel you should be reciprocated?

No actually, for those people asked me for a help and I was just happy to offer, I wasn't looking for reciprocation.

Interview record of P7

Gender: Female

Age: 34

Job: Research Fellow

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *A ring*

Who gave it? *From husband*

What was the occasion? *He got this gift when we moved to Nottingham to start my new job. He got this around Christmas time as congratulations. He bought it with his last pay packet from his job. We moved from Wales to Nottingham and he given up his job and started as full-time parent so that I can pursuit my career. So this is symbolic for that change.*

How did you liked it?

2. Which feature of the gift do you value particularly?

☑ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☐ Other

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☑ Use

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo
☑ Gift Voucher
☐ Software (MS Windows, Office)
☐ Message (Text or Voice)
☐ Music/ Movie
☐ Greetings Card
☐ Mobile App
☐ Else (Please specify below)

It was an iTunes voucher from my brother for my birthday. I spent it on apple apps.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people ☐ Display

☐ Carry ☐ Use

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Shared music. Mp3 files.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

Photos feels like sharing.

Unless there's special occasions like birthday music also feels a bit like sharing.

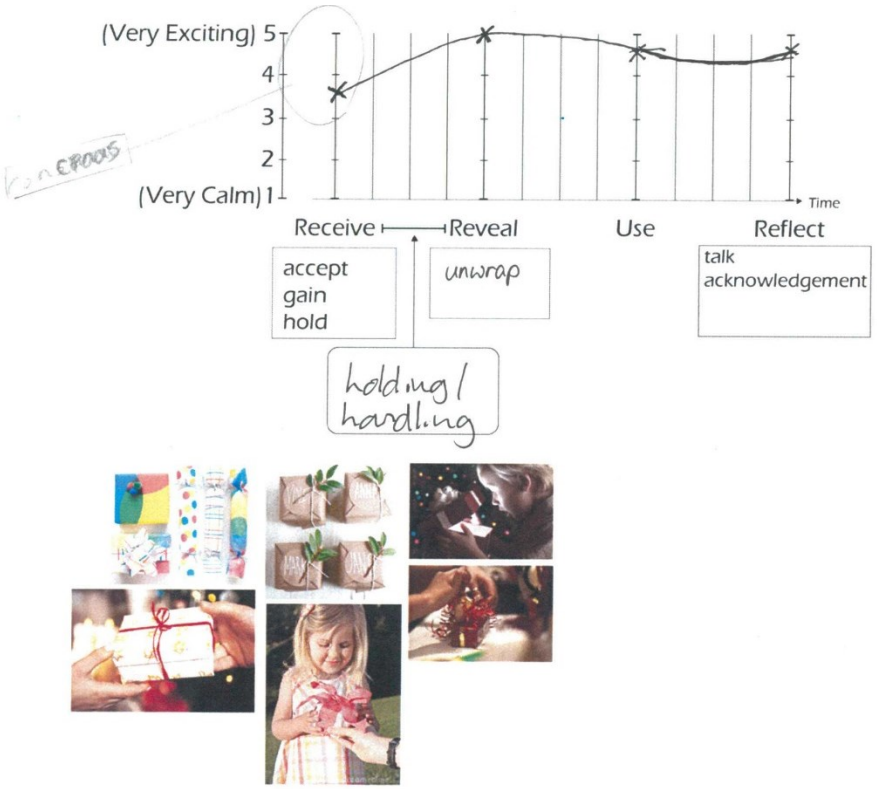
7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

We (me and husband) don't really exchange digital gifts with each other, other than articles … content that is interesting but nothing that feels like a gift. But we do still exchange physical gifts for birthdays, Christmas, etc.

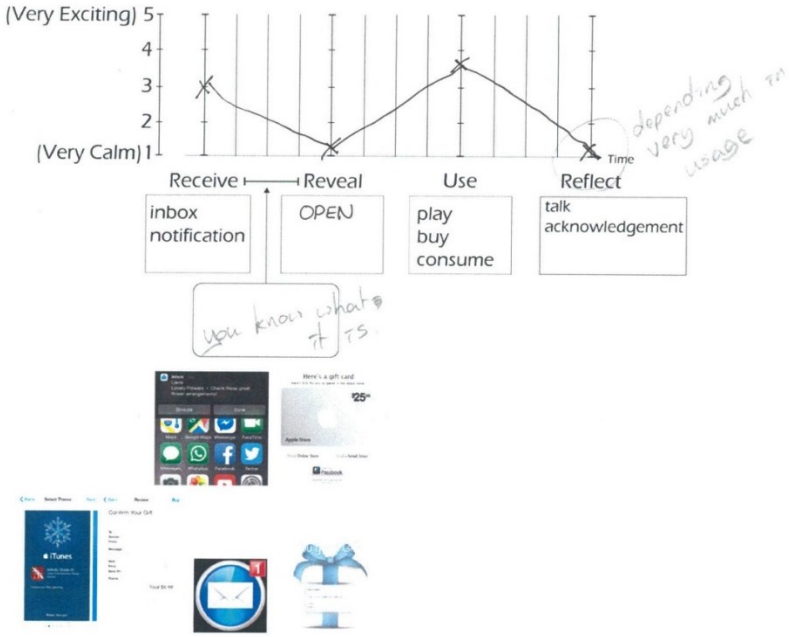
I still do think like sharing when you send digital information around. I think because the content is free – links. Association with gift giving about kind of ***purposefully*** *going to find something. Even if I search online now, I kind of putting in the effort to think about what would the person like, where can I get it, finding it, ordering it, and often I order it to come to me so that I can wrap it and them post it. In digital case, the framing of the act seems missing.*

I guess it's the same with the digital greetings card and things like that, it's nice to receive and nice to know someone thought of you and made the effort to kind of make a gesture. I think the design and business model and everything else, it just doesn't have that sense.. of personal and valuable. …

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.


(Very Exciting) 5
4
3
2
(Very Calm) 1
Time
Receive
Reveal
Use
Reflect
accept
gain
hold
unwrap
talk
acknowledgement
holding / handling

9. Then, also draw another for a digital gift you have received before.



10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

Yes, if someone shares photos with me of the same event with me then I think I do the same. Attach on email or put in the Dropbox.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☐ Photo
☐ Gift Voucher
☐ Software (MS Windows, Office)
☐ Message (Text or Voice)
☐ Music/ Movie
☐ Greetings Card
☐ Mobile App
☐ Else (Please specify below)

____

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

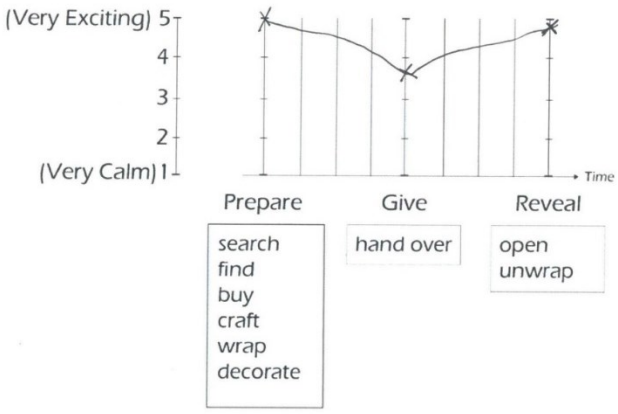
☐ Easy to transfer

☑ Shared

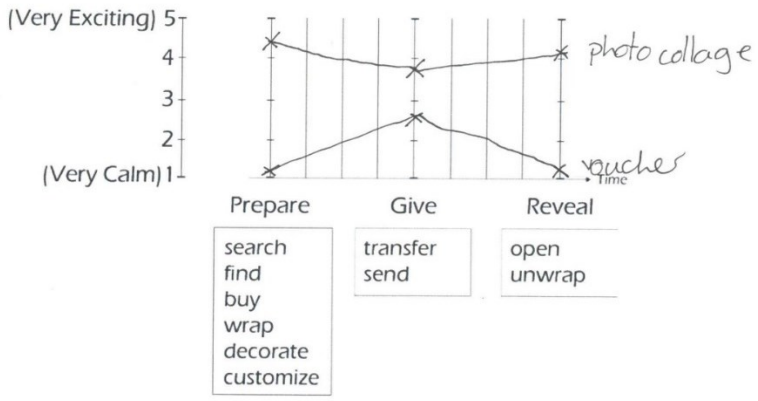
Photo collage, it's like a memento.

A gift is something that is for somebody and you don't have access to it.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Have you ever requested for a gift that is;

Physical –

Digital – *music, photo*

Have you ever been asked to offer something?

Physical?

Digital?

Do you feel you should be reciprocated?

Yes. I wouldn't do it (just give) for anyone.

1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

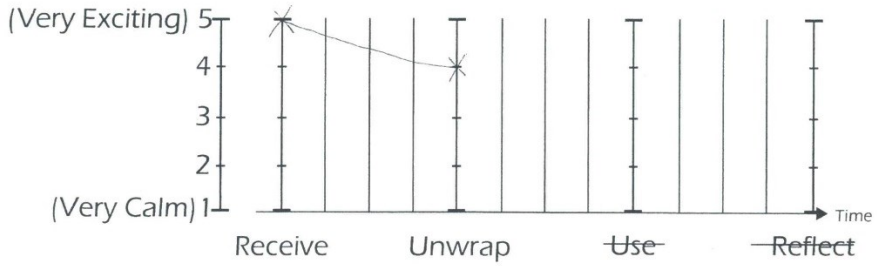
(1) Physical > Digital

(2) Physical < Digital

(3) Physical = Digital

In terms of the experience the digital voucher was more of a gift because I have applied it to my Amazon account and used it to buy things (a kindle ebook for myself and a DVD film documentary as a present for my father). PTO

2. When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.



I was most excited to see what you had designed for me to interact with, especially as we were individually taking turns to receive our gift with other participants' attention focused on us (like at a party thrown for you). This feeling was particularly intense because 歪 you chose me to go first.

Interview record of P8

Gender: Female

Age: 30

Job: PhD student (CS)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Bracelet*

Who gave it? *Sister*

What was the occasion? *She gave me for that I finished master's degree successfully.*

How did you liked it?

2. Which feature of the gift do you value particularly?

☑ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☐ Other

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☑ Carry

☐ Display

☑ Use

I always wear, everyday.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo
☐ Gift Voucher
☐ Software (MS Windows, Office)
☑ Message (Text or Voice) – *congratulations*
☑ Music/ Movie
☐ Greetings Card
☐ Mobile App
☑ Else (Please specify below)

English grammar book – digital version

Poems

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people ☐ Display

☐ Carry ☑ Use

It is very useful, I still use it.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Software.

My friend shared a MS office key. When I formatted my PC and needed it, I remembered that and it was so useful.

6-1. Which feature of the content made you to cherish it overtime?

☑ Useful

☐ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

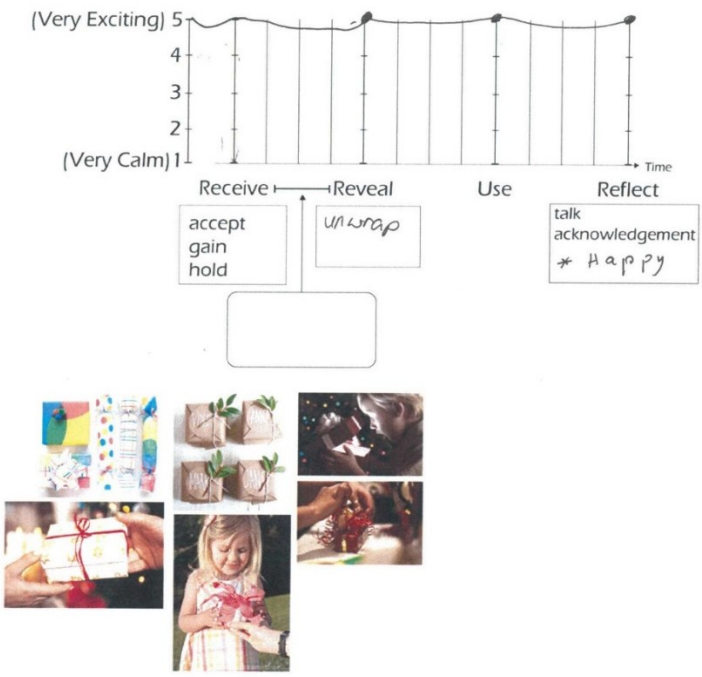
No

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

It is very convenient when I can't approach to the recipient with physical ones.

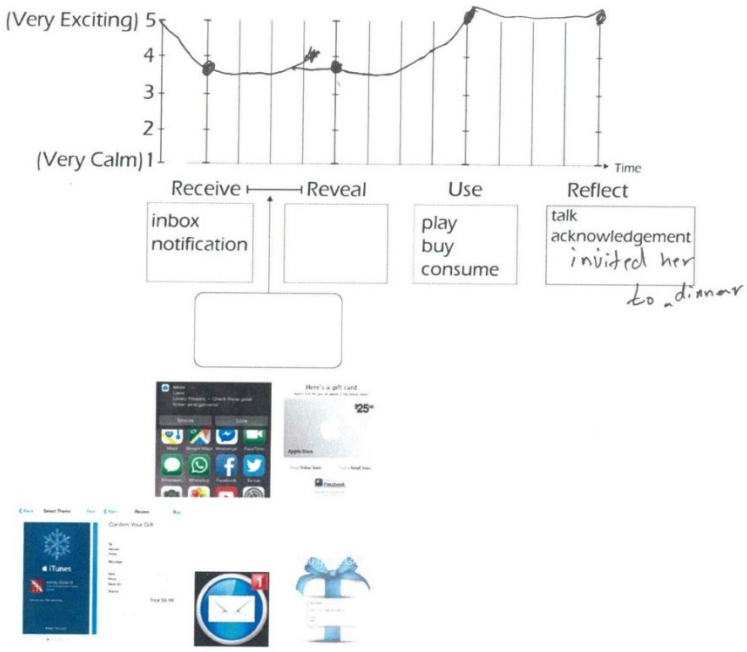
Some people does not value digital gifts as much as physical ones even if the monetary value is greater in digital case.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



9. Then, also draw another for a digital gift you have received before.

#



10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

Yes, when I received digital version of the English grammar book, I invited my friend to dinner.

It depends on what was the approach to me, but I don't think I need to reciprocate digitally to digital gifts.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo
☐ Gift Voucher
☑ Software (MS Windows, Office)
☑ Message (Text or Voice)
☑ Music/ Movie
☑ Greetings Card
☐ Mobile App
☐ Else (Please specify below)
____*digital book for children*

Photo of me, Nottingham, when I go to trip.

3. What kind of special treatment did you do?

☑ Customize

☐ Decorate

Labelling photos and make it into slide show with PPT.

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

☐ Easy to transfer

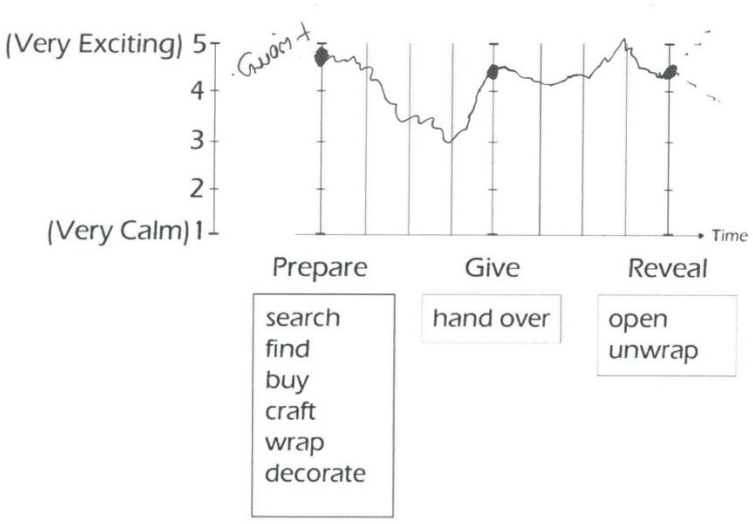
☑ Shared

Key licences

Greetings text for national holiday (it's not personal), or cultural (general) greetings message shared in friends/ family groups.

Texts, songs, Youtube links on SNS.

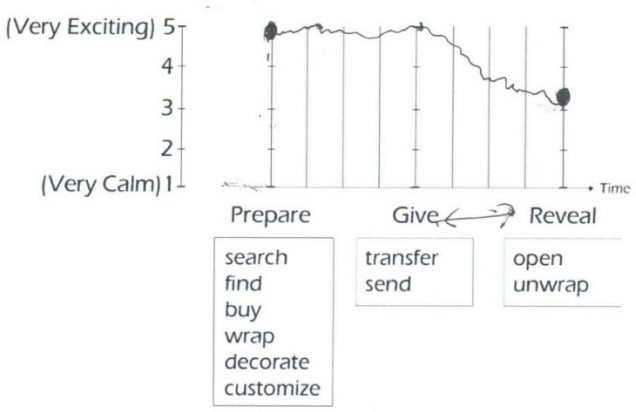
5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



When I prepare a gift, sometime I worry a little bit whether the person would like it or not.

I use very much decoration with physical one. I keep worry if she likes it or not. – it's quite clear when revealed.

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



When I purchasing a digital gift, searching and buying experience depends on the interface of the system was comfortable or not.

For digital things that I don't need to buy, there's no worry. Because I have specific idea what to give.

Sometimes, I don't get the feedback every time. Whether they received, they liked. I think they should reply if they found it nice, because then it's a gift.

Have you ever requested for a gift that is;

Physical –

Digital – *no*

Have you ever been asked to offer something?

Physical?

Digital? *Anti-virus program but not as a gift. (they asked for help but I gave them as gift)*

Do you feel you should be reciprocated?

Interview record of P9

Gender: Female

Age: 43

Job: Freelance Designer

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Tool set for Apple products*

Who gave it? *Father and mother in law*

What was the occasion? *Birthday. It was in my Amazon wish list.*

How did you liked it? *It wasn't something that I had expected.*

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☑ Utility

☑ Story/ Meaning

☐ Other

It was meaningful the fact that they actually went through the process. They are not actually very used to buying online. But they went through all the troubles actually.

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☑ Use

And take care of it particularly.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo
☐ Gift Voucher
☐ Software (MS Windows, Office)
☐ Music/ Movie
☐ Greetings Card
☐ Mobile App

☐ Message (Text or Voice) – ☑ Else (Please specify below)

Games vouchers (game currency) – gem, steam money

It's meaningful to me because I like games, I play often.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people ☐ Display

☐ Carry ☑ Use

Within this game it's actually about gift giving. In the guild we try to help each other out. I always giving people materials for crafting or like items that I have in my inventory. I mail them to them if they say they need them. I'm quite used to doing that. Because I've grown up taught to be generous to other people. And… I was doing this with this one person, and they kind of said to me "Don't do this, I don't like it."

- *Why?*

I don't know, I think I got a straight answer. They say, "When I want something I will tell you." And I think it made them obligated in some way.

- *How about when you receiving things?*

It's kind of the same way, I kind of realized when other people trying to giving me things I kind of feel obligated to give them back. I was just strange thing. Because I'm so used to giving things and I never stopped to think about how the other people would feel when receiving it.

I'm sure it happens outside of the game as well.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Mail – if it's old enough it become sentimental. They are the memories.

I keep mails. I wouldn't say that was a gift but it becomes something worth saving

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☑ Reminding a specific event

☑ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

It depends who it is from really.

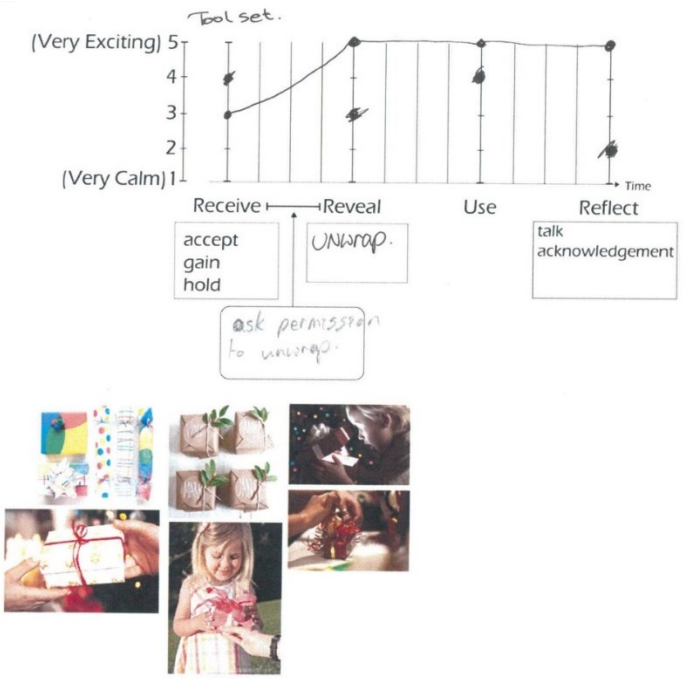
My husband bought me an app from my phone. It is a gift, but I wouldn't consider it as such. If it was for special occasion then I would. And he is so close to me. It rather feels mundane thing.

If it is from someone I don't know very well, then would consider it gift and feel kind of obligated to return the favour.

It actually depends from who.

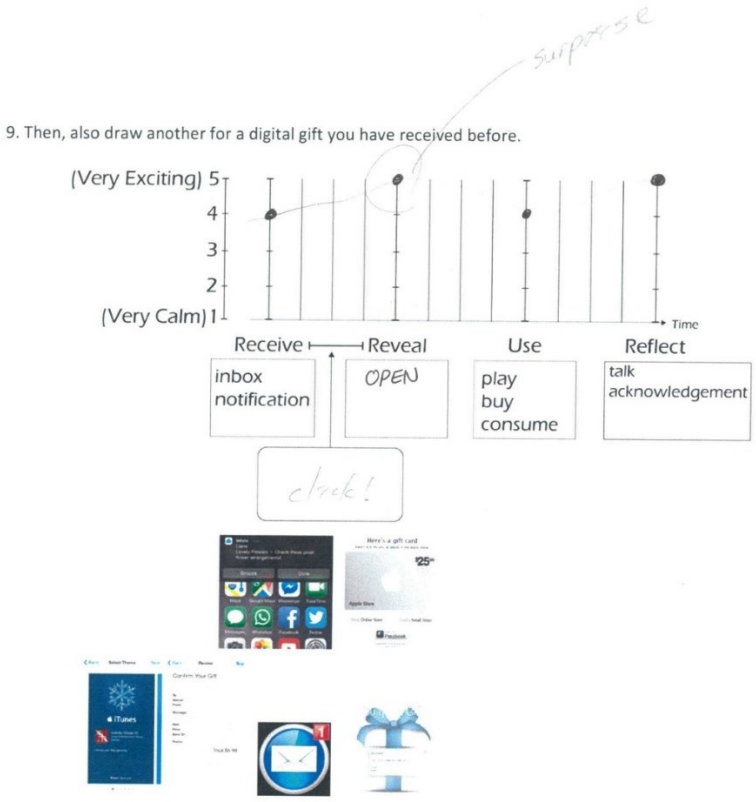
7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



9. Then, also draw another for a digital gift you have received before.

9. Then, also draw another for a digital gift you have received before.



10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

Yes, I feel obligated to give something back. (but can't think of any at the moment)

It doesn't have to be something equivalent but something they want.

But not for the birthday gift (game money) that I had from someone I don't know – people in my facebook group. They know that it was my birthday from Facebook. I didn't know the person very well so I didn't felt obligated to give back. It was little bit anonymous.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☐ Photo

☐ Gift Voucher

☐ Software (MS Windows, Office)

☐ Message (Text or Voice)

☐ Music/ Movie

☐ Greetings Card

☐ Mobile App

☑ Else (Please specify below)

____*Games, and game currency*

Drawing (photoshop)

I have sent photos to my families that I upload digital version and they get the physical copy of it. That's something strange, so you don't have any contact with the physical object before its sent to the person you are sending it to and that's kind of something very strange to me. I often wondered if that is actually as personal as something I go out and buy and post it to them.

People send things to each other for fun (beer in the game). I do it to be generous.

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

☐ Easy to transfer

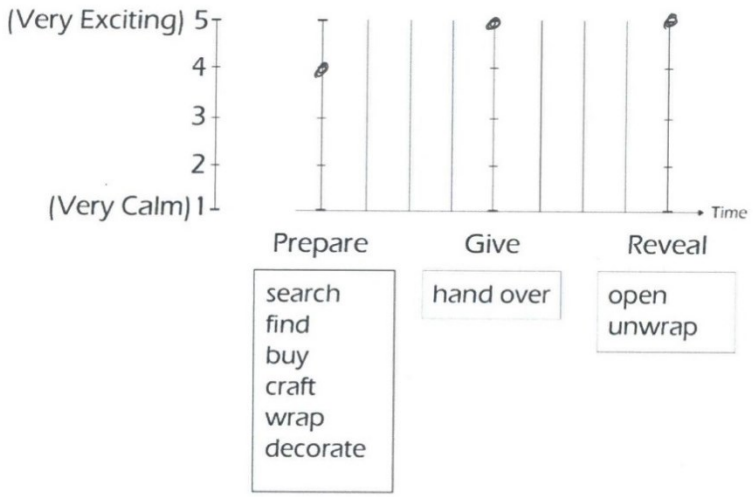
☑ Shared – *photos, facebook messages,*

It depends who they are (that I'm giving to).

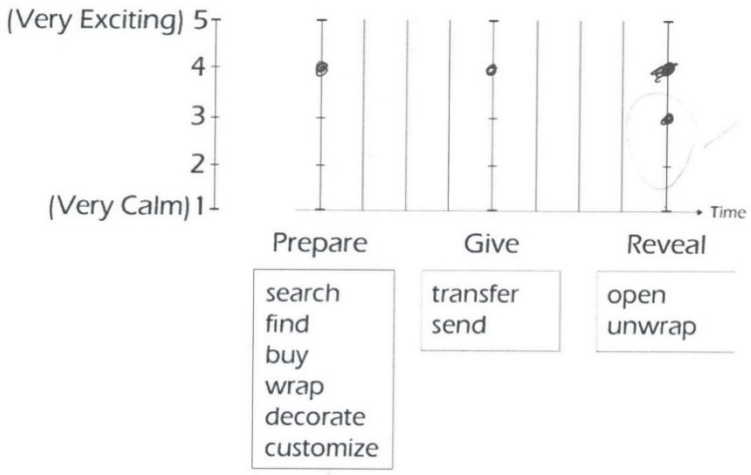
If they are not your immediate family then it becomes a gift. Because it's not shared resources if it's within the family.

There is a norm of sharing resources in the game within the guild. There's a guild bank, which people put things in there, there is trust involved with that. There's no obligation to return.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Have you ever requested for a gift that is;

Physical – *Amazon wish list*

Digital –

Have you ever been asked to offer something?

Physical?

Digital? *game gifts*

Illustrations, drawings

They use it for background, they just told me how they using it. (Thank you, feedback on how good or bad it is)

I don't let people to know that I do drawings.

Do you feel you should be reciprocated?

Maybe.. if I go back and do it again.

It's a lot of time.

In this game, people pay a lot of money to buy ultimate edition of the game, and in the past there was physical toys, t-shirts. But now they somehow stopped it. People become really upset that they don't get these rewards of ultimate edition. They now get digital reward, mini pack or game currency. They quite concerned about it even the physical box.

