



Kenshō



Alternative Life Departure

by

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Submitted in partial fulfillment of the requirements for the degree of

Bachelor of Industrial Design

Faculty of Applied Sciences & Technology
Humber Institute of Technology and Advanced Learning

Supervisors: Catherine Chong and Sandro Zaccolo



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2021

Abstract

Typically, an average of 55 million people die annually, presently, this number is substantially increasing due to COVID-19. End of life is often dealt with in one of two ways in Western Society: burial or cremation; both of which retain severe environmental implications. Burial and cremation methods have been traced back to 1400BC and AD 200, as technology advances, and the population exponentially increases these methods become glaringly archaic. Beyond the urgent environmental, and social responsibility that's in need of being confronted, there is a secondary challenge of creating a place of remembrance and mourning for those left to grieve the loss. Is it possible to create an end of life experience that is both environmentally sustainable, and emotionally gratifying?

Remaining unbiased and analyzing both the environmental, and emotional standing of such a sensitive topic is of utmost importance; interviewing a variety of groups ranging in age, gender, religious beliefs, and location can aid in the complete understanding of this challenge. This thesis offers an in-depth understanding of first-hand investigation with reference to existing practices through a series of Advisors. A one-to-one model will be developed in order to evaluate the functional ergonomics, establishing proper human factors, along with the analysis of full-bodied human interaction. Reviewing results from interviews and exploring human factors will guide this thesis to a design solution that encompasses an environmentally sustainable alternative for end of life. This solution will be respectful to both the deceased and grieving family, with a focus on creating a socially empathetic solution for those mourning.

Dedication

In loving memory of
| Audrey, & John Summerfield |

“One day there will be nothing left but stories.”

Acknowledgements

Very sincerely, this project would not have been possible without the help, guidance, and continued support of the Industrial Design Professors at Humber College. Specifically, in regard to this project; Catherine Chong, who continued to push the design to heights I never thought possible, Sandro Zaccolo who managed to be a consistent source of support and advice while he simultaneously completed his Masters Degree, and the endless patience of Reece Bennett. It goes without saying Dennis Kappen, Bruce Thomson, and all the full-time and part-time professors have made more of an impact on my life, skill set, and career identity than I ever thought possible, I couldn't be more grateful.

I would like to thank the knowledgeable team at Blackblitz Waterloo for stepping in during a global pandemic to produce elements of the scale model - without whom I would not have been successful in the completion of this process. Further, the knowledge of Brittany DaSilva, and Sarah Cizej; offering their insight opened this project to address the emotional magnitude of loss.

To my fellow classmates and 2021 graduates; I never knew so much talent could be squished into such average sized people. You each inspire me in a different way, and I can't wait to see what the future holds for you.

Lastly thank you to Liz, & Brandon Colford who generously opened their home to me, without the unwavering support you both provided I wouldn't have been able to complete this degree. Thank you to Jesse Vallery, who has kept me grounded, motivated, and laughing throughout what I can only describe as the most chaotic four years of my life; your endless encouragement and patience granted me the stability to grow. For those not mentioned by name; family, friends, and Keggers you are hugely impactful, uplifting, and motivating, this accomplishment belongs to all of you.

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Chapter 1

Problem Definition



Figure 1- <https://www.budgetsaresexy.com/why-im-obsessed-with-cemeteries/>

1.1 PROBLEM DEFINITION

Typically, an average of 55 million people die annually, presently, this number is substantially increasing due to COVID-19. End of life is often dealt with in one of two ways in Western Society: burial or cremation; both of which retain severe environmental implications. Burial and cremation methods have been traced back to 1400BC and AD 200, as technology advances, and the population exponentially increases these methods become glaringly archaic. Beyond the urgent environmental, and social responsibility that's in need of being confronted, there is a secondary challenge of creating a place of remembrance and mourning for those left to grieve the loss. Is it possible to create an end of life experience that is both environmentally sustainable, and emotionally gratifying?

1.2 INVESTIGATIVE APPROACH

Remaining unbiased and analyzing both the environmental, and emotional standing of such a sensitive topic is of utmost importance; interviewing a variety of groups ranging in age, gender, religious beliefs, and location can aid in the complete understanding of this challenge. With referencing existing practices, and seeking advice from Advisors, a one-to-one model will be developed in order to evaluate the functional ergonomics, establishing proper human factors, along with the analysis of full-bodied human interaction. Reviewing results from interviews and exploring human factors will guide this thesis to a design solution that encompasses an environmentally sustainable alternative for end of life. This solution will be respectful to both the deceased and grieving family, with a focus on creating a socially empathetic solution for those mourning.

In order to begin defining the user, and developing a solution; research considerations, and questions are developed.

RESEARCH CONSIDERATIONS	RESEARCH QUESTIONS
<ul style="list-style-type: none">• Current alternative methods available.• User's emotional needs.• Respectful handling of deceased.• Environmental impact.	<ul style="list-style-type: none">• Why do people choose either burial, cremation, or an alternative?• If cremation takes place, what is done with the ashes?• How are people memorialized?

Table 1

A combination of both qualitative, and quantitative data will be collected and analyzed in hopes of capturing repetitive pain points that may be addressed.

1.3 BACKGROUND

Grieving the loss of a loved one is one of the most difficult life events a person may go through, although it is likely something each of us will face at some point in our lives. Examining stoicism it became abundantly clear that Western society often gravitates away from discussing loss, excusing oneself with the inability to articulate complex emotion. The subject of death, or dying soon becomes taboo and out of the norm, thus, in a sense, further isolating those who are grieving. This taboo has created an environment that allow traditional end of life services; burial and cremation, to remain relatively the same since as early as 12th century BCE. These services thrive in tradition, however, in more recent years have been discovered to have a devastating environmental impact. These impacts range in severity; from use of habitable land, mishandling of raw materials, embalming fluids seeping into underground water ways, and further Co2 emissions are a all immediately impacting on the environment both locally, and globally. With COVID-19 infection rates continuing to climb, now is the time to challenge the taboo subject of death, and create a sustainable solution for end of life.

BURIAL



Figure 2- <https://www.funerals360.com/blog/caskets-and-urns/the-difference-between-a-coffin-and-a-casket/>

Death is an enormously meaningful process filled with complex and difficult to process emotions. Cultural rituals vary depending on location, tradition, and belief; these factors are also influenced by the social and economic dynamics. Further exploration of contributing factors will be examined shortly.

Since the 19th century, anthropologists have been examining and understanding past mortuary practices to gain insight towards burial techniques. Shockingly, it's been discovered that burials have taken place since pre-historic times “, it never occurred to anyone that other creatures, even other hominins (the primate group encompassing the genus *Homo*, along with the genus *Australopithecus* and other close relatives) could have engaged in similar behavior. Surely, the thinking went, humans alone operate in such an abstract world as to assign deep meaning to death”. (Salas, D. (2020, March 26).

CREMATION



Figure 3- <http://hardwoodhill.ca/urns/>

Although burial appears to be a more socially accepted and traditional method of disposal, research suggests cremation has been practiced throughout the ages. “Cremation had a revival beginning at the Vienna Exhibition of 1873, when Professor Ludovico Brunetti revealed a furnace he had invented specifically for use in cremation. Displayed with the furnace were about four pounds of cremated human remains. “Vermibus erepti—Puro consumimur igni,” the exhibit sign read: “Saved from the worms, consumed by the purifying flame.” (Stuart, L. (2015, September 11). This both reflects the cultural issues arising with the burial concept, and the attempt at creating a innovative resolution, as communities spoke of unsanitary cemetery conditions at the time. Thompson wrote what would become one of the 19th Century’s most influential pro-cremation works, “Cremation-The Treatment of the Body After Death” depicting a new method of disposal. The word

“spread quickly throughout Europe, then crossed the Atlantic. As early as 1874, the New York Times ran a series of articles on the subject which were picked up by newspapers and magazines across the country. The first cremation performed in the United States, other than practices by Native Americans, was the cremation of Colonel Henry Laurens, former president of the Continental Congress...While Colonel Laurens’ cremation was the first recorded in the US, it cannot be considered the first modern cremation in America. That distinction lies with a German immigrant named Baron Joseph Henry Louis DePalm. It was a cold and rainy December day in 1876 when the cremation movement in America made a major step forward” (Stuart, L. (2015, September 11)

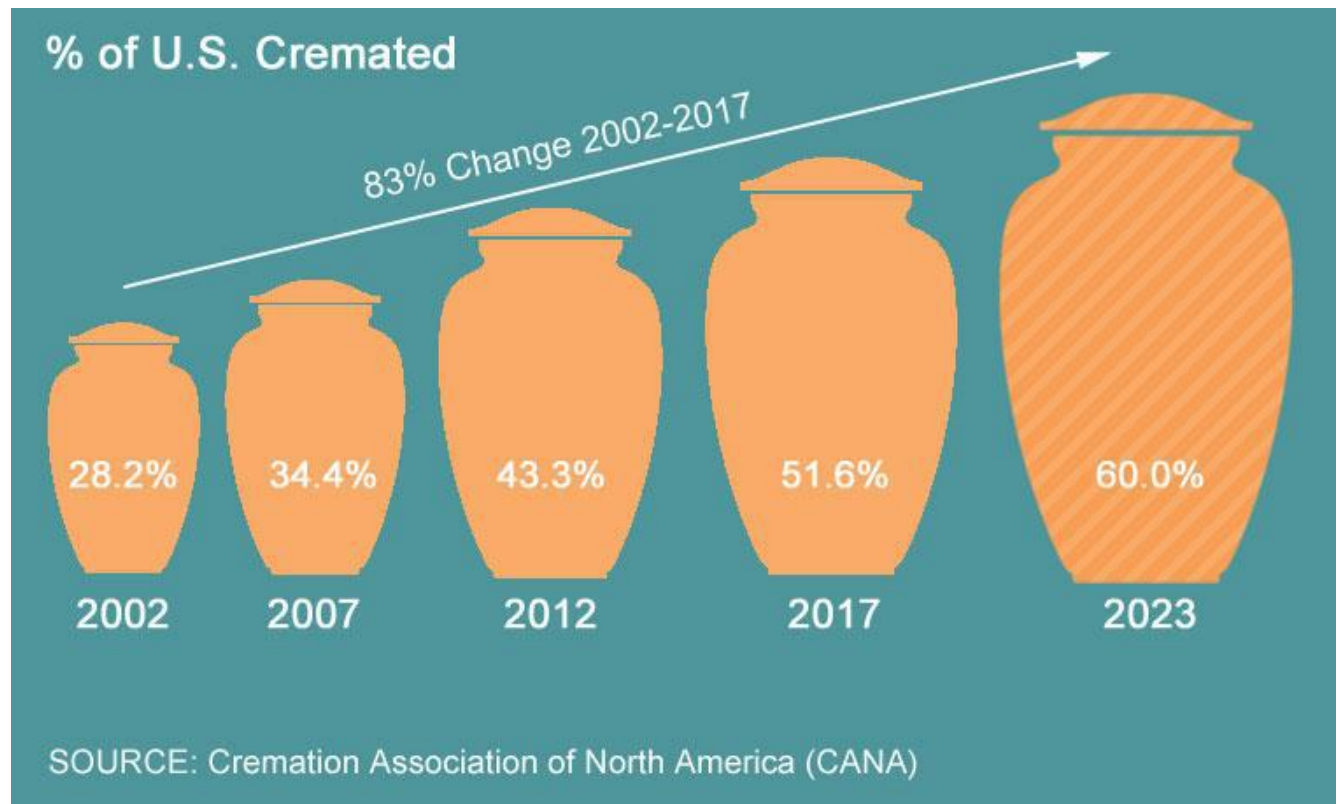


Figure 4- Retrieved from <https://www.funeralwise.com/plan/cremation/cremation-need-to-know>

Cremation has popularized since 1873, beginning with the fear of being buried alive, to religious adaptations reviling the separation of body and soul allows for eternal life. Today, over one-third of funeral homes in the United States now operate their own crematories; “10% (intend) to open their own within the next five years” (Cremation Services: What you need to know (2021)). This growing number indicates a growing trend of consumers choosing to select direct cremation, opposed to the counterpart of an embalming, viewing, and traditional funeral service. This growing trend is influenced by cost considerations, environmental concerns, fewer religious prohibitions on the practice and changing consumer preferences, such as the desire for simpler, less ritualized funeral practices. As communities continue to grow in population, and

are exposed to other cultures, the demand for cremation will continue to rise.

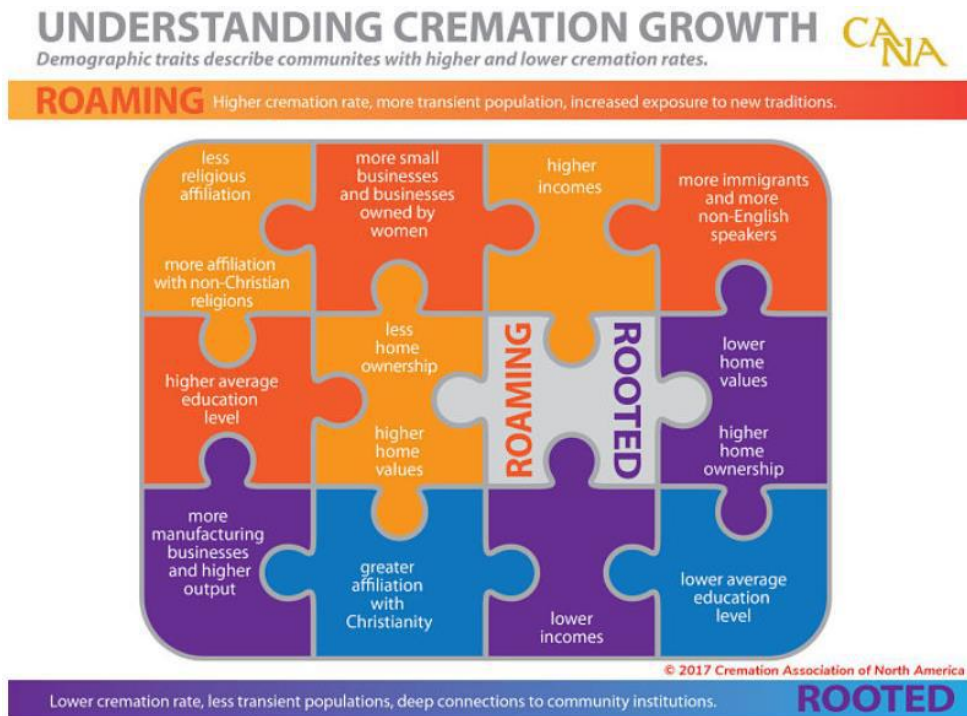


Figure 5- Retrieved from <https://www.cremationassociation.org/page/IndustryStatistics>

“ Key external drivers that influence funeral service are the number of deaths, number of adults 65 and older, number of cremations and U.S. per capita disposable income – all of which are projected to increase from 2015 to 2020 and in subsequent years (IBISWorld Inc., 81221, April 2015; U.S. Bureau of Labor Statistics). The number of adults 65 and older increased from 13% of the U.S. population at the time of the 2010 census to 14.1% in 2013 (U.S. Census Bureau). By 2030, when all baby boomers (born 1946-64) have joined the ranks of the older population, it is projected that 20.3% of the U.S. population will be 65 and older” (U.S. Census Bureau, P25-1140, May 2014).

One of the most influential contributing factors to the rise in cremation rates, is the size, location, and distribution of population. With easier access to transport, cultures that are once rooted with strong religious beliefs begin to loosen their connections to their geographic origins,

as their exposure to new traditions increase. Thus there is evidence that those born and raised in a rural environment, with little to no exposure to other culture is more likely to be buried, opposed to an individual living in a city.

ALTERNATIVE OPTIONS

On average, over 55 million people die per year. There are currently two popularized options that are available for expected end of life; burial and cremation. Both options negatively affect the environment, in several aspects, ranging from raw materials used to build coffins, habitable land use for cemeteries, embalming toxins reaching waterways, and Co2 emissions produced in cremation are some environmental impacts. Eco-friendly alternative options are becoming more readily available, and gaining movement in popularity.

This topic was originally chosen due to the mass graves being created for victims of COVID-19. From there, after experiencing a close personal loss, it quickly became abundantly clear that other options (beyond burial and cremation) are necessary. These options could not only have a more positive life cycle, but also have the ability to provide hope for grieving families. Secondly, this thesis topic stood out amongst the rest, due to it's uniqueness, this topic allows for new boundaries to be pushed. Although death affects everyone, it is also something that is taboo in western culture, it's often cast away and never spoken about. However, many cultures (for example: stoic philosophy) encourages one to speak about death in order to come to terms with their own fate, and through that live a more fulfilled life. In short, it would be interesting to explore in depth, perhaps find hope in a subject that is slightly dark and morbid, and change the stigma, and dialog attached to death.

Grieving the loss of a loved one is one of the most difficult life events a person may go through, although it is likely something each of us will face at some point in our lives. Examining stoicism it became abundantly clear that Western society often gravitates away from discussing loss, excusing oneself with the inability to articulate complex emotion. The subject of death, or

dying soon becomes taboo and out of the norm, thus, in a sense, further isolating those who are grieving. This taboo has created an environment that allow traditional end of life services to remain relatively the same since as early as 12th century BCE. These services thrive in tradition, however, in more recent years have been discovered to have a devastating environmental impact. These impacts range in severity; from use of habitable land, mishandling of raw materials, embalming fluids seeping into underground water ways, and further Co2 emissions are a all immediately impacting on the environment both locally, and globally. With COVID-19 infection rates continuing to climb, now is the time to challenge the taboo subject of death, and create a sustainable solution for end of life. How may we create a safe and respectful alternative for end of life?

	User <i>Primary, Secondary, Tertiary</i>	Product <i>Benchmark Products</i>	Environment of Use <i>Various environments of usage</i>
1	<u>Primary:</u> <i>Family of deceased</i> Grieving family, possibly dealing with sudden death, high funeral cost.	<u>Traditional burial</u> <i>Challenge:</i> Consuming habitable land with cemeteries.	<u>Land stability</u> <i>Challenge:</i> Sky burial used in areas with poor land stability.
2	<u>Secondary:</u> <i>Mortician</i> Career, person preparing deceased body for burial or cremation, often comforting grieving loved ones.	<u>Traditional cremation</u> <i>Challenge:</i> Producing Co2, and mercury (highly toxic in small	<u>Temperature, and humidity</u> <i>Challenge:</i> Changes the rate of decomposition

		doses)	
3	<p><u>Tertiary: Deceased</u></p> <p>Possibly having already made decision between burial, or cremation. Environmental impact of disposing body.</p>	<p><u>Mushroom burial</u></p> <p><i>Challenge:</i> Creating custom fit suit for deceased</p>	<p><u>Length of decomposition</u></p> <p><i>Challenge:</i> heat, humidity, oxygen level exposure can dictate the length of decomposition.</p>
4	<p><u>Place of mourning: Primary</u></p> <p>A place or object is at times proven helpful during grieving period.</p>	<p><u>Aqua-mation</u></p> <p><i>Challenge:</i> Keeping the body in high temperature for one week.</p>	<p><u>Nutrient cycle</u></p> <p><i>Challenge:</i> Many alternative methods focus on the completion of the nutrient cycle.</p>
5	<p><u>Cost of funeral: Primary</u></p> <p>Although, affected by secondary and at times tertiary (prior to death), high cost of casket, urn, funeral, grave plot, etc.</p>	<p><u>Sky burial</u></p> <p><i>Challenge:</i> Ritual due to unstable terrain</p>	<p><u>Land location</u></p> <p><i>Challenge:</i> Reducing the amount of land needed that is otherwise habitable</p>

6	<p><u>Length of decomposition:</u> <i>Secondary, Tertiary</i></p> <p>Time spent in cremation process (release of Co2)</p> <p>Time spent decomposing after burial (contribution to underground water)</p>	<p><u>Green burial</u></p> <p><i>Challenge:</i> Time taken to dig grave, higher risk of tampering.</p>	<p><u>Mourning site</u></p> <p><i>Challenge:</i> With the reduction of habitable land use, a place or mourning is (typically) needed.</p>
7	<p><u>Embalming:</u> <i>Secondary</i></p> <p>Time spent to embalm, legal practice, chemical exposure</p>	<p><u>Recomposing</u></p> <p><i>Challenge:</i></p> <p>Used on livestock, mental separation/ legal restrictions for human remains.</p>	<p><u>Religion</u></p> <p><i>Challenge:</i> Varying religious restrictions prevent further exploration of more eco-friendly alternatives.</p>
8	<p><u>Funeral:</u> <i>Primary, Secondary</i></p> <p>Cost of funeral, process of embalming (required after 48 hours), funeral home location.</p>	<p><u>Bio urn</u></p> <p><i>Challenge:</i></p> <p>Producing Co2</p>	<p><u>Disease control</u></p> <p><i>Challenge:</i> Keeping the public safe from the spread of disease and virus.</p>
9	<p><u>Cemetery:</u> <i>Primary, Secondary</i></p> <p>Cost of land plot, location close to</p>	<p>Body farm</p> <p><i>Challenge:</i></p>	<p><u>Inability of tampering</u></p> <p><i>Challenge:</i> Choosing a</p>

	funeral home, stable ground conditions.	Unappealing to family of diseased.	location, or creating an environment that will be respected by community.
10	<u>Habitable land: Secondary</u> The use of habitable land for cemeteries is increasingly high, what happens when we run out?	<u>Cremation diamond</u> <i>Challenge:</i> Wearable piece being lost or stolen.	<u>Raw material usage</u> <i>Challenge:</i> Finding sustainable alternatives for raw materials used.

Table 2

The importance of exploration of safe and respectful alternatives for end of life, is desperately needed, currently trending, and expected to exponentially grow in popularity. With the increasing infection rates of COVID-19, the need for environmentally friendly alternatives has never been so crucial. Creating an environment where a family is able to mourn, a mortician is able to safely prepare the deceased for a end of life solution that will not affect underground waterways, or produce an excess of Co2. These environmental impacts are both local, and global, affecting any community with a cemetery, or crematory. The possibility to create an alternative that can both provide a place of mourning, which can be explored in full body interaction design, and return a deceased back into the nutrient cycle (using full-bodied ergonomics) in a social responsible manner is possible after examining current benchmarks. The topic can be pushed into several directions based on the feedback given in the interview stage, allowing many solutions to be possible.

Chapter 2

Research



Figure 6 - <https://videohive.net/item/man-standing-on-the-cliff-of-mountain/19432839>

“...in this world nothing can be said to be certain, except death and taxes” (Franklin, B)

Research, exploration, and understanding is what leads to problem definition and thus design solution. This chapter is a reflection of the initial design development stage; research – due to the COVID -19 Global Pandemic there are limitations within the methodology and approach. Although unconventional or unideal research there’s an abundant amount of effort that the information is pure, unbiased, and a true representation of death and grief.

2.1 USER RESEARCH

Literature Search for Demographic Data

A literature search was performed on the Humber Library website, and Google Scholar to find statistical data relevant to those dealing with end of life.

The following search terms were used:

- “End of life”
- “Palliative and end of life care”
- “End of life statistics Canada”
- “End of life profile”
- “Burial and cremation trends”
- “Burial and cremation gender influence”

Findings

Findings have been summarized below according to the relevant categories: Gender, Age, Race and Ethnicity, Income and Education.

“Death is a sort of alchemy. It changes us in an instant into something completely new. Spirit, soul, and mind flash away, and what was once a living body becomes a new creation. This new thing, the corpse, is most evidently flesh and bones: pound after pound of inert ligaments, veins, arteries, organs, nails, skin, and hair. But it is also a powerful symbol, charged with meanings as many and varied as human cultures and individual personalities. The corpse represents, among other things, a threat to social order, an economic burden to the family, a reminder of our mortality, an offense to sight and smell, an affront to hopes of eternal life, and a reason to believe in the bodily resurrection.”

(Prothero, S. R. (2001).)

Gender

A gender-based analysis of burials from the coast of British Columbia shows that there are no significant differences in the frequency of burial, or grave goods between male and female burials.

Age

Based on analysis of the key external influences on the funeral service industry, business conditions are projected to slightly improve for the industry over the five-year period from 2015 to 2020, with revenue anticipated to expand at an average annual rate of 1% for funeral homes, crematories and cemeteries. In 2015, direct cremation services are estimated to make up approximately 6% of total industry revenue (IBISWorld Inc., 81221 and 81222, April 2015). Key external drivers that influence funeral service are the number of deaths, number of adults 65 and older, number of cremations and U.S. per capita disposable income – all of which are projected to increase from 2015 to 2020 and in subsequent years (IBISWorld Inc., 81221, April 2015; U.S. Bureau of Labor Statistics). The number of adults 65 and older increased from 13% of the U.S. population at the time of the 2010 census to 14.1% in 2013 (U.S. Census Bureau). By 2030, when all baby boomers (born 1946-64) have joined the ranks of the older population, it is projected that 20.3% of the U.S. population will be 65 and older (U.S. Census Bureau, P25-1140, May 2014). Per capita disposable income in the United States is predicted to increase at an average annual rate of 2.4% over the next five years as economic conditions continue to

improve. This means that consumer price concerns may somewhat diminish (IBISWorld Inc., 81222, April 2015).

Year	Annual Deaths per 1,000 Population	
1995	8.8	<i>Final Data</i>
2000	8.7	
2005	8.3	
2007	8.0	
2008	8.1	
2009	7.9	
2010	8.0	
2011-2012	8.1	
2013	8.2	
2014	8.1	
2015	8.2	
2016-2020	8.2	
2025	8.6	
2030	9.0	
2035	9.3	
2040	10.0	
2045-2050	10.3	

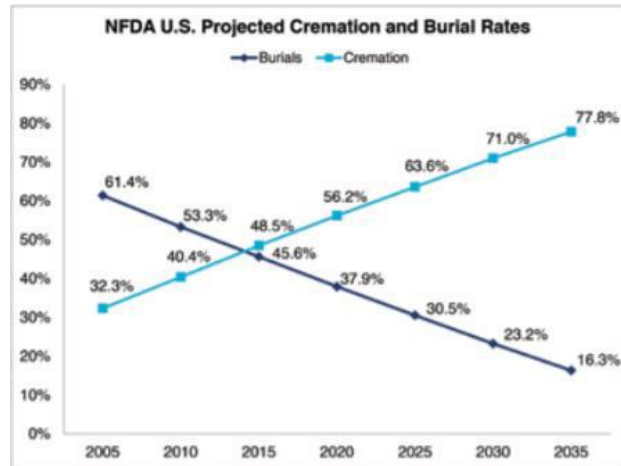


Figure 7 – Retrieved from http://mediad.publicbroadcasting.net/p/healthnewsfl/files/201507/03-a_2014_cremation_and_burial_report_2_.pdf

Figure 8- Retrieved from http://mediad.publicbroadcasting.net/p/healthnewsfl/files/201507/03-a_2014_cremation_and_burial_report_2_.pdf

Race and Ethnicity

Examining articles surrounding the impact of a child’s death in newly immigrated families and those with language barriers, it’s clear that making arrangements is especially hard and often isolating. In these instances community religious leaders offering lower cost burials and cremations are helpful. In many cultures it is customary to stay with the family until after the burial. During burial flowers are thrown on the coffin with kisses in some cultures while in others handfuls of dirt are thrown on the coffin by each family member and friend.

Education

The steadily rising popularity of cremation is attributed to a number of factors, including consumer cost considerations, environmental concerns, fewer religious prohibitions on the practice and changing consumer preferences, such as the desire for simpler, less ritualized funeral practices. Cremation has become socially acceptable as more Americans are thinking and talking about death in new ways, and its popularity is expected to intensify. A surge in the number of Americans that no longer identify with any religion has contributed to the decline of the historically traditional funeral in America – and the rise in cremation as the disposition of choice. In just seven years – from 2007-14 – the percentage of unaffiliated adults increased from 16% to almost 23% of the U.S. public (Pew, 2015). Since 2012, the percent of U.S. consumers (40 and older) who feel it is very important to have religion as part of a funeral has decreased by more than 7% – from 49.5% in 2012 to 42.3% in 2015.

Why are people choosing cremation in the first place? CANA research models demographic traits that correlate strongly with cremation rates. More of the U.S. population has chosen to roam across the country and around the world. Many have loosened their connections to their geographic origins and increased their exposure to new traditions. Conversely, there are significant portions of the population who are rooted to their hometowns and remain deeply connected to the traditions they grew up with.

UNDERSTANDING CREMATION GROWTH CANA

Demographic traits describe communities with higher and lower cremation rates.

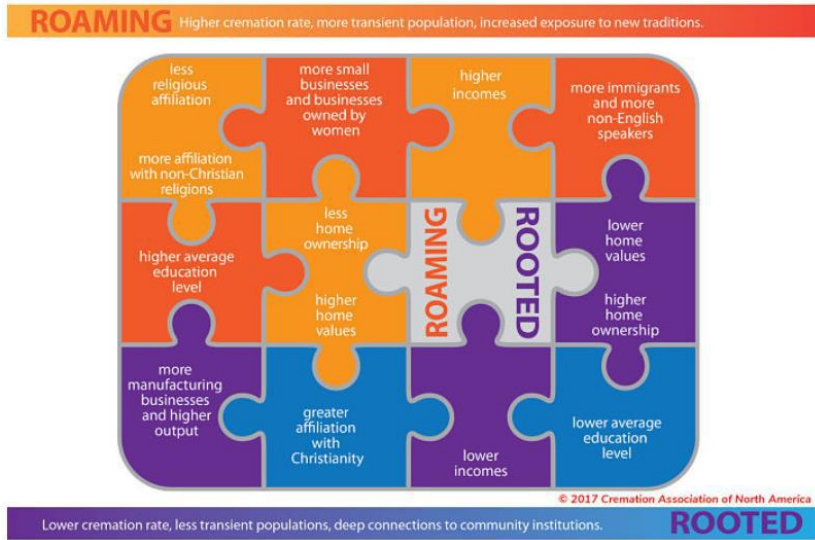


Figure 9- Retrieved from <https://www.cremationassociation.org/page/IndustryStatistics>

Income

Unfortunately, many families do not plan funerals and/or burial arrangements in advance. This means that typically funeral and burial decisions are made under considerable time and emotional pressure that may reduce search. In addition, cultural and/or religious constraints may narrow the range of options. Thus, we would generally expect to find that funeral and burial expenses are typically large near the time of the death.

US National Median Cost of an Adult Funeral with Viewing and Cremation 2017 \$6260

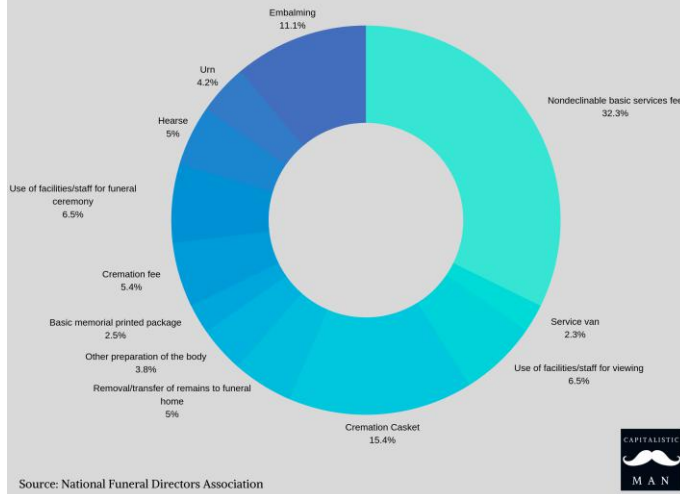


Figure 10- <https://www.capitalisticman.com/profitting-from-death-global-funeral-industry-overview-and-analysis/>

Direct Cremation	B.C.	Alberta	Sask.	Manitoba	Ontario
Funeral Home's Professional Service Charges					
Average Professional Service Charges	1,434	2,013	2,233	2,565	2,026
- Range of service charges (low to high)	295-3,525	710-2,842	1,230-3,420	1,780-3,475	550-3,970
Cremation container & other merchandise					
Cremation Container	250	250	250	250	250
Urn	100	100	100	100	100
Cremation Urn Vault	200	200	200	200	200
Cash disbursements					
Cremation fee - average	615	675	650	750	550
- Range of cremation fees (low to high)	290-915	525-895	570-900	675-800	442-649
Cemetery plot - average	1,100	1,100	1,100	1,100	1,100
- Range of public cemetery plot charges (low to high)	150-2,200	150-2,200	150-2,200	150-2,200	150-2,200
Cemetery Opening / Closing costs - average	400	400	400	400	400
- Range of Cemetery Opening / Closing Costs (low to high)	100-860	100-860	100-860	100-860	100-860
Grave markers / monument lettering	800	800	800	800	800
Total - Including Cemetery Plot	4,899	5,538	5,733	6,165	5,426
Total - Excluding Cemetery plot	2,399	3,038	3,233	3,665	2,926

Figure 12 – Retrieved from <https://inmemory.ca/resources/funeral-costs>

Cremation followed by Memorial Service	B.C.	Alberta	Sask.	Manitoba	Ontario
Funeral Home's Professional Service Charges					
Average Professional Service Charges	3,044	3,606	3,870	4,139	3,795
- Range of service charges (low to high)	1,039-6,270	2,680-5,620	2,630-5,095	2,588-5,955	2,010-6,495
Cremation container & other merchandise					
Cremation Container	400	400	400	400	400
Urn	250	250	250	250	250
Cremation Urn Vault	350	350	350	350	350
Cash disbursements					
Cremation fee - average	615	675	650	750	550
- Range of cremation fees (low to high)	290-915	525-895	570-900	675-800	442-649
Cemetery plot - average	1,100	1,100	1,100	1,100	1,100
- Range of public cemetery plot charges (low to high)	150-2,200	150-2,200	150-2,200	150-2,200	150-2,200
Cemetery Opening / Closing costs - average	400	400	400	400	400
- Range of Cemetery Opening / Closing Costs (low to high)	100-860	100-860	100-860	100-860	100-860
Grave markers / monument lettering	800	800	800	800	800
Clergy	250	250	250	250	250
Flowers	300	300	300	300	300
Total - Including Cemetery Plot	7,509	8,131	8,370	8,739	8,195
Total - Excluding Cemetery Plot	4,859	5,481	5,720	6,089	5,545

Figure 13- Retrieved from <https://inmemory.ca/resources/funeral-costs>

Graveside Burial	B.C.	Alberta	Sask.	Manitoba	Ontario
Funeral Home's Professional Service Charges					
Average Professional Service Charges	2,907	3,234	3,380	3,605	3,314
- Range of service charges (low to high)	1,250-6,665	1,325-4,400	2,125-5,340	2,595-4,570	1,300-5,490
Casket & other merchandise					
Casket	2,000	2,000	2,000	2,000	2,000
Outer Burial Container *	1,000	1,000	1,000	1,000	1,000
Cash disbursements					
Cemetery plot - average	2,800	2,800	2,800	2,800	2,800
- Range of public cemetery plot charges (low to high)	500 - 10,000	500 - 10,000	500 - 10,000	500 - 10,000	500 - 10,000
Cemetery Opening / Closing costs - average	1,100	1,100	1,100	1,100	1,100
- Range of Cemetery Opening / Closing Costs (low to high)	300-1,800	300-1,800	300-1,800	300-1,800	300-1,800
Grave markers / monument lettering	800	800	800	800	800
Clergy	250	250	250	250	250
Flowers	300	300	300	300	300
Total	11,157	11,484	11,630	11,855	11,564

Figure 14- Retrieved from <https://inmemory.ca/resources/funeral-costs>

Traditional Funeral	B.C.	Alberta	Sask.	Manitoba	Ontario
Funeral Home's Professional Service Charges					
Average Professional Service Charges	4,275	5,150	4,741	3,844	5,366
- Range of service charges (low to high)	2,243-7,290	3,695-6,815	3,345-6,375	2,900-6,610	2,705-8,200
Casket & other merchandise					
Casket	2,000	2,000	2,000	2,000	2,000
Outer Burial Container	1,000	1,000	1,000	1,000	1,000
Cash disbursements					
Cemetery plot - average	2,800	2,800	2,800	2,800	2,800
- Range of public cemetery plot charges (low to high)	500 - 10,000	500 - 10,000	500 - 10,000	500 - 10,000	500 - 10,000
Cemetery Opening / Closing costs - average	1,100	1,100	1,100	1,100	1,100
- Range of Cemetery Opening / Closing Costs (low to high)	300-1,800	300-1,800	300-1,800	300-1,800	300-1,800
Grave markers / monument lettering	800	800	800	800	800
Clergy	250	250	250	250	250
Flowers	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>
Total	12,525	13,400	12,991	12,094	13,616

Figure 15- Retrieved from <https://inmemory.ca/resources/funeral-costs/>

Tradition

The American way of burial deals with the decay of the material body via preservation. Embalmed, coffined, and buried, the preserved dead are said to be merely sleeping, patiently awaiting a future bodily resurrection, perhaps in a coffin designed to provide eternal protection from the elements. U.S. burial traditions deal with the decay of the social body by preservation too—by maintaining significant ties between the living and the dead (Stephen Prothero. (2001). Purified by Fire : A History of Cremation in America. University of California Press.)



Figure 16 – Retrieved from http://mediad.publicbroadcasting.net/p/healthnewsfl/files/201507/03a_2014_cremation_and_burial_report__2_.pdf

Families choosing cremation for their relatives do not typically pray to the dead or expect the dead to contact them. At least in those cases where cremated remains are scattered from a boat or airplane, there is no place for the living to visit the dead and thus no memorial site for the living to maintain, perpetually or otherwise. (Stephen Prothero. (2001)



Figure 17- Retrieved from http://mediad.publicbroadcasting.net/p/healthnewsfl/files/201507/03a_2014_cremation_and_burial_report__2_.pdf

Discussion / Conclusions

Based on the above research, it's apparent that the 'user' in this case, doesn't fit in a stereotypical box. However, from this data one is able to begin to direct their focus towards what will eventually be a finalized user profile. It's clear that trends indicate a significant shift in favour of cremation, over burial, which is due to a more open minded, higher educated, and culturally influenced 'transient' population. Surprisingly gender is not found to have any influence on the decision making process, however age and income are relevant factors. It's interesting to see that culture and race seem to be pushed by social isolation, and language barriers, causing a decision to be primarily made by a religious figure.

A final assessment shows that income is one of the most influential dictators in regards to choosing an after life option- with education, and location following close behind. This data pushes future research in the direction of cremation opposed to burial, as that traditional alternative is naturally fading in popularity.

User Behavior

A literature search was conducted to discover a user behavior for those considering cremation. For this search Google and the Humber Library website were used to extract relevant information. The following search terms were used:

- "Cremation statistics"
- "Cremation influences"
- "Cremation rise in popularity"
- "Cremation"

Findings

Findings have been summarized below according to the relevant categories: Activity Frequency; Duration of Activity; Group or Solitary Activity/level of focus; Motivation and lifestyle; Income Level & Purchasing Power; Location; Personality and cognitive aspects.

Activity Frequency

Cremation is becoming a more popular solution in comparison to burial. Cremation Association of North America (CANA) anticipates that by 2023 nearly 60% of Americans will choose cremation for their final disposition.

A big factor in the increasing popularity of cremation is the rising cost of in-ground burial. In addition, many religions and cultures have come to be more accepting of cremation, and society is much less tied to any one place.

