Intergenerational User Experience with Digital Memorial Artefacts

By

Vincere Ip

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Carleton University
Ottawa, Ontario

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Abstract

This study investigates the generational gap in modernized mourning rituals involving communicational technology such as social networking services. Current rituals of mourning have evolved using technology as a medium, but research in improving user experiences in the field of thanatosensitivity (a research field on death and technology) is limited. A diary study and semi-structured interviews were conducted to find design considerations that can be suggested to improve the user's digital interactions. This study identified that the younger generation is unconsciously comfortable with technology, whereas the older generation is uncomfortable trusting it. Although there are differences between these two generations, their desire for continuing to bond beyond death and to leave a life experience legacy are the same. As a result, four primary design considerations were suggested for products in this field: familiarity, continuing bond, flexibility, and affective-cognitive experience. Also, flexibility in design is desired, particularly in terms of portability and being able to connect globally. Lastly, the sensorial connection has been seen in both generations.

Keywords: Death, Design, Memorial Artefacts, Thanatosensitivity, Generational gap, User Experience

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Glossary¹

Baby Boomer: a person born in the year range 1946-1965

Bereavement: a period of mourning of a deceased family or friend

Continuing bond: a characteristic of grief, in which people innately recognize grief even if they have not physically experienced it

Digital legacy: an e-monetary value that was left behind after he or she dies, or the preservation of the deceased's data left on the internet

Generation Y: a person born in the 1972 - 1992

Generation Z: a person born between 1993 and 2011

Grief: an emotion of loss that results from a deceased loved one

HCI: an acronym for human-computer interaction. HCI is a field of study that focuses on human interaction and experiences with technology.

Heirloom: artefacts that are passed down from one generation to the next

Mourning: the feeling of sadness over the death of a loved one

Ritual: a performed action or ceremony in accordance with one's traditions

SNS: An acronym for social networking site. Boyd and Ellison (2008) defined it to “1) construct a public or semi-public profile within a bounded system, 2) articulate a list of other users with whom they share a connection, and 3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site” (p. 211).

¹ This glossary lists repetitive terminologies used in this thesis. All terminologies are defined in accordance with the study field of this thesis. Generalize definition of terminology is gathered from Cambridge Dictionary (<https://dictionary.cambridge.org/>).

Thanatosensitivity: “humanistically-grounded approach to HCI research and design that recognizes and actively engages with the facts of mortality, dying, and death in the creation of interactive systems” (Massimi & Charise, 2009, p. 251).

Triangulation: inclusion of multiple perspectives (typically three) to prevent bias and provide further insights

“Everyone’s generation is different,
and the way we memorialize is different.”
- Participant B6

“If you grew up with technologies,
you would be comfortable with it.
It is just a different way of looking at it.”
- Participant B3

Chapter 1: Introduction

The recent rise of digital technologies such as smart devices has allowed them to become a dominant and integral part of our daily lives. We recognize our dependency on digital technologies, whether through interactions with a product interface or interactions with social networking services through a screen. For example, during the COVID-19 pandemic, social distancing became mandatory in some regions, leading 4.7 million Canadians to work from home during March 2020 to prevent further virus-related fatalities (Statistics Canada, 2020). The ability to communicate via social platforms, such as Skype, Zoom, Slack, and Facetime on laptops, smartphones, or TVs, has allowed people to keep their social connections, work, and study outside of their home, thus transforming the social landscape.

Although digital technologies are ubiquitous in our lives, the concept of merging death and digital technology is very rarely seen. Identifying “death as an opportunity for design” (Pallister, 2018) was mentioned in the 2018 Design Economy Series, in which the need to integrate technology or contemporary ways of dying was acknowledged. Such design concepts for integrating technology and death were first seen in 2013 at the international Design for Death competition, organized by DesignBoom (DesignBoom, 2013). Many of the designs focused heavily on how we care for the dead, such as concentrating on the sustainability aspect of death, the aesthetic look of urns and funeral coffins; however, very few ideas were centralized on integrating technology with the emotional experiences of griever. Not only is finding a socially interactive death-related product rare, but research in the field of design focusing on user grief and death interactions through technology is also minimal.

Instead, most death-related studies focus on psychological frameworks and theories that help people deal with grief and traumatic life events. Research work in design is limited, specifically product design concerned with improving current mourning rituals and grief management. In contrast, some research related to implementing technological considerations with bereavement has been conducted in the Human-Computer Interaction (HCI) field. For example, the notion of thanatosensitivity, the research of death and dying in an interactive technological form, examines digitalization in the field of death and dying and has been frequently addressed in HCI studies along with other topics like privacy concerns, digital legacy, and social media (Massimi and Charise, 2009; Massimi and Baecker 2010; Banks, Kirk, Odom, and Massimi, 2011; Moncur and Kirk, 2014; Doeveling, Harju, and Shavit, 2015).

1.1 Study Rationale

Given that this thesis was written during the 2020 COVID-19 pandemic, the sociological context itself signals that technology integration in the experience of death and grief is more important than ever before: it is needed. For example, during the pandemic, a grandmother was in her final moments in the hospital, and, due to restrictions, only one person was allowed inside her room at a time, leaving everyone else to wait outside for their final chance to see her before she passed away. These restrictions further burdened the grieving process after her death: only five family members were permitted to be present during the memorial service. The use of live streaming and social communication platforms was essential during this time.

Some researchers incorporating social networking site (SNS) technology into the design of funeral settings, funeral products, and funeral practices have focused mainly on designing a funeral environment. While this demonstrated awareness that funeral settings require modernization, the overall grief and mourning user experiences need to adapt to current technological trends. However, technological implementation can come with limitations, especially given generational differences (Volkom, Stapley, & Amturo, 2014).

Due to this generational digital divide between the young and the old, some research in the Information and Communication Technology (ICT) field has found that digital and social media platforms are seen as excluding and impacting the older generation negatively (Seifert, 2018). While most of the research focuses on the social communication aspect in different environments such as education and marketing, relatively little empirical research regarding generational differences in the modernized mourning ritual setting was found. Young adults may utilize Facebook or other social media to express their grievances, while use from older generations is quite limited.

1.2 Research Questions

In recognizing the limited user experience research in the context of mourning and grieving situations, the initial research question of this study was, “How can communication technology be integrated into memorial ceremony artefacts to reflect on the modern user experience of mourning?” However, during the study, the initial question that was technology-focused has evolved into a user-centred question, focused on enhancing the experience of both the younger and older generations in their mourning and grieving processes. Thus, the main research question was developed as follows:

Main Research Question

How do the younger (Generation Z) and older (Baby Boomer) generations perceive digital mourning artefacts differently?

Furthermore, the lack of research on user interaction between the young and the old in the field of thanatosensitivity led to the following secondary research question:

Secondary Research Question

What design considerations are needed to develop a user interface for death-related technological products to enrich the user interaction between the Generation Z and the Baby Boomer generations?

1.3 Study Contribution

This study aims to understand how both the Generation Z and the Baby Boomers perceive current digital technology in a grief and mourning environment due to digital lifestyles' current ubiquity. Unlike everyday products, this is a sensitive and personal life event that everyone will encounter at some point in their lives. This thesis provides four design considerations generated from the insights and findings of this research. Based on these insights, several design scenarios of the expected user experience with each design consideration are presented to help designers design bereavement products for those who have lost their loved ones.

Also, since this study's topic requires integrating different knowledge and expertise from various disciplines, such as HCI, Culture and Religion, ICT, Psychology and Industrial Design, the study will have interdisciplinary spillovers. In particular, the literature review chapter provides a different perspective and understanding of today's grief and mourning experiences. As there are very few papers investigating the digital divide within the death and dying environment, this research will benefit the research community.

1.4 Overview of Thesis

Figure 1. Overview of Thesis

As shown in Figure 1, this thesis begins with a literature review of various perspectives on four areas: cross-cultural mourning practices, current mourning design and practices, thanatosensitivity, and existing generational issues.

First, to understand the current attitude and perspective towards death, different cultural and historical death-related elements were investigated. This investigation is found within Section 2.1. Second, the current mourning design section, Section 2.2, acknowledges the current mourning practices identified within psychology and sociology and looks at current mourning culture and death-related product designs. In Section 2.3, research in thanatosensitivity and existing technologies provides a review of HCI research, including exploring some restrictions and limitations of current technologies. The study of generational differences in other research fields is then investigated and discussed in Section 2.4. Lastly, Section 2.5 considers existing and desired heirlooms (artefacts passed down from one generation to the next), and memorial artefacts between the young and the old, the technology they observed in funeral settings, their mourning products, and the grief process.

Following this review, the thesis presents empirical research to address the research questions. Qualitative research methods, such as a diary study and semi-structured interviews, were employed to collect and synthesize user insights. The collected data was then analyzed through a thematic mapping and coding process. Finally, four design considerations are suggested, with possible scenarios as examples.

Chapter 2: Literature Review

As mentioned, the four relevant areas of study contributing to this thesis, cross-cultural mourning practices, current mourning design and practices, thanatosensitivity, and existing generational issues, are discussed in more detail in this chapter. Relevant literature about psychology, human-computer interaction, design, information computer technology, and culture is reviewed to cover such interdisciplinary topics. Since Pyszczynski, Koole, and College (2004) explain that death is the essence of our culture, the topic, a cross-cultural mourning practice, is discussed first.

Death culture comes in two forms: literal and symbolic. In its literal form, death culture refers to the *act* of dying, in which people believe that there are spiritual reasonings after death, such as believing in reincarnation or heaven. On the other hand, symbolic culture emerges from this literal culture, producing elements such as legacy, memories, objects, attitude, and belief left behind post-death. These symbols are referred to as the representations of the deceased, their death, and their culture (Pyszczynski, Koole, & College, 2004). To understand death-related products, this study will examine memories, cultural attitudes and beliefs of death, and technological objects, thus focusing on death's modern symbolic culture view.

2.1 Cross-Cultural Mourning Practices

Canada is a multi-cultural country comprised of various ethnicities and religions. This thesis acknowledges that the First Nations and Aboriginals are the original inhabitants of Canada. Due to such huge cultural diversity, only a few ethnicities are mentioned in this section. Europeans were the first ethnicity prioritized in this study for two reasons: first, their entanglement in Canada's historical background, as it was “found” by Europeans in the 14th century (Government of Canada, 2015), and second, according to the 2016 Statistics Canada report, they

are the largest ethnic group in Canada (Statistics Canada, 2019). However, this thesis study's participants were diverse: they were from different cultures and not exclusively from European backgrounds. Therefore, this section was explicitly refocused based on the ethnic backgrounds of the participants: on the cultural mourning practice of Chinese, Nigerian, Middle Eastern and Western European accordingly. A brief exploration of historical elements from the perspective of death, particularly death-related products and traditional coping methods for grief, follows this cultural exploration, thus providing a general understanding of cultural reasonings in the study and the current societal perspectives and attitudes on death.

2.1.1 Mourning Culture of China

The three major religions of China are Confucianism, Daoism, and Buddhism. They have shaped and developed many Chinese traditions, particularly Chinese death culture (Paimier, 2011). Yao and Zhao (2010) argue that unlike other cultures where religion and culture are independent of one another, in Chinese culture, “following one religion does not necessarily mean the rejection or denial of others” (p. 10). Based on the Yao and Zhao (2010) summary, today's Chinese burial ritual is historical and dates back to the Neolithic period (c. 8000-2000 BCE); in this ritual, the deceased's food and personal items are buried along with their body in the hope that these will be useful in the afterlife. This practice developed further during the Shang and Zhou dynasties (c. 1050–221 BCE), at which point humans and animals were sacrificed and buried along with the deceased. This ritual was performed to increase the deceased's comfort in the afterlife, bringing animals and servants along to take care of them. Around 400 to 500 BCE, this specific manifestation of the practice ceased as Confucian teachings were popularized (National Gallery of Australia, 2020). During the Han Dynasty (206 BCE-220 CE), pottery replications of humans and animals were buried instead. The famous Terracotta Army pictured in Figure 2 below is a

perfect example of this tradition. The “army”, a thousand life-sized clay soldiers, accompanied China’s first emperor, Qin Shi Huang Di, in his burial tomb (Roach, 2020).

Figure 2. Terracotta army

However, these grand displays shrunk over time, starting from the Song Dynasty (960 CE-1279 CE) onward. During the Ming Dynasty (1368-1644), while the elite still participated in such rituals, citizens no longer did (National Gallery of Australia, 2020).

Today, the tradition has modernized: cremation, rather than the burial of goods, has become common (Knapp, 2018). According to Janet Lee Scott (2007), the reason why cremation is a necessary part of the tradition, is because “burning changes the nature of the offerings, for in their original form they cannot go anywhere; burning accomplishes the vital transformation which sends the items to the ancestors, the gods, or the ghosts” (p.20). In such, the use of joss paper, a paper replica of money, and everyday goods are commonly burnt during mourning rituals (Figure 3, below).

Figure 3. Left: Joss paper replica of Apple goods; Right: The burning process (Knapp, 2018)

2.1.2 Mourning Culture of Nigeria

Nigeria is located in the western part of Africa and has been independent from Britain since 1960 (Eyetsemitan, 2002). Nigeria comprises three main tribes: Hausa-Fulani, Yoruba, and Igbo.

Given their religious difference, each of these tribes has different mourning practices and beliefs.

The Hausa-Fulani tribe composes 36% of Nigeria's population. They are mainly Muslim.

Yoruba makes up 15% of Nigeria's population, and they have both Christianity and Islam. Their traditional African belief is that they believe in reincarnation. (Eyetsemitan, 2002)

Historically, Africans mourning culture started to change during the time of colonization, the rise of modern economy, the religious impact through the arrival of Christian missionaries and the lost in decision-making power from the chief and tribal leaders (Jindra & Noret, 2011).

According to Lee and Vaughan (2008), one of the observed historical 'pagan' funeral rites would be the Nyakyusa burial rites, however, missionaries at that time were disturbed by this practice.

This resulted in Africans who were converted to Christianity to be banned from partaking in the tradition and focused solely on the Christian burial services.

Traditionally in Nigeria, the Igbo tribe believes in a creator god called Chukwu, alongside other spirits (The Editors of Encyclopaedia Britannica, 2020). They also believe that proper burial traditions are necessary for the deceased to be reincarnated. Funeral goods are commonly buried with the deceased; however, different tribes bury different items. For example, the Yoruba tribe buries food, clothes, and animals, whereas other tribes bury weapons and kitchenware.

Figure 4. Funeral dance (left) (Nwaubani, 2013) and funeral procession (right) (Ruddock, 2020)

However, a common tradition shared by all three is the gathering and bonding of the entire community and family during the death of a tribe member (Setsiba, 2012). Besides the deceased's religious ceremony, traditional mourning culture consists of a procession to the burial site or dancing and playing of music for multiple days as a tribute to the deceased (Figure 4) (Krystyna, 2019). According to Dr Vilma Ruddock (2020), other mourning customs consist of but are not limited to: isolation, and shaving the widows' hair for six months after the death, six months being the grieving period. For children, the period is halved to three months.

2.1.3 Mourning Culture of Western Europe

Western European attitude towards death was heavily researched by Philippe Ariès (1976), who argued that there are four types of attitudes towards death within this populace that can be seen from the Middle Ages until the 20th century.

The first attitude (accepting death) was speculated to have developed based on the constant wars between countries or people, in which death became a natural occurrence. From war emerges patriotism (San Filippo, 2006), where people are willing to die for the side wherever their loyalties lie. Even if there were no war, natural disasters and diseases threaten the human population, particularly in pre-modern times, due to the lack of medical treatment. (Ariès, 1976)

The second attitude (death is personal) was exhibited through paintings and artworks which fell under the *Danse Macabre* genre, otherwise known as the *Dance of Death* genre. The Dance of Death genre originated from a translated poem called “La Danse Macabre,” written by a monk named John Lydgate in Paris 1406 (Donington, 2010). This genre centred around the *Black Death* between the years 1347 and 1350 (World Health Organization, 2000). The theme portrayed by the Dance of Death is the personification of death as horrid yet engaging. Although death is drawn as a monstrous creature, artists also transformed death into a joyful and comedic event, as seen in Figure 6 on the following page. These representations indicate that the attitude towards death was not centred on fear, serving as a reminder that death is inescapable and at everyone’s door (Barnett, 2009).

Figure 5. Artwork with the theme of Dance of Death (Barnett, 2009)

Mourning culture, rituals, and emphasis on mourning products that we are familiar today started during the rise of Romanticism. The attitude towards death shifted from acknowledging a personal encounter with death to recognizing the emotional experience from losing a loved one, such as grief (Ariès, 1976). During Romanticism, mourning jewellery and articles were used as symbols of wealth as well as death. For example, only the wealthy were seen to have silk printed images of their deceased loved ones for keepsakes, given that silk was considered a luxury item (Hanington, 1997). The use of a mourning brooch was a customary article to wear to indicate the passing of a loved one. An interesting piece of mourning jewellery that encapsulates such Victorian traditions is none other than Queen Victoria's locket, which houses Prince Albert (her husband)'s hair and photograph (see Figure 7).

Figure 6. Queen Victoria's locket (GIA, NA)

In this Victorian time, mourning culture was rigid and constrained by "social and sartorial rules." For example, the need to wear black attire during mourning was a social expectation, particularly for widowed women first arose in Europe during this time. This tradition was influenced by Queen Victoria appearance of dressing in black as a sign of mourning for her late husband (Bedikian, 2008). Although symbolism was important, such as the symbolism of hair, the need to follow social trends dictated the societal view even more, as merchants had to import even more hair to be used for mourning jewellery to "supplement that of the deceased" (GIA, NA). Finally, attitudes towards death became taboo during the First World War. During this time, many Christians fell out of their faith as they did not comprehend what was "God's plan" in war (Franz, 2017, p. 203). As more citizens died on the battlefield, the way of mourning had to be altered, as families would not be able to see the bodies of their deceased loved ones return from battle (Franz, 2017). Also, Aries (1976) argues that the topic of death is silenced due to the evolution of medicine and science. Due to medical advancement, "one no longer died at home in the bosom of one's family, but in the hospital, alone" (Ariès, 1976, p. 87).