For gift giving, in the game you get a bag and you double clicking on it so that you open it to see what's inside. It has some suspense it in.

Interview record of P10

Gender: Female

Age: 48

Job: PhD student / Theatre designer

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Ring*

Who gave it? *Husband*

What was the occasion? *He made it for our engagement.*

How did you liked it? *It's special that he made it. He spent time making it just for me. It's over ten years.*

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☐ Other

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☑ Use

I often wear it when we go out together.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo
☐ Gift Voucher
☐ Software (MS Windows, Office)
☐ Message (Text or Voice)
☐ Music/ Movie
☑ Greetings Card
☐ Mobile App
☑ Else (Please specify below)

Magazine subscription (Christmas present)

I prefer physical greetings card better. I received some greetings card in the past and I look at it then it just goes away (from my mind). But with real one, what I often do is, we put the card on the shelves for couple of weeks. I can't get that with digital greetings card. It's still good to receive but it doesn't have long term effect. Even if the messages are personal. I download them on my hard but I don't necessarily revisit.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people ☐ Display

☐ Carry ☐ Use

No, I don't think so.

For the digital magazines, what happens is, I do have to remember that I get the magazine through app. It's hidden in the ipad with a lot of other things. Whereas the physical ones (magazines) have it's own identity. I revisit the physical ones often.

Whether it's digital or physical it reminds me of the gift giver.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

I have a group chatting room in Whatsapp. It's me and my three other sisters. There's only four of us always and we don't invite other family members. We share messages and photos in there, deliver greetings to each other's family. All of us live in different cities and the images sent through Whatsapp become quite personal because we can share the moment at that specific time. It's very mundane thing. When the images are sent, and we all see them ***instantly at the same time****, those feels very precious to me.*

Chat room itself is the thing I value. We had it over a year. Before that we used Facebook, email but that didn't really worked very well.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

No

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

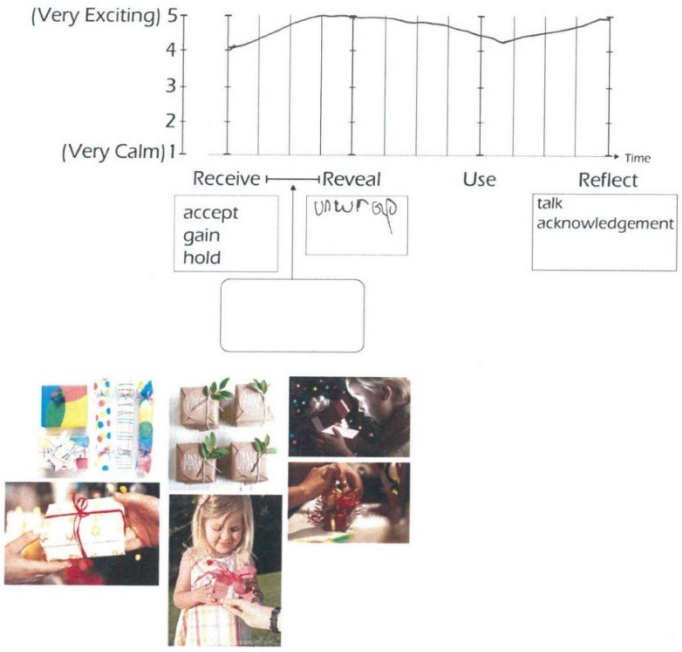
There's something about the physical gifts I value more. I prefer physical gifts. Because it feels more tangible. And I can feel it, interact with it. I tend to give physical gifts to people more.

I had given my niece a photo collage for her birthday. I collected some of her past photos and composed them into one collage. Then sent it digitally because she is quite young (21) so I thought she would be quite used to it(s format).

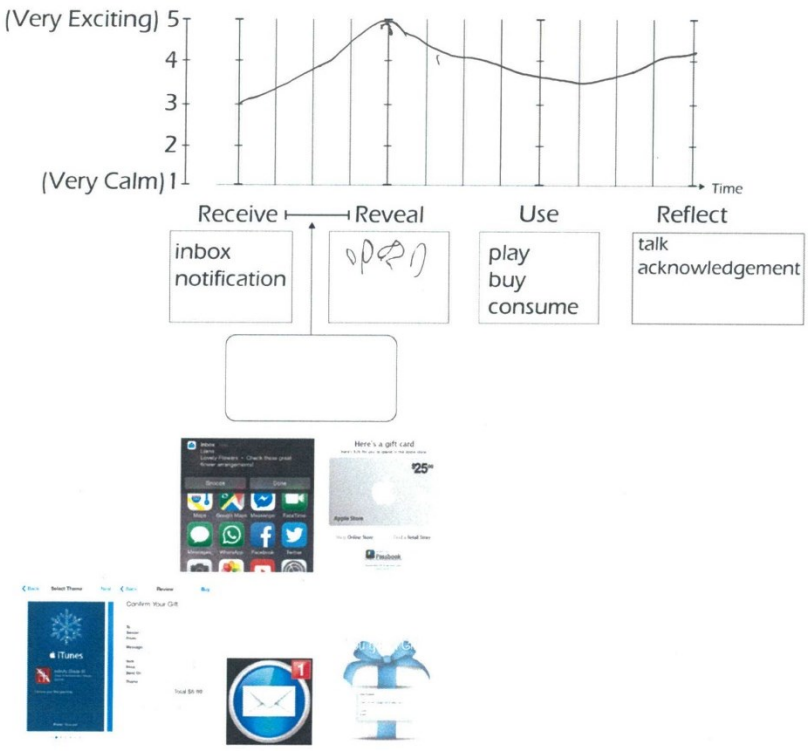
If it was for my sister, I would have printed out and send by post.

My other nieces send video clips that they created through Youtube to my daughter. They are quite young 14 and 11 years old.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



9. Then, also draw another for a digital gift you have received before.



It's point of the person who's giving the gift.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

No I don't necessarily.

But I think I treat in same way as physical ones.

[Questions for giver]

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

- ☑ Photo - *collage*
- ☑ Gift Voucher
- ☐ Software (MS Windows, Office)
- ☐ Message (Text or Voice)
- ☐ Music/ Movie
- ☐ Greetings Card
- ☐ Mobile App
- ☐ Else (Please specify below)

____

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

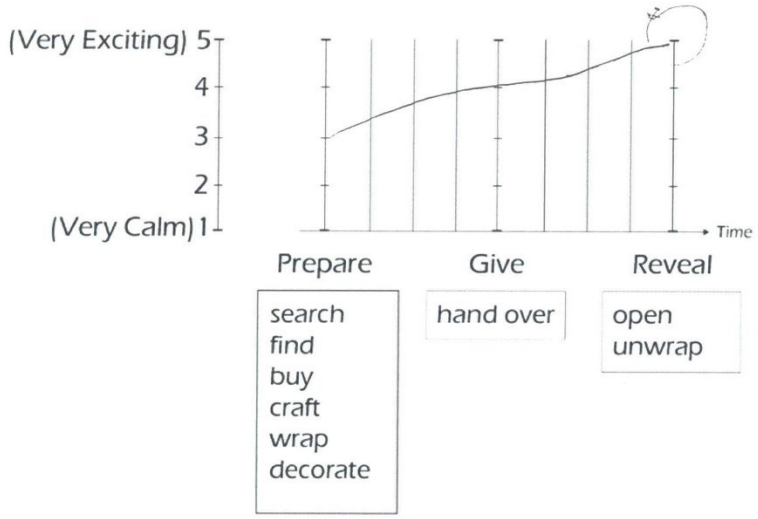
☐ Easy to transfer

☑ Shared – *photos,*

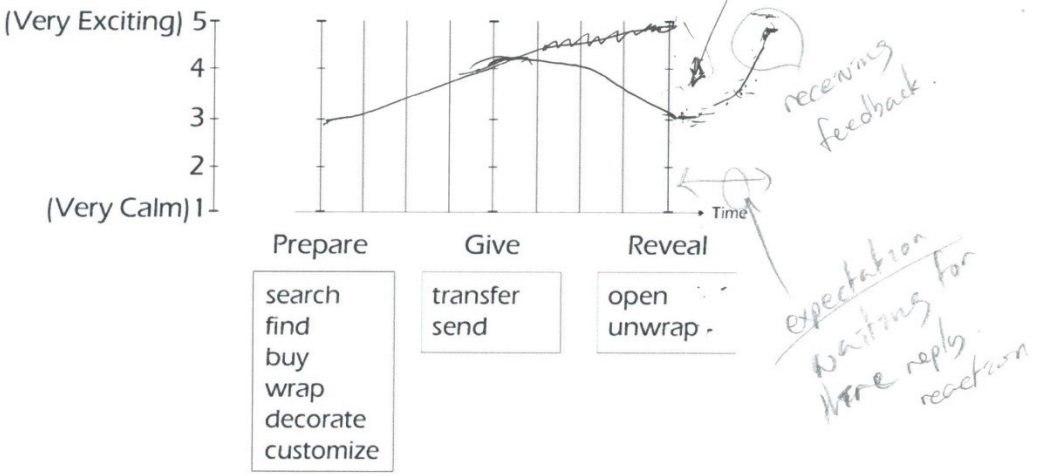
Digitized all the photos to share with other family members.

If I have offered something to someone, I would consider it as help. I suppose I see it as a service. – Like I designed a poster for my sister that I did a service for her.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



For revealing, it's quite low because I'm not there. Then when I get feedback from them I feel quite happy. So in between, I'm expecting their feedback, waiting for their reply and reaction. I think they are more personal and more selective (so that I'm waiting for the feedback how they take it).

Have you ever requested for a gift that is;

Physical –

Digital –

Have you ever been asked to offer something?

Physical?

Digital? *Design something, using Photoshop*

Do you feel you should be reciprocated?

No, because they asked me for help.

However, when someone helps me I give them something back.

Workshop Debriefing

1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

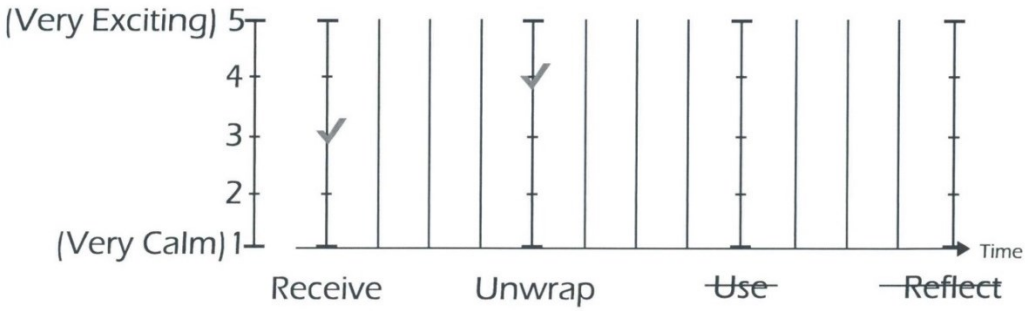
(1) Physical > Digital

(2) Physical < Digital

(3) Physical = Digital

I choose number one because it was more attractive and visually exciting than digita

2.When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.



P11

Gender: Female

Age: 27

Job: Research Fellow (CS)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Key ring with cow doll*

Who gave it? *Mother*

What was the occasion?

I couldn't go have home in '13-'14. A year before, I spent Christmas at home and when I had to leave, my mum bought this from a shop in the train station.

How did you liked it? *I collect cows*

2. Which feature of the gift do you value particularly?

☑ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☐ Other

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☑ Carry

☐ Display

☑ Use

It keep reminds me my mum and moment, situation then.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☑ Photo – *scanned old physical photos; not to lose them. They are selection of photos among others. – personal*

☑ Music/ Movie

☑ Gift Voucher

☑ Greetings Card *(in the past)*

☐ Software (MS Windows, Office)

☐ Mobile App

☑ Message (Text or Voice) – *thread of email*

☑ Else (Please specify below)

Games, Ebooks

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☐ Carry

☐ Use

I keep multiple copies of the same thing (photos, music, movie, etc.) in my laptop, in CDs, and in external hard drive. For two reasons, first, the CDs are difficult to find and second, my mum went through all the troubles to find it. Same with the photos, since I don't want to lose them.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Normal catch up text messages from the people I don't meet often or live abroad.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☐ Relationship with the giver

The situation that I was in made me feel that way.

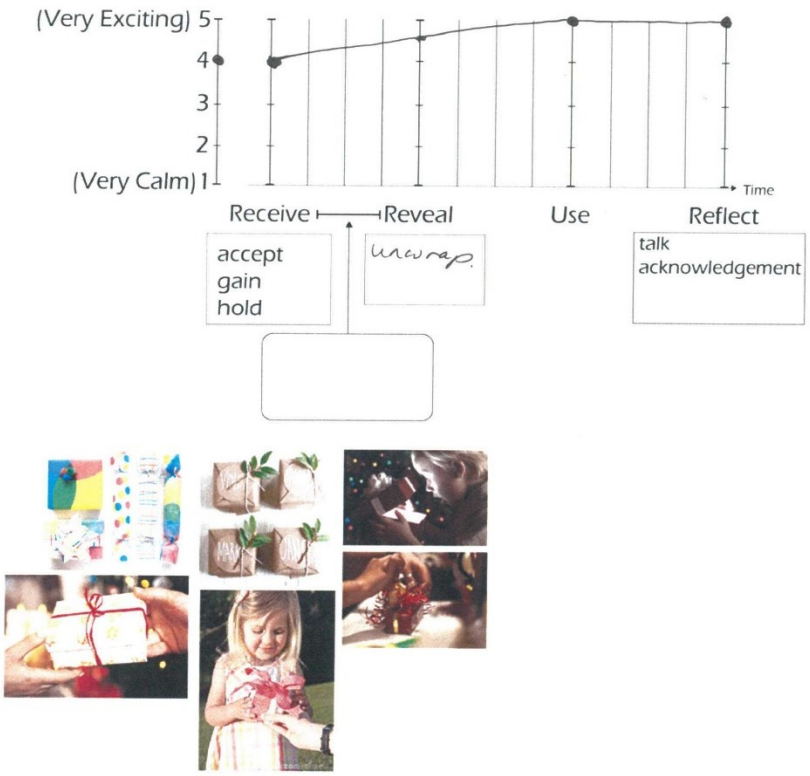
7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

Gift vouchers are like that. It feels impersonal. I agree it's a good value but would have been nice if it was something else for goodbye gift. I would have preferred physical things for that situation. Like books? I doesn't matter whether I like the book or not, it would have felt more appropriate.

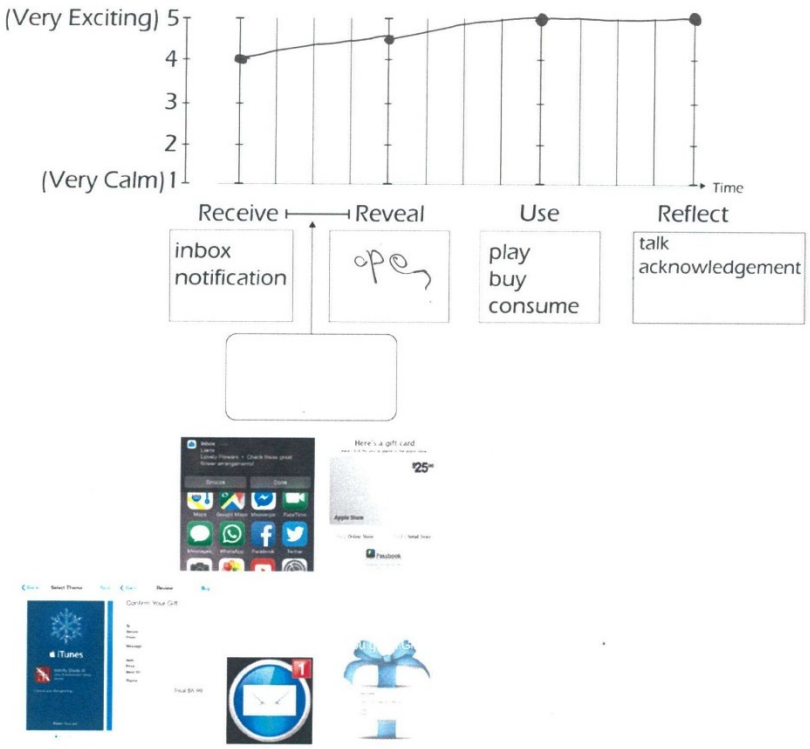
7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

Rather than the nature of the gift, it is the relationship that's more important.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



9. Then, also draw another for a digital gift you have received before.



10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

I feel some pressure but less than the physical ones.

You might value and use it every day than the physical ones but not the same obligation.

Digital things have connotation that it's much easier that the giver didn't go through the same trouble (like seeking for physical ones, go to shops and buy…).

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo *Photos from trip, my parents use it as a background.*

☐ Gift Voucher

☐ Software (MS Windows, Office)

☐ Message (Text or Voice)

☑ Music/ Movie *(Mp3 files)*

☑ Greetings Card

☑ Mobile App *(game)*

☑ Else (Please specify below)

____ *ebooks*

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

In most cases, I'm talking with them. Basically, checking that they received.

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

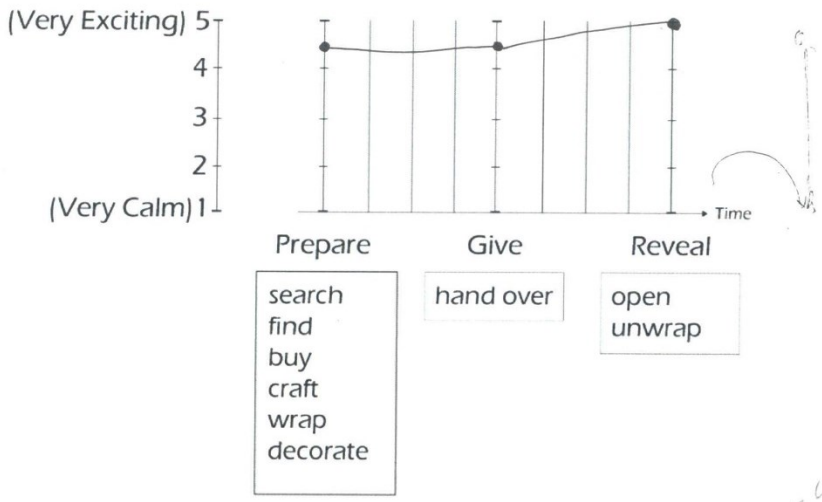
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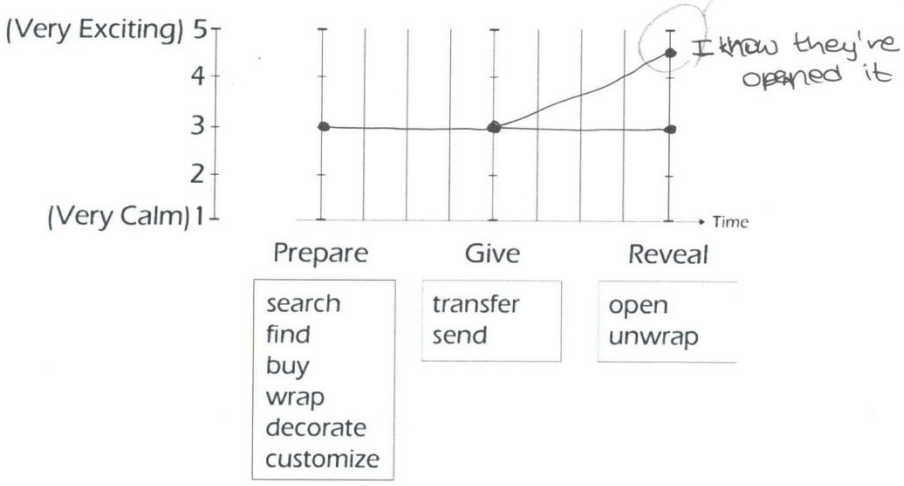
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Software

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



When I see them using it, I get really exciting. Confirming that they like it.

It's not exciting as much as when they reveal physical ones, because I didn't go through all the troubles of preparing it like physical ones.

Have you ever requested for a gift that is;

Physical –

Digital –

Have you ever been asked to offer something?

Physical? *Birthday gifts*

Digital? *Photos*

Do you feel you should be reciprocated?

For the services that people ask me to offer, people don't think it as something like a gift.

Workshop Debriefing

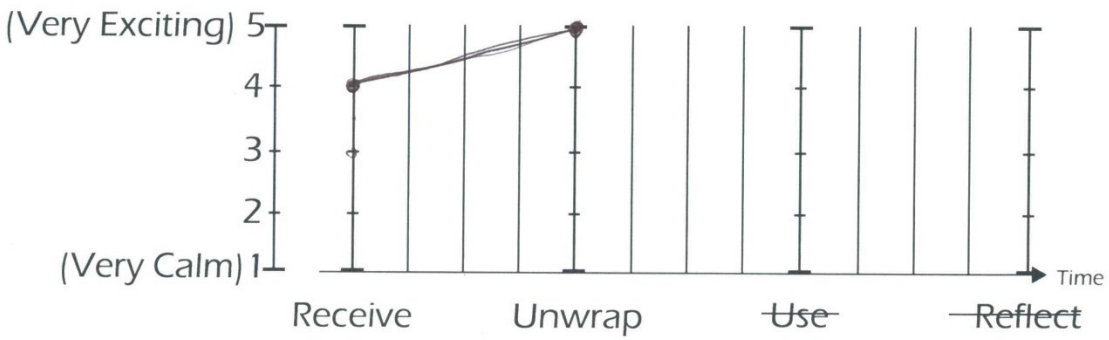
1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

(1) Physical > Digital

(2) Physical < Digital

(3) Physical = Digital

2.When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.



P12

Gender: M

Age: 32

Job: PhD Student (Media technology and design)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Holiday and a scarf.*

Who gave it? *Wife*

What was the occasion?

One scarf she weaved by herself.

The whole trip to Scotland was a gift for my 30 years birthday, organised for me. When we were there she bought me a scarf, which for her was a symbol of the reminder of the holiday.

How did you liked it?

2. Which feature of the gift do you value particularly?

☑ Aesthetical pleasure (Design, Material)

☑ Utility

☑ Story/ Meaning

☐ Other

It's hard to say which feature I value most but, I like the story about the scarf and also to meaning of it. But if I don't find it useful and beautiful, I wouldn't have worn it.

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☑ Carry

☐ Display

☑ Use

I always wear it all over the winter. I lost the scarf eventually and I tried my best to find it.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo

☐ Gift Voucher

☐ Software (MS Windows, Office)

☑ Message (Text or Voice) – *MMS (photo attached to the message)*

☐ Music/ Movie

☐ Greetings Card *(I feel these impersonal)*

☐ Mobile App

☑ Else (Please specify below)

Tumblr as an on-going gift exchange space

We use Tumblr as our private journal; we upload photo, music, video clips, messages, etc. Only for us.

On 31st birthday, she had this idea of creating a round-the-world trip, … she either cooked at home, foods of different countries or brought me to restaurants from different countries as a whole gift experience. And part of the gift was to documenting it – with photos. ***So the digital part of the documentation (via Tumblr).***

Since then, we've been kind of updating the Tumblr. Sometimes there are surprises there.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☐ Carry

☐ Use

I sometimes go back and look again. It's something private.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

Facebook birthday messages. Sometimes they are noise. That's why I don't put my birthday on facebook any more.

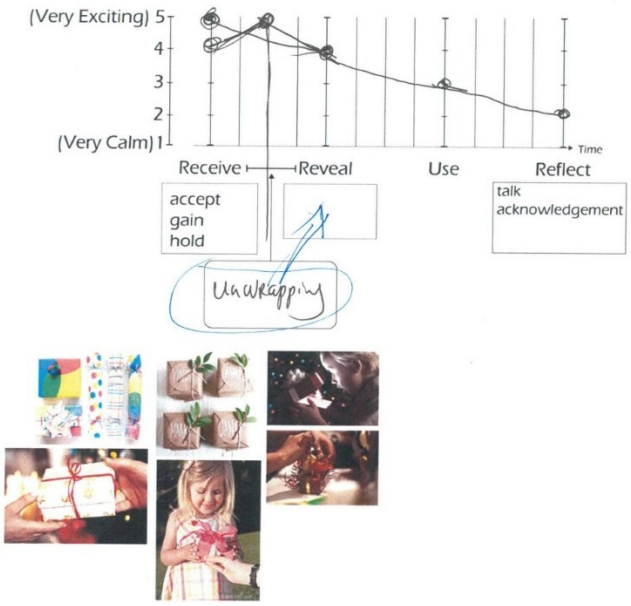
I think it disappeared now, but at one moment that the Facebook tried this digital gift things. It's hard to say because they are gift.

I remember as a child, I was not very grateful when I received a gift. And my parents had told me "hey, you have to be grateful, give them the pleasure to believe that you are pleased with the gift." And my little nephew is exactly like me. (Laugh)

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

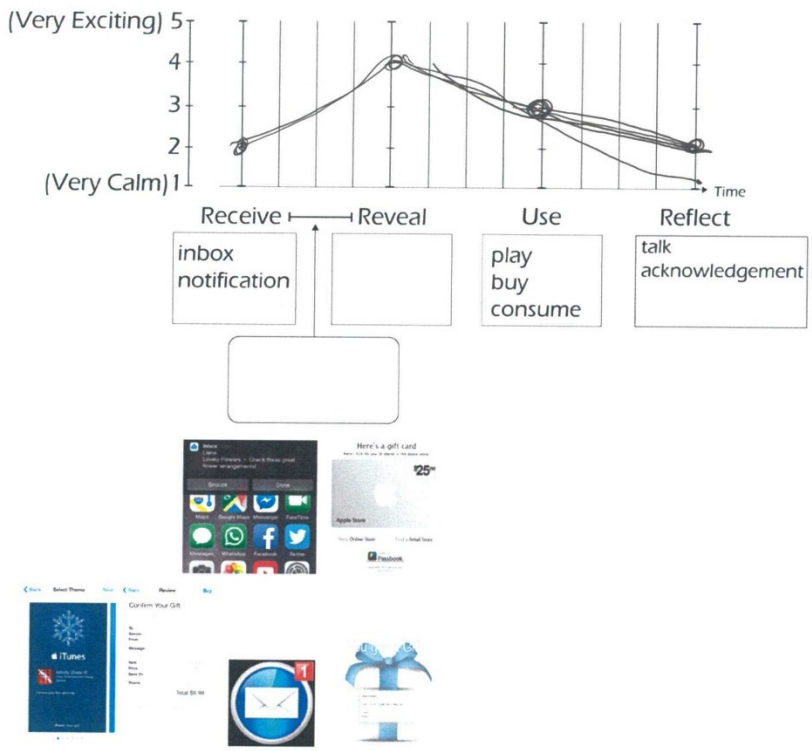
One thing about the gift is …, I tend to not value the gift itself (how much it is), I tend to value the fact that people have got out of their way, tried to make it personal. --- But digital gifts are difficult to give that sense.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



I'm always very excited when receiving something.

9. Then, also draw another for a digital gift you have received before.



10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

I think the obligation (digital) is bit lighter.

The thing with the physical gift, it's always there and reminds you that you need to reciprocate. With digital, it's bit fuzzier and you don't tend to remember every digital gifts you received and you forget. There's still obligation but it's lighter.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

I think it's in the offering moment that makes things as gifts. There's a bit of grey zone.