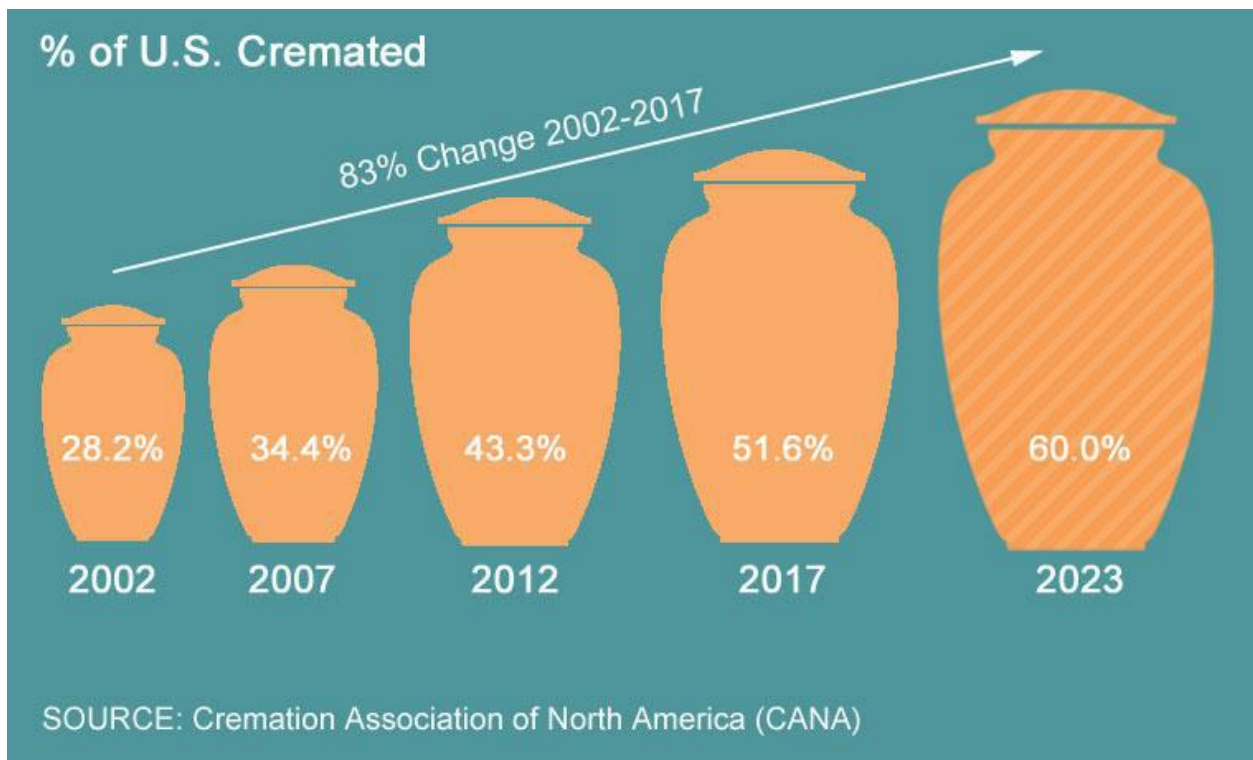


Figure 18- Retrieved from <https://www.funeralwise.com/plan/cremation/cremation-need-to-know/>

Social

Cremation in the West has changed in the turn of the Twentieth century. “Cremation was a symptom not only of massive urbanization and the drive for social hygiene but also an increased medicalization of death. With more people dying in hospitals rather than at home, their bodies were collected by funeral directors and might be kept in special premises away from their home. Indeed the very concept of the "funeral home" developed to mark a place where a body could be kept and visited by the bereaved family. Cremation thus was another example of a rising trend of commercialization and professionalization of various aspects of life in the West. Cremation was but one aspect of a broader tendency toward efficiency, scientific technology, and consumer choice. It also served the psychological function of allaying the fears of those who were haunted by irrational fears of decay or of being buried alive. Cremation is also often less expensive than burial.” (Davies, D. J. (2018).)

What influences our burial plans

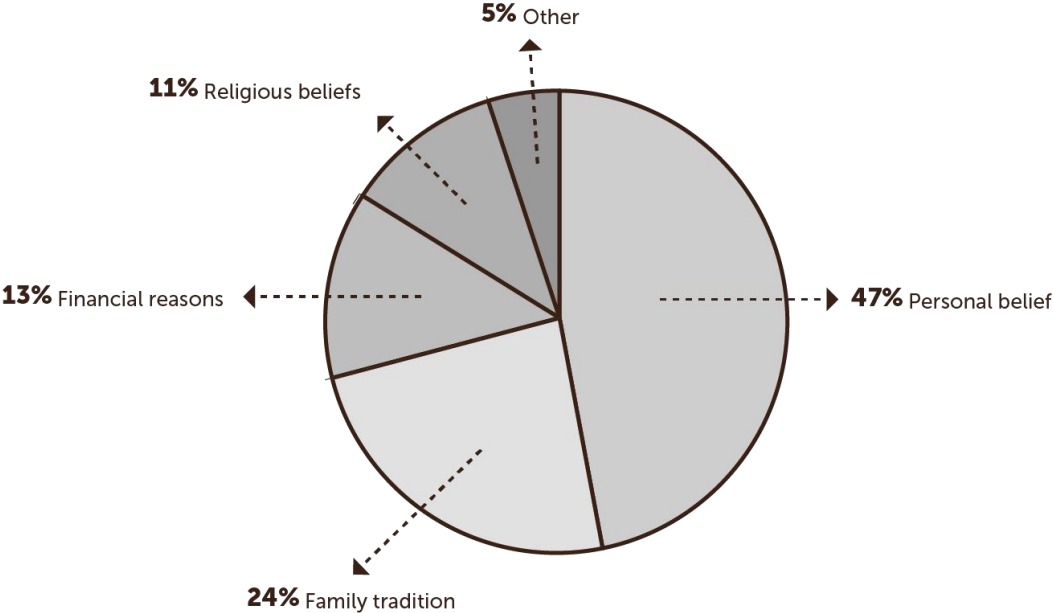


Figure 19 – Retrieved from <https://choicemutual.com/funeral-preferences/>

Life & Personality

What are the reasons behind burial plans — why do some people choose cremation while others decided on donating their body to science? Almost half of people (47%) made their burial plans based on personal beliefs and a fourth (24%) made their decision based on family tradition. The remaining respondents decided on their burial plans for financial, religious, or other reasons, such as wanting their family to decide. But what if those factors didn't matter when choosing a burial option? Would people take a different route? According to our survey, nearly a third of people would — 30% of respondents chose a different plan when not taking into account family traditions, religious beliefs, and finances. (Martin, A. (2020, May 21).

How people plan on being buried

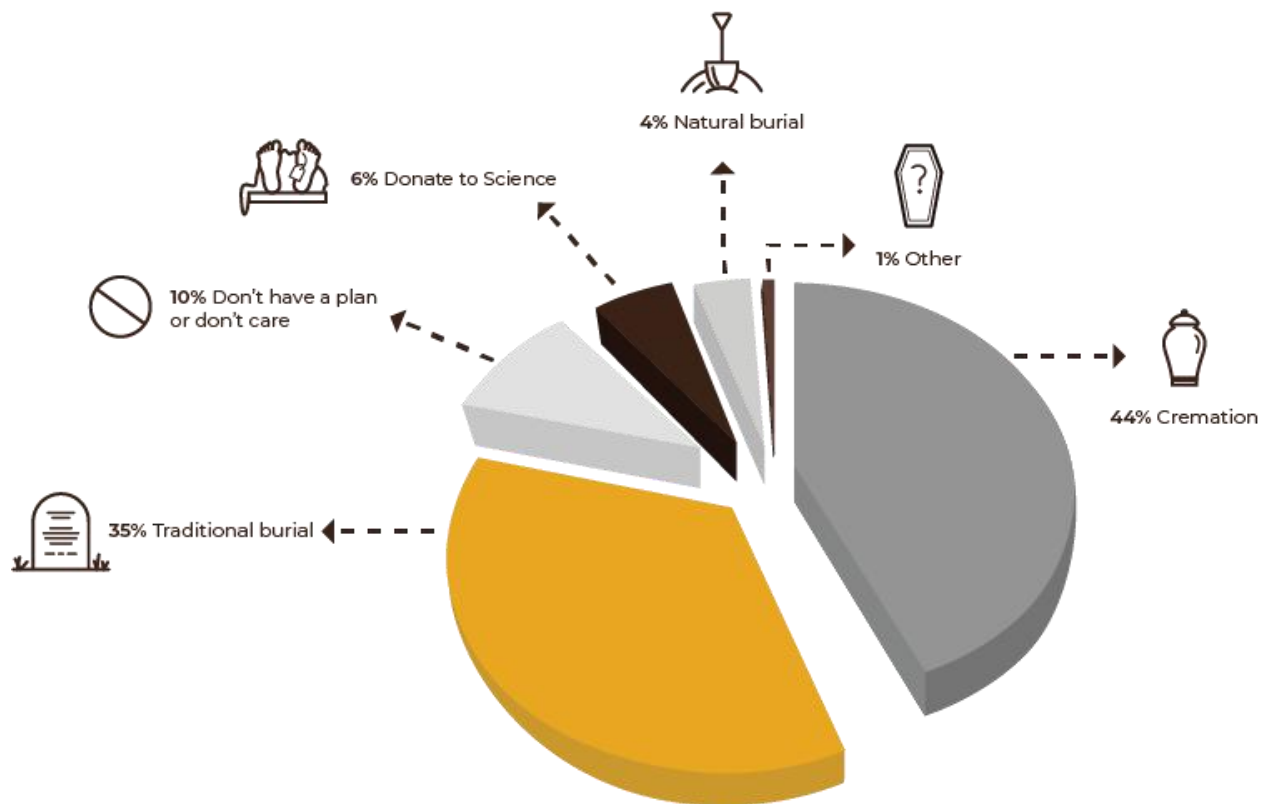


Figure 20- Retrieved from <https://choicemutual.com/funeral-preferences>

What those who are cremated plan to do with their ashes

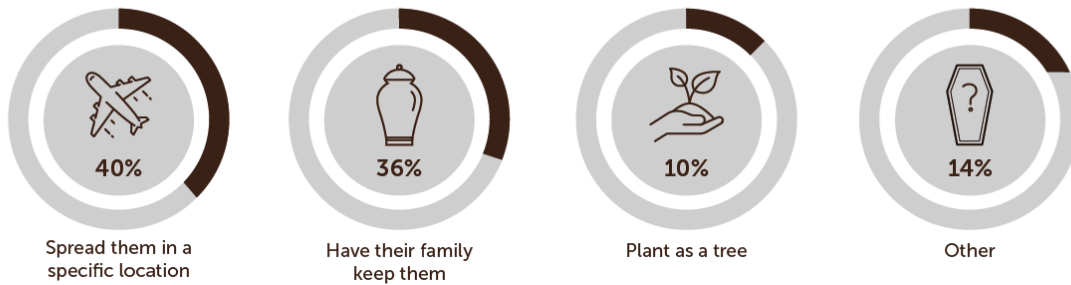


Figure 21 – Retrieved from <https://choicemutual.com/funeral-preferences/>

Income Level

Many factors go into the prices you are quoted for cremation services. Prices can vary widely from state-to-state, city-to-city, and even from provider-to-provider within your local area. Shopping around can yield significant results since the exact portfolio of cremation services you choose will play a big part in determining the overall price. For example, a full funeral with the body present will cost more than one with an urn on display since embalming will likely be required.

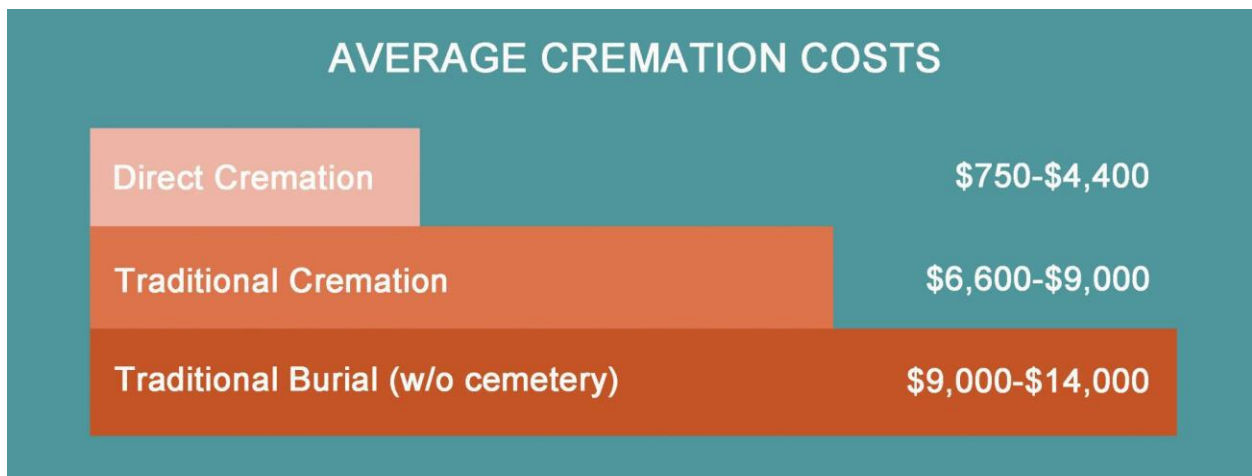


Figure 22- Retrieved from <https://www.funeralwise.com/plan/cremation/cremation-need-to-know/>

A direct cremation is a simple cremation with no funeral or memorial service. The deceased is transported directly to the crematorium, and the cremated remains returned to the family. This type of cremation is the most economical.

Traditional cremation, on the other hand, typically refers to a cremation that includes a memorial service or funeral (the body is present). Like direct cremation, the cost includes actual cremation costs and the price for the memorial service or funeral. It is more challenging to calculate a general cost estimate for a traditional cremation because you have many options for the type of service you have. For example, if you plan to have a funeral along with the cremation, you may be required to purchase embalming.

Location

Why are people choosing cremation in the first place? CANA research models demographic traits that correlate strongly with cremation rates. More of the U.S. population has chosen to roam across the country and around the world. Many have loosened their connections to their geographic origins and increased their exposure to new traditions. Conversely, there are significant portions of the population who are rooted to their hometowns and remain deeply connected to the traditions they grew up with.

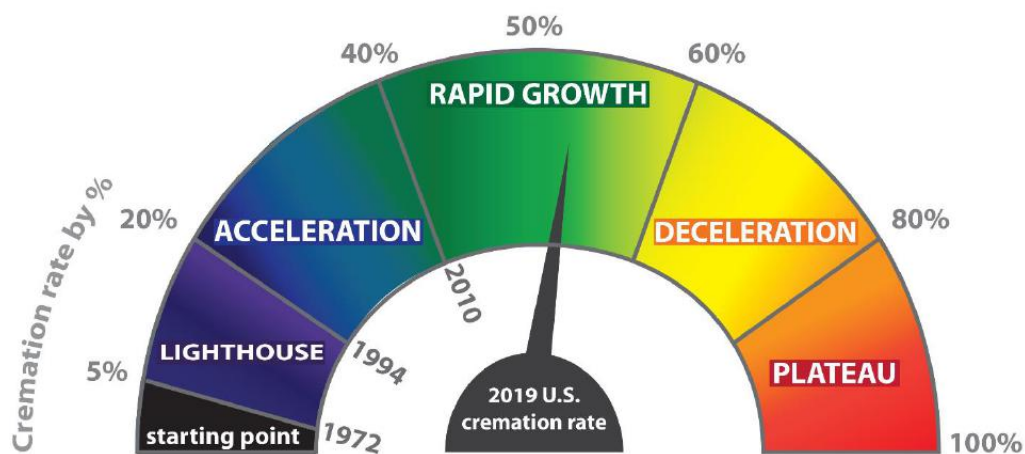


Figure 23- Retrieved from <https://www.cremationassociation.org/page/IndustryStatistics>

Primary User

Grieving family

The primary user is described in the form of a grieving person, who's loved one has passed away. After overcoming the initial shock of the loss, and taking time to process emotions and pursue a healing process, a person may feel ready to spread or scatter their loved ones ashes.

	Name	<i>Sarah Staedler</i>
	Age	<i>35</i>
	Location	<i>Vancouver, B.C</i>
	Family	<i>Cohabiting with spouse. Good relationship with extended family outside of city. Remains in contact throughout the year, visits 3 times a year.</i>
	Education	<i>Bachelors</i>
	Occupation	<i>Successful small business owner. Boutique owner and operator</i>
	Duration/ Frequency	<i>Tuesday- Sunday 55-65 hrs / week</i>
	Social/ Solitary	<i>Small, and close circle of friends. Social within the community, friendly and approachable business owner.</i>
	Other Activities	<i>Hiking, yoga, meditation, canoeing, camping, biking.</i>

Table3

The Primary, and Secondary user are equally important within the scope of this project. It's been said that "funerals are for the living", an important sentiment that lead to understanding the experience of the Primary user; the grieving family. Despite the sensitive nature of this project, gathering personal insight proved difficult.

A first and second user persona is developed in order to better understand the emotional boundaries, motivation, and to begin aiding in the identification of pain points. This persona, although fictitious helps to develop the design direction.

First User Profile:


"As a successful entrepreneur and business owner Sarah is naturally a risk seeker, she keeps well informed on upcoming trends and implements what she can to keep the interest of her clients. Sarah lives in a large city, and with that is exposed to a variety of people, environments, and situations that continuously challenge any close minded perspective she may otherwise have. Although she's successful in many ways, her successes didn't come without sacrifice. In order for her to achieve her dreams she made the decision to move away from her family and home town in Alberta – this move, although a crucial aspect to her success causes her to only see her family in person 3 times a year. This is difficult for her, she has a close relationship with her entire family even more so after her grandmother passes away 1.5 years ago. Dealing with the tremendous loss left her heartbroken, but as time passes, she's reminded every day that her grandmothers memory lives on. With newfound hope Sarah is looking to commemorate her grandmother in a way that brings her family together, and allows them to celebrate the life that was lived."

Secondary User

Preparing for end of life

The secondary user, although as stated, shares equal importance with the first, is a person preparing for their end of life. It should be known and understood that although the persona created is of an older individual reaching their natural end of life cycle, this user is not limited to those who are diagnosed with a terminal illness. Ultimately, the end user, no matter the circumstance is thinking about and creating asking themselves the question 'what will happen to my body after I die?', with the expectation that naturally, their wishes will be fulfilled.

Furthermore the secondary user is

	Name	<i>Ren Tanaka</i>
	Age	<i>71</i>
	Location	<i>Toronto, O.N</i>
	Family	<i>Cohabiting with spouse. Strong relationship with children, and grandchildren.</i>
	Education	<i>Bachelors, Diploma</i>
	Occupation	<i>Retired, teacher</i>
	Duration	<i>Worked from age 21-65</i>
	Social/ Solitary	<i>Active senior, friendly, and approachable. Living independently with spouse. Learning new things while enjoying retirement.</i>

	Other Activities	<i>Playing with grandchildren, painting, reading, walking with spouse, playing cards with friends.</i>
--	-------------------------	--

Table4

Second User Profile:

“Ren is well educated, well spoken, and well travelled. He has, and continues to live a full and happy life surrounded by friends and family. His career allowed him to educate the youths in his community which he found greatly fulfilling, and often continues to take a leadership role in community outreach programs. He independently pursues knowledge and maintains a humble belief that ‘there’s always something new to learn’, a sediment that has carried him safely through life. Although Ren is an idealist, that isn’t to say he’s void of realism- he’s experienced great loss in his life and because of that makes a conscious decision to live positively in the moment. Ren is abundantly aware that he is tapering towards the end of his life and is taking time to prepare his wishes ahead of time, to relieve his family the potential difficulty of guessing. He is environmentally conscious, and would like his death to have meaning, that would encourage his family to gather and celebrate his life.”

Tertiary User

The tertiary user can be described as a mortician. This individual is the one who interacts with the deceased in a safe and respectful manner, alongside aiding the family through the beginning stages of grief.

2.1.2 METHOD | CURRENT PRACTICE

Due to respect of COVID-19 restrictions and policies currently in place, along with the

sensitive nature of this topic in person observation methods are substituted with videos, surveys, and interviews. To begin, and in order to receive a more well rounded insight into the process of death, the topic is broken into two major sections; the decomposition process of a human body, and the emotional magnitude of loss. To understand the latter, a Hospice nurse is interviewed.

A short zoom interview is able to give enough information to collect data.

Name	Contact information	Basis of expertise
Sarah Jones Cizej	sarahcizej@gmail.com	Hospice nurse B.S.N. Nipissing University

Table5

The questions used in the interview are as follow:

- Can you tell me a bit about yourself and where you went to school?
- What drew you to being a hospice nurse?
- How do you begin your day?
- What interactions do you have with the patients other than administering medication? or assisting with tasks?
- What motivates you in this environment?
- Who do you usually see or interact with throughout the day?
- Is there anything else that you that you do throughout the day?
- Is there anything that you hear throughout your shift? Who else do you interact with?

- What are your conversations like with the family?
- Follow up question: Is there something that would help with (nurses being yelled at)?
- Follow up question: Is there a particular reason why yours doesn't (have counsellors on site)?
- What would you find the most difficult thing to deal with your job?
- Are those situations (family in denial) ones that you need to confront the family?
- What's the process for you when someone passes?
- Do you think people typically know if they want burial or cremation?

The interview data is collected, summarized and plotted on an empathy map:

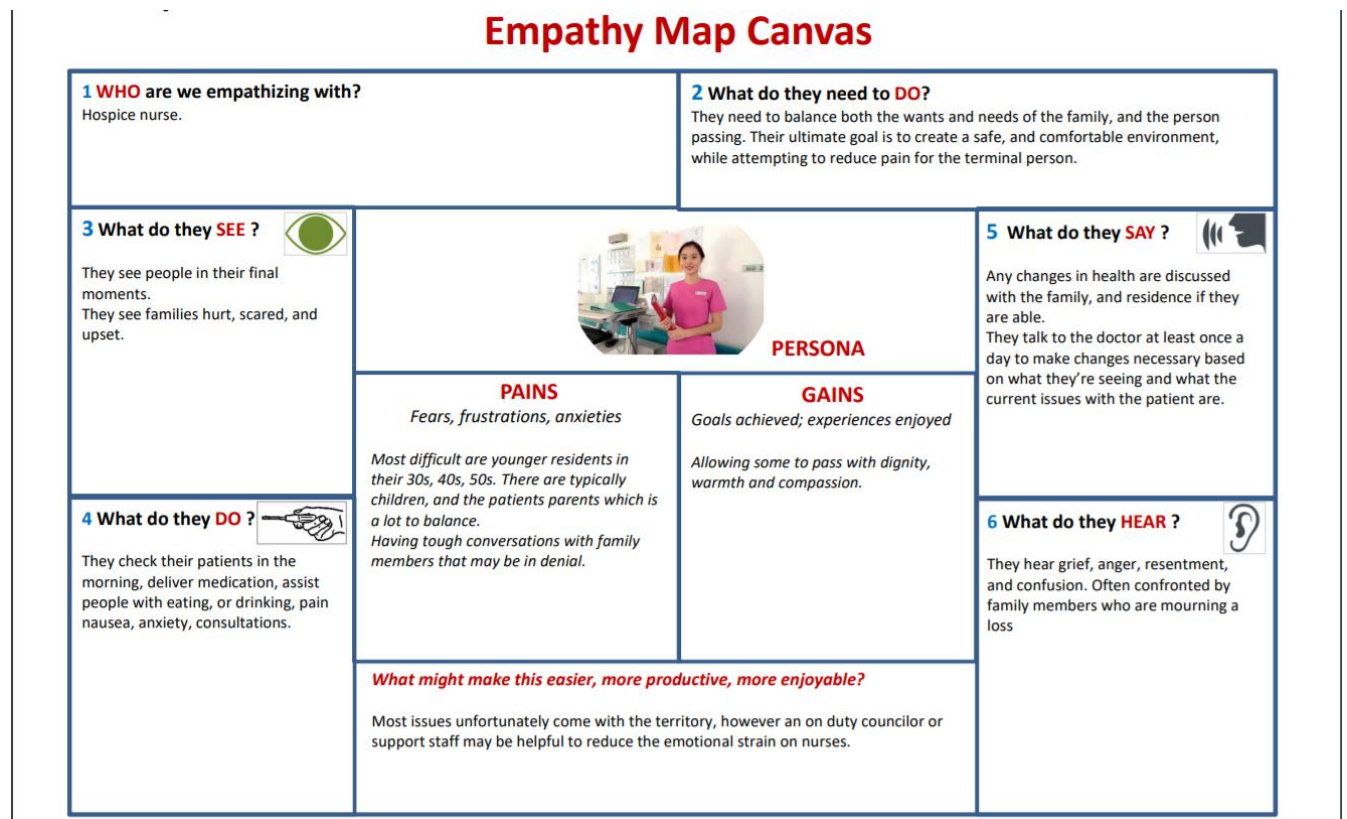


Figure 24

A major take away from this experience, is one that is obvious, however had been unintentionally missed. The person dying may not be an older person simply reaching their end of life, hospices' are meant for all people, including those struggling with a terminal illness. Since I hadn't planning to interview a hospice nurse (other interview fell through) the interview was very natural, and I had little time to prepare my questions. I really wanted to understand just what she does and goes through day to day, especially because she was in a rush and doing me a favour. I was able to get some valuable information, and more understanding towards the emotional part of death. It seems as if there is the initial shock of leading up to someone passing, a huge amount of emotion, and confusion. This may influence how a body will be dealt with (burial or cremation) and how an alternative may be chosen. This may need to be something put in place before a person becomes a patient in a care facility. This may seem minor, however reduces the target audience/ user, to someone who has accepted death, however is still slightly removed from it or the emotions of family members. As I continue to interview more people, and hopefully reschedule a meeting with a mortician, I will again be able to further reduce my user and understand the experiences of such a sensitive topic.

To better understand the decomposition of human remains, a second advisor is interviewed;

Name	Contact information	Basis of expertise
Brittany Dasilva	brittany.dasilva@gmail.com	Funeral Director

Table 6

The interview with Brittany Dasilva, Funeral Director has thus far been through email; due to a combination of scheduling conflicts, and a raise in the death rate, a phone interview has been re-scheduled. In order to gather a basis of information, Brittany answered a series of questions

allowing some insight into her profession.

Questions	Answers
<p>What does an average day look like for you?</p>	<p>“The average day of a funeral director is never the same. I assist families with funeral arrangements, coordinate visitations, funeral services at houses of worship, cremations, interments, repatriation of human remains, assist & co-ordinating the transferring of body from the place of death, as well as the embalming of their deceased loved one’s remains. Let’s not forget that we also take phone calls, send e-mails and have to apply/gather the proper documentation to allow such funeral services.”</p>
<p>Who do you interact with on an average day?</p>	<p>“Where I currently work I interact with the families of the deceased 95% of time. We have a team (Central Prep.) that takes care of the transferring, embalming, dressing and casketing of the deceased. Other funerals do not have a central prep team so they would be spending their days with both families and the deceased.”</p>
<p>What happens in the process of collecting the body?</p>	<p>“Transferring a deceased from a hospital requires a release from the hospital. To get a release, the medical certificate of death must be signed by the doctor. The funeral director is responsible for calling the hospital to inquire if the body is released and to make sure we have</p>

	<p>either verbal or written permission to transfer from the next of kin or the executor.</p> <p>Transferring from a nursing home, hospice or residence also requires the signed medical certificate of death or a nurse’s pronouncement. We cannot bring a deceased into our care until that paperwork is complete. There is an urgency to bring the deceased into our care when the passing occurs anywhere that isn’t a hospital because there’s no morgue so a verbal permission from next of kin or the executor is sufficient.”</p>
<p>Are bodies ever sent to the funeral home or do you always pick them up?</p>	<p>“There are companies (for example Mackinnon and Bowes) that assist funeral homes with afterhours transfer. The funeral homes phone lines are transferred at the end of the day to the transfer company. They are responsible for taking the first call (Death call), gathering the information needed to coordinate the transfer and the body will be brought to the funeral home.”</p>
<p>Is it difficult or uncomfortable to drive a hearse?</p>	<p>“Common question! It’s no different from driving a large truck.”</p>
<p>Is everyone in the funeral home trained in embodiment?</p>	<p>“They’re different types of personal licenses and business licenses.</p>

	<p>In order to be able to embalm, Cremate and bury a body you need to have a Funeral Directors Class 1 license. A Class 1 can provide all related professional services and memorial service on behalf of a licensed establishment.</p> <p>A Funeral Director class 2 can only arrange and direct customized funeral rites and ceremonies on behalf of a licensed establishment. Cannot provide embalming services. Then you have your funeral directors assistants that are able to perform transfers from hospitals & nursing homes and are able to assist on funerals.</p> <p>Some Funeral Homes also have Transfer Service Sales Representatives which can sell transfer services and direct cremations (No viewing or funeral) on behalf of a licensed transfer service operator. You can also have a Pre-Planner on site that can only enter into prepaid contracts funded by insurance plans for funeral supplies and services on behalf of a licensed funeral establishment.”</p>
<p>What is the current process if someone is wanting to be cremated?</p>	<p>“To Cremate a body:</p> <p>1) Burial Permit – Obtaining a burial permit requires you to register the death with the province. In order to do so you need to apply at the city clerk’s office or any police and fire station. You will need to have a signed statement of Death (Contains all the vital statistical information that was</p>



	<p>provided by the family), the medical certificate of death (Provided by the place of death and signed by the doctor).</p> <p>2) Coroner's Cremation Certificate – This is applied for online with the medical certificate of death.</p> <p>3) Cremation Application from the designated crematorium.”</p>
<p>What is the process of embodiment?</p> <p><i>Table 7</i></p>	<p>“All that is required for burials is the burial permit and of course cemetery property. Cemetery is completely separate from funeral services so they have their own permissions that they go through and sign with the family. You would just call the cemetery to book the opening and closing of the grave and provide them with the burial permit and Cemetery record (Basic information about the deceased) after the burial.”</p>



2.1.3 USER OBSERVATION | ACTIVITY MAPPING



The entire experience is difficult for the user. There is rarely a silver lining in the process- with that said it appears time aids in the perception of pain; the user is able to find more positive experience in the funeral process as time passes. There’s a clear issue with the overwhelming emotions and choices needed to be made quickly with burial. A lot of anxiety stemmed from choosing a casket, with a lot of push towards expensive caskets. This area can be improved with choosing different end of life options, or creating less options for the family to choose from, perhaps discovering their budget and then directing them to a specific section opposed to

having the family look around first. It's easy for a family to over spend during a time that is heightened emotionally.

In order to collect data to create an activity map, both a survey, and interview were created to examine both the burial, and cremation process. The primary focus is the emotional magnitude of loss, along with examining the beginning stages of the healing process.

<p>Step 1: Shock</p>	 <p>Figure 25- https://thriveglobal.com/stories/how-do-you-mourn-during-a-pandemic-2/</p>	<p>The initial shock of losing a loved one is overwhelming and complex.</p> <p>Many people in this stage struggle with accepting the loss and find themselves in a state of denial.</p>
<p>Step 2: Planning</p>	 <p>Figure 26- https://www.morrisnilsen.com/about/tour/</p>	<p>Despite the heightened emotions and after shock of the loss, many people find the planning process a necessary distraction in order to find a sense of baring. In this stage the individual is selecting a coffin, a burial site, and writing an obituary.</p>

<p>Step 3: Preparation</p>	 <p>Figure 27- https://muslimmatters.org/2019/06/27/gravedigger-short-story-wael-life-death-fight/open-grave/</p>	<p>The planning stage is accompanied by preparation, both for the individual, and the cemetery.</p> <p>Individual: contacting family, gathering pictures, items, and sentimental valuables to display at the funeral.</p> <p>Cemetery: Locating grave site, preparing the ground and digging the hole, covering the mound of dirt with faux grass, and creating a safe and visually appealing space for guests to gather.</p>
<p>Step 4: Funeral</p>	 <p>Figure 28- https://www.alamy.com/stock-photo/casket-coffin.html</p>	<p>The funeral and visitation is often times a long and difficult time for close friends and family to the deceased. At this time people gather to pay their respects to the family, reminisce on memories, and in some cases; view the body of the deceased if there's an open casket.</p>

<p>Step 5: Transport</p>	 <p>Figure 29- https://www.123rf.com/photo_83930224_closeup-shot-of-a-colorful-casket-in-a-hearse-or-chapel-before-funeral-or-burial-at-cemetery.html</p>	<p>Transporting the casket is done by a mortician in a hearse vehicle. Close members of the deceased drive slowly behind to ensure they all arrive to the cemetery at the same time to complete the burial process.</p>
<p>Step 6: Burial</p>	 <p>Figure 30- https://www.funerals360.com/blog/caskets-and-urns/the-difference-between-a-coffin-and-a-casket/</p>	<p>The casket is lifted out of the hearse, typically by a select group of friends and family called pallbearers. The casket is carried in a formal and respectful manner to sit overtop the grave site, suspended over the hole by strong rope.</p> <p>This is a moment for the family to say their final goodbye, typically flowers are placed on the casket as it's lowered.</p> <p>The family is then given the opportunity to watch as the grave is filled, however it is common for people to leave at this time as it's an emotionally</p>



		<p>overwhelming process and difficult to witness.</p>
<p>Step 7: Grieving</p>	 <p>Figure 31- https://www.deviantart.com/krissybdesignsstock/art/Fresh-Grave-152561077</p>	<p>The grieving process is painful. Feedback suggests that the more difficult times are directly after the funeral, when the distractions have settled and the person is forced to face the complex loss. There seems to be a common experience of struggling more at night, again, when daily distractions have dissipated and one is left to think of their lost loved one.</p>
<p>Step 8: Healing process</p>	 <p>Figure 32- https://www.amazon.com/CSFOTO-Background-Photography-Polyester-Wallpaper/dp/B07GCMVWFZ</p>	<p>The healing process is different for each individual person. It's complex, and unique to each person. Through interviews, some common trends tend to surround visiting the grave site on special occasions, creating positive traditions to memorialize the person, and lastly seeking counselling from a grief counsellor is a common aid.</p>

Table 8
Cremation

Steps 1-4 typically remain the same as burial

Step 6:
Crematorium



Figure 33-

<http://www.alexandramarley.com/Home/Dance>

The body is transferred to a crematorium, typically before the funeral service takes place. The deceased does not go through an embalming process, has all jewelry removed, and is placed into an 'oven' for 2-3 hours. The crematorium removes the ashes and typically places them in a selected urn for the family to receive.

Step 7: Grieving



Figure 34- <http://hardwoodhill.ca/urns/>

The grieving process remains the same as burial. However typically a member of the family keeps the ashes during this time.

Step 8: Healing



Figure 35- <https://www.oceanashes.com/>

Interestingly, the healing process for cremation differed from burial. Although the process of dealing with complex emotions remain the same, there's typically a second ceremony that takes place after the funeral service; spreading the ashes. After time has passes, and many people have begun to grasp the loss, a spreading of the ashes takes place. This process in many ways becomes similar to a celebration of life and entails gathering in the deceased favourite location and throwing the ashes in order to

process		allow the deceased to 'return back to earth'
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2.1.4 HUMAN FACTORS | RESEARCH OF EXISTING PRODUCTS

Urns and caskets come in a variety of material and sizes to accommodate the size of the deceased.



2.1.5 SAFETY & HEALTH | RESEARCH OF EXISTING PRODUCTS

Urns and caskets come in a variety of material and sizes to accommodate the size of the deceased.

2.2 PRODUCT RESEARCH

It became abundantly clear through the aid of research and interviews that the direction of continued understanding will lean towards cremation.

Examining four products creating a solution for cremated remains is compared in order to better understand the users needs. Analyzing these products into both their features and benefits is critical in creating an innovative solution.

Product Name	Product Image
<p>BIO URN</p>	 <p>Figure 36- https://urnabios.com/</p>
<p>The Passages</p>	 <p>Figure 37- https://www.cremationsolutions.com/turtle-biodegradable-urn-2-sizes</p>

Firework



Figure 38-
<https://heavenlystarsfireworks.com/ashe-s-fireworks-displays/>

EternEva Diamond



Figure 39- <https://eterneva.com/>

Table 10

Current benchmark key word takeaways include:

- Memorialization
- Environmental/ economic impact
- Send off
- Big Picture

These takeaways will be further explored in Section 2.2.1.

2.2.1 BENCHMARKING | BENEFITS & FEATURES

<p>Memorialization</p>	<ul style="list-style-type: none">• Adds emotional aspect• Long lasting• Object to keep and mourn• Option to use partial ashes• Personal kit (apart of process)• Personalized• Represents person in positive
<p>Environmental/ economic impact</p>	<ul style="list-style-type: none">• Combats deforestation• Combats overpopulating cemeteries• Combats pollution• Economically friendly• Locally crafted/ handmade• Produced with renewable resources
<p>Send off</p>	<ul style="list-style-type: none">• Celebration of life• Fitting tribute• Final goodbye• Represents lost life• Tribute to life

Big picture	<ul style="list-style-type: none"> • Less cemeteries • Life cycle • Return to earth • Reunite with nature
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Table 11

2.2.2 BENCHMARKING | FUNCTIONALITY

After breaking down and examining the benchmark products, it appears that two key elements emerge; creating an experience for the user, and turning the ashes into a new form. Each element is a key to the success of the product; the fireworks, although brief, create an experience of ‘reliving life’, a representation of a person who may have been a risk taker. Where as the BioUrn turns the ashes into a new form, that the user can then revisit and appreciate.


Another key take-away is noticing the space in which the ashes are spread; land, air, water and how those spaces reflect and represent the emotions of the Primary user, and the representation of the Secondary user. It appears the process in which the ashes are spread become a more relevant experience of understanding the deceased, what made up their personality, and the best way for their memory to be honoured. This brings a both comforting, and overwhelming conclusion that the product development may become a very niche user; as it may not be a suitable representation each Secondary user.



2.2.3 BENCHMARKING | AESTHETICS AND SEMANTIC PROFILE


Currently, after viewing benchmarks it’s clear there is a wide array of products, form, and aesthetic. This appearance and product function is a direct reflection of the personality of each Secondary user, thus the varying size, material, and intended use. With that there is space for forms that are more natural in aesthetic, along with a more humanized manufacturing process.

This will be further explored in section 2.2.4, while detailing the materials and manufacturing processes of these benchmarks. Beyond the differing aesthetic and material used, and understanding the reason behind these vast differences, an overview suggests that typically the product is neutral in colour, attempts a natural or modern form, while being intrusive to its environment (a persons house, where it sits until its use is fulfilled). Many of the products appear light weight, and built a small, 5th percentile build, this scale can be assumed as the BioUrn, and Passages are held with a single human hand as pictured.

2.2.4 BENCHMARKING | MATERIALS AND MANUFACTURING

Name	Product Image	Materials	Manufacturing
<p>BIO URN</p>	 <p><i>Figure 40- https://urnabios.com/</i></p>	<p>The urn contains recycled paper and recycled materials, coconut shells, growth medium (a proprietary mix of amino acids, and plant micronutrients), cellulose, coco fibre, and coco peat. Once ashes are poured in and the urn is planted, a tree will grow.</p>	<p>Packaged in a eco-friendly hand-made bamboo cylinder</p>

<p>The Passages</p>	 <p>Figure 41- https://www.cremationsolutions.com/turtle-biodegradable-urn-2-sizes</p>	<p>Recycled paper using non-toxic glues.</p>	<p>Local, fairtrade, handmade.</p>
<p>Firework</p>	 <p>Figure 42- https://heavenlystarsfireworks.com/ashes-fireworks-displays/</p>	<p>Shell of plastic, papier-mache, or heavy paper surrounding.</p> <p>The ingredients used to prepare stars are obtained from chemical supply companies and stored in barrels.</p>	<p>Dried dice become stars. They are moved to the packing room to be placed into cardboard containers. A hollow cardboard tube is placed in the center of the cylindrical container and stars are gently poured around it. A paper cap is placed on the filled container, now called a "break." The break is wrapped with heavy string, a process known as</p>

			<p>spiking. It is then poured into cardboard containers that are thicker and stronger than other breaks. This allows more pressure to build up before the salute bursts, resulting in a louder bang. These salutes are then spiked and pasted like other breaks.</p>
<p>EternEva Diamond.</p>	 <p><i>Figure 43- https://eterneva.com/</i></p>	<p>Carbon, compressed.</p>	<p>Isolating the carbon from all the other elements found in ashes or hair. While much of the elemental carbon burns off during cremation, there still remains carbon in bones called carbonates, which is</p>

			<p>the carbon we're isolating from all other elements. 0.5-4% of remains are made up of carbon and it takes us many weeks of work to purify and extract it. The result is a carbon graphite powder, which is the starter material for the diamond! machines replicate the growing conditions under the earth (2,500 degrees fahrenheit and 850,000 pounds per square inch). Over time, your loved one's carbon crystallizes on top of a diamond seed, and</p>
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			grows into a raw diamond.
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Table 11

2.2.5 BENCHMARKING | SUSTAINABILITY

Sustainability is the ultimate goal, focus, and essential element to consider while furthering into the development stage. Ideally, a solution should be created that can contribute positively to the to the environment, similar to BioUrn. This element is as equally important as providing a new experience, or physical object in which the Primary user can receive, similar to EternEva. Each benchmark aims to create an ecofriendly solution while still proving a positive experience for those grieving the loss.

2.3 SUMMARY

There are several key factors being examined in Chapter 2, the narrowing of scope for the result of the Primary user; grieving family, Secondary user; Deceased, and the Tertiary user; the mortician. After compiling information, reducing the project to focus on cremation, opposed to a combination of cremation and burial persona profiles aided in the understanding of said users. In order to further the understanding examining already existing benchmark products create a essential criteria to consider while further development takes place.

Chapter 3

ANALYSIS



Figure 44- <https://mymodernmet.com/paige-bradley-expansion-sculpture-now-available/>

3.1 ANALYSIS – NEED

The funeral industry is riddled with unmet user needs. Although there are two primary options for the user to choose; burial, or cremation, unfortunately both are accompanied by environmental impact, high cost, and unmet emotional needs. The severity of both cost, and environmental impact for burial, far outweighs those of cremation, ultimately influencing the direction of design, and solution. A continuous problem emerges when examining the emotional needs for those grieving, and spreading ashes; more specifically, unable to see, and being uncomfortable touching the ashes.

3.1.1 NEEDS/ BENEFITS | Not Met by Current Products

Current products being used by the funeral industry and cover an array of users in order to attempt to fulfill their needs. Analyzing research gathered by anonymous surveys, two product categories are revealed; traditional, and alternative methods. Narrowing the exploration and focusing on comparable benchmark alternative products proved to be beneficial in further understanding the users wants and needs.