In general, the topic of death would rarely be mentioned to avoid hurting feelings and evoking emotional loss for the family or the person who is close to death (Chapple, Ziebland, & Hawton, 2015). In contrast, Walter (1991) argues against Aries's theory, stating that death is neither taboo nor forbidden. He argued that people were ignorant of death, and as such, the topic of death became hidden. So, as we modernize, people are losing touch with relationships and traditions, and people do not mourn as long as during the Victorian era. However, both concepts validate that the modern era's attitude on death revolves around silence.

2.2 Canada's Current Mourning Design and Practices

2.2.1 Modern Mourning Culture

From the section 2.1 cross-cultural mourning practices showcases different cultural routines and traditions on death and dying. In today's generation, mourning culture in Canada has been influenced by our reliance on technology and an open-minded approach when talking about sensitive topics. The recent social resurgence of third-wave feminism, LGBTQ+ rights, and freedom of speech indicates that people are open to conversations and talking about sensitive topics that would have otherwise been deemed taboo in the 19th century (Zubiel-Kasprowicz, 2017). The topic of death and the grieving process have been challenged, improved, and changed through mental health awareness campaigns and the Canadian government's support. These aids are meant for those who are coping with the loss of a loved one, suicidal attempts, anxiety about death, and support for their family members' end-of-care patients. The health support system plays a significant role in Canada's mourning culture. However, despite available resources from the Canadian government, a shortage of memorial grief products is seen in the market, leading to a lack of accessibility.

The way we grieve and cope with one's death has also become "complicated" (Cobb, et al., 2011, p. 997) due to social media outlets. Social media has become integrated with our daily lives and influences our decision-making process, our behaviours becoming part of an electronic culture (Doeveling, Harju, & Shavit, 2015). During the 2020 COVID-19 pandemic, virtual mourning was seen as a solution due to movement restrictions. However, Weir (2020) argues that digital solutions during the pandemic are still imperfect, as a lack of social connection in mourning culture persists. Nevertheless, the shift to technological mourning has become even more prominent during the pandemic (Weir, 2020).

2.2.2 Various Stages-based Mourning Process

Given that the experience of grief is universal, some psychological studies of the mourning process explain what is known as the grief cycle. The grief cycle is the process that a person experience when they are mourning a deceased loved one. One of the earlier mourning processes proposed by Bowlby and Parkes in 1970 stated four phases of grief. It explains that people do not recognize the loss at first, then slowly recall the deceased and memorialize their presence, then, they fall into despair from realizing that they are no longer here, and finally, they restructure their lives to adapt to the death (Mallon, 2008).

Similarly, after observing her patients, Elisabeth Kubler-Ross explained the five stages of grief in her book, *On Death and Dying* (1969), These stages explain that humans experience is a wide range of emotional responses that lead to final acceptance in acknowledging a loved one's loss. From these two popularized mourning stages, further mourning stages were built upon and introduced. Different models of grief are showcased in Table 1.

Researcher	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Bowlby and Parkes	Numbness	Yearning		Despair	Re-organization	
Elisabeth Kubler- Ross	Denial	Anger	Bargaining	Depression	Acceptance	
Sander	Shock	Awareness of Loss	Conservative	Withdrawal	Healing	Renewal
Horowitz (1976)	Outcry	Denial	Intrusion	Working Through	Completion	
William Worden (2009)	Accept the loss	Process the pain		Adjust without the deceased	Find a connection with the deceased	
Rando (1993)	Recognize the loss	React to Separate	Recollect and Reexperience the relationship and bond	Relinquish memorial artefacts	Readjust	Reinvest

Table 1. Phases of Mourning

From the different stages above, we can extract four broad common stages: 1) denial of a loved one's passing; 2) acceptance; 3) memorialization of the dead as a way of healing or adjusting; 4) experiencing a personal reconstruction, either through adapting or recovering.

Although all models and processes mentioned are similar, these models do not necessarily adequately capture individual responses to grief. Some people may experience more prolonged and complicated grieving periods than others, lasting over six months. This is known as prolonged grief disorder. Methods used to relieve such grief stem from a psychological perspective using either Rando's Six R's or Stroebe and Schut's Dual Process Model. A similarity in both models explains that the mourner would have to readjust their life structure, values, or role to move on. For example, if a mother passed away, the father may have to take on the mother's role to uphold the family's routine and structure.

2.2.3 Current Mourning Product Designs

According to Bruce Hanington (1997), the most common consumer death-related artefacts are coffins and urns, as any burial service or management of the deceased's body involves either burying or cremating the body. Although coffins and urns are essential commodities, their design has yet to change since described in Hanington's 1997 study. Innovation is mainly aesthetic compared with traditional urns (Figure 8), such as the design concept proposed by Maria Tyakina for urns, which complement contemporary environments (see Figure 9). The design focuses more on the aesthetic appeal of transforming the traditional ornamented and darker colour tone urn (Figure 9) into a simpler, contemporary, and brighter colour style urn for the modern home setting.

Figure 7. Traditional urn (Sylvan Funerals, 2020)

Figure 8. Maria Tyakina's cremation urns for contemporary home (Hitti, 2018)

A more sustainable design concept can be observed in the *Egg-Shaped Burial Pod* design concept or the *Emergence* design concept, pictured in Figure 10. Both designs focus on placing the deceased's body in a sustainable, decomposable casket alongside a tree's seed. As the body decomposes, it feeds the tree's new growth, creating an irreversible bond, alluding to the notion of rebirth. Although this product has no connection to digital technology, sustainability changes the perspective of traditional burying. Such tombs can be regarded as an innovative emotional design that connects the deceased to Mother Nature.

Figure 9. Egg-Shaped Burial Pod (Yalcinkaya, 2019) and Emergence by Enzo Pascual (Riviere, 2013)

Jamer Hunt, ex-director of the Master of Fine Arts (MFA) Transdisciplinary Design programme at Parsons School of Design, once said, “designing for the end of life is not something venal or style-driven. It is a deeply human need to wrestle with a profound moment in our social relationships.” (Pallister, 2018). As such, death-related products should have an aesthetic and emotional value, encouraging interaction and attachment to the design. For example, this can be observed in the design concept called *Family Tree* by Loucas Papantoniou (Figure 11). This design places hexagonal urns in a honeycomb pattern, creating a beehive effect. The outside of the honeycomb has an Organic LED (OLED) display cap, which can interact with smartphones to customize memorial messages displayed on its screen.

Figure 10. Family Tree by Loucas Papantoniou with OLED display (Sadausakite, 2013).

As expressed by the IFA 2019 award-winning concept, *Hashira no Kioku*, or “Memory of Hashira”, designed by the mui Lab, merging human interaction with technology harmonizes the home. Its design intends for its owner to record memories that could become lost or damaged over time due to renovations and moving, such as marking a child’s height or writing a message (Figure 12). Importantly, it maintains aesthetic value yet remains high-tech, hiding technology behind a highly tactile screen. The product resembles a block of wood yet employs digital components when interaction occurs, allowing it to camouflage in any room. (mui Lab, 2019) Although this product was not designed with grief and mourning rituals in mind, much can be learned from its design and home integration.

Figure 11. Mui Lab's Hashira no Kioku (Height Marking in Wood) (mui Lab, 2019)

2.2.4 Affective and Cognitive Experience

Affective experiences are our impressions, nostalgia, and emotions gained through experiences. Cognitive experience is the perception and recognition (led by the senses) that precedes the experiencer's emotions or affect. Importantly, the two types of experience work in unison: when recalling memories through sound and music, it has been proven to be stimuli to both our emotions and our cognitive system. (Jancke, 2008)

An example that highlights the integration of affective and cognitive experiences in design would be the *SkyPad Interactive Wall* (Figure 13). It is an interactive mural that provides information about the history and memories of the Seattle's Space Needle. Visitors can leave their digital footprint by marking where they are from on a digital globe. (Society for Experiential Graphic Design, 2014)

Figure 12. SkyPad Interactive Wall (Society for Experiential Graphic Design, 2014)

Another example of affective and cognitive experiences in design is the recent University of Southern California's (USC)'s Shoah Foundation project which documents holocaust survivors' stories. Given the era of the holocaust, the number of survivors is dwindling, and thus unable to continue telling their important story to children of the next generation. So, Kori Street, a Canadian and senior director at USC's Shoah Foundation, started a project that captures holocaust survivors' images and projects them as holograms, thus telling their stories beyond the grave (Figure 14). Despite relying on augmented technology, this project fosters ideas in line with this study: the need to preserve history and memories has been integrated into the design. As Kori Street stated, "It's not about technology for technology's sake. They connect with the human story." (Sumanac-Johnson, 2019)

Figure 13. Preserving holocaust's stories with holograms (Sumanac-Johnson, 2019)

2.3 Thanatosensitivity

Thanatosensitivity is an example of an emerging topic in the field of research in HCI due to the evolution in web technologies and limited research associated with death and users in a digital environment. (Massimi and Charise, 2009; Banks, Kirk, Odom, and Massimi, 2011)

Michael Massimi and Andrea Charise coined the term Thanatosensitivity. It is defined as a “humanistically-grounded approach to HCI research and design that recognizes and actively engages with the facts of mortality, dying, and death in the creation of interactive systems” (p. 251). Thanatosensitivity comes from the terminology thanatology, which is defined as the study of death (*Thanatos*—death and *ology*—the study of). (Massimi & Charise, 2009)

In the subject of thanatosensitivity, multiple fields have been researched, such as digital bereavement support and products, the use of SNSs, privacy issues revolving around SNSs, and online identity and culture.

2.3.1 Digital Mourning Culture

Recently, some memorial elements regarding thanatology have been introduced, such as the use of technology in a funeral setting (photographs, videos, e-guest books and memorial webpages), online memorials, posting of condolences and death related messages social media, and virtual memorials (DeGroot, 2012; Jones, 2004; Hourizi, Moncur, Pitsillides, and Walter, 2012; Doeveling, Harju, and Shavit, 2015; Ellison and Marwick, 2012).

Virtual memorials, for instance, can be described as the funeral experience for people to attend online. People started using online platforms to mourn their loved ones' loss. For example, in 2007, after the 2007 Virginia Tech shooting, a mass increase of facebook condolences messages was seen (DeGroot, 2012). In this study, we understand grieving on social media encompasses posting on the social platform about deceased loved ones, their lives, their emotional connections, and memories of those individuals.

Writing a post is a psychological form of acceptance on behalf of the loved one and allows for external help to be granted through public outreach, either through separate posts, comments, or information sharing (Cobb, et al., 2011). Examples would be leaving messages on the deceased's Facebook *wall*, an online messaging page that allows people to post messages directed to the respective Facebook user. Condolence messages commonly reply to people's post about their loved ones' passing (Figure 15).

Figure 15. Example of Facebook Condolence Messages (Atelier, 2010)

2.3.2 Digital Legacy

Elizabeth Hunter and Graham Rowles (2005) explains that the word, legacy, can be classified in three different categories. It can be a material legacy, which is defined as a physical or monetary value left behind after someone's passing, such as heirlooms or artefacts. It can also be a legacy of value, which is leaving a "personal, social or cultural context" (p. 339). Lastly, it could be a biological legacy, which is the passing of genetics and the physical aspect of the body, such as giving away your deceased loved one's heart in a heart transplant.

Similarly, digital legacy is the preservation of the deceased's online identity, and "if an individual's online content is a profection of their identity, then preservation of that content is in essence a preservation of his or her identity in a digital form" (Carroll, 2012, p. 12). As such, digital legacy is the result of a leaving our stories and memories that connects to our virtual identity in an online environment.

The idea of focusing on the physical interaction versus the digital heirloom was mentioned by Missimi and Baecker (2010) as a more popular choice of inheritance due to the sentimental values that come from the product's physical touch the complexity of digital heirlooms. For example, the digital heirloom's password may prevent users from accessing it, such as the passwords of email accounts.

Some examples of digital legacy services would be *Lexikin* and *Dead Social* (Figure 16), where the platform stores data, assets, memories, and information to create a digital legacy for their clients.

Figure 14. Dead Social and Lexikin websites user interface (DeadSocial, 2015) (Lexikin, 2019)

2.3.3 Continuing Bond

According to Dennis Klass and Edith Steffen (2018), a continuing bond is a new research area for grief. Continuing bonds explain the characteristic of grief, as they argue that people innately can recognize grief even if they have not physically experienced it. As one experiences grief, it demonstrates the bond and relationship between that person and their lost loved one. They also argue that when someone experiences a lost loved one, their relationship does not end there. This bond continues even after death, as can be seen when people mourn.

2.3.4 Virtual Funerals

Funeral and memorial homes have also expanded their services online due to the influence of digital technology. For example, in 1997, the *WorldWide Cemetery* (Figure 17) created a virtual cemetery to enable people to access information about the deceased and leave a message in the virtual guest book, and leave a virtual flower on their virtual gravestone, as seen in Figure 8 (Hanington, 1997).

Figure 15. WorldWide Cemetery (Hanington, 1997, p. 48)

Compared to the 1997 funeral services, the virtual funeral is rarely seen despite people's dependency on digital technologies. Current online funeral platforms provide different types of services than the one seen on the WorldWide Cemetery. Current funeral web services offer teams to support in planning a funeral service for your deceased loved one. This support could reduce psychological fatigue and mental stress due to their loved ones' death, and educate the overall population on the procedure or requirement for a funeral burial, cremation or memorial services, or even cultural funeral procession differences. Some common information displayed on funeral or memorial home webpage would be, the deceased's information and any information about the funeral itself. They can also provide e-guestbooks, bereavement, and memorial supports on social media (DeGroot, 2012).

Figure 16. Sample of an online funeral service webpage (basicFunerals, n.d.)

In 2013, Hadas Arnon designed a digital cemetery as an attempt to change the interface and interaction of existing virtual funerals. However, the purpose was different from the Worldwide Cemetery. He proposed a scenario where each deceased loved one's digital data can be stored on a memory stick labelled with their name and date of death (Figure 19). Whenever a family member wishes to memorialize a specific person, they can go to a place and request to take out the USB and then watch or listen to whatever is on the memory stick (Figure 20). The aim was to improve the overall user experience of the living as “the way we perpetuate our dead takes a lot of space, and eventually, we sit in front of a stone trying to imagine the face and memories of our beloved person.” (Arnon, 2013)

Figure 17. Hadas Arnon's digital cemetery (Arnon, 2013).

Figure 18. Hadas Arnon's scenario for the digital cemetery (Arnon, 2013).

Similarly, Sonic Memorial provides audio artefacts of survivors, such as the 911 incident, to remember this event (Cohen & Willis, 2004, p. 597). The evolution of the funeral and memorial experience might allow the deceased to retain their “identity” as a legacy, preserving first-hand data for historical purposes, as well as further bringing awareness about the current shift in society and community on using digital technologies as a means to improve user experience in the realm of death and dying (Moncur & Kirk, 2014).

2.3.5 SNS

In this thesis, the word ‘smart’ refers to ‘smart product’ in which Mühlhäuser (2008) defines it as “an entity (tangible object, software, or service) designed and made for self-organized

embedding into different (smart) environments in the course of its lifecycle, providing improved simplicity and openness through improved p2u and p2p interaction by means of context-awareness, semantic self-description, proactive behavior, multimodal natural interfaces, AI planning, and machine learning.” (p. 163)

This study focuses on SNS technology due to its popularity, and much research in bereavement has recently discussed its potential application. The use of SNS technology has become an essential component of smart products that can be seen incorporated into our home appliances and vehicles, such as the *Smart Home Refrigerator* (Samsung, 2020) and the electric car (e.g. Tesla). The use of smartphones has allowed users to have easy access to emails, photos, contact lists, texting, the internet, music and ease of communication through the access of social network services (SNSs) (Sarwar & Soomro, 2013).

Regarding SNSs, Boyd and Ellison (2008) defined these platforms as allowing users to “1) construct a public or semi-public profile within a bounded system, 2) articulate a list of other users with whom they share a connection, and 3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site” (p. 211). For example, it is required for users to create a personal account to enter Facebook. Based on the account information and parameters, the user can establish a network with others they know and browse content generated by others.

Since SNS technology has been applied as one of the core technologies of many smart products, some in the field of thanatosensitivity have questioned: how do we treat the deceased’s data privacy; where is their data stored; who is in charge of their data; who owns their data; who owns the passwords and access to their social media accounts when not stipulated in their will; or, is their data considered heirloom’s, in which the living can inherit their accounts (Massimi and Charise, 2009; Baecker and Massimi, 2010)? Such questions require serious consideration as we are living in a ubiquitous computing environment.

However, people are not fully aware of the importance of inheritable data and digital privacy, as shown in Becker and Massimi's (2010) study. They found that about 22% of the participant's deceased family did not have a will, 20% were not sure about the will, and for those who did have a will, none of them arranged their data in their will (Baecker & Massimi, 2010, p. 1823). Although not everyone is unaware, companies have started implementing privacy options for social accounts after death. For example, Google had implemented posthumous data protection by not revealing the deceased user's privacy without prior consent from the deceased. Besides, Google accounts have access to a lot of different platforms such as Gmail and Youtube. If one wishes to memorialize their loved one by going through their YouTube music playlist, they would not be able to unless they were able to legally convince Google of their data inheritance (Leaver, 2013). Similarly, on Facebook, the user can choose their account to become a memorialised account or have it permanently deleted. If the client does not specify how they would like their account to be treated, the account will become memorialized when Facebook is notified that they are dead. However, "no one is allowed to log into a memorialized account" (Facebook, 2020).

