



# Establishing shared positive moments between elderly caretakers and their families

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**Master thesis**  
**By Tsai Cheng(Dora) Ho**



## Preface

I started the project by reflecting on my experience of living apart with family members and think how the interaction happens when one of my family members becomes a caretaker. After graduating from high school, I have been living apart from home for 7.5 years. For the past 1.5 years, I have studied abroad in the Netherlands.

To live apart from my family members, sometimes it can make me homesick to feel the distance that we are on different sides of the earth. With this distance, with the experience of interacting with

family members remotely, I strongly feel the difficulty of connecting with elderly family members, especially when they are caretakers and not accessible with the internet.

After an emergency, my paternal grandfather started to use life-prolonging systems, such as tube feeding, oxygen machine, and need intense care. My maternal grandfather accidentally fell last year, after the accident, he can't walk by himself, thus need to live in the long term care institution.





Some questions hunt me during the process of seeing those happening in my life as a granddaughter. Advanced medical technology can prolong human life. It can be useful if people live happily, with their meaning of life; however, it can also result in a long time for a caretaker to spend in their last stage of life to live in a long term care institution or live with caregivers. A person who becomes a caretaker means (s)he always needs to rely on other people's assistance. Some caretakers lose their hope of life; some informal family caregivers are discouraged from the caretaker's degrading

situation. In this context, I have the vision to bring back the hope and meaning of life to the caretakers by mentally connecting them with people they love.

My paternal grandfather passed away by the end of the thesis, he always inspires me with design ideas, and this time reminds me of how important it is to seize the moments that we can enjoy together.

# Acknowledgments

First of all, I would like to thank my supervisors, though we meet online, we can still spread positive energy with the screen and camera! I enjoy meeting and chatting moments that we can be mentally healthier and learn from each other. Thank you, Marieke, for your support to encourage me to be back to Taiwan and celebrate my grandfather's 100 years old birthday, it is worth and meaningful in my life, and it has done the project connected to my life. And thank you for questioning me on the missing points, it does give me stress, but it made me grow better. Thank you, Froukje for your positive energy and the support, you are always inspiring and can express an in-depth knowledge with simple words that everybody can understand.

Studying industrial design was my dream when I was 13. I am thankful for the SPOSAD program, and the Ministry of Education(MOE) in Taiwan provided the opportunity to make my dream come true. Thank you, Rudolf, for mentoring during the design camp, it has inspired me a lot, and I am glad to keep developing products that can connect older adults.

Working from Taiwan, I want to give big thanks to the support of friends and organisations. Special thanks for Jubo.health, offering the opportunity for collaboration. Thanks, CEO Jessy and HR Peter, for the first meet and the virtual guide of the office. Thank you, Derek, Alu, as design directors to share the knowledge with me. Thanks, Guan-Hua, Shin-en, Ya-Han, for introducing me to Jubo. And thanks nurses Ren-Kang and Wanqiao hospital for providing the resources to research the LTC institution. Thanks to Silver Linings Global and family caregiver association for knowledge support for the project. Thank you, Yen-Ting Chen, Chan Lu, Shin-Ru Wu, Gui-Yi Liao, Mu helping to find the key people to interview and testing; Thanks a lot, A-Gin and your family, Yu-Tzu and your family, Wen-Ying and your family, for helping the interview and testing.

I worked on a thesis from Taiwan alone, but I am not lonely. Thanks, Wen-Ying, Chin-Tang, for mentally and practically and physically support for my life in the past two years, you are the most considerate, supportive, and inspirative designer. Thanks to Chen, Winnie, Schao, and Taiwanese students, support keeping me updated on life in the Netherlands.

A big thanks to my family. Thank my parents for supporting me to study the subject that I believe. Thank you, my sister, for mentally supporting and professionally support, the instant consult with a doctor inspired me a lot with many of my Medesign projects. Finally, I appreciate my grandfather gave me a harmonious big family, love, and care in my childhood. Thank you for all the inspiration you gave me has led me to the elderly design area. Few days after my green light presentation, you graduated from your life, it has been a difficult time for us to lose you, but we will keep up the positive attitude to face any challenges in our lives.





# Table of Contents

<b>01</b>	<b>The context</b>	<b>12</b>
01.1	Aging in place	12
01.2	The interaction with family members	12
01.3	The interaction of an informal family caregiver (IFC)	13
<b>02</b>	<b>Problem Definition</b>	<b>14</b>
02.1	The interaction of a family member who lives apart	14
02.2	The diversity of positive moments	14
02.3	The quality of prolonged life	15
02.4	The design goal	15
02.5	Information technology service in institution-care	16
02.6	The design opportunity	16
<b>03</b>	<b>Project objective &amp; approach</b>	<b>18</b>
03.1	Project objective	18
03.2	Design Methods	18
03.3	The iterative design process	20
03.4	Experience prototyping	21
<b>04</b>	<b>Exploration</b>	<b>22</b>
04.1	Patient journey map of home care context	23
04.2	Problem statements from stakeholders	23
04.3	Insights from patient journey map: Positive moments	24
04.4	Interview related organizations in Taiwan	26
04.5	Takeaways from understanding an Informal Family Caregiver	27
04.6	Observation: Home care and institution care	28
04.7	Takeaways comparing home-care with institution-care	30
04.8	Interview with the stakeholders	30
04.9	Insights from Interview	32
04.10	Takeaways from Interviews	40
04.11	Positioning statement and Design goal	41
04.12	Brainstorming for small ideas	41
<b>05</b>	<b>Conceptualization</b>	<b>42</b>
05.1	Design with the users	42
05.2	Prototype 1: Video eating	43
05.3	Insights from prototype 1	44
05.5	Takeaways and reflections	48

05.4	Concept iterations	48
05.6	Prototype 2 : Autonomy	50
05.7	Insights from prototype 2 (Autonomy)	51
05.8	Takeaways and reflections	52
05.9	Evaluating the current concept from the field	53
05.10	Takeaways from the field research in LTC in Taipei	56
05.11	Redefine the design goal	57
05.12	Story board of the concept	57
05.13	Ideation on the user interface	58
05.14	Prototype 3: Accessibility	58
05.15	Insights from Prototype 3 (Accessibility)	60
05.16	Takeaways from Prototype 3 (Accessibility)	61
05.17	Prototype 4: Non-verbal interaction	62
05.18	Insights from prototype 4	63
05.19	Takeaways and reflections form prototype 4	63
05.20	Conclude from the conceptualization	64
05.21	The experience journey map	66
05.23	The two Scenarios	68
<b>06</b>	<b>Exploratory testing</b>	<b>74</b>
06.1	The goal for exploratory testing	74
06.2	Recruiting participants	75
06.3	Prototype 5, A new family cultural	76
06.4	The exploratory testing set up	77
06.5	Overall result from each of the participants	78
06.6	What went well	81
06.7	What can be better	84
06.8	More to explore	85
06.9	Conclude from the testing results	86
06.10	The final design	87
06.11	The final design experience journey map	88
06.12	Design for future scenarios	90
<b>07</b>	<b>Discussion and recommendation</b>	<b>96</b>
07.1	Project Discussions	96
07.2	Recommendations	98
07.3	Reflecting on the process of project	99
<b>08</b>	<b>Reference</b>	<b>100</b>
<b>09</b>	<b>Appendix</b>	<b>102</b>
A.	Project exploring process	
B.	Project Brief	
C.	Patient Journey map of home care	
D.	Interview participant descriptions	
E.	Concept Sketch	

# Executive Summary

In Europe and Asia, people face a significant aging society (Gilroy, R., 2007). In Asia, Taiwan underlies one of the most aging countries (Chan, A., 2005). To give care to elderly citizens, some Taiwanese elderly people live at home, while others live in a care institution. For those who live in institutions, they may lose the connection with their family member. Some problems were defined in the context:

- 1) Due to distance, busy work, or Covid-19, when visiting is not accessible; young people can't see caretaker.
- 2) Elderly people may not be familiar with a touchscreen, which lead to a barrier with younger people
- 3) Residents who newly moved to an institution lose the connection with their family members, and have less and less shared moments with their family

The objective led to the design goal :  
Establishing shared positive moments between an elderly caretaker and family members.

This thesis involves exploration, conceptualization, and evaluation phases. An iterative design approach was taken to gain relevant insights from the user and context in the conceptualization phase. Several experience prototypes (Buchenau & Suri, 2000) were designed and made to understand the current context and user experience, evaluate ideas, and

communicate with stakeholders.

The exploratory activities had lead to the main insights:

- 1) Elderly people who live apart from their families experience a happiness drop after a big family meeting.
- 2) The camera position affects the engagement of a video call.
- 3) Elderly caretakers rely on a caretaker's help to contact. They may lose their one on one personal relationship after they lose their autonomy of reaching people.
- 4) The usability problem for Elderly people to interact with a smartphone can be lead by the lack of haptic feedback on buttons, less agility on fingers, and the massive information on the screen.
- 5) Remote talking with visual reference is a handy way for young people; it triggers more shared topics to talk about with elderly people.
- 6) Elderly people can be engaged more in family members' life from video calling.

Thus, I envision the future scenario to have more tiny enjoyable moments for an elderly caretaker to establish shared moments by video calling with family members.