Digital aspect of it makes even harder what's gift and not, because sometimes you don't even have wrapping. There's significant difference when I say, "I have this movie file on my computer, I want to watch it with you." – it doesn't feel like the gift. But if I put the file in the USB and give to her then say, "I want to watch this movie with you.", it would

have been a gift – but in both cases the end result will be almost the same. This is why it's difficult to say what's digital gift and what's just digital thing that you want to share with somebody.

2. Which of the followings in the list did you give as a gift?

☑ Photo
☐ Music/ Movie
☐ Gift Voucher
☑ Greetings Card
☐ Software (MS Windows, Office)
☐ Mobile App
☑ Message (Text or Voice)
☐ Else (Please specify below)

Have sent commercialized greetings card personally. - feels gift.

Context makes difference.

How the recipient uses makes me think that was a gift or not. If I send a photo via email, I would not know whether she will keep it in a hard driver, or maybe she would have used it as a background screen. It's harder to know how they will use it.

Also an occasion. If I send a photo for their birthday, it feels like a gift but if not it feels less like a gift.

So my mum, she likes to see the photo when I travel.. I send

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

I designed a greeting card with Photoshop. – sent to about 20 people. (The way I created feels like gift)

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

☐ Easy to transfer

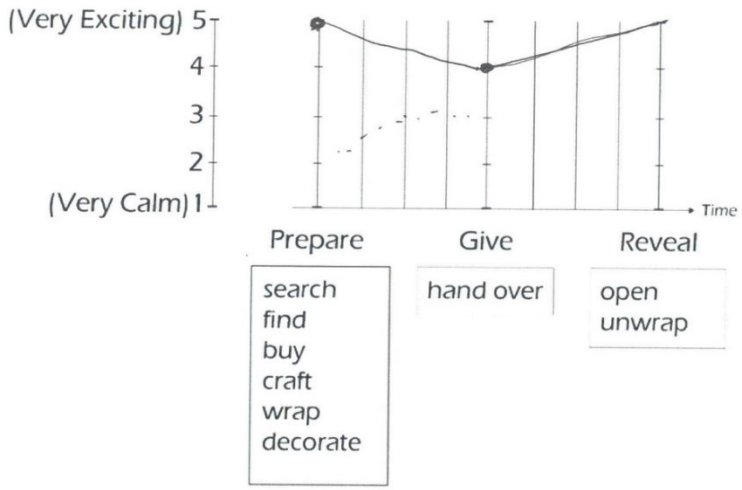
☑ Shared

Photos, TV series, music – I give them to my colleagues, exchange.

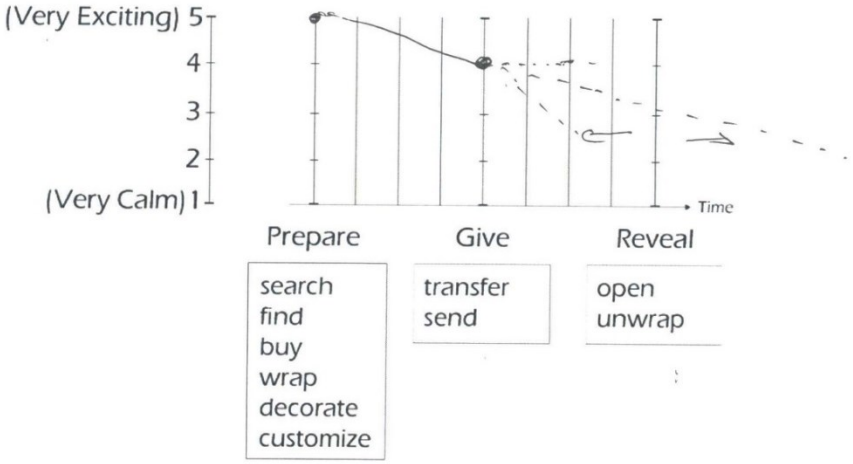
It's a fact that you don't really expect them to use it. It's like "Ok, Here's whole series of Game of Throwns", …, maybe they (the files) will just sits there and never be watched. I think there's the reason. You don't have the same expectations.

Also, one other reason is, there's commodity value. Those files are … it would have been copied from elsewhere anyway. (It's prevalent)

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Have you ever requested for a gift that is;

Physical –

Digital –

Have you ever been asked to offer something?

Physical?

Digital?

Culturally, the act of requesting makes it feels less like a gift.

Do you feel you should be reciprocated?

It depends in the context.

Who it is, what the work is.

If it's a easy work, lighter reciprocation. But if it's more than that, I wouldn't just do it for free.

In creative professions, there are lots of people who thinks that because you are working with passion you can work for free. It's complicated that they don't realize that you are doing the job.

Workshop Debriefing

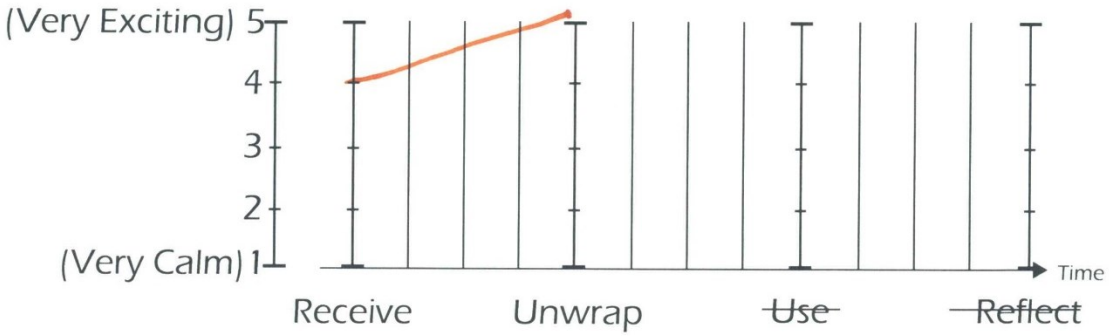
1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

(1) Physical > Digital

(2) Physical < Digital

(3) Physical = Digital

2.When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.



P13

Gender: M

Age: 35

Job: PhD (Art&Design)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Watch, vintage style rolex*

Who gave it? *Father*

What was the occasion?

I had been wanting to get this watch since I was 21. I just got it last year. The way I got it was, this was actually my father's, which was gifted to him when he got married by my grandfather.

Normally, I don't like to wear Rolex, I don't even like to wear metallic stripped watch. But I really like the design of it and the fact that this has some heritage type of value into it. He (my father) said he will give to me when I get married. So I got this last year, when I got married.

And same time, there was a watch given to my mum also inherited to my wife. So we have same looking watch. (In the future) If my son or daughter wants it, as long as this works (I will inherit this to them)… this is not functioning very well at the moment. (laugh)

How did you liked it?

This is not everyday item but I do wear it from time to time. Like summer times – metallic style goes well.

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☐ Other

I value the story and meaning of it more than the design, material, and utility of it.

I did a lecture in a design school last year, about emotionally durable design, and this became really good example that I could've show to students and draw out discussions.

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☑ Display

☐ Use

I like to collect items such as, watch, glasses, perfume. I have specific location (table) where I display these things, like collection things that I value most.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo
☐ Gift Voucher
☐ Software (MS Windows, Office)
☐ Message (Text or Voice)
☐ Music/ Movie
☐ Greetings Card
☐ Mobile App
☑ Else (Please specify below)

Cyworld – Korean SNS – gift items (skins, music)

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☑ Show to other people
☐ Display
☐ Carry
☑ Use

The way to respect or to appreciate the gift is by showing the use of it. I think it's same (for physical gifts). If you receive a gift from someone else than we try to wear or carry that gift when we meet that person. So at the same time, most of the gift that I received in Cyworld was the avatar room decorations. So I was keep using it to show to other people.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

When I got married, the actually wedding day is so hassle, I don't remember things because it goes by so quickly. I've actually hired two professional photographers, what they usually do is, they ask me to certain pose, they trying to capture the certain moment of me shaking people's hands. But that's not what I wanted. I wanted some photo shoots of me being really naturally acting or …. So on the next day of the wedding, I texted everyone who attended my wedding, to appreciate them for their attendance and at the same time I asked them to forward all the photos that they have taken. So it was all blurry pictures, the proportion was wrong but I have received hundreds of photos … The way that the picture tells me, the way that I like the picture was quite different than the professional ones. It was more natural, I don't look as good as the photographers took, but it's actually capturing every moments, … Putting that into slides was like watching a movie of myself…

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☑ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

Commercial text messages.

Don't have many experience receiving digital gifts.

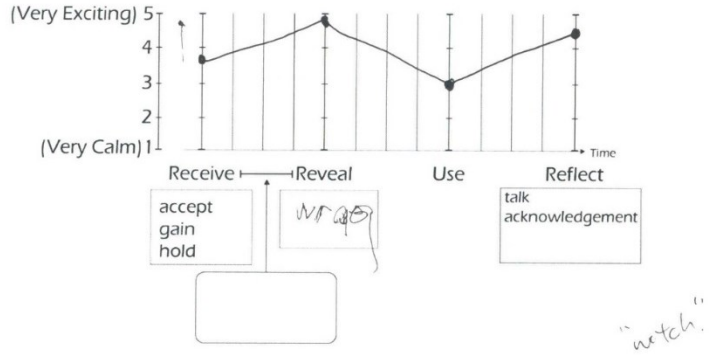
7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

I think how people perceive the digital gift to the real tangible gift is quite different. There's a culture behind the tangible gift, where we give something that other people want, and we spend quite a lot of time trying to figure out what other people wants. It's not like one way gift, it's more about figuring out what that person wants, and there's a lot of days that represents exchanging the gift. It deals with giving.. you know.. more happiness, or some satisfactions or needs to the personal love…

But for digital gift, it's almost like … you are drawing the commercial purpose behind it. That's how I perceive the digital gift. Because this is not something that I can keep physically and the digital gift always have to followed by the platform. So, in order to receive something from Cyworld, I need to use Cyworld.

I think we put more consideration on what we want to give in the tangible gift exchange culture. But digital gift is quite easy to deliver… I personally never have gifted anyone a voucher (digital). Because I don't think it's valuable (enough). I've seen a friend whose giving his wife a voucher for birthday present, and I think that's very rude. … ridiculous.

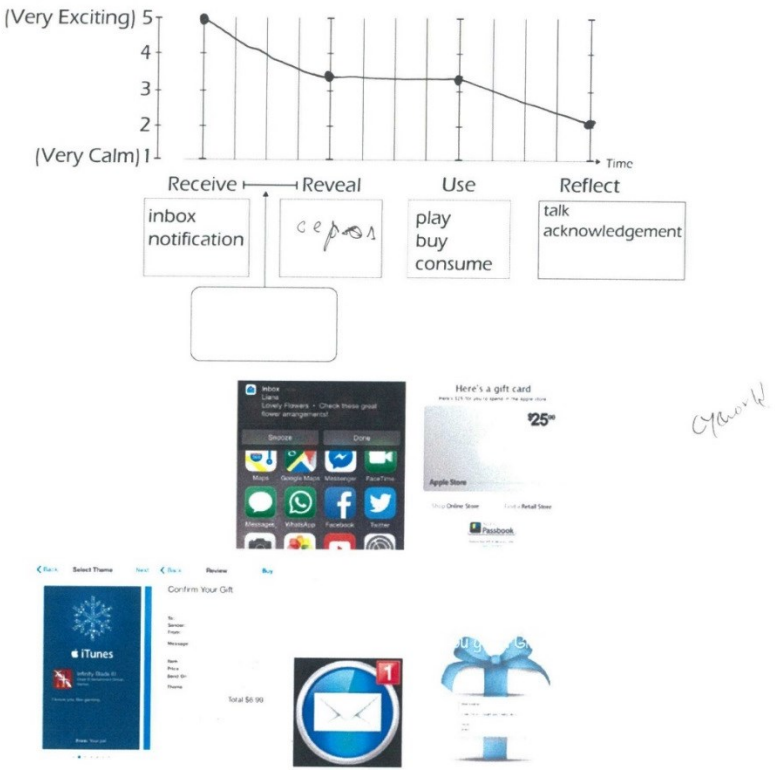
8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.





I'm one of the guys who tear off the wrapping papers. Because I value what's inside more. I never kept wrapping paper. But I enjoy them moment when I tearing it.

9. Then, also draw another for a digital gift you have received before.



I think we never reflect (talk) back.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

Yes, but I think that obsoletes.

I think for tangible gifts, once you received it there's occasions where you remember, but I don't think that's the case for the digital.

(I do feel the obligation) At the moment when received it. But I think, as time goes by, I think it that intention obsoletes.

[Questions for giver]

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☐ Photo
☐ Gift Voucher
☐ Software (MS Windows, Office)
☐ Message (Text or Voice)
☐ Music/ Movie
☐ Greetings Card
☐ Mobile App
☑ Else (Please specify below)

Cyworld (items, music)
Website (wasn't convincing)

3. What kind of special treatment did you do?

☑ Customize

☐ Decorate

I designed a website. It wasn't something she needed or wanted, it was me who wanted to give to her. I don't know whether she liked it or not. But she was Ok.

I sent the link.

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

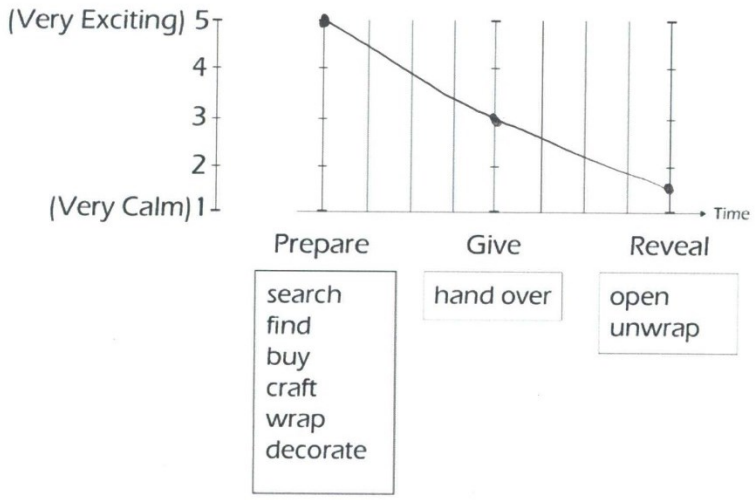
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Sending photos, messages digitally is just to report what I'm doing.

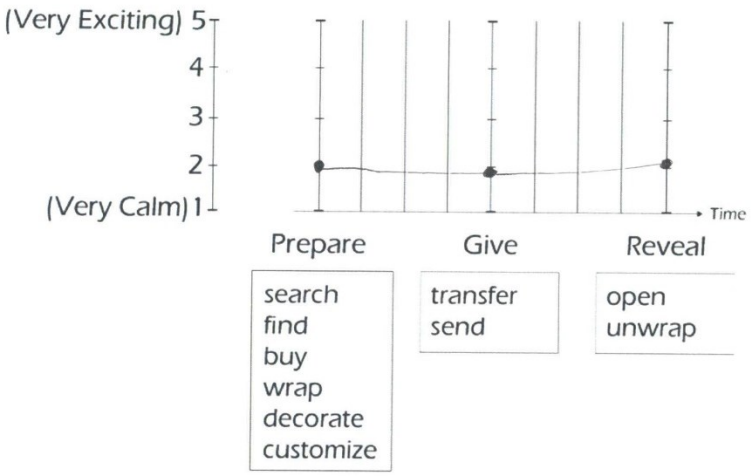
5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



general self.

I really like the moment when I try to figure out what that person wants and preparing it. I really feel happy and excited about the process.

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Have you ever requested for a gift that is;

Physical –

Digital –

Have you ever been asked to offer something?

Physical?

Digital?

Design a logo, poster for their business. But I never thought that was a gift.

I used to work as a web designer before. I have experienced how people don't value the digital contents as much as tangible stuffs. I was working 1999-2001, back then the most annoying job was receiving a call that rejecting project request. So many clients call that they need a website and but basically when we get to the stage where we discuss about the prize of it, that's when the discussions end. They say "can you design with couple of £100?" and we are, "No..". That's what they had in mind, expectation, and I don't think it changed much. People in the web platform industry are still struggling to increase the value of it. So I think that's the nature of how people view it.

We thought that it would increase as much as the use of the web increase.

The value of the website has changed (increased) but who can actually build the website has changed also (there's many pre-build platforms). I think that why they don't really value the work of other people building website.

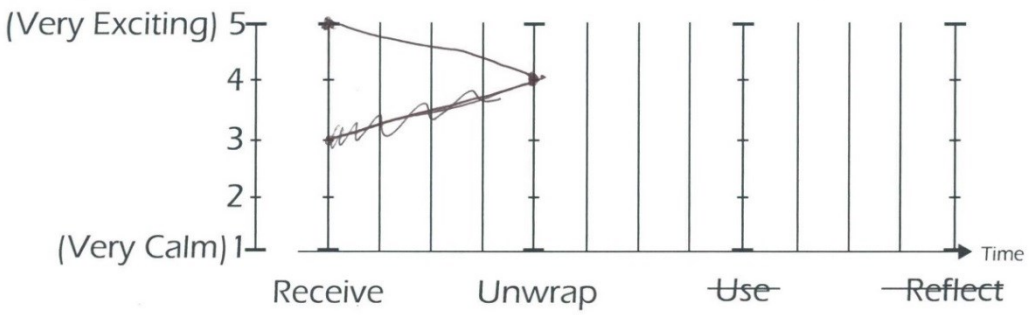
Do you feel you should be reciprocated?

No I wouldn't take it for job. But it get's annoyed once they start to make revision.

1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

(1)	Physical	>	Digital
(2)	Physical	<	Digital
(3)	Physical	=	Digital

2.When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.



P14

Gender: M

Age: 28

Job: PhD (CS)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *A book consists of letter, diary and photos*

Who gave it? *Girl friend*

What was the occasion?

Last year's birthday gift, surprise gift.

How did you liked it?

We've been together almost ten years, so I already received normal gifts like wallet, bags, and stuff, etc. Eventually, we became think about other gifts that would value. So we thought about diaries, pictures to recap the whole year.

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☑ Other

She made it by herself. A lot of effort … choosing the photos, choosing the moment, writing… From here (this), I remember what's going on (have been done). She remembered the events.

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☐ Use

I gave her the similar present. Collection of tickets, bills, photos – logging what we have done, where we went together.

For this book, I just keep it personal space. Have shown to my brother and sister but not anybody else.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☑ Photo

☑ Gift Voucher

☑ Software (MS Windows, Office)

☐ Message (Text or Voice)

☑ Music/ Movie

☑ Greetings Card

☐ Mobile App

☐ Else (Please specify below)

Photo – I go back home once a year and that's usually summer, which is after my birthday. So there's a delay between summer holiday and birthday. So usually, she takes one of the best photos and decorate it as an image, then she send it via email.

Same with music and movie. She edits some video clips of us and sends it via email.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☑ Show to other people

☑ Display

I used (the image) as my profile photo on my messenger app. (Line, Whatspp)

☐ Carry

☐ Use

I used to like physical things.. well I now receive lots of digital things and get used to it. When I first received a (digital) photo of my girlfriend I printed out and put on my wall.

(It seems like, for physical gift, you keep it more personally, but with digital gift, you seem to publicize and show to other people) – Yes! I never took a photo of this physical gift (diary book) and display to other people.

I'm from Indonesia, we are not used to be technological, and digital things. We prefer physical things, so (for example) rather than online shopping, we prefer going to shop and look and touch the things.

Positive (aspect) of digital things are we can show it, we can display it, maybe be we can post it to Instagram, Facebook. But we cannot touch it.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Images with quotes. --- Friends sent me

I like the quotes… my friends capture these images from online and they send me through messenger. It keep reminds me…

I sync with my laptop and transfer these photos and collect them.

6-1. Which feature of the content made you to cherish it overtime?

☑ Useful -- *meaning*

☑ Reminding a specific event

☑ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

I once received software from my father. ---- but.. that still was a gift …

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

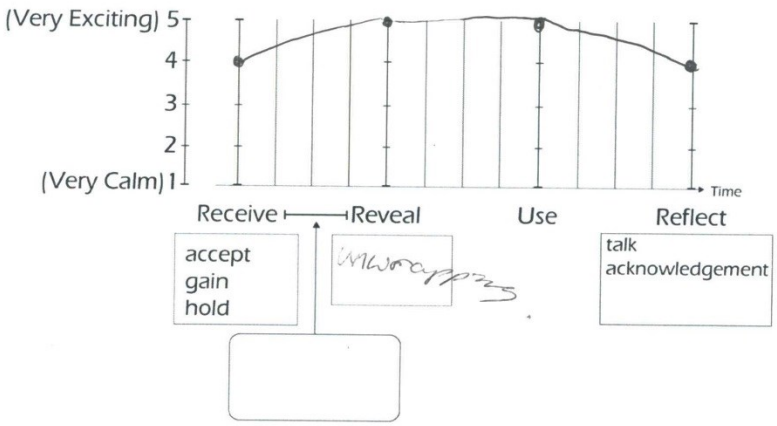
Maybe it's because of culture.. we tend to keep things. For example, this one (diary book) I can feel and touch, but with digital ones I can only touch phone (screen). But positive thing about digital thing is that we can send to far distance. For example me and my girlfriend can send each other photos directly without any fees, or anything…

If I want to send her a physical gift, I have pay postal fee and I have to wait for delay. But with digital, I can do it instantly. And I can share it directly…. But with physical gift, I don't know why I didn't do it (take photo of it share) but it's just good to be as it is..

Transferring money is like a digital gift as well. .. We also celebrate Chinese New Year and we call it "xxxxx" that we get some money from parents as a return of greetings we say to them. It's usually wrapped in an envelope. And we can't open it in front of them – to be polite.

But some families with strong culture, their parents don't transfer the money in New Year, because it's not the same.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.

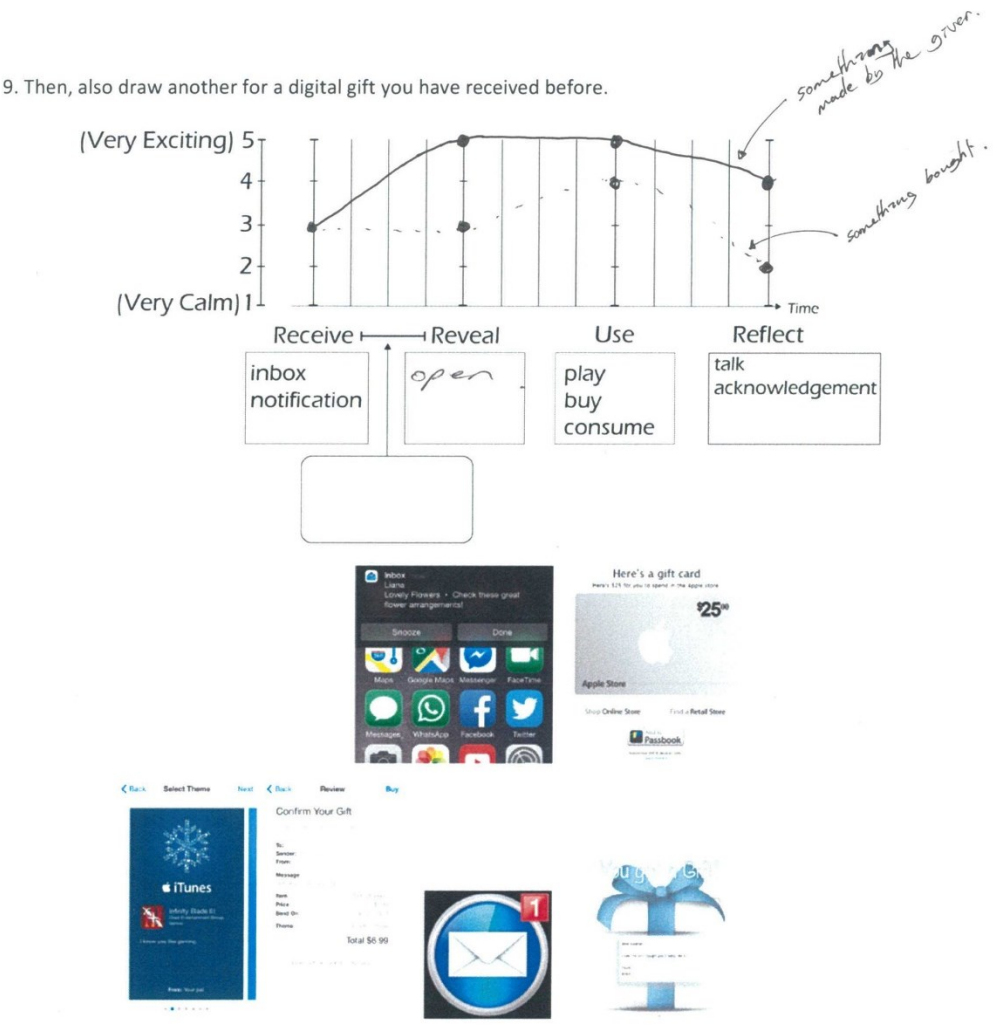




I usually carefully unwrap. I keep the wrapping paper.

9. Then, also draw another for a digital gift you have received before.

9. Then, also draw another for a digital gift you have received before.



Receiving, for me I'm more excited with physical gifts. When I open it, it depends on the content.

For digital gifts, I value something that's made by someone (giver) than the ones been bought – no matter how much they are.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

Yes, I think so.

Comparing with physical gifting case – For physical gifts, I would not do that often (reciprocate). For digital things, it's easy.

[Questions for giver]

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo

☐ Gift Voucher

☐ Software (MS Windows, Office)

☐ Message (Text or Voice)

☑ Music/ Movie

☐ Greetings Card

☐ Mobile App

☑ Else (Please specify below)

Game (I created)

When I played RPG, people barter (exchanging) with each other.

3. What kind of special treatment did you do?

☑ Customize

☑ Decorate

Same as my girlfriend, I created an image with photos and music.

I also created a game (word typing kind of) that consists of word related to us and our events.