2.4 Generation Gap

A generation gap is the differences in skills, opinion, values, beliefs, and experiences between two generations, generally comparing the older and younger generation (Subramanian, 2017). Some problems discussed in research revolving around the generational gap are digital exclusion due to lack of digital literacy (Ferlander & Timms, 2006), social exclusion that affects the younger generation's view and use of technology due to the influences from the older generation (Valentine, Holloway, & Bingham, 2002), and misconceptions about computers from the older generation (Morris, Goodman, & Brading, 2007). However, one of the biggest problems with

the generational gap is the digital divide affecting older generations' mental health. Research has stated that the older generation is at risk of experiencing a negative emotional impact on their mental well-being, such as suffering from chronic loneliness (Seifert, 2018) due to the lack of social connection and social isolation from the digital world (Ball, et al., 2017). Overall, the research relevant to the generation gaps discusses the use of information and communication technologies between the old and young generations in different settings, such as telecenters (Bailey & Ngwenyama, 2010) or in education between parent and child (Caskey, 2002).

2.4.1 Digital and Social Exclusion

There are four prominent digital generational gaps discussed in the research, particularly in the ICT field: the psychological gap, the material gap, the skill gap, and the usage gap (Van Dijk & Hacker, 2003). The psychological gap is based on the lack of desire from the older generation to use digital technology, from the lack of experience, fear, or emotional offset towards communication digitalization. The material gap is the lack of physical resources needed to access technology. For example, if the user cannot access a computer or a smartphone, they would not have the same experience available to others. The skill gap describes those who lack the knowledge to use and access digital communicational means. Lastly, the usage gap talks about users not finding the need and motivation to use the technology. If the user's environment does not require the need for technology, then the user would not have the opportunity to learn or interact with it.

2.4.2 Communication

Venter (2017) also argues that a lack of communication between Generation Y and Baby Boomers is also apparent due to Generation Y being the first generation utilizing digital means

for social communication. Her result in bridging the two-generational gap was the need for “understanding, respect and open-mindedness” (p. 504), and she claims Baby Boomers must adapt to Generation Y. However, her study is limited to face-to-face communication between these two generations and does not pertain to the mourning and bereavement environment. In relationship to death and dying, communication is also relevant in the bereavement and grief process. Studies have indicated that having a conversation about death with family and close loved ones helps decrease the anxiety that the individual or the family member may experience after the death of that loved one (Keeley, 2007; Generous & Keeley, 2013).

A conversational game designed by Common Practice tried to solve a family setting's communication issue by designing the game, *Hello* (Figure 21). The goal was to bring the topic of death in a fun and approachable way (Common Practice, 2020). The game comprises a booklet in which players ask each other questions based on the booklet. Players can give a chip to another player if they wish to express their thanks. The game's goal is that the family or friends are informed of what each desires after their death or realise what they should value before their death.

Figure 19. Hello Communication Game (Common Practice, 2020)

2.5 Summary

This section investigated what has been researched in related fields of study and the current generational problems. From the psychology field, we have a general understanding of the phases of mourning, which brings awareness to how humans cope with grief. We also learned that there is an illness called prolonged grief disorder, which may occur if the person cannot overcome grief in six months: this is an indicator of a design opportunity in this area.

Different traditions and rituals from four mourning cultures (China, Nigeria, Middle Eastern and Western Europe) were investigated in the cultural section. The review helps us understand the products or tools used in traditions and narrows down potential design opportunities. Shifting from a geographical, cultural perspective, we find that the current generational culture centres around technology. Furthermore, a rise in a research trend called Thanatosensitivity was found, with a focus of research in multiple streams, such as privacy, digital legacy, virtual funerals, and social media. The review helps us understand that there are three parameters outline products that can be classified as SNS, allowing us to understand the perimeter when designing SNS related products. As well, through this review, we learn about continuing bond and the digital mourning culture that are relevant when designing modernized bereavement product.

Lastly, we narrowed down the study to examine current generational issues, particularly with technology. Studies in Information Communicational Technology indicate multiple generational problems, such as digital and social exclusion and lack of communication. Research shows four potential generational gaps, focusing on the older generation perspective: this further strengthens the hypothesis that the younger generation would value or utilize technologies more than the older generation.

After conducting the literature review, the lack of research about the generational gap in the study of grief and mourning was noticed. Also, from the psychological and cultural research, user experience was vital to mourning as a life experience, and consideration of the overall mourning experience would help pinpoint the design considerations when developing any product related to death. This process helped refine the research question to be, “*What are the design considerations for developing a user interface for death-related technological products to enrich user interaction between the younger and the older generations?*”

Chapter 3: Methodology

3.1 Fieldworks Method

Since this study's topic is a sensitive and intricate one, a qualitative research method was employed instead of quantitative research to focus on categorizing key insights that bring a deeper understanding of the user's experience using digital memorial artefacts. The specific methods used were diary studies: semi-structured interviews used to collect multiple streams of information which can then be analyzed to formulate themes to determine possible design considerations (Hanington, B., & Martin, B., 2012, pp. 66-67).

To understand the current perspective of grief and participants' experience with memorial artefacts, we first looked for their engagement with bereavement products. Then, the digital components in the bereavement setting were investigated.

The diary study was chosen as the first choice method because it allows the participants to answer the questions asked in a diary format on their own time and in a comfortable place. The terms booklet and diary are interchangeably used in this study, as the diary was made in the form of a booklet (see Appendix A). The booklet allows the participants to express their feelings, anecdotes, experiences, ideas, and opinions in the same form as a diary. As human memory tends to be more triggered when it interacts with a tangible and meaningful object, the diary study effectively prompts the participants to interact with their memorial objects to trigger their personal experiences.

Since it is easier for people to recognize a task than to recall it from their memory (Weinschenk, 2011, p. 53), the second method, the semi-structured interview, was used to ask follow-up questions, clarify and elaborate on the answers they provided in the booklet. The booklet in the interview helped the participants remember their memories and think about items they may have missed and had wished to share. For example, one of the participants wrote about the artefacts belonging to their deceased father and mother but did not mention their sister until during the interview, as the interviewee exclaimed: “Oh! Talking about clothes, my sister left me some before she passed away...” (B6). This type of data richness shows that using both diary studies and interviews aids to effectively gain insights more independently than using either one of these methods as a stand-alone.

In terms of the notion of triangulation in this research, to reduce some possible bias and provide further perspective on the topic (UNAIDS, 2010), a prototyping workshop with new participants in both the young and older generations was considered as the third angle along with the two methods mentioned above. In this case, the prototypes would have come from the proposed themes from the diary studies and semi-structured interviews. However, due to the government’s COVID-19 restrictions, we could not proceed with the prototyping test.

3.2 Planning Stage

3.2.1 Participant Demographics

The participant’s age was an essential factor to control in this study. The participants were split into two groups that follows the Statistics Canada definition of generations, the Generation Z group born between 1993 and 2011 and the Baby Boomers group born between 1946 and 1965, to restrict the age variables (Statistics Canada, 2015). As participants below 18 years old would

be deemed a vulnerable population, participants' were necessarily above 18, limiting the Generation Z participants to between 18-26 years old.

Since this is a qualitative research method, a sufficient number of participants, 13, were recruited, this is further elaborated on in the recruitment section in this chapter. All interviews and interaction with the participants were conducted by the author. The smaller participant pool was targeted, which allowed us to focus on the meaningful relationship between the two generations in the context of mourning (Dworkin, 2012). Six participants under the age of 24 were categorized as part of the Generation Z group, and seven of the participants over the age of 60 were categorized as part of the Baby Boomers group. As this method required the participant to fill out the booklet in English, the participants had to be English speakers while also having distinct cultural backgrounds, traditions, and religions. After the data was gathered, we examined the bond between the two generations in a general lens, then narrowing it down to a specific ethnicity or religion.

Participant Code	Culture / Country	Religion
G1	Colombian	Catholic
G2	Nigerian	Catholic
G3	Nigerian	Muslim
G4	Lebanese	Muslim
G5	United Kingdom	Did not disclose
G6	United Kingdom	None
B1	Jamaican	None
B2	Did not disclose	Did not disclose
B3	Did not disclose	None
B4	Chinese	None / Buddhism
B5	Chinese	Catholic
B6	Chinese	Catholic
B7	Chinese	Catholic

Table 2. Demographic of participants

All research data are password protected. Any hard copies or printed copies of data (including any handwritten notes) are kept in a locked cabinet. Research data are only accessible by the researcher and the research supervisors. Each participant was coded for confidentiality. For example, the first participant under the Generation Z category would be coded as G1, whereas the first participant under the Baby Boomer category would be coded as B1. The number given to the participant was given at random. The Carleton University Research Ethics Board reviewed the ethics protocol for this project, which provided clearance to carry out the research (Clearance #: 111138).

3.2.2 Recruitment

The recruitment process involved posting recruitment posters (Appendix A) on Facebook, sending them via email and contacting community centres to distribute the poster. The snowball sampling method was employed to recruit participants of similar ages through word of mouth. For example, participant G2 recruited participant G3. A total of four participants (G1, G3, B6 and B7) were recruited through the snowballing method, and the rest of the participants were contacted directly by the interviewer through a phone call, text or email. This study started with recruiting participants in July 2019 and was cut off when 13 participants were gathered due to this study's time limitation. Although the probing with the prototype was not conducted, it would have followed a similar recruitment process. However, the only difference would be that the recruitment would take longer, and it would aim for a larger participant pool.

3.2.3 Diary Study

In this study, the participants were given a booklet in September 2019, which was then collected in January 2020. In the booklet, participants were asked to answer a series of open-ended

questions and sketch out images. The participants were asked to keep the booklet for up to seven days to fill out and explore.

The time limit of seven days gave the participants more than enough time to search for their existing artefacts or heirloom to draw or describe it within the booklet and brainstorm and design their desired heirloom. If participants required additional time, they could ask the researcher. However, not all participants finished the booklet before the seven days as some of the participants were unsure on how to describe their answers.

To determine the amount of time it would take for the participants to finish and the difficulty in the questions provided, two pilot studies were conducted. Booklets were given to two participants that were associated with the author. No time limit was imposed in the pilot study, and the participants' answers were not used. Both participants from the pilot study finished the booklets in one day. They also had no difficulties in comprehending the booklet's questions or felt uncomfortable with any of the questions.

The booklet questions are broken down to two categories: what they had (current memorial artefacts and heirlooms they possessed) and what they desired (future heirlooms or memorial artefacts).

The questions asked in the booklet are as follows:

1. How do you cope with grief from the passing of loved ones?

2. Do you possess any heirlooms/memorial artefacts that are passed down from deceased family members or loved ones? If so, please list or sketch out heirlooms/memorial artefacts that you have. If you don't have any, please list or sketch out possession that reminds you of a current family member or loved ones.
3. Where do you currently keep those heirlooms/memorial artefacts? If you don't, where would you keep those heirlooms/memorial artefacts if you do? Why? Please be detailed and, if possible, sketch out the location.
4. How often would you or do you take out those heirlooms/memorial artefacts? Do you carry it around, or do you leave it in one place?
5. How do you maintain the condition of the heirlooms/memorial artefacts?
6. How long can your heirlooms/memorial artefact last and preserve for? (in years)
7. Do any of your heirlooms/memorial artefacts incorporate technologies of any kind? If so, please list down all the heirlooms/memorial artefacts that consist of some kind of technology.
8. If you were given a chance to design your own heirloom for your future generation / loved ones, what would it look like? Please sketch or describe your desire heirloom.
9. What are the three keywords or main design concepts you would use to describe your heirloom design?
10. What would be the reasoning/motivation/inspiration behind your design?
11. Where would you like your heirloom to be placed? Please be detailed.
12. Please list those that you think would interact with your heirloom.
13. Please list all the social media (SNS) you use.
14. How many hours daily do you spend with social media?

15. Have you ever left a message on social media to remember someone who has passed away?

Please provide an example of a message you would leave for someone who passed away on social media.

16. What would be reasons why you would message on social media to honour a passed loved one if you do?

17. What other technological methods have you used or experienced in interacting with someone who has passed away?

The first question was asked as an opener to gauge what current method and tools were used to help them cope with grief. This question set the stage on the topic of what this booklet would be exploring.

The second question aims to explore the current memorial artefacts and heirlooms that the participant possesses. The question's goal was to see if there was a difference in what the generations deem as memorial possessions. Questions three to six were about the preservation (maintenance, location) of and meaning behind their current artefacts or heirloom. The seventh question focuses on technology, as this study is about incorporating digital technology, ending the first half of the booklet.

From question eight to twelve, the participants are given the task to design their desired heirloom. The questions intended were to see if they had the time to design and give to someone, what would they give? The goal behind this section is to see what both the young and old generations want their heirloom or memorial artefact to be so that others can remember or if they want to be remembered at all. Technology-focused questions were asked, starting with question thirteen. These questions were placed near the end of the booklet to avoid bias from the participants when answering the study's earlier section. These questions mainly focus on SNS and other technologies with which they interact. SNS was used as the primary technology, as this is currently one of the most demanding and ubiquitous technologies.

3.2.4 Semi-structured Interview

The follow-up semi-structured interview was scheduled for a week after the handing out of the booklet. Most of the interviews took about thirty to one hundred and twenty minutes at a time and were in a place convenient for the participants. Since the participants were spread out between Toronto and Ottawa, all the interviews were conducted in the Ontario region. The interviews were typically at a coffee shop or fast-food restaurant (e.g., Bridgehead, Starbucks, McDonald) located at the participant's convenience or on the Carleton University Campus. All interviews were conducted in a quiet area.

An hour before the interview, the participants gave the booklet back to the researcher. The researcher would then read over the booklet before conducting the interview. The researcher then asked the interviewees additional questions to further expand their answers from the booklet. The booklet, in this case, would prompt the interviewees to recognize what they had written and why they had written it. Moreover, this gave additional time and reflection to fill in answers that they did not complete or elaborate. With their permission, all the interviews were voice recorded, and the researcher kept all the booklets to take home at the end of the interview.

The questions asked in the interview were identical to those in the diary questions. The reason for that was to use those questions as a starting point to explore and expand the answers they provided in the booklet. For example, some booklet answers were very vague in terms of wording and very short due to the booklet's limited physical space, which was a reason for implementing them in the first place. There were incidents in which the participants remembered specific experiences during the interview that were not mentioned in their booklet response. The diary also helped support the interview flow as it helped the interviewee recall what is beyond their answers and reduce the time of thinking and brainstorming during the interview session.

Some additional questions were asked in each interview to explore different products and digital interactions in a funeral setting. The first question was if they had attended a funeral. If the participant had attended the funeral, the following questions were focused on what he or she observed at the funeral and if there were technological products used in the setting. This part of the research was omitted from the booklet as it was not directly related to either category of the booklet questions: what they had and what they desired. The omission was purposeful to prevent an overload of information and trigger any additional bias from religion, traditions, or culture that they have seen when designing their desire heirloom. Participants are aware that they have the option not to answer or disclose any information regarding the additional questions, as these questions may trigger a negative emotional impact on the participants. However, no participants felt uncomfortable in this study, and all chose to answer the additional questions.

3.2.5 Analysis and Coding for the Diary Studies and the Semi-Structured Interviews

Content analysis was implemented using a Microsoft Excel spreadsheet. Each tab in the spreadsheet focused on one question from the booklet. Each participant's response in the booklet and their respective interview transcripts were placed side by side to see their response in a more organized and clear manner (Figure 18). A primary keyword and a secondary keyword were noted on the side columns next to the author's interpretations. The primary keywords were determined based on the participant's central message. For example, when asking about how the participants cope with grief, one of the participants answered, "Just music. I really love listening to music. Depending on my mood, I would listen to a different type of music" (G4). As such, the primary keyword for this participant was music.

The secondary keyword was determined by an additional influencing factor or another keyword that was mentioned repeatedly. In this case, the mood was the secondary keyword, as the mood was the determining factor for the music choice or how the participant grieves in general. Lines that were potential insights were also highlighted. These keywords were reviewed by supervisors as well. Using the Excel spreadsheet information, a thematic mapping (Appendix A.6) was conducted to find centralized themes that would lead us to possible design considerations for the study.