"Tiny Moments" is a product-service system design that comes out of the project. It involves a control panel and a software concept. It establishes the connection for elderly caretakers and their families enables more engagement for each other's lives.

The research led to five scenarios of use in the future:

- 1) Providing for confidence with a better look for an elderly caretaker
- 2) Remote selfie with beautiful scenes
- 3) Picture as a reference to talk about (Family members)
- 4) Activate a link again
- 5) Polite refuse when busy

For elderly caretakers, the shared positive moments can bring them to the novelty of family members' lives, have more bonding from loved ones; for family members, they bring memorable moments for them. For family members, it brings the moments, and the pictures can be the memories in the future.





# 01 The context

## 01.1 Aging in place

With the advance of medical technology and better public health, the world is facing the population aging. Europe and Asia are facing a significant number of public aging (Gilroy, R., 2007). The increase in life expectancy in Singapore, Japan, and Taiwan underlies the rapid growth rate of the aging population (Chan, A., 2005). Taiwan will encounter a super-aged society by 2025 (Yi-Yin Lin, n.d.), the Ministry of Health and Welfare in Taiwan has implemented a new act, Long Term Care 2.0, to respond to the aging society. One of the goals is to enable older adults to grow older at their home and community, so-called aging in place (Shwu-Chong Wu; Kun-Yang Chuang, 2001). Aging in place has been an excellent choice for the elderly to enjoy their life, it creates a feeling of connection with family and their familiar surroundings (Wiles et al., 2011).

To age at home, it is common to hire a foreign caretaker to take care of the elderly at home in Taiwan (Chiou et al., n.d.), and some also have a family member become an informal family caregiver (IFC), to coordinate and accompany with the caretaker (Linderholm & Friedrichsen, 2010). To age in an institution, there will be formal caregivers and healthcare professionals, the family members can visit them if they have time.

## 01.2 The interaction with family members

In a home care context, one of the family members will take the role of an IFC, who represents the big family for providing care to the caretaker, will assist the foreign caregiver, and coordinates the family members' opinions decisions. The different roles have made interactions different. For an IFC, the workload can be intense since it can be a 24/7 with no experience and uncertainty (Janze & Henriksson, 2014). Previous research described it as an "Unexpected career" since the IFC seldom prepared for the new role (Carol S. Aneshensel; Leonard I. Pearlin; Joseph T. Mullan; Steven H. Zarit; Carol J., n.d.). Also, most caregivers regard caregiving as a full-time job, with the responsibility of their loved one's life (Sawatzky & Fowler-Kerry, 2003). For family members, many young people don't live in their hometown after they start their studies, work or new family life, elderly people who live in their home town have less opportunity to interact with their offspring. Interestingly, in China and Japan, there is a similar relationship pattern for grandparent/grandchild with Taiwan. The relationship is described as non-judgmental love and attention, since people may take care of their grandchildren when they are little. (Report: Transformation - Studio D Radiodurans, 2017) For a foreign caregiver, though they do not have a blood relationship with the caretaker, she/he spends the most time with the caretaker, and also live with the whole family for several years.

### 01.3 The interaction of an informal family caregiver (IFC)

There are some barriers lead to lower quality of interaction between an IFC and an elderly. First, for the IFC, the intense stress of caregiving for a loved one can lead to low qualities of interactions between an IFC and a caretaker.

Previous research indicated that an IFC feels that they have the social responsibility to hide their negative emotions in front of

a caretaker (Linderholm & Friedrichsen, 2010). The suppression of low mood causes the lower mental health of the caregiver (Khalaila & Cohen, 2016).

With Long Term Care Plan 2.0 in Taiwan, part of IFCs' workload can be shared by formal caregivers or the daycare centers. IFCs can focus more on providing the quality of interaction with their loved ones.

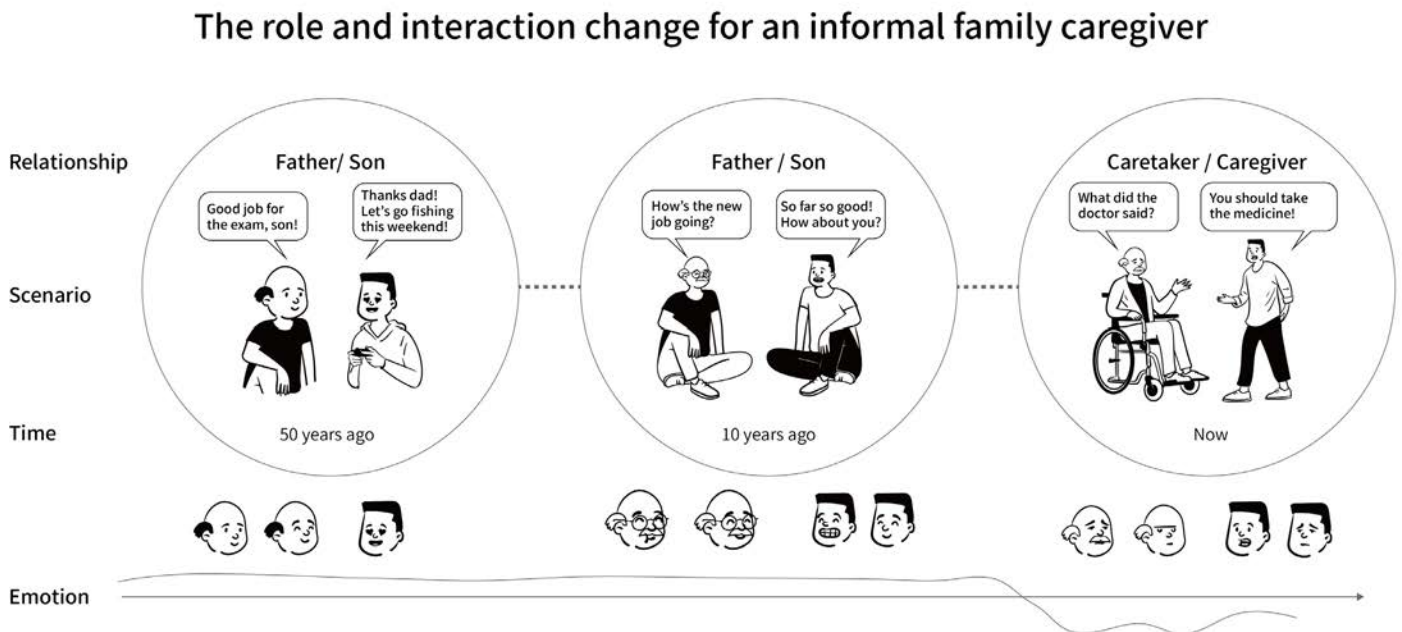


Figure.1-1 The role and interaction change for an informal family caregiver

# 02 Problem Definition

## 02.1 The interaction of a family member who lives apart

It's difficult for the elderly who live alone to interact with family members. First, a smartphone is the leading portal and the handiest way for family members to receive a message (Ahn & Jung, 2016), but it is not what they are familiar with. Also, the health situation of the elderly differs from each case. It's hard for them to use a single device to fit all circumstances. As a result, the quality of interactions between family members and the elderly becomes lower. The initial problem defined in this question is: How to enable a caretaker to keep in touch with each others? (Figure 2-1)

## 02.2 The diversity of positive moments

The definition of "positive moments" differs between people and culture. There are different ways for people to express affection to family members.

In terms of personalities, some like to talk and share a lot, while some may prefer to sit and say nothing.

In terms of cultural and social aspect, we can see the greeting sentences in different languages can such as "How are you?", "Bonjour", "Hola", "こんにちは", which have similar meaning of asking the recent situation. However, compare to the greeting in Taiwan, the greeting is more specific, and practical. Elder people in Taiwan greet people by saying: "tsia'h-pá--buē?" in

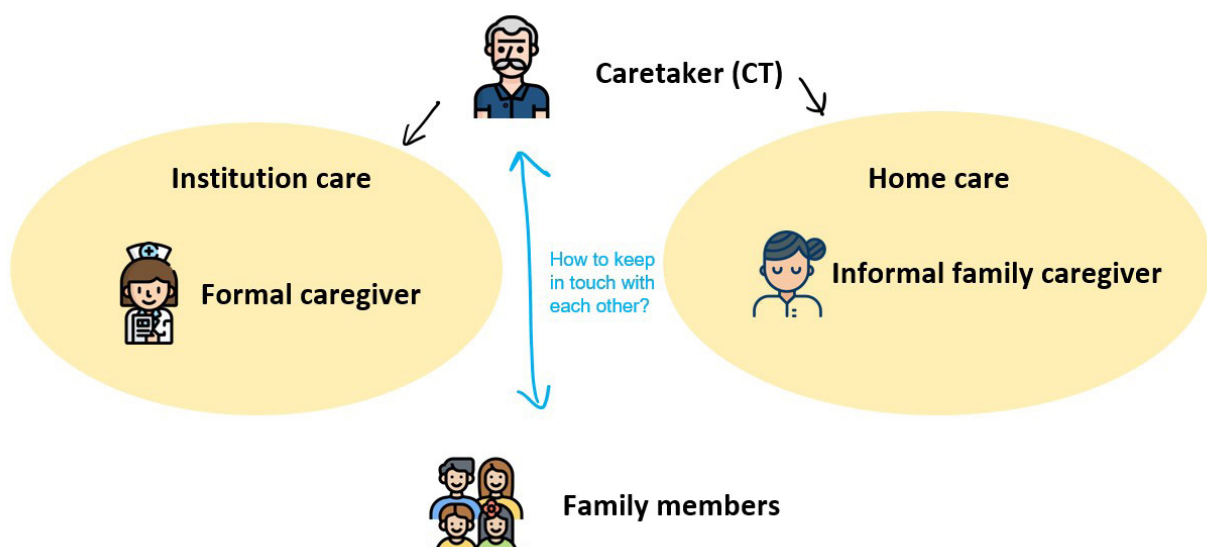


Figure 2-1. The research question in the context



Figure 2-2. A context of "tsia'h-pá--buē?"(Have you eaten yet?) greeting with neighbors - photograph next to my grandfather's house.