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

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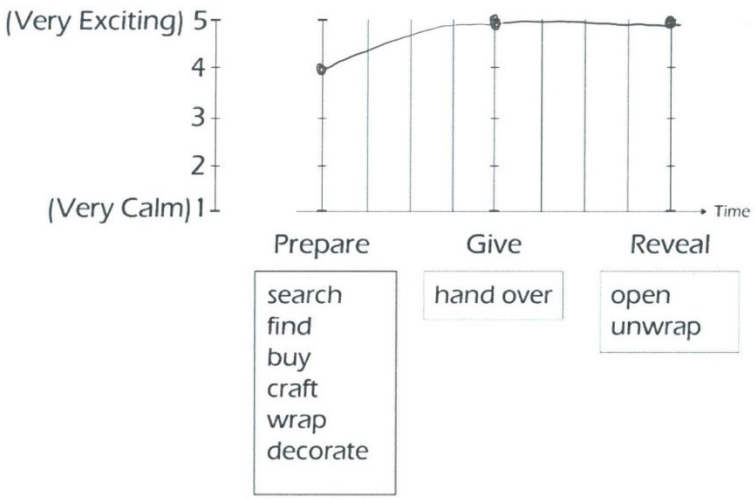
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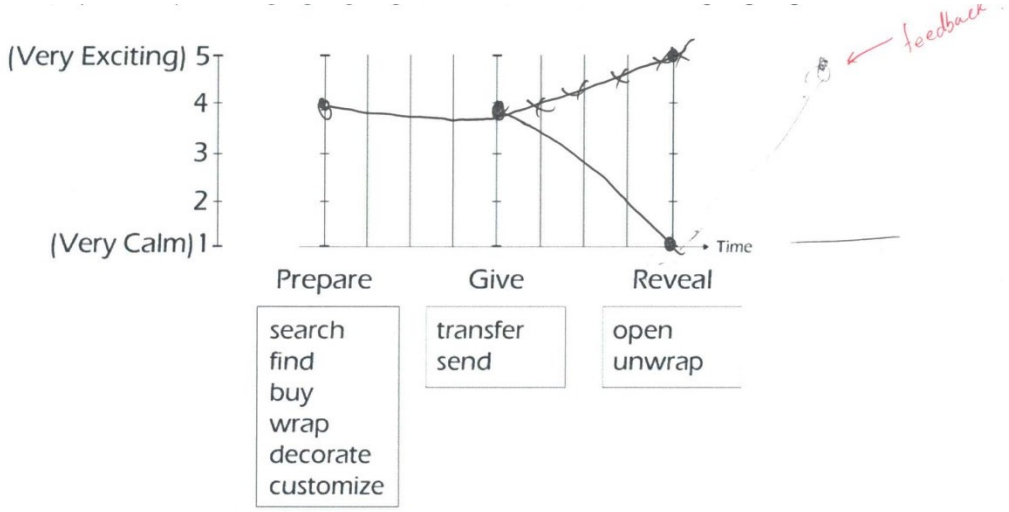
Sending pictures (images with quotes) captured from else where is not a gift. – it's not taking a lot of effort. It's just a everyday thing.

Effort and value creates the gift. Not only expense but also.. how useful, meaningful..

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Have you ever requested for a gift that is;

Physical –

Digital –

Have you ever been asked to offer something?

Physical?

Digital?

Code, Software, Website.

Do you feel you should be reciprocated?

If I know the people very well, I'm happy to do it.

But if I don't know the person very well, I think I expect some back.

I never thought about these things can be a gift but I now feel these are gifts. For me, giving these things, ok I do your favour and in return you should give back in the future, you just keep the solidarity. I just thought gifts are something that I give to my best friends… I owe him something so I need to give something back.

Culturally, we pay for physical thing such as, sculpture, crafted things. So if someone asks to someone to craft a physical thing they will pay for it. But with digital things… it seems easier.. but it's not.

And sometimes, people request editing. (Laugh)

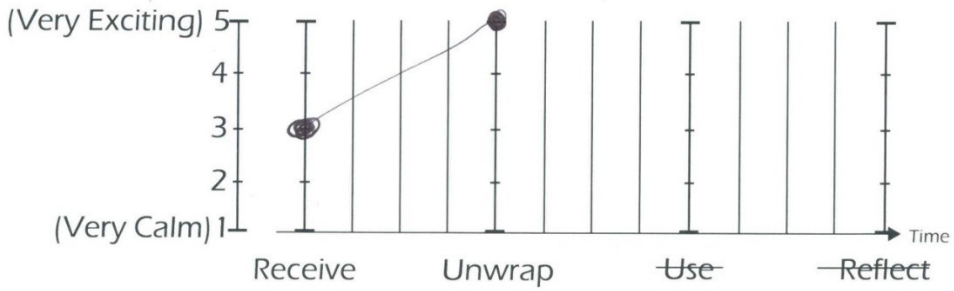
1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

(1) Physical > Digital

(2) Physical < Digital

(3) Physical = Digital

2.When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.



P15

Gender: F

Age: 33

Job: PhD (CS)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you.

Who gave it?

What was the occasion?

How did you liked it?

Things that are personally made for me. For example, a photo album that I received when I met my ex-boyfriend. Because this kind of gift make sense only to me.

There was a cassette tape from my dad when I was ten. It was a proper gift from him. But looking at it now, I don't have a cassette player now, it kind of changes over time, I don't use it. I still remember it as a good gift.

There was also a Christmas gift few years ago, it was first Android phone that I had. G1 it was very good gift.

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☑ Utility

☑ Story/ Meaning

☐ Other

At that time, he (giver) didn't know if I would like it and I also didn't know, but soon it turned out to be I like it and I used Android ever since. It became meaning.. it changed my life… I liked programming then. I sold the physical phone but I still cherish the OS, I don't use Apple (Laugh).

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☐ Use

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☑ Photo *–there are photos with message.*
☐ Music/ Movie
☐ Gift Voucher
☑ Greetings Card
☐ Software (MS Windows, Office)
☐ Mobile App
☑ Message (Text or Voice) *– birthday message*
☑ Else (Please specify below)
WoW , in-game gift

Photo – Sometimes my mum sends me photo when they go out, MMS. It's like special and I consider them as a gift.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☑ Show to other people
☐ Display
I would show photos of my mum to other people.
☐ Carry
☑ Use

For in-game gift, I use it often. I carry them, display them in the game. I wouldn't take out of the digital world, game. Some people go crazy that they print pictures of their character and put it on the wall or use it as their background of their PC. Try to live the game even out side, but it wasn't me.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Some pictures, photos.. yes. Some nice messages, emoticons.. some thing that's emotionally charged.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☑ Reminding a specific event

☑ Relationship with the giver

When someone takes photo of me and they forget to send you. Then suddenly they remembered and send to me, and it's very nice.

Or it could be specially made pictures to make you feel better.

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

So if it was software or mobile app, but I don't even remember I receiving it, it's quite impersonal and gift voucher too. Even if I did I would've thought that really bad gift. It's like empty gift.

Software feels impersonal. (Laugh) if someone gives me Windows Office, I wouldn't think it was very thoughtful. It's easy to obtain. … and… This is similar thing with regard to physical things. Because for me it's not very personal, unless someone brought the software for me I wouldn't think it's a good gift because I can buy it myself, it's just like money giving.

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

I would judge them similar with physical gifts. How much it's actually related to the person and specific… and how much it's made only for that person. I would apply same to digital gifts.

It's practical gift but it's not the same… I don't like practical gift.

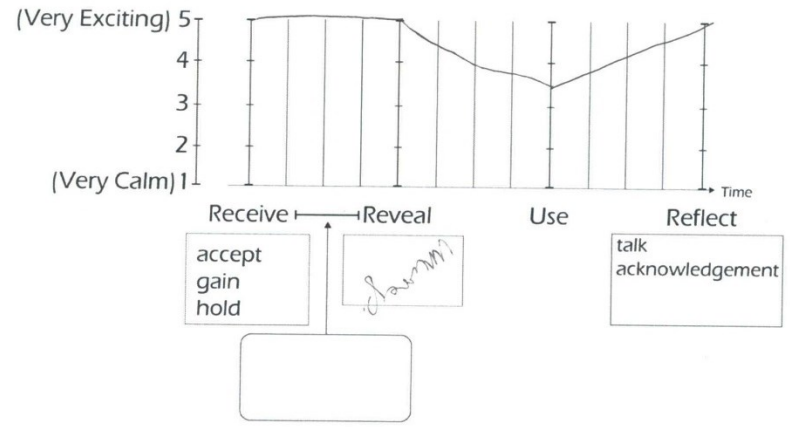
What about iTunes music?

If someone found some music, I don't know … and gave to me, it's nice. But there has to be an idea in it. An idea in the gift. If it's something special for me then it's a gift. If I went to see a gig with a friend, then he bought me a digital copy of the gig as a reminder, it would be nice. But it will be some emotional attachment to it. Something specific about it. So it would be something different if I bought it myself. Because it's from the friend to remember our good time together.

If it was an iTunes track without any prior experience related to it, it will be something less. But there will be some chance to give me something surprising. I would found good new music.

As a gift, digital music track is more valuable that I can related to some event. … attachment.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.

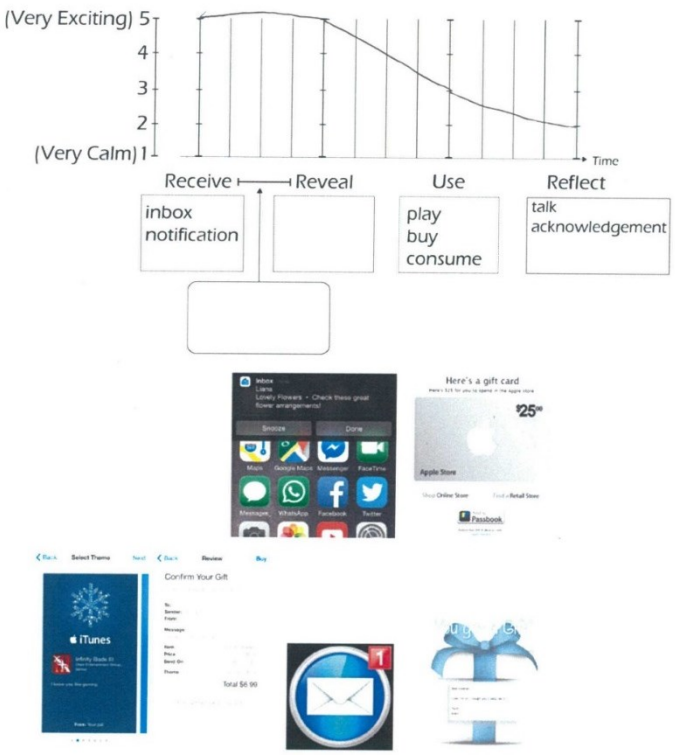




I try to guess what it is before I open.

When I use it, I find that it doesn't quite fit me. Even though the intention was good.

9. Then, also draw another for a digital gift you have received before.



10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

I think it's bit less.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

- ☐ Photo
- ☐ Gift Voucher
- ☐ Software (MS Windows, Office)
- ☐ Message (Text or Voice)
- ☐ Music/ Movie
- ☑ Greetings Card
- ☑ Mobile App
- ☑ Else (Please specify below)

Wow – in-game gifts

When I send the photos and messages, I see it much less..

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

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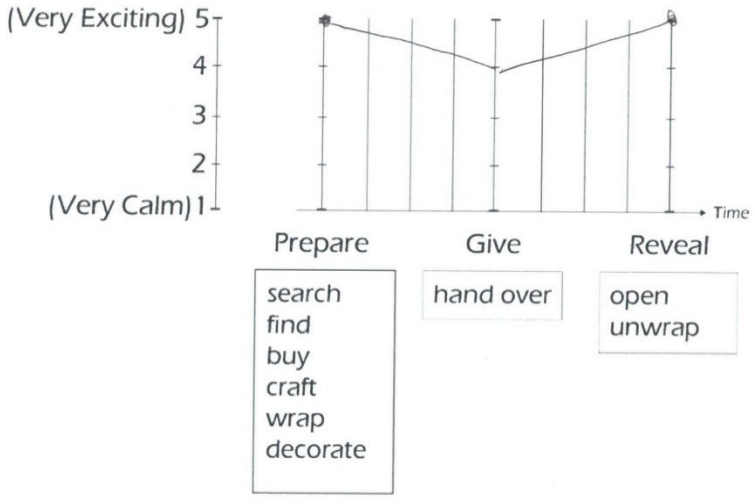
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☐ Shared

It's kind of less valuable when it's just a digital photo, it doesn't make me inconvenience or anything. I don't have to go out of the way…

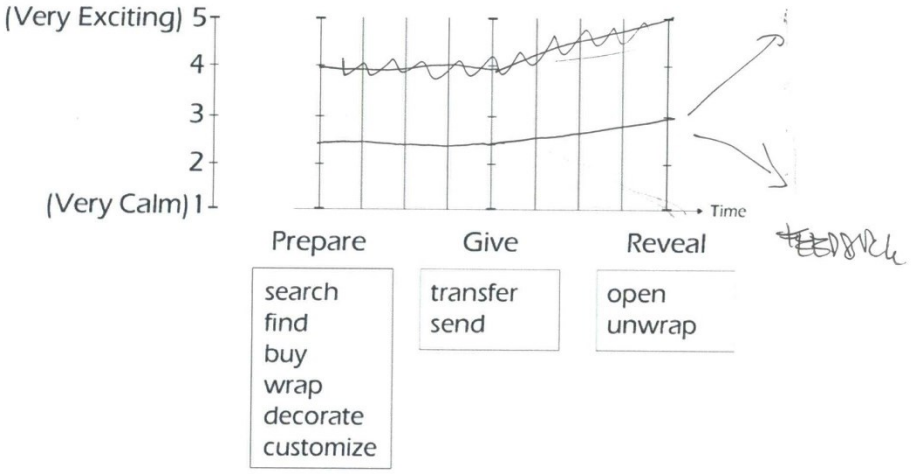
When I received it (photo) I see that they made it, actually thought about me, thought what's gonna make me happier and send it to me.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



doubt a bit, worrying if they will like it

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Revealing is missing because I'm not there. But when I get the notification that they opened, it's exciting. It makes me to expect how they took it.

Sometimes I don't get the feedback.

Have you ever requested for a gift that is;

Physical –

Digital –

Have you ever been asked to offer something?

Physical?

Digital? *Website.*

But I didn't do it, I didn't have time then.

Do you feel you should be reciprocated?

For the website case, nobody considered it as a gift. It's just something that they asked to help them out. If someone asked for their birthday, I would probably do it.

Nobody would ask a specific birthday present for digital one.

P16

Gender: F

Age: 28

Job: PhD (CS)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you.

Who gave it?

What was the occasion?

How did you like it?

Bracelet

21st Birthday gift from my Grand mother.

I haven't worn it many times, I worn it only in special occasions (wedding) because it's fairly expensive. It's got like lots of gems. I went to look for it yesterday in my jewellery box and one of the gems fallen out so it looks damaged. I thought about wearing it this weekend for wedding, but the gem that's missing is quite obvious so I'm not sure whether I will wear it..

2. Which feature of the gift do you value particularly?

☑ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☐ Other

I really like the look and design of it, You can tell that it's not that something you just bought in a high street shop. You can tell that it's a good quality, and I like the design …slightly different colours …

It's.. my grand mother gave me.. because she died few years ago so it's got that sort of meaning as well..

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☐ Use

Wear in special occasions, put it in a box.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo
☑ Gift Voucher
☐ Software (MS Windows, Office)
☐ Message (Text or Voice)
☐ Music/ Movie
☑ Greetings Card
☐ Mobile App
☑ Else (Please specify below)
Money – online transfer

When I went on a holiday last year, my parents sent me some money. On the transaction you can write some notes, it says "For your holiday".

Physical money – sometimes in Christmas I get money enveloped.

(Do you feel same?)

I think what you do afterwards is different. Because if you had cash, bank note, you might have put it somewhere (….) so don't spend it on supermarket shopping, whereas if it go straight into your account you might more like to spend it not thinking about person who gave you the money.

But there's similarity that there's a note in the reference when transferred with the physical cash that's enveloped.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people
☐ Display
☐ Carry
☑ Use *just use it and … yeah…*

I'm not sure I have. It's something transient. … So the card type thing, it's only relevant for one day… like birthday. It's not something you keep and referring back to. … either (digital, physical) …

Ah… physical card, we sort of display few days. But no, not done that with digital things.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

When people sharing music on Facebook, that I didn't know before, I sort of cherish that. In the long term, when I remember… it's that particular person introduced me to it. And then you got a kind of record them posting videos to remind you that was them who introduced them to you.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☑ Relationship with the giver

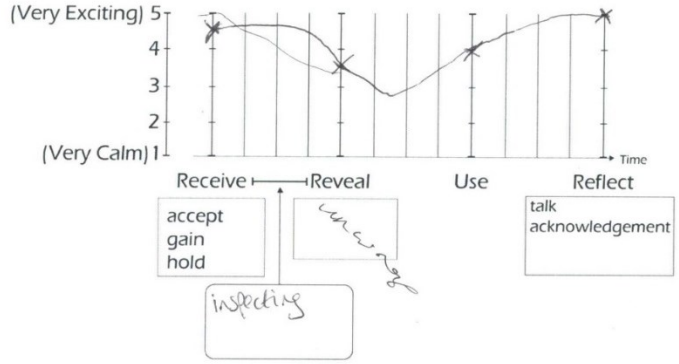
7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

I can see…when I received a gift voucher or money, I haven't fully regarded it as a gift in a same way I might did if it was a physical thing. I think when someone sends you a gift digitally, and don't have an exchange face to face, perhaps, then doesn't have quite similar value and easier to just spend it without really thinking about what you are spending it on.

I didn't thought about receiving photos and messages as gifts. I feels more like communication, a regular text messege.

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.

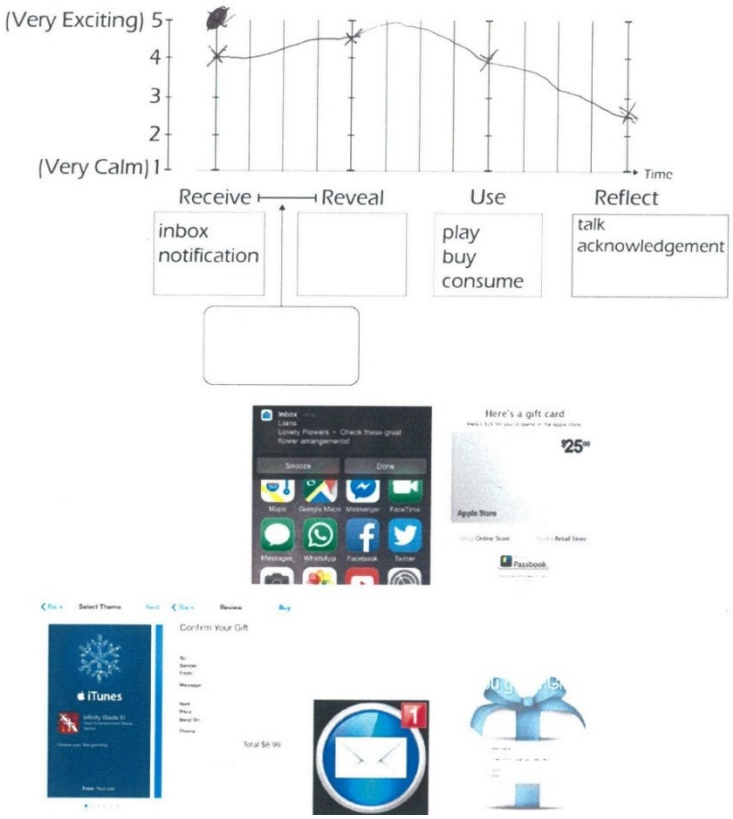




Slightly less excited when it's revealed, I don't know why.

Sometimes anticipation is more exciting then finding out what it is.

9. Then, also draw another for a digital gift you have received before.



Usually, I would be fairly excited (when received) because usually.. everything that comes to my inbox is really boring .. and if something says like 'someone sent you a gift' then that would be much more exciting then normal email.

If it was a gift voucher I would be more excited.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

I think I feel the obligation to give acknowledgement, showing gratitude.

I don't think I have to match.

(This participant couldn't think when she actually reciprocated... but do think need to reciprocate.)...hesitating to say ...

"If it was..." (have no experience)

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☐ Photo
☐ Music/ Movie
☐ Gift Voucher
☑ Greetings Card
☐ Software (MS Windows, Office)
☐ Mobile App
☐ Message (Text or Voice)
☐ Else (Please specify below)

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

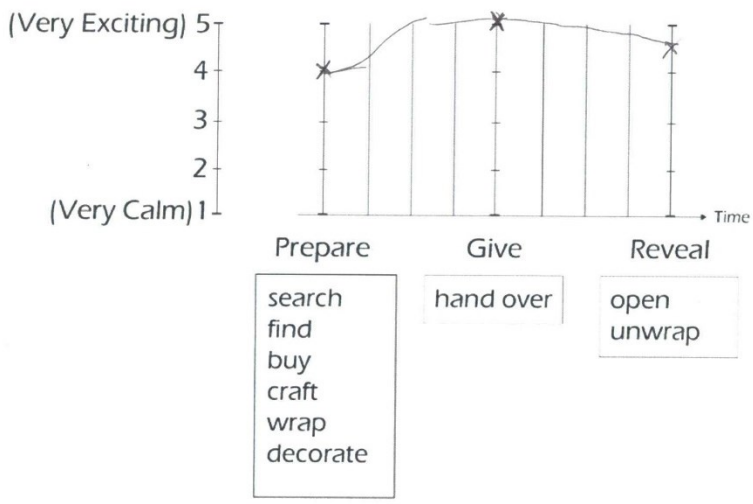
☑ Easy to transfer

☐ Shared

Sharing photos, articles, music link...
Maybe because it's easy to transfer, easy to do without thinking about it. I think if you do digitally, you don't think so much about ... the artefact itself. Because it's so easy to do. There's no transaction physically.

I still consider a copy of physical photograph as a gift... if it was decorated maybe.

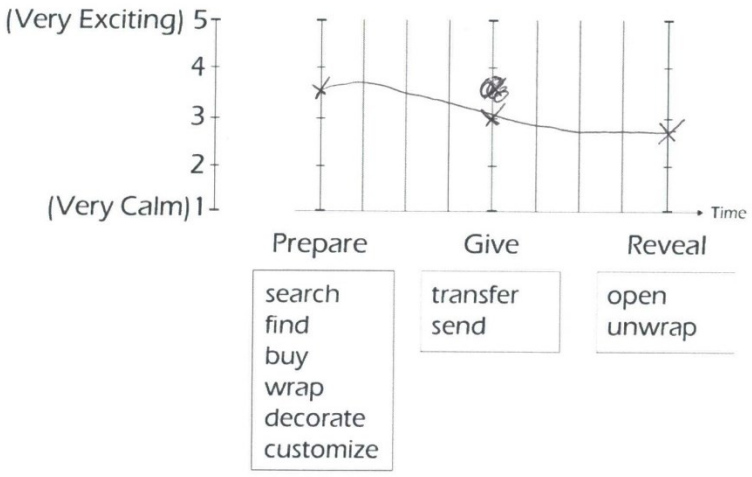
5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



Sometimes it's challenging trying to find right thing.

When they open it, it's exciting but also, it's… a bit nervous as well to see how they respond to it.

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



I'd say more excited.. hm… I'm not sure now…

If you doing in digital gifts, it's more likely to be …(it's probably easier to find) so less of that kind of walking around, trying to find.. but then it's not quite exciting.. Giving … I don't think that massively exciting because you don't know whether the person received it straight away or not. When revealing, I don't even know when they got it or not. I can't imagine it exciting.

P17

Gender: F

Age: 28

Job: office worker (Business)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Tumbler*

What was the occasion? *Birthday*

Who gave it? *Friend*

How did you liked it? *Constellation*

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☐ Other

It's reflecting my constellation character, that shows she was thoughtful about me and it was a surprise gift.

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☐ Use

I'm only keeping it but not using it. I don't particularly like the design of this. I have another one for daily use.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☑ **Photo**	☑ **Music/ Movie**
☑ **Gift Voucher**	☑ **Greetings Card**
☐ Software (MS Windows, Office)	☐ Mobile App

☑ **Message (Text or Voice)**

☐ Else (Please specify below)

_____e-moticons for messaging app.

_____

_____

One of my friends sent me a photo of my ex-boyfriend's childhood, I think it was only the photo that I can receive from that friend, and therefore it was special.

Greetings messages, image files (downloaded or URL link) that I would like.

Mp3 files via email, links, some time just name of artists, title of the song – this regarded as a gift because they were thinking about me and thoughtful.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☐ Carry

☑ **Use**

For the physical gifts, I use them.

For the digital gifts I give feedbacks to the giver after I use them. I usually send them the text to thank them. I try to let them know how much they are meaningful to me.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Links to particular music or short movie clips.

"My friends shares links of music or music videos quite often… and one time, a friend of mine shared me a link. At that time, I actually ignored it, didn't even replied to say thanks or anything. Then 2 days later, I just went into the link and it was a music video. I just loved it. I watched it several times after then. It evoked me lots of different emotions.. Happiness, pleasure, envy-ness, sadness, etc. Then I loved the music. I think after then we talked about the music and I really appreciated it as a gift that she thought about me and have sent the link."

But not all of the URL links are appreciated. When I totally got into it, I feel it as a gift.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☑ **Reminding a specific event**

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

Digital gift is not very commonly shared concept.

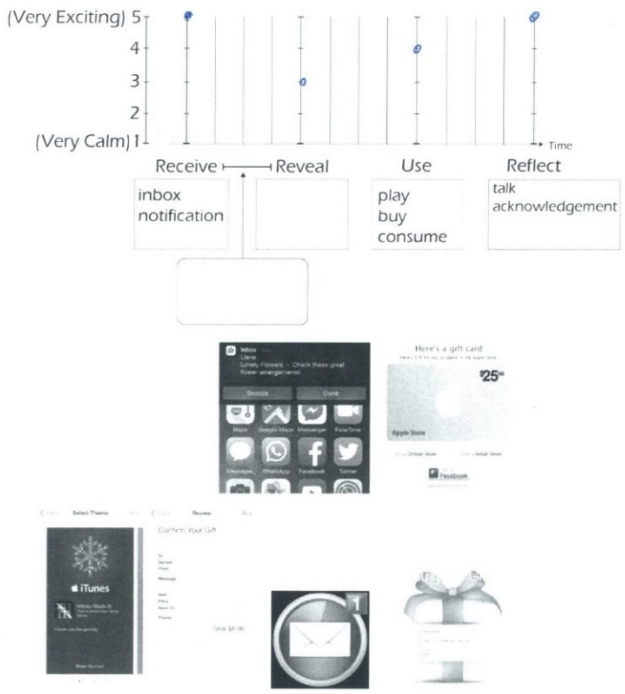
Digital gifts are like a food, … for example like gift voucher for specific restaurant, is like I received an event, something like experience, so it becomes special. When it is something that I have to consume with someone else, it become more meaningful than things that I can use by myself.

I prefer physical gifts, because I can keep reflect back. .. when it's useful or meaningful.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



9. Then, also draw another for a digital gift you have received before.



10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

Less

It feels like the giver's effort is much less than the physical ones.

For the gift voucher that I received, I sent a photo how I'm enjoying it. For others, I send feedback.

Physical gift – we say thank once we received and I think we keep the thankfulness for ourselves while using it.

Digital gift – we say thank once we received and express feedback when using it as well.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☐ Photo

☐ Gift Voucher

☐ Software (MS Windows, Office)

☑ **Message (Text or Voice)**

☑ **Music/ Movie**

☐ Greetings Card

☐ Mobile App

☐ Else (Please specify below)

_____emoticon_____

_____URL link_____

I happened to know an artist that my friend would like, I sent a URL link to her.

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

☑ **Easy to transfer**

☑ **Shared**

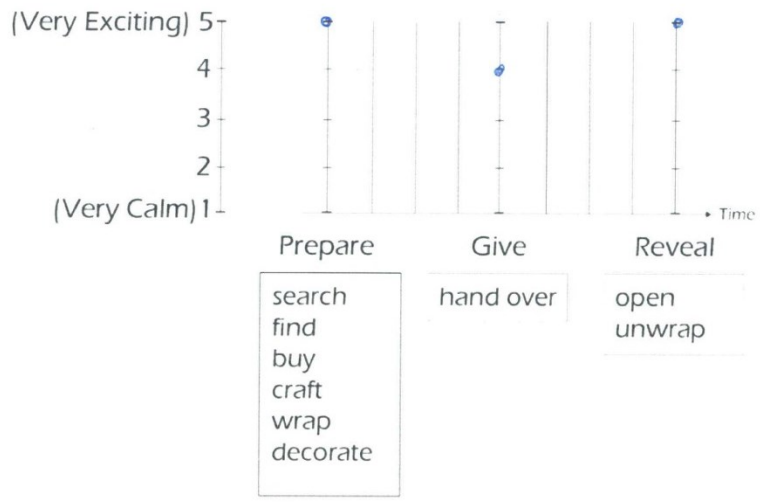
The photos that I received are targeted on me personally, so they are personally meaningful. But when I send them, I send them a lot, I'm showing what I love… I didn't took it for them it was for me.