It's clear that current alternative methods tend to address the dire need of providing opportunity for more eco-friendly alternatives. These alternatives however, often times do not address the other needs of low cost, accessibility, and emotional gratification. It appears that the user is forced to choose between handling their loved one in a sensitive, respectful manner and an emotionally removed eco-friendly alternative. This summary comes with the exception of several products; Bio Urn (BioUrn (2020, November 20) , arguably one of the more popular alternatives manages to provide both a cost effective eco-friendly solution, while still addressing the emotional needs of the user.

3.1.2 LATENT NEEDS

User 1 (Grieving Family) Needs (Cremation focus)	
Cost Effective	At times, the cost of a funeral service is left to the grieving family. This may dictate a divide between the funeral service received opposed to the service desired.

Emotionally Gratifying	Creating a space in which a person is able to return or visit their deceased love one is an important option for many families. This is often unable to happen when ashes are spread or spread in several places.
Comfortable Interaction	Through research it's been unveiled that at times people feel uncomfortable touching or interacting with the ashes.

Table 12

User 2 (Wishes of Deceased) Needs	
Perceived Comfort	The user makes a end of life decision based on what will happen to their body and if it meets their specific values. They often times view it through the lens of that situation happening to them while they're alive, and mentally struggle with the options available.
Cost	At times, the cost of a funeral service is taken care of by the user before they are deceased. This is in an effort to remove the perceived burden from loved ones and to secure their funeral expectations.

Environmental Impact	The environmental impact of human remains is beginning to be better understood by the general public, with that many people are looking for alternatives that are less harmful.
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Table 13

3.1.3 CATEGORIZATION OF NEEDS

Due to the sensitive nature of this topic, and abiding by current 2020 COVID-19 restrictions, in person observation proved difficult. Other methods of research, such as anonymous online surveys, and interviews are used in place of this to receive feedback and ultimately better user understanding.

User 1 Needs

Cost	Economics is a large factor in the ability for a family to supply their loved one a funeral they subjectively feel is a proper representation of said person. This factor changes with economic growth, however trends indicate many users are attempting to reduce the cost of funeral services.	STRONG
Emotionally Gratifying	Although this aspect is subjective based on the current emotional space	STRONG

	<p>of the user, it's important to create a product and environment that at minimum doesn't diminish the emotional magnitude of the loss. The purpose is to explore an alternative that allows growth, respect, and hope.</p>	
<p>Comfortable Interaction</p>	<p>While conducting personal surveys, it's important to note that some, although not all, users found at times it difficult to touch the ashes with their hands. Ashes are sticky and the user feels it to be disrespectful to wipe the ashes off of their hands.</p>	<p>MODERATE</p>

Table 14- Manfred Max-Neef Human

User 2 Needs

<p>Perceived Comfort</p>	<p>Cremation was created to relieve the fear of bugs and insects, along with being buried alive. Unfortunately when a person thinks of an afterlife solution, they often times mentally think of the experience the same as if</p>	<p>STRONG</p>
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	<p>they were alive and how they may feel about their body receiving that experience. Thus its crucial to create a humanized process.</p>	
<p>Cost</p>	<p>Similar to the first user, the second user may be concerned with, and absorb the cost of their own funeral in order to ensure their after life hopes are fulfilled. This is however less of a concern for the Secondary user, as they are prepared for the investment.</p>	<p>MODERATE</p>
<p>Environmental Impact</p>	<p>As a larger population becomes educated, an increased interest and concern of environmental impact follows. This trend is intended to grow further as education continues to rise and signs of global warming</p>	<p>STRONG</p>

	and pollution continue to show.	
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Table 14

3.1.4 NEEDS ANALYSIS DIAGRAM

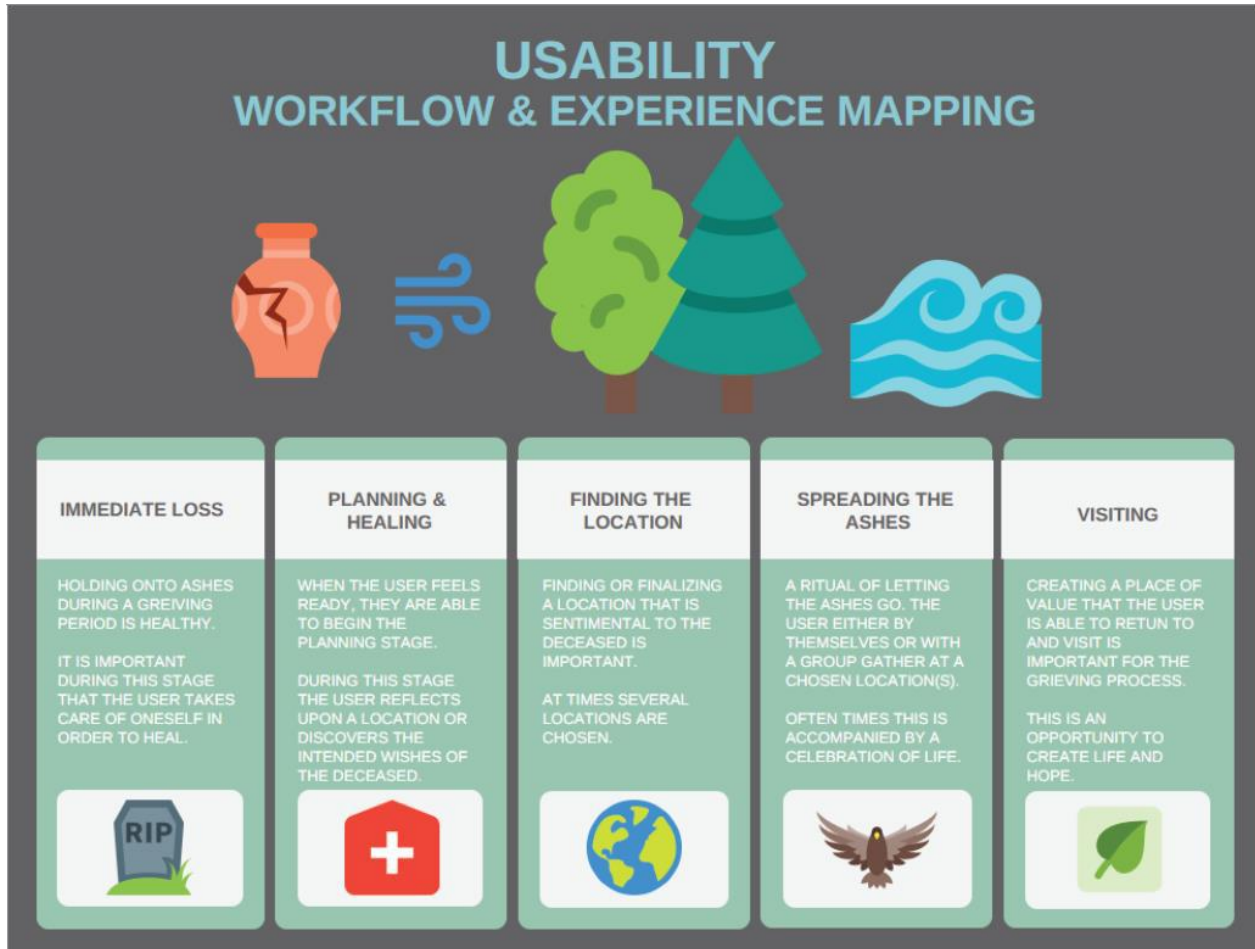


Figure 45

Further exploring and analyzing the needs of the Primary and Secondary user, a short anonymous survey is released to the general public in order to gather information regarding their personal experience of spreading ashes. The infographics attached at summarized versions of the information collected.

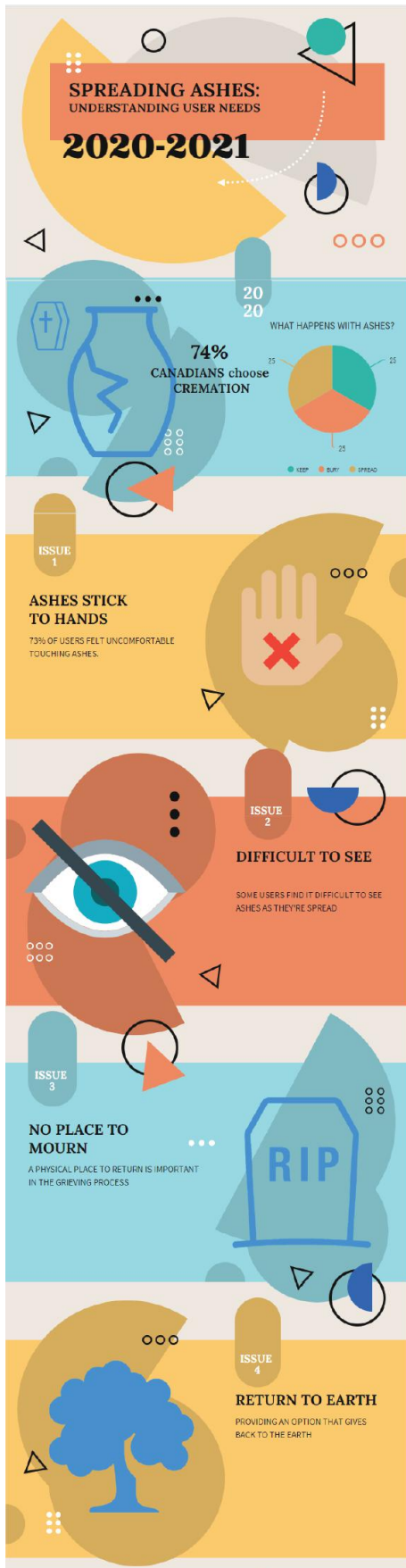


Figure 46

3.2 ANALYSIS – USABILITY

3.2.1 ACTIVITY | WORKFLOW MAPPING

Originally while first collecting data, this section is explored with the view point of burial, it's been included to aid in the understanding and comparison between both experiences from a Primary user perspective. The experience of releasing cremated remains is currently being investigated and maps accordingly in order to compare experiences. Experiencing mapping proved to be a useful tool in the data analysis, offering a visual representation of the data collected to inform the primary pain points as the user completes their desired task. The activity map is used to benchmark the average experience which a person may have during the activity and the actual level of satisfaction that they experience. This can be used then to analyze places for improvement, which can inform the thesis design solution.

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 6	Stage 7	Stage 8
	Planning	Preparation	Execution	Execution	Execution	Execution	Presentation	Mediation	Completion
User Goals	To create a memorial service that both honours the deceased, and creates a safe place to mourn for those grieving.	Planning process for burial							
User Actions	Calling funeral home, contacting family, possibly choosing a funeral home, possibly choosing a casket, possibly choosing a burial site.	Locating grave site, booking a casket, taking family to site, digging hole, receiving casket, possibly hiring a funeral home to look after the site.	Arriving at burial site, setting up chairs, viewing casket, viewing casket, possibly viewing casket, possibly viewing casket.	Transporting casket	Guests arriving at site	Casket on grave	Lowering casket	Burying	Visiting cemetery
Storyboard / Photos									
Shock	Shock	Shock	possible shock		possible shock				
Grief	grief	grief	grief	grief	grief		grief	grief	grief (more mild with time)
Anger	Possible anger (depending on death)								
Relief							Possible relief- lay to rest	Possible relief- lay to rest	Possible relief- lay to rest
Healing								Begin Healing	Begin healing
Problems	Heavy winter weather makes it difficult to dig	Cold weather/ frozen ground makes difficult to dig	Holding composure	Moving deceased can be cumbersome	Overcoming shock of seeing casket		Nerve-wracking, emotional, and shocking to see casket	Prevent filling Difficult to watch	Having time to visit grave
	Choosing the right casket		Long day dealing with heavy emotions	yourself in the heavy casket					Keeping grave well kept
	Choosing the "right" service		Hoping funeral honours person						
	Price of sudden death								
Ideas / Take-aways	reduce price and overheads	Using heavy machinery	create space for griever	More items to aid carrying casket	In a sense a necessary step and helpful in overall healing process.	In a sense a necessary step and helpful in overall healing process.	Many members leave or turn away for this	Many members leave or turn away however some find it part of healing process.	Upkeeping smaller, more local form of grieving site.
		Cremation	grieving process begins after this						
			Overwhelming shock						

Figure 47

3.2.2 ACTIVITY | EXPERIENCE MAPPING

Originally while first collecting data, this section is explored with the view point of burial, it's been included to aid in the understanding and comparison between both experiences from a Primary user perspective. The experience of releasing cremated remains is currently being

further research, the scope of the project is reduced to creating an emotionally gratifying, and environmentally positive experience for the primary user; the person grieving. An extensive process has been created in which the user interacts with several objects, taking part in combining the ashes with paper, seeds, and colour in order to create a paper flower. The user is then able to take the paper flower (containing their loved ones cremated remains) and spread the ashes in a new way, while also spreading wild or water flower seeds. This report explores the research, and observation of 1:1 scale human body interaction, in an attempt to address current and future ergonomic issues.

Exploring the ethical, efficient and feasibility of common urns. Exploring the volume, weight, and sustainable material and processing of creating and using urns, while considering the purpose and use of user interaction. A special focus on the structural integrity, and balance of the urn while exploring new designs. Further exploring traditional papermaking in East Asia, primarily understanding the process, materials required, and sustainable process which creates paper. Further exploring Mexican bark paper in an attempt to further understand the variety of fibers, and material scope that is possible for the ashes to be combined with.

	Name of Current Solution	Solution Purpose	Similar Existing Product Category (to be compared)
1	Transportation Urn	To transport and combine the ashes with material to create final product.	Traditional Urn

2	Rocker	To allow time for final goodbye, and to begin the process of combining ashes.	Childs crib
3	3D printer	Process in which final product is created, material (colour, seeds, texture) is added.	3D printer Food printer Traditional paper manufacturing
4	Flower	Final product; created out of ashes, paper, and customized options. Appearance similar to flower. Added function: Spin/ fly	Artificial flower Spinning toy Flying toy

Table 15

Methodology

The ergonomic evaluation and analysis of current end of life alternative designs vary greatly in both their solution and approach. Thus the current design solution being explored is broken into 4 parts, all of which are compared to their respective products.

Objective(s)

Ultimately the ideal outcome of this process is to gain helpful insight through the exploration, and evaluation of the current potential design solution through means of examining full-bodied human interaction design, and full-bodied ergonomic challenges. Primarily, the ‘full-body’ focus will be reduced to three major body parts, this is to accomplish a full understanding of the selected interacting touch points, while accommodating a time restriction. This ergonomic

evaluation report outlines the methods used, to evaluate the three major interaction body-parts in order to assess human factors, ergonomics, and convenience of use challenges.

Decision(s) to be made:

Grief and mourning is an unfortunate life truth that affects everyone, due to this the focus of ergonomic design and rationale is targeted towards both the 5th percentile female, and 95th percentile male. An attempt to accommodate wheel chairs will also be made in order to be as inclusive as possible.

Three body part interactions

1. Urn; carrying (Arms)
2. Rocker; combining ashes (hands, arms, upper body)
3. 3D printer; operating controls (Head neck, shoulders, hands, and arms)

Description of Users Targeted by Products

The target demographic is broad in range due to the openness of grief and the overall broad affect it has on all humans. In order to narrow a scope

the age range in focus is 33-55, males and females, located in a large city, having lost a loved one. The deceased has been cremated and the target user is looking to create a memorial along with aiding in the emotional healing process.

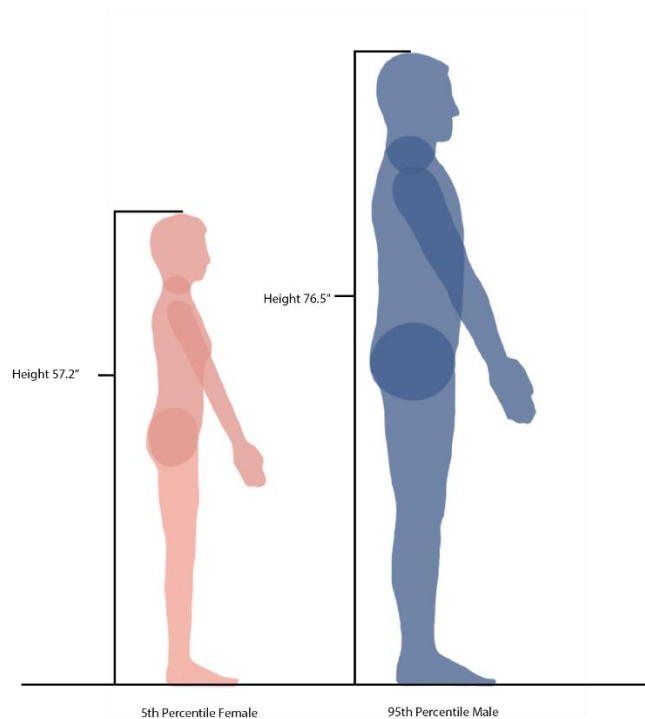


Figure 50

Evaluation Process

Due to the large scope of the project, and the several user interactive components, the evaluation consists of both physical, full scale (1:1) model, along with full scale (1:1) CAD models. Both varieties have been explored using 5th percentile female, and 95th percentile male human factors. The primary purpose of observation is to critique the following:

1. Urn: Overall size, and volume.

Ensuring the user is able to carry the urn, and place it within the Rocker comfortably, along with solidifying the intended volume of ashes.

2. Rocker: Shape, height, and motion of rocker. Observing the user is able to reach the Rocker and complete the low impact intended motion.

3. 3D printer: Ensure the height, layout, and user interactive screen is of appropriate height and size for users to comfortably interact and clearly view the manufacturing process.

4. Flower: Observe the size and shape of the product, ensuring the center button (gently, and repeatedly pushed to create clockwise motion) is of appropriate size.

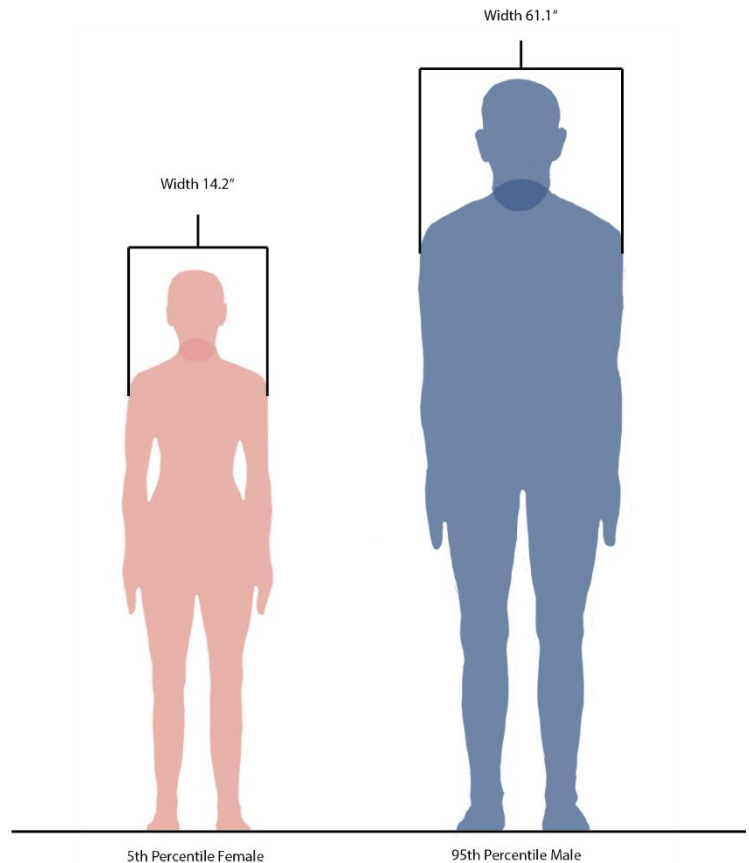


Figure 51

Description of User Observation Environment Use in this Study

Due to the current severity of COVID-19, and the updated Ontario quarantine policies, a

walkthrough did not take place in the traditional sense. A verbal walk through is carried out instead to ensure the overall user process is achievable.

Location and Timeframe

Date of Observation(s): 1/8/21 (Observation 1)

Location of Observation(s): Guelph, ON (Observation 1)

Results

Urn

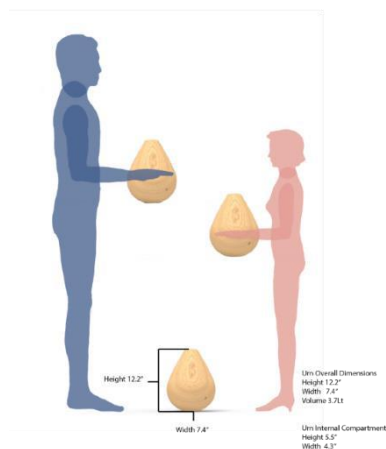


Figure 52

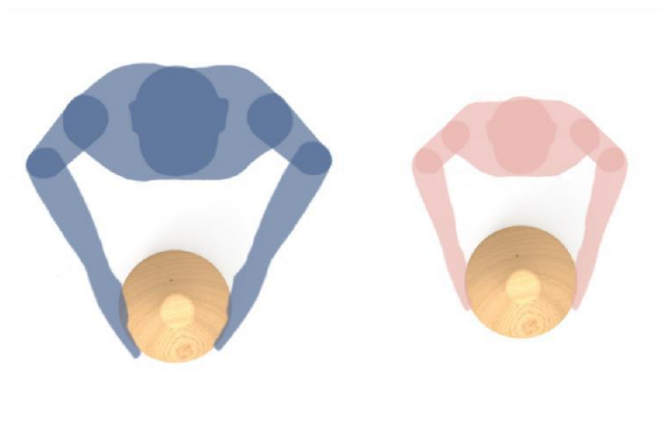


Figure 53

Rocker

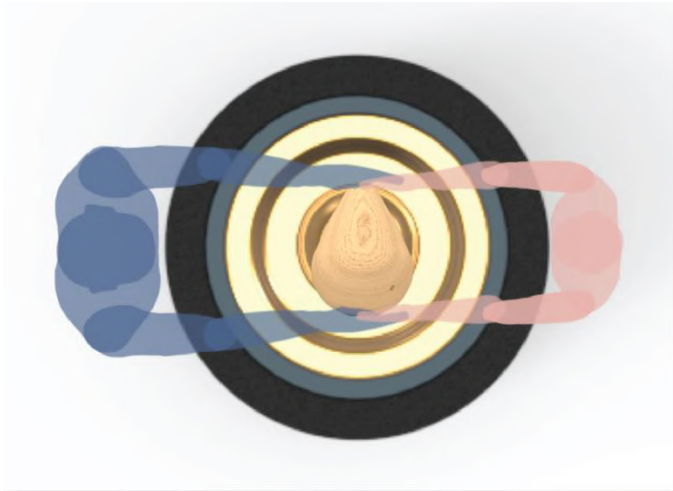
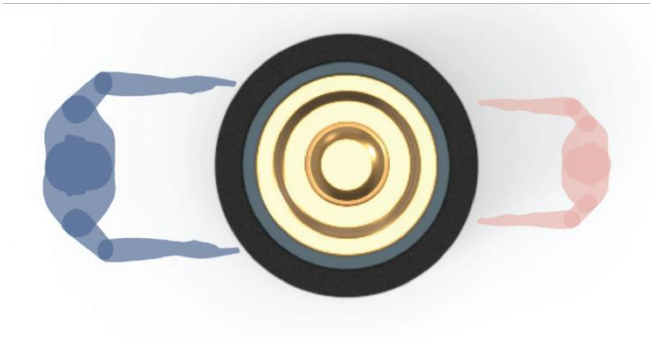
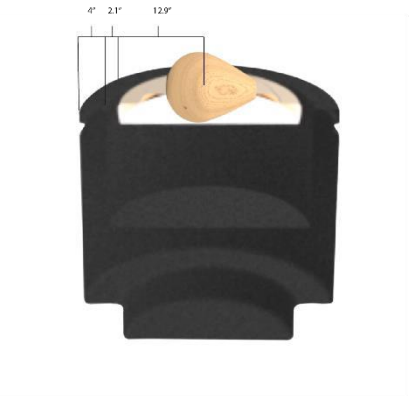


Figure 54

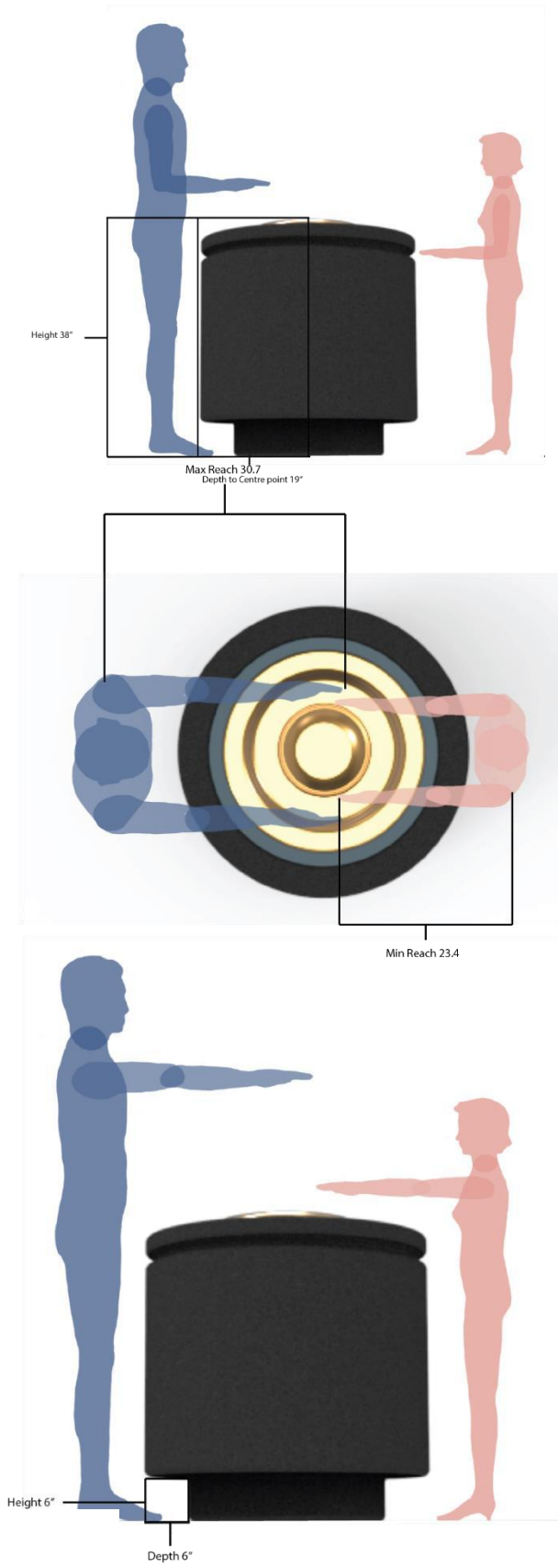


Figure 55

3D Printer

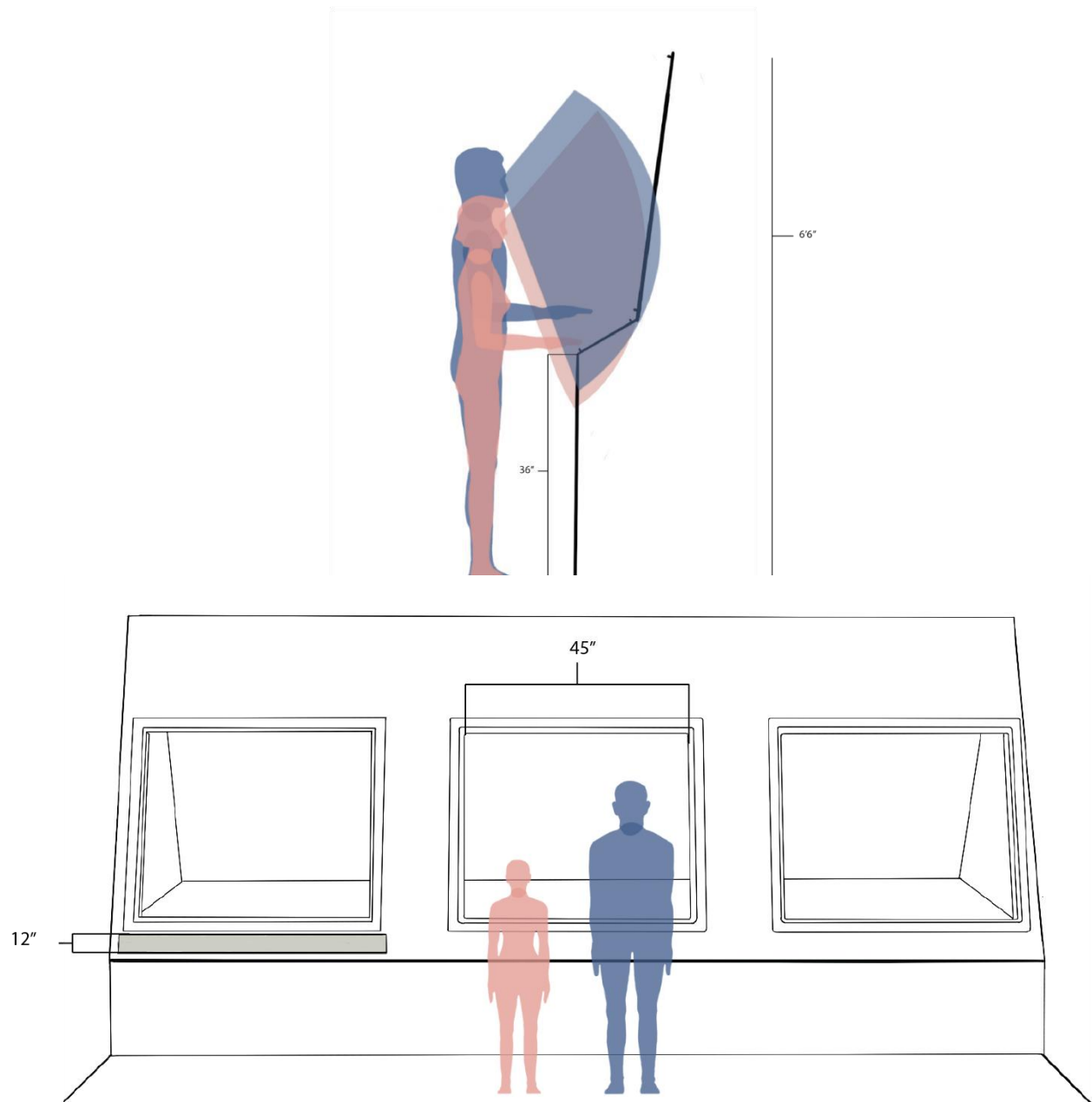


Figure 56

Flower



Figure 57

Analysis

Urn

Process: The user obtains a wooden urn by mail delivery, allowing time and space to gather and place the desired amount of ashes to be processed into a memorial flower.

Ergonomic evaluation: The Urn is divided internally with a pocket; keeping the ashes separate from the paper material which will be combined at a later date. The exterior of the Urn has a volume of 3.7Lt, standing at a height of 12.2", and a width of 7.4", while the internal pocket 5.5" x 4.3" has a volume of 380ml (1.5 cups). The focus primarily being the external size, and dimensioning of the product, as the ergonomic analysis is the focus of this report. The Run size

and dimension is to ensure the 5th percentile female is able to comfortably hold and safely move the object without the potential of injury. Although the primary user is highly considered, it's also important to empathize with the staff member interacting with the Urn, as they are required to move and place the Urn into the Rocker and 3D printer. The Urn is 12" with a double walled lining to help reduce weight as the employee at one point needs to place the Urn in the Rocker, a distance of 19". The width of the Urn 7.4", is both to accommodate the volume required to accommodate the ashes and material, along with creating a comfortable holding position which is less than a shoulder width apart for the 5th percentile female. The Urn has a rounded bottom, meaning 7.4" is the maximum distance, and the user is able to hold at a lower or narrower point if necessary.

Rocker

Process: The user enters a quiet room to say a final goodbye to their loved one, and to begin the process of combining the ashes with the material. The Urn is placed into the rocker by an employee prior to the user entering the room, and is later removed by an employee after the user has left the room.

Ergonomic evaluation: The maximum height of the Rocker is 38" in order to accommodate the 5th percentile female, while creating a feasible environment for the 95th percentile male. The intended rocking motion is low impact as the Urn sits on a hollow bed, floating on a bed of water. As the user pushes the bed, a momentum is naturally built, and a rocking motion begins. Water is intentionally used as it aids in the users (potential) mental burier of combining the ashes with water, and material during the 3D printing process, to create the final product. A foot space of 6" x 6" is to allow the user to comfortably stand as close to the Rocker as possible, while removing the need to move or shift their feet. The Rocker has an overall diameter of 19", as mentioned the need to place the Urn on the Rocker must be accessible to the employees, while allowing the user the opportunity to touch or place their hand on the Urn as a final

goodbye. The diameter of 19" is to accommodate the reach of a 5th percentile female, which is 23.4", while still being in a optimal control zone (70 degree head/ eye tilt) for the 95th percentile male.

3D Printer

Process: The printing process is broken into three separate panels to aid the user in understanding the process. Large glass panels allow the user to see every aspect of the creation process, allowing opportunity to add colour, local wild or water flower seeds, or dried flower pedals with an interactive control panel. The final product is a customized paper flower that is capable of low flight of approximately 12-15 feet and is created in a three step process (A more detailed description of this process will follow).

Ergonomic Evaluation: The key ergonomic considerations within the 3D printing process is the control panel, and the window size.

The control panel sits at 36", and accommodates an approximate 30 degree tilt to prevent screen glare for both the 5th percentile female and 95th percentile male. The interactive touch screen is large, at a width of 12" in order to display large non language icons, to accommodate visually impaired, and language barriers. The height, distance and tilt of the touch screen is within the optimal control zone of both percentiles (70 percentile head and eye movement), while the 5th percentile woman is within a comfortable 15 degree range in arm movement. Due to the controls being non critical, low impact, and brief selections, the ergonomic aspect ratio of the paneling is within an acceptable boundary.

The large windows in which the user can view the creation process have a length of 45", and a height of 6'6". Both are chosen to create an immersive experience for the user, while allowing space for emotional comfort. The window length of 90", easily accommodates the maximum shoulder width of two 95th percentile males which is 19.8". The top of the glass paneling is 6'6" which is a similar height to a door frame, this is 30 degrees upward eye or head movement for

the 5th percentile female which is still within a comfortable sight line. It's important to note that although the glass screen size is large the creation process is slow and not visually overwhelming, there is opportunity for the user to explore other areas of the building at this time as the process takes place.

Flower

Process: The user receives a 12 memorial paper flowers which rotate clockwise as the user presses the inner button to allow flight. The memorial flower is able to maintain low flight for 12-15 feet.

Ergonomic assessment: The flower pedals vary in size, and are combined into a piece at a maximum diameter of 5". This is to create a final product that's able to be manageably handled by the 5th percentile female, whose hand has a length of 6.2" and width of 2.6", however the light weight material is manageable and low impact to carry. The button has a diameter of 1", which may be difficult for the 95th percentile male to interact with as their hand has a length of 8.2", and width of 4.5". Further exploration is necessary, understanding the height of the spinning mechanism, and weight necessary to push the button can be accessed using a flat palm, however may be too small for the larger percentiles hand to interact with.

Limitations and Conclusion

Identifying critical human dimensions affecting product use were as follows:

1. The design of the Rocker can and will interfere with a person in a wheelchair.
2. The 3D printing process may be too convoluted and complex; ergonomically the window size, although intentionally large and separated may create a space that is overwhelming as the 5th percentile female cranes her neck.
3. Flower push button may be too small for 95th percentile male, dependent on weight of force required.

Unresolved Ergonomic Issues

Some user needs that remain unresolved is primarily wheelchair accessibility, although this is primarily witnessed with the rocker, the environment or location of this process may need to be reviewed. The size and process of the 3D printer may be a too large for the 5th percentile woman, and may need to be reduced to one window. Lastly, the memorial flower, specifically the button which activates the spinning mechanism may need to be increased in diameter as further exploration of height and push weight is further explored.

Alternative Solutions

Based on the current design solutions, alternatives may be considered in order to comfortably accommodate a larger number of people.

1. Lower the Rocker or create a slight inclined path to accommodate the height of a wheel chair.
2. Reduce the 3D printing process to one, or smaller screens, depending on the positioning of the user.
3. Increasing the overall diameter of the push button which engages spin and flight on the memorial flower.

3.4 AEASTHETICS & SEMANTIC PROFILE

Exploring end of life alternatives naturally falls in conjunction with spirituality, existentialisms, and philosophy; three tiers of non-physical form that are imperative to be reflected in the final design. In contrast, the design must also be unassuming, non-pressuring in reference to belief systems, and a perceived welcoming place for all users. An immense amount of detail is focused on care and handling of human ashes; balanced between the lines of a clean, and safe system and a respectful humanized manner. All of these elements are communicated intentionally through the form of each step within the process.

3.5 SUSTAINABILITY | SAFETY, HEALTH & ENVIRONMENT

Throughout one's life, it's inevitable that we as humans contribute to the overall devastating affects of global warming, air and water pollution, and species extinction due to our lifestyle choices. Furthermore, that pollution continues after our life and into death as our bodies decompose either naturally, or through other means such as cremation. Although cremation is found to be the less environmentally harmful alternative to burial, there is still elements such as CO2 that are released during this process that ultimately harm the planet. Developing solutions that are sustainable, and maintain a positive exchange with the planet help relieve some impact of human life, or death.

Throughout the initial design and development stages, sustainability is consistently at the forefront; a continued reference point. Some material and manufacturing aspects have been challenging to solve, as the balance of respecting a person's ashes, along with being sensitive to the emotional magnitude of the user(s) involved in the process is of equal importance. Specifically, the final product; memorial flower, is created from paper and speaking through the lens of sustainability the use of recycled paper is optimal, however emotionally may present its challenges. Utilizing and sourcing environmentally conscious, and sustainable pulp crucial as "the fourth-largest industrial sector worldwide... approximately 6% of the total industrial energy consumption and contributing 2% of direct carbon dioxide (CO2) emissions produced by industries" (Corcelli, 2018). Gaining knowledge through research, it's clear that innovative solutions are emerging such as efficient and sustainable papermaking from virgin pulp can seamlessly integrate into said thesis solution development. Utilizing already existing innovative material, process, and manufacturing is able to allow for the most sustainable outcome of this project.

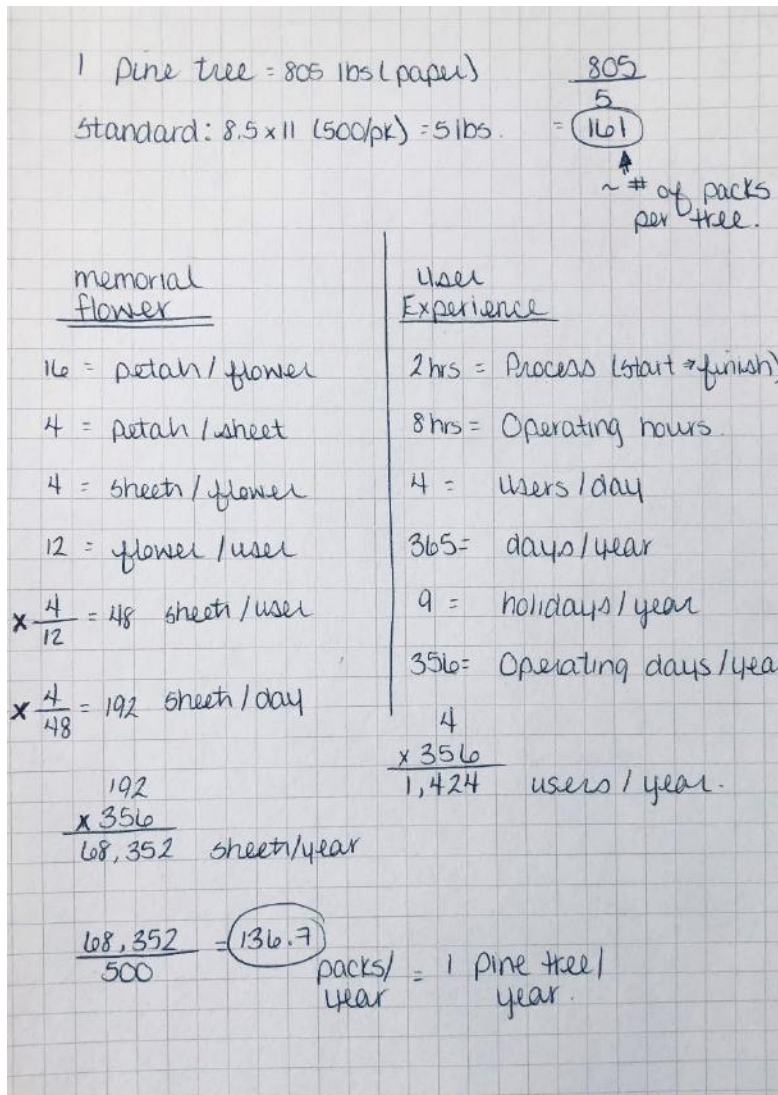


Figure 58

Health

The health of the primary user, employee, and surrounding environment is very important. Selecting material that is local, sustainable, long lasting, and hand crafted is chosen to aid in the overall health of the environment. Specific material is chosen that is easily wipeable to aid the employee in their daily tasks, preventing strain and repetitive use and motion, along with light material for lifting. A primary focus is the memorial flower; addressing the biodegradable outcome that is able to emotionally impact the

user, while not leaving a negative impact on the environment. The mechanism breaks apart upon landing on solid ground; reducing it's appeal if found by a child. Secondly, it breaks down easily in water, obtaining the goal of the 2012 California water bill.