Taiwanese, which means "have you eaten yet?" for greeting. Lian Heng (1918) describe it as a cultural background that it is difficult to get food in the early time period in Taiwan; If people have not eat, they invite people to come to their home and have meals together (Li Xianzhang, 1978). Untill now , people in Singapore (Teo Jez tine,2018) and from my observation, senior people who speaks Taiwanese in southern Taiwan greet with the same sentance with family or friends (Figure2-2).

It is essential to find how people interact and greet, and to explore more about the nature of family interactions in social aspect and bring insights to the design concept.

### 02.3 The quality of prolonged life

In this context, I have the vision to bring more shared positive moments with family members and the elderly. I believe the meaning of caregiving for a loved one is not only to prolong a person's life but also to have a meaningful experience and interaction with the loved people.

### 02.4 The design goal

The goal of design the following: "Enabling shared positive moments between an elderly caretaker and family."

## 02.5 Information technology service in institution-care

In LTC institutions' service system, Jubo.health currently provides an information platform for the formal caregivers showing the caretakers' health situation in the institution. With this information, the formal caregiver can give the family members messages and feel more relieved. However, the current information the family members can receive is mainly the figures such as blood pressures, heartbeat, etc., which only shows the signs of life. Jubo's current challenge is how to use information technology to enable the elderly who live remotely with his family members to keep connect with their family members and healthcare professionals.

## 02.6 The design opportunity



Jubo.health (Jubo) is a digital healthcare solution that centers on collecting, analyzing, and reporting the seniors' healthcare data. They deliver an exceptional care service experience for the caregiving institutions.

Jubo has the strength of developing information technology services. Jubo lays the role of an information service provider based in Taiwan for long-term care institutions aiming to connect people by connecting data.

Jubo's current clients are mainly the care institution service, which helps communicate between formal caregivers and between caregivers and caretaker's family members.

The current service Jubo provides the formal caregivers to get information about the caretakers and deliver health information of the caretakers to their family members (Figure.1-4). Their current challenge is to develop a design concept to enable elderly caretakers and family

members to live apart but feels together. From Jubo's website, the current information Jubo provides with family members is about health conditions and the photos of activities the caretaker experience sent by formal caregivers in the care home.

Contacting notes:

Jubo is fascinated with the design direction this project proposed: to provide a sense of connection with their family members.

In this project, Jubo plays as a partner to connect research resources in a care institution and a potential company to collaborate to implement the design.

Discussing with the design team, we agree on the vision to design something that can enable both family members and the elderly to interact remotely, which can also enrich the interaction experience when they meet face to face. I saw an opportunity to provide the warmth and love for family members in institution care.

Jubo thinks it can be a futuristic portfolio for them, and can also be a start-up company I build to collaborate with them. Since I am developing an experience design, it can include software and physical interactions. Jubo is the leading brand to provide software service informal caregiving context. In this project, I position myself as a start-up company that can have a partnership with Jubo.

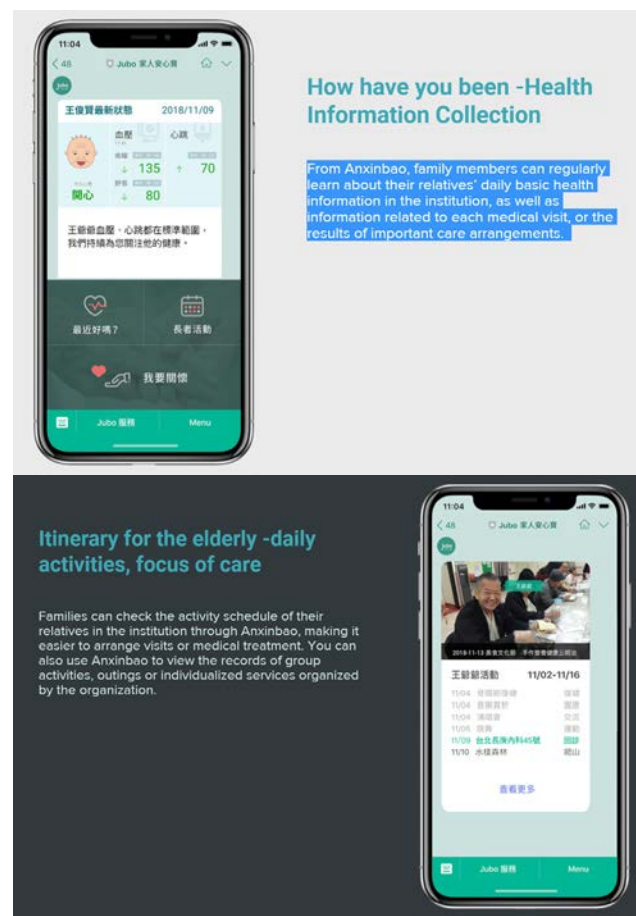


Figure1-4. The service Jubo provides with family members, health information of a caretaker in a messaging app - Screen capture from Jubo's official website, translated by Google Chrome.



# 03 Project objective & approach

## 03.1 Project objective

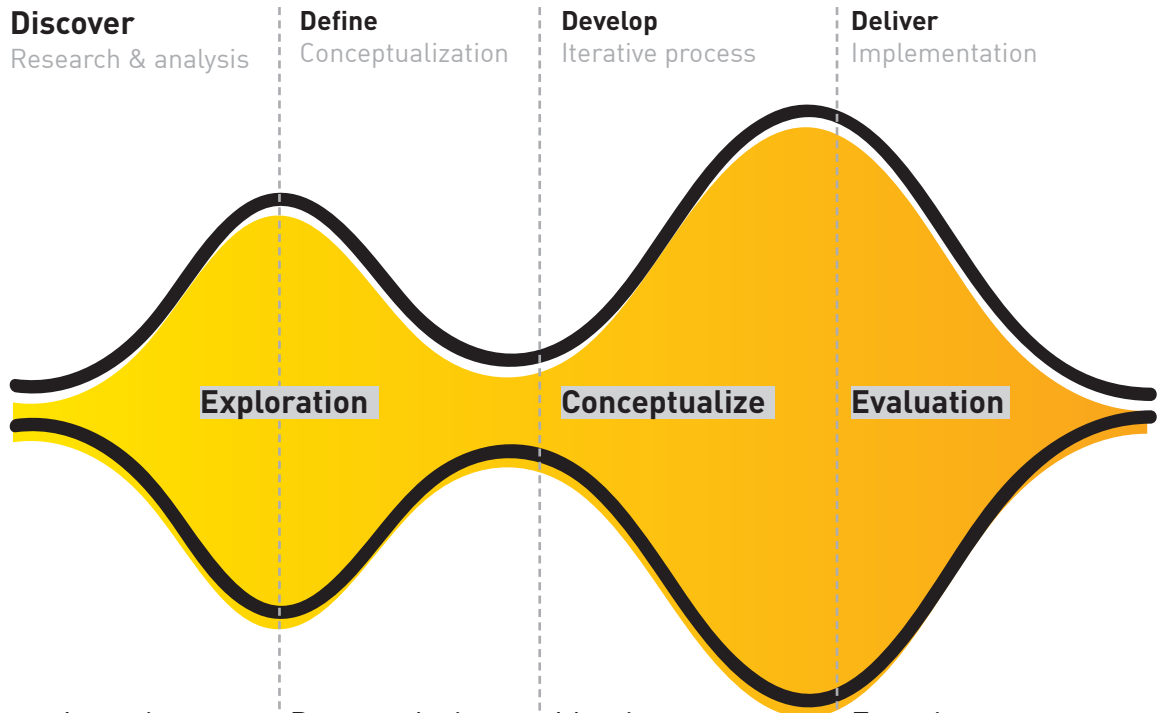
**"Design a product for establishing shared moments between family members and elderly caretakers with quality interactions."**

In the caregiving context, I saw a design opportunity to increase the quality of interaction with the family members, to make the prolonged life of the elderly more meaningful. The design goal is: "To create shared positive moments between family members and elderly caretakers with quality interactions."