Photos are so easy to transfer that doesn't need any of my effort.

Gift involves time and effort.

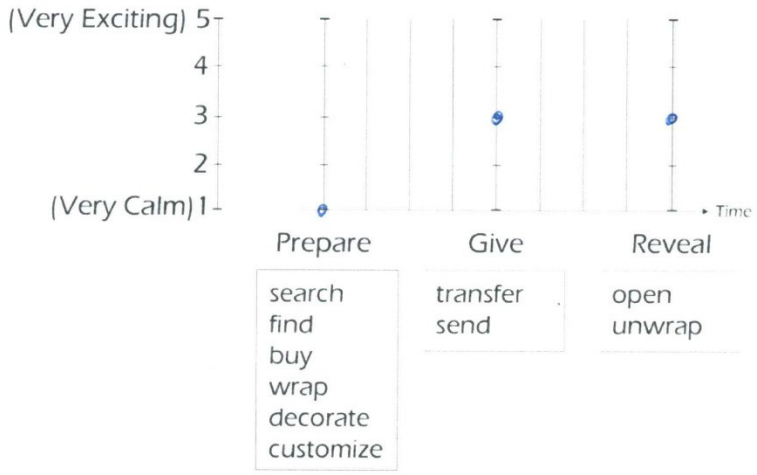
A gift has to reflect the recipient taste and situation they are facing.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



I become so stressful when preparing. I'm rather nervous.

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Usually, it's not planned gift when it's digital.

Have you ever requested for a gift that is;

Physical

Digital

Have you ever been asked to offer something?

Physical?

Digital?

Logo, video, music editing, ppt design

Do you feel you should be reciprocated?

Never thought they are gift. If the receiver reciprocates, it's good, if not, then fine.

P18

Gender: M

Age: 27

Job: PostDoc (Physics)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Hand written Letter*

What was the occasion? *When I was in the army training.*

Who gave it? A friend mine.

How did you liked it? *It was the time that I was having quite hard time, some how she knew it and sent me the letter. I never expected from her.*

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☐ Story/ Meaning

☐ Other

It was more than normal catch up kind of thing. The content felt actually more thoughtful.

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☐ Use

I didn't show it to anybody but showed off the fact that I received the letter.

I think the way I treat things that I value is keeping it personally in personal place. I collect things.

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ **Photo**
☐ Music/ Movie
☐ **Gift Voucher**
☐ **Greetings Card**

☐ Software (MS Windows, Office)

☐ Message (Text or Voice)

☐ Mobile App

☐ Else (Please specify below)

Digitally drawn images_(Birthday)___

e-book that each and every pages were photographed by the sender__

I felt the photo – related to our conversation - as a gift at that time, but I didn't really keep it.

E-book; I didn't especially downloaded or saved it, even if I perceived it as a gift.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☐ Carry

☐ Use

Nothing special. If I received them via email or text, I just assume that it will be kept in my inbox so I don't specially do anything. Also I didn't really tried to find it going through all my inbox, but thinking it will be there somewhere.

I don't especially save them or keep them specially.

Gift vouchers, emoticons – I take photo how I used it and send to the giver to say thanks.

Photos – if it is especially for me, or like.. professional quality, I would consider it as a gift.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

For me, gift is something exclusively for me. Meaningful. That's same when I give somebody a gift.

I received an information document for the 4weeks army training, it was well categorized. – I didn't regarded that as a gift. It feels more like a friendship duty. … strange why I did not felt it as a gift, I now think it was a gift. (Laugh)

Actually, he distributed to every member in our group. Not only to me.

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

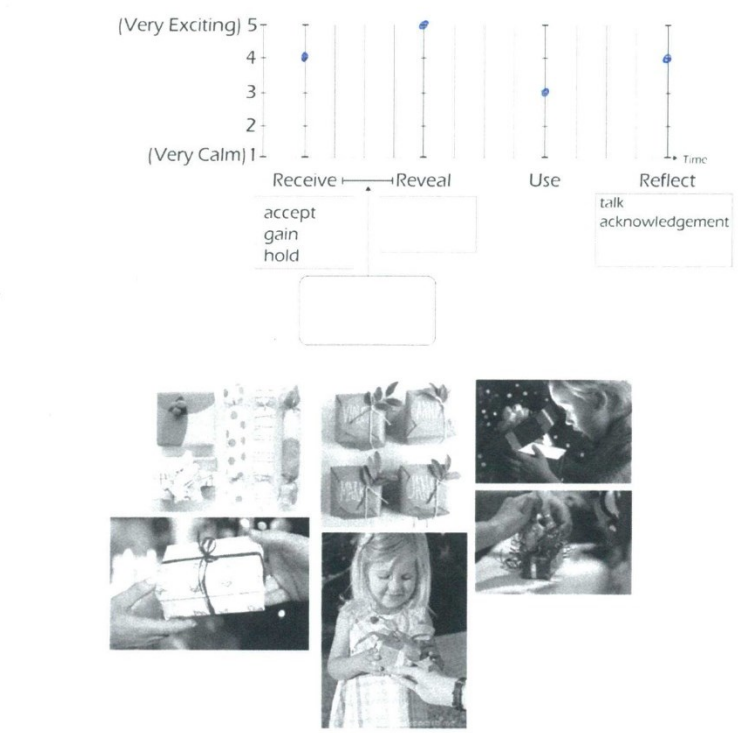
Meaning is the most important thing, whether it's digital or not.

When I think about the digital gift, it can always be copied, everyone can have it, the concept of 'limited edition' feels less.. "the one in the world" kind of notion…

When I received a physical gift, perception that this is the only one in the world is made. But this rarely happens with digital ones. I think therefore digital ones are less valued.

So, it there's a specific marker, sign that this is only for me, it will become much more meaningful even if it is digital version.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.

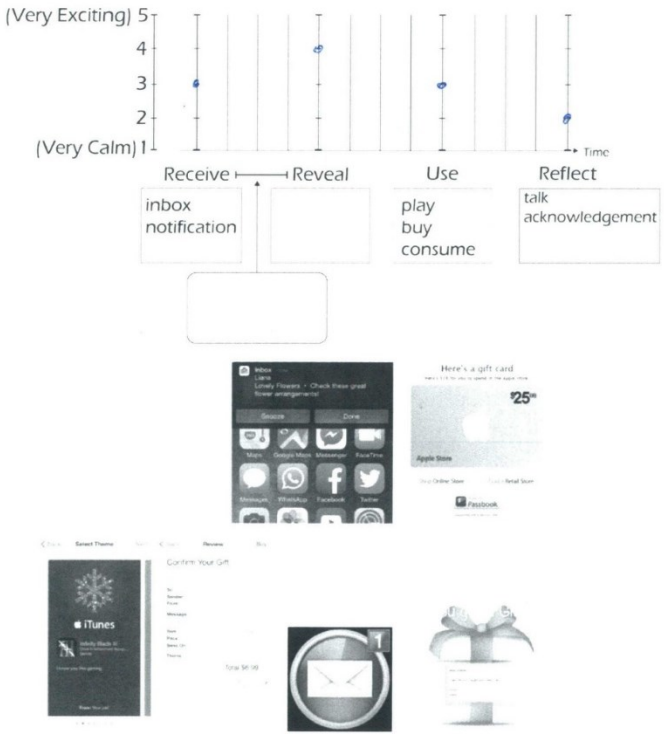


Using is not very exciting.

Anticipating what's inside is really exciting.

I just tear off the wrapping paper. Not very carefully.

9. Then, also draw another for a digital gift you have received before.



It's generally less than physical ones. Digitals feels less thoughtful, sincerity,... than the physical gifts (relatively). But digital gifts were often useful. Like gift vouchers.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

Similarly think but didn't actually happened (reciprocated).

It's strange that when I received digital gift vouchers or emoticons, I felt really good so then afterwards, I have sent similar things not to the person who had sent me the gift, but to other people because I knew (experienced) that it makes somebody happy with this kind of light, tiny gift.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ **Photo**
☑ **Gift Voucher**
☐ Software (MS Windows, Office)
☑ **Message (Text or Voice)**
☑ **Music/ Movie**
☐ Greetings Card
☐ Mobile App
☐ Else (Please specify below)
_Link (humour, fun) -

Music – I recorded me singing a song, playing guitar.

Emoticons, Kakako talk gifts

Messages – voice message (recorded me reading a short story),

Photo – reminding me of the specific person, when I accidently see something in daily life that the person would like then I take a photo of it, I sent to her. (Context matters) Something that only the giver and I know.

3. What kind of special treatment did you do?

☑ **Customize**

☑ **Decorate**

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☑ **Copied**

☐ Easy to transfer

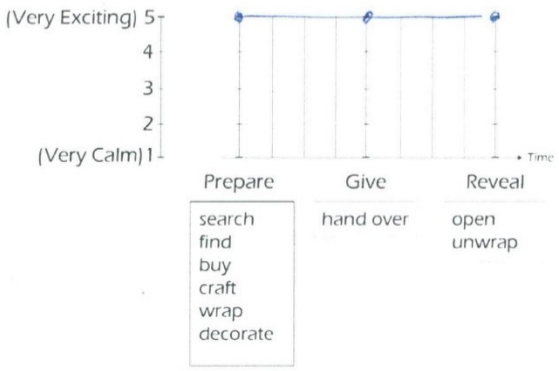
☑ **Shared**

Song (same file that previously regarded as a gift) – it depends on whom I'm sending to

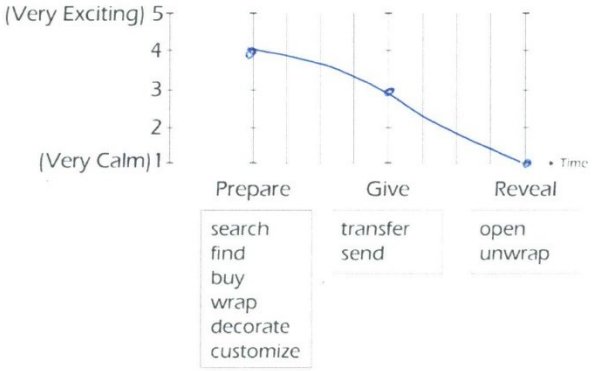
Information related contents. – they are not really gifts. Ex) paper links

For me, utility is not the most important factor to consider something as a gift, or maybe the least important.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



I can't see recipient's emotional (facial) expression when they opened, revealed, so it's always less, even in preparation. I imagine the recipient's reaction when I prepare a gift, but in digital case, my expectation is quite less than the physical ones.

But I become quite excited like 4 when I get feedbacks.

Have you ever requested for a gift that is;

Physical

Digital

Have you ever been asked to offer something?

Physical?

Digital? *Song, Read, Drawings*

Do you feel you should be reciprocated?

No, no. Because they are gifts, I don't expect any reciprocation.

This interviewee stated that he collects every physical things that he received such as, letters, presents, documents, invitation cards, etc. more or less obsessed in collecting things. However, later in the interview, realized that he never considered doing similar thing for digital things. Even if he received and thought something valuable, left it in the inbox or messaging app and didn't particularly looked back.

He also has a blog that he records his thoughts, works, uploads photos, music, etc. But didn't think of doing – collecting – digital gifts in any similar way.

P19

Gender: M

Age: 21

Job: UG Student

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you.

Basketball

What was the occasion? Birthday, 5 years ago.

Who gave it? Father

How did you liked it? At that time, many friends around me played basketball and it allowed me to practice a lot. So after, I could get along with my friends well.

I still have it, back in my home.

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning,

☐ Other

It allowed me to play basketball. Apart from that, I give someone a birthday gift if I think he is my close friend, I will give him most meaningful gift, or something created by me. But if he is not my close friend, I might just buy him something.. Something that can be bought with money doesn't go through my heart.

(Assuming, this participant was trying to say that the basketball was very thoughtful gift to me personally.)

2-1. As a way of valuing the gift, how do you treat it after received? I placed it in the corner of my room. I don't use it any more.

☐ Show to other people

☐ Carry

☑ Display

☐ Use

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo
☐ Music/ Movie
☐ Gift Voucher
☑ Greetings Card
☐ Software (MS Windows, Office)
☐ Mobile App
☐ Message (Text or Voice)
☐ Else (Please specify below)

—— ——————

_____

2012, People used email to send digital cards to each other.

In China, at that time there was a talking software (QQ) that sends birthday card – automatically. People just input some words for greetings. ----- I don't think this is valuable. A friend sent me a birthday card via this software. It is sent automatically by this software not written by him. So I don't value it as much as a gift.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people
☐ Display

☐ Carry
☐ Use

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

I don't really value any digital things. Because I can find some digital things, I can watch movie by free, I can play free games by internet. So I don't think it is valuable thing to give digital things. Because it is not a real thing.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

Greetings card sent via email.

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

People get digital things by free on internet.

Just digital format of something is not considered to be a gift. If I had printed a letter and sent to a friend in other country, then it can be a gift.

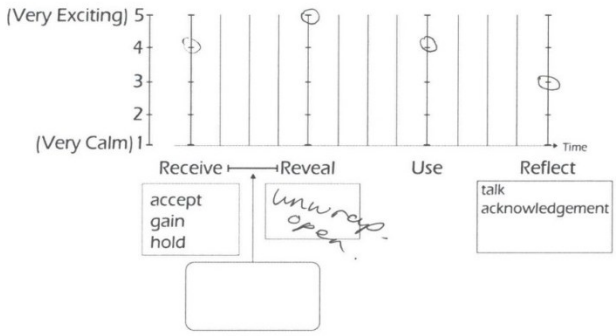
Requires reembodiment (Belks 2013).

Photos sent and received between friends doesn't feel as a gift.

I think if there's a service that helps people (e.g. couples) to memorize events and times they spent together and make it into a video would be useful and it will be a 'meaningful' gift. (Something that is meaningful is important.)

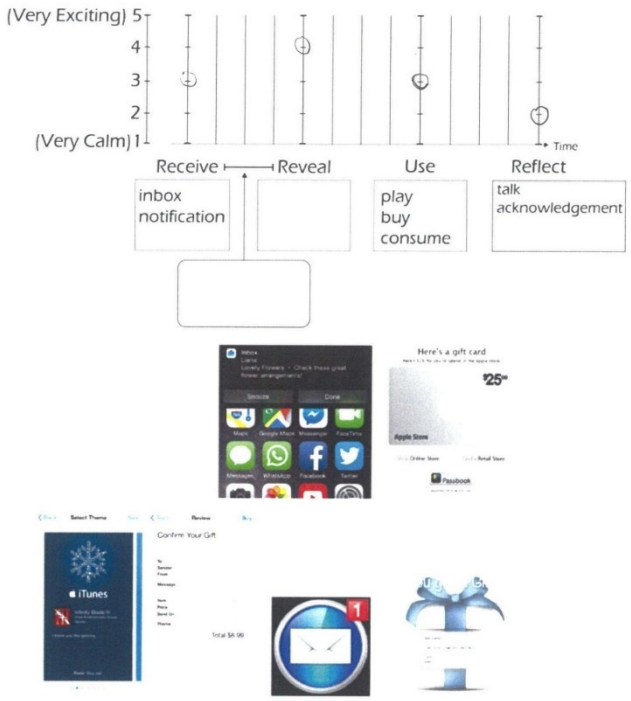
Quality of life have raised, so people can buy things easily, so something that is made is considered to be meaningful.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.





9. Then, also draw another for a digital gift you have received before.



Receive – (3) When I received as an email, it is just a common thing, so I didn't thought it as a gift.

Reveal – (4) When I reveal, I used it. (time gap is short)

I was only excited at my first or second experience of revealing them (greetings card). After then, it is just same. But still exciting, because it means some people remembering the date of my birthday. I don't value the content of the gift, but the fact they remembered my birthday.

Use – (3)

Reflect – (2)

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

I replied "Thank you" messages to them. I tend to send greetings messages on their birthdays rather than the card.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☐ Photo	☐ Music/ Movie
☐ Gift Voucher	☐ Greetings Card
☐ Software (MS Windows, Office)	☐ Mobile App
☐ Message (Text or Voice)	☑ Else (Please specify below)

___a short video clip created by myself

A video clustered with photos and messages, I created the video by my heart, it took so long time for me. It was meaningful thing.

- Did your friend also thought that as a gift? She thought it was a gift, but she thought it is easy and simple.

3. What kind of special treatment did you do?

☑ Customize

☑ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

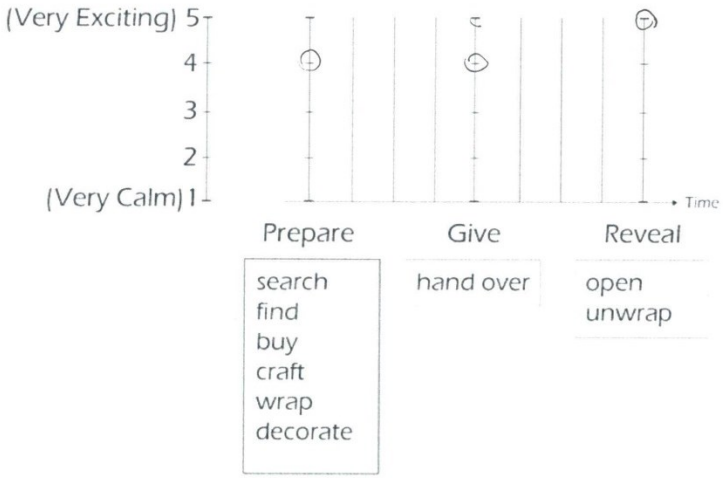
☑ Copied

☐ Easy to transfer

☑ Shared

And it is free. I can get it as well.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.

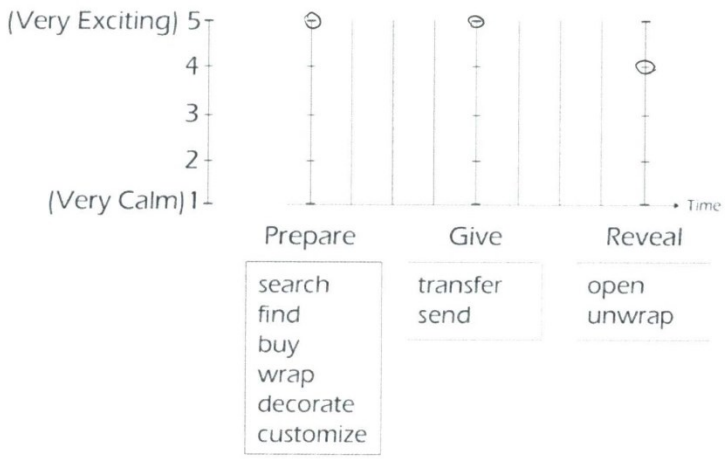


Prepare (4)

Give (4)

Reveal (5)

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



For the movie clip this participant created. Highly excited at each stage.

Prepare (5) – I created it by myself and it took quite a lot of time.

Give (5)

Reveal (4) - I was quite happy and excited before getting feedback from her. But not as much as preparing and giving.

P20

Gender: F

Age: 24

Job: PhD Student

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. Watch

What was the occasion? When I entered University, first time I going out to live away from my family.

Who gave it? Father

How did you liked it? I still have it, been about 6, 7years. It was like something really precious to me. It not about the price money, it's a first gift I received from him. Before, I haven't received any formal gift from my father, but this was the first gift he gave to me. It was properly wrapped.

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☐ Story/ Meaning

☑ Other : Emotional attachment, Care

2-1. As a way of valuing the gift, how do you treat it after received? I always keep it with me. It's in my room and in some special occasions I would wear it. It's not an everyday item. I'd wear in my sister's wedding, really big big interview – special. I'd consider it as something lucky symbol.

☐ Show to other people

☐ Carry

☐ Display

☑ Use

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☑ Photo

☑ Gift Voucher

☑ Software (MS Windows, Office)

☐ Message (Text or Voice)

☑ Music/ Movie

☑ Greetings Card

☑ Mobile App

☐ Else (Please specify below)

My friend is a photographer. It was my birthday, he took me cutting the cake and gave me the photo in hard copy as well as digital version. Digital version sent via email, so that I can upload onto Facebook, or Tweeter. And the hard copy that I can keep forever with me.

He also gave me Photoshop licence and taught me how to use it as well.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☑ Show to other people

☑ Display – on facebook

☑ Carry – on iphone app, yes I carry the photo.

☑ Use

Hard copy – I keep it in the frame. It's always there. It's very rare.

Soft copy – it is in my hard disk and also uploaded on Facebook. I also tag the person who gave me the photo to thank him giving me the gift.

Digital photos are very easy to exchange.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Photos which I ask them, but I value them as I can remember the time.

iphone applications – when I actually used it and it was useful.

6-1. Which feature of the content made you to cherish it overtime?

☑ Useful

☑ Reminding a specific event

☑ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

Music, Movie, Software

It's not actually freely available but you have other sources that you can get it.

Music, movie, you can easily download it.

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

There are different source for the gift.

Itunes vouchers. – it is something that I'm not interested in shopping digital things in itunes. So it just expired.

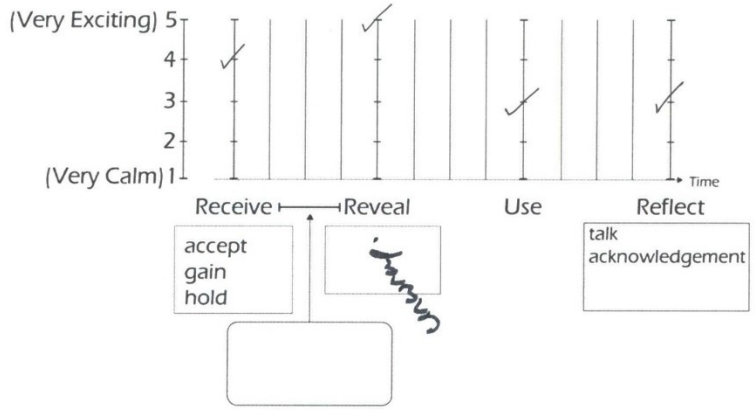
Gift can be digital.

It's not like I always prefer digital or always prefer physical, it depends upon what gift I'm getting. If I've been given a voucher, I wouldn't consider it as much value as a gift. Because it will go away after certain period of time. Suppose if I shop, I wouldn't remember that gift voucher any more. I wouldn't attach much value (to it).

But if I received a photo that I never thought of I would get, then I would attach value to it. For example, Photoshop software, I use it very often so I would attach a lot of value to it. It depends on what gift I'm getting.

Rather than digital or physical.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.





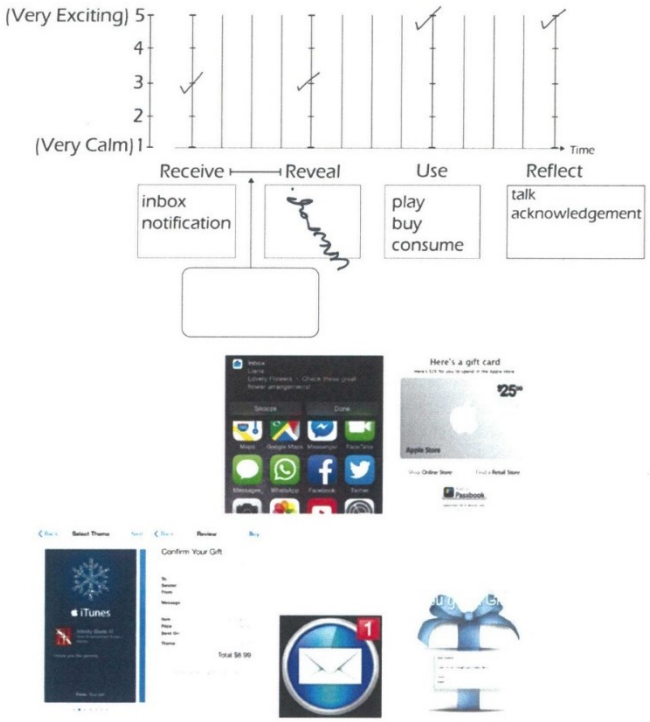
Receive – 4

Reveal – 5 : *unwrapping is more exciting.*

Use – 3

Reflection – 3

9. Then, also draw another for a digital gift you have received before.



Receive (3) –

Reveal (3) –

Use (5) –

Reflect (5) –

I think digital gifts are more useful and the physical gifts are more for display. Of course, if I'm giving something digital, it should be useful. Otherwise, you can't even use, you can't even display it, there's no point, there's no value.

Physical things might be useful but more emotional.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

It depends on the person I received.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo

☑ Gift Voucher

☐ Software (MS Windows, Office)

☑ Message (Text or Voice) – *thank you messages to parents. They would value the content of the message and consider as a gift.*

☐ Music/ Movie

☑ Greetings Card

☐ Mobile App

☐ Else (Please specify below)

_____

_____

3. What kind of special treatment did you do?

☑ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

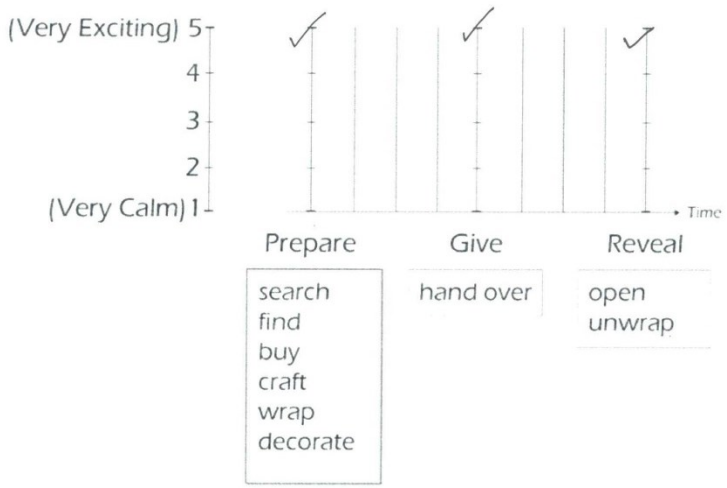
☐ Copied

☐ Easy to transfer

☑ Shared

If the photo was something that the person was never expecting, and you are sharing on the Facebook then its intention is like gifting.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.

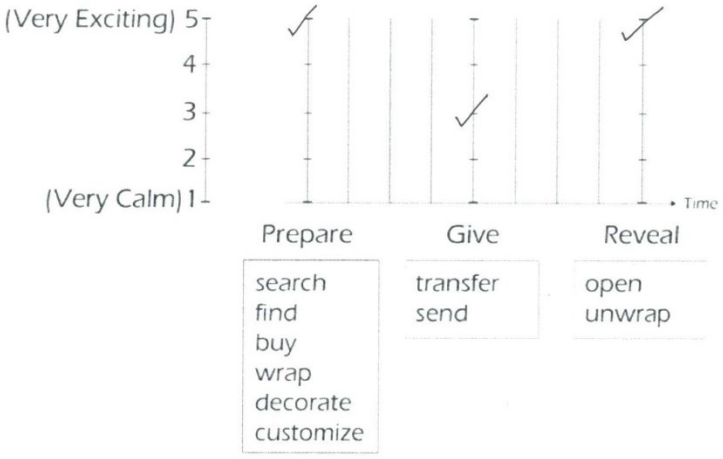


Prepare (5)

Give (5) –

Reveal (5)

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Reveal (5) – In most cases, I always do the video call to say that I have sent the gift. So I can also see how they react when they reveal.