	A	B	C	D	E	F	G
1							
2	Coding & Analysis Question 1		How do you cope with grief from the passing of loved ones?				
3							
4	Interview	Booklet Transcription	Interview Transcription	Concepts	Vincere Interpretation / Comments	Primary keyword	Secondary key
5	1	It's really hard to cope, but I try to <i>diver my mind from thinking about it</i> . I mean I would only think of the <i>beautiful memories</i> I had than the ones I wish I would have if they were still here	SQ1: Do you cope with friends, family or just yourself? SA1: I mean, I sometimes do it myself. Most of the time, if I am sad, my friends would notice that I am sad SQ2: Are there any items, objects, activities that you would have or do that would assist with the coping? SA2: Honestly, no. Just music. I really love listening to <i>music</i> . Depending on my mood I would listen to <i>different type of music</i> SQ3: Where would you listen to your music? SA3: When my mind gets overcrowded, I would go out and <i>take fresh air</i> but most of the time I would listen to <i>music</i> in my room	Music - Nature - Mood - Beautiful Memories - Positivity	Participant answer revolves around personal mood and aims for positive than negative memories.	Music	Mood
6	2	<i>Pray</i> Stay around the people I love and <i>share experiences</i> I've had with those people	SQ1: Who are these people that you wrote of? SA1: Depending on the loved one that was lost, for example, when my grandma died, I basically stayed with my family members. <i>Everyone from my dad side felt the same way that I felt. We were able to cherish each other up and share memories we have.</i>	Pray - Share Experiences/Memories	Participant focuses on sharing memories and experiences with others	Memories	Pray
7	3	I tend to <i>talk about the death</i> of loved one with friends and other family members. <i>Pray & Accepting feelings</i> by either crying, and watching movie. <i>Sometime, I bury myself in work & volunteering</i>	SQ1: You mention watching movie as a way to cope, what kind of movie? SA1: Anything funny. To be honest and honestly, I love romance drama and I read a lot too. I live in a fantasy world. That's what my friends says. As long as I have that with me, I don't know why, I just don't think about the world or anything that is going on around me. So, I tend to like, not in a good way, but at the same time you just deal with it in my own way, so I find that I <i>either read or watch movies</i> . That's the way I cope with it. <i>Sometimes I bury myself in work, like it's not happening. Just avoid it. Pretend it is not happening.</i>	Pray - Avoidance - Share Experiences/Memories	Participant answer is conflicting - P3 mentions "talking about the death" and "Just avoid it and pretend it is not happening". Participant's full answer leans towards avoiding issues or negative emotions, "I just don't think about the world or anything that is going on around me"	Avoidance	Memories
8	4	I guess <i>faith</i> is the first step towards healing. Remembering the persons life what they did and the <i>good memories</i> you shared together. <i>Religion / Celebrating Life</i>	SQ1: Can you tell me what you meant by faith is the first step? SA1: So, we all have to <i>accept the idea of death</i> at a certain point and that we all are going to die. Faith is the first thing that kind of helps us grief or begins the process of grief, <i>if we don't have this faith and belief and that this cycle of life, it would be harder for us to accept.</i> SQ2: Can you tell me how your faith copes with grief and healing? Tools? What is the process? SA2: We <i>pray</i> for them. We <i>read a lot</i> , our way in <i>asking God to forgive them and for their afterlife.</i>	Pray - Share Experiences/Memories - Beautiful Memories - Acceptance	Participant answer is religious focus. Believes in the acceptance of death and coping with grief is link to having faith and beliefs.	Pray	Memories
9	5	I tend to draw out my feelings while <i>listening to some of my favourite songs</i> , or other songs that I know would <i>improve my mood</i>	SQ1: What kind of songs do you listen to? SA1: High energy - <i>feel good songs</i> . Mixed songs. I sometime listen to sadder songs. <i>High energy mainly to work out my feelings.</i>	Music - High Energy - Mood	P5 participant's answer is similar to P1, but focuses on high energy songs - using music as medium to work on mood	Music	Mood
10	6	I think of the <i>happy times</i> I shared with the deceased	SQ1: What do you mean by happy times? SA1: Things that <i>we have done together</i> and you know ways that they <i>influenced me in a positive way.</i> SQ2: Are there any tools, products, items or anything specific that you would use to assist you during those times? SA2: <i>Memories</i> , photographs. Probably <i>photographs</i> is the best option	Happy Times (Beautiful Memories) - Positivity - Photographs	P6 participant's answer is similar to P2	Memories	Photographs
	7	My realization for coming to terms with grief and passing of love ones is an act of letting go. I believe that <i>we own nothing</i> , but simply share time and space. Since <i>nothing last forever</i> , the times that you share should be cherish. I also believe that the person death is just a <i>transformation from the physical to the spiritual realm</i> . Therefore they are <i>release from the confinement of the flesh</i> . The <i>memory</i> of them <i>then and the now</i> is a celebration of	SQ1: Can you expand on what you mean by memory of them should be celebrated? SA1: Because that is at you can go on. <i>All you have are memories.</i> SQ2: You used the term "celebrated", is this base on your own religion, tradition, personal beliefs, or other reasons that you used it? SA2: <i>Personal. No religion. Don't believe in religion. Celebrate is a transition. It just a transition from the physical to the spiritual realm. Nothing is final</i> SQ3: "Acting of letting go" So do you mean you would not want to rethink or memorize that person? SA3: It is like water. When you drink the water, it just go out. SQ4: This question was targeted at if you were feeling upset with a passing of a loved one, how would you recover from that? SA4: First. The way I was brought up is different. So, my view is different than the family view. I see things as sharing time and space. Nothing else. So, every relationship is sharing that time and space with that person. As long as they are in front of me, like how you and I are talking, this is	Space & Time - Sharing with others - Nature Memories - Transition between physical to spiritual realm - Acceptance	Participant is philosophical. P7 repeatedly mentions space and time and the concept that life is a "transition from the physical to the spiritual realm". Reference of nature. No religious beliefs but seeks spiritual freedom from physical confinement.	Space & Time	Transition
	Interviewee Information		Question	Question (2)	Question (3)	Question (4)	Question (5)
			Question (6)	Question (7)	Question (8)	Question (9)	Question (10)

Figure 20. Microsoft Excel spreadsheet content analysis

3.2.6 Probing with prototypes

Due to time and the restriction on face-to-face contact due to the COVID-19 pandemic, we could not probe with prototypes; however, a study design had already been formulated and can be found below.

Four prototypes would be developed and tested for the themes found from the diary studies and semi-structured interviews. The prototype test would consist of three sessions. In each session, approximately six older and younger participants would be present. A pair of old and young participants would be formed as a group. Each group would interact with one of the prototypes for 15 minutes. In that 15 minutes, they would interact with the object and answer questions on a sheet provided to them. The author would video record the participants to observe their interaction and collect back the answers to questions. The prototype test would validate the findings using the previous methods and further determine possible design modifications.

Below is the list of questions that would have been asked during the prototyping test. They are broken into three categories (visual, usability and experience) to gauge response and interaction further to determine specific user design considerations from these prototypes. Questions from the visual section gather the participant's first impression and thoughts of the product before interacting with it.

Visual

1. What was your first impression of this design?
2. What did you think is the purpose of this design?
3. What is your expected reaction or feedback from this design?

Product Usability

1. Did the design do what you expected? If not, why?

2. Was there anything that ‘surprised’ you when interacting with this product? If so, what was it?
3. Was there anything that you found ‘unpleasant’ when interacting with the product? If so, what was it?

Overall Experience

1. How did you feel when interacting with the product? What caused that feeling?
2. Do you see yourself using this product in the future? Why?
3. Are there things you wish to improve or include in this design? If so, what are they?

Chapter 4: Findings

Although the booklets were given to the participants in person seven days before the scheduled interview, answers were not entirely complete, given confusion as to what to say. However, when prompted by the interviewer's informal questions, they answered the question fluently (please see Appendix A for some informal questions). Similarly, if the booklet responses answered the question thoroughly, no further questions were asked. Therefore, the results showcased per question will be a combination of findings from the booklet and the interview as each of these methods complement one another. A breakdown of the question response will be shown in the next section. Note that SQ is short for sub-questions, and SA is short for sub-answers. This will be shown in the interview response section, as the interview was semi-structured, resulting in asking interviewees additional questions to prompt different responses. The first question is an opening question. From the grief response, we can pinpoint the use of music, external tools, and the concept of community within the experience. Table 3 below shows participants' responses to the first question from the booklet and the interview.

Question 1: How do you cope with grief from the passing of loved ones?

Participants	Booklet Response	Interview Response
G1	It's really hard to cope, but I try to divert my mind from thinking about it. I mean I would only think of the beautiful memories I had than the ones I wish I would have if they were still here	<p>SQ1: Do you cope with friends, family, or just yourself? SA1: I mean, I sometimes do it myself. Most of the time, if I am sad, my friends would notice that I am sad.</p> <p>SQ2: Are there any items, objects, or activities that you would have or do that would assist with the coping? SA2: Honestly, no. Just music. I really love listening to music. Depending on my mood, I would listen to a different type of music</p> <p>SQ3: Where would you listen to your music? SA3: When my mind gets overcrowded, I would go out and take fresh air, but most of the time, I would listen to music in my room</p>
G2	Pray. Stay around the people I love and share experiences I've had with those people	Depending on the loved one that was lost, for example, when my grandma died, I basically stayed with my family members. Everyone from my dad side felt the same way that I felt. We were able to cherish each other up and share memories we have.
G3	I tend to talk about the death of a loved one with friends and other family members. Pray and accept feelings by either crying or watching movies. Sometimes I bury myself in work and volunteering	To be honest and honestly, I love romance drama, and I read a lot too. I live in a fantasy world. That's what my friends say. As long as I have that with me, I don't know why; I just don't think about the world or anything that is going on around me. So, I tend to like it, not in a good way, but at the same time, you just deal with it in my own way, so I find that I either read or watch movies. That's the way I cope with it. Sometimes I bury myself in work like it's not happening. Just avoid it. Pretend it is not happening.
G4	I guess faith is the first step towards healing. Remembering the person's life, what they did, and the good memories you shared together. Religion / celebrating Life	<p>We all have to accept the idea of death at a certain point and that we all are going to die. Faith is the first thing that kind of helps us grief or begins the process of grief; if we don't have this faith and belief and that this cycle of life, it would be harder for us to accept.</p> <p>SQ2: Can you tell me how your faith copes with grief and healing? Tools? What is the process? SA2: We pray for them. We read a lot, our way in asking God to forgive them and for their afterlife.</p>

G5	I tend to draw out my feelings while listening to some of my favourite songs or other songs that I know would improve my mood	Like high energy – feel-good songs. Mixed songs. I sometimes listen to sadder songs. High energy mainly to work out my feelings
G6	I think of the happy times I shared with the deceased	<p>SQ1: What do you mean by happy times? SA1: Things that we have done together, and you know ways that they influenced me in a positive way.</p> <p>SQ2: Are there any tools, products, items, or anything specific that you would use to assist you during those times? SA2: Memories, photographs. Probably photographs are the best option</p>
B1	My realization for coming to terms with grief and passing of loved ones is an act of letting go. I believe that we own nothing but simply share time and space. Since nothing lasts forever, the times that you share should be cherished. I also believe that the person's death is just a transformation from the physical to the spiritual realm. Therefore, they are released from the confinement of the flesh. The memory of them then and the now is a celebration of becoming free.	<p>SQ1: Can you expand on what you mean by memory of them should be celebrated? SA1: Because that is all you can go on. All you have are memories.</p> <p>SQ2: You used the term “celebrated”; is this based on your own religion, tradition, personal beliefs, or other reasons that you used it? SA2: Personal. No religion. Don't believe in religion. Celebrate is a transition. It is just a transition from the physical to the spiritual realm. Nothing is final.</p> <p>SQ3: “Acting of letting go.” What do you mean? SA3: It is like water. When you drink the water, it just goes out.</p> <p>SQ4: If you were feeling upset with a passing of a loved one, how would you recover from that? SA4: First. The way I was brought up is different. So, my view is different and the family view. I see things as sharing time and space—nothing else. So, every relationship is sharing that time and space with that person. As long as they are in front of me, like how you and I are talking, this is everything to me. There is no guarantee in life. So, everything in life will transition or will pass right by</p> <p>SQ5: You never felt unhappy for a deceased loved one? SA5: No. They are free.</p>

B2	<p>Patience. Talk with those who love them. Presence. Participation in rituals of their closest family or friends</p>	<p>SQ1: Who were you indicating when you wrote: “talk with those who loved them”?</p> <p>SA1: Well, it depends. I was thinking, recently a closed colleague who passed away suddenly. I also had a grandmother, an older family member in my husband's side of the family. So, it depends. Generally, to speak to the people who are close to them is a good way to share the memory of them, and this kind of sharing a feeling, you don’t have to talk very much because you all understand how important that person was.</p> <p>SQ2: Are there any artefacts or items that assisted you in your conversation with these people?</p> <p>SA2: That’s one that is fresh in my mind is a fellow African study person who died in the plane crash. It was close to his office. The place was there. There was a table with a candle that they had prepared. There was a book in which people could write. There was a ritualistic thing about it. There was a picture of him, so there were no objects that belonged to him, but there were a few objects there. There were a few people there to welcome the people who were visiting him. To see people who are dear to him. To just be able to speak and help them and remember together was very helpful in the case of my relatives. We had to share memories of those who loved them.</p> <p>Grief is this bizarre thing. The people that you are not in good terms with try to force themselves in. At the time, you don’t want to see them. There is a lot of nasty stuff happening around that, so I spoke about the good thing through all that acrimony, but it is not easy. That is often to the time of renewal of nasty stuff because the family is so broken that the dominant people who are imposing, not so good people use that like they use everything else to bother everyone else. So, I have excluded all that in the reflection, and I took what I am able to keep out of all that mess as something constructive, positive, and on my husband family, things are not like that. This is the usual what is in the family, not like a seriously broken family. That is a whole new chapter. I thought you about hopeful, positive ways to think about in the future, so I thought I would spare you that part.</p> <p>SQ3: What are ways in which you unite the broken aspect of the family during these time when a loved one passed away? For example, activities, tools, things that are concrete.</p>
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		<p>SA3: I am my own advocate. I tried. But it is not easy. It is always received the same nastiness that created the break. That is not exactly like, for example, we collected funds for that grandmother. I sent some money. Then they remind, they used it negatively. I tried to use it positively. It is a difficult ground. Objects are terrible because heirlooms...is jealous, right? I have abandoned any claim to anything. The little bits I have which you see there. I got before, and I still have them, but they are not after. I don't know how it figures down, but I am one family out of three in Canada is a divorce. Some go better than others. Mine is an early one. I am a veteran of divorcee. Mine was buggy. The whole idea of grief, I can go and grief by myself when nobody else is there, but I can rarely grief collectively. What I wrote here is about things and when it went well. But it is usually my husband family or my colleagues or something very personal. But the public part of it as hellish as the divorcee. That resurrected, that makes it worst. It keeps that rubbish alive. The really nasty dark part of the family, the sentiments can be really bad. Like, who gets the ring? Who gets the war metal? All that kind of stuff</p>
B3	Typically, I tend to keep the grieving process as mere private and personal. I may discuss the situation but tend to keep it contained to small group that was involved, for example, family memories. This is especially true if the person has lived a long and fruitful life.	<p>SQ1: Are there any tools, objects, or items ich assist you in the coping process?</p> <p>SA1: Usually photographs and music. I am just thinking about recent events, mainly revolving around photographs, music, and just our own memories.</p>
B4	I feel pain and sad. Then I will have myself busy and talk to my friends and relatives to liberate	<p>SQ1: What do you mean by talking to my friends and relatives to liberate?</p> <p>SA1: So it is like talking to my brother and sister to release your sorrow.</p> <p>SQ2: Would you go to a particular place to memorialize the person or bring out particular items?</p> <p>SA2: Back then, when I was still in Hong Kong, the area we lived in, there was no special area to memorialize the person. Everything was at home.</p> <p>SQ3: Are there any activities in which you would do to cope with grief?</p>

		<p>SA3: Usually, we would just be silent and just think about the past.</p> <p>SQ4: Do you prefer to be by yourself or in a group?</p> <p>SA4: Usually, by myself.</p>
B5	<p>Cried. Saying Prayers for their souls. Talked with someone. Playing Piano.</p>	<p>SQ1: Who is this someone that you mentioned?</p> <p>SA1: I think it would be people who are close to me, like my husband, my sisters and even my friends.</p> <p>SQ2: Are there any activities, items or places that would help you cope with grief?</p> <p>SA2: In my experience, I would not purposely go somewhere, but I will take items of the deceased out to memorialize.</p> <p>SQ3: Why do you say you would not “purposely” go somewhere?</p> <p>SA3: Well, so far, when my family members passed away, I did not particularly choose to go somewhere to think about them. But I will think that if I do have the opportunity to go back to that place, then I will think about them, but I would not choose to purposely go somewhere to think about them.</p>
B6	<p>Grief is natural when losing one's loved ones. This is life. No one can be forever alive, and I believe earthly death is not the end, for one day, we will meet again. Grief is inevitable. No one can be exempted. I'll pray for my deceased loved ones for eternal life after death. Grief can be lessened as time elapsed.</p>	<p>SQ1: Are there any activities, items, or place that would help you cope with grief?</p> <p>SA1: Well, for me, for example, my older sister who passed away. I would put a picture up to memorialize her, and I do have a lot of her photos at home. I will also pray for her.</p> <p>SQ2: Can you explain what you mean by putting a picture up?</p> <p>SA2: I have this special picture of her and a picture of her living. It is encased in a special frame. It is not a frame I purposely bought by it, but when I happened across it, I thought of her. It said, “give me the love,” which is like the love she gives me is a lot.</p> <p>SQ3: Are there any traditions or rituals that you take part in with the picture?</p> <p>SA3: Unlike a lot of families, I am not that close to my sister. She lived in Hong Kong with her own family for a long time, and I was here in Canada for so many years. If I had a family, then I might participate in traditions and rituals, but for me, there is a distance and gap between us. It is almost two lives. However, this is only between relationships in a family, but if I was to talk about other relationships, like my cat, for example, it is different.</p> <p>SQ4: Can you further explain about your cat relationship vs a relationship between your family?</p>

		<p>SA4: I am not saying I am not close to my sister, but when you have someone always next to you, their leaving causes a bigger impact on you. When my cat left, that was a huge impact on me. I had this cat for more than ten years. When he was no longer here, and I came home from work, I would say, “Garfield, I am home!” even though I know he is not here anymore. Sometimes I would even say, “Garfield, time to sleep”. These actions, I kept doing it for a period. The feeling was terrible. When I even just thought of it, I was very upset.</p> <p>SQ5: In coping with grief of your deceased cat, were there any activities, items or places that helped you?</p> <p>SA5: No, I won’t. For me, I am a person with a religion. I am Catholic. So, when he left, I burnt him to be ashes. At the animal hospital asked how I wanted to deal with his ashes and told me about how there was a place to scatter the ashes, so I did that. I am not the type to save the ashes or leave it at home. However, I do have pictures and a spot for him.</p>
B7	Religion is the main medicine besides friends and family members. Keep active in the community. Volunteering for non-profit organizations.	<p>SQ1: You mentioned religion is the main medicine; can you explain?</p> <p>SA1: I am Catholic. In Catholic we would pray, and we believe that when someone dies, they go to a better place. What we believe in is more positive than negative. We don’t dwell on grief.</p> <p>SQ2: So, you would not be upset or experience grief?</p> <p>SA2: Well, let’s talk about my parents, when they passed away, I was upset for about a month; for the entire month, I did not want to eat.</p> <p>SQ3: Would you go somewhere specific or do a specific activity or take certain items to help you when you are upset during that time?</p> <p>SA3: Yes, of course. My dad had a lot of notes. He does not know English, so he took English courses. He was a very hardworking man. When he comes home from his classes, he would write notes, and it is quite funny. He would write the English word like Scarborough to See-Scar-Bow (pinyin?). I like rereading these warm and comedic notes. To other people, it is of no value, but to me, this is extremely valuable.</p>

Table 3. Raw data of grief response from booklet and interviews

4.1 Existing Heirloom and Memorial Artefacts

Question 2: Do you possess any heirlooms/memorial artefacts that are passed down from deceased family members or loved ones? If so, please list or sketch out heirlooms/memorial artefacts that you have. If you don't have any, please list or sketch out possession that reminds you of a current family member or loved ones.