## 03.2 Design Methods

In this project, the outline of the research applied a double diamond approach. To find a feasible way of establishing positive moments in a caregiving context, I will use qualitative design methods such as interviews, observations to collect the data. Then by clustering the findings, naming the findings to upper-level insights, and do ideations based on the insights. In the developing phase, an iterative process with experience prototype will be used to gain insights from the user experience and to contextualize the design concept. For the evaluation phase, the design solution(s) was tested in the context in a more extended time period. After gaining insights from users, some future scenarios of use were generated and visualized to communicate with users and stakeholders.





**Exploratory activities**

Interviews  
Observations  
Statement cards

Data analysis  
Brainstorming  
Field evaluation

Ideation  
Experience-prototyping

Experience-prototyping  
Visualizing future scenarios

**Exploratory questions**

**Exploration phase**

- What is the care context in Taiwan?
- What are the different aspects of home care and institution care?
- How can we create meaningful interactions for a caretaker and an Informal Family Caregiver?
- What are the nature of family relationships in families in Taiwan?
- What are the positive moments for an elderly and his/her family members?

**Conceptualize phase**

- How will elderly people interact with a video eating experience?
- How can we enable elderly people autonomously to make a video call?
- How to enable elderly people to interact with a touchscreen?
- How will elderly people interact with video calling without talking, but a non-verbal way to shared moments remotely?
- What will be the new culture if we enable an elderly caretaker to catch a video calling from family members?

### 03.3 The iterative design process

The process of conceptualization is to do fast-paced, explorative prototypes, and test them in the context with users (Figure 3-1). The goal of doing the prototype is not for the final proof of the concept. It is more likely to explore design opportunities, gain more understanding of the stakeholders, and learn more about how users interact with the designed artifact.

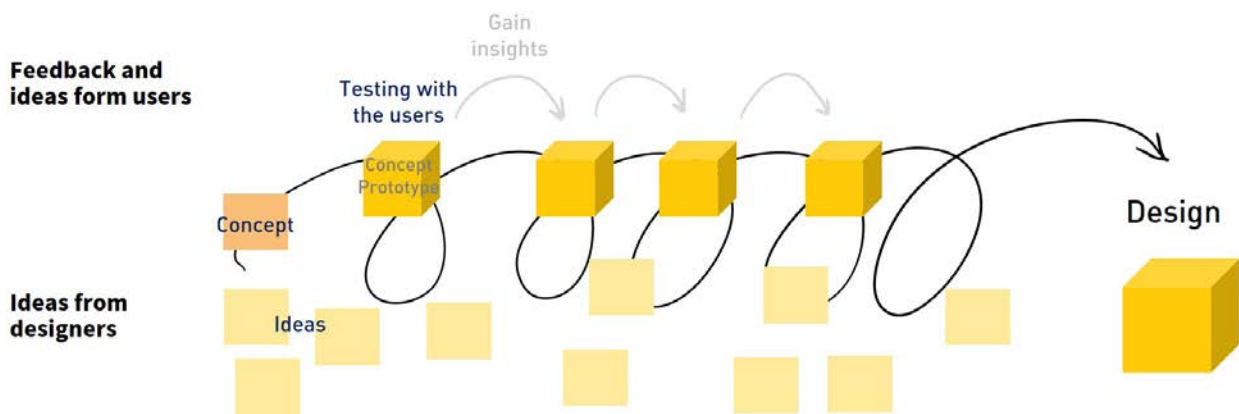


Figure3-1: The iterative designing approach

### 03.4 Experience prototyping

The definition of concept prototype in this research does not mean that it should be a tangible object, it can be any measures that enable users to experience the aspect(s) of a design concept with experimental goals and assumptions behind the prototype. Buchenau, M., & Suri, J. F. (2000) defined it as "Experience Prototype" that helps designers:

1. Understand the existing context and user experience
2. Explore and evaluate design ideas
3. Communicate ideas to user or stakeholders

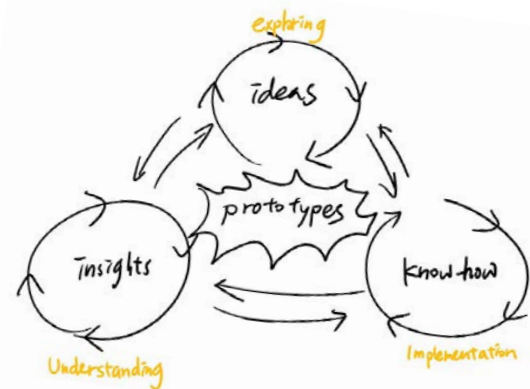


Figure 3-2: the role of experience prototypes in this project

## 04 Exploration

In the exploration phase, several qualitative research activities were conducted to get insights from the context. The first part I observed from home care was that I compared a home-care and an institutional care context. After having some questions in the real context, I conduct several interviews with formal caregivers, informal family caregivers, and family members who live apart.

For the exploration phase, there are some exploratory questions:

- What are the natural relationships people have in families in Taiwan?
- What are the positive moments for an elderly and his/her family members?
- How does an informal family caregiver adapt to his/her new role?

### 04.1 Patient journey map of home care context

I started this research from the observation with my family. After an emergency occurred, my grandfather started to use a life-prolonging system and need to be taken care of carefully. I started with my family member's observation, interview with a doctor, and literature reviews about the context. In a home care context, there are multiple stakeholders, including a caretaker, a foreign caregiver, an informal family caregiver, and healthcare professionals. The research started with observing a big family and interview with the caregiver to know more about emotions. After that, several conversations with a General Practitioner (GP) provide more about the medical context and a healthcare professional's viewpoint. The patient journey map illustrates the interaction in this caregiving context. (See the full journey map in Appendix) From the journey map, I found that the informal

caregiver takes the role of communicating with other family members and is responsible for the caretaker's decision making. The caregiving becomes more stressful, and the emotion line drops down to negative.

### 04.2 Problem statements from stakeholders

Informal Family Caregivers

- After the caretaker's hospitalization, the work of IFC is high, not only for physical activity but also for mental stress.
- The IFC's role-switching from family members to a caregiver can make him/her lost the nature of interaction with a family.
- The current situation for the caregiver is Unwanted, Unspoken, Unseen, and Unsupported (L. Parameswaran, 2017)

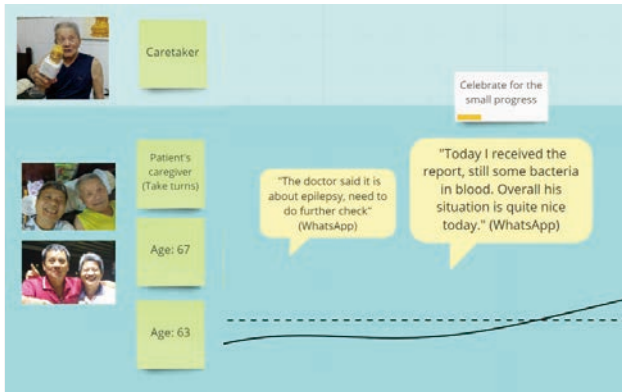
Foreign caregiver

- Higher physical activity

Elderly Caretakers

- Resistant to the medical equipment
- Negative emotions to adapt to the health situation

### 04.3 Insights from patient journey map: Positive moments



#### Celebrate the little progress.

One of the differences in taking care of a child with the elderly is that children will get better skills when they grow up. But for the elderly, it is already a great success to keep the current situation. Encourage the caretaker and caregiver to celebrate the success of being the same!



#### Family members show appreciation to the IFC also provides positive words for the caregiver.

Since the caregiver also communicates with family members. In urgent situations, an IFC can be very intense and stressful when emergency things happen. The appreciation or any positive feedback from family members will be a relief.



#### Family members' backup for the decision

Since the caretaker can not express an opinion in some situations, it is essential or the IFC to get other family members' backup for the decision he/she made for the caretaker.

**Caretaker**

"Can you help me to remove the glove?" (told to the caregiver)

Shows respect to the caretaker.

Give autonomy (remove the glove)

**Patient's caregiver (Take turns)**

Age: 67

**Give autonomy and respect to the caretaker.**

Even though his health condition is not alright, the caretaker still has a clear mind and needs to be respected and wants to be autonomous for his life.

**Caretaker**

"I feel I am ready to die but I can't." (Chat with the caregiver)

Talk about past, Shows respect to grandpa's philosophy

**Patient's caregiver (Take turns)**

Age: 67

**Talk about the past**

The difference between a formal caregiver and an IFC is that IFC has the experience and the memories of living with the elderly, they can talk more about the past and use what the elderly caretaker said before to encourage him.

**Patient's caregiver (Take turns)**

Age: 67

Age: 63

**Patient's family member**

Children  
Male: 73,66,63,62  
Female: 77,69

**Think about the future and prepare for that**

For the caregiver and the family member, taking care of elder loved ones is a high-stress work since they never know when they may lose him/her. The uncertainty and panic in every emergency had led to their mature thinking about the future, and let them discuss more on different scenarios. The caregivers want to feel more prepared for the future.



## 04.4 Interview related organizations in Taiwan

To gain more understanding of the Taiwanese context, I contacted some organizations in Taiwan in related areas to interview them and get inspiration from the organizations that know the current situation.

### Taiwan association of family caregiver



There are two primary goals for the organization: innovating new service and promote new ideas about the act and policy to the government. One is to innovate some further service for the caregivers. For example, the service is a caring café, helps them reduce the stress; and designs a website tool to help family members discuss caregiving (mostly the practicalities, such as financial). Their main objective is to gain insight from their service, know caregivers' needs, and promote new acts and policies.