Safety

Travelling with urns can be difficult, and invasive and the ashes can be viewed as a threat as the containers can be difficult to scan. However, many users seek travel destinations to spread their loved ones ashes in a desired location. A focus on safety, for both the user possessing the

ashes, and the security the memorial flower is specifically utilizes materials that are both biodegradable and can be easily identifiable when being X-rayed in airport security without the need for removal or tampering. Biodegradable urns meet the TSA traveling safety guidelines.

Sustainability Statement for Final Design

The sustainability of the complete thesis system solution, each individual component extending from raw material, to final production has been considered. The primary focus of this topic is to ultimately reduce the environmental impact of end of life, thus the sustainability of each component weighs heavily in the ability to achieve said outcome.

Through extensive research it is clear the system in place can be successful a successful one. A large amount of the negative environmental impact takes place in the extraction of raw material, and manufacturing stage, however the life cycle length of these components are long, are typically able to be recycled, or broken down. There is a large focus on maintaining a natural environment, closed loop cycle wherever possible, and creating an indoor environment that is self sustaining. Beyond that, the indoor environment can also be utilized as a local and sustainable material source when needed. Components being released into the environment focus on having a low manufacturing impact, breaking down in water within an allotted time, and providing a positive outcome to the environment in the form of non-invasive plant life.

3.6 FEASIBILITY & VIABILITY

Materials & Manufacturing

To better display the material and manufacturing solutions being utilized, the graph below helps to organize the information of this complex project.

Solution	Materials	Manufacturing
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<p>Location & Flower Creation (3D printer)</p>	<p><i>Architectural Components</i></p> <p>Biocementation</p> <p>Bamboo</p> <p>Glass</p> <p>Stainless steel</p> <p><i>Indoor water feature</i></p> <p>Self-cleaning/ filtering closed loop water system.</p> <p><i>Indoor garden</i></p> <p>Non-intrusive species</p>	<p>“Biocementation is defined as composites of enzymes and microbial biomass with inorganic chemicals. Biocementation is a process to produce building material based on MICP mechanism. These include wall and building coating method, solid, and sand stabilizing.” (Koç, G 2019).</p> <p><i>Indoor water feature</i></p> <p>Mimicking a self sustaining fish tank on a larger scale. Substrate: rooting medium. Water: movement created by miniature waterfall, and other elevation changes. Living plants: Micro algae, Java Moss, Java Fern; low maintenance, non-invasive. Small marine life: Carp, Koi, snails.</p>
<p>Urn</p>	<p><i>Urn</i></p> <p>Bamboo</p>	<p>Utilizing small batch manufacturing, a handful of hand crafted urns are</p>

		<p>locally sourced using indoor bamboo growing farms. Approximately 20 urns are made initially.</p>
<p>Rocker</p>	<p><i>Rocker Well (Body)</i></p> <p>Stone</p> <p><i>Rocker Cradle (Urn holder)</i></p> <p>Recycled Hollow Aluminum</p>	<p>A large negative contributor to the LCA of the stone body, is the process of extracting the stone from the earth. However, the benefits begin to outweigh as the material is long lasting and natural.</p> <p>Utilizing local quarries, and artisans being a primary focus in this step to both reduce the transportation distance and fund the local economy.</p> <p>Die Cast process creates a hollow Aluminum body. Aluminum is light weight, easy to mold, and doesn't rust. This component sits in water, thus a non- rusting material is</p>

		important. This material is easily wipeable and can withstand as a high touch surface.
Memorial Flower	<p><i>Pulp</i></p> <p>Spruce/ Pine; locally sourced from ethically responsible and sustainable tree farm.</p> <p>Pulp water source: On location, filtered water source reduces oil consumption.</p> <p><i>Mechanism</i></p> <p>100% all natural and biodegradable material. Using recycled plant materials, and cellulose.</p> <p><i>Flower petals and seeds</i></p>	<p>Small batch, in house pulp processing is manageable due to the size of the final product. Sourcing sustainable spruce/ pine forests on a micro scale; 1-2 trees/ location/ year.</p> <p>The mathematics have been broken down and included (Figure 1).</p> <p><i>Mechanism</i></p> <p>Utilizing an already existing process; water, heat and pressure and without any glues or binding agents; a solid form is created with a structure similar to plastic.</p> <p><i>Flower petals and seeds</i></p>

	Local, unintrusive flower and plant seeds.	Petals gathered from in house gardens that contribute to the indoor environment.
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Table 17

Benchmark

Sustainable initiatives and benchmark examples

Solution	Material	Benchmark & Sustainability Support
Location & Flower Creation (3D printer)	<i>Architectural Components</i> Biocementation Bamboo Glass Stainless steel <i>Indoor water feature</i> Self-cleaning/	<u>Benchmark: Woodland Park Sustainable Zoo</u> Zoos and aquariums can improve their sustainability performance using a Triple Bottom Line (TBL) framework. This framework helps to identify and shape how the ecological integrity and social contributions of zoos can be upheld and enhanced alongside economic commitments. Only when these three elements are in balance will a more sustainable outcome be achieved (Townsend, 2009)

	<p>filtering closed loop water system.</p> <p><i>Indoor garden</i></p> <p>Non-intrusive species</p>	
<p>Urn</p>	<p>Bamboo</p>	<p><u>Benchmark: Bamboo cremation urn</u></p> <p>The urns are cleaned, and sanitized thoroughly and re-used until they naturally break down. Since bamboo is a sturdy and long-lasting material, this will take time.</p> <p>Bamboo is also chosen due to it's light weight and density. This allows it to be safely shipped/ mailed to the users home with as minimal carbon footprint as possible.</p> <p>Completed life cycle assessment approach, taking into account the input and output flows occurring along the</p>

		<p>production chain in relation to the use of bamboo.</p> <p>Findings conclude that “Concerning the carbon storage of bamboo and plybamboo, has environmental benefits in the impact categories of climate change and global warming” (Chang, 2018).</p>
<p>Rocker</p>	<p><i>Rocker Well (Body)</i></p> <p>Stone</p>	<p><u>Benchmark: Using natural stone in Green Building Projects</u></p> <p><i>Rocker Well (Body)</i></p> <p>Stone is a natural product of the Earth, the original green building material. It does not require other materials or resources to create it. There is an abundant supply with varying textures and colours. Stones such as slate, limestone, travertine, and granite will all age beautifully and gracefully, providing years of use and enjoyment. Stone can easily stand up to high traffic use and high touch areas. Stone is completely recyclable and has the potential to serve many different uses and purposes over its lifetime. (Viera, 2015)</p>

	<p><i>Rocker Cradle</i> <i>(Urn holder)</i></p> <p>Recycled Hollow Aluminum</p>	<p><i>Rocker Cradle (Urn holder)</i></p> <p>LCA report examines “6 methods and 2 case studies examining aluminum recycling. Revealing a straight forward process, however slight surface and structural quality lost” (Van der Harst, 2016). This loss in surface luster quality is acceptable as an after production polish is maintainable.</p>
<p>Memorial Flower</p>	<p><i>Pulp</i> Spruce/ Pine</p>	<p><i>Pulp</i></p> <p>Evaluating efficiency through EMA it’s found that “among the three forest systems under study, Spruce/Pine forest management displays the most sustainable option for paper production.” (Corcelli, 2018)</p>

	<p><i>Mechanism</i></p>	<p><i>Mechanism</i></p> <p><u>Benchmark: Eco Water Urn</u></p> <p>“2012, California passed a law (Bill AB1777) requiring that all urns for ashes buried at sea must be able to break down within four hours” (Stuart, 2015)</p> <p>Although it is biodegradable, it will not biodegrade unless it is placed in or exposed to water. Therefore, it can be used for a land or water burial right away or it can be used as a regular memory piece to hold onto for many years. Due to the material and composition, if a water burial is chosen the memorial flower will float for several minutes before submerging and breaking down.</p>
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Table 17

3.7 DESIGN BRIEF

The design brief is a guideline provided as a directional aid while continuing further into the design process.

<p>Intuitive</p>	<p>Ensuring the process in which the Primary user is participating is simple and natural. While emotions are heightened conflicts</p>
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	can naturally arise as frustrations grow. The process goal is to bond, heal, and create a sense of hope.
Humanized and Trustworthy	The process does not feel mechanical despite the fact that machines are completing a task. Removing visual cues, creating natural environment, and ensuring the final product that's produced meets the expectation of the user.
Positive Environmental Impact	Ultimately, the goal is to contribute to the environment in a positive way. Focusing on incorporating local plant life that encourages the growth and development of local ecosystems – a massive focus on local in order to avoid the accidental introduction of an invasive species.
Create a Positive and Unforgettable Experience	The Primary user is overcoming a devastating loss. It's important to be empathetic towards that experience by focusing on mental health exercises, and solutions while the user interacts with the product. An example of this is creating a product that needs to be released outside with others, this puts the user in a situation that causes them to socialize outdoors, two proven mental health reliefs.
Safe	The final product, act of participating in the creation of said product, and the use of the product in its intended environment must be safe for the user and those around them.
Ergonomic	The final product, act of participating in the creation of said product, and the use of the product will not discriminate

	towards body size. The Primary user is able to participate in each stage of the product creation process.
Aesthetic	The aesthetic of the environment, and product will be natural, neutral, however not morbid. The intent is to create a sense of hope for the user, and with that a clean, natural, 'zen' or 'spa' aesthetic will be created in order to focus on mental health along with redirecting the taboo narrative surrounding death.
Respectful	The handing of the ashes will be done so in a respectful way as this is the remains of a human being. The Primary user will be aware of the process taking place in order to be comfortable with the creation. Although any un-humanized aspects will be relatively hidden from sight, the process will be vocalized prior to the process.
Create an Emotional Connection	Another important value in order to create a humanized process is creating an emotional connection with the user. This is done with a combination of aesthetic, safety, and understanding towards the user.
Focus on Healing/ sense of hope	The last goal is to create a sense of healing. Accomplished, again with the natural aesthetic, experience provided, and then after by releasing the ashes.

Table 18

Chapter 4

DESIGN DEVELOPMENT

4.1 IDEA GENERATION

4.1.1 AESTHETICS APPROACH

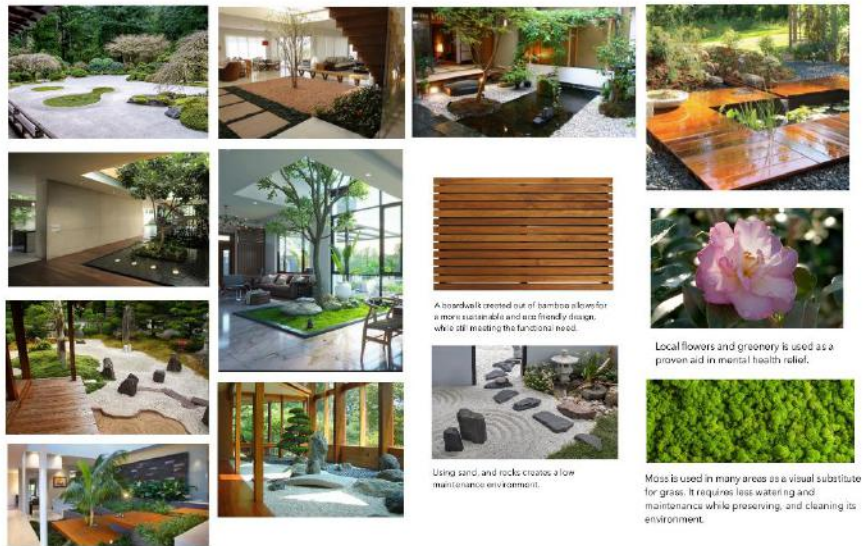


Figure 59

The layout aesthetic is mimicking a garden, greenhouse, spa, or zen garden. Primarily the layout is non-religious as to not discriminate, and welcoming to all. This is best represented by combining and balancing both natural and manufactured pieces into an environment.

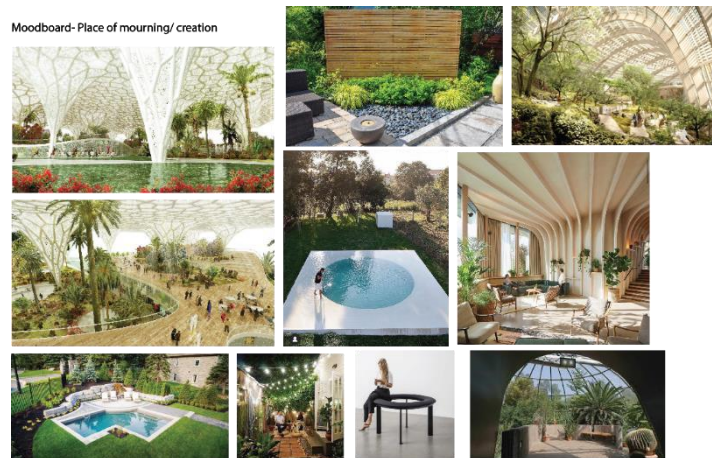


Figure 60

Further examples and representation of natural environments that balance both the natural and manufactured. Understanding light, movement, and warmth are explored to allow the space to be non-claustrophobic.



Figure 61

The beginning concept of the memorial flower begins with understanding movement. This is found in the form of dance, fabric and wind, and within an ocean environment. A hopeful concept bring flight or having the ashes float away peacefully from the users hand.

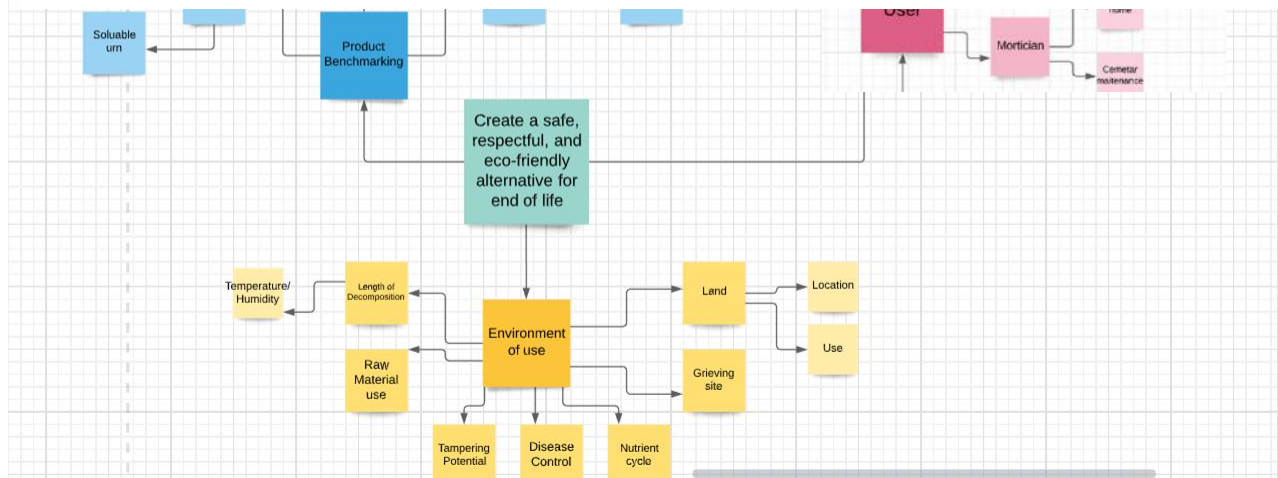


Figure 62

4.1.2 MIND MAPPING

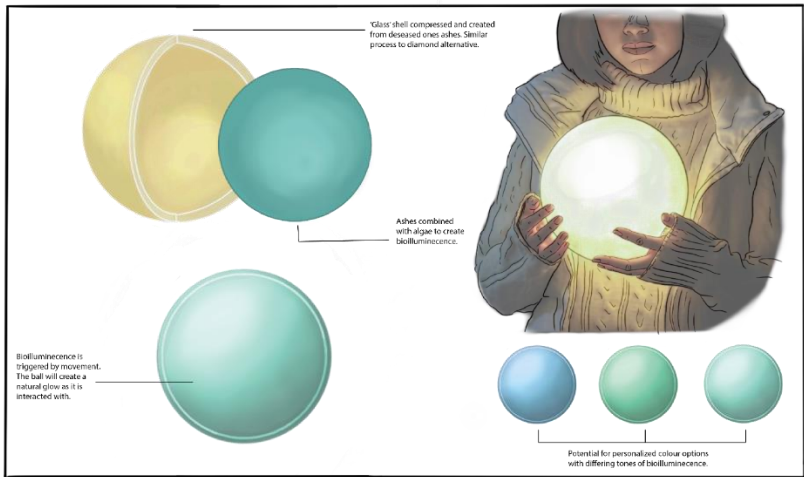
4.1.3 IDEATION SKETCHES

At the beginning of the design process loose ideation sketches and concepts are developed. These concepts are heavily reliant on already existing products to aid the visualization and aid in understanding the process and technology.

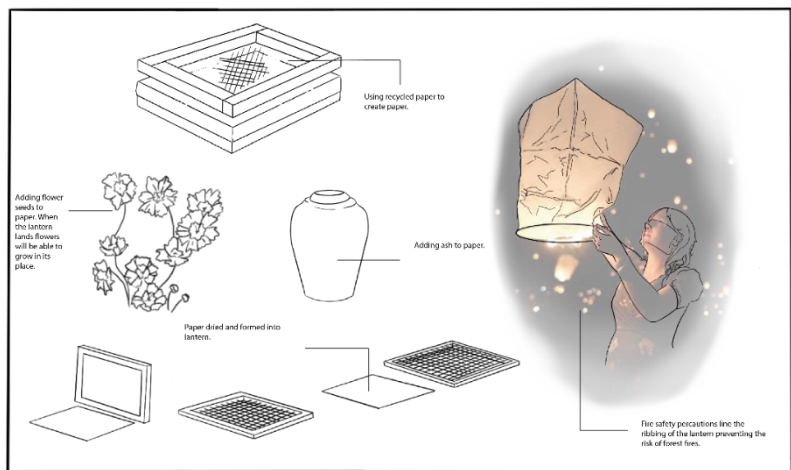
These concepts are listed below:



End of life alternative Concept 5

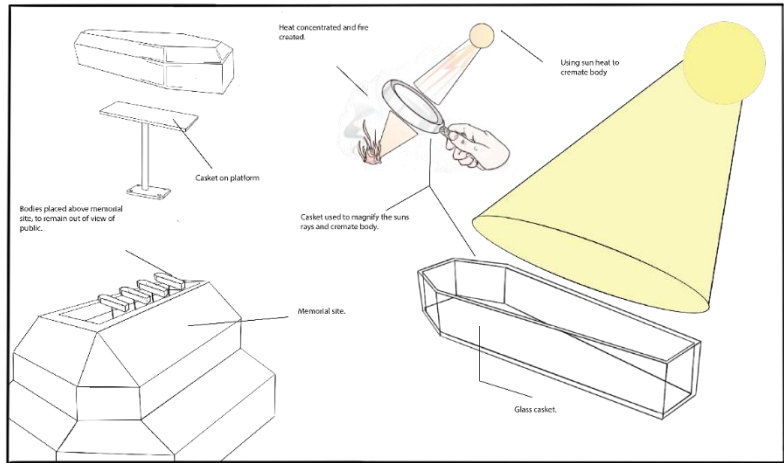


End of life alternative Concept 1

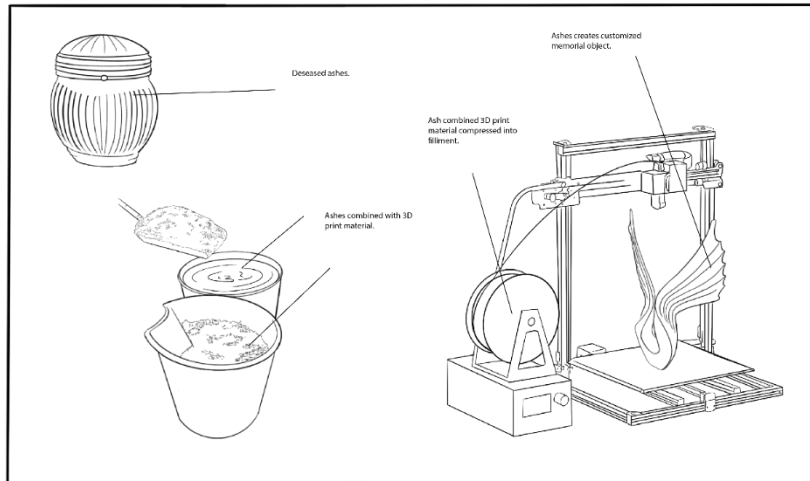


End of life alternative Concept 4

Figure 63



End of life alternative
Concept 2



End of life alternative
Concept 3

Figure 63

4.2 PRELIMINARY CONCEPT EXPLORATIONS

Through further research and understanding of trends, technology capability, and having gathered personal research of the user profile a further a more developed concept exploration is created.

The concept explorations are listed below:

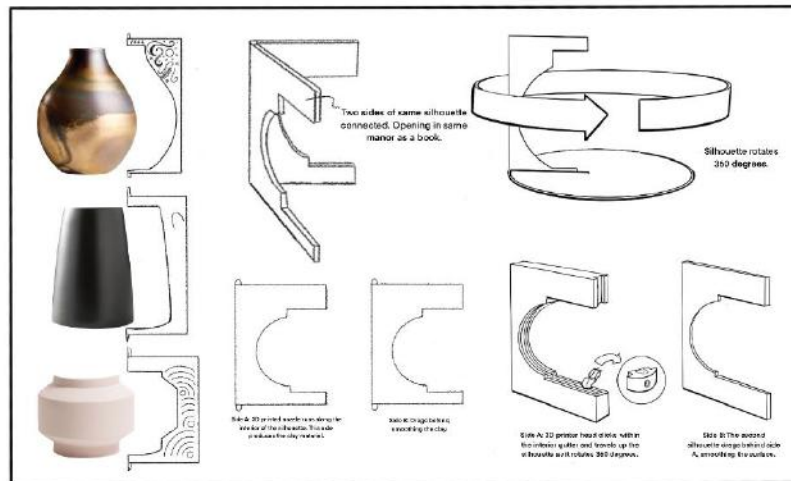
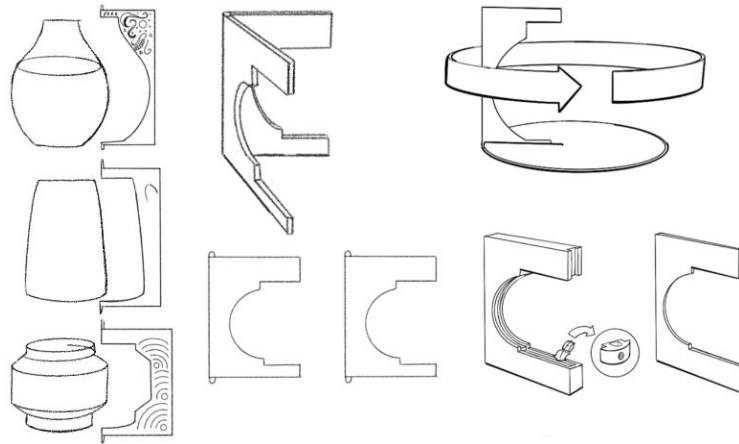


Figure 64

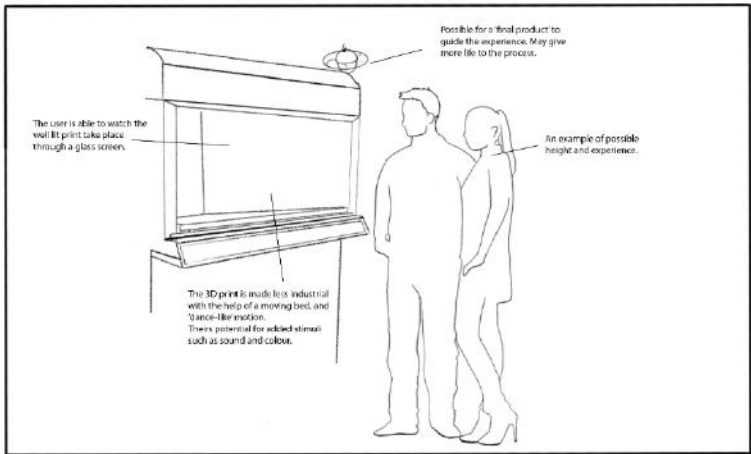
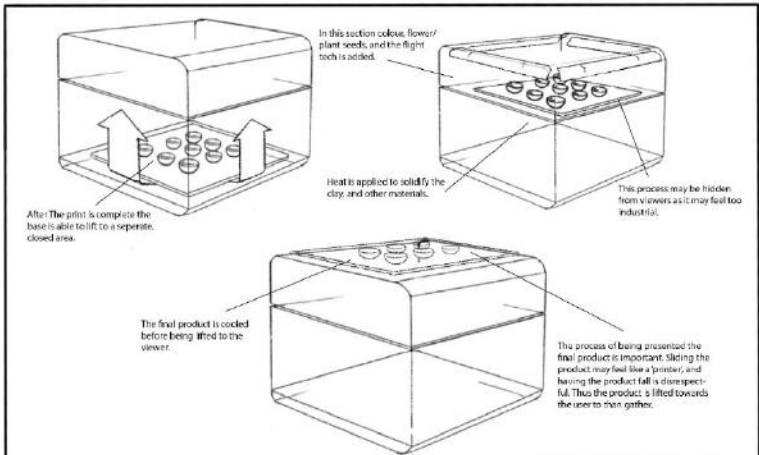
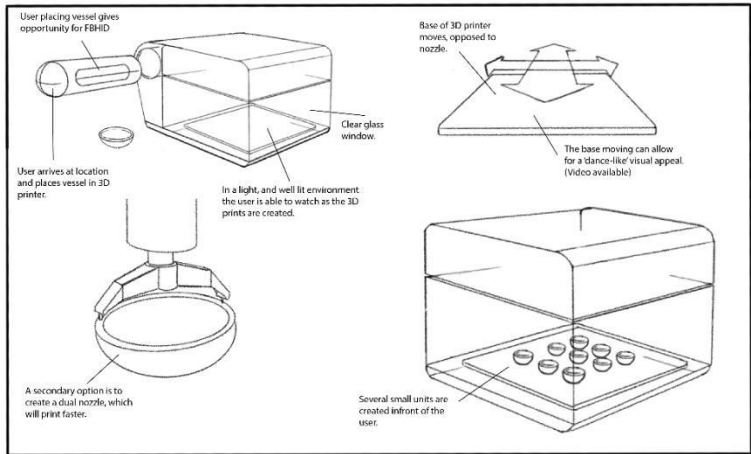


Figure 65

4.3 CONCEPT STRATEGY

The concept strategy begins to narrow in on specific concepts that are developed in previous stages. Its within this stage that the scope of the project is created, meaning this project begins to develop several sections all in alignment with the criteria. This is to allow the project to be full bodied and allow all points of the thesis criteria to be met. Throughout the remainder of this report the sections will be separated in order to indicate the depth of understanding of detailed ergonomics, material, and processing.

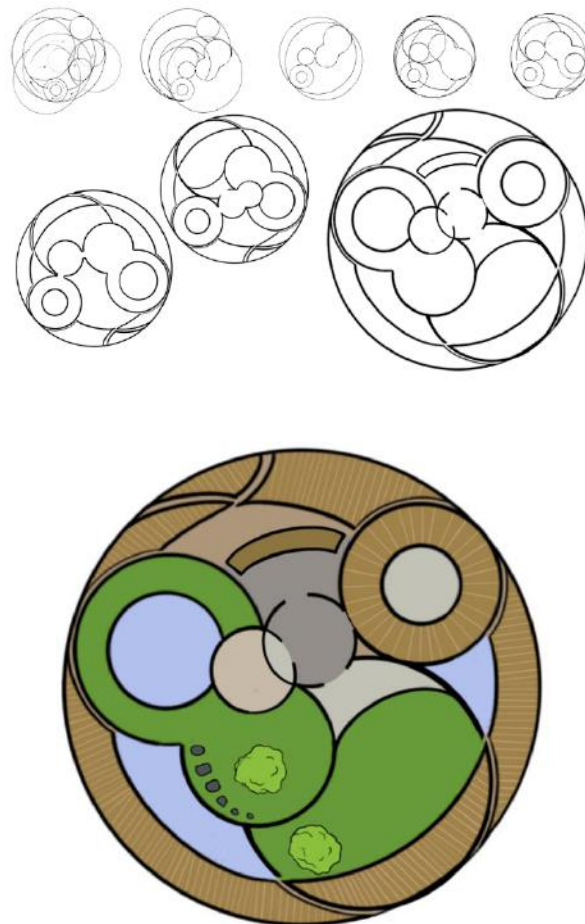


Figure 66

Traffic flow

The user is given the opportunity to move freely in the open space of each room.

They are able to move at their own pace, and encouraged to experience and take in the present moment. This is achieved by blocking the view of the following room with doors and walls. Surrounded by nature, the user is given an experience that's relaxing and promotes positive mental health and healing.

Mix Ashes- Final goodbye

In the centre of the first room there is a rocking unit in which the user places the vessel containing the ashes. The user may enter individually, or with others- this is a time for final goodbyes. The user rocks the unit containing the vessel which begins the process of combining the ashes with the clay.

3D print

The ashes are moved by a staff member and loaded into the back of the 3D printer- out of the users line of sight. The user is able to select preferences of colour, seed type, and watch the oxidation.

Gather final product

After the print is complete the user moves to the next room. During this time of transition a staff member collects the printed ashes, arranges them in a package and places them in an access door to the next room. The user is able to enjoy the space during this time, and gather the ashes in their own time.

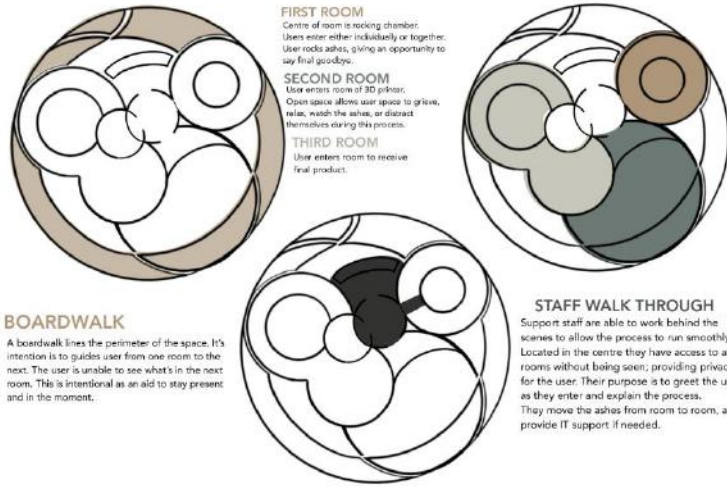
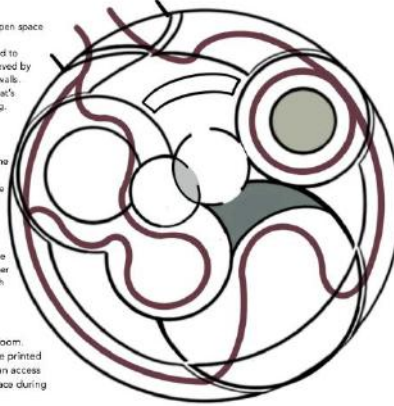


Figure 67

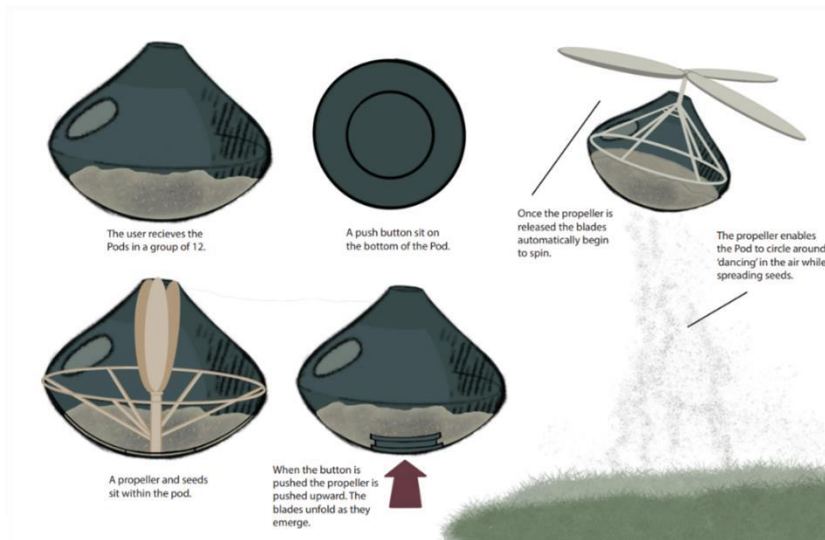


Figure 68

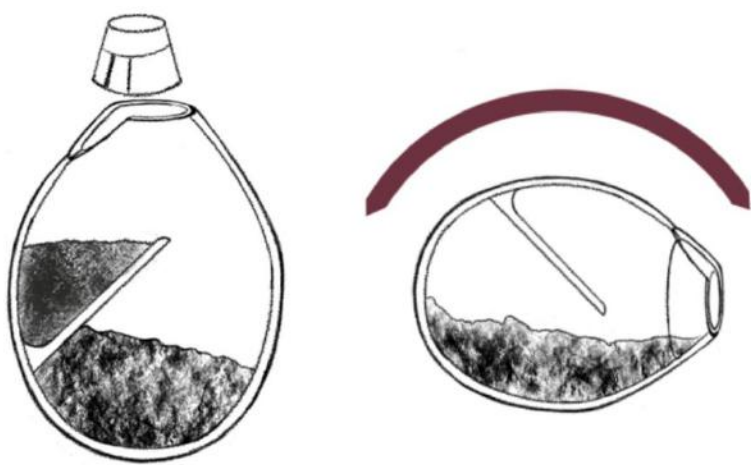
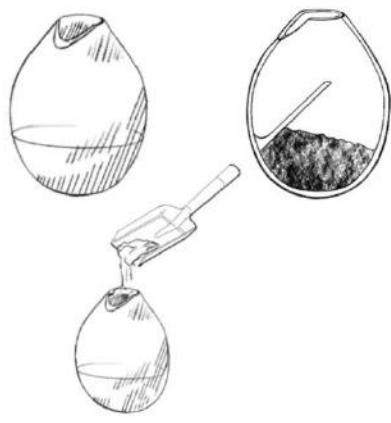
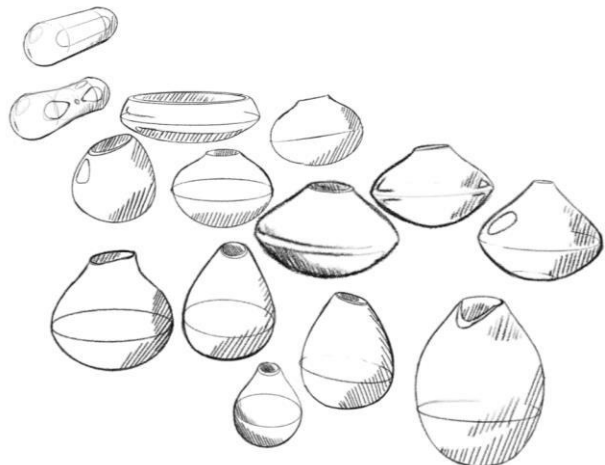
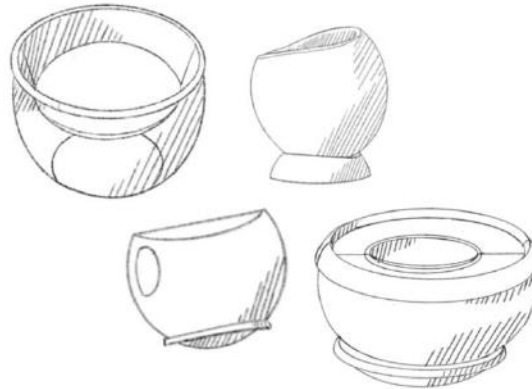


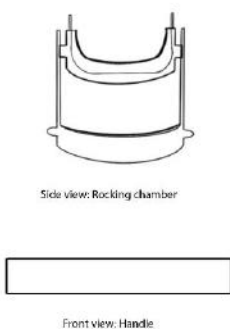
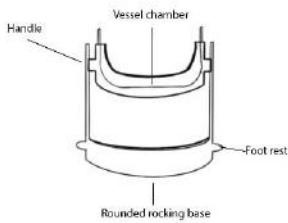
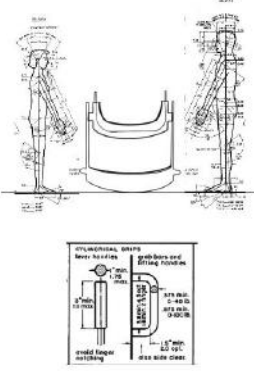
Figure 69



Configuration 2: Components	Configuration 2: Diagram	Configuration 2: Ergonomics
<p>Top view</p> <p>Side view</p> <p>Considerations</p>	<p>3D Printer</p> <p>Glass screen</p> <p>Control option menu</p>	
<p>Definition</p> <p>Components: User views as his 3D print Glass window: Allows user to see 3D print take place Touch screen console: Allows user to interact with and personalize final product.</p>	<p>This diagram depicts the current design features of the 3D printer. These components are subject to change.</p>	<p>While dealing with an interactive object, the 50th percentile for both male and female have been chosen to be examined. Comfort and usability are considered. 5th and 95th percentiles will be considered.</p>

Configuration 1: Components	Configuration 1: Diagram	Configuration 1: Ergonomics
<p>Front view</p> <p>Top view</p>	<p>Top Lid: Access to hollow interior</p> <p>Hollow interior containing clay ingredients and ash</p> <p>Bottom lid: Output connects to 3D printer.</p>	
<p>Definition</p> <p>Components: Need to combine with clay ingredients Glass window: Allows user to see amount of ash Top lid: Access to hollow interior Bottom lid: Access to 3D print output.</p>	<p>This diagram depicts the current design features of the vessel. These components are subject to change.</p>	<p>While dealing with an interactive object, the 50th percentile for both male and female have been chosen to be examined. Size considerations, weight, and handles will be considered. 5th and 95th percentiles will be considered.</p>

Figure 70

Configuration 3: Components	Configuration 3: Diagram	Configuration 3: Ergonomics
 <p>Side view: Rocking chamber</p> <p>Front view: Handle</p>	 <p>Handle</p> <p>Vessel chamber</p> <p>Foot rest</p> <p>Rounded rocking base</p>	 <p>50th Percentile male and female</p> <p>50th Percentile male and female</p> <p>50th Percentile male and female</p> <p>50th Percentile male and female</p>
<p>Definition</p> <p>Components:</p> <ul style="list-style-type: none"> Chamber: allows vessel place for vessel to combine with clay ingredients. Foot rest: Added stability Handle: Added stability 	<p>This diagram depicts the current design features of the vessel chamber. These components are subject to change.</p>	<p>While dealing with an interactive object, the 50th percentile for both male and female have been chosen to be examined. Comfort, and stability are strong considerations. 5th and 95th percentiles will be considered.</p>

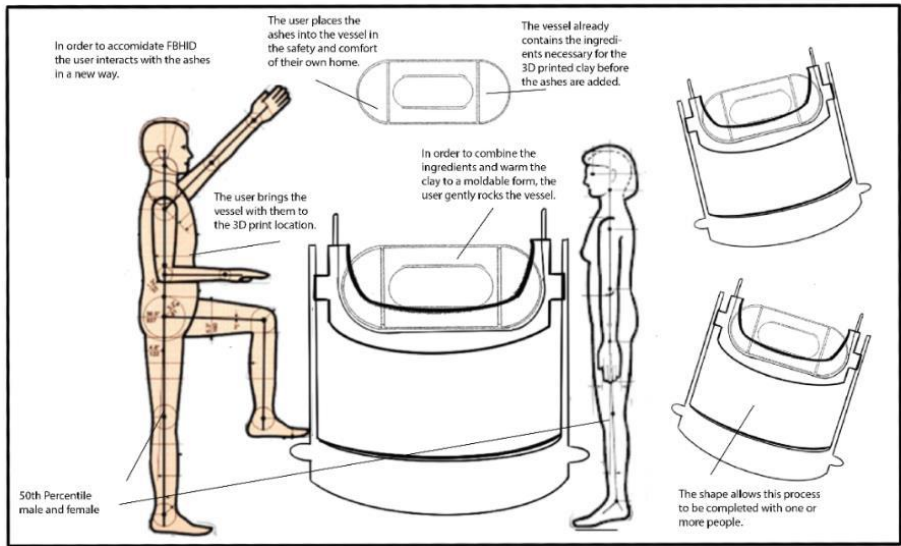


Figure 71

4.4 CONCEPT REFINEMENT

Concept refinement is beginning to design within the limitations of the previous scope. The concept is beginning to develop into a zen philosophical experience for the first person user, as the imagery of yin and yang begin to develop among the layout. The environment begins to come to life as the refinement stage is further analyzed to first person viewing points and understanding the process in full. At this point full bodied human interaction as been met, along with sustainability.