Participant Code	Memorial Artefact / Heirloom
G1	Engraved necklace and picture of her mother
G2	Toy dinosaur, necklace, pictures, letters, and painting
G3	Pendant, sand, stickers, towel, and picture frame
G4	Gold ring with pearl
G5	Family album
G6	Gold cross necklace and snow globe
B1	Picture of parents
B2	Trunk, ironing board, doll, steel clutter, memoirs
B3	Photographs, handwritten cards and notes, knick-knack, figurines
B4	Jade (wears as a necklace)
B5	Jewellery (mix type), clothes (knit clothing), videos, writing piece, letters, gold phoenix bracelet
B6	Gold earring, watch
B7	Family photos and deceased daily used objects (watch, purse, etc.), father's notes, knit baby clothes

Table 4. Existing heirloom and memorial artefacts

Type of Artefacts	Generation Z	Baby Boomers
Jewellery	5	3
Picture and Video	4	4
Clothing	1	2
Written Memories	1	4
Toy and Figurines	1	2
Housewares and Furnitures	0	2

Table 5. Record of times a type of artefact was mentioned.

The younger generation commonly mentioned jewellery and pictures, whereas the older generation mentioned various artefacts; notably, they were particularly interested in pictures, videos and written memories, such as cards and letters. The type of jewellery mentioned was commonly necklaces or made from expensive materials such as gold, pearl, or jade.

When examining what heirloom was and what memorial artefacts were from all the participants, only participants G1, G4, and B4 had specified that the item they listed was an heirloom.

“I do have an heirloom which is a necklace from my dad before he passed, my initials are engraved on it.” (G1)

“Yes, in my culture, we possess heirlooms, particularly on the female sides”. (G4)

“Yes, my mother remained [left] two pieces of jades for me.” (B4)

Whereas other participants (G2, G3, B1 and B6) specifically mentioned they had no heirlooms,

“I don’t have any heirloom/memorial artefacts passed down, but I do have possessions that remind me of my loved ones.” (G2)

“I do not think I possess any memorial artefacts or heirloom.” (G3)

“I have no heirlooms, only a picture of my mother and father on their wedding day.”

(B1)

“No [heirloom] just earrings from my mom and watch from my elder sister. Those are not valuable jewellery but of course memorable.” (B6)

The concept of leaving something behind or being attached to a memorial artefact was not a value universally upheld by participants. B1 had mentioned that he did not believe in keeping the deceased’s products, as *“whatever I have of them is already in me.”* When asked why he had a photograph of his deceased parents, he explained that this was due to his sister's pressuring him to keep it. This follows suit with his reasoning on how he grieves and believes in the *“act of letting go.”*

Question 3: Where do you currently keep those heirlooms/memorial artefacts? If you don't, where would you keep those heirlooms/memorial artefacts if you do? Why? Please be detailed and, if possible, sketch out the location.

Participant Code	Location of item
G1	Jewellery bag at home
G2	On display in a room or with parents
G3	Pendant – wearing Sand/sticker and picture frame – display at home Towel – in a box wrapped in a layer at home
G4	Jewellery box at home
G5	Bookcase at home
G6	Necklace in a box Snow globe on the desk
B1	In a picture frame in the living room
B2	Trunk – house entrance Ironing board – basement Cutlery – the kitchen. Memoirs - bookshelf
B3	Photographs – digitalized Knick knacks – display case
B4	Always wearing it
B5	Jewellery and clothes– wear or closet Others in bag or chest
B6	Jewellery bag at home or wear (watch)
B7	In a safe at home

Table 6. Individual response to where they place their artefacts

Location	Generation Z	Baby Boomers
Jewellery Bag	1	1
Box	3	1
Bookcase	1	1
Digitalized	0	1
On Display	3	2
In Use	0	3
Currently Wearing	1	3

Table 7. Location of artefacts

The Baby Boomer generation tended to wear or use their memorial artefacts, whereas the younger generation would have them stored away in an enclosed space or on display at home.

Question 4: How often would you or do you take out those heirlooms/memorial artefacts? Do you carry it around, or do you leave it in one spot?

	Generation Z	Baby Boomers
Wearable	3	2
Stationary	3	5

Table 8. Number of participants that had artefacts stationary or were wearing

Frequency of Use	Generation Z	Baby Boomers
Often	1	2
Seldomly	4	2
Never	1	3

Table 9. Frequency of using the artefacts

Participant	Reasonings
G1	On special occasion - based on mood
G2	Only to bring them out when trying to recall or miss them
G3	The necklace is worn every day
G4	Every couple of years to take it out. Does not want to lose it
G5	Only leave bookcase when relative would want to see it
G6	Never moves it
B1	-
B2	Items are in use. The only ragdoll is in cardboard box under the stairwell
B3	Fear of losing and fear of interacting with technology and public space (digitalizing)
B4	One of the jades is kept in the drawer (to not lose it), while the other jade is currently worn
B5	Clothes sometimes are worn. The majority of the items are kept away. Jewellery is worth keeping because jewellery you need to keep it for your future generation
B6	-
B7	Items are kept in a safe and all together in one spot (basement)

Table 10. Reasonings on the frequency of use

No significant results were shown on whether Generation Z or the Baby Boomer generation's artefacts were wearable or stationary. However, during the interview, the artefact's safety and the fear of losing or the fear of having the article stolen was mentioned by both generations. In terms of frequency of use, the younger generations mentioned that they would sometimes take the artefacts out to reminisce, use, or wear.

Question 5: How do you maintain the condition of the heirlooms or memorial artefacts?

Participant Code	Frequency	Method
G1	Never	-
G2	Never	-
G3	Sometimes	Clean the gold product and remove jewellery before a shower to prevent rust
G4	Often	Shine and clean the gold with cloth and water and sometimes toothpaste
G5	Sometimes	Older photos aren't touched to preserve them. Everything else is placed in a binder
G6	Sometimes	Clean the snow globe when it is dusty, but the necklace is left untouched
B1	Sometimes	Dust the picture frame
B2	Often	Replaced the cover of cardboard and fixed the wooden leg of the ironing board. No maintenance for trunk and cutlery
B3	Often	Pictures are digitalized. Figurines and Knick Knack are left untouched
B4	Sometimes	Only remove during swimming or bath
B5	Never	Seldom used so does not need to maintain
B6	Never	-
B7	Sometimes	Keeps in a safe and in a plastic box. But does not maintain a lot of the items; even if they are broken, they will still be kept.

Table 11. Maintenance of existing heirloom or artefacts

Frequency of Maintenance	Generation Z	Baby Boomer
Often	1	2
Sometimes	3	2
Never	2	2

Table 12. Frequency of maintenance

No insights were found from this data set. Common terminologies that can be seen are dust and gold. Both generations do not often take their artefacts out for maintenance.

Question 6: How long can your heirlooms/memorial artefact last and preserve for? (in years)

All participants believed that the item would last them a minimum of 20 years until, well, eternity: all participants were unclear on how long they thought it would last and never thought about how long it could be preserved.

Question 7: Do any of your heirlooms/memorial artefacts incorporate technologies of any kind? If so, please list down all the heirlooms/memorial artefacts that consist of some kind of technology.

Participant Code	Type of Technology and Additional Comments
G1	Besides taking pictures of the photo in the frame, no other digital photo of parents or digital products
G2	Pictures scanned and saved in a computer
G3	"I would not want it to be digital. Like, I only have pictures, but I would not consider that digital"
G4	-
G5	Photographs
G6	Has mechanical technology (snow globe). No digital products
B1	"No technology, just pictures."
B2	Different technologies are incorporated into the artefacts, such as print technology, carpentry, etc. Only computerized technology would be the typing of the memoir
B3	Photos scanned, and music imported from CDs. None of the other artefacts left from his mother had technology involved, as she was not a "technical person."
B4	-
B5	Pictures and videos transferred by a participant after some years
B6	-
B7	-

Table 13. Technologies incorporation in existing heirloom and artefacts

Technology	Generation Z	Baby Boomer
Yes	3	4
No	3	3

Table 14. Yes or no answer if participant's artefact incorporated technology

The most frequent answer from each generation was the digitalization of photos. No use of digital technology or integrated technology was mentioned.

4.2 Desire Personal Heirloom Design

Question 8: If you were given a chance to design your own heirloom for your future generation or loved ones, what would it look like? Please sketch or describe your desire heirloom.

Question 9: What are three keywords or main design concepts you would use to describe your heirloom design?

Participant Code	Designed Heirloom	3 Key Words
G1	Journal of life experience	Hardcover, Stylish, Memorable
G2	Letter about life experience	Fun, Progressive Learning, Love
G3	Wristband (Bracelet) with moon and star	Infinity, Simple, Plain
G4	A piece of music using VR	Senses, Memories, Music
G5	Sculpture with family heritage	Modern, Sleek, Curved
G6	A gold ring	Simplicity, Long-Lasting, Modest
B1	A family crest	Earth, Water, Heaven
B2	A patch of garden or birdfeeder	Unobtrusive, Alive, Joyful
B3	Combination of notes or photos or videos – family tree	Family, Connection, Love
B4	Same jade heirloom in a necklace form	Memorable, Easy to carry, Valuable
B5	Video with important family life events	Love, Family, Forever
B6	Necklace with music symbol	Peace, Hope, Memories
B7	Jade	Love, Care, Forever

Table 15. Designed heirloom listing

Type of Heirloom	Generation Z	Baby Boomer
Jewellery	2	3
Art (music, painting, sculpture)	2	0
Picture or Video	0	2
Written (letter, book, journal, memoir)	2	0
Nature	0	1
Family Crest	0	1

Table 16. Type of heirloom chosen from either generation

In the booklet's desire section, the aim was for the participant to draw out what they desired; however, only three participants drew, whereas the rest of the participants described their idea during the interview. The interviewer roughly sketched their ideas based on what they described verbally for those who did not draw yet have a clear understanding.

The three most repeated keywords used from both generations were love, family, and memories. An observation is that none of the Generation Z mentioned incorporating videos or pictures despite pictures and videos being the most mentioned in the existing heirloom section. For the Baby Boomers, we saw jewellery design and the concept of a family were mentioned often.

Question 10: What would be the reasoning/motivation/inspiration behind your design?

Participant Code	Reasoning, Motivation, and Inspiration
G1	A journal that describes her feelings and would be directed to her closed loved one overseas
G2	A handwritten letter that teaches her future generation about the life lesson she learned
G3	A wristband that represented her with a cultural component such as the sun and the moon and an infinity symbol.
G4	A piece of music as her heirloom. She wishes the emotional connection from the music would enact feelings and memories of her and the loved ones. She also mentioned having this music played in a VR environment that projects scenery of nature and clouds.
G5	Collaboration with her relatives to design a “ <i>sculpture or art piece inspired by our family history and origins.</i> ”
G6	A simple gold ring as he was unable to brainstorm any ideas and this item was the first thing he thought of

B1	Creating a family crest that would describe his family passage or family tree. His reason was that if anyone in the future generations were curious about their past and needed answers, this would answer their questions
B2	A patch of garden or birdfeeder that is portable. She reasons that “ <i>plants carry on growing</i> ” and that she does not want something imposing. She wishes for something living and for something people can associate her with
B3	Showcase his family tree, notes, photos, and videos. He reasons that “ <i>it is helpful and interesting to know where you come from.</i> ”
B4	Same jade heirloom that he had received from his mother to pass down to his child; however, the design portion would be designing a necklace to hold this jade as his necklace is a makeshift string that is not sturdy
B5	A video that can showcase the different stages of life that she had. For example, when she was a baby, moments in her childhood, etc. This idea was her hope to showcase her experience, feelings and influences towards certain stages in her life, “ <i>because like this is the entire family, everyone is connected, and you can show that my family experienced a lot through this video and what they experience and how they overcame and rejoiced in different stages.</i> ”
B6	A necklace that was representative of her with elements of religion and music.
B7	A piece of jade that has the Chinese character ‘love’ engraved on it. She reasoned that having the Chinese character would allow “ <i>her future generation to know their background, their tradition, their culture and their belonging.</i> ” The use of jade is an important material for the Chinese, especially Jadeite Jade. The value of jadeite jade is also high, and she hopes that in a time of need, her future generation can pawn this jade to help them financially. Lastly, the term love is based on her value of recognizing the person's existence.

Table 17. Reasoning, motivation, and inspiration behind designed heirloom

Purpose	Younger Generation	Older Generation
Personal Interest	3	1
Culture and Religion	1	2
Family (background, information, crest)	1	5
Teaching (life experience)	1	1
Interactive (collaboration with others)	1	0

Table 18. Number of participants and their intended purposes behind the desired heirloom

The Baby Boomer group mostly discusses their desire to share their family’s culture, religion, and heritage. However, one participant responded about the intention behind an heirloom, and if possible, she would not design one. She explains that it is because “everyone’s generation is different, and the way we memorialize is different,” her design would not make certain relatives

remember her as they do not really know her. She also questions the practicality of an heirloom from the perspective of a single, unmarried woman: *“I have some single friends like me, and we do discuss if we pass away what do we do with them... if when I die, and my money can help him or them, then I would pass it to them. It is much more practical”* (B6). In contrast to the older generation, the younger generation focused on sharing their feelings or personal representations. G6’s design was solely based on his first impression of what an heirloom should be, and no additional purpose or intent was behind it.

Question 11: Where would you like your heirloom to be placed? Please be detailed.

Question 12: Please list those that you think would interact with your heirloom.

Participant Code	Location of heirloom	User interacting with heirloom
G1	No preference	Boyfriend and Family Members
G2	Where it is visible	Younger siblings
G3	Where the person is comfortable	Friends and Siblings
G4	No preference	Family and Friends
G5	With all other heirlooms	Family and Friends
G6	Shelf	No one – perhaps children in the future
B1	Picture frame – front of the door as a reminder	Anyone
B2	In the garden	Family and friends
B3	No idea	Children
B4	Somewhere safe / always wear it or have it on the body	Daughter
B5	Somewhere private (bedroom)	Family and Friends
B6	Home	No one
B7	Somewhere safe	Children

Table 19. Location of heirloom and intended receiver

Location	Number of times mentioned by	
	Generation Z	Baby Boomer
No Preference	2	1
Visible (Display)	2	1
Hidden (Private and Safe)	0	5
Nature (Garden)	0	1
Up to the receiver	1	0
Others	1	0

Table 20. Location of heirloom

Interaction	Number of times mentioned by	
	Generation Z	Baby Boomer
Children	0	3
Current Family Members	5	2
Anyone	0	1
No One	1	1

Table 21. Intended Receiver of Heirloom

G6 mentioned no one because he believes that the heirloom would be left or given to someone after his death, but he is not going to die soon, so he is unaware of who in the future should receive the heirloom. For B6, she reasons that she is a single lady; if she were to give to the future generation, it would be money. As such, she chose her sister after much contemplation but still stuck with the concept of ‘no one.’

Table 17 re-emphasizes the fear of losing the heirloom, like Table 10, as most of the older generation chose to keep the designed heirloom in a hidden, private, or safe place. In contrast, the younger generation did not prefer or left it to the heirloom recipient. No one in the younger generation mentioned the need to keep their designed heirloom safe.

4.3 Technological Considerations

Question 13: Please list all the social media (SNS) you use.

Question 14: How many hours daily do you spend with social media?

SNS Platforms Type	Generation Z	Baby Boomer
Social Networking (Facebook, LinkedIn, Messenger, WhatsApp, WeChat, Google Hangout)	6	5
Photo Sharing (Instagram, Snapchat)	5	0
Microblogging (Twitter)	0	1
Video Sharing (YouTube)	2	3
Email	2	3

Table 22. Number of participants that use the respective type of SNS platforms

Hours Spent on SNS	Generation Z	Baby Boomer
Less than 1 hour	1	2
1-5 hours	3	5
More than 5 hours	2	0

Table 23. Hours spent on SNS

The social media terminology varies between individuals. Many of the older participants provided whatever they did on the internet or were not aware that specific applications could be considered under social media such as WhatsApp, “*I use WhatsApp, but I don’t know if that is considered social media*” (B3). A similar situation occurred with the younger generation: “*I don’t think LinkedIn is, but I use LinkedIn as well*” (G3).

Question 15: Have you ever left a message on social media to remember someone who has passed away? Please provide an example of a message you would leave for someone who passed away on social media.