#### Meeting takeaways:

I talked with the person who represents the service innovation team. She gave me inspirations about the family caregiver's mindset. Some people may get too stressed by the intensive tasks, but they may not regard that as a responsible work but something they should do because they love him/her. Thus a family caregiver needs to distinguish that "love and "task" in family caregiving are two different things, like on the two sides of a seesaw. A family caregiver needs to find a balance with both sides, then s/he can enjoy the caregiving.

### Silver Linings Global (SLG)



Silver Linings Global is a social enterprise that encourages innovations to address the rapidly aging trend's emerging needs. They play the role of a bridge and bring state-of-art changes and knowledge to the healthcare industries around the world to the Taiwan government and local industries. They also conduct a design challenge to encourage innovations that address the need for an aging society with Stanford longevity center.

I interviewed Deborah Yang, one of the CEO of SLG, who has experience in visiting the aging innovations and caregiving institutions around the world every year. We discussed the project. She provides some cases for inspiring.

#### Dignity in care:

A caregiving company in Belgium. They have the vision to think of caregiving as a 23+1. It means that every day, they should pay 1 hour on the intensive care they should do, and the rest of 23 hours are about living their life, it should be meaningful and should be like a human.

News for the Ages(by Memory well): They do not see seniors as patients, but

every person has meaningful life stories. Communication for the Ages was founded to enhance person-centered care through life storytelling.

Meeting takeaways:

The two cases that Deborah shared with me brought her point about the elderly-centered design mindset. Despite thinking about how to give better care from a service provider side or how to make sure the elderly are safe and healthy from a family member's viewpoint, Deborah reminded me that it is essential to bring meaningful interactions for the elderly.

## 04.5 Takeaways from understanding an Informal Family Caregiver (IFC)

### 1. Distinguishing love and care

For an IFC, the need to be clear about love and care are two separate parts and make the right balance.

### 2. Meaningful interactions in caregiving

In the caregiving context, more innovations focus on efficiency, accuracy, to provide care. However, to stand in an elderly caretaker's shoes, what they desire is about dignity and being respect

### 3. Relationship with family members

For an IFC, the communications with family members living apart are quite remarkable. The appreciation and the backup of decisions from family members can support the family caregiver.

## 04.6 Observation: Home care and institution care

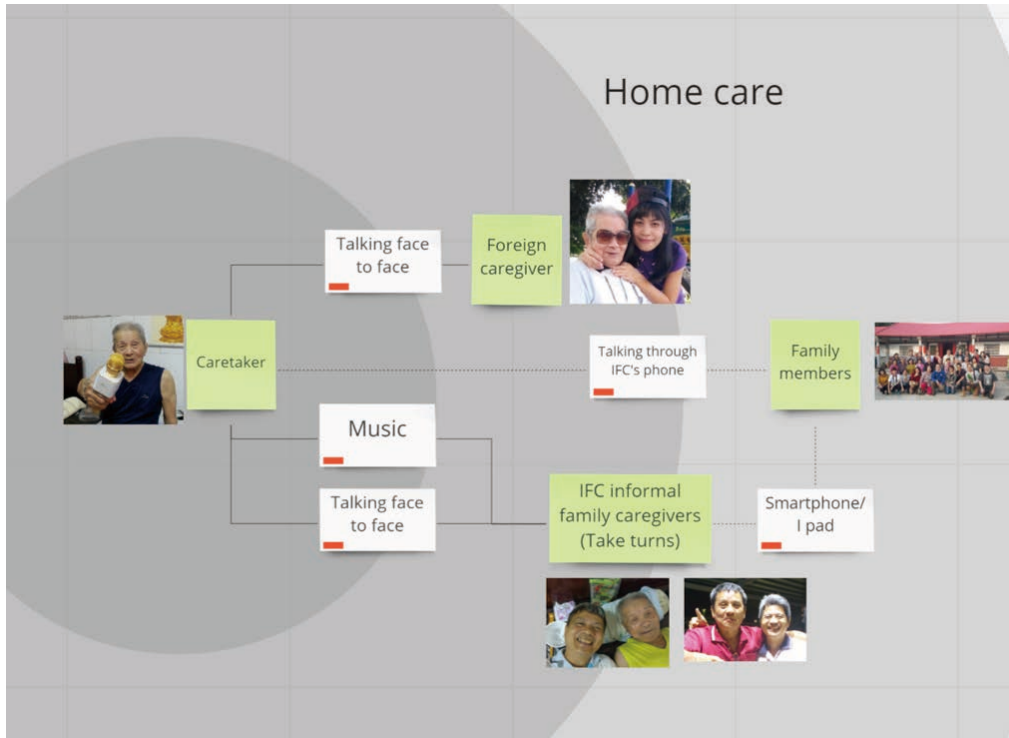


Figure4-1 : Stakeholders in home-care

### Home-care

A caretaker with a confirmed need from a doctor is allowed to hire a foreign caregiver in a home-care context.

- Foreign caregiver as a family-member-like relationship

A foreign caregiver can live in a family for several years (in this case, five years until the caretaker passed away). Some foreign caregivers are fluent in the language the family speaks, but some may have difficulty communicating with them.

- Live with one of his child's families.

Typically, a caretaker lives in his home, some with one of the CT's sons/daughters' families. Other family members will come to a caretaker's place for family reunions, celebrate for birthday.

### Positive moments in home-care

- Children/grandchildren visit quite often
- More people take care of him (foreign+ family caregiver)
- Neighborhoods and relatives will greet and visit anytime
- Sing songs with family members
- Video calling
- Birthday party
- Can meet everybody on national holidays



Figure4-2: Home care context

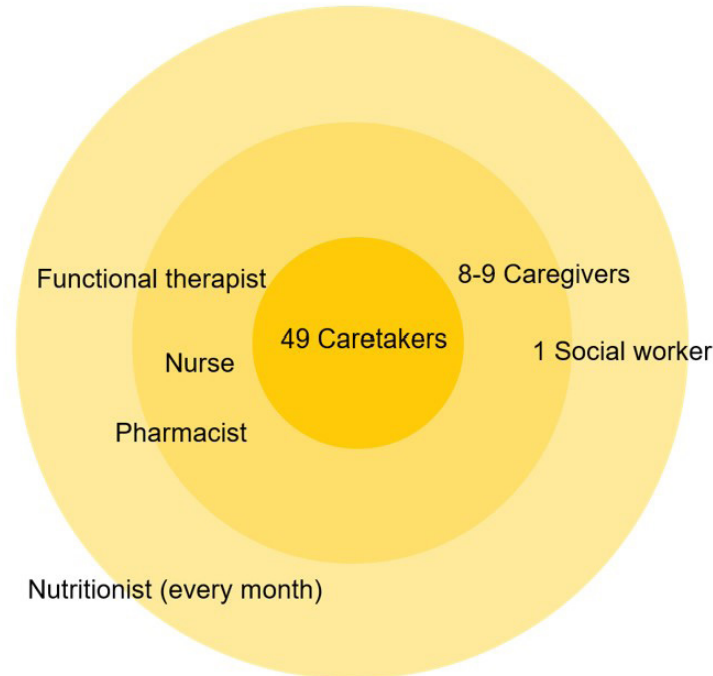


Figure4-3:Stakeholders in an institution-care

### Institution care

He fainted two times, and he can not walk anymore. He is reluctant to live in the institution, but he understands it is safer to live there.

There are three people in the room, speaking different languages. He was talkative before, but now he has no friends there.

The formal caregiver provides meals for caretakers. Caretakers can ask for different food if they have additional needs.

The institution is next to a hospital. If they need to go to the doctor, the formal caregiver will inform the primary contact family member, then bring the caretaker to the hospital.

Due to the Coronavirus epidemic, family members are not allowed to visit the residents in the care institutions and hospitals.

### Positive moments in Institution-care

- Eating exceptional food from the institution
- Listen to radio
- Watch TV program
- \* Family members visit
- \* Activities from some outside organizations
- \* During Corona situation is not possible



Figure4-4: Institution care context



Living at home with family



Living in the institution alone

Figure4-5: The comparison of eating in a home care and a institution

## 04.7 Takeaways comparing home-care with institution-care

### 1. Both are accompanied by an unfamiliar person

At institution-care, caretakers interact with formal caregivers; At home-care, with foreign caregivers. Both are people they may not know before, and some may not speak the language they understand.

### 2. Accessibility to people

At home-care, family caregivers and foreign caregivers have closer contact with family members.

Caretakers can experience significant and small decisive Moments with family members. For institution care, caretakers can only passively be visited, to see people they love.

### 3. Time spent by a caregiver

In home-care, foreign caregivers spend 24 hours a day for caregiving; however, in institution-care, a caregiver is responsible for 5-7 caretakers. The time spent on each person is much less comparing with home-care.

## 04.8 Interview with the stakeholders

The insights above led to further exploration questions in an institution context:

- What are the positive moments for a family member?
  - What are the positive moments for a family caretaker(coordinator)?
  - What is the desired caretaking experience for the elderly who live in a care institution?
  - How can we provide a positive experience of caretaking at home for the elderly who live in the institution? (especially when family members can not visit the institution)
- To explore the questions above, some interviews were conducted with the stakeholders in the context are informal family caregivers, family members, and formal caregivers.