Figure 72

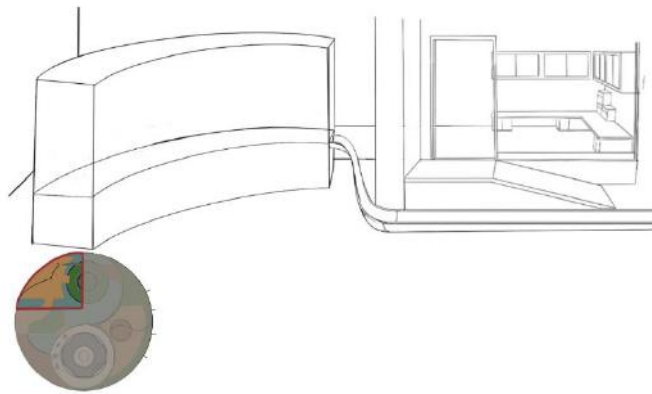
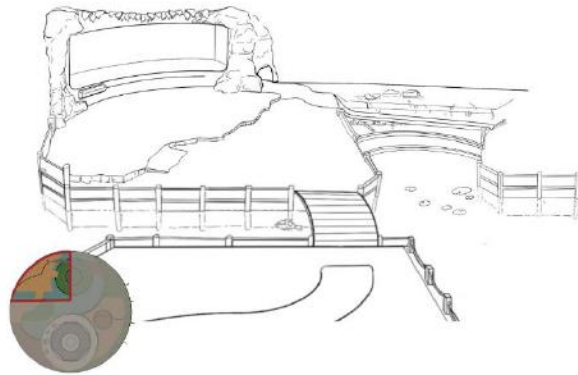
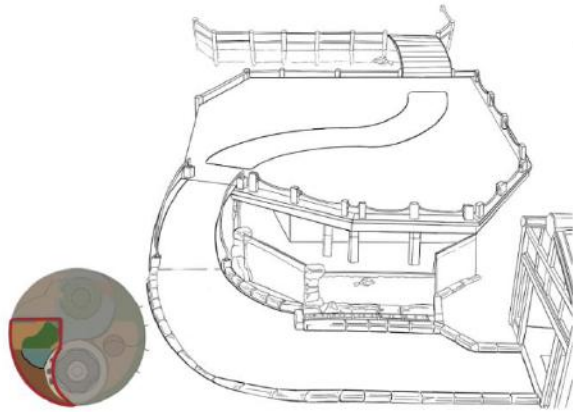


Figure 73

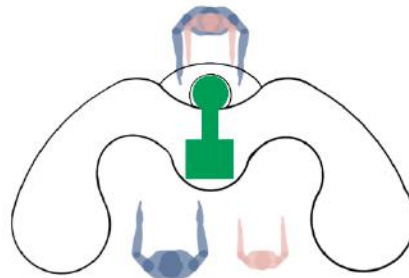
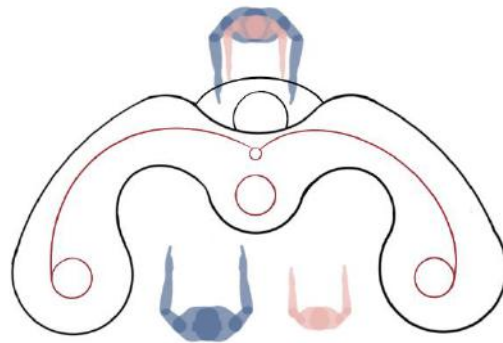
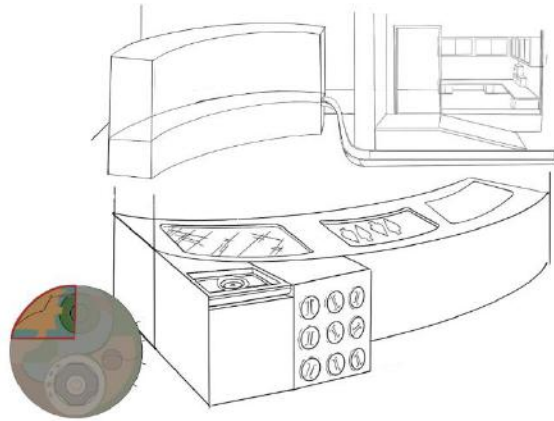


Figure 74

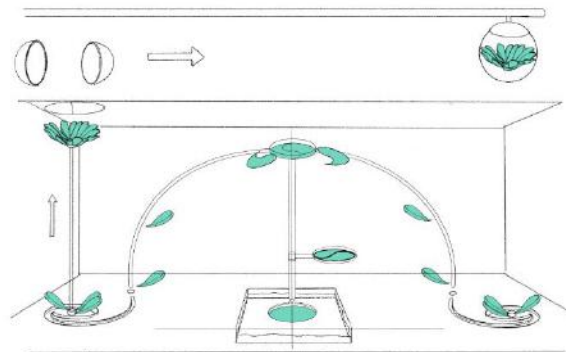
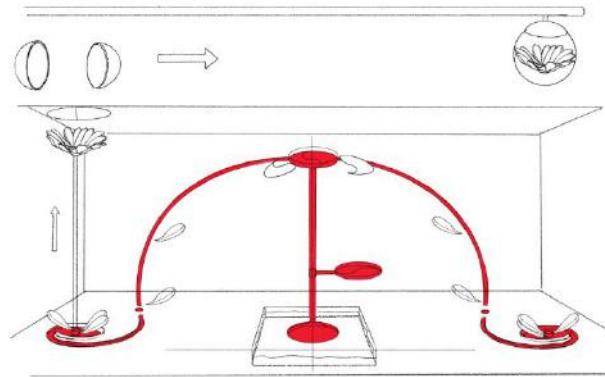
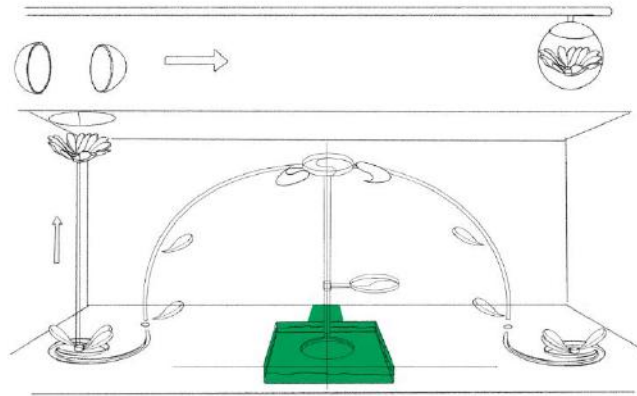


Figure 75

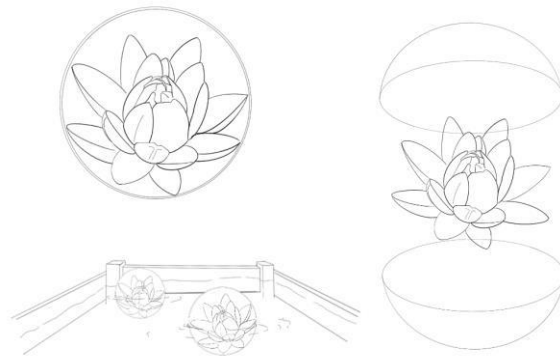
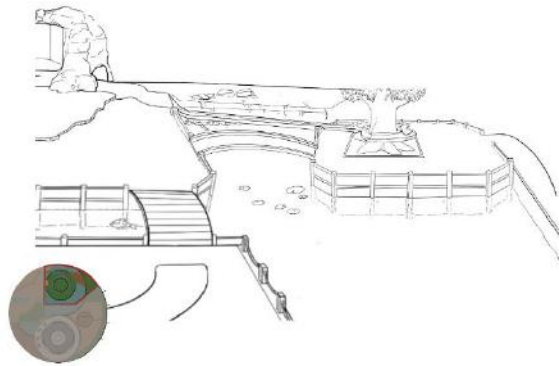
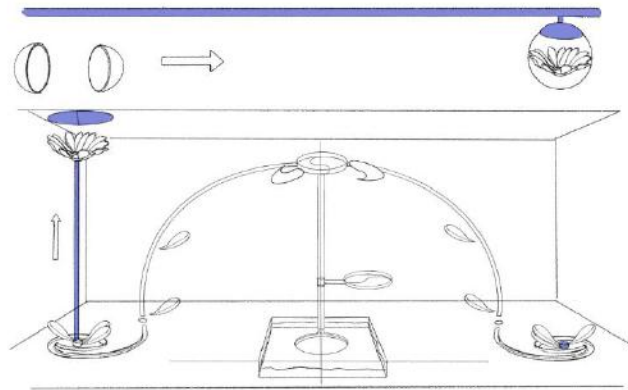


Figure 76

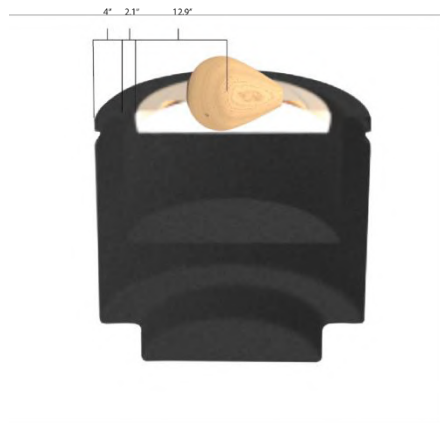
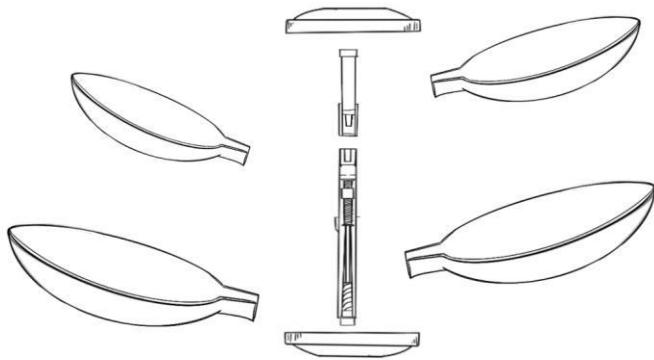
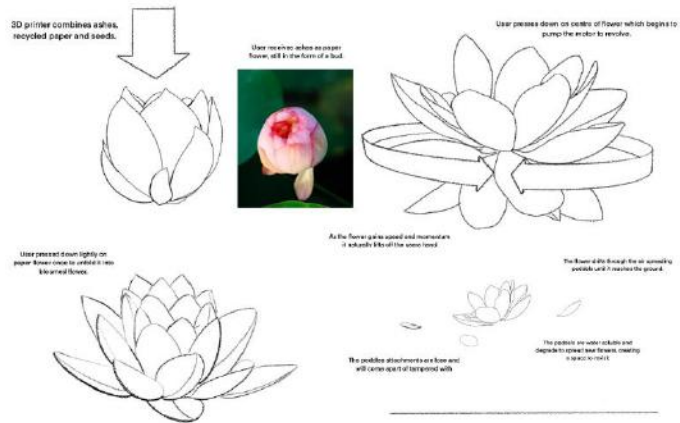


Figure 77

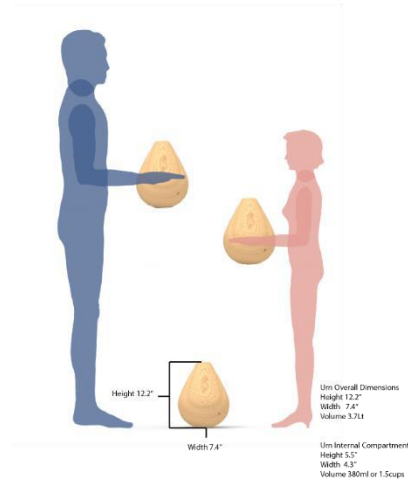


Figure 78

4.5 DESIGN REALIZATION

4.5.1 PHYSICAL STUDY MODELS

A rough physical model is created to further understand the ergonomic profile of the thesis. Due to the large scope of this project along with the limitations created by COVID-19 lockdown, the physical model is reduced to the Printer. This piece has the largest amount of touch points and the most complex manufacturing out of all the component.



Figure 79

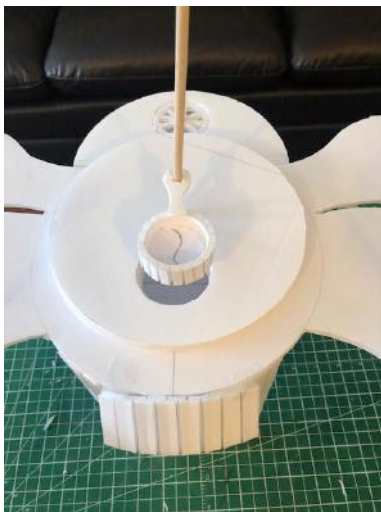


Figure 80



Figure 81



Figure 82

4.5.2 PRODUCT SCHEMATICS

A more detailed schematic overview is preformed in understanding the human form factors along with ensuring the project meets the thesis criteria. Several touch points are analyzed, along with in depth understanding of 5th and 95th percentile interaction with the printer.

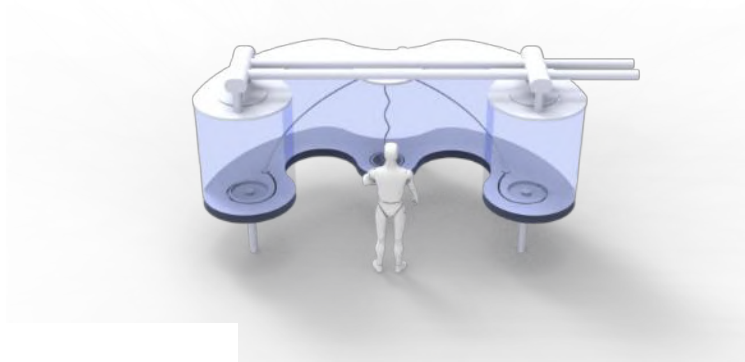


Figure 83

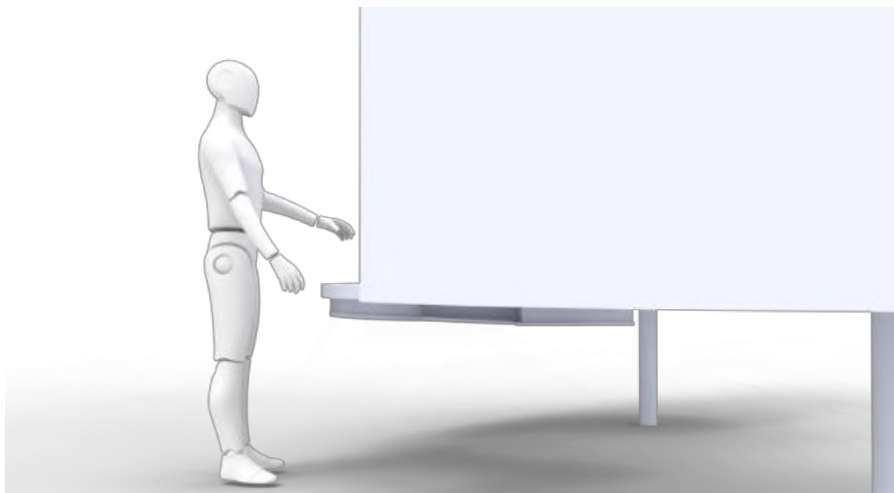
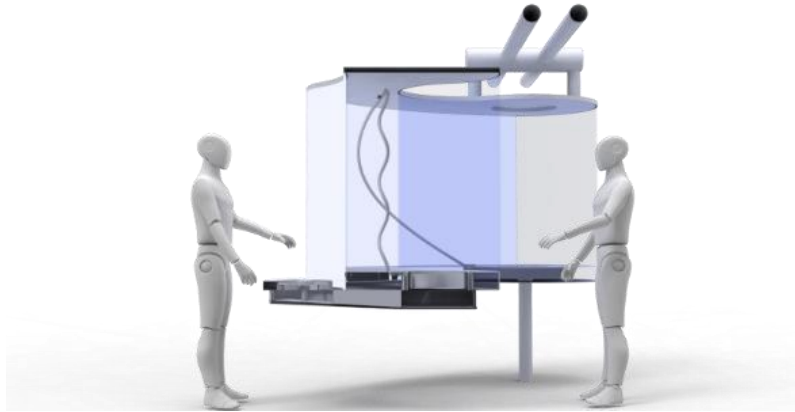


Figure 84

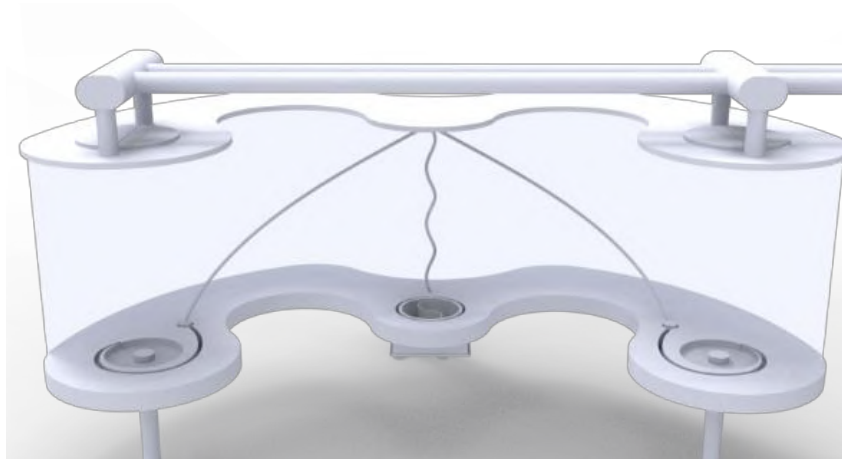
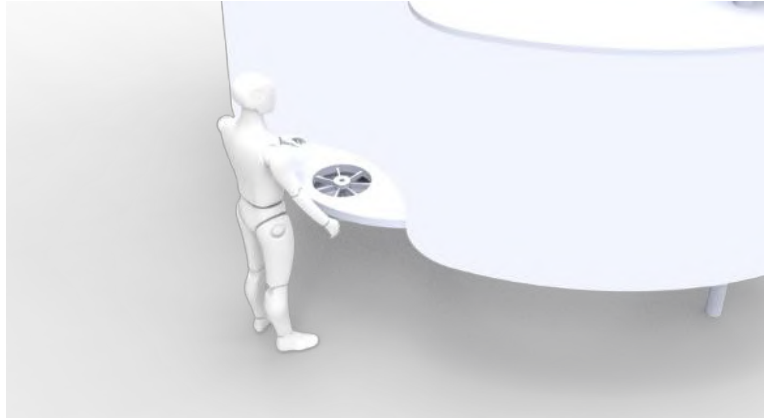
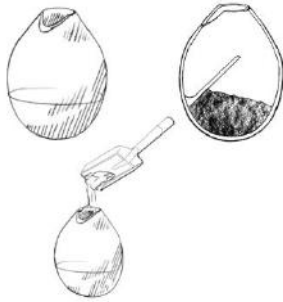


Figure 85

4.6 DESIGN RESOLUTION

Urn



Material: Hardwood | Maple, Walnut, Oak

The Urn is the first step within the process that the user interacts with.

It's important to reflect the branding

Figure 86

through the urn; each individual product is handcrafted to reflect the care taken within the entire process. This also allows the wood to maintain its individuality as each urn will vary slightly in colour, tone, and opening. No colour stain will be added to the wood, simply a clear water-resistant surface lacquer to protect the piece and add its life cycle. This is to aid in communicating the transparency, purity, and care of the overall process -ultimately preparing the user to be welcomed into a natural and inviting environment.

The user orders the urn, which arrives by mail to their house; this gives them time to deposit a portion (1-2 cups) of the ashes on their own time and in their own way as to not rush or emotionally overwhelm the user. The urn contains a false bottom, allowing the ashes to remain pure and separate from the paper and mixing components that rest below said point until the intentional mixing process begins.

Layout

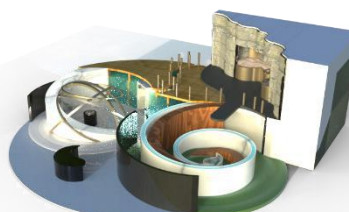


Figure 87

The layout is the primary focus, where the user is spending their time, and where they are experiencing heightened emotions. The space is non-religious and instead bridges the gap, merging two worlds together; the natural, and the manufactured – leading the user create a memorial flower that will eventually be re-united with the earth. Varying heavily in materials however remaining consistent within the theme, natural elements are primarily used throughout the entire space; stone, sand, metal, moss, and greenery. Mimicking a garden, greenhouse, or spa the layout is inviting and relaxing while the user ventures throughout the creation journey. The birds eye view of the layout is representative of Yin and Yang; this symbol reflects the concept of dualism as believed the universe creates itself out of chaos of material energy and balances between the positive and negative.



Figure 88

Rocker- Tilt

The user arrives with the ashes, which are placed in the center of the Rocker by a staff member. The user then enters the room and is able to begin the intentional mixing process. The urn sits atop a cradle floating above a base of water, the user is then able to gently rock the cradle, in turn moving the ashes and mixing the remains with the paper inside the urn. This allows the user to feel more apart of the process, it allows them a chance to say their final goodbyes, and creates a sense of involvement or intention.

Printer | Creation Process | Employee

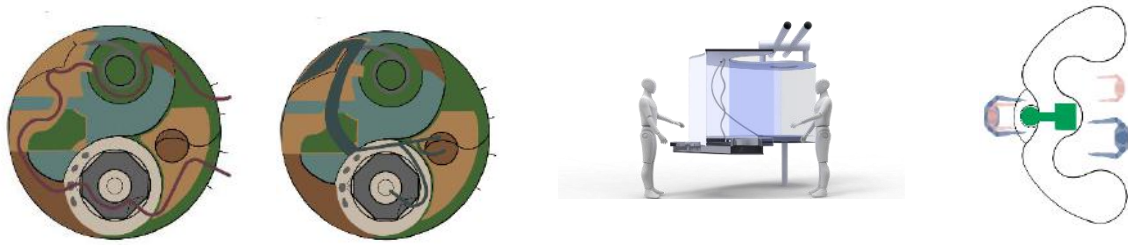


Figure 89

<p>Two separate paths; red outlines the users path, dark blue/grey outlines the staff members path</p>	<p>Left; Employee, depositing ashes. Right; User, selecting memorial flower preferences, and watching creation process.</p>
--	---



Figure 90

<p>Process in which ashes are deposited into printer (out of sight from user)</p>	<p>User, first person perspective of creation process.</p>
---	--

The Creation Process is slightly complex, however necessary as it removes the user from specific aspects of the process that are more industrial. To begin, the user leaves the Rocker and urn after saying their final goodbye and are lead to the upper deck (an all natural space that gives a place to explore while the ashes are being transferred), during this time an employee gathers the urn and ushers it to the printer via a short tunnel connecting the Rocker room and the Creation room (allowing them to move out of sight from the user). Through the remainder of the process the employee is unseen and separated from the user, they sit 'behind the scene' deposit the ashes, and ensure the printer is functioning properly. The employee places the urn on a water well which washes all of the ashes, paper, and mixing component out and into a water grate. The user selects their preferences for the memorial flower; colour, seeds, pedals- which are automatically distributed into the paper mixture.

The user than begins to watch as their memorial flower is created in front of them.

Printer | Creation Process | User

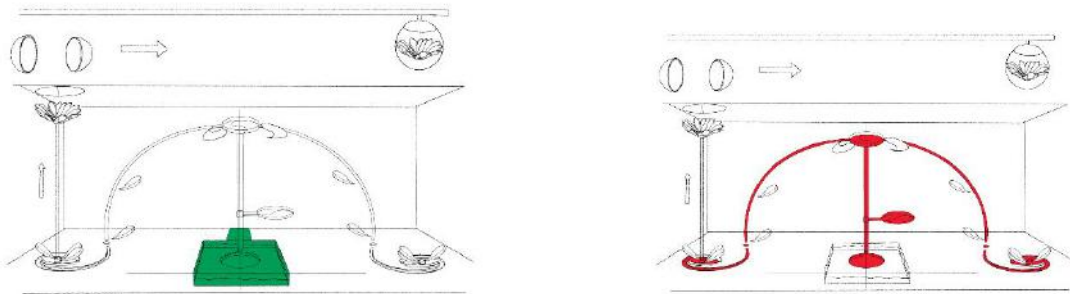


Figure 91

<p>Downward slope connects the ashes from the employee section behind the wall, and the</p>	<p>The user is able to watch as the memorial flower is created. A round strainer gathers</p>
---	--

<p>user section. The user is unable to see this area, however it is the location in which the mixture is drawn from.</p>	<p>mixture from the base below, and begins fast drying while rotating upwards. As it reaches the top the paper is dried enough to be moved.</p>
--	---

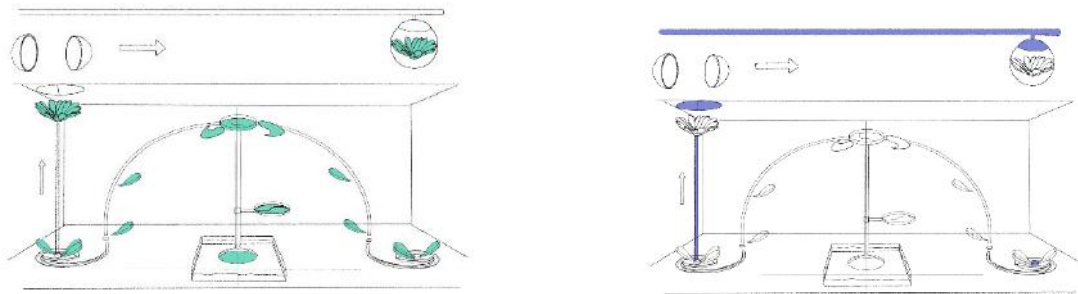


Figure 92

<p>Paper pedals are created as they branch from the raised strainer to connect to their flower center. The pedals are the colour the user selected and contain dried pedals and seeds.</p>	<p>Once the flower center has gathered enough pedals it is raised upward into an opening of the printer top. It is no longer in sight of the user. At this point it is collected and sealed into a clear plastic ball and moved to enter the next section.</p>
--	---

The user printer process attempts to humanize an otherwise industrial and mechanical process. Although the machine is using robotics, it is timed in a fashion to be visually appealing to the user and to represent a graceful dance.

Gathering

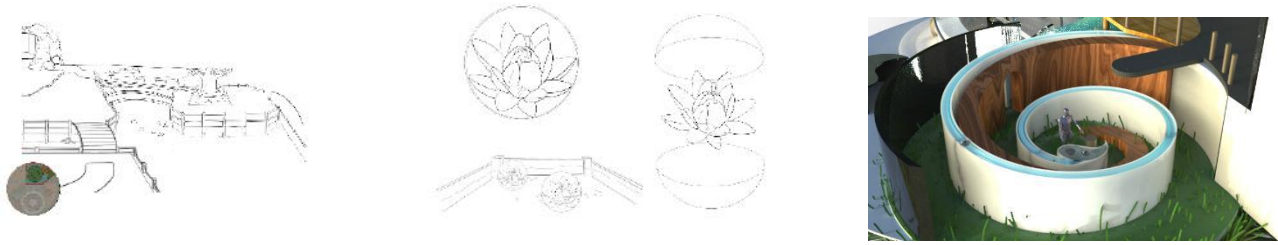


Figure 93

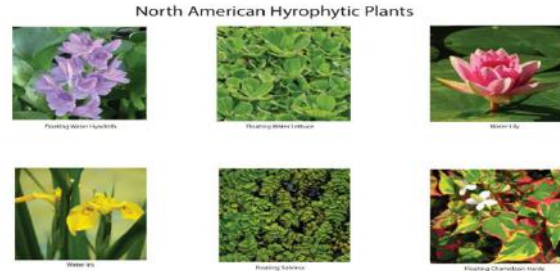
The Creation Process deposits the memorial flower into a gentle stream. The user is able to walk next to the flower as it drifts down to the gathering point. This process allows the user to be re-united with the new ashes in a quiet and relaxing environment. All natural elements are present to the users senses; water can be heard and felt, warm wood, and smooth stone surround the user as they create both walkways and walls. The user gathers the memorial flowers in a small body of water, intentionally mirroring the water present in the rocker, however the base is now shaped as one half of the Yin and Yang.

Memorial flower



Memorial flower with center mechanism	Memorial flower	Memorial flower in ball
---------------------------------------	-----------------	-------------------------

Figure 94



The user is able to take the memorial flower and do with it what they please; the piece is intentionally created to adapt to the users wishes. They are able to keep the memorial flower in the ball, possibly leaving it in their garden, or in their home. They are also able to spread the ashes in either water or on land, by pumping the

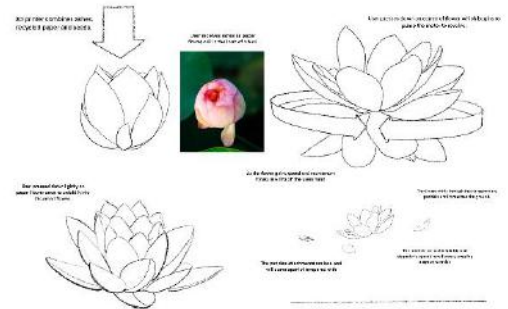


Figure 95

center of the flower up and down, the pedals begin to spin and build momentum, as momentum builds the flower is able fly and coast between 12-15ft. In the Creation Process the user is able to select which seeds they wish to grow in the place of their loved one, all of which are non-invasive species and include both Wildflower, and Hydrophytic plants, this allows the user to return to visit their loved one no matter what environment they choose to spread the ashes.

Logo, Name, Branding



Figure 96

Kensho [Ken-sho] – Japanese

(n.) The zen experience or enlightenment, when one's own nature is seen for what it truly is.

The logo combines several symbols; the large green circle comes from the Japanese philosophy of Enso. This symbolizes absolute enlightenment, strength, elegance, the universe, and the void. The circle may be open or closed. In the former case and as chosen, the circle is incomplete, allowing for movement and development as

well as the perfection of all things. Zen practitioners relate the idea to wabi-sabi; the beauty of imperfection. This is chosen to be in direct alignment of the yin and yang symbolisms mentioned earlier. This in contrast to the circle being closed which represents perfection. In the centre there is two connecting spirals; Fibonacci's Sequence, which is an equation connected with the Flower of Life (referencing the memorial flower). A sacred geometry shape that is found all throughout nature, this symbolizes creation and reminds us that everything is connected. As a whole the logo is meant to reflect that although our loved ones may have passed, we still remain connected with them.

4.7 CAD DEVELOPMENT

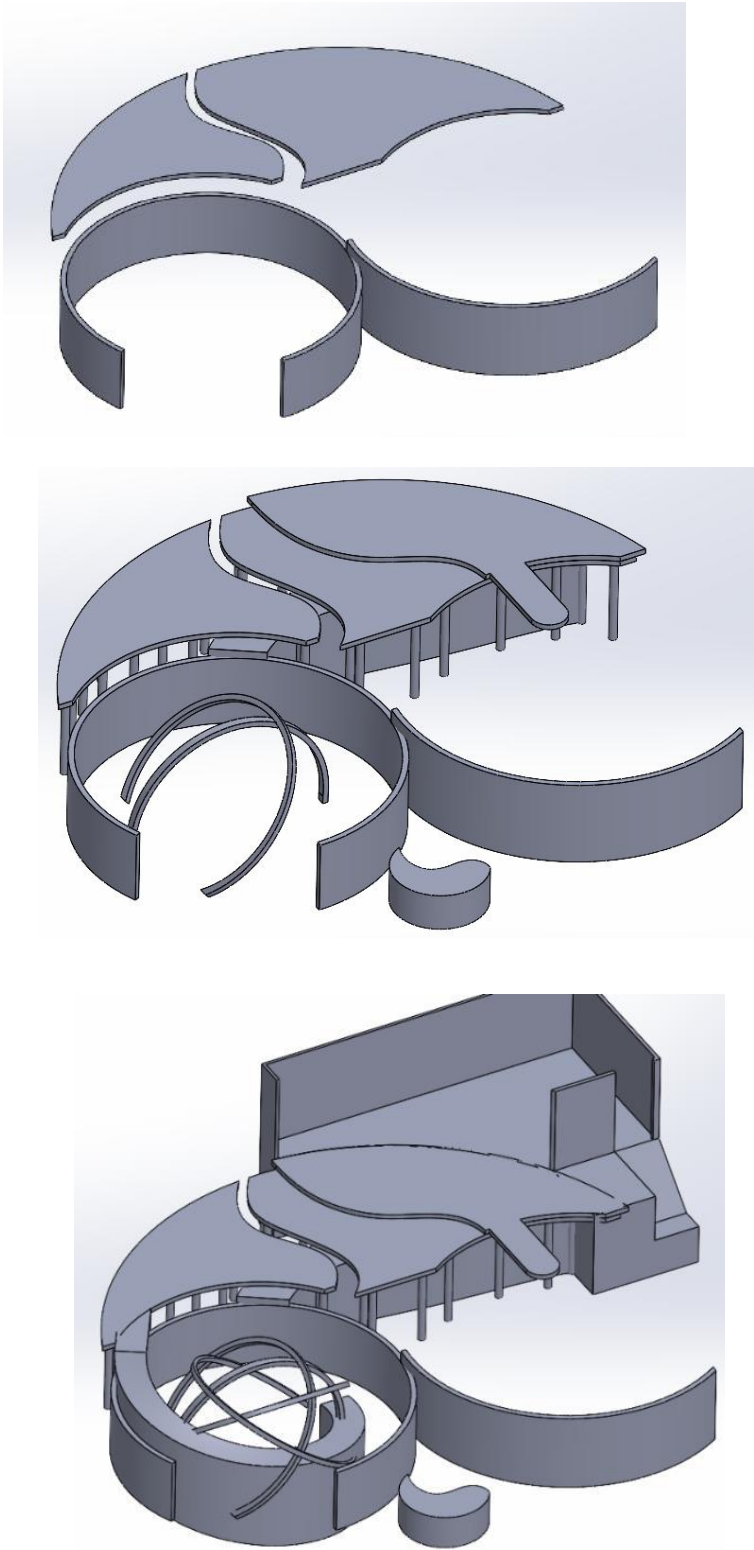


Figure 97

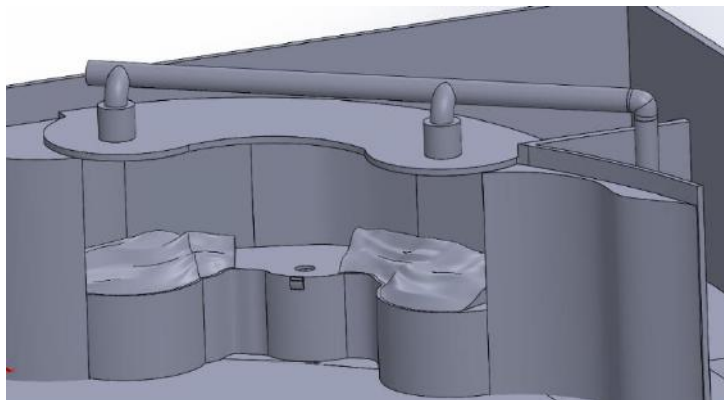
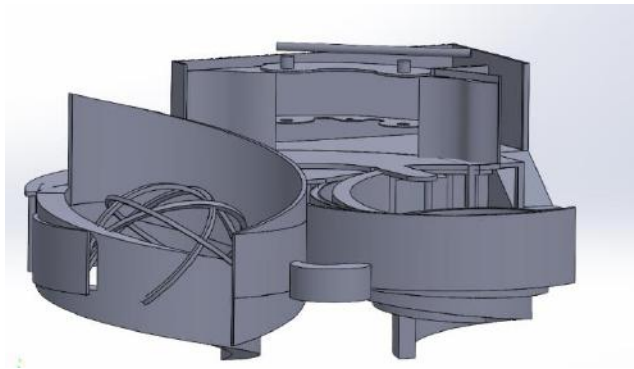
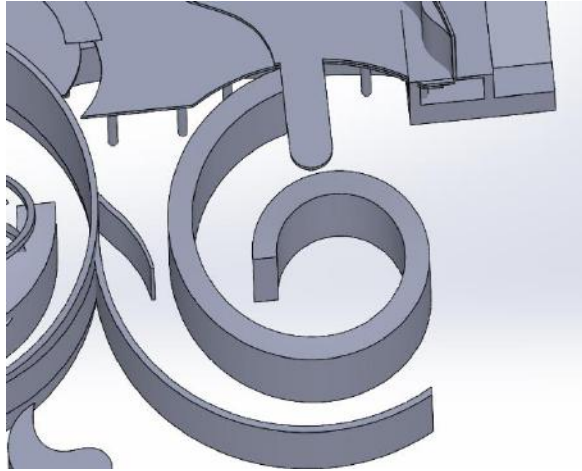


Figure 98

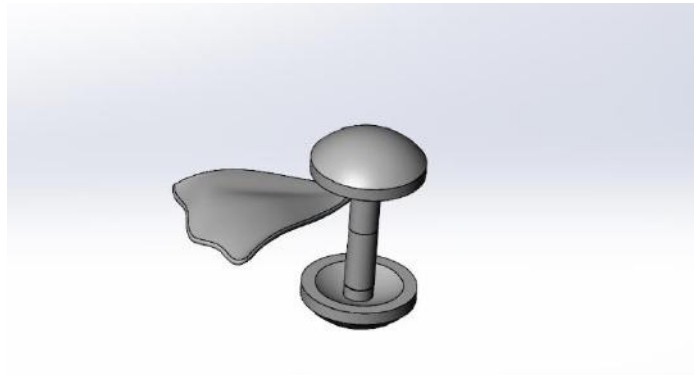
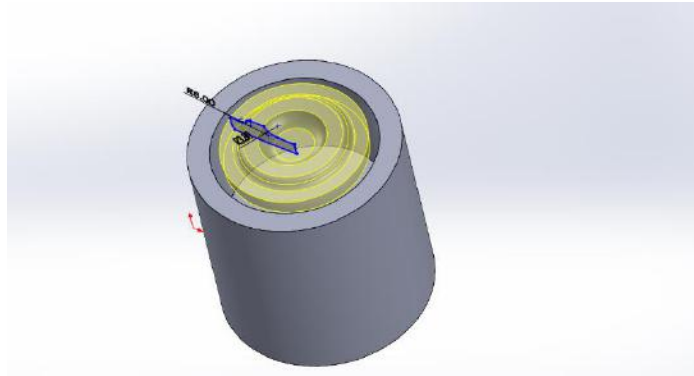
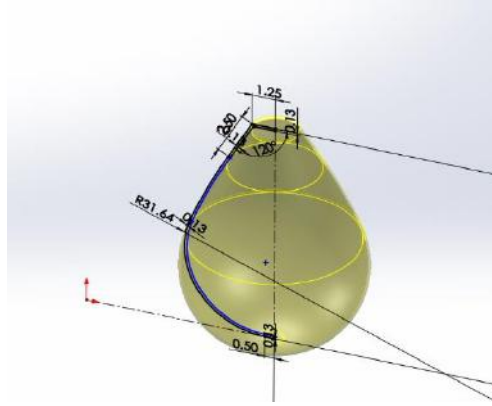


Figure 99

4.8 PHYSICAL MODEL FABRICATION





Figure 100



Figure 101



Figure 102

Chapter 5

FINAL DESIGN

5.1 SUMMARY

Description

Kensho is a process in which a person creates a memorial flower from the deposited ashes (human remains) of their loved one, creating an eco-friendly and emotionally gratifying alternative life departure.

Explanation

Creating a safe, clean, and welcoming environment Kensho is able to aid in the memorial process by guiding a person to an emotionally accepting place. The process of creation is angled towards everyone, and is emotionally gratifying for those experiencing the loss. The Memorial Flower is a final product that the primary user is able to take home and keep or spread as they please.

Benefit Statement

The Memorial Flower is small, and light weight, thus easy for someone to carry to anywhere in the world and set free. The flower is water biodegradable and deposits seeds when combined with the earth; creating a place in which the primary user can return and visit their loved one. This creates a newly imagined grave yard, instead of dark stone tombstones stacked as aisleway dependent on the extraction of raw material, in it's place is a welcoming field of flowers. An eco-friendly, alternative that also allows the primary and secondary user to become re-connected within the creation process.