Participant Code	Message Sample or Comment
G1	Mom/dad, I wish you were here so we could be together happy birthday in heaven! Death day: Mom/Dad, It's been a while, I miss you so much. I love you!
G2	I don’t want to say you want to get something back from it, but it is definitely something that is share something with people. You don’t expect to post something for you anymore. (Comment)
G3	No. For my loved ones? No. Even for my friends no. I just feel like it is out there, it does not mean much, I like to keep it to myself. I may tell my friends, like, this person died, I would not share it on Facebook or social media. (Comment)

G4	It will probably be a tribute to them, or about how life is too short and we should reflect on ourselves and our actions. (Comment)
G5	It is with great sadness that I write that (relative/loved one) has recently passed away. They were (describing personality), and to know that they will no longer around be a bitter pill to swallow. While unfortunately, they are not here anymore, at least I know they will never be fully gone
G6	I might respond to something and leave my sympathy. But I would not post anything like that. I would not post it publicly. I would let other people know that there is something going on in my life, but like Facebook and other social medias, friends are not always friends. (Comment)
B1	Safe Travels
B2	Did not post on SNS but did write out email to invite colleagues to a memorial service. (Comment)
B3	Yah. I just usually offer my condolences. Depending on the messages, I would just say, oh, that person is obviously very important to you. He or she is a lovely person. I tried to do the typical “my condolence” or like, or sad face... but a bit more. I read; I actually have some empathy. Social media is, in many ways, I find it to be very negative. I find that a lot of social media is negative. (Comment)
B4	Only have commented but never posted. Just recently, my friend’s dad passed away. He told me this through WhatsApp, and I just messaged him back to not be so sad. (Comment)
B5	Our heartfelt condolences to you and your family. Hope that our heavenly father brings you and your family the much-needed peace during this sad time. Will pray for your mother's soul!
B6	Prefer face to face. (Comment)
B7	I prefer typing it because sometimes, you just don’t know what to say. Also, there are lot of resources, like to choose a good comment or reply, I can find it on Google. I don’t want to see the people right after learning of a deceased loved one related to them. My first approach would be to send a message via social media, text, this type of stuff. I don’t want to bother them because I understand they have a lot of stuff they need to go through and do not have the time to deal with visitors. That said, calling is much more sincere; however, that is really only for later stage based on relationship. (Comment)

Table 24. Comments on leaving or not leaving SNS condolences posts

Technology	Generation Z	Baby Boomer
Yes	2	3
No	4	3

Table 25. Yes or no answer of participants leaving condolence post

Although the Baby Boomer left more comments or posted more messages about grief on social media than the younger generation, both generations were very strongly against posting these messages on social media or connecting personal death-related content with the internet.

Question 16: What would be the reasons why you would message on social media to honour a passed loved one if you do?

Participant Code	Reasonings
G1	To let people know that I still really care about them, just as I can post on any other person's birthday, my parents still matter
G2	<p>A contradiction was seen as in the booklet she wrote, “if I do decide to leave a message to honour a passed loved one, it might probably be because that persona has impacted my life and those of the people that might see my message collectively.”</p> <p>In the interview, she mentions, “I don’t know... and I don’t think so [of posting]. I don’t think I would post it on any other social media, only the texting kind of style. Even when I text something down, it is not the full expression of how I feel... I rather write or talk”</p>
G3	I don't think I would want to post a message on social media
G4	Because you've thought of them and miss them
G5	If they were really close to me or if the people that follow me or family and friends of that person. Even then, I doubt I'll post it due to the reason stated in question #15
G6	I wouldn't. I'd prefer to remember my loved ones in private without involving unrelated parties and the internet
B1	Only if they have been of great importance
B2	Not many. I do not want to display grief. I might say later to invite people to an event commemorating them.” Although she would not display grief, she does read up on other people’s display of grief, “Oh yeah! I read a lot of it. The guy was really loved. I did read on social media. It was retweeted by these African studies that was how I was able to do it. Some people were away and wanted to share, and they were important in his life. That was fine. I was happy with that. I would not want to do this myself. I thought it was a vanity to say I am here; I am important for him
B3	Social media is not the place for private or personal information
B4	In the past, when my parents died, these kinds of social media were not present or popular or common. There was no way to let people know about the passing of loved ones. So now that there are these resources, then I can use them.
B5	To express my respect to her/him. To let them know she's so missed. To let go of my sadness. To let the family members know we're with them and want to show their grief. Unable to be present to send condolences.
B6	Participant did not wish to comment. No message was left in the booklet.
B7	First stage is consideration. Her reasoning was further commented on in question #15.

Table 26. Reasons on leaving a message on social media

The majority of the younger generation had no intention of posting or had never posted on social platforms regarding grief. The outlier, G1, whose parents have passed away, actively posts about memorializing their death on a public platform, particularly on their birthday or the day they died. The response from the older generation was more open in communicating on social platforms. They were more comfortable in private messaging individuals than publically commenting or messaging about death. Another outlier, B7, mentions that she would always text or message the deceased's relative first before meeting face to face. Her reasoning was to give time and space to the individual as an act of consideration.

Question 17: What other technological methods have you used or experienced in interacting with someone who has passed away?

Participant Code	Technological Methods
G1	None
G2	None – would write a letter or send emails to someone who passed away
G3	None – if my friends want me to be at the funeral, I would, but I would not want to go. It is a very sad thing.
G4	None – not a familiar concept within the culture
G5	Slideshows and photos
G6	Photographs and videos
B1	None
B2	Email, Telephone, Letter and Card
B3	Online Obituary Websites, Photos on iPhone
B4	None – technologies were not that advanced back then, and I don't have any experience in having to conduct a funeral with these technologies yet
B5	None
B6	None
B7	None

Table 27. Technology usage during the passing of someone

The majority of the participants had not used technologies within the mourning period, except B3, who had used online obituary websites and had seen online funerals but never interacted with them. Also, the younger generation mentioned slideshows, videos, and photographs. An

observation was that the younger generation had little to no experience of someone passing away, which resulted in their answers being sparse.

Question 18: Have you ever attended a funeral or memorial service? If so, please describe the ritual that was conducted.

As mentioned in Chapter 3.1.4, this question was a bonus question not included in the booklet: it was asked during the interview. This question's original goal was to investigate whether technology was used in a funeral environment through the participants' stories and experiences.

G1's response was based on her personal experience in the passing of her father in Colombia. The religion of the parents was Protestant, while the participant is Catholic. *"When a person dies, they carry the person's corpse to the village. I mean, some people would bury in their backyard and stuff depending on your tradition, because mine, we don't do that. We just do the burial in the village. So, you carry the corpse to the village, and the night before the burial, people are crying and doing stuff. I mean, just hanging around until the burial date. Still sad. The next day, the burial. I honestly did not notice much about tradition until my dad's burial. They made me eat. They made me eat early in the morning."* They still use coffins. Children or families of the deceased must hold onto the picture frame in the procession. Pictures were shown for showcasing. No technologies were seen incorporated in the event.

G2's response is based on her observation when attending her grandmother's funeral in Nigeria. *"One thing I noticed was the overall celebration rather than mourning. Because they tend to say in our culture that after a certain age, I think it was 75 or something, it is no longer mourning for the person but a celebration of life. We call it celebration life. So before the burial, we have fun, food and party and everything before we move to the burial site. So that's why it was meant to be something heartbreaking; they tend to enforce to you that you should not feel like pain at*

first but remember that person it is a joyful thing.... The burial itself, by pouring sand... My grandma, they bury her in the family house. They built a mini house by the family house. It is in the same compound as the family house, and you can see the place they bury. Everything that happens in the church was there; the priest was there."

G3 never attended a funeral. The response was based on her knowledge of what she had heard or learned. *"For Muslims, I know we have to bury them immediately. We celebrate their passing. It is more about the rite of the pass. You wrap them in this white cloth. In Nigeria, you can just bury them in the land or bury them in a cemetery. Dig a hole, put it in a coffin, and bury it in your backyard."*

G4's religion is Islam and has attended one funeral. *"For me, in Islam, we usually wash the deceased body, we go to a room, lay them on a bed, close people go inside, look and say goodbye. Take them back and bury them. After that, people will go to moss or a specific place to show condolences and say they're sorry. They listen to the Quran being recited. We shake hands with the people."* Wrapping the deceased in cloth and eating food together are also some aspects she described.

G5 attended a funeral. Observation is based on memory from a young age. *"When you go into the funeral home, there is this waiting room where people can conglomerate before going into the funeral procession. The first funeral that I have been to was when I was ten, and they had this slideshow, they have done that.... At all the funerals I have been to, and I have been to a few (all immediate families). Then when my grandfather passed away, on my European side, I was unable to be there; it was during the school year, and I was pretty young. What one of my parents did who went, she took a video of family and friends and then it is just not a necessity for*

our own purposes but for also the extended family as well, on that side of the family to honour that person. That would be it.”

G6 mainly attended a church funeral, although they do not recall what kind of church. The only technologies noted were music and electronic photographs. Mentions about remembering involved music. *“Oh, the process was, you know...everybody would gather around, people would see each and talk about the deceased and remember them, the official seating would start, and loved ones would come up and acknowledge.”*

B1 provided two funeral stories. Both stories revolve around the military. One was about a cheating couple. Another story was about his father and his father’s war experience. *“I look at things differently when you grow up with a sniper. Everything is about discipline. You have to see everything. This is how it is. If we get caught in a civil unrest, like where I am from. You realize that it doesn’t take much for you to come home. You learn to let go. You look at it differently. You don’t hold onto things with two hands. You learn to embrace it. This is where my mentality changed. It started very young. By the time you go to school, you are already going through five to eight funerals. By the time you finish school, let say you had 32 people; out of 32 of us, only three of us were left alive. There were a lot of funerals.”* Participants also discuss legacy when asked about technologies or other product-based observation: *“Just whatever pictures they had. Young. Old. Different slide shows. They had a picture of a portrait. In the past, we heard stories of what they were like, but no pictures. Some people are alive and dead. Some people are dead but still alive. Mother Theresa is dead, but she is still alive. Meaning their legacy or their works keep them alive. Some people are alive and walking around like they are dead and never contributed to anything. They don’t even know why they exist.”*

B2 described a memorial service that occurred two years before the interview. No digital technological, or physical products were recalled. *“So, when that colleague passed away, there was no funeral ceremony; there were two memorial ceremonies since there was no casket. There was a church ceremony, and there were a lot of images at the back. I don’t know if they used PowerPoint, but there was a lot of that films. People were coming on skype. They did not come on Skype, but they did a Skype video in a way that was played in the ceremony. There was a faculty ceremony in the university location, again a lot of projected images, testimony and little films. There was a lot about this colleague on social media, Twitter, and on Facebook. But I don’t remember that stuff making into these two ceremonies.”*

B3 attended different types of funeral and memorial services. The description of a funeral procession was vague. The observation was that people attend and talk to one another. When speaking of the technologies involved, B3 stated: *“Usually there is a slideshow going on. Music playing. Multimedia. Big screen. Pictures. Transitioning. Very common. You bring your photographs, and they will scan them. They will digitize your music.... Some older people, older than me, they would not... email is too impersonal. Technology is cold. They want something written.”*

B4 has attended many funerals. The funeral style was Taoist: *“Although we don’t believe in any religion, but we do pray to the Buddhist gods. My mom and dad were in Taoist style. Taoist style has something called ‘Breaking the Hell’. Taoist priests would recite the scriptures, and then they would do the Breaking the Hell ceremony. The Taoist priest would light some fire in the centre, and the Taoist would dance around the fire. After finishing dancing, they would break these slate shingles. Then my brother, who is the oldest, would carry this religious item; it’s a bamboo stick with white flaps that soaked in water on the end in one hand and held the picture in*

another. While holding these stuff, he would then walk around the coffin once, and the Taoist would be in front of him recite scriptures. This is a Taoist style.” No digital technologies were used. When asked why a Taoist choice was chosen, he mentioned that Chinese people are sensitive to the topic of death. The future generations do whatever the elder in the household says.

B5 has attended memorial services and funerals. *“Actually, not really, most were at a funeral home. I feel like these funeral homes... well their procession, at night there is a visitation, and the feeling is very serious and quiet.”* The participant was hesitant in answering and mentioned God, her religion and music.

B6 has been to many funerals as she participated in a church choir for funeral services. She described three short funeral stories, first, about her sister’s funeral that was in Hong Kong. The style of the funeral was Taoist. The second funeral was a nun and took place at a Chinese Catholic church. It was observed that *“At the funeral, there was this red carpet. In the middle, they laid out this red carpet. The reason why it was done was so that it lifted up the atmosphere in the church as this is a celebration of her life.”* Regarding the third funeral, involving a couple, she observed that she felt very touched by this funeral based on the couple’s story told during the funeral.

B7 has attended many funerals before. *“I am actually afraid of seeing corpses that are disfigured. I found that the death of children is the saddest funeral I have been to.”* The majority of the funeral attended were church funerals as she is Catholic. However, a funeral she recalls would be Taoist and Buddhist style funeral, *“my nephew who is in Canada, decided to do a Taoist style for his deceased mother. My nephew, who was 10ish years old, said it was like a*

magic show. Like, imagine seeing guys who would mumble words and walk around in a circle and spit out fire and stuff. To them, it was different; it was mythical.” An observation from the participant in technologies, *“In the Buddhist style they have this device. It is kind of like a recorder that has recorded the scriptures; it was very peaceful. It was one device that kept repeating the voice of the scriptures. They believe that these scriptures would allow the soul to be willing to leave this world and be reincarnated in a peaceful.”*

Participant Code	Cultural Demographic	Style of Funeral Attended	Funeral Experience
G1	Colombian	Colombian	Some
G2	Nigerian	Nigerian	Limited
G3	Nigerian	NA	None
G4	Lebanese	Muslim	Limited
G5	United Kingdom	Memorial Service	Limited
G6	United Kingdom	Church	Limited
B1	Jamaican	Mix	Vast
B2	NA	Church and Memorial Service	Some
B3	NA	Memorial Service	Vast
B4	Chinese	Taoist	Vast
B5	Chinese	Memorial Service	Some
B6	Chinese	Church and Taoist	Vast
B7	Chinese	Church and Taoist and Buddhist	Vast

Table 28. Relationship between demographics, style of funeral and funeral experience

A noticeable observation from Table 28 was the difference in funeral experience between the two generations. The older generation has more and the younger generation has less. In terms of technology, only those who attended memorial service mentioned the use of technology, such as PowerPoint, Skype, slideshow, etc. Although limited digital technologies were mentioned in the religious and culturally based funeral (e.g. Muslim, Nigerian, and Colombian funerals), some props, and specific funeral-based items were used. For example, B7 mentions the recorder that reads scriptures and the white cloth used in Muslim funerals mentioned by G3 and G4.

4.4 Overview Insights from Data Analysis

An overall observation of the study is necessary to link both interviews and diaries together. In the diary study, the terms memorial artefact and heirloom were used. The definitions of both terms were provided within the booklet, along with the rules of the study. However, confusion occurred when a participant mentioned during the interview, *“Oh my god! I did not think it could be an artefact, but it was a towel. Which is weird! I just remembered!”* (G3). This could mean that she did not understand the term ‘artefact’ or understood the term but did not recall the memory or the item until prompted by the interview questions.

A similar situation occurred with a few older generation participants as well. For example, B7 mentions her father’s notes that she had kept for memory. She did not mention this in her booklet response, but when asked if she does anything to assist her when she is experiencing grief, her response was, *“My dad had a lot of notes I like rereading these warm and comedic notes. To other people, it is of no value, but to me, this is extremely valuable.”*

The data was split in two, as seen in the Venn Diagram in Figure 23, to analyze the differences and the similarities between the two age groups.

Figure 21. Venn diagram - insights from data analysis

Technology

Although both generations had expressed their preference towards analogue-based mourning experiences and had limited interaction with digital technology in the event of a deceased loved one, the reasons from both generations were different. The younger generation expressed that communicating on social media platforms such as Facebook about a loved one is uncomfortable or is an action they would not do, while the older generation expressed that they do not trust the internet. They find the action of posting online as vain. When the Baby Boomers were asked about their technological usage, most had listed email and texting as their top two SNSs, whereas the younger generation did not list these unless asked. Both reasonings stem from the concept of being unfamiliar; unfamiliar to use the technology in a mourning environment, with the trust and operation of the technology itself, and a lack of funerals or experience with death and dying. This led to the design consideration of increasing familiarity to increase credibility towards potential digital death-related products.

Life Experience and Family

Both generations indicated their desire to pass on life experiences and connect back to their family roots, as indicated in their heirloom design. The reason for passing down on their life experience was to teach their future generation about values, traditions, family history, and remembering the individual. This led to the consideration of continuing bonds, as participants expressed desirability to have a continuous relationship between the individual and the deceased.

Stationary vs. Portability

Both generations store and wear their existing artefacts. Both generations would wear mainly jewellery, and other households or antiques were left at home. Stationery items were either

stored in a safe drawer, cabinets or away from eyesight. The reason for storing it was to protect it, not lose it, or not have it be on display. Items that were stored were commonly not of monetary value but held sentimental value to the user. Portability was mentioned in the desire component for participants who are constantly travelling or moving. However, a negative comment about portability was the fear of losing the product. Another observation for both generations was that the participants were from different countries and cultures. When they attended their deceased loved one's funeral, many had to go back to their home countries. Many would also have family members across the world, leading to the concept of flexibility as a design consideration to increase the design's usability.

Sensorial Experience

Both generations had mentioned photos, videos, and music in both existing memorial artefacts and desired heirloom. Sensorial experience evokes affective emotions and triggers the cognitive experience, leading to the design consideration of affective-cognitive experience to enhance overall user interaction of death-related products.

Chapter 5: Discussion

As mentioned in section 4.4, the design considerations that this study suggests to consider in order to answer the secondary question, ‘What are design considerations in developing a user interface for death-related technological products to enrich the user interaction between the young and the older generations?’ would be:

- i) Familiarity: Inclusion of different interactions, experiences, and cultural routines of both old and young generations, thus reflecting the generational differences in technological knowledge, skill, interaction, and a routine applied to the mourning environment.
- ii) Continuing Bond: An informative element for a digital legacy that allows the user to experience a deceased person's memorial connection, thus reflecting on the desire to focus on family, family legacy and passing on one’s life experience.
- iii) Flexibility: A physical or technological component that allows the users to interact with the artefact in a distance or carry safely, thus tackling the fear of losing mourning artefacts and social connection between users.
- iv) Affective and Cognitive Experience: A sensorial interaction with the physical or visual interface of the artefact, thus enhancing the overall user experience while reflecting on the use of auditorial and visual elements in existing artefacts.