## Participants

- Informal Family Caregiver (2)
- Family members (7)
- Formal caregiver (3)

(The details of each participant see Appendix)

## Recruiting participants:

For recruiting interview participants, I describe the context and ask if there is some friend who has their family member currently living in the institution, or someone who is a formal caregiver. I post on my page on social media, which only my friend can see.

## Interview questions

### Interview questions for a family member

[Basic info]

- What is the health situation of the caretaker?

- How will you describe your relationship with the caretaker?

[Current interaction]

- Is there something that the caretaker regularly does in a day?

- How do you contact the caretaker before the outbreak of the virus?

- What is the last time you both feel happy when you met the caretaker face to face?

- Is there a sad story that you want to share?

[Express concern without meeting face to face]

- How did the interaction between you and the caretaker change after the restriction of visiting the caretaker?

- How do you contact him/her when you can not visit there?

- Is there something that makes you feel you are mentally closer to him/her when you are not there?

[Imaging the future]

- If the caretaker can use a smartphone, what will be the first thing you want to do with him/her?

- How will you keep interact with him/her?

### Interview questions for formal caregivers:

- How long do you do this job?

- Where do you often do your job? At a caretaker's homes or in hospitals?

- Are there any other people working in this context? Can you describe what it looks like for your day of work?

- Is there any caretaker that makes you impressed? What happened?

- Have you ever observed the interaction for the caretaker with their family members? How do they do it?

- Is there some happy story that you can share?

- Is there some sad story that you can share?

- If the institution or the government can change something, what do you think will helps most?

[Imaging the future]

- Imagine one day you also need caregiving, what would you expect?

- How do you want to maintain the interaction with family members?

### Interview questions for an IFC

- When do you start the caregiving?

- Are there any different interactions for you with the caretaker after caregiving?

- What is the happiest moment with the caretaker?

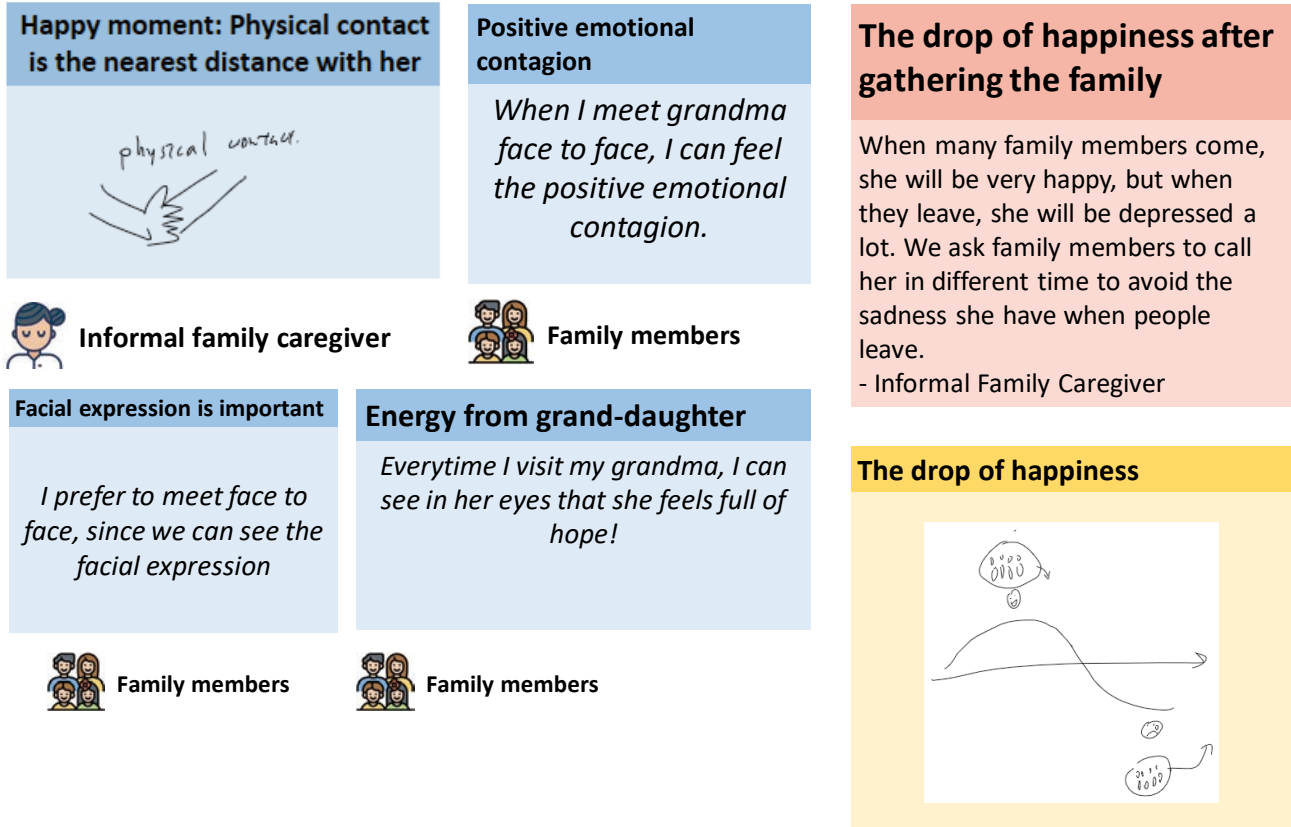
- Is there any sad moment with the caretaker?

- What is the last time the caretaker feels happy, what were you doing then?

- How do the caretaker contact with other family members?

## 04.9 Insights from Interview

### Insights about family interactions with in-person meet



#### Be there

For interacting with family members, facial expressions, the vibe, the energy from grandchildren, and the positive emotional contagion is crucial for caretakers. For interaction with the informal family caregiver (IFC), physical contact can shorten the distance of them.

#### The drop in happiness

When many family members visit the elderly caretaker, she feels happy, but when they leave, a caretaker feels more depressed. Diener, Lucas, & Scollon (2009) define the Hedonic treadmill: Happiness can be affected by both good and bad things. However, people adapt to the happiness quickly. However, in this situation, caretakers experience the drop after the Hedonic treadmill.



Quotes from interview

Findings from me

Idea

### The motive force of rehabilitation from family

*The caretaker need to have the willingness to stay healthy habit. The motive force can be family member's encouragement.*



Caretaker (CT)

### Remember me 🎵

*I feel that she needs to feel people care and remember her.*



Family members

### Food is the most important thing

*After her situation turns worse, she seldom reply us. She only reply one question: do you want to eat steamed bread? (Her favorite food)*



Family members

### Cooking as a ritual

*Cooking is one of the rituals for my grandpa. It's also the way he shows love to cook some warm food for my grandma.*



Family members

### Food as a common topic to talk about

*The ritual of my grandpa is to cook. They often ask if I have meals yet. We don't have additional topic to talk about.*



Family members

### Talking about food

*If I can't go to see my grandparents, I will call them, asking: " have they eat meals yet?"*



Family members

### Remember me: the need to receive some affections.

The elderly caretaker needs to feel the concern from people. The sense of being concerned with people they care about can increase their willingness to live, which can encourage them to improve their health.

### Food as a common topic to talk about

"Did you eaten yet?" is the local way of greeting in Taiwan. Food is also a common topic to show concern with a loved one. Also, eating together is an everyday activity to do with family members.

## Opportunities for positive family interactions in distance

### Video calling

*If my grandma can use a smartphone, the first thing I want to do with her is to do video calling*



Family members

### Video calling

Some people can't hear clearly, I will use video calling for them to talk with their family members



Formal caregiver

### Video calling is the best!

*I love to meet face to face, but if I can't be there, I would like to do video calling with them if the internet is stable*



Family members

### Memories through multi-sense

*She lose the ability of see, but she can recognize people from their voice.*



Family members

### Video calling makes it less distance

*I feel that video calling makes it less distance, and my daughter is more polite than talk to me face to face.*



Family members

### Strong depression to say goodbye to family

*When many family members come, she will be very happy, but when they leave, she will be depressed a lot. For her birthday party, the alternative is to ask family members to call her in different time (The days before her birthday), so that she can be happy during the call, and not being too sad when people leave.*



Family members

### Video calling makes the distance closer.

Video calling reduces the distance among people when they interact with a family member remotely. Moreover, it provides fruitful interactions than traditional calling since facial expressions, and small actions are also visible. The barrier to video calling with an elderly family member is that they need other people's help to use a video calling device.

Quotes from interview

Findings from me

Idea

**Distance makes relationship beautiful**

*I feel that distance can make the relationship better. My daughter lives in different country, everytime she calls me I can feel that she miss home a lot. If she lives with me we conflict with small sthings.*



Family members

**Sharing food**

*I will drive to take my grandparents travel every weekends. Sometimes share food with them.*



Family members

**Share the happiness**

I like to share happy things with my family who lives apart, but I tend to hide the negative emotions.  
– Family member



Family members

**CT feels precious to receive people's calling from far away**

*Grandma received my brother's calling from Australia, she feels so happy.*



Family members

**Transparent interactions with family members in the caring center**

*For some case, the family send every meals here, but some family seldom come.*

*If I have time I will give more assistance to those who are alone, to be accompany with them.*



Formal caregiver

**Remote greetings are more enjoyable**

The distance can also make the relationship beautiful, and people feel it more precious to receive greetings from a person who is far away.