5.2 DESIGN CRITERIA MET

5.2.1 FULL BODIED INTERACTION DESIGN

Kensho is an alternative life departure that aids both the primary and secondary user. The human-centered design approach is ergonomic and empathetic to those in the process of developing their memorial flower. Special attention is made to utilize material, and form that allows for a wheelchair accessible approach, meaning all bodies are able to experience this process.

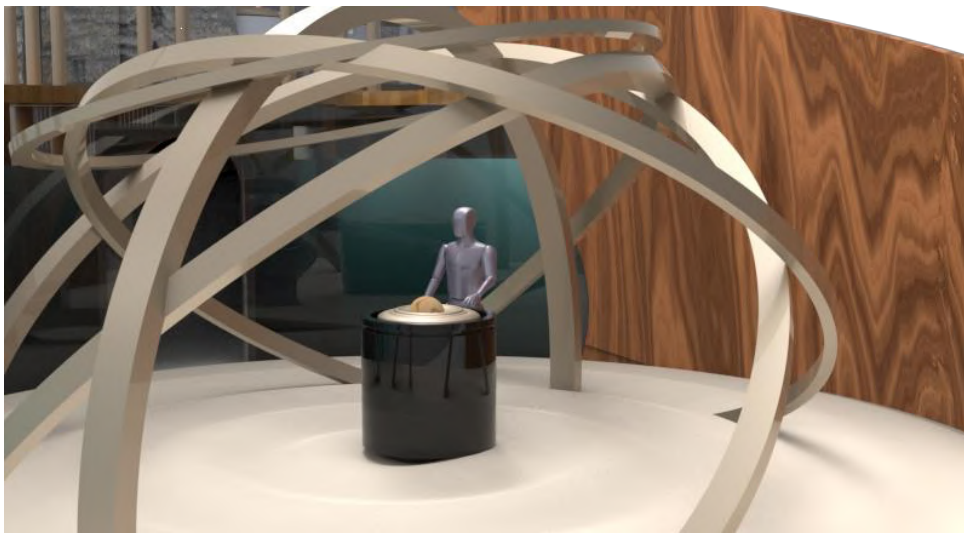


Figure 103

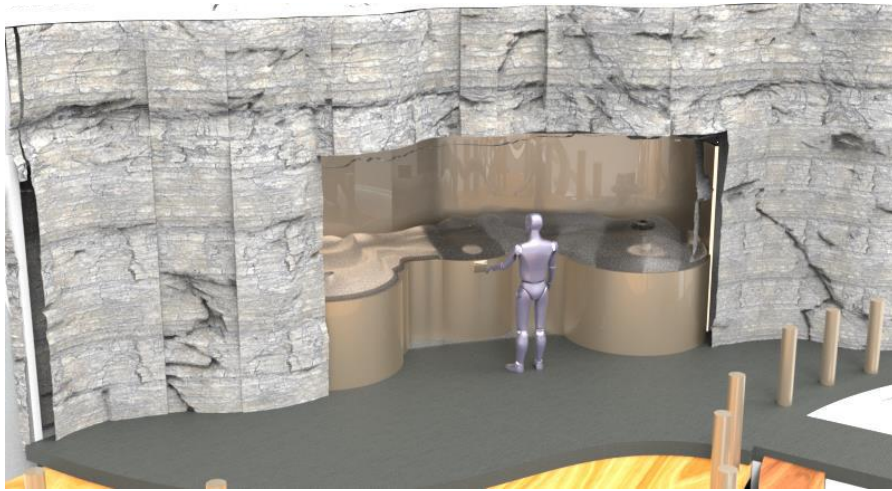
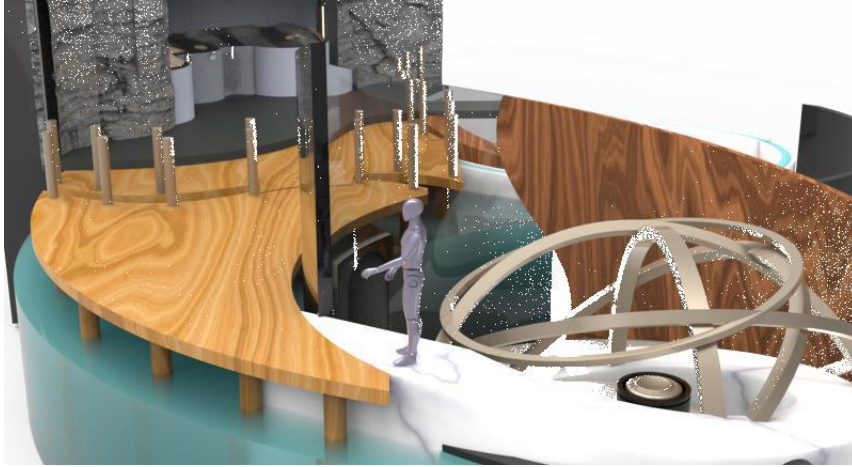


Figure 104

5.2.2 MATERIALS, PROCESSES AND TECHNOLOGY

The materials, process and technology used to create Kensho are thoroughly researched and chosen specifically to aid in the overall sustainability of the design. Allowing the system to primarily rely on a self cycling system, and utilizing local arborists and growth allows the layout to be more sustainable than buildings and environments that are comparable in size. A more in depth examination of the materials, process, and technology can be found in Section 3.6 Feasibility, and Viability. Utilizing natural elements such as stone, bamboo, locally sourced paper pulp, and wood are present within every aspect of the design concept. These materials and parts can be sourced from third-party suppliers which currently support Canadian research initiatives and produce equipment used by Canadian research agencies. Likewise, functional systems such as plumbing, air filtration and lighting will also be outsourced to third party companies with efficiency and sustainability at the forefront of production.

5.2.3 IMPLEMENTATION- FEASIBILITY, AND VIABILITY

HIGH COST ITEMS					
<i>Concept Items</i>	<i>Description</i>	<i>Estimated Cost/ each</i>	<i>Similarly Produced Item</i>	<i>QTY</i>	<i>Material</i>
Land Use	Architecture Component	\$1.2 Million	-	-	-
Bio-cementation	Architectural Component	\$350/ft2 =1.05 Million	Cement	3000ft2	Bio-cement

Bamboo	Architectural Component	\$300	Bamboo hedge	-	Bamboo
Glass	Architectural Component	\$200,000	Double Pane window	-	Double Pane Glass Window
Stainless steel	Architectural Component	\$500,000	Commercial Building material	-	Stainless steel
Drywall	Architectural Component	\$1000	Commercial building Material	-	Drywall
Brick	Architectural Component	\$40/ ft2 =\$90,000	Commercial Building Material	-	Brick
Insulation	Architectural Component	\$18,500	Commercial Building Material	-	Insulation
Flooring	Architectural Component	\$40/ft2 =\$60,000	Commercial Building Material	-	Stone: granite

Wood	Architectural Component	\$30,000	Commercial Building Material	-	Hard and softwood
Stone	Architectural Component	\$120,000	Commercial Building Material	-	Stone: Marble
Lighting	Architectural Component	\$200,000	Commercial Building Material	50	LED lighting Panel
Glass Paneling	Architectural Component Fish tank	\$500,000	Commercial Building Material	-	Reinforced Glass Fish tank paneling
Stainless steel sheets	Printer	\$400	-	30	Stainless steel
Stainless steel piping	Printer	\$350	-	8	Stainless steel
Hydraulic arms	Printer	\$14,000	-	3	Various
Custom window	Printer viewing	\$60,000	-	3	Glass

Computer	Printer	\$15,000	-	1	Various
Stone	Rocker Well	\$6,000	Campania International Concrete Longvue	1	Mineral: Granite
Lighting	Printer	\$320	Soft light	5	LED Light Panel
MEDIUM COST ITEMS					
<i>Concept Item</i>	<i>Description</i>	<i>Estimated Cost</i>	<i>Similarly Produced Item</i>	<i>QTY</i>	
Self-cleaning/ filtering closed loop water system	Indoor water feature component	\$5,585.00	Kangen Leveluk SD501	1	Various
Hollow Aluminum	Rocker cradle	\$700.00	3003 Aluminum Hollow Sphere	1	Aluminum
Plant life	Interior feature	\$5,800	Tropical plants, Assorted	-	Various

Hydrophytic life	Interior feature	\$3,600.00	In-vitro Live Aquarium Plants	-	Various
Aquatic life	Interior water feature	\$3,000	-	-	Various; Koi, turtles, snails.
Water heating	Interior water feature	\$4,315.00	Solar Water heat Kit, Closed Loop	1	Various
Indoor Heating system	Architecture Component	\$3,950.00	Furnace Lennox ML296UHO7OXV36 B	1	Various
Indoor Cooling system	Architecture Component	\$3,050	Air Condenser Lennox 13ACXNO24-230	1	Various
Doors	Architecture Component	\$2,220	Armor Door Commercial Security Exterior Collection	4	Fire door

Titanium Table	Interior table	\$3,244.00	Industrial, European, 21 st Century	1	Titanium
Chairs	Staff section	\$2,000	-	6	Variety
Tables	Staff section	\$1,500		3	Wood
Kitchen microwave	Staff section	\$318.00	Panasonic NNST663SC	1	Various
Kitchen sink	Staff section	\$499.00	Kraus Loften All-in-one dual mount stainless steel	1	Stainless Steel
Kitchen fridge	Staff section	\$999.00	IKEA-FRYSBAR	1	Stainless steel
Toilet	Staff section	\$218	American Standard Cadet 3	1	Porcelain
Bathroom sink	Staff section	\$498.00	Glacier Bay Ashland	1	Porcelain
Hand drier	Staff section	\$1,599.00	Dyson Airblade AB02	1	Stainless Steel

Pulp : Pine tree	Memorial Flower	\$600		1	Pine
LOW COST ITEMS					
<i>Concept Item</i>	<i>Description</i>	<i>Estimated Cost</i>	<i>Similarly Produced Item</i>	<i>QTY</i>	
Hydrophytes seeds	Memorial Flower	\$400	-	-	Various
Wildflower seeds	Memorial flower	\$400	-	-	Various
Dried petals	Memorial flower	\$100	Eco-friendly Biodegradable Dried Petals	-	Various
Nuts	Architectural Component/ Printer	\$1,500	Commercial Building Material	-	Various
Bolts	Architectural Component/ Printer	\$1,500	Commercial Building Material	-	Various
Door Handles	Architectural components	\$200	Commercial Building Material	4	Various

Carpenter Material	Architectural components	\$2,000	Commercial Building Material	-	Various
Miscellaneous	Miscellaneous	Miscellaneous	Miscellaneous	Miscellaneous	Miscellaneous
Total Cost		4,112,422			

Table 19

5.3 FINAL CAD RENDERING

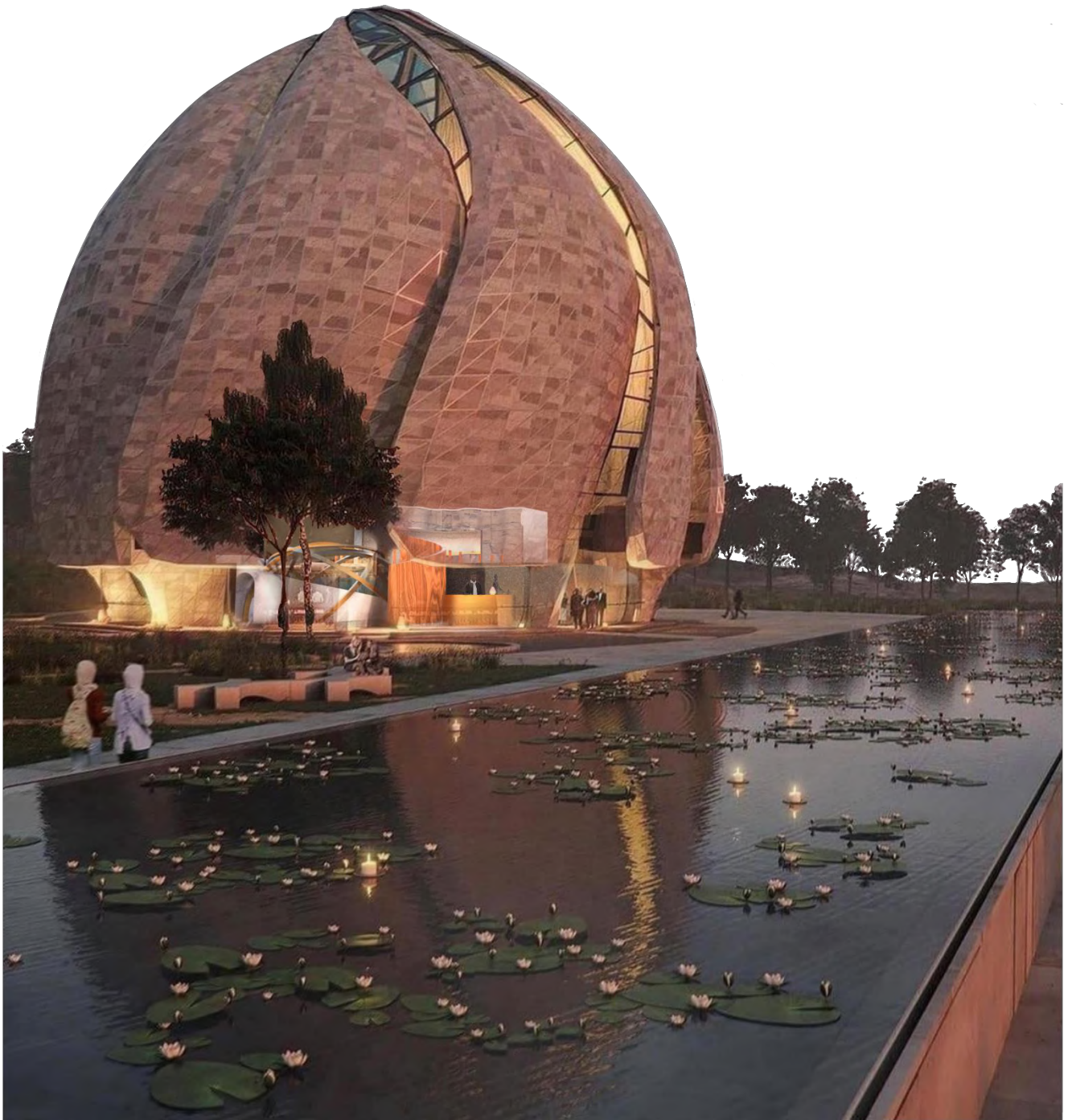
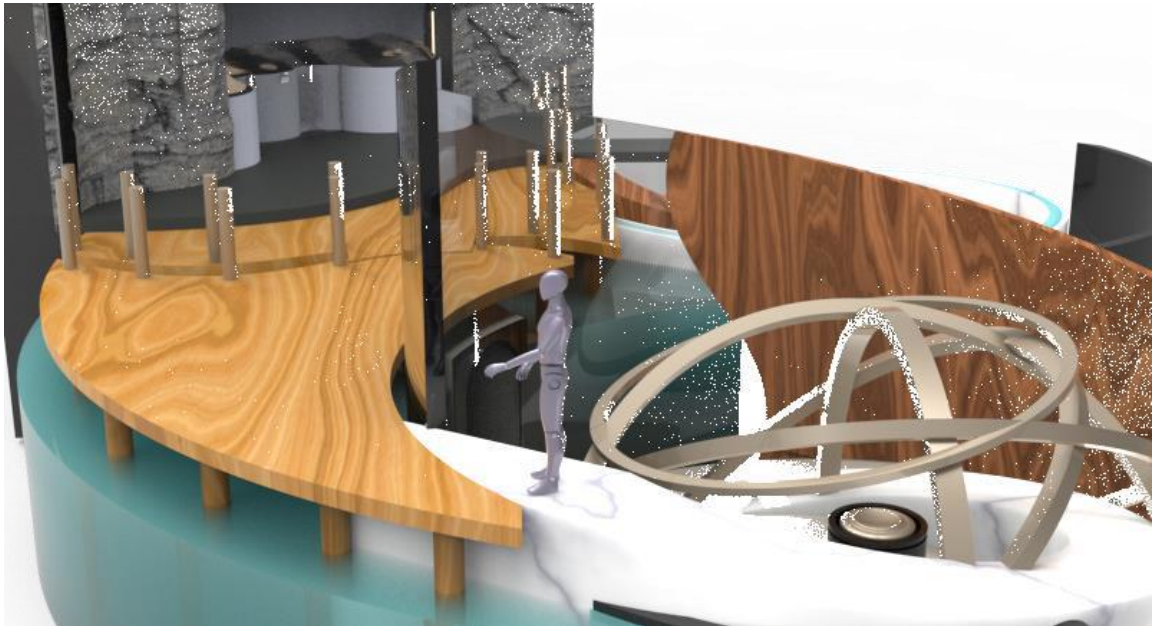
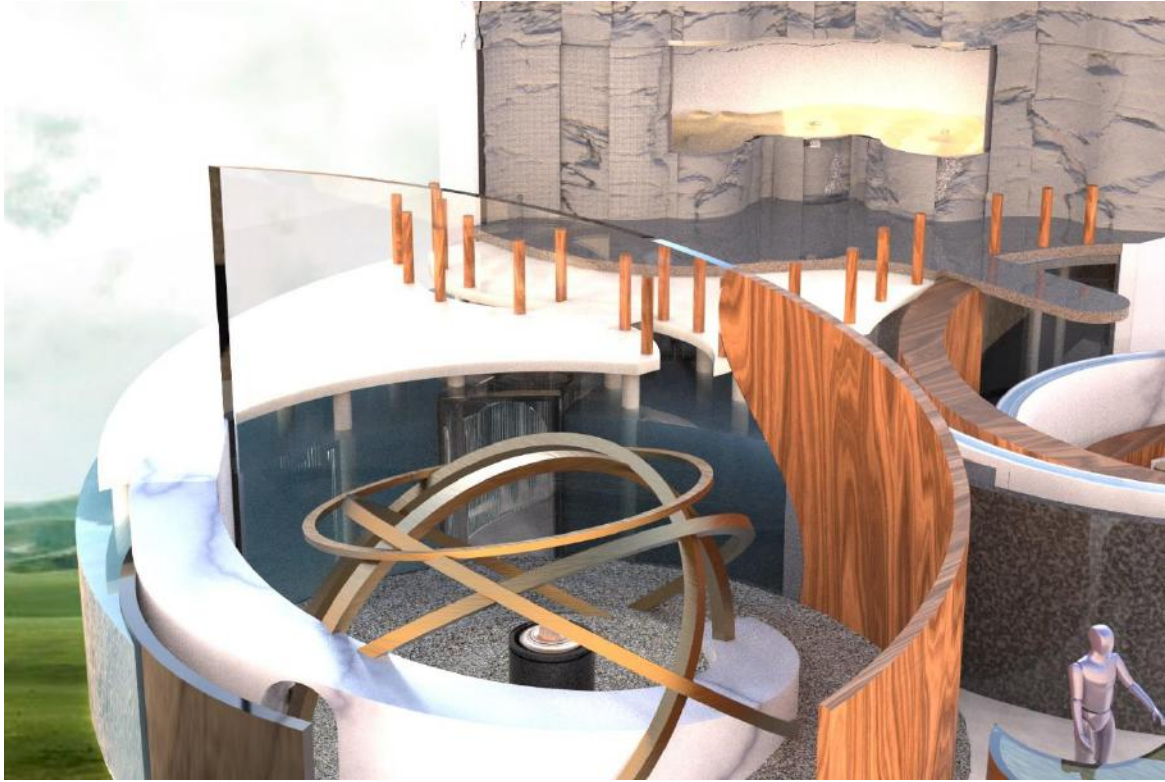


Figure 105



5.4

Figure 107

5.4 PHYSICAL MODEL



Figure 108





Figure 109

5.5 TECHNICAL DRAWINGS

All technical drawings representative of 1:30 scale

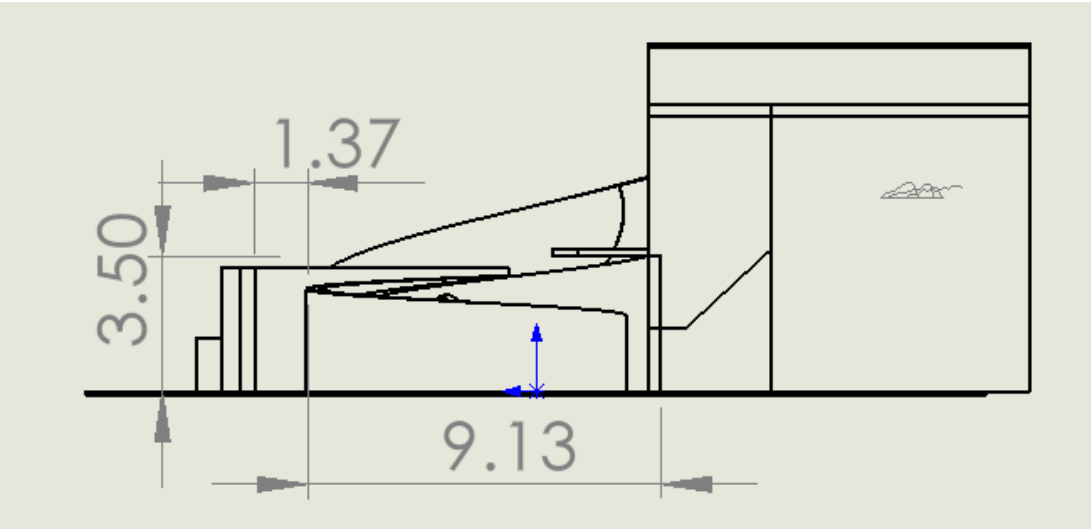
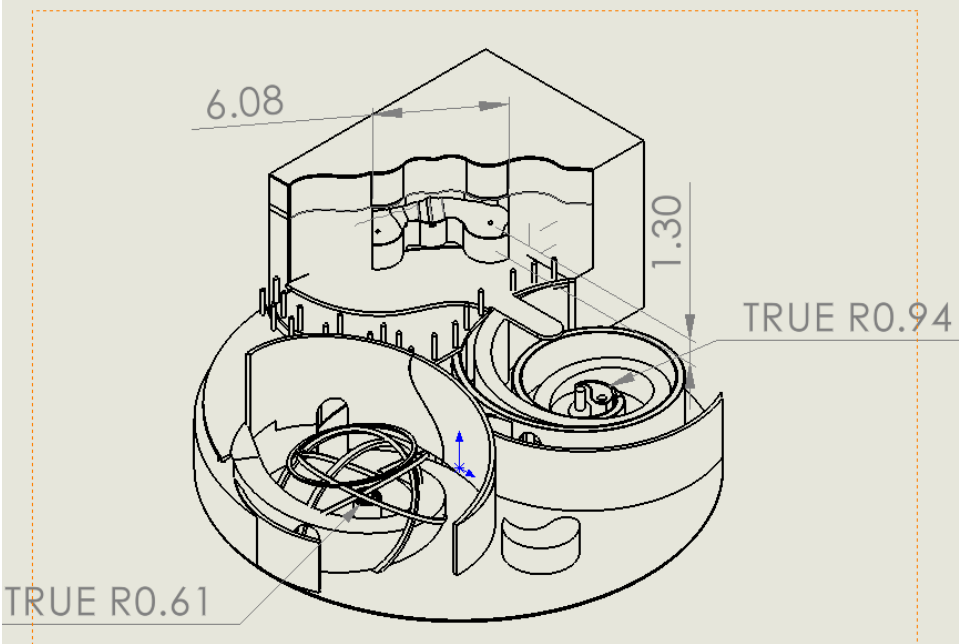


Figure 110

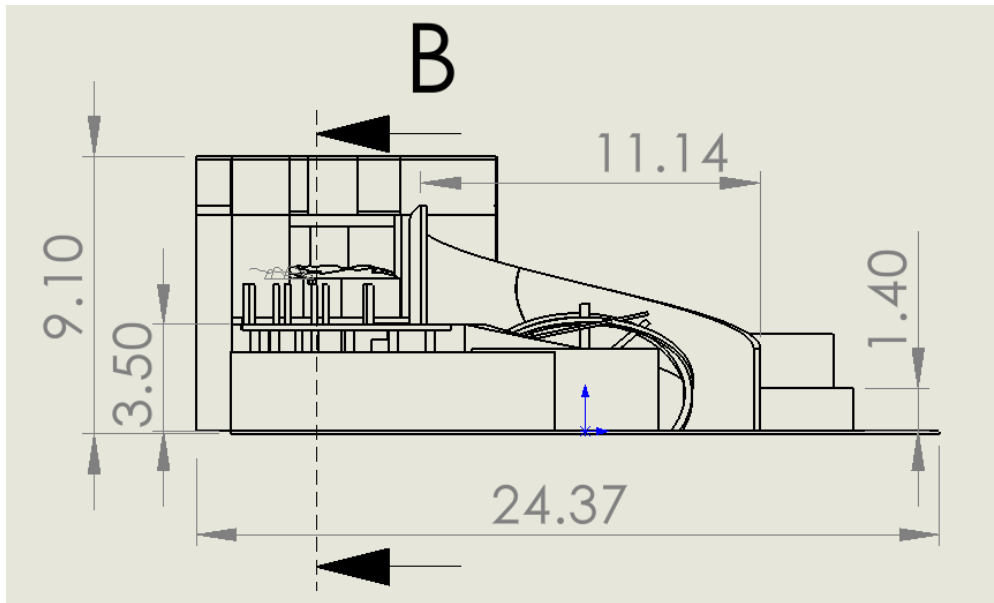
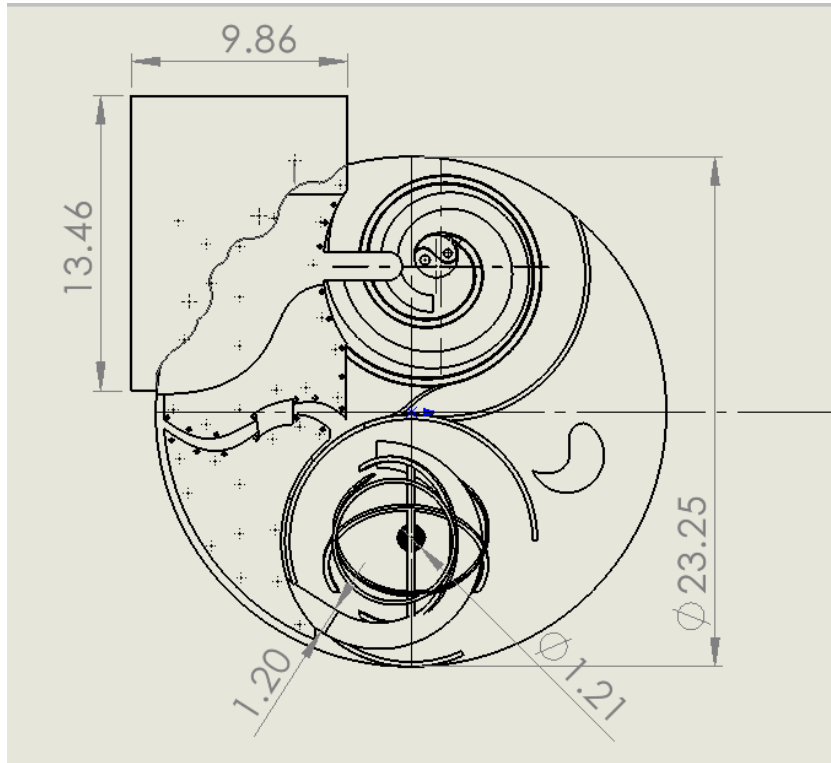


Figure 111

5.6 SUSTAINABILITY

The sustainability of the complete thesis system solution, each individual component extending from raw material, to final production has been considered. The primary focus of this topic is to ultimately reduce the environmental impact of end of life, thus the sustainability of each component weighs heavily in the ability to achieve said outcome.

Through extensive research it is clear the system in place can be successful a successful one. A large amount of the negative environmental impact takes place in the extraction of raw material, and manufacturing stage, however the life cycle length of these components are long, are typically able to be recycled, or broken down. There is a large focus on maintaining a natural environment, closed loop cycle wherever possible, and creating an indoor environment that is self sustaining. Beyond that, the indoor environment can also be utilized as a local and sustainable material source when needed. Components being released into the environment focus on having a low manufacturing impact, breaking down in water within an allotted time, and providing a positive outcome to the environment in the form of non-invasive plant life.

Chapter 6

CONCLUSION



Figure 112

Kensho provides the user with an end of life alternative, one that alleviates the strain of environmental impact, aids in the emotional journey of those mourning the loss, and provides a place in which they are able to return. The memorial flowers light weight and compact form allows the user to transport the ashes with ease, encouraging a more comfortable handling and releasing process. Distributing the ashes in a manner that is gentle, respectful, bringing forward a playful and charming element. The re-imagined memorial site will no longer inhabit rows of stone scripted with names, it will instead wildly grow, intertwine, and live.

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Appendix

A- DISCOVERY

Thesis Opportunity Revision

A) Concept 1 = 89pts

B) How might we deliver immediate aid to front line soldiers and officers?

Product Category: Professional Equipment

Working Title: Line of fire, life saving system The primary source of information is first hand (my brother); a Sergeant in the Canadian Army, experienced front line infantry veteran, and a published military historian. With that, the army, and police force (an area many vets move to post war) although large in size, is a tight community thus a range of contacts to continue research. This concept arose with a personal, blatant misunderstanding of the purpose of landmines. Learning that landmines are not meant to kill a person, instead they are intended to cause severe injury. A common war tactic, to create distraction during a firefight and overall weakens the line of defence, as 2-3 soldiers ceasefire in order to aid their injured, thus allowing the enemy to gain ground. This topic was chosen due to its uniqueness (compared to limited other thesis personally viewed in the past three years). The solution is difficult and can come in the form of either a product or a vehicle, all of which encompass full-bodied ergonomics. Lastly, creating something that not only helps someone in a time of crisis, but also reduces the overall effectiveness of landmines and thus possibly deterring the need for them in future has lasting effects.

WHAT| Reducing the number of lives lost in a war zone, or shooting.

WHY| Creating a solution that may save lives and reduce the overall risk of landmines. Reducing this risk will intern decrease or begin to invalidate the need for landmines - a war tool that both litters land, rendering it useless, and exposes further and continued risk to civilians.

HOW| This problem has the potential to encompass FBHID, by utilizing the structure of the already existing uniform of both a military soldier, and police officer. Creating a sustainable solution is necessary for the success of the project, as it's required to survive in a warzone, along with the social responsibility of reducing lives lost.

A) Concept 2 = 82pts

B) How might we educate and motivate those struggling with obesity?

Product Category: Recreation and Sports Equipment Working

Title: Self- Guided Solution Towards Overall Health With the guidance of a combination of personal trainers, and dieticians, the complexity of nutrition, and exercise became very clear. Body fat percentage, insulin levels, and muscle mass play a major role in a person's overall health and well being. It's noted that typically, a person is able to get themselves out of an anxious or depressed state after regular exercise in an average of 6 months. Further research in current marketing campaigns paints an overwhelming, and saturated market, full of scams, and tones of an elite upper class privileged to custom personal training. Guidance for proper health, exercise and well being, should be attainable for everyone and 1 T Thesis Opportunity Revision Summerfield cremation tree is an example of this.

WHAT| The focus of the problem lies in the negative environmental impact of the disposal of human (and other body; animal) remains.

WHY| The increased overwhelming number of deceased is difficult for countries to keep up with, forcing them to resort to mass graves. This solution presents a temporary fix, as the bodies are disposed of respectfully, create an added concern of the eventual impact to groundwater.

HOW| This problem meets the thesis criteria in that it encompasses human body interaction, needing the full understanding of the size, and decomposition of a human body. An ergonomic factor can be created for both the body, and the person operating

the burial/ decomposition process. This problem is in need of a sustainable solution, that is our social responsibility.

Typically, an average of 55 million people die annually, presently, this number is substantially increasing due to COVID-19. End of life is often dealt with in one of two ways in Western Society: burial or cremation; both of which retain severe environmental implications. Burial and cremation methods have been traced back to 1400BC and AD 200, as technology advances, and the population exponentially increases these methods become glaringly archaic. The implications of burial include: habitable land lost to cemeteries, excess of raw materials used for caskets, and toxic fluids (such as formaldehyde) leak from the human remains to find underground waterways. This presents an increased danger of ingestion to communities and wildlife located within a close proximity to cemeteries. Keeping in mind cemeteries, are currently growing in size encompassing a larger land mass than ever before, as the need for grave plots grow. Cremation: although the more environmentally efficient option out of the two, is still not without it's flaws. This process contributes a large amount to annual Co2 emissions, directly effecting the local air quality. Beyond the urgent environmental, and social responsibility that's in need of being confronted, there is a secondary challenge of creating a place of remembrance and mourning for those left to grieve the loss. Is it possible to create an end of life experience that is both environmentally sustainable, and emotionally gratifying?

Remaining unbiased and analyzing both the environmental, and emotional standing of such a sensitive topic is of utmost importance; interviewing a variety of groups ranging in age, gender, religious beliefs, and location can aid in the complete understanding of this challenge. With referencing existing practices, and seeking advice from Advisors, a one-to-one model will be developed in order to evaluate the functional ergonomics, establishing proper human factors, along with the analysis of full-bodied

human interaction. Reviewing results from interviews and exploring human factors will guide this thesis to a design solution that encompasses an environmentally sustainable alternative for end of life. This solution will be respectful to both the deceased and grieving family, with a focus on creating a socially empathetic solution for those mourning.

A- How may we create a safe and respectful alternative for end of life?

B- On average, over 55 million people die per year. There are currently two popularized options that are available for expected end of life; burial and cremation. Both options negatively affect the environment, in several aspects, ranging from raw materials used to build coffins, habitable land use for cemeteries, embalming toxins reaching waterways, and CO₂ emissions produced in cremation are some environmental impacts. Eco-friendly alternative options are becoming more readily available, and gaining movement in popularity.

C- This topic was originally chosen due to the mass graves being created for victims of COVID-19. From there, after experiencing a close personal loss, it quickly became abundantly clear that other options (beyond burial and cremation) are necessary. These options could not only have a more positive lifecycle, but also have the ability to provide hope for grieving families. Secondly, this thesis topic stood out amongst the rest, due to its uniqueness, this topic allows for new boundaries to be pushed. Although death affects everyone, it is also something that is taboo in western culture, it's often cast away and never spoken about. However, many cultures (for example: stoic philosophy) encourage one to speak about death in order to come to terms with their own fate, and through that live a more fulfilled life. In short, it would be interesting to explore in depth, perhaps find hope in a subject that is slightly dark and morbid, and change the stigma, and dialog attached to death.

D- Grieving the loss of a loved one is one of the most difficult life events a person may go through, although it is likely something each of us will face at some point in our lives. Examining stoicism it became abundantly clear that Western society often gravitates away from discussing loss, excusing oneself with the inability to articulate complex emotion. The subject of death, or dying soon becomes taboo and out of the norm, thus, in a sense, further isolating those who are grieving. This taboo has created an environment that allow traditional end of life services to remain relatively the same since as early as 12 th century BCE. These services thrive in tradition, however, in more recent years have been discovered to have a devastating environmental impact. These impacts range in severity; from use of habitable land, mishandling of raw materials, embalming fluids seeping into underground water ways, and further Co2 emissions are all immediately impacting on the environment both locally, and globally. With COVID-19 infection rates continuing to climb, now is the time to challenge the taboo subject of death, and create a sustainable solution for end of life. How may we create a safe and respectful alternative for end of life?

E- User Primary, Secondary, Tertiary Product Benchmark Products Environment of Use Various environments of usage

- 1 Primary: Family of deceased
Grieving family, possibly dealing with sudden death, high funeral cost. Traditional burial
Challenge: Consuming habitable land with cemeteries. Land stability Challenge: Sky burial used in areas with poor land stability.
- 2 Secondary: Mortician Career, person preparing deceased body for burial or cremation, often comforting grieving loved ones. Traditional cremation Challenge: Producing Co2, and mercury (highly toxic in small doses) Temperature, and Humidity Challenge: Changes the rate of decomposition
- 3 Tertiary: Deceased Possibly having already made decision between burial, or cremation. Environmental impact of disposing body.

Mushroom burial Challenge: Creating custom fit suit for deceased Length of decomposition Challenge: heat, humidity, oxygen level exposure can dictate the length of decomposition.

4 Place of mourning: Primary A place or object is at times proven helpful during grieving period. Aqua-mation Challenge: Keeping the body in high temperature for one week. Nutrient cycle Challenge: Many alternative methods focus on the completion of the nutrient cycle.

5 Cost of funeral: Primary Although, affected by secondary and at times tertiary (prior to death), high cost of casket, urn, funeral, grave plot, etc. Sky burial Challenge: Ritual due to unstable terrain Land location Challenge: Reducing the amount of land needed that is otherwise habitable

6 Length of decomposition: Secondary, Tertiary Green burial Challenge: Time taken to Mourning s Challenge: With the Time spent in cremation process (release of Co₂) Time spent decomposing after burial (contribution to underground water) dig grave, higher risk of tampering. reduction of habitable land use, a place or mourning is (typically) needed.

7 Embalming: Secondary Time spent to embalm, legal practice, chemical exposure Recomposing Challenge: Used on livestock, mental separation/ legal restrictions for human remains. Religion Challenge: Varying religious restrictions prevent further exploration of more eco- friendly alternatives.

8 Funeral: Primary, Secondary Cost of funeral, process of embalming (required after 48 hours), funeral home location. Bio urn Challenge: Producing Co₂ Disease control Challenge: Keeping the public safe from the spread of disease and virus.

9 Cemetery: Primary, Secondary Cost of land plot, location close to

funeral home, stable ground conditions. Body farm Challenge: Unappealing to family of diseased. Inability of tamperinChallenge: Choosing alocation, or creating an environment that will be respected by community.

10 Habitable land: Secondary The use of habitable land for cemeteries is increasingly high, what happens when we run out? Cremation diamond Challenge: Wearable piece being lost or stolen. Raw material usage Challenge: Finding sustainable alternatives for raw materials used.

F- The importance of exploration of safe and respectful alternatives for end of life, is desperately needed, currently trending, and expected to exponentially grow in popularity. With the increasing infection rates of COVID-19, the need for environmentally friendly alternatives has never been so crucial. Creating an environment where a family is able to mourn, a mortician is able to safely prepare the deceased for a end of life solution that will not affect underground waterways, or produce an excess of Co2. These environmental impacts are both local, and global, affecting any community with a cemetery, or crematory. The possibility to create an alternative that can both provide a place of mourning, which can be explored in full body interaction design, and return a deceased back into the nutrient cycle (using full-bodied ergonomics) in a social responsible manner is possible after examining current benchmarks. The topic can be pushed into several directions based on the feedback given in the interview stage, allowing many solutions to be possible.

How may we create a safe and respectful alternative for end of life?

Who are we designing for?

Primary: *Family of deceased*

Grieving family, possibly dealing with sudden death, high funeral cost.

Secondary: *Mortician*

Career, person preparing deceased body for burial or cremation, often comforting

grieving loved ones.

Tertiary: Deceased

Possibly having already made decision between burial, or cremation. Environmental impact of disposing body.

Why is this topic important and relevant?

On average, over 55 million people die per year. There are currently two popularized options that are available for expected end of life; burial and cremation. Both options negatively affect the environment, in several aspects, ranging from raw materials used to build coffins, habitable land use for cemeteries, embalming toxins reaching waterways, and Co2 emissions produced in cremation are some environmental impacts. Eco-friendly alternative options are becoming more readily available, and gaining movement in popularity.

Why was this topic chosen? (unsure which was needed)

This topic was originally chosen due to the mass graves being created for victims of COVID-19. From there, after experiencing a close personal loss, it quickly became abundantly clear that other options (beyond burial and cremation) are necessary. These options could not only have a more positive life cycle, but also have the ability to provide hope for grieving families. Secondly, this thesis topic stood out amongst the rest, due to it's uniqueness, this topic allows for new boundaries to be pushed. Although death affects everyone, it is also something that is taboo in western culture, it's often cast away and never spoken about. However, many cultures (for example: stoic philosophy) encourages one to speak about death in order to come to terms with their own fate, and through that live a more fulfilled life. In short, it would be interesting to explore in depth, perhaps find hope in a subject that is slightly dark and morbid, and change the stigma, and dialog attached to death.

What are current solutions?

Alternative to traditional burial

Mushroom burial- Custom fit suit; consumes cadaver completing the natural cycle.

Bio Urn- Cremation ashes planted, and tree grows in place.

Alternative to cremation

Aqua-mation- Cadaver in high temp water/ acid tank- bones ground and later given to family.

Cremation diamond- Cremation ashes compressed into diamond- given to family.

Expert

Brittany Dasilva – graduated from Humber mortician program

Guelph Funeral home- Have reached out and awaiting response

Survey Questions

When the objective is to narrow down the inquiry from a topic to a specific focus, the survey emphasis is on those tasks or jobs central to the activity, and to determine the main pain points for the user or rate limiting tasks. Below are possible questions for such a survey.