5.1 User Design Considerations

5.1.1 Familiarity

The younger generations were more inclined to have physical possessions than digital ones, which was different from what Baecker and Massimi (2010) had mentioned in section 2.3.2. They had also asserted a generational gap in the thanatosensitivity field, but the young participants in their study had expressed that they follow the trends, whereas the young participants in this study had expressed their desire for a tangible approach in mourning.

Based on the literature review, this study's initial assumption was that the younger generation would value or utilize technologies more than the older generation. However, none of the participants had any existing memorial artefacts with computerized technology incorporated into the product or connection to any social, communicational technology like SNS. The only digitalization mentioned was the reference to the scanning and digitizing photos, letters, or notes from the older generations. In fact, the idea of using SNS and displaying public grief online was repulsed by the younger generation more than the older generation:

- (1) *"I am not interested [social media], and although I use it and I see other people posting personal things, I just feel it's kind of awkward to leave a message on social media like you are expecting some specific response back."* (G2)
- (2) *"To be honest, if you were to give me something. I would not want it to be digital. Like... I only have pictures, but I would not consider that digital."* (G3)
- (3) *"I would be uncomfortable in delving into such a personal matter on social media where everyone can see it."* (G5)

(4) *“I’d prefer to remember my loved ones in private without involving unrelated parties and internet.”* (G6)

(5) *“Social media is in many ways; I find it to be very negative.”* (B3)

(6) *“I don’t like people going online like it is a competition of grief. I find that difficult... I do not want to display grief.”* (B2)

The undesired and emotional disconnect in using technology in a death-related environment re-emphasizes Van Dijk and Hacker’s (2003) psychological generational gap mentioned in 2.4.1. A difference would be that in this study, both generations are uncomfortable and not just the older generation. However, some aspects of technology were still accepted. For example, a virtual reality (VR) environment was mentioned by participant G4 in her design.

A psychological setback in utilizing social technology for grief and bereavement would be the fear of privacy leakage resulting in a trust issue towards the overall concept of using technology in this environment. These privacy concerns are based on the recollection of memories that the older generation had experienced.

“Photographs, I have them on my computer. I wouldn’t necessarily archive everything on my phone. That is an old school way of thinking. Younger people would not think twice about it. I am a little more guarded. If you grew up with technologies, you would be very comfortable with them. It is just a different way of looking at it.” (B3)

To combat privacy concerns, adapting to a familiar routine or habit should be considered when designing a bereavement social, technological interface. People are attracted to familiar patterns or routines (Ward, 2013). According to Billingsley, Smith and McAndrews (2002), the feeling of familiarity is evoked when people know about the stimulus without remembering details about the experience. Familiarity comes from patterns and habits, which could explain why the concept of texting or hosting private social groups was compromised as an ‘acceptable’ medium for both generations to communicate about death in a virtual space. As texting and emailing are two everyday actions that both generations do daily, these actions became a habit, which resulted in both generations being comfortable enough to use in a sensitive environment.

Although using technology, Figure 24 illustrates a sample scenario that can have the technology integrate behind the product's physicality, decreasing the fear of privacy concerns. The scenario follows the concept of capturing special moments using the familiar tool—the phone—and having the individual's memory showcased in jewellery to use as a medium to start a conversation with others personally.

Do you ever wish to have a product that is dedicated to your deceased loved one and consists of all their special moments?

Figure 22. Familiarity Scenario

5.1.2 Continuing Bond

In the booklet's design portion, the concept of connecting back to the family roots was a prominent element in what both generations had wanted as part of their designed heirloom. As most of the older generation are married and have a family, their value and desire to leave behind their family member. As such, the older generation tends to consider family as a priority over that of the younger generation, as can be seen in the use of family crest (B7), in the heirloom (B4), family tree (B3), in the video documenting family events (B5), and with a cultural heritage aspect (B7). For the younger generation, on the other hand, only one person (G5) emphasized a sculpture (G5) as a historical family connection, whereas the rest of them focused on what represented themselves, their own life experiences and stories. Both generations had desired to leave an element of themselves to their future generation, no matter if it is in the form of a letter, a journal, a video, or a piece of jade. It represents a legacy—a continuation of themselves, a continuing bond.

Not all of them had desired to leave something behind. Two of the older generation expressed that they would prefer not to leave anything, and one of them said that the heirloom would be useless for future generations because an object loses its value when the memory associated with the object fades away. For example, suppose the younger generation has no memory of an older generation but received an heirloom belonging to the said older person. In that case, the object may not hold more value than another object that the younger generation can recall the memory of. However, this concept changes when there is an intent behind the object, such as “*leaving answers*” (B1) for the future generation. The future generation may not have memories of the person, but the product would hold value.

Therefore, providing space or ability in the user's design to leave their legacy, answers, or intention for the future generation would be highly valuable in bonding the old and young generation in no matter which era.

For example, the scenario (Figure 25) shows a product that could remind the user of important dates related to deceased loved ones, such as birthdays or death days. This would tackle the problem of losing the deceased's value and memories and create a lasting bond between the user and the deceased. The scenario also illustrates an opportunity for the younger generation to bond with the older generation.

Do you ever wish to have a product that can remind you of when your deceased loved one special day is and remind you to remember him or her?

Figure 23. Continuing Bond Scenario

5.1.3 Flexibility

No matter if they held monetary value or not, the majority of the items were kept at home for safekeeping, as participants are more worried about losing the item than it being stolen. For example, in the younger generation, participant G1 had mentioned that she had lost the only photo she had of her mother, but luckily, she had a photograph of the photo on her smartphone. G4 also mentioned the fear of losing his grandfather's golden cross necklace, stating, *“You don’t want to lose it. It is special, and you can wear it a couple of times, but you mainly do not want to lose it. Plus, it is old and not trendy. Aesthetic wise, it is not there.”* B4 also mentioned worrying about losing his jade piece in the older generation, which is why he has found a long wool string to make a temporary necklace with the jade.

Similarly, the father’s note belonging to B7 was also kept safe even though it held no monetary value. The inconveniences of bringing memorial values outside of their home were further mentioned in B2’s design. Her design was a garden or a birdfeeder (see Table 3); however, she wishes for it to be portable since her family and herself are constantly moving.

To tackle this problem, the application of technology can be a solution. For example, a device protects the actual heirloom while your personal smart device connects and communicates with the device to provide information on your heirloom and images. This would allow the user to carry the device anywhere and access the heirloom without the fear of losing it. Flexibility, in this case, allows the user to control their own space and time wherever and whenever they wish to have access to their heirloom or memorialize.

In addition to the concept of flexibility, Figure 26 illustrates a sample scenario of an SNS application that incorporates aspects of sharing the memorial artefact and grieve in a social setting while protecting the artefact from harm and loss. This relates to the SNS parameters (Boyd & Ellison, 2008, p. 211) mentioned in 2.3.5, in which the use of a semi-public profile with access to the list of family and friends that uses the same service or application.

Do you ever wish to have the ability to attend your loved one funeral or support their family anywhere and anytime?

Figure 24. Flexibility Conversation Scenario

5.1.4 Affective and Cognitive Experience

In section 2.2.4, affective and cognitive experiences were explained as personal feelings and sensorial perception to recalled memories. As time progresses, it can become harder for people to recall specific details regarding an event, a person, or a thing. To recall memories, we can also stimulate our brain through images, as a picture can trigger our iconic memory. Images and videos were common tools used during the mourning timeframe, as seen in 4.1 existing memorial artefacts. Although images and videos were not popular responses in the 4.2 desire heirloom design section, the use of music and sculpture were seen.

Using auditory stimuli to trigger our memory was found in the study when an older generation participant (B12) commented on how she secretly recorded her sister's voice before she died to keep a memory of her and remember her voice. Music was also a recurring element discussed in the study that was showcased in both the desire section and the funeral observation section. Also, a younger participant (G4) also desired a musical piece incorporated in a VR environment so that those who use the VR and listen to the music would be reminded of her. As music is a universal language, a common connection and understanding are apparent no matter the age or generation.

Figure 27 illustrates a possible scenario that incorporates sensorial experiences to evoke personal feelings resulting in an affective and cognitive experience. The scenario concept is a picture frame that holds a short video component that allows the user to hear the deceased's voice and imagine they are holding a conversation.

Do you ever wish to be able to hear your deceased loved one's voice and see them talk to you?

Figure 25. Affective and Cognitive Experience Scenario

5.2 Possible Application of the Design Considerations

This section presents a possible application of the four design considerations; familiarity, continuing bond, flexibility, and affective-cognitive experience, as discussed in the thesis. (Figure 28). The potential target user group of the concept would be the general population.

Figure 26. Initial design concept sketches

The inspiration behind the suggested design concept is a jade plant (Figure 29), which bears a resemblance to a family tree structure where multiple family members (petals) are on one branch. A jade plant is also a common succulent house plant that can be bought in local Canadian stores.

Figure 27. Jade Plant

The suggested design concept is an artificial potted jade plant. Each jade petal on the plant represents one deceased loved one (family, friends, or pet). Each jade leaf can be connected to the artificial branch or connected to a necklace. The pieces can light up to remind the user when it is a special date for the deceased loved one (Figure 24); however, that is only if the jade piece is connected wirelessly to an app. The app consists of a family tree that can be shared, edited, and provided information to those the user restricts. The app also consists of a chat system, a legacy wall, access to the live funeral, or even an easier way for the user to send donations to the family (similar to Figure 27).

Based on one of the design considerations, familiarity, firstly, the suggested design concept emphasizes the tactile and analogue user interaction with a physical object at the front and hides the digital technology.

Second, the design concept symbolizes another design consideration, ‘continuing bond’ with the root, branches, and leaves, visually representing family connection and bonding. As one of the participants had mentioned, *“Everything we talked about leaving something for the next generation, which is good, that is if they want answers (of themselves)”* (B1).

This interview quote asks such fundamental questions of our origin as to where we are from and our backgrounds. Through the suggested design idea, one could visually link to other relatives, intuitively visualize their relationship, and trace their genealogy.

Also, family bonding and re-experiencing special moments can be done through saving videos and photos of the individual into their respective profile. This allows easier access to memorialize the individual when he or she dies. For example, a grandmother and her grandson's precious time together can be captured on a smartphone. Then, the data can be saved into the application and further saved in the grandmother's profile. When she dies, other family members (particularly the child when they grow up) can re-experience that precious moment.

Third, portability was another design concept focused on the user's design consideration—flexibility. This goal was determined by noticing that some participants prefer to keep their memorial items in fear of losing them. Items that were taken on the go were mainly wearable pieces, such as a necklace. As such, the petal can be removed from the stem and hooked onto a necklace connector piece that allows the user to wear the petal on the go if they wish to do so. As each petal would symbolize one deceased individual in the family, when the user wishes to memorialize the individual, they can wear the respective petal on the go. If the user is afraid of losing the petal or overcome by grief, they can hook it on to the tree's branch, making the product stationary.

Finally, the user design consideration of affective-cognitive experience is shown from the colour change in the petal from green to yellow as a visual cue to the family (user) that it is a special day for the deceased individual to which the petal is connected (e.g., birthday, death day, or anniversary). Another purpose of changing the colour of the petal is to trigger the user to evoke affective emotion and reminisce about the deceased with the family. This could potentially lead to family communication and re-watching videos or photos of the deceased. Auditory experience can also be found from the speaker output on the pot. This allows the user to play music or remember the deceased's voices from playing back recordings.

Chapter 6: Conclusion

Technology is a necessary tool in death and dying. For example, those who do not know what to do when someone dies can search for information on the internet. Those who have family or friends spread out around the globe or not living close to home can use social media to announce the news of the death. Those who create a presentation at funerals or need to find music or a platform to collect donations can also utilize many programs and technologies to assist them. However, technology can only be used by those who know how to use it. The digital generational gap between the Baby Boomers and Generation Z is seen with the rise of social media and ubiquitous social platform use from the younger generation.

This thesis investigates how these two generations perceive digital mourning artefacts differently. This study aims to provide design suggestions, which designers could use as reference when designing sensitive memorial objects. Through the diary studies and the semi-structured interviews with both old and young generations, this study attempted to answer the sub-question: *What are design considerations in developing a user interface for death-related technological products to enrich the user interaction between the young and the older generations?*

From the findings and analysis, this study suggests that designers should consider the following design considerations when designing bereavement products:

- i) Incorporate the notion of ‘familiarity that reflects the interaction, experience, and cultural routines of both the old and young generations to increase digital artefacts' credibility.

- ii) Allow users to experience a ‘continuing bond’ with the deceased person. This could be portrayed through an interaction or a visual representation that leaves an opportunity for a digital legacy.
- iii) Integrate ‘flexibility’ in the design that allows the user to carry around the artefact anywhere and anytime without the fear of losing it. As well, the social aspect of connecting with other loved ones in the event of a loss.
- iv) Enhance the affective and cognitive experience through interaction with the physical or visual interface of the artefact. The use of auditory and visual cues can help stimulate memories and connections of the deceased from the use of the artefact to the user.

6.1 Study Limitations

As mentioned in section 3.1.6, the data collection and analysis triangulation could not be completed due to the social distancing regulations implemented regarding COVID-19. The design considerations concept was initially intended to be a prototype for eliciting participant feedback related to the four considerations. However, the lack of accessibility to the modelling facilities made it difficult for the author to build prototypes and conduct their testing with target users to see their engagement with the suggested design considerations and validate whether it could enhance their mourning and grieving experience. Unfortunately, the third method, the prototype test, was not conducted due to this difficulty.

6.2 Future Research

Future studies will be necessary to recruit more participants in terms of a broader range of cultures and religions to provide a more diverse and richer user experience in mourning and grieving. The next step in the research would also be conducting the third method to validate and limit bias responses. This would garner insight into the effectiveness of the design

considerations. Also, future research on the application of other technologies such as internet of things (IoT), augmented reality (AR), and virtual reality (VR) with bereavement and specifically in investigating how to incorporate and create digital legacy mentioned in section 2.3.2 could provide an asset to designers when designing potential bereavement products.

During the study, the experience of grief and technology was vastly different between the two generations due to age and demographics. The older generation had a rich experience with grief, whereas the younger generation did not. As there was no control variable in this study about experiences, future research would have more specific control factors such as relationship to grief experience or relationship to technology. Lastly, it would be valuable to examine social exclusion with only older generations in death and dying to find an additional solution for the older generation.

Appendices

A.1 Ethics Clearance

CERTIFICATION OF INSTITUTIONAL ETHICS CLEARANCE

The Carleton University Research Ethics Board-B (CUREB-B) has granted ethics clearance for the research project described below and research may now proceed. CUREB-B is constituted and operates in compliance with the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS2).

Ethics Protocol Clearance ID: Project # 111138

Research Team: Vincere Ip (Primary Investigator)
WonJoon Chung (Research Supervisor)
Dr. Robert Biddle (Research Supervisor)

Project Title: Design to reduce the generation gap in the realm of death and dying: bridging baby boomers & generation Z to preserve memories of our deceased loved ones

Funding Source (If applicable):

Effective: July 11, 2019

Expires: July 31, 2020.

Please ensure the study clearance number is prominently placed in all recruitment and consent materials: CUREB-B Clearance # 111138.

Restrictions:

This certification is subject to the following conditions:

1. Clearance is granted only for the research and purposes described in the application.
2. Any modification to the approved research must be submitted to CUREB-B via a Change to Protocol Form. All changes must be cleared prior to the continuance of the research.
3. An Annual Status Report for the renewal of ethics clearance must be submitted and cleared by the renewal date listed above. Failure to submit the Annual Status Report will result in the closure of the file. If funding is associated, funds will be frozen.
4. A closure request must be sent to CUREB-B when the research is complete or terminated.
5. During the course of the study, if you encounter an adverse event, material incidental finding, protocol deviation or other unanticipated problem, you must complete and submit a Report of Adverse Events and Unanticipated Problems Form, found here: <https://carleton.ca/research/ethics/forms-and-templates/>.

Failure to conduct the research in accordance with the principles of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans 2nd edition* and the *Carleton University Policies and Procedures for the Ethical Conduct of Research* may result in the suspension or termination of the research project.

Upon reasonable request, it is the policy of CUREB, for cleared protocols, to release the name of the PI, the title of the project, and the date of clearance and any renewal(s).

Please contact the Research Compliance Coordinators, at ethics@carleton.ca, if you have any questions.

CLEARED BY:

Date: July 11, 2019

Natasha Artemeva, PhD, Chair, CUREB-B

Janet Mantler, PhD, Vice-Chair, CUREB-B

CERTIFICATION OF INSTITUTIONAL ETHICS CLEARANCE

The Carleton University Research Ethics Board-B (CUREB-B) at Carleton University has renewed **ethics** clearance for the research project detailed below. CUREB-B is constituted and operates in compliance with the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS2).

Title: Design to reduce the generation gap in the realm of death and dying: bridging baby boomers & generation Z to preserve memories of our deceased loved ones

Protocol #: 111138

Principal Investigator: Vincere Ip

Department and Institution: Faculty of Engineering and Design/Industrial Design (School of), Carleton University

Project Team (and Roles): Vincere Ip (Primary Investigator)

WonJoon Chung (Research Supervisor)

Dr. Robert Biddle (Research Supervisor)

Funding Source (if applicable):

Effective: July 23, 2020

Expires: July 30, 2021

Please ensure the study clearance number is prominently placed in all recruitment and consent materials: CUREB-B Clearance # 111138.