**Food and eating as a connection with people**

Food can be a medium for people to show love. When people are having meals, it is one of the best moments to connect with people.

## Insights about The positive moments for a caregiver

**Caregiving as a return of you grow me up before.**

*She felt sorry for her situation to us sometimes, but I feel thankful for her about how she take care of me when I was a child.*



Informal family caregiver

**Formal CG: More close than family**

*There was a grandma said: I found that you treat me better than my daughter. I feel that I am just doing my job, to express my concern.*



Formal caregiver

**The accomplishment comes from the deep thankfulness from CT**

*Once I helped a grandma to clean her foot, she feels so happy and has a long time not having clean foot.*



Formal caregiver

**The feedback and thankful from CT**

*The detail actions of caregiving is an important process to let the caretaker feel be concerned.*



Formal caregiver

### **A fulfilling caregiver**

Caregiving can be happy when the caretaker shows accomplishment to the formal caregiver. For an IFC, they feel caregiving is a return of his/her loved one.

Quotes from interview

Findings from me

Idea

### Infinite the responsibility is not healthy for a IFC

*Reflecting from my family's situation, since they have more emotional connection with the CT, IFCs tend to have more concerns on the responsibility of the caring, with the expectation from other family members.*

### IFC as a responsibility

*I feel that I've already done all the work that I should do.*

### Less emotional connection, less pressure and clear duty line of caring.

*I feel that when IFC don't have a close relationship with the CT, they have less emotional connection with them, and with less mental and moral pressure. They can be clear about the duty of caring, what they should do.*



Informal family caregiver  
(less emotional connection)

### Formal CG: This is just a job, she works with less emotional connection

*The formal caregiver seldom active contact clients, her clients are from previous patient or the nurse lead.*



Formal caregiver

### Task-focused v.s. Emotion-focused

For a formal caregiver, he/she take it as a responsible work with less emotional connection. For IFCs, some regard their work as a responsibility: they tend to be more explicit about what they can do and what can not control, while others show emotional bonding, they tend to give caregiving the responsibility, which can make them feel stressed.

## The family interactions in a care institution

### The need of contacting family members

There are two situations that the caretakers need to contact their family members:

1. Need some stuff that need their family members to buy for them
2. New residents, they miss their family members a lot

- Head of nurse

### In the corona virus situation, patients' family member can't visit them.

If one can use smartphone, they will contact their family members, but if they don't, Their family member will call me, and I will take my phone to the patient and let them talk to each other.



Formal caregiver

### An alternative to meet during Covid-19



In care institution, they encourage video calling instead of meeting in-person during Covid-19 situation, however the caregivers are not accessible with smartphones. - Observations

### Current interaction: Formal caregivers borrow their personal smartphone to the caregivers for video calling.

Sometimes family members will ask to video calling with the residents, I will use my smartphone and my personal account for them to call. They talk and see each other, then the family member feels relieved. It lasts for less than 5 minutes. - Formal caregivers in Taipei and Chiayi



Formal caregiver

### I can assist them maximum for 5 minutes

I think I can assist them if they have some problem on the device, maximum for 5 minutes.



Formal caregiver

### Video calling as a rigid demand in care institution

Formal caregivers identified the need for video calling now in the care institution, primarily for the COVID-19 situation.

### Limited time for assistance

Formal caregivers have limited time for assistance video calling since they borrow their phones for the caregiver's calls and wait there until their calling end.

Quotes from interview

Findings from me

Idea

**Lose 1 on 1 Personal relationship**

Sometimes I want to talk directly to my grandma, but my aunt is the caretaker of her, and she will listen to what we are talking about.

**Privacy for the elderly?**

They elderly don't have privacy and their personal relationship with their family or friends.



Figure 4-6. A personal experience of interacting with a caretaker with people's assistance

**A caretaker's relationship relies on assistance.**

The limited access to contact a caretaker somehow reduce the interactions for an elderly caretaker. Furthermore, since s/he relies on a caregiver's help, s/he can only access a familiar friend or a family member s/he knows.



## 04.10 Takeaways from Interviews

### 1. The hope of caregiving

The sense of being concerned with people they care about can increase caretakers' willingness to live and well-being. For caregivers, it will be fulfilling to see the positive moments for the caretaker's life.

### 2. Hedonic treadmill and the happiness drop(Diener, Lucas,& Scollon,2009)

After the in-person meet with whole family members, it is difficult for an elderly caretaker to say goodbye. The desired interaction can be short, but high frequency, not a big event, ends sharply. In this way, an elderly caretaker can enjoy the moment without suffering from depression.

### 3. Autonomy & Accessibility

It will be a win-win situation for caretakers and caregivers to bring autonomy for an elderly to contact their family members autonomously.

### 4. Eating as a universal topic to all age

"Have you eaten yet?" is the traditional greeting sentence people use in Taiwan, and the pattern of interaction can also be seen until now, no matter what age, people knows eating, and we care about if our loved people eat well.

## 04.11 Positioning statement and Design goal

### Framing the concept

From the exploration phase, I found that eating is a ritual for everyday life, and food has not only the functionality of giving people nutrition but also an important way for people to show concern from their loved ones. From the observation and interview from people who live in the institution, it also shows the contrast of eating with family members and eating alone, especially for the older adults in the institution. When the roommate's family comes and brings food for them, it makes them feel lonely. The insights about food and the eating experience lead me to the design direction.

### Positioning statement:

**"Eating can be a medium for people to show concern."**

### Design goal:

**"Enabling video eating to share positive moments for a caretaker and his/her family members."**



Figure: Eating together at home

## 04.12 Brainstorming for small ideas

There are several ideas on the journey of eating. The first concept is from "during eating," which enables people to eat online together.

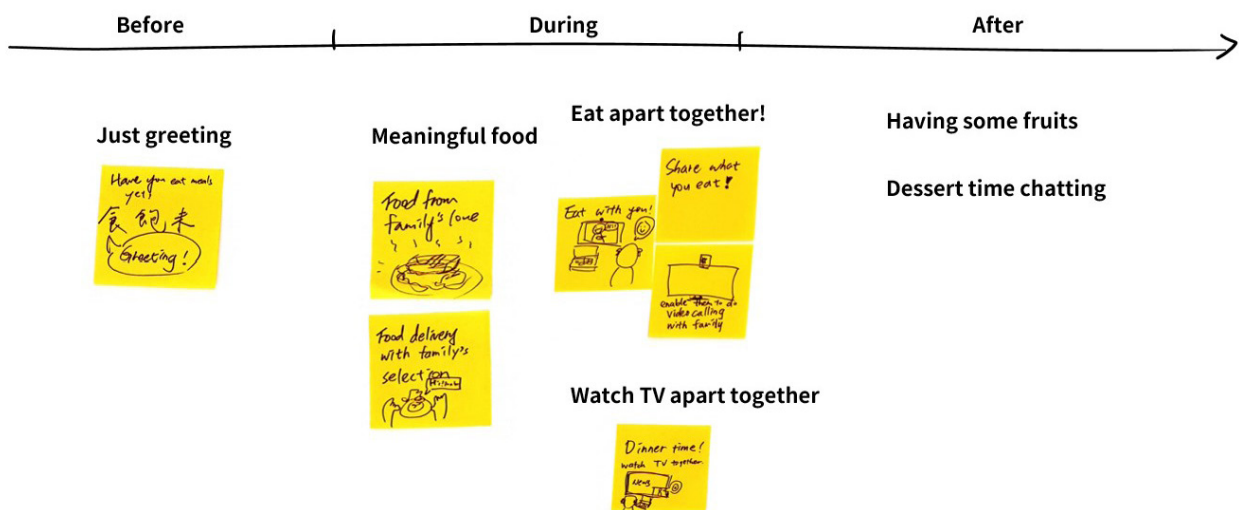


Figure: Small ideas in a journey of eating

# 05 Conceptualization

## 05.1 Design with the users

From the exploration phase, the idea about "video eating apart together" was selected to test further. In the conceptualization phase, we define the design goal. To look into the design goal, I assume there are three core aspects crucial for enabling the current design concept to happen in the context:

1. Accessibility of a caretaker: How to make video calling accessible for an elderly caretaker?
2. The trigger: How to encourage a family member and a caretaker to share positive moments?
3. The positive moment: What can be the positive moments that people intended to share?

During the concept iteration phase, there are some iterative activities. Five experience prototypes were designed and made to experimenting with users. Some interviews, observations in the institution were conducted to evaluate and get insights from the context. There are two aspects of the design concept that need to be tested: Establishing the connection and creating positive moments.

## 05.2 Prototype 1: Video eating



Figure: Prototype Eat part together

This prototype is a video calling during and after the participant has her lunch. It aims to give her a sense of accompanying and hope to encourage her to eat more.