Advisor Questions

1. What is the process of embalming?
2. What is the process of burial?
3. What is the process of cremation?
4. Are these decisions typically pre-made before you meet the family or do you have to educate the family?
5. Are you ever placed in a situation to guide a family into choosing one option over another?
6. What is the more difficult process for you and why?
7. Do you offer alternative methods? If so why or why not?

Survey Questions

8. Have you considered your plans for end of life?
9. Do your plans consist of traditional or alternative options?
10. What influenced your decision to make that choice?
11. Would you consider an alternative choice if it fit your values?
12. For each of those frustrations, what are your work arounds/remedies which you are currently using. *Work arounds can be extra preparation, an aid or tool, someone else who helps, a different arrangement*
13. For each what would be on your 'wish list' to make this activity **easier**, or more efficient.
14. For each what would be on your 'wish list' to make this activity **more enjoyable**.

Refinement Questions

1. Who is the user (what type of user) (*Age, sex, gender, other relevant demographics*)
2. Are they a primary or a secondary 'user' (*e.g. caregivers and service providers are secondary 'users'*)
3. How often do you do this task? How long does it take?

For a more in-depth inquiry, consider doing

- 1) Empathy Map
- 2) User Journey Map

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Alternative to cremation

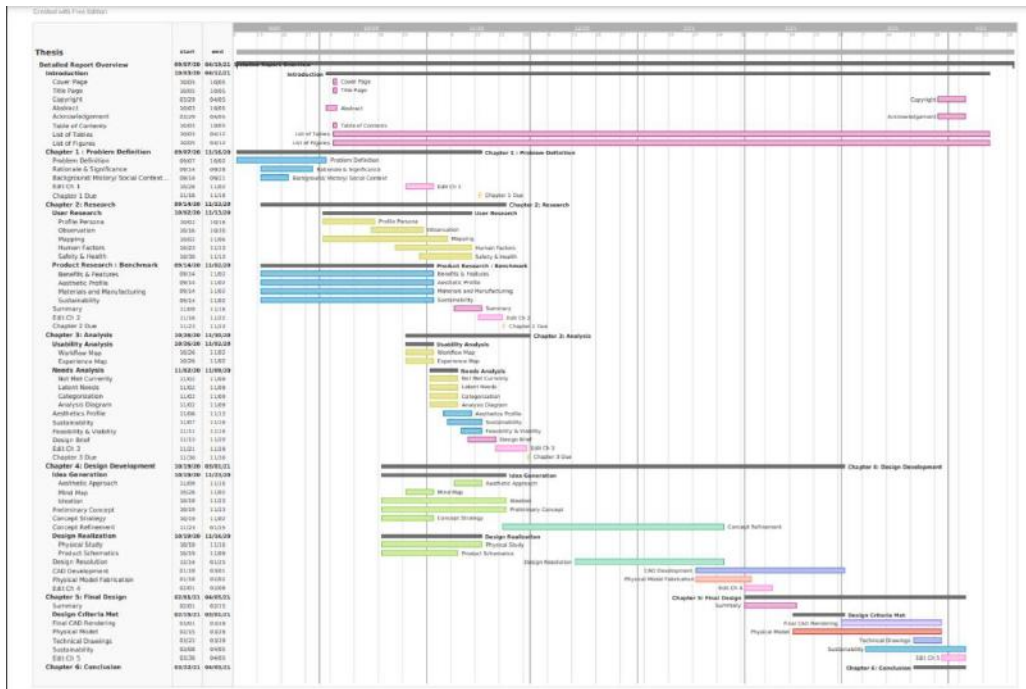
Aqua-mation- Cadaver in high temp water/ acid tank- bones ground and later given to family.

Cremation diamond- Cremation ashes compressed into diamond- given to family.

Expert

Brittany Dasilva – graduated from Humber mortician program

Guelph Funeral home- Have reached out and awaiting response



Certificate of Completion

This document certifies that

Sinead Summerfield

*has completed the Tri-Council Policy Statement:
Ethical Conduct for Research Involving Humans
Course on Research Ethics (TCPS 2: CORE)*

Date of Issue: **5 October, 2020**

B- DISCOVERY

While still exploring this topic, it is important to note that a single 'user' is currently unattainable until an advisor is obtained, and interviews/ surveys have taken place. Thus my current focus and purpose is to build a scope and understanding behind the decision making process of burial vs cremation

User Profile Report

"...in this world nothing can be said to be certain, except death and taxes" (Franklin, B)

Although it is a certainty that everyone of us will eventually parish, a social taboo remains in Western society creating a narrative driven away from creating an open death dialogue. Death

and dying are an uncomfortable subject for most, and typically avoided until establishing a burial or cremation plan later in life. This avoidance can lead to social isolation to those who have experienced a loss, and prevents society from creating innovative alternatives. Burial and cremation are the leading solutions for afterlife care, however come with them an abundant amount of negative environmental impacts; consuming habitable land, poisoning underground waterways, and Co2 emissions are a few of the lasting impacts of these processes. It's time to challenge the uncomfortable and explore alternatives.

User Demographic

Targeted demographic criteria for which general characteristics and information was sought included: age, gender, ethnicity, income/ purchasing power, and education.

1.1. Image search for General Demographic Characteristics

A Google Image Search was performed to understand what a person grieving, and a person considering after life may look like.

The following search terms were used:

- “Grieving”
- “End of life considerations”
- “End of life”
- “Mourning”
- “Mourning loss - Family”

Findings

Findings have been collected, and displayed in a table.

IMAGE	DEMOGRAPHIC INFORMATION
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Figure 1

Retrieved from: <https://www.minnpost.com/second-opinion/2012/12/time-bury-five-stages-grief-myth/>

Age: Middle-aged
Gender: Mixed
Culture: White
Income: Unknown
Educational background:
Unknown
Career/ Volunteer: Unknown



Figure 2

<https://www.verywellhealth.com/how-to-survive-thanksgiving-day-grief-1132581>

Age: Middle-aged
Gender: Mixed
Culture: African American
Income: Unknown
Educational background:
Unknown
Career/ Volunteer: Unknown



Figure 3

Retrieved from: <https://www.helpguide.org/articles/end-of-life/late-stage-and-end-of-life-care.htm>

Age: Geriatric
Gender: Mixed
Culture: White
Income: Unknown
Educational background:
Unknown
Career/ Volunteer: Unknown



Figure 4

Retrieved from: <https://www.nia.nih.gov/health/providing-comfort-end-life>

Age: Geriatric
Gender: Assumably female
(indicated by jewelry, size/ shape
of hand)
Culture: White
Income: Unknown
Educational background:
Unknown
Career/ Volunteer: Unknown



Figure 5

Retrieved

from: <https://www.nbcnews.com/think/opinion/coronavirus-shows-us-why-time-decide-end-life-care-when-ncna1178496>

Age: Assumably younger
(indicated by less wrinkles on hand)

Gender: Unknown

Culture: Unknown

Income: Unknown

Educational background:

Unknown

Career/ Volunteer: Unknown

Literature Search for Demographic Data

A literature search was performed on the Humber Library website, and Google Scholar to find statistical data relevant to those dealing with end of life.

The following search terms were used:

- “End of life”
- “Palliative and end of life care”
- “End of life statistics Canada”
- “End of life profile”
- “Burial and cremation trends”
- “Burial and cremation gender influence”

Findings

Findings have been summarized below according to the relevant categories: Gender, Age, Race and Ethnicity, Income and Education.

“DEATH IS A SORT OF ALCHEMY. It changes us in an instant into something completely new. Spirit, soul, and mind flash away, and what was once a living body becomes a new creation.

This new thing, the corpse, is most evidently flesh and bones: pound after pound of inert ligaments, veins, arteries, organs, nails, skin, and hair. But it is also a powerful symbol, charged with meanings as many and varied as human cultures and individual personalities. The corpse represents, among other things, a threat to social order, an economic burden to the family, a reminder of our mortality, an offense to sight and smell, an affront to hopes of eternal life, and a reason to believe in the bodily resurrection.”

(Stephen Prothero. (2001). *Purified by Fire : A History of Cremation in America*. University of California Press.)

Gender

A gender-based analysis of burials from the coast of British Columbia shows that there are no significant differences in the frequency of burial, or grave goods between male and female burials.

Age

Based on analysis of the key external influences on the funeral service industry, business conditions are projected to slightly improve for the industry over the five-year period from 2015 to 2020, with revenue anticipated to expand at an average annual rate of 1% for funeral homes, crematories and cemeteries. In 2015, direct cremation services are estimated to make up approximately 6% of total industry revenue (IBISWorld Inc., 81221 and 81222,

April 2015). Key external drivers that influence funeral service are the number of deaths, number of adults 65 and older, number of cremations and U.S. per capita disposable income – all of which are projected to increase from 2015 to 2020 and in subsequent years (IBISWorld Inc., 81221, April 2015; U.S. Bureau of Labor Statistics). The number of adults 65 and older increased from 13% of the U.S. population at the time of the 2010 census to 14.1% in 2013 (U.S. Census Bureau). By 2030, when all baby boomers (born 1946-64) have joined the ranks of the older population, it is projected that 20.3% of the U.S. population will be 65 and older (U.S. Census Bureau, P25-1140, May 2014). Per capita disposable income in the United States is predicted to increase at an average annual rate of 2.4% over the next five years as economic conditions continue to improve. This means that consumer price concerns may somewhat diminish (IBISWorld Inc., 81222, April 2015).

Year	Annual Deaths per 1,000 Population	
1995	8.8	<i>Final Data</i>
2000	8.7	
2005	8.3	
2007	8.0	
2008	8.1	
2009	7.9	
2010	8.0	
2011-2012	8.1	
2013	8.2	
2014	8.1	
2015	8.2	
2016-2020	8.2	
2025	8.6	
2030	9.0	
2035	9.3	
2040	10.0	
2045-2050	10.3	

Figure – Retrieved from <http://mediad.publicbroadcasting.net/p/healthnew>
 ...9451.../201507/03

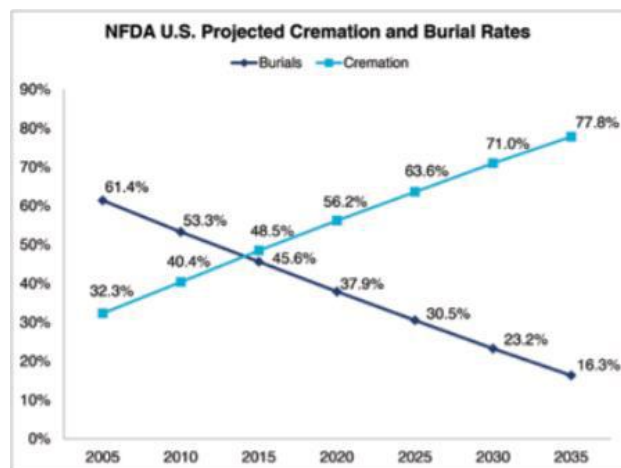


Figure 7- Retrieved from <http://mediad.publicbroadcasting.net/p/healthnew>
 wsfl/files/201507/03-

Race and Ethnicity

Examining articles surrounding the impact of a child's death in newly immigrated families and those with language barriers, it's clear that making arrangements is especially hard and often isolating. In these instances community religious leaders offering lower cost burials and cremations are helpful. In many cultures it is customary to stay with the family until after the burial. During burial flowers are thrown on the coffin with kisses in some cultures while in others handfuls of dirt are thrown on the coffin by each family member and friend.

Education

The steadily rising popularity of cremation is attributed to a number of factors, including consumer cost considerations, environmental concerns, fewer religious prohibitions on the practice and changing consumer preferences, such as the desire for simpler, less ritualized funeral practices. Cremation has become socially acceptable as more Americans are thinking and talking about death in new ways, and its popularity is expected to intensify. A surge in the number of Americans that no longer identify with any religion has contributed to the decline of the historically traditional funeral in America – and the rise in cremation as the disposition of choice. In just seven years – from 2007-14 – the percentage of unaffiliated adults increased from 16% to almost 23% of the U.S. public (Pew, 2015). Since 2012, the percent of U.S. consumers (40 and older) who feel it is very important to have religion as part of a funeral has decreased by more than 7% – from 49.5% in 2012 to 42.3% in 2015.

Why are people choosing cremation in the first place? CANA research models demographic traits that correlate strongly with cremation rates. More of the U.S. population has chosen to roam across the country and around the world. Many have loosened their connections to their geographic origins and increased their exposure to new traditions. Conversely, there are

significant portions of the population who are rooted to their hometowns and remain deeply connected to the traditions they grew up with.

(<https://www.cremationassociation.org/page/IndustryStatistics>)

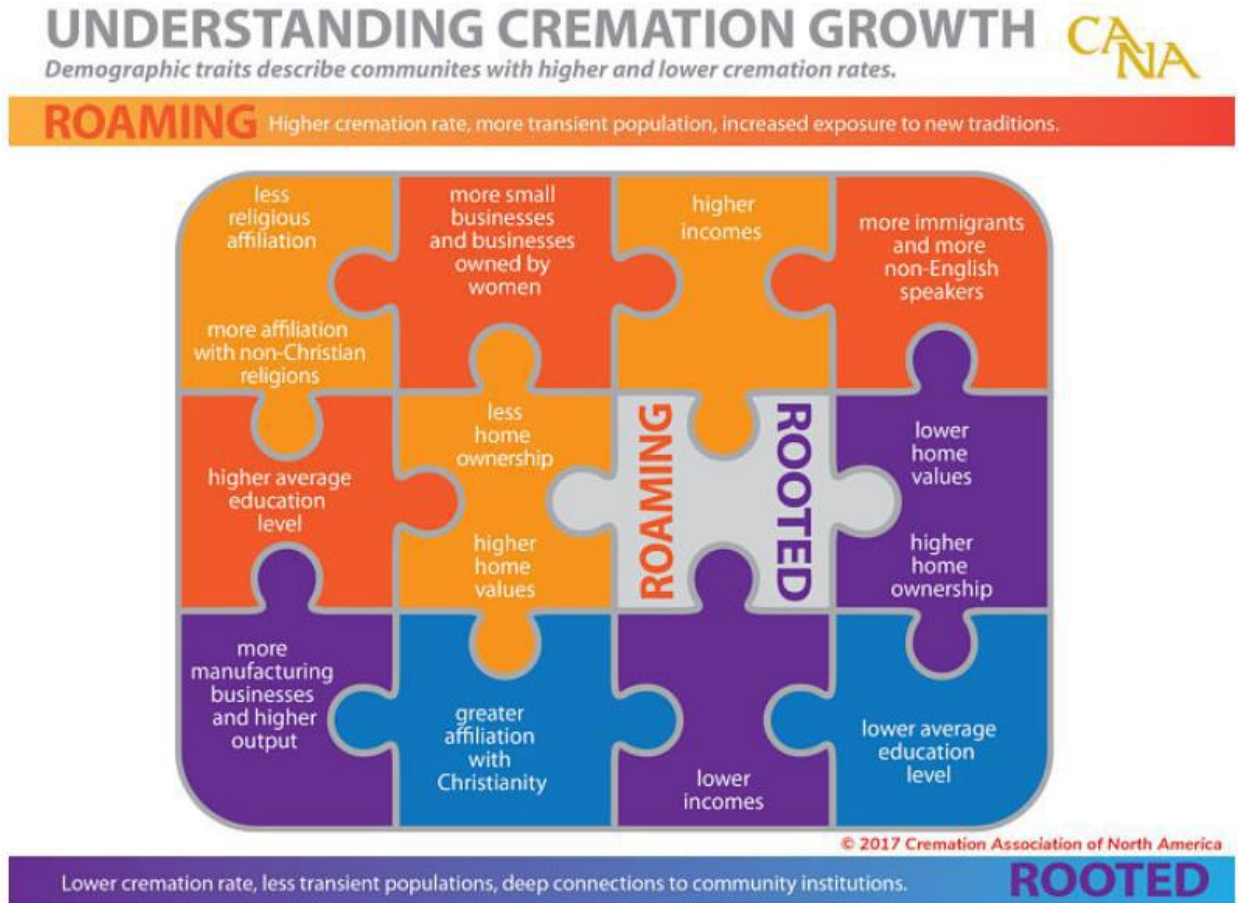


Figure 8- Retrieved from <https://www.cremationassociation.org/page/IndustryStatistics>

Income

Unfortunately, many families do not plan funerals and/or burial arrangements in advance. This means that typically funeral and burial decisions are made under considerable time and emotional pressure that may reduce search. In addition, cultural and/or religious constraints may narrow the range of options. Thus, we would generally expect to find that funeral and burial expenses are typically large near the time of the death.

US National Median Cost of an Adult Funeral with Viewing and Cremation 2017 \$6260

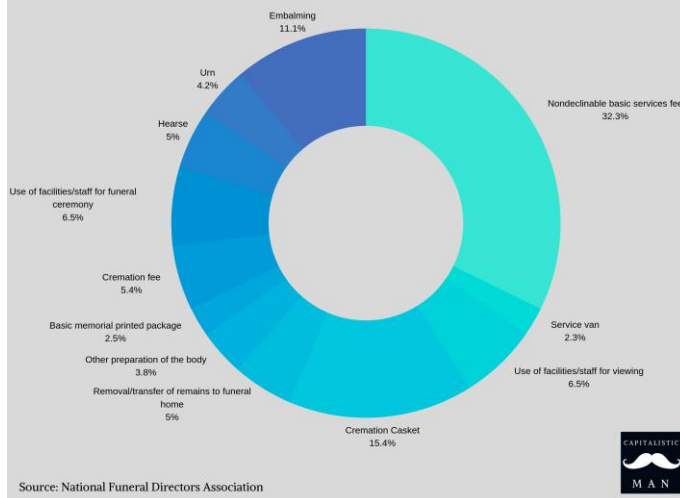


Figure 9- <https://www.capitalisticman.com/profitting-from-death-global-funeral-industry-overview-and-analysis/>

Direct Cremation	B.C.	Alberta	Sask.	Manitoba	Ontario
<u>Funeral Home's Professional Service Charges</u>					
Average Professional Service Charges	1,434	2,013	2,233	2,565	2,026
- Range of service charges (low to high)	295-3,525	710-2,842	1,230-3,420	1,780-3,475	550-3,970
<u>Cremation container & other merchandise</u>					
Cremation Container	250	250	250	250	250
Urn	100	100	100	100	100
Cremation Urn Vault	200	200	200	200	200
<u>Cash disbursements</u>					
Cremation fee - average	615	675	650	750	550
- Range of cremation fees (low to high)	290-915	525-895	570-900	675-800	442-649
Cemetery plot - average	1,100	1,100	1,100	1,100	1,100
- Range of public cemetery plot charges (low to high)	150-2,200	150-2,200	150-2,200	150-2,200	150-2,200
Cemetery Opening / Closing costs - average	400	400	400	400	400
- Range of Cemetery Opening / Closing Costs (low to high)	100-860	100-860	100-860	100-860	100-860
Grave markers / monument lettering	800	800	800	800	800
Total - Including Cemetery Plot	4,899	5,538	5,733	6,165	5,426
Total - Excluding Cemetery plot	2,399	3,038	3,233	3,665	2,926

Figure 10 – Retrieved from <https://inmemory.ca/resources/funeral-costs>

Cremation followed by Memorial Service	B.C.	Alberta	Sask.	Manitoba	Ontario
Funeral Home's Professional Service Charges					
Average Professional Service Charges	3,044	3,606	3,870	4,139	3,795
- Range of service charges (low to high)	1,039-6,270	2,680-5,620	2,630-5,095	2,588-5,955	2,010-6,495
Cremation container & other merchandise					
Cremation Container	400	400	400	400	400
Urn	250	250	250	250	250
Cremation Urn Vault	350	350	350	350	350
Cash disbursements					
Cremation fee - average	615	675	650	750	550
- Range of cremation fees (low to high)	290-915	525-895	570-900	675-800	442-649
Cemetery plot - average	1,100	1,100	1,100	1,100	1,100
- Range of public cemetery plot charges (low to high)	150-2,200	150-2,200	150-2,200	150-2,200	150-2,200
Cemetery Opening / Closing costs - average	400	400	400	400	400
- Range of Cemetery Opening / Closing Costs (low to high)	100-860	100-860	100-860	100-860	100-860
Grave markers / monument lettering	800	800	800	800	800
Clergy	250	250	250	250	250
Flowers	300	300	300	300	300
Total - Including Cemetery Plot	7,509	8,131	8,370	8,739	8,195
Total - Excluding Cemetery Plot	4,859	5,481	5,720	6,089	5,545

Figure 11- Retrieved from <https://inmemory.ca/resources/funeral-costs>

Graveside Burial	B.C.	Alberta	Sask.	Manitoba	Ontario
Funeral Home's Professional Service Charges					
Average Professional Service Charges	2,907	3,234	3,380	3,605	3,314
- Range of service charges (low to high)	1,250-6,665	1,325-4,400	2,125-5,340	2,595-4,570	1,300-5,490
Casket & other merchandise					
Casket	2,000	2,000	2,000	2,000	2,000
Outer Burial Container *	1,000	1,000	1,000	1,000	1,000
Cash disbursements					
Cemetery plot - average	2,800	2,800	2,800	2,800	2,800
- Range of public cemetery plot charges (low to high)	500 - 10,000	500 - 10,000	500 - 10,000	500 - 10,000	500 - 10,000
Cemetery Opening / Closing costs - average	1,100	1,100	1,100	1,100	1,100
- Range of Cemetery Opening / Closing Costs (low to high)	300-1,800	300-1,800	300-1,800	300-1,800	300-1,800
Grave markers / monument lettering	800	800	800	800	800
Clergy	250	250	250	250	250
Flowers	300	300	300	300	300
Total	11,157	11,484	11,630	11,855	11,564

Figure 12- Retrieved from <https://inmemory.ca/resources/funeral-costs>

Traditional Funeral	B.C.	Alberta	Sask.	Manitoba	Ontario
Funeral Home's Professional Service Charges					
Average Professional Service Charges	4,275	5,150	4,741	3,844	5,366
- Range of service charges (low to high)	2,243-7,290	3,695-6,815	3,345-6,375	2,900-6,610	2,705-8,200
Casket & other merchandise					
Casket	2,000	2,000	2,000	2,000	2,000
Outer Burial Container	1,000	1,000	1,000	1,000	1,000
Cash disbursements					
Cemetery plot - average	2,800	2,800	2,800	2,800	2,800
- Range of public cemetery plot charges (low to high)	500 - 10,000	500 - 10,000	500 - 10,000	500 - 10,000	500 - 10,000
Cemetery Opening / Closing costs - average	1,100	1,100	1,100	1,100	1,100
- Range of Cemetery Opening / Closing Costs (low to high)	300-1,800	300-1,800	300-1,800	300-1,800	300-1,800
Grave markers / monument lettering	800	800	800	800	800
Clergy	250	250	250	250	250
Flowers	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>
Total	12,525	13,400	12,991	12,094	13,616

Figure 13- Retrieved from <https://inmemory.ca/resources/funeral-costs/>

Tradition

The American way of burial deals with the decay of the material body via preservation.

Embalmed, coffined, and buried, the preserved dead are said to be merely sleeping, patiently awaiting a future bodily resurrection, perhaps in a coffin designed to provide eternal protection from the elements. U.S. burial traditions deal with the decay of the social body by preservation too—by maintaining significant ties between the living and the dead

(Stephen Prothero. (2001). Purified by Fire : A History of Cremation in America. University of California Press.)

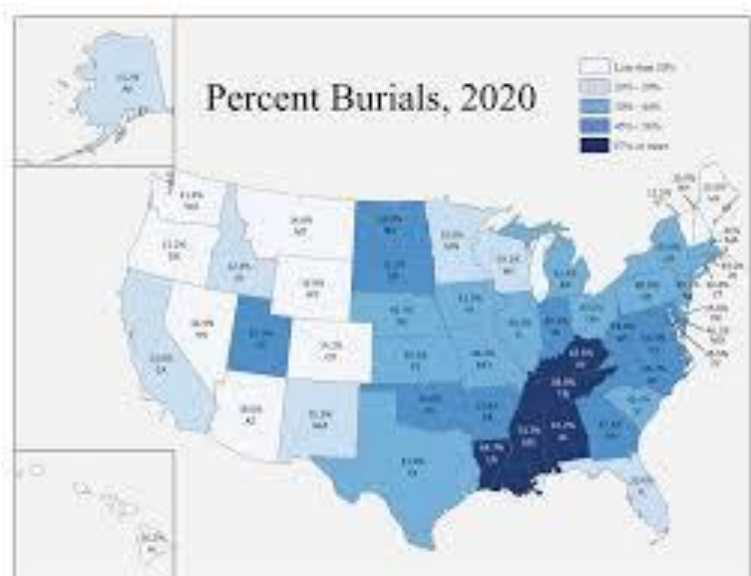


Figure 14 – Retrieved from

http://mediad.publicbroadcasting.net/p/healthnewsfl/files/201507/03a_2014_cremation_and_burial_report_2_.pdf

Families choosing cremation for their relatives do not typically pray to the dead or expect the dead to contact them. At least in those cases where cremated remains are scattered from a boat or airplane, there is no place for the living to visit the dead and thus no memorial site for the living to maintain, perpetually or otherwise. (Stephen Prothero. (2001). Purified by Fire : A

History of Cremation in America. University of California Press.)



Figure 15- Retrieved from

http://mediad.publicbroadcasting.net/p/healthnewsfl/files/201507/03a_2014_cremation_and_burial_report__2_.pdf

Discussion / Conclusions

Based on the above research, it's apparent that the 'user' in this case, doesn't fit in a stereotypical box. However, from this data one is able to begin to direct their focus towards what will eventually be a finalized user profile. It's clear that trends indicate a significant shift in favour of cremation, over burial, which is due to a more open minded, higher educated, and culturally influenced 'transient' population. Surprisingly gender is not found to have any influence on the decision making process, however age and income are relevant factors. It's interesting to see that culture and race seem to be pushed by social isolation, and language barriers, causing a decision to be primarily made by a religious figure.

A final assessment shows that income is one of the most influential dictators in regards to choosing an after life option- with education, and location following close behind. This data

pushes future research in the direction of cremation opposed to burial, as that traditional alternative is naturally fading in popularity.

User Behavior

A literature search was conducted to discover a user behavior for those considering cremation. For this search Google and the Humber Library website were used to extract relevant information. The following search terms were used:

- “Cremation statistics”
- “Cremation influences”
- “Cremation rise in popularity”
- “Cremation”

1.2. Findings

Findings have been summarized below according to the relevant categories: Activity Frequency; Duration of Activity; Group or Solitary Activity/level of focus; Motivation and lifestyle; Income Level & Purchasing Power; Location; Personality and cognitive aspects.

1.3. Activity Frequency

Cremation is becoming a more popular solution in comparison to burial. Cremation Association of North America (CANA) anticipates that by 2023 nearly 60% of Americans will choose cremation for their final disposition.

A big factor in the increasing popularity of cremation is the rising cost of in-ground burial. In addition, many religions and cultures have come to be more accepting of cremation, and society

is much less tied to any one place.

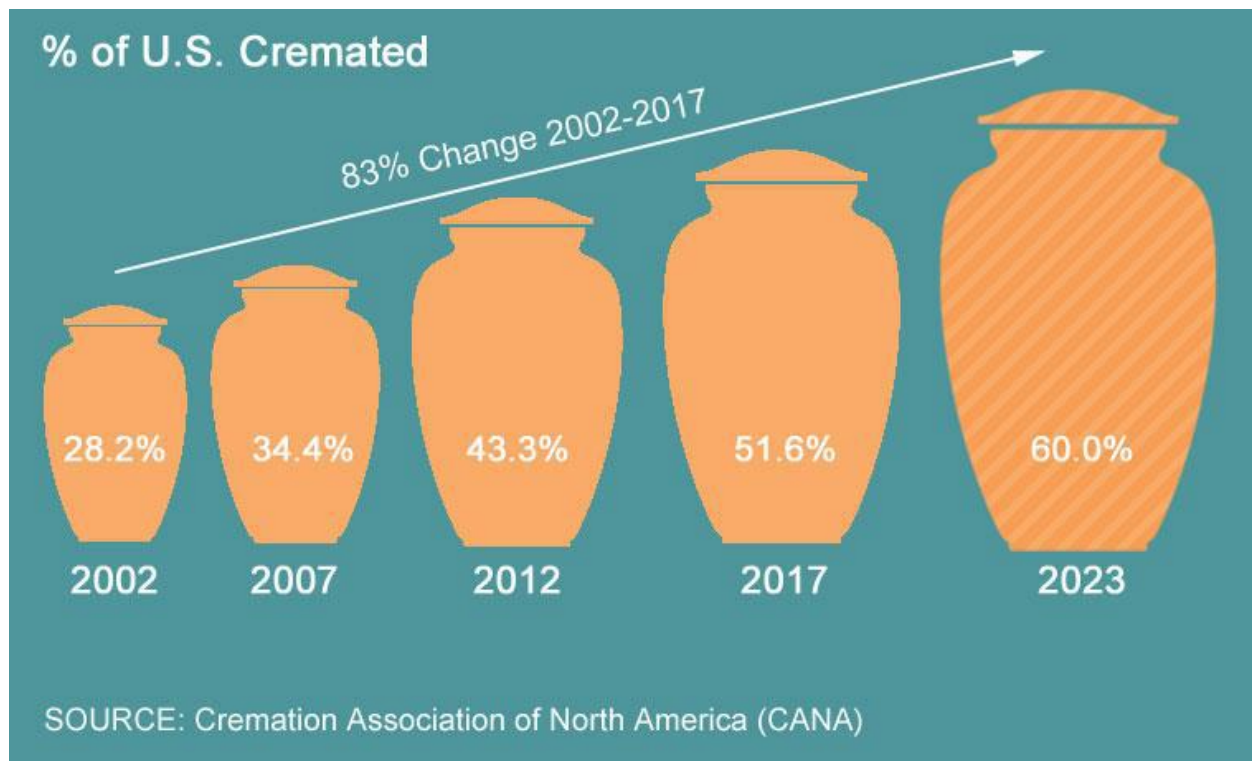


Figure 16- Retrieved from <https://www.funeralwise.com/plan/cremation/cremation-need-to-know/>

Social

Cremation in the West has changed in the turn of the Twentieth century. "Cremation was a symptom not only of massive urbanization and the drive for social hygiene but also an increased medicalization of death. With more people dying in hospitals rather than at home, their bodies were collected by funeral directors and might be kept in special premises away from their home. Indeed the very concept of the "funeral home" developed to mark a place where a body could be kept and visited by the bereaved family. Cremation thus was another example of a rising trend of commercialization and professionalization of various aspects of life in the West. Cremation was but one aspect of a broader tendency toward efficiency, scientific technology, and consumer choice. It also served the psychological function of allaying the fears of those who were haunted by irrational fears of decay or of being buried alive. Cremation is also often

less expensive than burial.” (<http://www.deathreference.com/Ce-Da/Cremation.html#ixzz6b4B7UyCe>)

What influences our burial plans

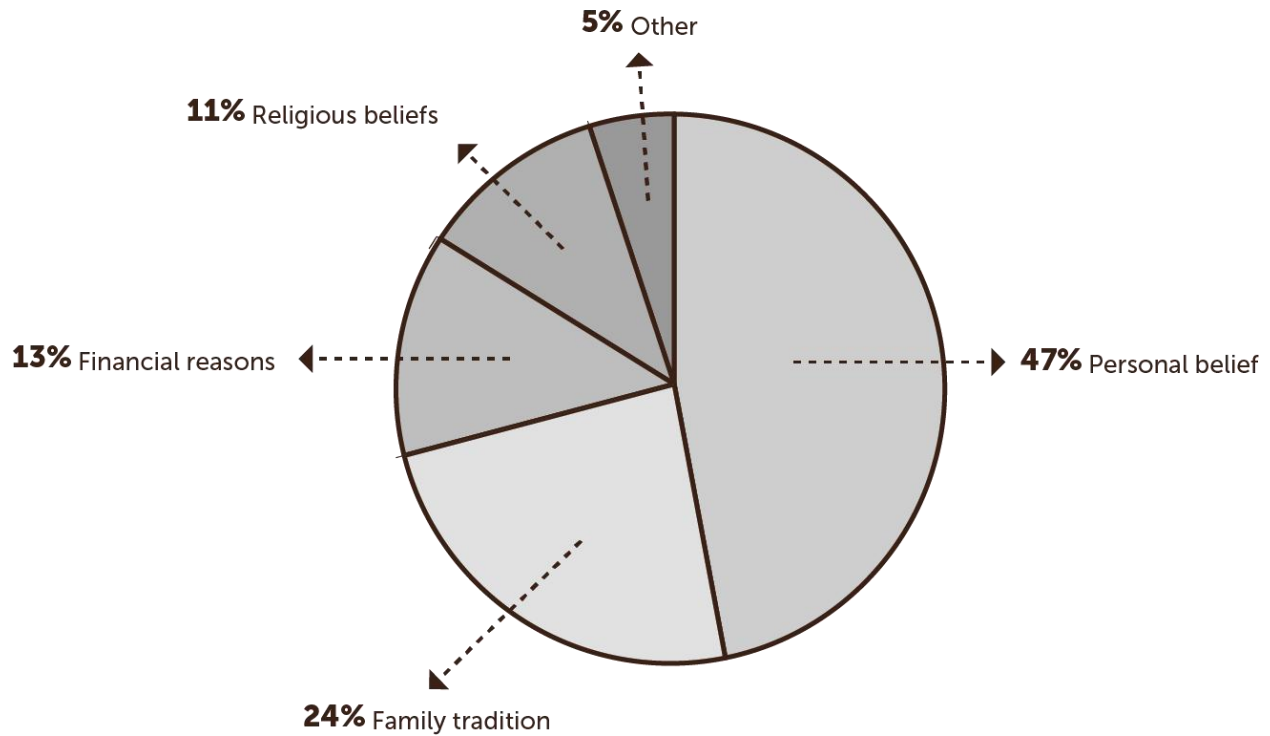


Figure 17 – Retrieved from <https://choicemutual.com/funeral-preferences/>

Life & Personality

What are the reasons behind burial plans — why do some people choose cremation while others decided on donating their body to science? Almost half of people (47%) made their burial plans based on personal beliefs and a fourth (24%) made their decision based on family tradition. The remaining respondents decided on their burial plans for financial, religious, or other reasons, such as wanting their family to decide. But what if those factors didn't matter when choosing a burial option? Would people take a different route? According to our survey, nearly a third of people would — 30% of respondents chose a different plan when not taking into

account family traditions, religious beliefs, and finances. (<https://choicemutual.com/funeral-preferences/>)

How people plan on being buried

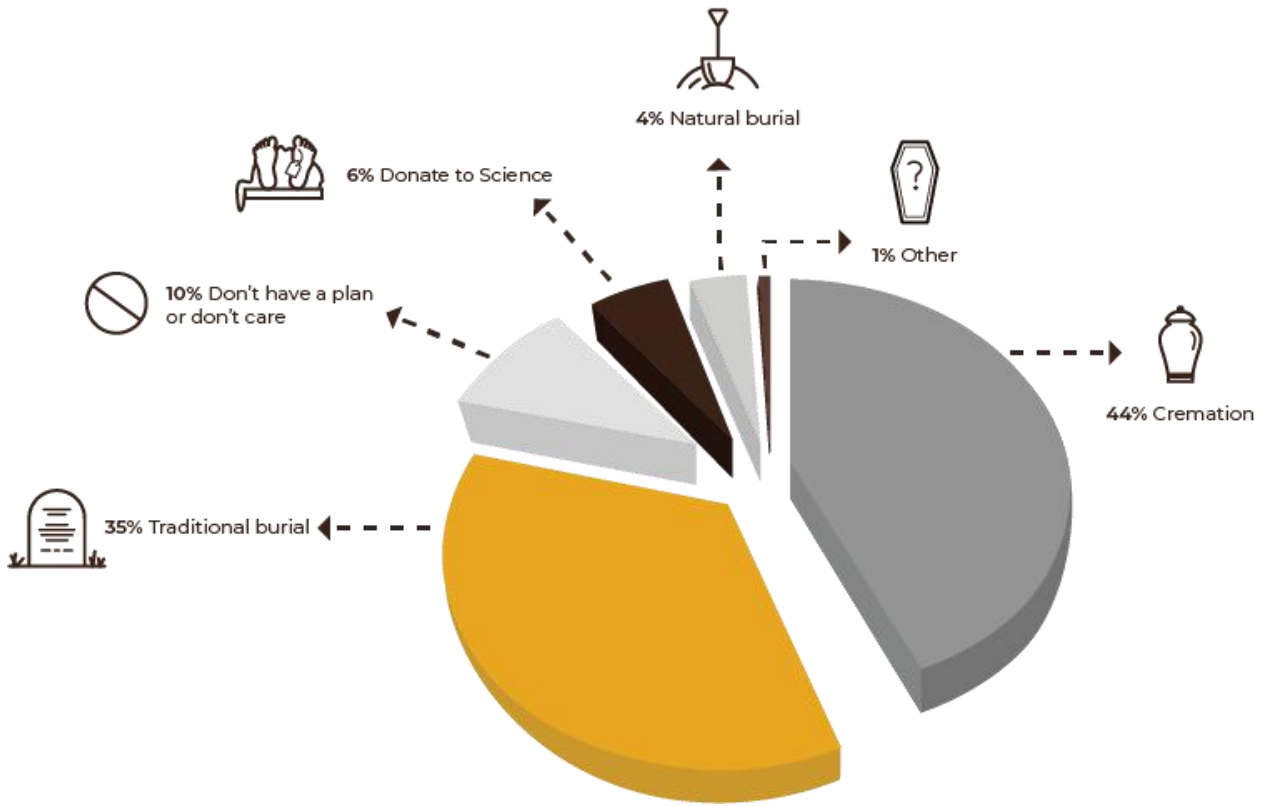


Figure 18- Retrieved from <https://choicemutual.com/funeral-preferences>

What those who are cremated plan to do with their ashes

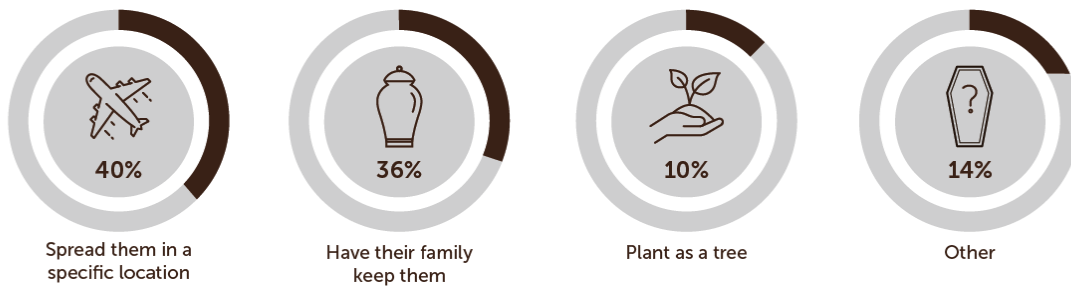


Figure 19 – Retrieved from <https://choicemutual.com/funeral-preferences/>

Income Level

Many factors go into the prices you are quoted for cremation services. Prices can vary widely from state-to-state, city-to-city, and even from provider-to-provider within your local area.

Shopping around can yield significant results since the exact portfolio of cremation services you choose will play a big part in determining the overall price. For example, a full funeral with the body present will cost more than one with an urn on display since embalming will likely be required.