Restrictions:

This certification is subject to the following conditions:

1. Clearance is granted only for the research and purposes described in the application.
2. Any modification to the approved research must be submitted to CUREB-B via a Change to Protocol Form. All changes must be cleared prior to the continuance of the research.
3. An Annual Status Report for the renewal or closure of **ethics** clearance must be submitted and cleared by the renewal date listed above. Failure to submit the Annual Status Report will result in the closure of the file. If funding is associated, funds will be frozen.
4. During the course of the study, if you encounter an adverse event, material incidental finding, protocol deviation or other unanticipated problem, you must complete and submit a Report of Adverse Events and Unanticipated Problems Form.
5. It is the responsibility of the student to notify their supervisor of any adverse events, changes to their application, or requests to renew/close the protocol.
6. Failure to conduct the research in accordance with the principles of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans 2nd edition* and the *Carleton University Policies and Procedures for the Ethical Conduct of Research* may result in the suspension or termination of the research project.

Special requirements for COVID-19:

If this study involves in-person research interactions with human participants, whether on- or off-campus, the following rules apply:

1. The study requires prior approval of the relevant Dean's Office. See [Principles and Procedures for On-campus Research at Carleton University](#) and note that this document applies both to on- and off-campus research that involves human participants. Please contact your Dean's Office for information about obtaining this approval.
2. You must submit a copy of that approval to the Office of Research **Ethics** prior to starting any in-person research activities.
3. If the Dean's approval requires any significant change(s) to any element of the study, you must notify the Office of Research **Ethics** of such change.

Upon reasonable request, it is the policy of CUREB, for cleared protocols, to release the name of the PI, the title of the project, and the date of clearance and any renewal(s).

Please email the Research Compliance Coordinators at ethics@carleton.ca if you have any questions.

CLEARED BY:

Date: July 23, 2020

Bernadette Campbell, PhD, Chair, CUREB-B

Natasha Artemeva, PhD, Co-Chair, CUREB-B

A.2 Consent Form

CONSENT FORM

Name and Contact Information of Researcher

Vincere Ip, Carleton University, School of Industrial Design, Faculty of Engineering and Design

Email: vincereip@cmail.carleton.ca

Project Title

“Design to reduce the generational gap in the realm of death and dying: bridging baby boomers and generation Z to preserve memories of our deceased loved ones.”

Carleton University Project Clearance

Clearance #: 111138

Date of Clearance: July 11, 2019

Invitation

You are invited to take part in a research project because you are either between the ages of 18-24 years old or 55-75 years old. The information in this form is intended to help you understand what we are asking of you so that you can decide whether you agree to participate in this study. Your participation in this study is voluntary, and a decision not to participate will not be used against you in any way. As you read this form and decide whether to participate, please ask all the questions you might have, take whatever time you need, and consult with others as you wish.

What is the purpose of the study?

The purpose of this study is to find a link between baby boomers and generation Z to be able to communicate, memorialize, and preserve memories of passed loved ones.

Participants are required to complete the booklet within 7 days, and we estimate the interview will take 30-60 minutes to complete. Your participation in this study is voluntary, and you may choose to withdraw at any time.

What will I be asked to do?

If you agree to take part in the study, we will ask you to:

- a) Take the booklet. home and answer the questions in the booklet
- b) Once the booklet is done, contact the interviewer (phone: 613-854-6018 or email: vincereip@cmail.carleton.ca). Meet up with the interviewer for a 30- to 60-minute follow-up interview to clarify any answers in the booklet.

Risks and Benefits

We do not anticipate any bodily risks from participating in the workshop, nor do we anticipate that you will derive any benefit. Participants have the right to stop the research and withdraw from it anytime. Any sign of psychological harm or distress is presented, the research will stop and participants will be withdrawn.

Possible Benefits

You may not receive any direct benefit from your participation in this study. However, your participation may allow researchers to help develop a series of requirements for designers to better understand your wishes and desires in honouring your loved ones.

Compensation/Incentives

You will not be paid or compensated for your participation in this study.

No waiver of your rights

By signing this form, you are not waiving any rights or releasing the researchers from any liability.

Withdrawing from the study

If you withdraw your consent during or after the course of the study, all information collected from you before your withdrawal will still be used unless you request that it be removed from the study data.

After the study, you may request that your data be removed from the study and deleted by notice given to the researcher: Vincere Ip, within one day of the withdrawal of the study.

Confidentiality

We will remove all identifying information from the study data as soon as possible, which will be after one year of the researcher's dissertation.

We will treat your personal information as confidential, although absolute privacy cannot be guaranteed. No information that discloses your identity will be released or published without your specific consent. Research records may be accessed by the Carleton University Research Ethics Board in order to ensure continuing ethics compliance.

The results of this study may be published or presented at an academic conference or meeting, but the data will be presented so that it will not be possible to identify any participants unless you give your express consent.

You will be assigned a code so that your identity will not be directly associated with the data you have provided. All data, including coded information, will be kept in a password-protected file on a secure computer.

Data Retention

After the study is completed, your de-identified data will be retained for future research use. No faces or identities will be revealed in any video or audio recording.

New information during the study

In the event that any changes could affect your decision to continue participating in this study, you will be promptly informed.

Ethics review

This project was reviewed and cleared by Carleton University Research Ethics Board B. Should you have any ethical concerns with the study, please contact the REB Chair, Carleton University Research Ethics Board-B (by phone: 613-520-2600 ext. 4085 or by email: ethics@carleton.ca). For all other questions about the study, please contact the researcher.

Statement of consent—print and sign name

I voluntarily agree to participate in this study.	☐ Yes	☐ No
I agree to be audio-recorded	☐ Yes	☐ No

I agree to be contacted for the following interview and return of the diary

☐ Yes ☐ No

Signature of participant

Date

Participant's phone number or email to be contacted: _____

Researcher: Vincere Ip

I have explained the study to the participants and answered any and all of their questions. The participant appeared to understand and agree. I provided a copy of the consent form to the participants for their reference.

Signature of researcher

Date

A.3 Recruitment Invitations

Online Invitation

Volunteers needed for diary research and interview

We are looking for volunteers to participate in diary research.

The primary objective of this research workshop is to find key elements between the baby boomers and Generation Z's to be able to communicate, memorialize, and preserve memories of passed loved ones.

You will be given a booklet. In the booklet, you will be asked to answer a series of open-ended questions and to sketch out images. The participant will keep the booklet for a period of a week to fill out and explore. After the week, participants will be asked to meet for a 30-60min follow-up interview with the researcher at the time and location of the participant's convenience.

To be eligible, you must be:

- Ontario Residency
- English speaking
- Between the age 18-24 years old OR 55-75 years old

If you are interested, please email the researcher, Vincere Ip, at vincereip@email.carleton.ca for more details on participating.

The ethics protocol for this research has been reviewed and approved by the Carleton University Research Ethics Board [B], which provided clearance to carry out the research. (Clearance #: 111138)

CUREB-B:

Should you have any ethical concerns with the study, please contact the REB Chair, Carleton

University Research Ethics Board-B (by phone: 613-520-2600 ext. 4085 or by

email: ethics@carleton.ca). For all other questions about the study, please contact the researcher.

Email Invitation

Subject: Invitation to participate in a research project

Dear Mr/Mrs/Miss/Ms,

My name is Vincere Ip, and I am a Master's in Design student in the Department of Engineering and Design at Carleton University. I am working on a research project under the supervision of Assistant Professor WonJoon Chung.

I am writing to you today to invite you to participate in a study entitled "*Design to reduce the generational gap in the realm of death and dying: bridging baby boomers and generation Z to preserve memories of our deceased loved ones*".

This research will investigate key elements between the baby boomers and generation Z's to be able to communicate, memorialize, and preserve memories of passed loved ones.

To be eligible, you must be currently living in Ontario, English-Speaking, and must be either 55-75 years old or 18-24 years old.

In this study, you will be given a booklet. In the booklet, you will be asked to answer a series of open-ended questions and to sketch out images. The participant will be asked to keep the booklet for up to seven days to fill out and explore. After the booklet is completed, participants will be asked to meet for a 30-60min follow-up interview with the researcher at the time and location of the participant's convenience.

All research data will be password protected. Any hard copies/printed copies of data (including any handwritten notes) will be kept in a locked cabinet. Research data will only be accessible by the researcher and the research supervisors.

The ethics protocol for this project was reviewed by the Carleton University Research Ethics Board, which provided clearance to carry out the research. (Clearance #: 111138)

CUREB-B:

Should you have any ethical concerns with the study, please contact the REB Chair, Carleton University

Research Ethics Board-B (by phone: 613-520-2600 ext. 4085 or by email: ethics@carleton.ca). For all

other questions about the study, please contact the researcher.

For any further questions, please contact me at vincereip@cmail.carleton.ca.

Sincerely,
Vincere Ip

A.4 Diary Study Booklet Sample

	<p><i>Design Research Booklet</i></p>
<p>Participant Number #</p> <p>Please specify your age:</p> <p>Date:</p>	<p><i>Thank You for your participation</i></p> <div data-bbox="675 1476 1042 1610"><p>Researcher's Information: Vincere Ip E: vincereip@gmail.carleton.ca P: 613-854-6018 Please contact researcher when booklet is complete</p></div>

	<p>Rules</p> <ol style="list-style-type: none"> 1. Please answer as many questions as you can in the booklet. 2. You have a week to complete this booklet. 3. A 30-60min follow up interview will be conducted prior to completion of the booklet. 4. You have the right to pass any questions that makes you feel uncomfortable or irrelevant to you. 5. You can put any elements in this booklet (pictures, stamps, stickers...etc.) that would assist you in answering the questions. 6. All information will be anonymized in the thesis. 7. If desire, any non-identifying information will be deleted upon completion of dissertation. <p>Terminology</p> <p>Heirlooms: A valuable or inheritance that is passed down from generations to generations</p> <p>Memorial Artefacts: A piece of article that is valuable or memorable of the person who has passed away</p>
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1. How do you cope with grief from the passing of loved ones?	Do you have any comments or questions for the researcher?
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<p>17. What other technological methods have you used or experience in interacting for someone who has passed away?</p>	<p>2. Do you possess any heirlooms/memorial artefacts that are passed down from deceased family members or loved ones? If so, please list or sketch out heirlooms/memorial artefacts that you have. If you don't have any, please list or sketch out possession that reminds you of current family member or loved ones.</p>
<p>3. Where do you currently keep those heirlooms/memorial artefacts? If you don't, where would you keep those heirlooms/memorial artefacts if you do? Why? Please be detail and if possible, sketch out the location.</p>	<p>16. What would be reasons why you would message on social media to honour a passed loved one if you do?</p>

<p>15. Have you ever left a message on social media to remember someone who has passed away? Please provide an example of a message you would leave for someone who passed away on social media.</p>	<p>4. How often would you or do you take out those heirlooms/memorial artefacts? Do you carry it around or do you leave it in one place?</p>
<p>5. How do you maintain the condition of the heirlooms or memorial artefacts?</p>	<p>14. How many hours daily do you spend with social media?</p>

<p>13. Please list all the social media (SNS) you use.</p>	<p>6. How long can your heirlooms/memorial artefact last and preserve for? (in years)</p>
<p>7. Do any of your heirlooms/memorial artefacts incorporate technologies of any kind? If so, please list down all the heirlooms/memorial artefacts that consist of some kind of technology.</p>	<p>12. Please list those that you think would interact with your heirloom.</p>

<p>11. Where would you like your heirloom to be placed? Please be detail.</p>	<p>8. If you were given the chance to design your own heirloom for your future generation / loved ones, what would it look like? Please sketch or describe your desire heirloom.</p>
<p>9. What are 3 key words or main design concepts you would use to describe your heirloom design?</p>	<p>10. What would be the reasoning/motivation/inspiration behind your design?</p>

A.5 Semi-Structured Interview

Question 18: Funeral Related Observation and General Questions

- Have you ever attended a funeral?
- Can you describe some rituals, traditions, and processes of a funeral that you remember attending?
- Where was this funeral service held?
- At the funerals, was there anything that was digitalized or technology incorporated?
- Did you notice any significant object or tool that is used at that funeral? (i.e. food, sound, materials like clothing, etc.)

A.6 Analysis Mapping Chart

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Page 3 Results

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Page 3 Results (contd.)

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Page 4 Results

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Page 5 Results

(X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because:
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Page 5 Results (contd.)

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Page 5 Results (contd.)

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed - 3 more not displayed
- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed - 181 more not displayed

Page 6 Results

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Page 6 Results (contd.)

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Page 7 Results

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Page 7 Results (contd.)

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Page 8 Results

[illegible]

Page 9 Results

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Page 10 Results

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Page 10 Results (contd.)

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Page 11 Results

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Page 12 Results

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Page 13 Results

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Page 13 Results (contd.)

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Page 14 Results

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Page 14 Results (contd.)

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Page 15 Results

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Page 17 Results (contd.)

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Page 19 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font Arial-BoldMT is not embedded. Font Arial-BoldMT can not be embedded because: Could not find matching font to embed
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Page 19 Results (contd.)

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Page 20 Results

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Page 21 Results

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Page 21 Results (contd.)

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Page 22 Results

- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because:
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- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded
because: Could not find matching font to embed

Page 22 Results (contd.)

- (X) Font Arial-BoldMT is not embedded. Font Arial-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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Page 23 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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Page 24 Results

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Page 25 Results

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Page 25 Results (contd.)

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Page 26 Results

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Page 26 Results (contd.)

- (X) Font TimesNewRomanPS-ItalicMT is not embedded. Font TimesNewRomanPS-ItalicMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-ItalicMT is not embedded. Font TimesNewRomanPS-ItalicMT can not be embedded because: Could not find matching font to embed
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- (X) Font TimesNewRomanPS-ItalicMT is not embedded. Font TimesNewRomanPS-ItalicMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed - 94 more not displayed

Page 27 Results

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Page 28 Results

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Page 29 Results

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Page 29 Results (contd.)

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Page 30 Results

- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because:
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Could not find matching font to embed
- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because:
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Page 30 Results (contd.)

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Page 31 Results

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Page 31 Results (contd.)

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Page 32 Results

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Page 33 Results

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Page 37 Results (contd.)

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Page 39 Results (contd.)

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Page 40 Results

(X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because:
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Page 41 Results (contd.)

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed - 20 more not displayed

Page 42 Results

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Page 44 Results (contd.)

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Page 45 Results

(X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because:
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Page 45 Results (contd.)

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Page 46 Results

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Page 46 Results (contd.)

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Page 47 Results

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Page 47 Results (contd.)

- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed - 88 more not displayed

Page 48 Results

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Page 48 Results (contd.)

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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- (X) Font Arial-BoldMT is not embedded. Font Arial-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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Page 50 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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Page 52 Results

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Page 54 Results

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Page 55 Results

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Page 56 Results

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Page 56 Results (contd.)

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Page 57 Results

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Page 57 Results (contd.)

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Page 58 Results

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Page 59 Results

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Page 61 Results (contd.)

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Page 62 Results

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Page 62 Results (contd.)

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Page 63 Results

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Page 63 Results (contd.)

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Page 64 Results

- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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Page 65 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font Arial-BoldMT is not embedded. Font Arial-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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Page 66 Results

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Page 66 Results (contd.)

- (X) Font ArialMT is not embedded. Font ArialMT can not be embedded because: Could not find matching font to embed
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- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed

Page 67 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font Arial-BoldMT is not embedded. Font Arial-BoldMT can not be embedded because: Could not find matching font to embed
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Page 73 Results

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Page 74 Results

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Page 74 Results (contd.)

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Page 76 Results

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Page 77 Results

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Page 77 Results (contd.)[illegible]

Page 78 Results

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Page 79 Results

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Page 79 Results (contd.)

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Page 80 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font Arial-BoldMT is not embedded. Font Arial-BoldMT can not be embedded because: Could not find matching font to embed
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Page 80 Results (contd.)

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Page 81 Results

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Page 82 Results

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Page 83 Results

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Page 84 Results

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Page 88 Results

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Page 89 Results

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Page 89 Results (contd.)

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Page 94 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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Page 95 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font Arial-BoldMT is not embedded. Font Arial-BoldMT can not be embedded because: Could not find matching font to embed
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Page 96 Results

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Page 98 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed

Page 99 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed

Page 99 Results (contd.)

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Page 100 Results

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Page 103 Results (contd.)

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Page 104 Results

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Page 105 Results

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Page 107 Results (contd.)

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Page 108 Results

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Page 109 Results

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Page 110 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
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- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-ItalicMT is not embedded. Font TimesNewRomanPS-ItalicMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-ItalicMT is not embedded. Font TimesNewRomanPS-ItalicMT can not be embedded because: Could not find matching font to embed
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Page 111 Results

- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because:
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Page 111 Results (contd.)

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Page 112 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed

Page 113 Results

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Page 113 Results (contd.)

- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed
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- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-ItalicMT is not embedded. Font TimesNewRomanPS-ItalicMT can not be embedded because: Could not find matching font to embed
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- (X) Font TimesNewRomanPS-ItalicMT is not embedded. Font TimesNewRomanPS-ItalicMT can not be embedded because: Could not find matching font to embed
- (X) Font ArialMT is not embedded. Font ArialMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed - 108 more not displayed

Page 114 Results

- [illegible]

Page 129 Results

[illegible]

Page 130 Results

(X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed

Page 130 Results (contd.)

- (X) Font Arial-BoldMT is not embedded. Font Arial-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed

Page 131 Results

- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed
- (X) Font TimesNewRomanPS-BoldMT is not embedded. Font TimesNewRomanPS-BoldMT can not be embedded because: Could not find matching font to embed

Page 141 Results

- (X) Font TimesNewRomanPSMT is not embedded. Font TimesNewRomanPSMT can not be embedded because: Could not find matching font to embed