Workshop Debriefing

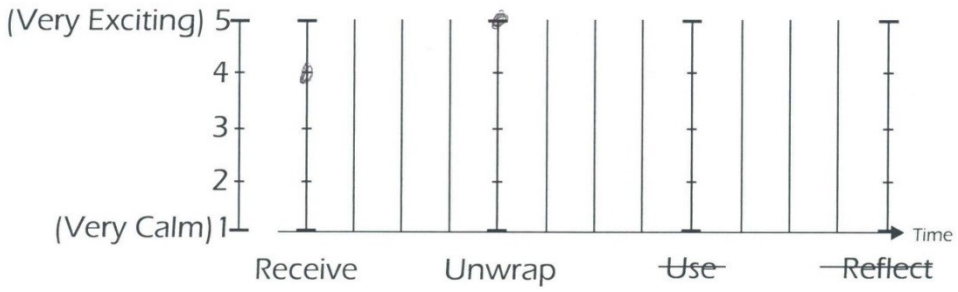
1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

(1) Physical > Digital

(2) Physical < Digital

(3) Physical = Digital

2.When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.



P21

Gender: F

Age: 24

Job: Student

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Ring*

What was the occasion? *Me and him were both out for shopping, we were just browsing about window shopping, and we went to the Pendora store because I just wanted to have a look. And I saw this ring, and I liked it. And then we left.*

Then I went to toilet and he went to toilet as well. I waited him to come out, was wondering why he is taking so long. Then I finally see him, he was completely somewhere else. And we went off.

A bit later he talked me he want to tell me something and I thought something bad. Then he pops out a little box that's gift wrapped. I was completely shocked. For that reason I think it's been so meaningful, because he just went out of his way and got it. Of all the gifts he given to me, that's the probably the meaningful one.

It (the day) was nothing, it was just, we went out for shopping but because of that I remember that day so well now. I won't forget that day.

Who gave it? Boyfriend, in the beginning when we met

How did you liked it?

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning .

☐ Other

I think it's the story that I value as much as the ring now. I keep it safe in the box.

Now the ring has loosen for my finger, but sometimes I do wear it and when I wear it he loves it. I wear it when I going to see him.

2-1. As a way of valuing the gift, how do you treat it after received? *In the beginning, I used to wear it all the time, every day. But I stopped wearing it, and I kept it. I wouldn't say I go around and showing people it. The box is kept in my shelf. I don't think I'm that much of a jewellery person, that's why I don't wear it every day. I really like the look of it.*

☐ Show to other people

☐ Carry

☐ Display

☑ Use

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo	☐ Music/ Movie
☑ Gift Voucher	☑ Greetings Card
☐ Software (MS Windows, Office)	☐ Mobile App
☐ Message (Text or Voice)	☐ Else (Please specify below)

_____

_____

Department store gift voucher.

It was from my sister, she sent to my email. It was a birthday present. She wasn't able to see me.

I received lots of photos but I don't know whether I would classed them as a gift. I wouldn't perceive a photo as a gift. I had greetings card before, but I'm not sure whether I would class the greeting card as gift either. If you posted me or if you gave me card by hand, I would class that as something. Because you kind of went out of your way, it's more effort isn't it – like actually giving you something physically.

It's weird, even though I got the gift voucher as a gift, I mean, it is a gift but… I don't know, it's a bit different to receiving a gift voucher as a card. I mean, it is a same but it feels different. I know you are getting a same thing. You are getting a voucher for something. But it doesn't feel the same.

Also, a text message, I wouldn't in my head perceive that as a gift either.

It weird that you'd only associate gifts with like physical objects.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people	☐ Display
☐ Carry	☑ Use

It was sent to me online, I really couldn't do much with it. It was just left in my email account. Compare to things actually given to me, in physical – I can see it, lying on my bed, I would look at it more and think "oh, that person got me that". But because it was in my email box, I just kind of left it and forgot about it for a bit, until I pass by the store and remind of myself I got a voucher that I can use here. I actually completely forget about it compare to physical stuffs that I can see.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Greetings card – In the beginning, I just thought it's a greeting card but I think later on, that person actually thought about my birthday and actually went through effort to go online, typing greeting messages and actually sent me. They actually remembered my birthday. And that's really really nice.

In digital case, it happens (value and cherish) later on.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☑ Relationship with the giver

It has sentimental value, it's actually in my inbox and I wouldn't delete it I would keep it.

We just know it' there.

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

I think it depends on as they thought of it as a gift, did they send me as a gift, or it was just a nice gesture that they would do.

Maybe greetings card, maybe they thought it was a gift.

The gift voucher, I don't think I regarded it as much (as a gift) because it was digital. Because it was online, compared to giving me a physical gift card. It is a gift, anyone classify it as a gift but it didn't feel as much as gift because it sent to me online.

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

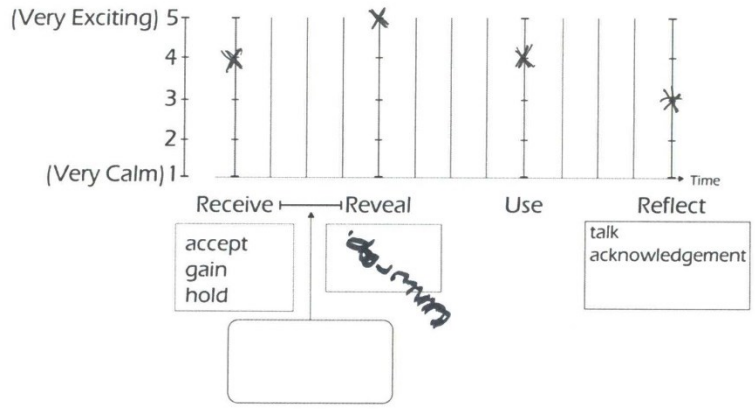
I don't think I prefer digital gifts. I don't think they mean as much as giving someone a (physical) gift. I just don't think they are worth giving.

I would definitely pick physical ones over digital. If someone give me a digital gift, "Oh, well. Ok" and I might forget about it in a day or two.

And maybe I thought if someone does giving me a digital gift, maybe I'd feel as if they not putting in as much effort into giving you that gift. I feel like it's something maybe they quickly done, because they didn't have time and therefore not putting an effort in. Maybe especially, if it is for like special occasion, I think by giving a physical gift, it shows you putting a lot of effort and become more meaningful.

Maybe a person had spent a lot more time selecting an online gift voucher, but I would not have clue.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.





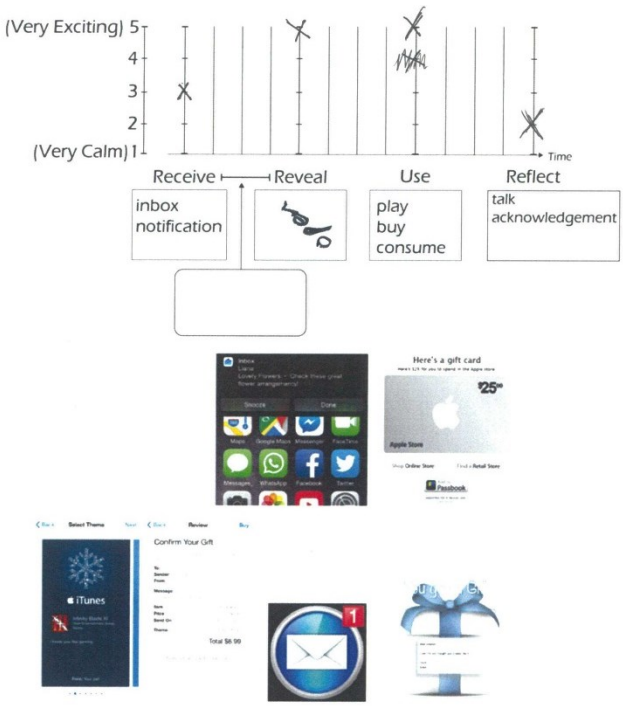
Receive – 4

Reveal – 5 I used to be like that, unwrapping really carefully. But soon I realised what's the point, it's going to go in the bin anyway. I used to keep the wrapping paper, but recently I just stopped.

Use – 4

Reflect – 3

9. Then, also draw another for a digital gift you have received before.



Receive (3) – I was calm, because it was an email. I didn't expecting it.

Reveal (5) – Revealing was quite exciting even though I just clicked on it to open it. There's still an excitement of getting a gift. But it dropped very quickly, once you seen it.

Use (5) – Using it was exciting, because I didn't have to spend my own money.

Reflect (2) – Even though I appreciated it I stay calm.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

Yes, gift is a gift. But I don't think I have to give them a digital gift back.

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☐ Photo
☐ Gift Voucher
☐ Software (MS Windows, Office)
☐ Message (Text or Voice)
☐ Music/ Movie
☐ Greetings Card
☐ Mobile App
☐ Else (Please specify below)

_____

_____

I have experienced online order of a physical product and sent to them. I had excitement because I thought the gift was something that they really needed.

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

☑ Easy to transfer

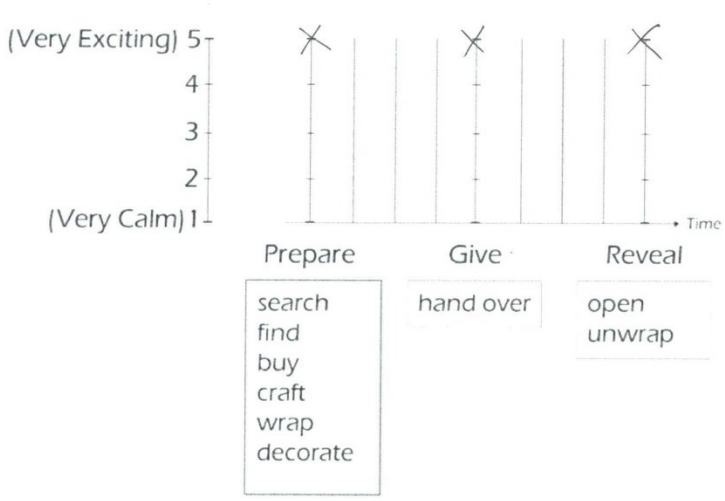
☐ Shared

Photos, music, etc. It's not a gift. It's a photo that you just quickly get from somewhere you saved and you send it to someone and it takes like 2 seconds, it's not time consuming, and it's free. It's so quick.

When you buy a gift for someone, you think about that person likes and that itself is an effort. And going out looking around.. that's effort. And you buy for them.

"This participant emphasized effort that has put on to digital gifts to regard them as a gift or not."

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.

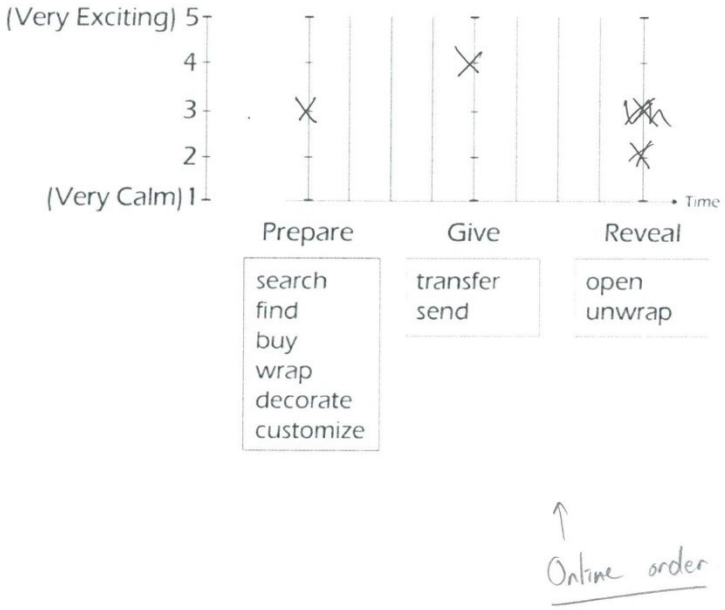


Prepare (5)

Give (5)

Reveal (5)

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Online order.

Prepare (3) I don't think I find it exciting even though I put an effort in finding it.

Give (4)

Reveal (2) – Even though they are receiving an actual product, thinking back, I was quite calm. It's not like in physical case, when you get to see their face and reaction. I think that's the best bit, seeing their reaction

P22

Gender: F

Age:

Job: Student

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Photos (printed out), because you can remember people. It seems like the person remember you in a different way… not giving you.. clothes this type of generic things, so it's more sentimental.*

What was the occasion? *I used to live in an other city far away from home. When I started to study there, a group of friends made a present to me, based on photos. I brought them with me and I remember them. 5 photos in one frame.*

Who gave it? *A group of my friends*

How did you liked it?

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☑ Story/ Meaning

☐ Other

The gift (photos) is more remarkable than utility-wise things (computers).

2-1. As a way of valuing the gift, how do you treat it after received? *I received it about three years ago in Brazil, and I took it with me here in the UK.*

☐ Show to other people

☑ Carry

☑ Display

☑ Use

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☑ Photo ☐ Music/ Movie

☐ Gift Voucher

☐ Software (MS Windows, Office)

☑ Message (Text or Voice) – birthday greetings

☑ Greetings Card

☐ Mobile App

☑ Else (Please specify below)

____Video (friend made)_____

_____

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☑ Carry

☑ Use

It's a video log, so I watch when I feel homesick.

- Shown to other people? *No*

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Some messages that I have received at the birthday. Some of them are not like a gift.. just saying "happy birthday." But some people say sad (touching?) thing that sounds like a gift for me. Saying how they like me.

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☑ Reminding a specific event

☑ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

From some events, people post photos in Facebook (photos that taken with me). The person was to make surprise or give me a gift in some way. But I don't feel like it. Because I don't feel missing like the person is. When I don't like the person so much.

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

Because I don't liked the photo and the person. Not because it was digital.

I think whenever … I received as a gift, I feel it like a gift.

She received a video created by a friend on a USB stick wrapped in a box.

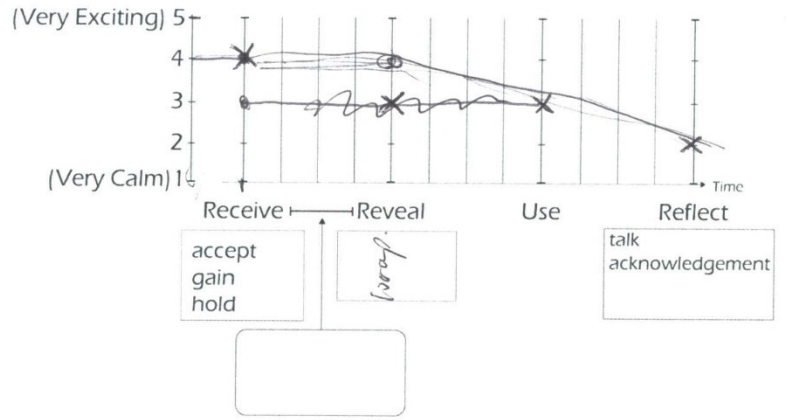
I wasn't expecting this type of gift. So I bring the box and so excited to see what's inside. When I opened the box, there was USB. I was not expecting this kind of thing and disappointed. When saw the video, it was so good. I really liked it.

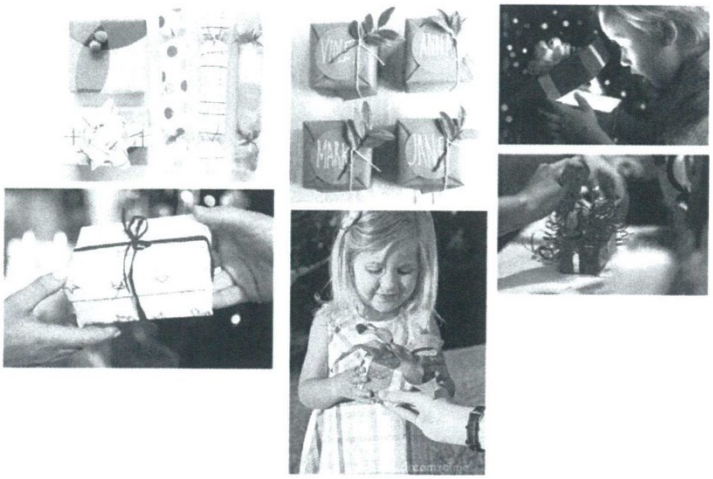
When I think about digital gifts, they can be surprising .. like this. When people are exploring an idea or… someone can send you a photo and surprise you because you are not expecting it.

But sometimes I think digital gifts are just practical. People give it for you and it doesn't have the same act of going out, looking for a present, finding…

Do you feel the same with your video gift? *No, because I could see that she did a lot of work. She chosen the music, assembled.. she might played a lot. (Like preparing a physical gift.)*

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.





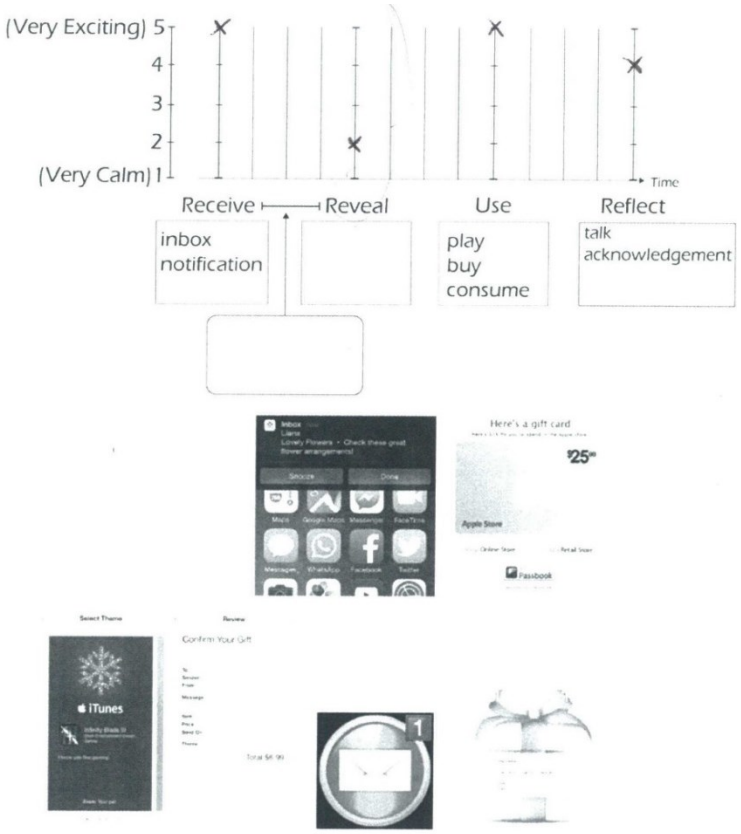
Receive – 4 When I receive it, I'm more excited to know what it is.

Reveal – 4

Use – 3

Reflect – 2 When I remember about the physical gift, I already know what it is, already used it for a long time. So not that excited.

9. Then, also draw another for a digital gift you have received before.



Receive (5) – When I received, I was so excited.

Reveal (2)

Use (5)

Reflect (4) – Every time I remember that I have the USB, I can use it and I remember the video. I'm excited to open it and to see it. It was something more remarkable than the physical gift.

And, the physical gift, I keep seeing it every time because it's displayed. But the digital gift, I don't see it every time. I see it when I open it. Physical gifts become mundane thing … like a laptop, it is useful.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo – sent through message or post on Facebook
☐ Gift Voucher
☐ Software (MS Windows, Office)
☐ Message (Text or Voice)
☐ Music/ Movie
☐ Greetings Card
☐ Mobile App
☐ Else (Please specify below)

_____

_____

I decide to post a photo for my boyfriend as a surprise.

How do you differentiate photos sent as a gift and not a gift? Sometime you post a photo to just see people at that moment. But in this case (sent via email), it was a gift for him. I felt I was giving him something like a frame. I was giving just for him. I was giving him through email as a same purpose of the framing the photo.

3. What kind of special treatment did you do?

☐ Customize

☑ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

☐ Easy to transfer

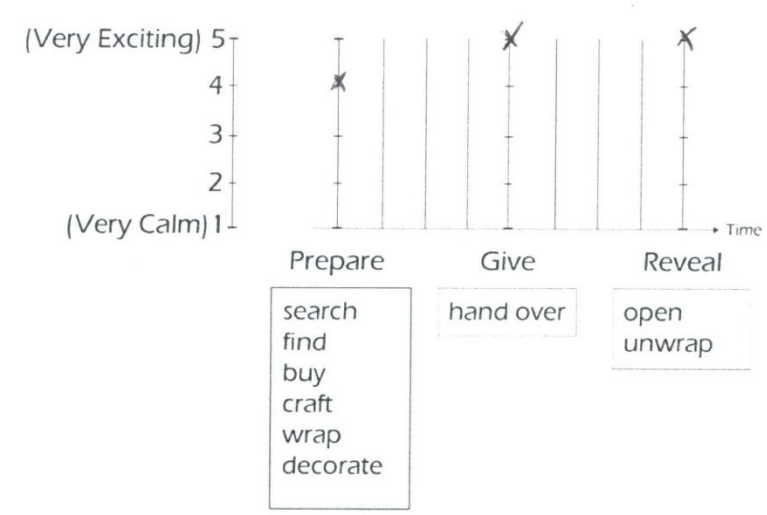
☐ Shared

☑ A lot of people do.

Facebook message and photos – it's a different way of communicating, it's not a gift.

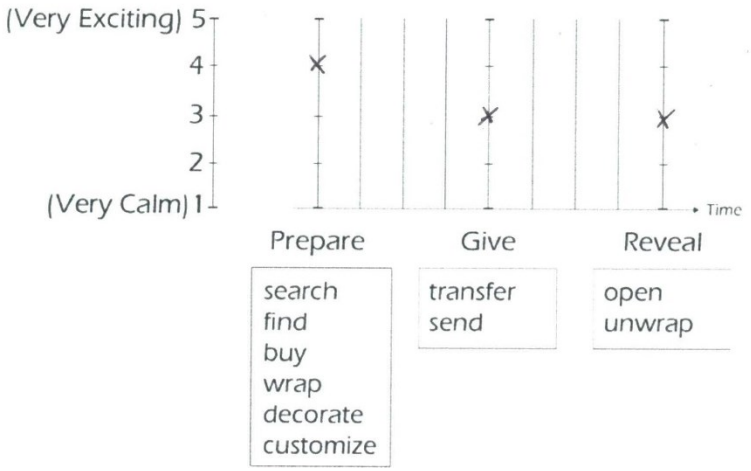
Email was the gift and it is different from Facebook. It was just for him.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



I'm more excited when someone opening the gift than when I open it.

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.

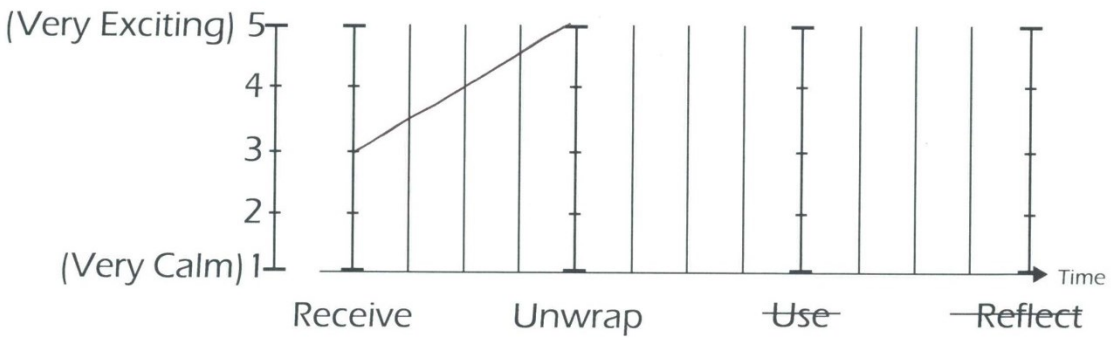


Workshop Debriefing

1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

(1)	Physical	>	Digital
(2)	Physical	<	Digital
(3)	Physical	=	Digital

2.When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.



P23

Gender: F

Age: 25

Job: Research Assistant

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Orchid*

What was the occasion? *Birthday*

Who gave it? *Friends*

How did you liked it?

2. Which feature of the gift do you value particularly? *Colour coded with the cake.*

☑ *Aesthetical pleasure (Design, Material)*

☐ Utility

☑ *Story/ Meaning*

☐ Other

2-1. As a way of valuing the gift, how do you treat it after received? *I placed it right in the middle of the living room. The first thing you can see when entre the house.*

☐ Show to other people

☐ Carry

☑ Display

☐ Use

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☐ Photo

☐ Music/ Movie

☑ Gift Voucher

☑ Greetings Card

☐ Software (MS Windows, Office)

☐ Mobile App

☑ Message (Text or Voice)

☑ Else (Please specify below)

___money transfer_____

_____

I revisit the nice text messages my boyfriend sent me. Especially when I'm abroad.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☐ Carry

☑ Use

Digital gifts are generally useful

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Text messages, Greetings card – not necessarily meant as a gift

6-1. Which feature of the content made you to cherish it overtime?

☐ Useful

☐ Reminding a specific event

☑ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

Amazon voucher

(e.g. from study = compensation)

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

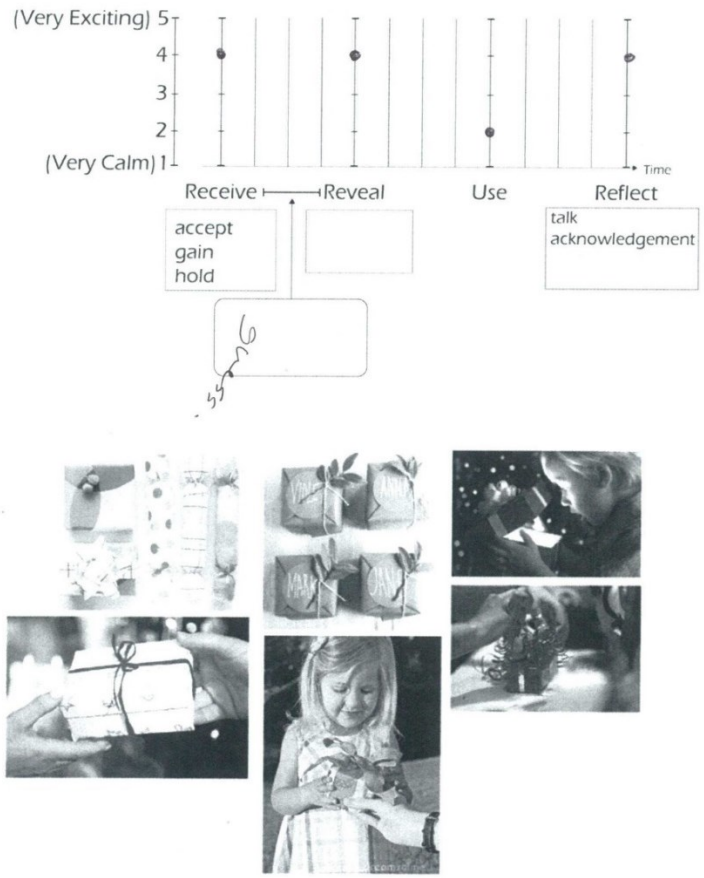
I'm generally positive.