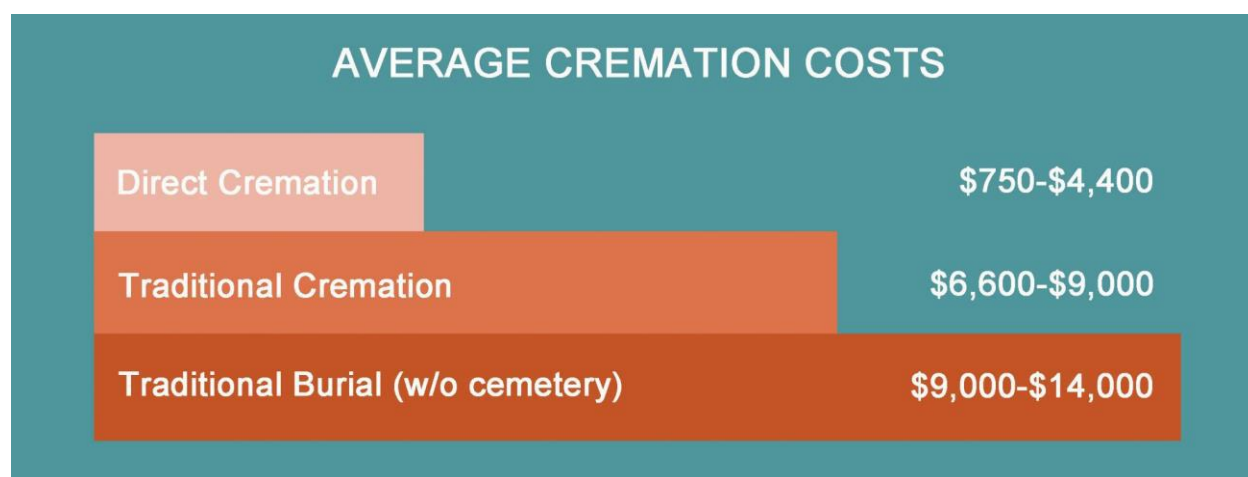


Figure 20- Retrieved from <https://www.funeralwise.com/plan/cremation/cremation-need-to-know/>

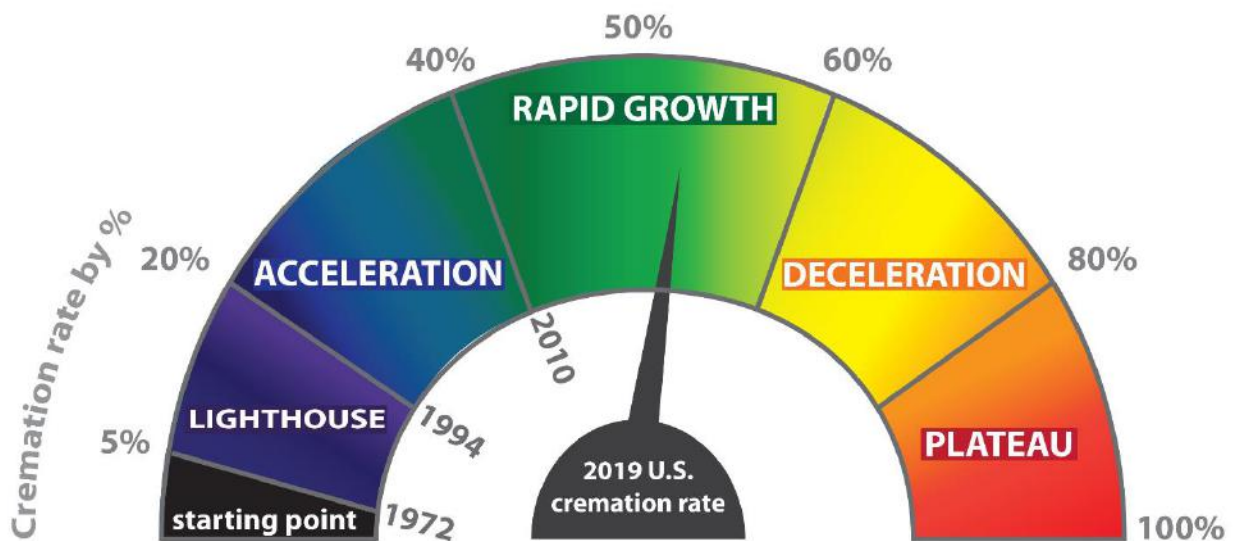
A direct cremation is a simple cremation with no funeral or memorial service. The deceased is transported directly to the crematorium, and the cremated remains returned to the family. This type of cremation is the most economical.

Traditional cremation, on the other hand, typically refers to a cremation that includes a memorial service or funeral (the body is present). Like direct cremation, the cost includes actual cremation costs and the price for the memorial service or funeral. It is more challenging to calculate a general cost estimate for a traditional cremation because you have many options for the type of

service you have. For example, if you plan to have a funeral along with the cremation, you may be required to purchase embalming.

Location

Why are people choosing cremation in the first place? CANA research models demographic traits that correlate strongly with cremation rates. More of the U.S. population has chosen to roam across the country and around the world. Many have loosened their connections to their geographic origins and increased their exposure to new traditions. Conversely, there are significant portions of the population who are rooted to their hometowns and remain deeply connected to the traditions they grew up with.



Conclusion

The variable found in this aspect of understanding the user had to do with income, and location opposed to behavior characteristics.

User Profile Summary

User	Description
------	-------------

Primary	Family of deceased
Secondary	Deceased (pre-plan preference)
Tertiary	Mortician/ Crematory

Persona

Name: Andrea Moreson
Age: 67
Income: Retired- Restricted income
Education: Bachelors
Relationship Status: Married
Location: Waterloo, Ontario
Religion: Open/ NA
Career/ Volunteer: VP mid size company
Social: Book and running club
Hobbies: Reading, Running
End of life choice: Cremation



Profile

Andrea Moreson, is a 67 year old Caucasian female. She attended Ryerson University to receive her Bachelor’s degree in business. She worked her way up in a midsized company to become a successful VP, a position she maintained for 14 years. She prides herself in being an open minded leader, who is tough but fair.

User behaviour

Andrea is a social person who keeps up an active life style with running and reading. Her book

group keeps her socially busy, while still challenging her intellectually. She is able to analyse and articulate novels, which helps keep her open minded.

User Observation

Thesis Topic: *How may we create a safe, respectful, and eco-friendly alternative for end of life?*

Objective of the user observation:

To determine the main pain points of the user post burial, and post cremation. The intent of this observation is to understand the emotional needs being met of the individual partaking in the funeral / ceremony.

Video URL's

Video #1

URL: <https://www.mountpleasantgroup.com/en-CA/Immediate-Help/Burial-Preference/Burial-Casket/Resting%20Place%20-%20Casket.aspx>

Title: Casket Burial

Brief Description: Overview of process of casket burial of loved one.

Relevance to Thesis Topic: Best unbiased, nonreligious, version of burial that could personally be found.

Video #1

URL: <https://www.mountpleasantgroup.com/en-CA/Immediate-Help/Burial-Preference.aspx>

Title: Cremation process

Brief Description: Overview of process of cremation.

Relevance to Thesis Topic: Best unbiased, nonreligious, version of cremation that could personally be found. The aim was to find a similar narrative, short clip that represented the process. These videos filled said requirements

Results

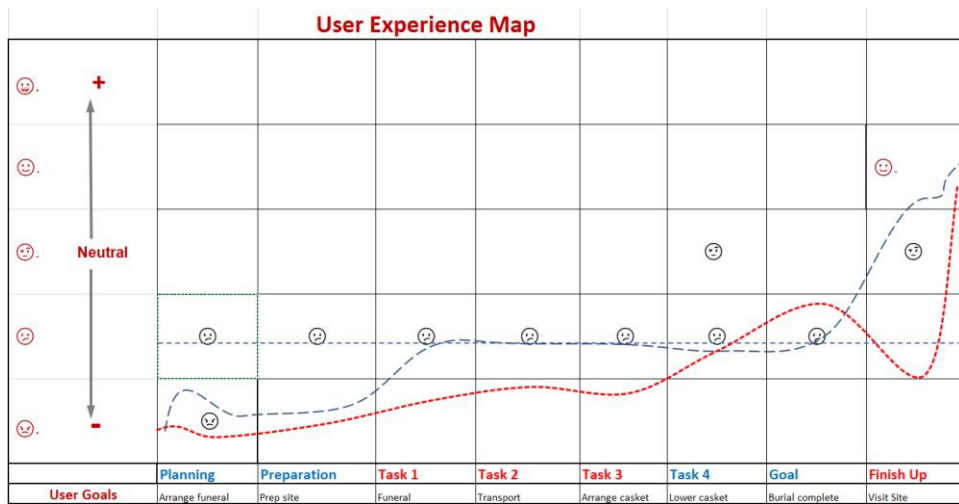
Transcript

“Hi Katie thank you for joining me today I understand that you have watched. Yes. Are you in full understanding of both videos. Yes, I am Dr permission to record you. Yes, you too. just so you know you can terminate this interview, or your observation at any time. Hope you're using videos as an example opposed to an observation. Not problem. So to begin, what is your feedback of the cremation cremation. Most of my relatives have been buried. Not a problem if you prefer we can focus on that area. Yes, I would prefer that. Do you mind walking me through the process of any burial service. To begin, you first have to call the funeral home. And they oftentimes will come in, pick up the body. And in the case of our most recent death. We already knew that the person wanted to be buried so that relieved, the decision. Either cremation or burial. However, I'm sure that some people have to choose for their loved one and a few days after we went and chose a casket which was quite cold. There was a lot of options which was overwhelming. And we just wanted to do what was right for, for our, our person. We ended up just choosing a very simple plain cast that we thought resembled. In the past, and we then spent the next few days gathering photos pulling them from Facebook Instagram any sort of social media platform and speaking with family and relatives to try and gather as many photos and mementos as possible this was to help in the funeral. So when the funeral day arrived. We set up all of the pre prepared photos and Memorial items on display for the funeral. This was present for the dissertation. So at that time we created family, and there was an open casket so I was a large part of the grieving process. I hadn't been exposed to an open casket before. So that was difficult. However, there were a lot of people who I seem to find it helpful in the process. After

the visitation we went to the funeral. The next day, so the party was transported to a gravesite the plot of land had already been chosen. And there was six people's being a Paul bear. A carried his casket to the grave and onto those. It was on like a platform almost that lower down ventually. And that's when the funeral really took place that's when the obituary was read when it was beautiful days we were standing outside or in the casket said her words. We'll decide to put flowers on top of the casket opposed to within it. We know that the person, we're bearing wouldn't have won their suit to to get dirty, which was a nice light hearted silver lining. I did not watch the casket being lowered I decided to leave at that point but I know several people did stay in Mars casket be lowered. And I believe that he a family state to watch the, the burial take place so the dirt go on top of the casket sorry you had to go through that. Would it have helped to have less options for the casket choosing. It was pretty overwhelming and it felt almost as if it was like a car salesman like we're being pushed in a lot of directions, there was like a basic version and a partner version, and all you really want is the best for your loved one, but it's also a very expensive piece that's necessary to bury that person. So fewer options that are perhaps less expensive may be helpful in this process. Definitely a difficult gathering all of the photos and arranging all the photos of the loved one.yes and no. It was difficult at the time but it also helped bring up memories and allow us to talk about good times, which I think is in the mourning process. Do you plan to go back and visit the grave site. Yes, I do. I just will probably wait until after one turn after a bit of time has passed.” Interview stopped recording- connection issues

Images





	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	
User Goals	To create a memorial service that both honors the deceased and creates a safe space to grieve for those bereaved.	Plan funeral service	Execution	Execution	Execution	Execution	Execution	Execution	
User Actions	Research and identify the best funeral home to use. Contact funeral home to discuss services and costs. Arrange for transportation to funeral home.	Working with the funeral home, select a casket and service location. Coordinate with family and friends for service.	Preparation of casket. Preparation of service site. Arranging for transportation to service site.	Transportation of casket. Preparation of service site. Arranging for transportation to service site.	Service site preparation. Transportation of casket. Arranging for transportation to service site.	Service site preparation. Transportation of casket. Arranging for transportation to service site.	Service site preparation. Transportation of casket. Arranging for transportation to service site.	Service site preparation. Transportation of casket. Arranging for transportation to service site.	Service site preparation. Transportation of casket. Arranging for transportation to service site.
Storyboard / Photos									
Shock	Shock	Shock	Possible shock	Shock	Possible shock	Shock	Shock	Possible relief	
Grief	Grief	Grief	Grief	Grief	Grief	Grief	Grief	Grief	
Anger	Possible anger (depending on cost)								
Relief						Possible relief	Possible relief	Possible relief	
Healing								Possible healing	
Problems	Members present but not participating in service.	Costs are high and not covered by insurance.	Timing of service is difficult to coordinate.	Members are not participating in service.	Members are not participating in service.	Members are not participating in service.	Members are not participating in service.	Members are not participating in service.	
Notes / Take-aways	Costs are high and not covered by insurance.	Costs are high and not covered by insurance.	Costs are high and not covered by insurance.	Costs are high and not covered by insurance.	Costs are high and not covered by insurance.	Costs are high and not covered by insurance.	Costs are high and not covered by insurance.	Costs are high and not covered by insurance.	

Major Take-aways from the User Journey Map and User Experience Map

The entire experience is difficult for the user. There is rarely a silver lining in the process- with that said it appears time aids in the perception of pain; the user is able to find more positive experience in the funeral process as time passes. There's a clear issue with

C- DISCOVERY

Product #1

BIO URN <https://urnabios.com/>

Promotional Piece *(Highlight the Benefit)*

Bios Urn® is an urn for ashes, which transforms the ritual of death into an act of regeneration and life. It's aim is to convert the “end of life” into a transformative process and promoting a return to life through nature. **Less room for cemeteries**, and more room to **grow trees** is one great way to **deal with pollution, overpopulation, and deforestation**. The company's objective is none other than to offer a **economic, ecological and sustainable product** that falls in line with our group's philosophy: things can be different.

Features *(Highlight the Features)*



1. **Bio degradable urn**
2. **Never expires**
3. **Tree grows in place of burial**
4. Helping both **reduce traditional cemetery** size, but also **increase forests**
5. Creates **grieving location/ memorial site**

Product #2

FLOATING BIODEGRADABLE URN<https://www.passagesinternational.com/biodegradable-urns/water/turtle-urns/>

Promotional Piece *(Highlight the Benefit)*

The Passages® **Biodegradable Paper** Turtles are **hand-crafted from recycled paper using non-toxic glues**. The turtles are **available in two sizes**. The adult size will accommodate a full set of human remains, and the mini turtle will accommodate roughly two or three tablespoons of cremated remains. The turtles are designed to **float briefly before sinking**. The time that the turtle takes to sink will depend on the weight of remains inside and local water conditions. Once the turtle sinks, it will **biodegrade naturally over time**.

Features *(Highlight the Features)*



1. **Local, hand crafted, fair pay**
2. **Produced from renewable resources**
3. **Water biodegradable**
4. **Reconnects body to earth in life cycle**
5. **Approved by AGF, and GBCC**

Product #3

FIREWORK

<https://heavenlystarsfireworks.com/>

Promotional Piece *(Highlight the Benefit)*

Heavenly Stars Fireworks are the market leader in the incorporation of ashes into fireworks.

Established since 2007 the family-run business has built upon the success of our professionally fired corporate, wedding firework displays and retail firework business to bring scattering ashes with fireworks into the public eye. **The aim is to give a fitting and wonderful tribute to life.**

Features *(Highlight the Features)*



1. **Prompts a celebration of life**
2. **Eco friendly, in that the remaining ashes burn up**
3. **Not all ashes are required to be used**
4. **Represents a new target of grief, mourning, and memorialization.**
5. **Adds a new emotional aspect**

Product #4

DIAMOND

<https://eterneva.com/loved->

[ones?utm_source=google&utm_medium=cpc&utm_campaign=traffic&utm_term=Ashes2DiamondsE](https://eterneva.com/loved-ones?utm_source=google&utm_medium=cpc&utm_campaign=traffic&utm_term=Ashes2DiamondsE)

[xact&utm_campaign=&utm_source=adwords&utm_medium=ppc&utm_term=ashes%20diamond&hsa_mt=e&hsa_src=g&hsa_acc=2770935254&hsa_tgt=kwd-312288484443&hsa_kw=ashes%20diamond&hsa_ver=3&hsa_ad=437025416090&hsa_net=adwords&hsa_cam=10107085868&hsa_grp=107221383731&campaignid=10107085868&adgroupid=107221383731&adid=437025416090&qclid=Cj0KCQiA48j9BRC-ARIsAMQu3WTWMG-oCgAvz0QpOfUuqPhtPuhc_hpvDDsmhiCf0Kh-2daxoJZZFR4aAoE0EALw_wcB](https://www.google.com/search?q=ashes%20diamond&utm_campaign=&utm_source=adwords&utm_medium=ppc&utm_term=ashes%20diamond&hsa_mt=e&hsa_src=g&hsa_acc=2770935254&hsa_tgt=kwd-312288484443&hsa_kw=ashes%20diamond&hsa_ver=3&hsa_ad=437025416090&hsa_net=adwords&hsa_cam=10107085868&hsa_grp=107221383731&campaignid=10107085868&adgroupid=107221383731&adid=437025416090&qclid=Cj0KCQiA48j9BRC-ARIsAMQu3WTWMG-oCgAvz0QpOfUuqPhtPuhc_hpvDDsmhiCf0Kh-2daxoJZZFR4aAoE0EALw_wcB)

Promotional Piece *(Highlight the Benefit)*




The element of **Carbon (C)** accounts for **18% of the human body**, which makes turning **human ashes into cremation diamonds** possible since a diamond is in fact crystallized carbon. Natural diamonds grow in an environment of extreme pressure and high temperature deep in the earth mantle over millions of years. That high pressure and temperature is **recreated in a laboratory**, which creates the growth of ashes to diamonds.

Features *(Highlight the Features)*

1. Carbon neutral
2. Personalized/ made of person
3. Personalized kit provided

4. Wearable product- piece or object to mourn

5. Long lasting representation of person in positive sense

BENEFITS	Sort #1	Sort #2
From Promotional Material	DATA [On Menu Bar] → 	Groups like categories
Adds emotional aspect	Adds emotional aspect	Memorialized 10
Celebration of life	Celebration of life	Adds emotional aspect
Deals with deforestation	Deals with deforestation	Grows trees
Deals with over population	Deals with over population	Long lasting
Deals with pollution	Deals with pollution	Multi-size
Ecological	Ecological	Object to keep and mourn
Economically friendly	Economically friendly	Option to use partial ashes
Fair pay	Fair pay	Personal kit (apart of process)
Fitting tribute	Fitting tribute	Personalized
Float before sinking	Float before sinking	Represent person in positive
Grows trees	Grows trees	Wearable
Handmade	Handmade	
Less cemeteries	Less cemeteries	Environment/impact 11
Life cycle	Life cycle	Deals with deforestation
Locally crafted	Locally crafted	Deals with over population
Long lasting	Long lasting	Deals with pollution
Multi-size	Multi-size	Ecological
Object to keep and mourn	Object to keep and mourn	Economically friendly
Option to use partial ashes	Option to use partial ashes	Fair pay
Personal kit (apart of process)	Personal kit (apart of process)	Handmade
Personalized	Personalized	Locally crafted
Produced with renewable resources	Produced with renewable resources	Produced with renewable resources
Reconnects body	Reconnects body	Reconnects body
Represent person in positive	Represent person in positive	Sustainable
Represents life	Represents life	
Simple	Simple	Send off 6
Sustainable	Sustainable	Celebration of life
Tribute to life	Tribute to life	Fitting tribute
Wearable	Wearable	Float before sinking
		Represents life
		Simple
		Tribute to life
		Big picture 2
		Less cemeteries
		Life cycle

FEATURES		Sort #1	Sort #2
From Promotional Material	Re-order: NOUN first	DATA [On Menu Bar] →	Group like categories
Never expires	Diamond: carbon neutral	Diamond: carbon neutral	Diamond 2
Bio Degradable	Diamond: Longn lasting	Diamond: Longn lasting	Diamond: carbon neutral
Tree grows in place	Firework: ashes burn up	Firework: ashes burn up	Diamond: Longn lasting
Unisex design	Firework: ecofreindly	Firework: ecofreindly	
Grieving location	Tree: Grieving location	Tree: Grieving location	Firework 2
Personalized	Tree: Personalized	Tree: Personalized	Firework: ashes burn up
Bio degradable	Urn: Bio degradable	Urn: Bio degradable	Firework: ecofreindly
Bio degradable paper	Urn: Bio degradable	Urn: Bio degradable	
Hand crafted	Urn: Bio degradable paper	Urn: Bio degradable paper	Tree 2
Fair pay	Urn: Fair pay	Urn: Fair pay	Tree: Grieving location
Renewable resources	Urn: Hand crafted	Urn: Hand crafted	Tree: Personalized
Water biodegradable	Urn: Never expires	Urn: Never expires	
Ashes burn up	Urn: Renewable resources	Urn: Renewable resources	Urn 10
Eco friendly	Urn: Tree grows in place	Urn: Tree grows in place	Urn: Bio degradable
Carbon neutral	Urn: Unisex design	Urn: Unisex design	Urn: Bio degradable
Long lasting	Urn: water biodegradable	Urn: water biodegradable	Urn: Bio degradable paper
			Urn: Fair pay
			Urn: Hand crafted
			Urn: Never expires
			Urn: Renewable resources
			Urn: Tree grows in place
			Urn: Unisex design
			Urn: water biodegradable

Benefits Table

Key Benefits of Comparable Products	
<i>Keyword</i>	<i>Frequency</i>
Memorialized	10
Environment/ impact	11
Send off	6
Big picture	2

Features Table

Key Features of Comparable Products	
<i>Keyword</i>	<i>Frequency</i>
Diamond	2
Firework	2
Tree	2
Urn	10

D- DISCOVERY

Empathy Map

Thesis Topic: *How may we create a safe, respectful, and eco-friendly alternative for end of life.*

Objective of the user observation:

To determine the main pain points of the user while aiding in the emotional capacity of death, and dying. A hospice nurse is exposed to the person, and loved one while helping create an experience that's as comfortable as possible.

User (individual or group):

This topic requires a multitude of 'users' primary and secondary users become blurred depending on the position and focal point. To begin I had intended to interview a mortician, however due to scheduling conflict I was unable, and was lead to an interview with a hospice nurse. I intend to later speak with those who have created a death plan and have a full grasp on what they want after they pass.

User Background:

Since the user is mixed, their backgrounds are wildly different.

A nurse, or doula, are there to aid a person while dying. They attempt to create a comfortable space, have a full understanding of morbidity, with a strong education to back their decisions.

Mortician, aids in the process regarding the deceased. They are educated chemists, that aid the body to appear similar to a living person (for viewing purposes). This person has a strong understanding both of grief, and how a body decomposes.

Lastly, the living person, of a non-religious background, who has accepted that they will one day pass and have put plans for their funeral in place to reflect their wishes.

Method:

Interview

Driven by the analysis method- the Empathy Map.

Questions

Recording Techniques Used

- *transcription app, Otter.*

Result

Transcript

“Hi, Sara, thank you for joining us.

Hi. Not a problem. happy to help.

So as you know, I'm currently finishing up my Bachelor of industrial design. And my thesis thesis is focusing on safe, respectful and eco friendly alternatives for end of life, as in burial or cremation.

Kind of morbid, but the intent is to create a bit of help. I've been trying to network and through word of mouth, I've heard that your hospice nurse, I hope you don't mind me reaching out, I was wondering if you'd be able to answer some questions for me.

Hi, Sinead, I'd be more than happy to answer some questions. It's such a cool topic. I'm totally used to morbid. And I'm more than comfortable about talking about death.

Amazing. Before we begin, if you feel uncomfortable with any of the questions or feel the need to stop, please let me know there's absolutely no issue with that.

I also want to inform you that this will be used as data for my thesis. If you don't feel comfortable with me using your name dream, it's not a problem.

I completely understand. I've been in school and I find with my name being used.

Perfect. Are we ready to begin? Yeah, go ahead.

So I've broken this topic into two sections. The breakdown in the decomposition process of the human body and the emotional magnitude of loss. I assume your work may be more involved in the emotional side of things. But I also don't want to put words in your mouth.

Yes, I do typically work

primarily on the emotional side with the family and the patient.

Can you tell me a bit about yourself and where you went to school?

Of course, I went to nipissing. College for nursing. I'm a registered nurse. I finished school. Seven years ago, I believe. And and I began just working in hospitals. And then I found hospice and was drawn to that area.

What drew you to being a hospice nurse?

Well, in my early 20s, my grandparents passed away. And they were in a hospice. And I found it very inspiring to be around those nurses seeing how strong they were, and creating kind of an environment that let them pass peacefully.

So how do you begin your day?

Well, I'm on night shift. So my answers may be different than those on day shift. But I'm still happy to answer any questions. Of course, and if you just go ahead and tell me how you're, I guess, an outline of your day. So typical day for me is 12 hours, day and night, I usually have five residents to care for. So I get a report in the morning and do a quick round to make sure everyone's safe or less like a hospital Hospital in the sense that we don't have a set schedule for patients. So no early wake up time or blood work or anything. We go out there in what works best for them. We do usually give out meds in the morning and throughout the day. Though what interactions do you have with the patients other than using? Sorry, other than giving medication? or helping wash people? assist them to eat or drink? If they're able, our main goal is to manage any symptoms that they may have pain, nausea, anxiety, consultation, anything.

What motivates you to do that?

I'm honestly not sure I just really like helping people. I like seeing them. them happy. Like it's, it's

tough to describe because they're in a really tough situation. There's a lot of emotions, a lot of the time, they're aware that they're about to pass. But oddly, a lot of them still joke around, they still have a sense of humor.

They're like a death isn't as

I shouldn't say this. It's not. It's not as sad as people.

Think once you have accepted it, I guess.

Who do you usually see or interact with throughout the day? Well usually see the patients Of course, I see fellow nurses. I usually see and talk to the doctor at least once a day to make any changes necessary based on what we see. So any of their symptoms that are changing any discomfort that they may have. We relay that to the doctor.

Is there anything else that you that you do throughout the day?

Oh well, I think We also do laundry and dishes and make food and clean sometimes too. But that's just our particular hospice. It's not every hospice that does that. We just want to make people comfortable and we stay busy.

Is there anything that you hear throughout your shift? Like who do you? Who else do you interact with? What are your conversations like?

Oh, something that's quite difficult is having hard are tough confronting conversations with family members.

Maybe they're in denial that things are changing, and we have to confront them with reality. We often bear the brunt of people's frustrations because they aren't coping well.

That's really sad. I'm sorry that you have to deal with that.

Oh, it's, it's just kind of part of the job.

Is there something that would help with that? Well, some hospice have a, a coping counselor, and who sometimes there to help soften the blow for the nurses.

Is there a particular reason why yours doesn't?

I honestly think it's just funding and a combination of COVID.

That makes sense. What would you find the most difficult thing to deal with with your job? I would say the area I find most difficult is dealing with younger residents in their 30s 40s and 50s. They're usually both children and their parents involved. So it's sad and complicated. And generally personally harder because we're in that age group so it's difficult to see appear struggling so much. Are those the kind of situations that you need to confront the family with?

With their denial?

Yes, yeah. The younger The, the person, the harder it is, or it seems to be for the family to accept.

What's the process for you when someone passes?

When someone passes, we learn

The family unless they're already there, and then allow them time to be in the room with the residents to grieve, cry, everything like that.

We go in at some point and wrap the body in a cotton sheet straighten them and the room to make things more. I don't just to look nice. I just mean The family feel a bit more comfortable. Once the family feels they're ready we call the funeral home that they've chosen to work with and the funeral home comes to us. We offer a little honoring ceremony most families want to partake but not all where we the staff and the family. Walk the residents down the hall to the front doors on a stretcher Of course. And then often do a reading or something. We give them Families have fingerprints keepsake in a frame as well of their loved ones fingerprint. And then we walk the resident out sort of like an honor guard. The residence goes into the funeral home band.

Do you think people typically know if they want burial or cremation

I would say generally people know that they want burial or cremation ahead of time. A lot of people know what funeral service they're going to use.

But then sometimes things have to happen very quickly and family members haven't considered any offers.

That's less common though. It does

More people have at least a vague idea of a plan.

That's Very helpful.

I understand You need to leave Sara but thank you so much for your time and I really value your input not a problem. If you have any






Any more questions, feel free to reach out. Thank you so much.

Bye

Bye”

Analysis

Empathy Map Canvas

<p>1 WHO are we empathizing with?</p> <p>Hospice nurse.</p>	<p>2 What do they need to DO?</p> <p>They need to balance both the wants and needs of the family, and the person passing. Their <u>ultimate goal</u> is to create a safe, and comfortable environment, while attempting to reduce pain for the terminal person.</p>	
<p>3 What do they SEE? </p> <p>They see people in their final moments. They see families hurt, scared, and upset.</p>	 <p>PERSONA</p>	
<p>4 What do they DO? </p> <p>They check their patients in the morning, deliver medication, assist people with eating, or drinking, pain nausea, anxiety, consultations.</p>	<p>PAINS</p> <p><i>Fears, frustrations, anxieties</i></p> <p><i>Most difficult are younger residents in their 30s, 40s, 50s. There are typically children, and the <u>patients</u> parents which is a lot to balance.</i></p> <p><i>Having tough conversations with family members that may be in denial.</i></p>	<p>GAINS</p> <p><i>Goals achieved; experiences <u>enjoyed</u></i></p> <p><i>Allowing some to pass with dignity, <u>warmth</u> and compassion.</i></p>
	<p>5 What do they SAY? </p> <p>Any changes in health are discussed with the family, and residence if they are able. They talk to the doctor at least once a day to make changes necessary based on what they're seeing and what the current issues with the patient are.</p> <p>6 What do they HEAR? </p> <p>They hear grief, anger, resentment, and confusion. Often confronted by family members who are mourning a loss</p> <p>What might make this easier, more productive, more enjoyable?</p> <p>Most issues unfortunately come with the territory, however an <u>on duty</u> counselor or support staff may be helpful to reduce the emotional strain on nurses.</p>	

Major Take-aways from the Empathy Map

A major take away from this experience, is one that is obvious, however had been unintentionally missed. The person dying may not be an older person simply reaching their end of life, hospice's are meant for all people, including those struggling with a terminal illness.

Since I hadn't planning to interview a hospice nurse (other interview fell through) the interview was very natural, and I had little time to prepare my questions. I really wanted to understand just what she does and goes through day to day, especially because she was in a rush and doing me a favour.

I was able to get some valuable information, and more understanding towards the emotional part of death. It seems as if there is the initial shock of leading up to someone passing, a huge amount of emotion, and confusion. This may influence how a body will be dealt with (burial or cremation) and how an alternative may be chosen. This may need to be something put in place before a person becomes a patient in a care facility. This may seem minor, however reduces the target audience/ user, to someone who has accepted death, however is still slightly removed from it or the emotions of family members.

As I continue to interview more people, and hopefully reschedule a meeting with a mortician, I will again be able to further reduce my user and understand the experiences of such a sensitive topic.

J- DISCOVERY

IDSN 4002

SENIOR LEVEL THESIS ONE

Humber ITAL / Faculty of Applied Sciences & Applied Technology

Bachelor of Industrial Design / FALL 2020

Catherine Chong / Sandro Zaccolo

FTA-4 THESIS TOPIC APPROVAL (TEMPLATE)

This project/assignment constitutes 5% of total mark for the course

Start: Week #4 / Sep-28

Due: **Week #5 / Oct-05**

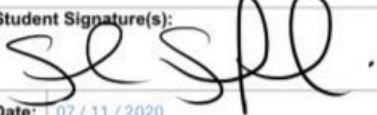
THESIS TOPIC APPROVAL:

Student Name:	Sinead Summerfield
Topic Title:	How may we create a safe and respectful alternative for end of life?

Abstract

Typically, an average of 55 million people die annually, presently, this number is substantially increasing due to COVID-19. End of life is often dealt with in one of two ways in Western Society: burial or cremation; both of which retain severe environmental implications. Burial and cremation methods have been traced back to 1400BC and AD 200, as technology advances, and the population exponentially increases these methods become glaringly archaic. The implications of burial include: habitable land lost to cemeteries, excess of raw materials used for caskets, and toxic fluids (such as formaldehyde) leak from the human remains to find underground waterways. This presents an increased danger of ingestion to communities and wildlife located within a close proximity to cemeteries. Keeping in mind cemeteries, are currently growing in size encompassing a larger land mass than ever before, as the need for grave plots grow. Cremation: although the more environmentally efficient option out of the two, is still not without it's flaws. This process contributes a large amount to annual Co2 emissions, directly effecting the local air quality. Beyond the urgent environmental, and social responsibility that's in need of being confronted, there is a secondary challenge of creating a place of remembrance and mourning for those left to grieve the loss. Is it possible to create an end of life experience that is both environmentally sustainable, and emotionally gratifying?

Remaining unbiased and analyzing both the environmental, and emotional standing of such a sensitive topic is of upmost importance; interviewing a variety of groups ranging in age, gender, religious beliefs, and location can aid in the complete understanding of this challenge. With referencing existing practices, and seeking advice from Advisors, a one-to-one model will be developed in order to evaluate the functional ergonomics, establishing proper human factors, along with the analysis of full-bodied human interaction. Reviewing results from interviews and exploring human factors will guide this thesis to a design solution that encompasses a environmentally sustainable alternative for end of life. This solution will be respectful to both the deceased and grieving family, with a focus on creating a socially empathetic solution for those mourning.

Student Signature(s):	
Date:	07 / 11 / 2020

Instructor Signature(s):	
Date:	07 / 10 / 2020

IDSN 4502
SENIOR LEVEL THESIS TWO

Humber ITAL / Faculty of Applied Sciences & Technology
Bachelor of Industrial Design / WINTER 2021
Catherine Chong / Sandro Zaccolo


CRITICAL MILESTONES: APPROVAL FOR CAD DEVELOPMENT & MODEL FABRICATION

Student Name:	Sinead Summerfield
Topic / Thesis Title:	Alternative Life Departure

THESIS DESIGN APPROVAL FORM

<p>Thesis design is approved to proceed for the following: <input checked="" type="checkbox"/> CAD Design and Development Phase</p>
<p>Comment: Initial CAD progress well as of week #7/March 1st, continue with detailing and refinement.</p>

<p>Thesis design is approved to proceed for the following: <input checked="" type="checkbox"/> Model Fabrication Including Rapid Prototyping and Model Building Phase</p>
<p>Comment: Design development progress well as of week #7/March 1st, once CAD is completed, can move forward to model fabrication from week #9 onward.</p>

Instructor Signature(s):	
	
Date:	10th March 2021

K- DISCOVERY

The purpose of this plan to gain valuable insight from accredited sources according to the chosen thesis topic. The sources will then aid in the direction of problem finding, and eventually problem solving through the understanding of the user's perspective. Due to the sensitivity of the topic, there will be online surveys performed, however will be given a warning of sensitive content. This survey will be examining the personal experience of choosing funeral options- furthermore examining why one option is chosen over another.

Advisor Initiative

Two Advisors have been sent confirmation information; Brittany Dasilva, and Susan Shearing and I am currently awaiting reply. Jake Turner, and Michael Teeple, have agreed to sign the Advisor form as well, however have more limited experience in their respected fields and are currently arranging network connections to provide.

Advisor Contacts:

Advisor Name	Advisor Occupation	Advisor Confirmation	Research Plan
Brittany Dasilva	Mortician / Funeral Director	Y	Phone Interview
Susan Shearing	Vet Tech University of Guelph	Y	Phone/ in person interview
Jake Turner	Animal Crematory	Y	Phone/ in person interview

Michael Teeple	OPP Forensics	Y	Phone/ in person interview
Graham, Scott, Rob Giddy	Graham Giddy Funeral home / Funeral director	Awaiting reply (Oct 16)	Phone Interview/ in person interview/ tour
Susan Koswan	The Good Green Death Project	Awaiting reply (Oct 16)	Phone Interview
Karry Sawatsky	Death Doula	Awaiting reply (Back up in place if falls through) (Oct 16)	Phone Interview
Shelley Carter	Local Artist/ Memorializes death	Awaiting reply (Oct 16)	Phone Interview

Advisor initiative schedule pdf attached

Interview/Survey Questions

Scientific

- What is the natural process of tissue breakdown?

- How long does this process typically take?
- Do chemicals; like formaldehyde severely affect the time taken for a body to decompose?

Interview/Survey Questions

Emotional

Many contacts have been placed, and are leading to further networking. The networking is divided between scientific sources, and emotional sources. The ultimate goal is to interview a person who understands how body tissue breaks down, and is able to brainstorm alternatives- along with a grief counsellor, or person who has a deep understanding of the emotional understanding of death. This will aid in the separation and solution of eco-friendly processing, as well as create a human centered design that will address the grieving and memorializing process. An attempt to gather more perspectives early on is currently being made- this is to ensure a blind spot is not created early on.



Faculty of Applied Sciences & Technology

Bachelor of Industrial Design / FALL 2020 & WINTER 2021

IDSN 4002 / 4502
SENIOR LEVEL THESIS ONE & THESIS TWO

PARTICIPANT INFORMED CONSENT FORM

Research Study Topic: How may we create a safe, respectful, and eco-friendly alternative for end of life?
Investigator: Sinead Summerfield | 519-803-6230 | sineadsummerfield15@gmail.com
Courses: IDSN 4002 & IDSN 4502

I, Sarah Cizej (First Name/Last Name), have carefully read the Information Letter for the project Creating a safe, respectful, and eco-friendly alternative for end of life, led by Sinead Summerfield. A member of the research team has explained the project to me and has answered all of my questions about it. I understand that if I have additional questions about the project, I can contact Sinead Summerfield at any time during the project.

I understand that my participation is voluntary and give my consent freely in voice recording, photography and/or videotaping; with the proviso that my identity will be blurred in reports and publications.

Consent for Publication: Add a (X) mark in one of the columns for each activity

ACTIVITY		YES	NO
Publication	I give consent for publication in the Humber Library Digital Repository which is an open access portal available to the public	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Review	I give consent for review by the Professor	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Privacy

All data gathered is stored anonymously and kept confidential. Only the principle investigator /researcher, Sinead Summerfield and Prof. Catherine Chong or Prof. Sandro Zaccolo may access and analyze the data. All published data will be coded, so that visual data is not identifiable. Pseudonyms will be used to quote a participant (subject) and data would be aggregated.

I also understand that I may decline or withdraw from participation at any time, without negative consequences.

I understand that I can verify the ethical approval of this study, or raise any concerns I may have by contacting the Humber Research Ethics Board, Dr. Lydia Boyko, REB Chair, 416-675-6622 ext. 79322, Lydia.Boyko@humber.ca or Sinead Summerfield | 519-803-6230 | sineadsummerfield15@gmail.com.

Verification of having read the Informed Consent Form:

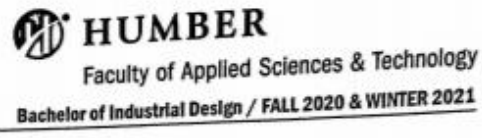
I have read the Informed Consent Form.

My signature below verifies that I have read this document and give consent to the use of the data from questionnaires and interviews in research report, publications (if any) and presentations with the proviso that my identity will not be disclosed. I have received a copy of the Information Letter, and that I agree to participate in the research project as it has been described in the Information Letter.

Sarah Cizej
Participant's Name

S. Cizej
Participant's Signature

Apr 21/21
Date



IDSN 4002 / 4502
 SENIOR LEVEL THESIS ONE & THESIS TWO

INFORMATION LETTER

Conditions of Participation

- ✓ I understand that I am free to withdraw from the study at any time without any consequences.
- ✓ I understand that my participation in this study is confidential. (i.e. the researcher will know but will not disclose my identity)
- ✓ My identity will be masked.
- ✓ I understand that the data from this study may be published.

I have read the information presented above and I understand this agreement. I voluntarily agree to take part in this study.

Sarah Cizej
 Participant's Name

S. Cizej
 Participant's Signature

Apr 21/21
 Date

Project Information

Thank you very much for your time and help in making this study possible. If you have any queries or wish to know more about this Senior Level Thesis project, please contact me at the followings:

Phone: 519-803-6230
 Email: sineadsummerfield15@gmail.com

My supervisors are:

Prof. Catherine Chong, catherine.chong@humber.ca
 Prof. Sandro Zaccolo, sandro.zaccolo@humber.ca



Faculty of Applied Sciences & Technology

Bachelor of Industrial Design / FALL 2020 & WINTER 2021

IDSN 4002 / 4502

SENIOR LEVEL THESIS ONE & THESIS TWO

PARTICIPANT INFORMED CONSENT FORM

Research Study Topic: How may we create a safe, respectful, and eco-friendly alternative for end of life?
Investigator: Sinead Summerfield | 519-803-6230 | sineadsummerfield15@gmail.com
Courses: IDSN 4002 & IDSN 4502

I, Brittany DaSilva (First Name/Last Name), have carefully read the Information Letter for the project **Creating a safe, respectful, and eco-friendly alternative for end of life**, led by **Sinead Summerfield**. A member of the research team has explained the project to me and has answered all of my questions about it. I understand that if I have additional questions about the project, I can contact **Sinead Summerfield** at any time during the project.

I understand that my participation is voluntary and give my consent freely in voice recording, photography and/or videotaping; with the proviso that my identity will be blurred in reports and publications.

Consent for Publication: Add a (X) mark in one of the columns for each activity

ACTIVITY		YES	NO
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Review	I give consent for review by the Professor	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Privacy

All data gathered is stored anonymously and kept confidential. Only the principle investigator /researcher, **Sinead Summerfield** and Prof. Catherine Chong or Prof. Sandro Zaccolo may access and analyze the data. All published data will be coded, so that visual data is not identifiable. Pseudonyms will be used to quote a participant (subject) and data would be aggregated.

I also understand that I may decline or withdraw from participation at any time, without negative consequences.

I understand that I can verify the ethical approval of this study, or raise any concerns I may have by contacting the Humber Research Ethics Board, Dr. Lydia Boyko, REB Chair, 416-675-6622 ext. 79322, Lydia.Boyko@humber.ca or **Sinead Summerfield | 519-803-6230 | sineadsummerfield15@gmail.com**.

Verification of having read the Informed Consent Form:

I have read the Informed Consent Form.

My signature below verifies that I have read this document and give consent to the use of the data from questionnaires and interviews in research report, publications (if any) and presentations with the proviso that my identity will not be disclosed. I have received a copy of the Information Letter, and that I agree to participate in the research project as it has been described in the Information Letter.

Brittany DaSilva
Participant's Name

Participant's Signature

Nov 9/20
Date