The perception about the gift has changed a bit.

Now the convenience of the digital gift fits into my life style. (unlike before)

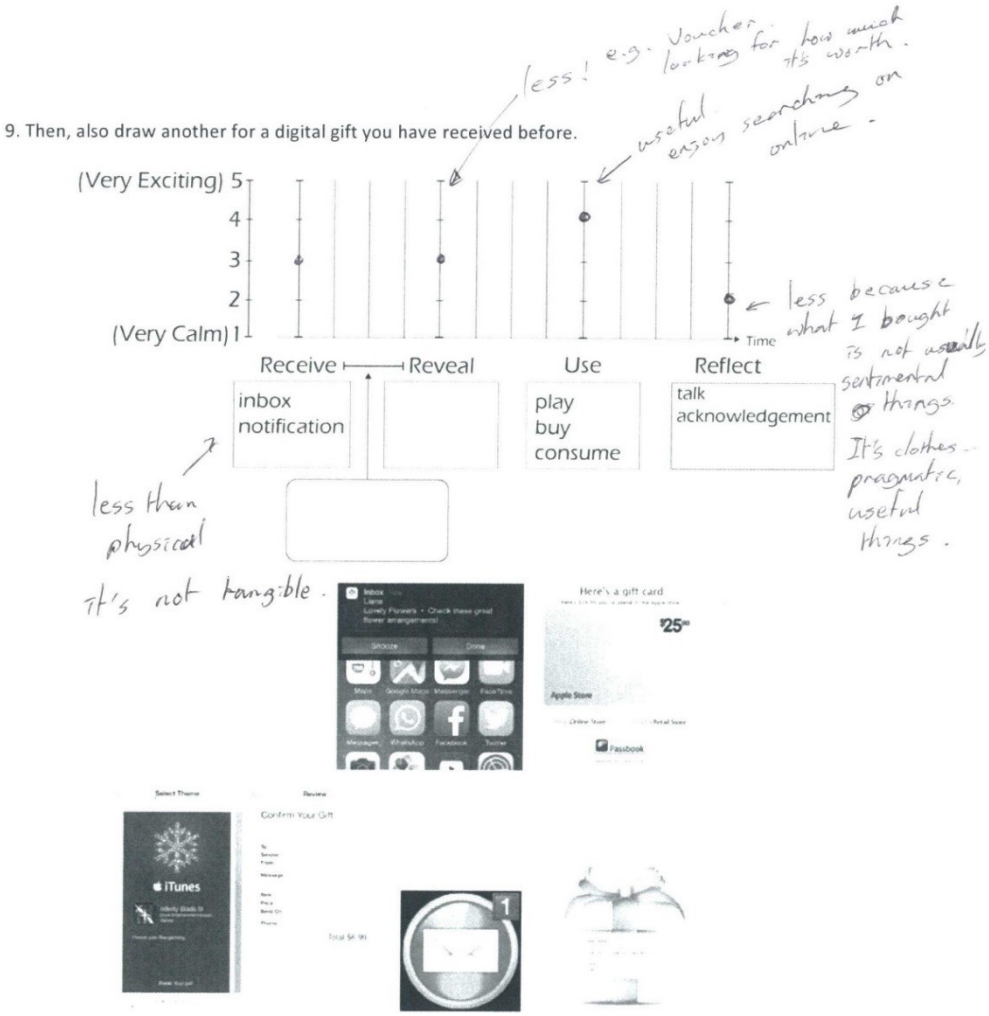
But it depends on who they are from too. If I had received an Amazon voucher from my mum for birthday, I would be really happy, but If that was from my boyfriend, that would be horrible.

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.



Guess what the gift might be. – in between receive and reveal

9. Then, also draw another for a digital gift you have received before.



Receive (3) – less than physical "it's not tangible"

Reveal (3) – Less! e.g. vouchers: I tend to look for how much it's worth. (rather than the meaning)

Use (4) – useful, enjoy searching on online (to spend a voucher)

Reflect (2) – Less. Because what I bought is not usually sentimental things. It's clothes, etc. something pragmatic and useful things.

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo
☐ Gift Voucher
☐ Software (MS Windows, Office)
☑ Message (Text or Voice)
☐ Music/ Movie
☑ Greetings Card
☐ Mobile App
☐ Else (Please specify below)

_____
_____

3. What kind of special treatment did you do?

☑ Customize

☑ Decorate

"For photos, I created a photo collage for my boyfriend's mum."

"I used an mobile app to create the collage."

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

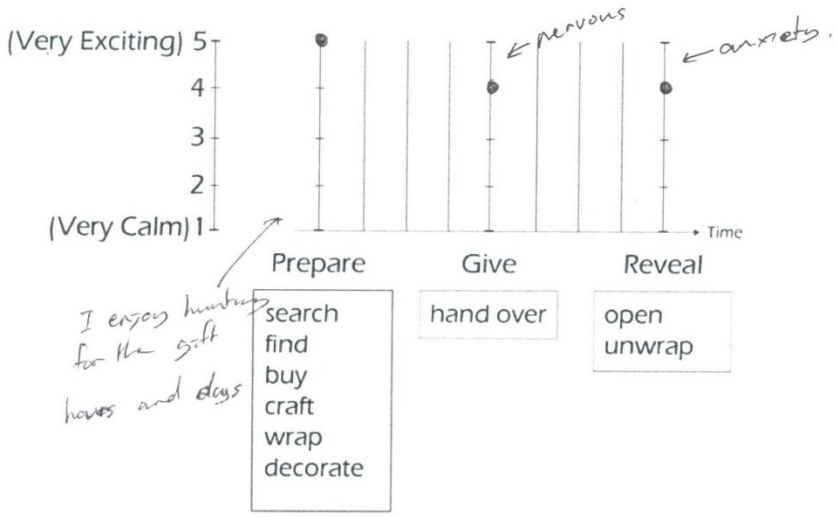
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☑ Easy to transfer

☐ Shared

Less effort needed.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.

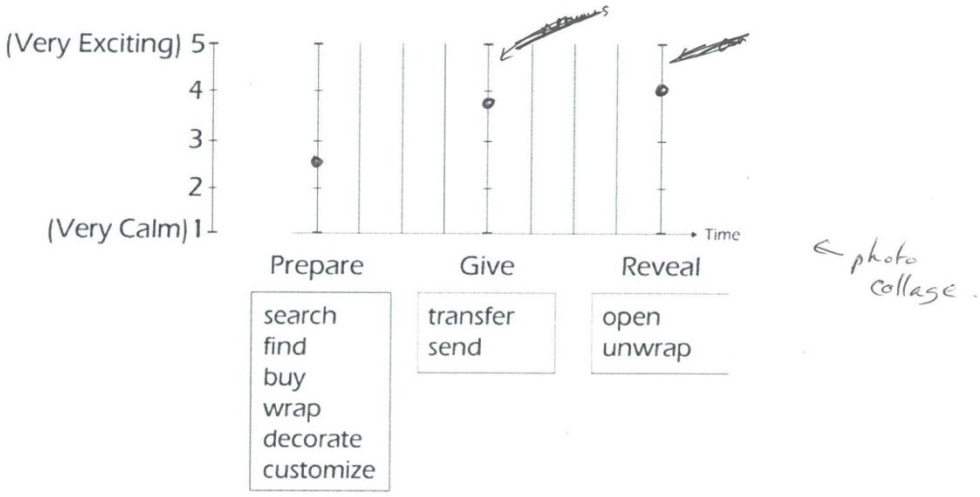


Prepare (5) – I enjoy hunting for the gift hours and days.

Give (4) – become nervous

Reveal (4) – There's a bit of anxiety.

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



"This participant emphasized [effort] that has put on to digital gifts to regard them as a gift or not."

Thinking of the photo collage.

Prepare (2.5)

Give (4)

Reveal (4)

This participant emphasized effort that has put on to digital gifts to regard them as a gift or not.

P24

Gender: F

Age: 24

Job: PhD student (HCI)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you. *Cake*

What was the occasion? *Birthday*

Who gave it? *Friends bought it as a surprise.*

How did you liked it? *I liked that they've chosen the flavour I liked – cheese cake, not chocholate.*

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☐ Story/ Meaning

☑ Other

- Did you keep anything besides the cake in ? *They put the card with it. It reminds me of that experience and memory. Although I couldn't keep the cake.*

2-1. As a way of valuing the gift, how do you treat it after received? *I put it (card) aside, because I have a box with all the postcards, birthday cards, and greetings cards from my friends.*

☐ Show to other people

☐ Carry

☐ Display

☐ Use

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☑ Photo

☑ Gift Voucher

☐ Music/ Movie

☐ Greetings Card

☐ Software (MS Windows, Office)

☐ Mobile App

☐ Message (Text or Voice)

☑ Else (Please specify below)

___money transfer_____

_____

Gift is for more special occasion, but you send messages everyday, so it's no longer perceived as a gift.

Special messages? *I would see it as a communication, not as a gift.*

What kind of photo did you receive as a gift? *When my parents were visiting me and we went to London and Tower Bridge, and we took a photo. Then they produced a postcard with that personalised photo and I received photo at the machine and also received by email. It was in a form of printable postcard that I can send.*

For example, if me and my friend went on holiday together to somewhere memorable and beautiful… and we took a photo together on the beach .. and if afterwards he or she send me that photo, then I would see it as a gift. Not just everyday photo… like food (laugh).

But wasn't it the service that sends you the email? *Yes, but I liked my parents paid and I produced it by myself and all of my family members got one.*

But it was the selfie machine took our photo.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☑ Show to other people – I shared it on my Facebook

☐ Display

☐ Carry

☑ Use – as a screen photo, as a profile photo.

I tend to digitise a lot of things in my life nowadays. Because I move, relocate a lot to different places past few years.

What kind of things do you digitise? *So, for example, if someone buy me a book they buy me a Kindle book .. and card.. I would see the digital card is valuable. It's difficult to keep the physical contents of something.*

Do you necessarily revisit those photos? *If it's in my photo gallery (PC) or folders, I wouldn't necessarily go back very often, but if it's really valuable to me, I just put it in really ambient displays such as (phone) lock screen that I will see all the time.* Like profile photo? Yes.

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

6 -1. Which feature of the content made you to cherish it overtime?

☐ Useful

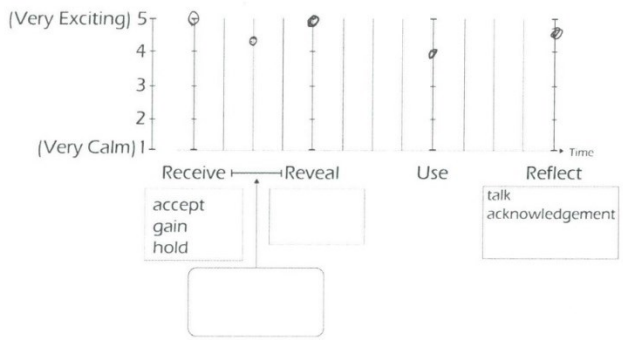
☐ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.





Receive – 5

Reveal – 5

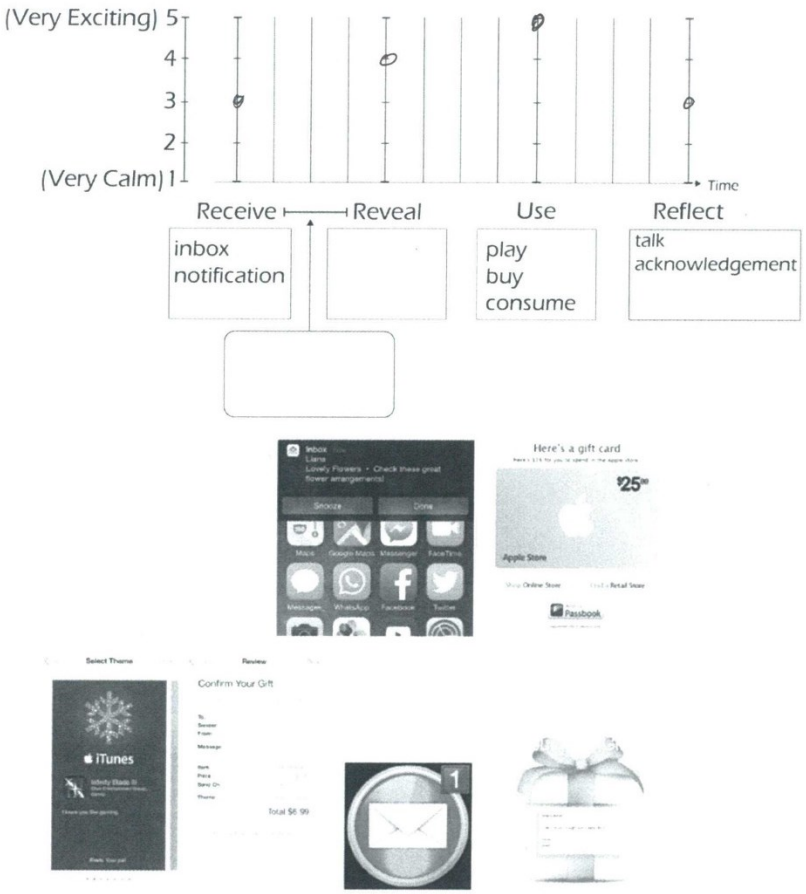
Use – 4

Reflect – 4.5

What do you do just before you open the gift? *Screeming. (laugh) When I receive (a gift), I would be really surprised. .. This is amazing. Although I didn't know the content yet, but I think someone made an effort to surprise me was really precious as well. I will be exciting here as well. But I tried myself to calm down a bit.*

Do you unwrap carefully? *Yes, carefully.* In order not to damage to the paper*? Yes, of course.*

9. Then, also draw another for a digital gift you have received before.



Receive (3) – Not as exciting (as physical)

Reveal (4) – Reveal may be exciting a bit.

Use (5) – I think consumption may be better here.

Reflect (3)

Receiving process in digital format, you have so many notifications from mobile phone everyday and sometimes they are spam. So (I) don't feel very excited really.

Would it be the way you receiving the notification (of the gift) is the same as the other ones (text messages)? *Yes, as other normal communications. As I said, text messages not perceived as gift. So, when I receive the text message, even though… maybe.. something inside is a gift element, I wouldn't see it as a gift. So I wouldn't be so exciting.*

It is same for other 'gifts' ? Like vouchers? *Seeing the title of the email saying "Your received a gift voucher", I wouldn't be excited but happy to know someone sent me the gift (voucher). But not as much as physical gifts.*

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo – through email
☐ Gift Voucher
☐ Software (MS Windows, Office)
☐ Message (Text or Voice)
☐ Music/ Movie
☑ Greetings Card
☐ Mobile App
☑ Else (Please specify below)
Flash (Digital Interactive greetings card)_____

Photo – good memory, not random photos

3. What kind of special treatment did you do?

☐ Customize

☐ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

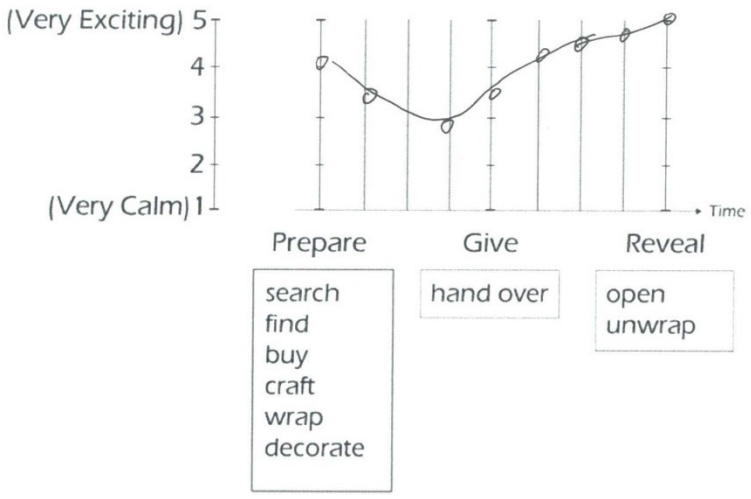
☐ Copied

☐ Easy to transfer

☐ Shared

☑ Less effort needed. – added by the participant

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.

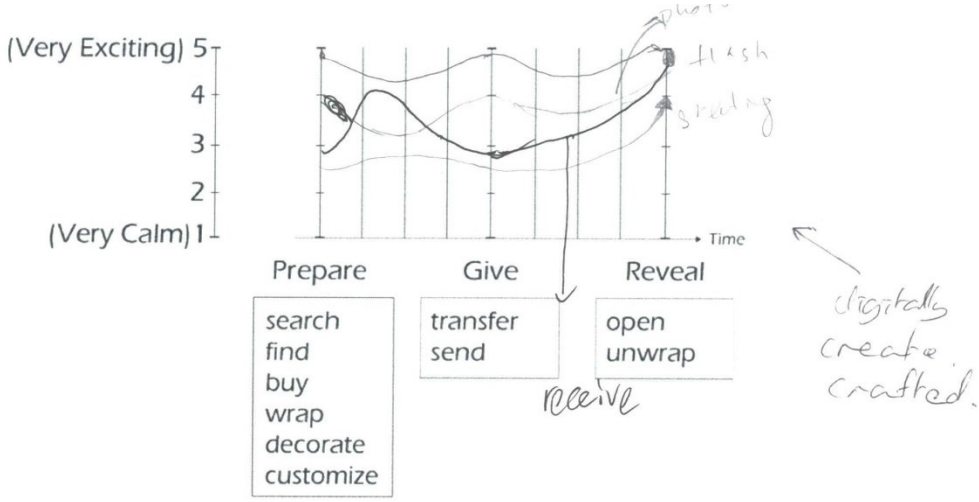


Prepare (4) – I enjoy hunting for the gift hours and days.

Give (3.5) – become nervous

Reveal (5) – There's a bit of anxiety.

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



You still feel quite excited when the receiver reveals. *(Excitement) when someone receiving it, I think it's lower (marked 3). Because I send it either by email or messages.*

Do you try to imagine how that person would reveal? Is that you become excited?

Yes, because they give me a response – "I really like it", "It's really special"

Would say (excitement for Reveal stage) is same level with physical? *Depends on the individual gift. If they are both (physical and digital) well prepared and specially designed for the receiver, I think it will be equally exciting.*

Was there any example for this (Digital) ? *Like the flash I made for my friend. I spent a lot time on it. Took our photos and put in the flash, designed everything by myself and it's interactive, clickable and it will reveal different elements. I was expecting them to be really excited when they receive it. I also felt happy about the process.*

1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

(1) Physical > Digital

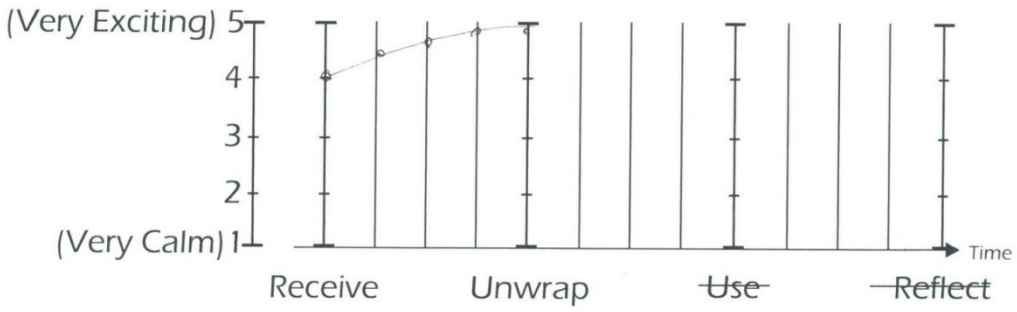
(2) Physical < Digital

(3) Physical = Digital

+ playing out of the music → experience itself.

whole experience as the gift.

2.When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.



give suspence of the result.

~~beca~~ becareful with the data

↳ adds the excitement.

P25

Gender: F

Age: 25

Job: PhD student (HCI)

[Questions for receiver]

FOR PHYSICAL GIFTS

1. Tell me about your gift that you received in the past and become meaningful to you.

What was the occasion?

Who gave it?

How did you liked it?

2. Which feature of the gift do you value particularly?

☐ Aesthetical pleasure (Design, Material)

☐ Utility

☐ Story/ Meaning

☐ Other

2-1. As a way of valuing the gift, how do you treat it after received?

☐ Show to other people

☐ Carry

☐ Display

☐ Use

FOR DIGITAL GIFTS

4. Which of the followings in the list have you received as a gift?

☑ Photo
☑ Music (mp3 files)
☑ Gift Voucher
☑ Greetings Card
☑ Software (MS Windows, Office)
☑ Mobile App

☑ Message (Text or Voice)

☑ Else (Please specify below)

___money transfer_____

_____

Photo messages – it depends. Sometimes it's just like a joke communications. Other times, so.. my friends occasionally send me pictures of her little boy, and considered them a gift. Because it's like sharing special moments. So.. I was one of the first people she sent pictures of to.. when he started crawling, things like that. So sharing that moment is like a gift. Messages too. Something special. Not like everyday photo.

5. How did you treat the digital content as a way of valuing a gift from someone else, comparing with the experience you had with any physical gift.

☐ Show to other people

☐ Display

☐ Carry

☑ Use

So with photos as I will make sure that I stored them somewhere safe so I always got them. And yes, I kind of cherish them and make sure that they (are) stored somewhere safely and I can refer back to them.

With music, I tend. I have quite a lot of music so I tend to. I can remember when I here it that this was gifted by somebody but probably have.. like higher value as physical gifts. Often forget.

In terms of other things.. When I'm using something, like when I'm using software that's been gifted, I remembered that person who gifted that to me and I should be grateful.

- You kind of using it as a way of valuing it? Yes,

6. Is there any digital content that you ***have received from someone else, which was not necessarily meant to be a gift, but you cherish and value it constantly***?

Software – Because it was something for functionality. … For my course, (he) just giving me a software that I needed. At that time, I think they would've just seen it as like… oh you just need it, so I'll just gonna buy you.. And I saw guite high value in it. I thought it is a really sweet gesture. Something that has a use.

6 -1. Which feature of the content made you to cherish it overtime?

☑ Useful

☐ Reminding a specific event

☐ Relationship with the giver

7. Among the digital artefacts listed in 4, is there anything you ***have received as a gift but did not regarded much like a gift***?

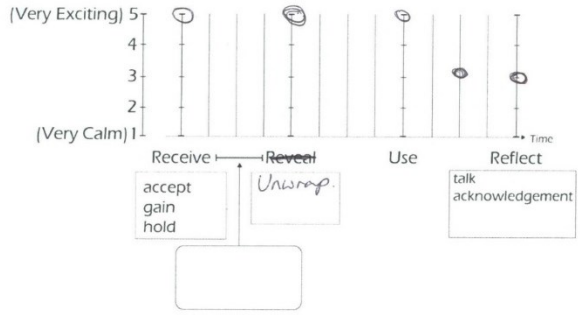
Friends have emailed me like vouchers for .. offer for a restaurant .. and don't see them as a gift, I see them as something that I can find myself. Even they have put thought into it, and chosen to share it with me.

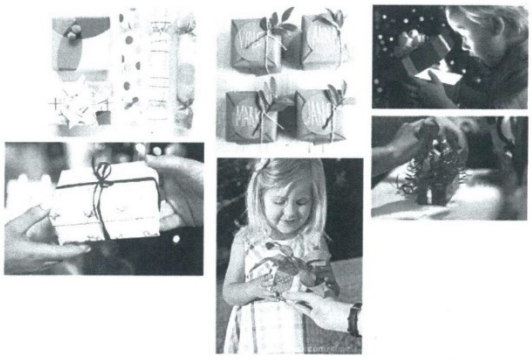
And.. potentially.. the music. Music that isn't that I like. If you know what I mean? When somebody send me a track and I.. (hm) I'm like.. it's not my style of music.

When somebody gives you a gift that you don't physically like, you don't see as a gift. (Laugh).. You have to have that reaction.. "Oh…. Thank…s…!!" .. Kind of false thank you. (Laugh)

7-1. And could you tell a reason for that? (This could be a personal opinion about the digital gift.)

8. Think about the time you received a physical gift, when was the moment you were mostly excited/pleased regarding the whole process of receiving a gift? Please specify below as an example shown.





Receive – 5

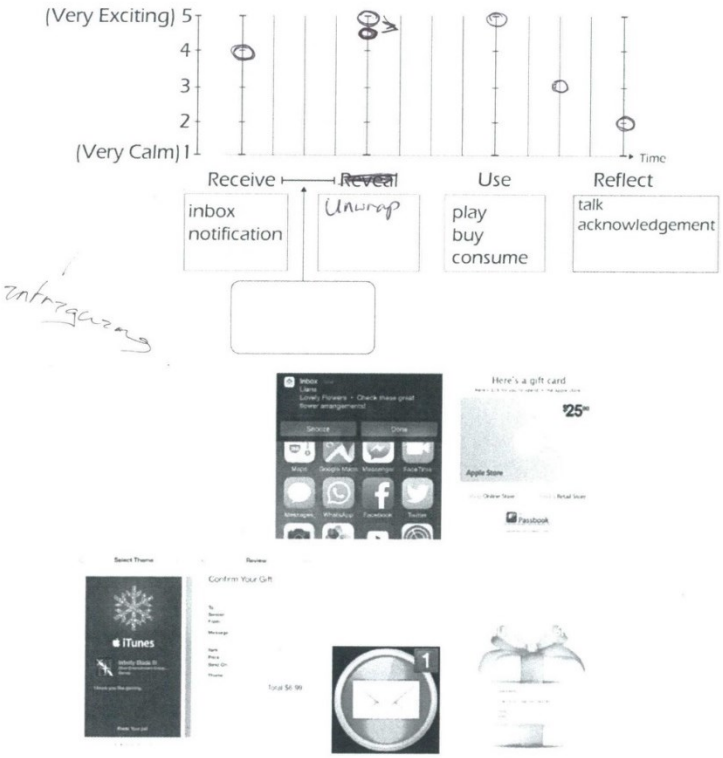
Reveal – 5

Use – 5

Reflect – 3

I find the receiving and unwrapping very exciting. I think, this use one, kind of goes down with time. So for me, the first use of it is very exciting still. As it becomes more common place, it just .. goes to there.. somewhere down here (3). And then reflecting, I would still kind of exciting over time.

9. Then, also draw another for a digital gift you have received before.



Receive (4) – I find it more intriguing than exciting. Like.. I find it.. "oh, what's that?" but not necessarily going "Oh, it's present!" Because it's not traditional sense. Even though it might say it is a gift. I would be confused by it. Because it doesn't look like a gift.

Reveal (5) – I might get more excited as I discover what it is and unwrap it.

Use (5) – And.. again… it quite excited when I play it for the first time but I will probably say that goes down probably faster and becames less and less in terms of reflection.

Reflect (2)

When you discover what it is that somebody has bought for you, there is that initial excitement. I think that happens in both gifts. But again, it depends on the gifts, doesn't it. And how much .. I suppose the thought and the giver as well. – it can be affected. But, maybe not as much as the physical gift, because you are not unwrapping, you are just opening a file. So you are not physically grabbing something and pulling apart and revealing.

Asked again about the excitement at the Reveal stage. *Yeah, probably that one might be 4.5 rather than 5, in comparison (to physical gifts) But in reflections to itself, it probably got that stage (5).*

10. When you received a digital gift, do you feel obligation to reciprocate in a similar way to the physical ones?

(Questions for giver)

~~1. If you have never experienced giving a digital gift to someone else, is there any reason for it?~~

~~(Please give any personal opinion about digital gifting.)~~

2. Which of the followings in the list did you give as a gift?

☑ Photo – Facebook posting: nice way to say thank you.

☐ Gift Voucher

☐ Software (MS Windows, Office)

☑ Message (Text or Voice)

☑ Music/ Movie

☑ Greetings Card – when they first came out, it was an exciting thing to do.

☐ Mobile App

☐ Else (Please specify below)

_____

Are you used to creating/decorating photos as a gift? Yes, I use software to make things. (e.g. photoshop)

3. What kind of special treatment did you do?

☑ Customize

☑ Decorate

4. If you have ***offered a digital content to someone else but did not regard this as a gift,*** why was the reason?

☐ Copied

☐ Easy to transfer

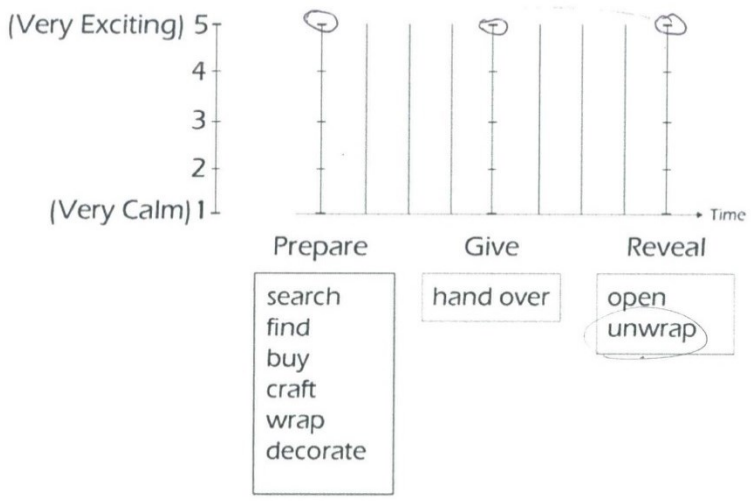
☑ Shared

I've given music to friends before and again it's because my taste .. and I'm sharing music with a lot of people and used to promote music. And I think they don't see that as a gift. Just something I'm doing.

Even though I might consider it sharing other songs that I think personally illustrate somebody's behaviour or is quite keen to what they like, so I might make a playlist for somebody. And I did that once because I used to run a website and I put a playlist up especially for somebody because they told me they want me to find songs specifically for their style. I secretly embedded into the website and put up this playlist. I mentioned it to them like a month later and they were like "Oh, I didn't even know that was there." So they didn't think it was anything for them. They thought they didn't see it because it was digital content online, I guess.

It was actually a gift. Because I physically changed the website and it was a nice gesture. They just didn't realise that it was there.

5. Think about the time you gave a **physical gift**, when was the moment you were mostly excited/pleased regarding the whole process of gifting? Please specify below as an example shown.



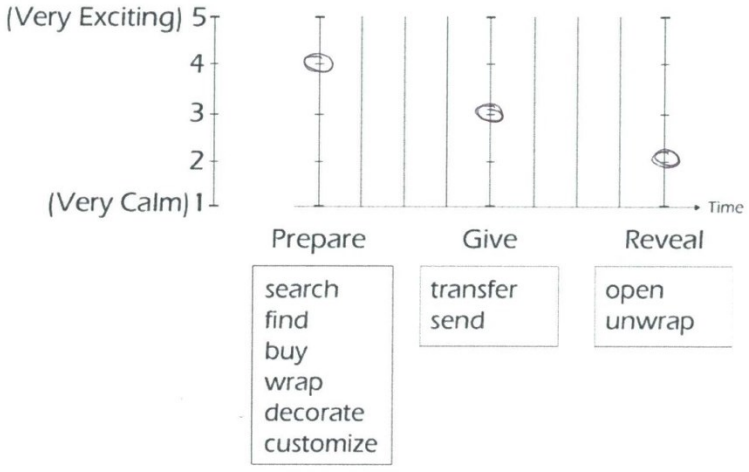
Prepare (5)

Give (5)

Reveal (5)

I get very excited throughout the whole process. So I'm kind of up here (5) the whole time.

6. Then, if you had experienced gift-giving a **digital artefact**, draw another for a digital gifting below.



Prepare (4) – I guess, I actually find it less so. So, I find it quite exciting when I find something I know somebody will like. But certainly less than that (physical gift).

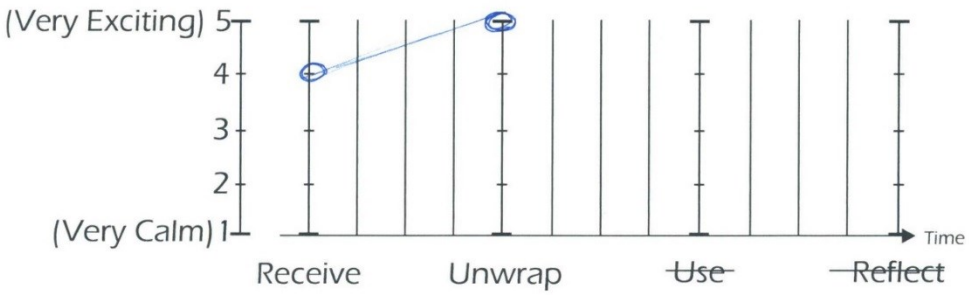
Give (3) – I feel calmer when I giving it as well.

Reveal (2) – I guess I'm not that bothered about their reaction to it either. When it's digital gift, it's kind of it's there. Today, I messaged somebody saying "Attract me, you should listen to this." I consider that as a little gift because it's something that I heard and felt (they would) personally like. But I also know that they probably won't listen to it. I don't know.. I'm not so bothered.

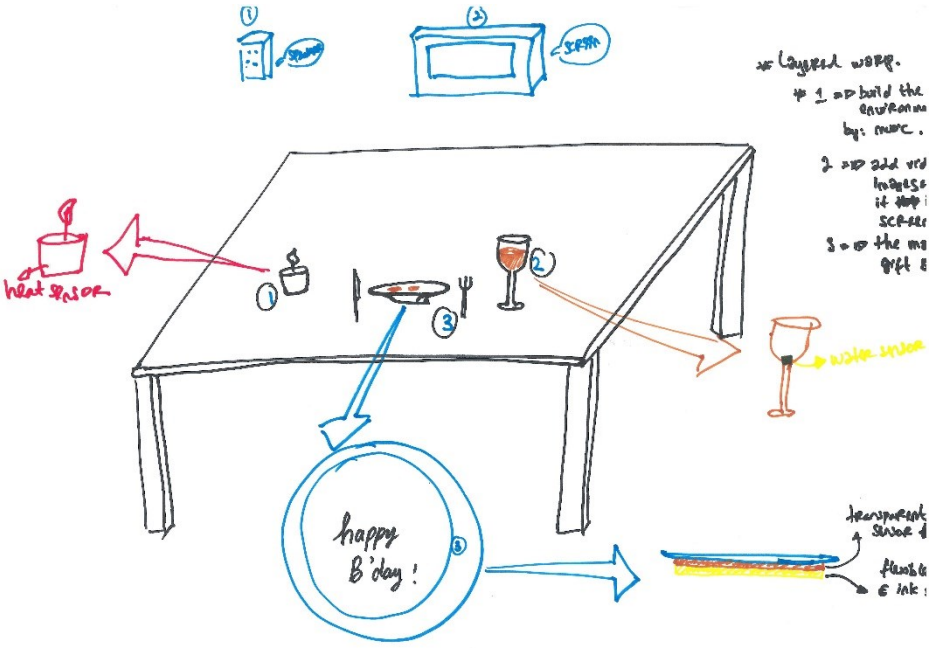
1. During the workshop, you received digital gifts (a music and gift voucher sent via email) by unwrapping the tangible object. According to your experience and regarding the scenario, which of the two medium did you more considered like a gift?

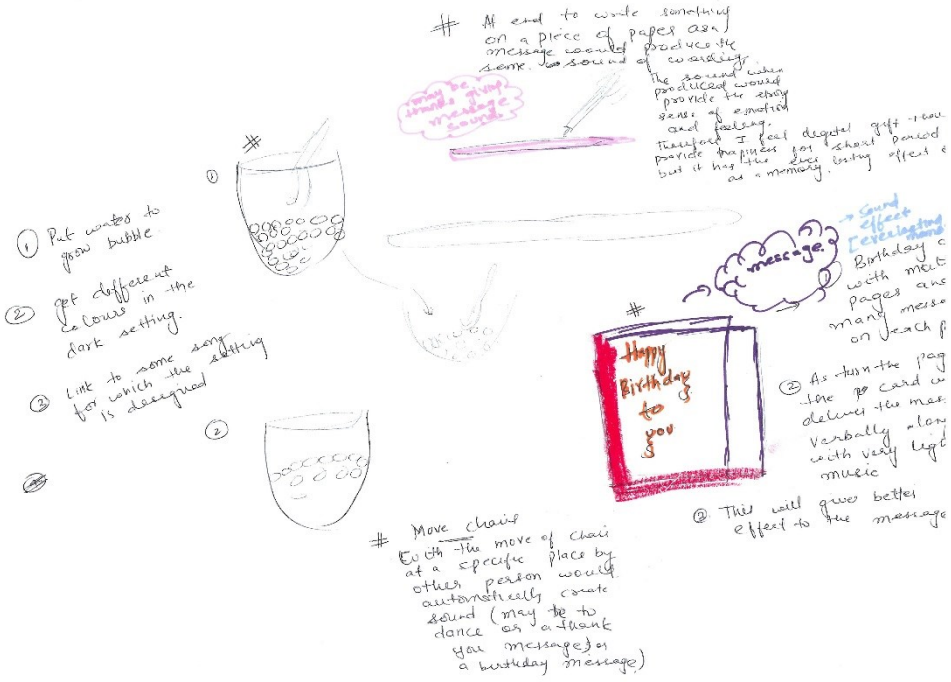
(1)	Physical	>	Digital
(2)	Physical	<	Digital
(3)	Physical	=	Digital

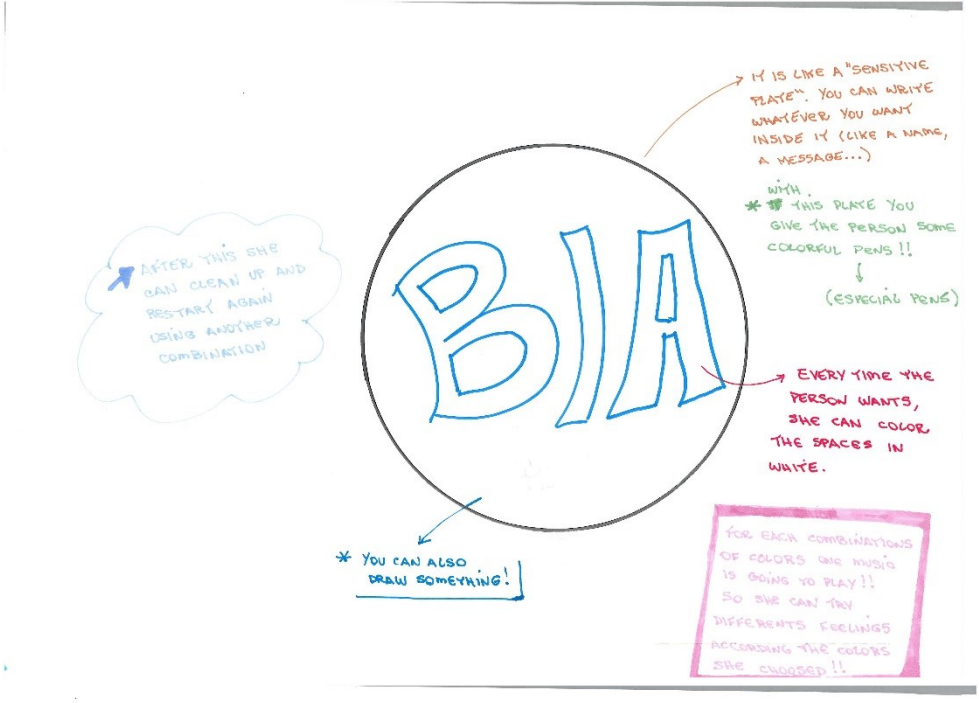
2.When you received and unwrapped your gift in the workshop how did you felt? Could you plot the level of excitement about your receiving experience. This is referring to digital gift receiving experience.

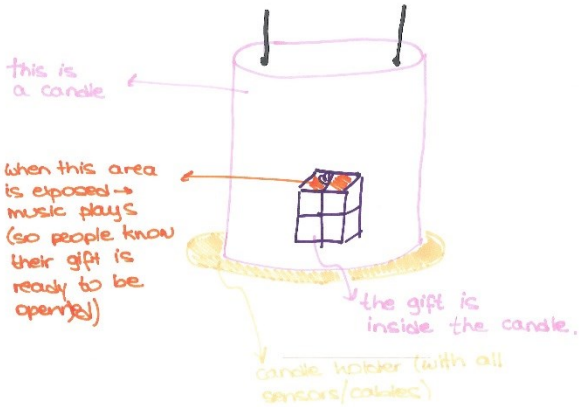


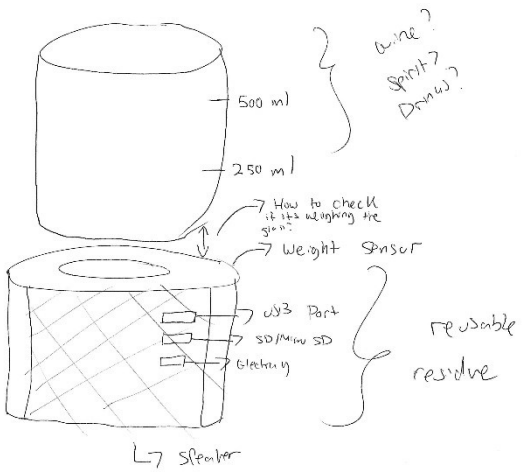
2. Idea Sketches from Design Workshop with Hybrid Gifts

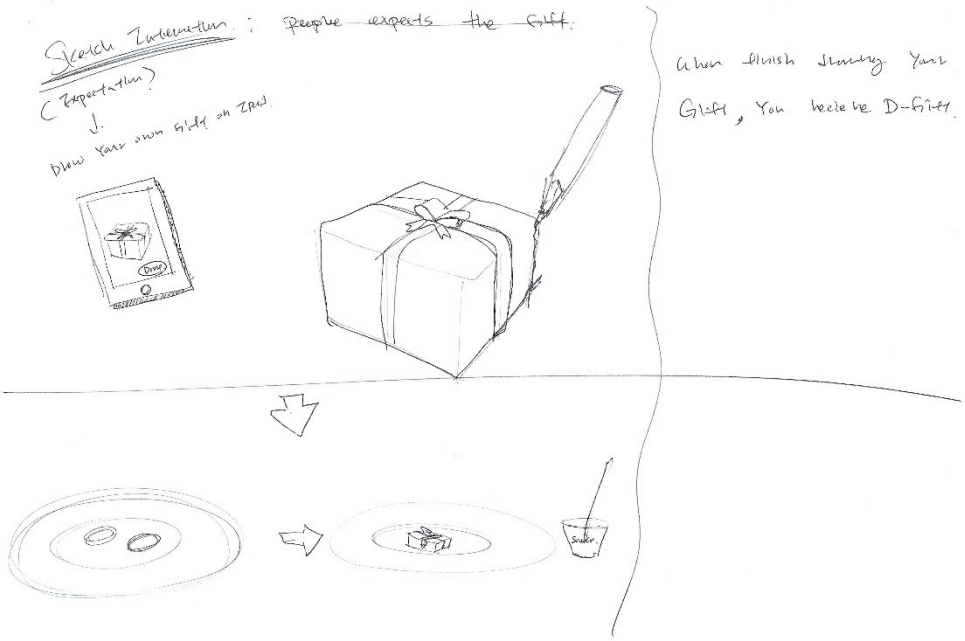


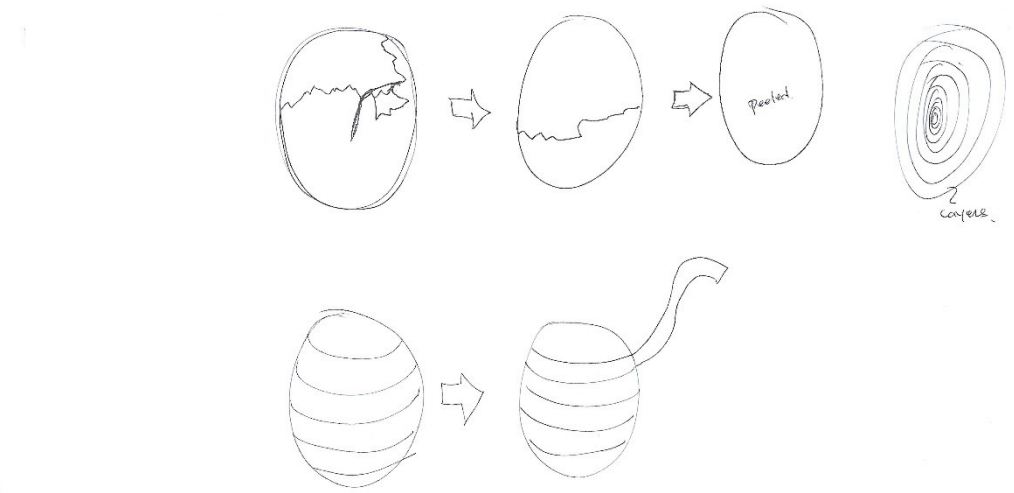


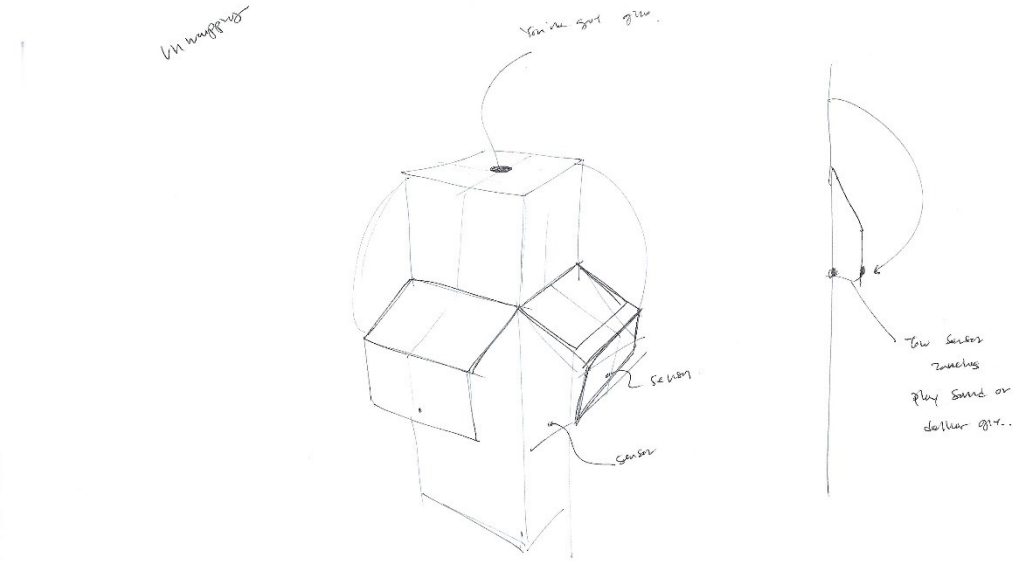

BIA
IT IS LIKE A "SENSITIVE PLATE". YOU CAN WRITE WHATEVER YOU WANT INSIDE IT (LIKE A NAME, A MESSAGE...)
WITH
* THIS PLATE YOU GIVE THE PERSON SOME COLORFUL PENS !!
(ESPECIAL PENS)
AFTER THIS SHE CAN CLEAN UP AND RESTART AGAIN USING ANOTHER COMBINATION
EVERY TIME THE PERSON WANTS, SHE CAN COLOR THE SPACES IN WHITE.
* YOU CAN ALSO DRAW SOMETHING!
FOR EACH COMBINATIONS OF COLORS ONE MUSIC IS GOING TO PLAY !!
SO SHE CAN TRY DIFFERENTS FEELINGS ACCORDING THE COLORS SHE CHOOSED !!

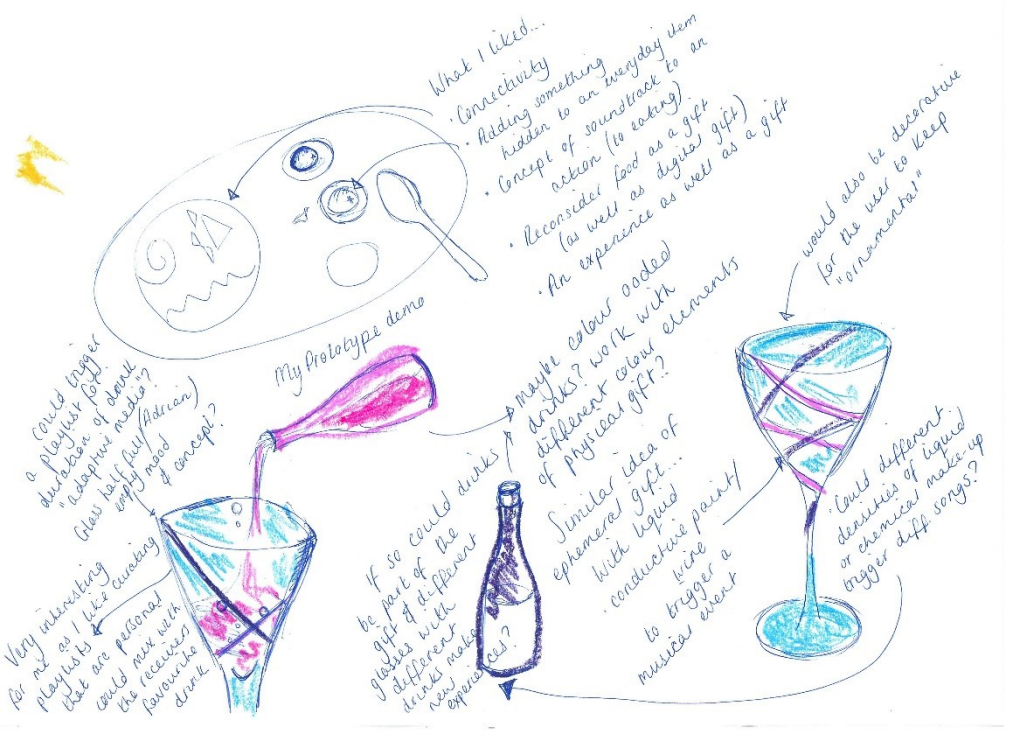

this is a candle
when this area is exposed → music plays (so people know their gift is ready to be opened)
the gift is inside the candle.
candle holder (with all sensors/cables)

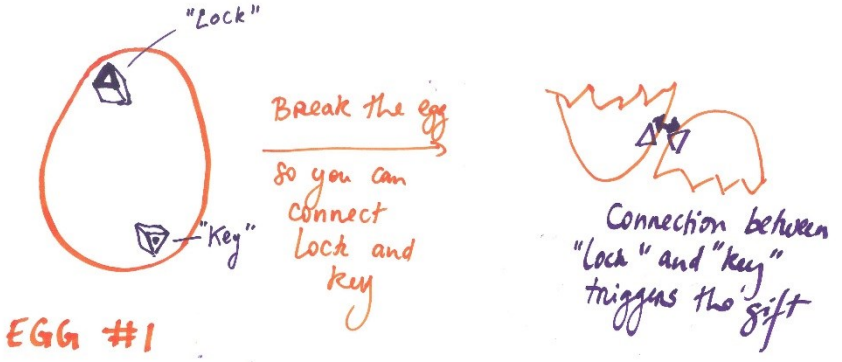

500 ml
250 ml
How to check it is weighing the gift?
Weight Sensor
USB Port
SD/Mini SD
Electricity
Speaker
wine?
Spirit?
Drink?
reusable
residue


Sketch Interaction: People expects the Gift.
(Expectation)
Draw Your own Gift on Card.
When finish drawing Your Gift, You receive D-Gift.
Draw
Smile

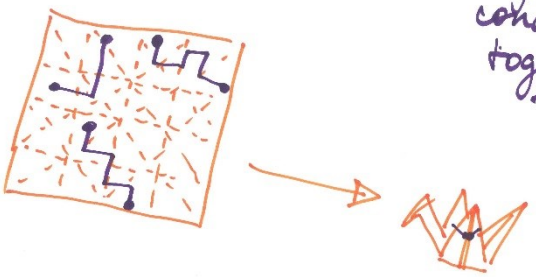

Peeled
covers


Unwrapping
You've got
sensor
sensor
touching
play sound or
dollar sign..


What I liked...
· Connectivity
· Adding something hidden to an everyday item
· Concept of soundtrack to an action (to eating)
· Reconsider food as a gift (as well as digital gift)
· An experience as well as a gift
My Prototype demo
Could trigger a playlist for duration of drink
"adaptive media"
Glass half full/half empty mood of concept?
Very interesting for me as I like curating playlists
Could mix with the received favourite drink
If so could drinks be part of the gift of different glasses with different drinks make new experiences?
maybe colour coded drinks? work with different colour elements of physical gift?
Similar idea of ephemeral gift... with liquid conductive paint/ wire to trigger a musical event
would also be decorative for the user to keep "ornamental"
Could different densities of liquid or chemical make up trigger diff songs?

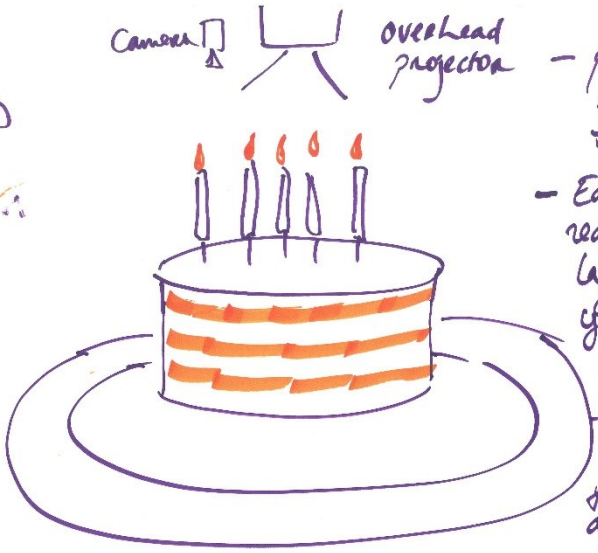

"Lock"
"Key"
Break the egg
So you can connect lock and key
Connection between "lock" and "key" triggers the gift
EGG #1

CONDUCTIVE ORIGAMI



You need to fold the Origami to bring the conductive points together and trigger the gift

THE AUGMENTED CAKE



- projects an image on the cake.
- Each time you reach a new layer, it shows you a different image
- It encourages you to eat the cake in a particular way
- Can be made "social": each person at the table eats a different part of the cake and gets a part of the gift