### Assumption behind the prototype:

Eating together with video calling can make us feel less lonely and eat more

### Prototype testing process:

1. Introduce why I am eating with her with calling
2. Introduce what I am eating today
3. Eat together
4. Chat after lunch

### Participant:

She lives with her family. I have been to

eat with her for 2 or 3 times through video calling with my friend and having dinner face-to-face, so she remembers me. She has depression, and she seldom talks, she eats less and gets thinner.



Figure: A camera stand for set up the test

### The setting of the camera:

To let the participant see what I am eating, I used a camera stand to make the camera in the right position that shows my bowls and my face at the same time.

### Setting up the testing:

I asked the participant's family member to help to set up the video calling lunch. We set a time to start the lunch, and I asked the family member to take a picture of the screen and the participant to show the context and see how the participant interacts with the prototype.

### 05.3 Insights from prototype 1 (Video eating)

#### For the Camera setting:

Me: also see the food I am eating  
Participant: with an iPad stand



The participant's camera position with an iPad stand only shows the face on the button, looking at the camera

The family member of the participant helps to hold the camera and see the bowl of the participants.

#### Know how involving human and technology

##### Setting the camera better can increase the sense of involvement

The position of the camera is quite remarkable. It affects how the person in front of the device sees through the camera or not. If people see the other side but not the camera may create a sense of not listening. Also, it is good to see the dishes we are eating, which makes it more like to eat at the same table.

### Feel happy for receiving the greeting from a new friend.

*It was a happy lunch. Grandma was more happy than usual. She feel happy to get other people's care. – A Family member*

### Eat together needs to set the eating time beforehand

*This time the grandma eat earlier than her family member said, so we started the video calling a bit after the participant start to eat.*

### Didn't refuse food

*Normally when we put food in her plate, she will say she is full already and refuse the food. But today she didn't. She eats more meat today. – A family member*

#### Insights about human interaction

##### **Eating with a new friend (acquaintance)**

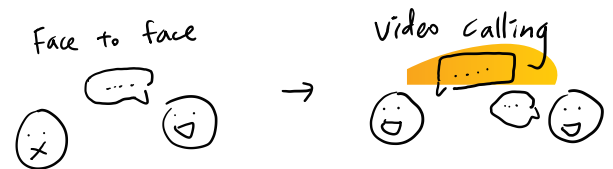
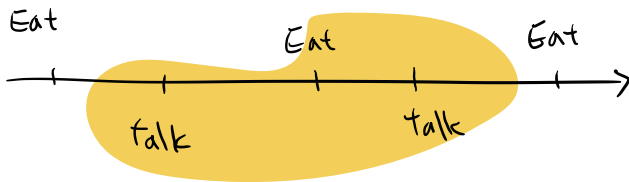
She feels happy to see me again and feel that I care about her

#### Insights about human interaction

##### **Accept the food, and eat more meat**

My assumptions behind this is because she is in front of a new friend. Also, probably because of her mental workload in the video calling, she is thinking less about if she wants to do with the meal.





#### Feel like to fill the blank

*When we are eating, we seldom talk, it's mainly participants' family member chat with me, just like I was there. – A Family member*

Insights about human interaction

#### Fill the silence

Video callings afford elderly people to talk more and fill the silence. However, it will be unhealthy for them to do when having meals if they swallow air in the stomach.

#### Video calling as a conversation pusher

*After having lunch, we keep the video calling connect. The participant is more actively talking with video calling than face to face. – My observation*

Insights about human interaction

#### The push of Video calling on the conversation

The participant is more active to talk through video calling than face to face

### Talk with a digital device is not a problem for an elderly

*She is quite familiar with the way to talk to an iPad. My uncle call her with iPad as well, but it's normally without video.  
– A family member*



### Insights about human interaction

#### **Be familiar with talking via a digital device**

Be familiar with talking via a digital device. For the elder participant, to talk with a digital device is not a problem. The participant keeps looking at the screen to see what is happening there and had conversations smoothly.

## 05.5 Takeaways and reflections

### 1. A camera setting is essential for engagement.

Some elderly people are not familiar with having a proper camera setting. It results in a weird position we can only see from the video calling. At the same time, our eyes seem not looking at the camera; thus, we may seem less engaged.

### 2. Video calls can be a push for people to keep talking

It could be because I sent an invitation to the participant to meet or the push of video calling. It seems not like the silence grandma I met before.

### 3. The conflict interaction of video calling and eating.

Video eating might make people feel busy with their mouths since people talk more with eating together with video calling than in-person.

### 4. It takes efforts to have an online appointment with the elderly.

Things need to be set up with the caregiver and family members of the participant. It highlights the accessibility problem.

## 05.4 Concept iterations

### Concept Iteration questions

- How to let people see the meals?
- How to set up Who and When to eat together?
- What about the rhythm of the video eating?
- What is the value they get from this experience?

### Small ideas for concept iteration

<p><b>Idea</b></p> <p>A external camera that can be easily turned to positions</p>	<p><b>Idea</b></p> <p><i>Lunch together calendar?</i></p>
<p><b>Idea</b></p> <p>A pad or smartphone stand that enables young people to eating with grandparents.</p>	<p><b>Idea</b></p> <p><i>Grandma' s lunch dating reservation chatbot</i></p>

**Feedback from Jubo**

- Current interaction in an institution:

Family contact book, reporting the activity the caretaker does in the institution. However, it does not work well. Interestingly, they also encourage the formal caregiver to take a picture of what they eat today to their family member in their service.

- Feedback on this design direction:

The concept direction was a concept that enables family members and a caretaker to eat together remotely.

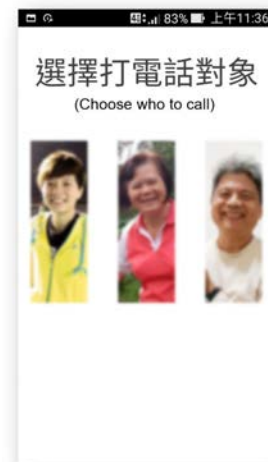
Jubo thinks that institutions (their clients) will be interested in this direction. Since currently, there is no existing service in Taiwan. It is also their next product development plan.

- No existing service

Currently, the design director assumes that there is no equivalent value for the caretaker and the service provider.

Moreover, probably also because the alternatives work for now. Currently, family members who are willing to show affection to the caretaker may have their alternative.

## 05.6 Prototype 2 : Autonomy



Testing the concept prototype in the context

Prototype Autonomy is a simplified user interface for video calling. On the interface, there are family members' faces that the user can choose whom to call. By pressing on the photos, it connects to the app that can contact the person. Then a user can press the Video calling icon to confirm and send the call.

### **The goal of the prototype:**

Enable the caretaker to video calls with people without assistance.

### **Design Concept:**

"Easy-click video calling."

Exploratory questions:

1. How to enable them to interact with people whom they want to contact?
2. Will the user be interested to learn and use it every day?

### **The participant:**

Ninety-five years old, male. He lives in an institution, and due to Covid-19, he has not seen family members for a long time.

### **Process:**

His family members are quite excited to talk with him through Video calling since they have not seen each other for a long time.

In the end, he called two of his family members during the testing.

## 05.7 Insights from prototype 2 (Autonomy)

### "Not familiar with the interaction with a touchscreen"

*1. The participant literally "Press" the button:*  
The way to press a button on a touchscreen is not like pressing a physical button. It is a gentle touch on the interface.

*2. The participant has less agility to move fingers:*

It takes some effort for him to press the right buttons on the screen. An elder user may have less agility to move his/her fingers.

*3. The participant accidentally touches on other parts of the screen:*

The participant may not be aware that the screen is not only a screen but also a touch interface.



Figure: The participant literally "press" on the screen seems to wait for haptic or animation feedback from it.

### "Not familiar with the icons and information on the screen"

*1. The participant may not be familiar with icons on the interface:*

The participant failed to understand the icons on the screen, such as calling, video calling.

*2. Camera position:*

The participant did not notice that his finger is covering the camera, and may not notice that his face is not positioned well.

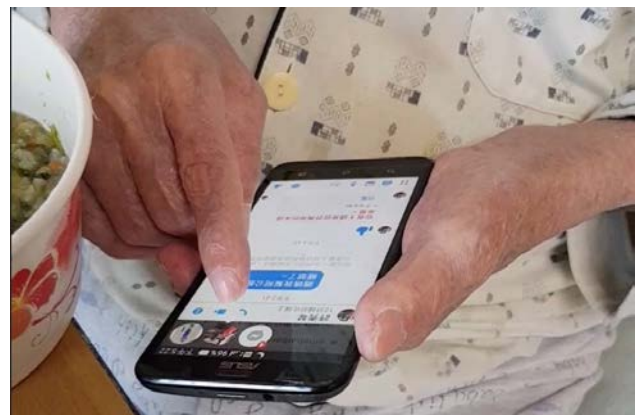


Figure: The participant cannot tell the icons' meaning, and memorize the second one for video calling.



**"Catching a calling from people is much easier than making one."**

For family members, after they know that we have this new portal to talk to granddad, they are excited to talk with him.

For a Caretaker, it is easier to catch the call

**" Not noticing the camera. "**

Elderly participants may not aware of the position of their camera, they didn't notice their faces are out of the screen, and may cover parts of the camera with finger accidentally.

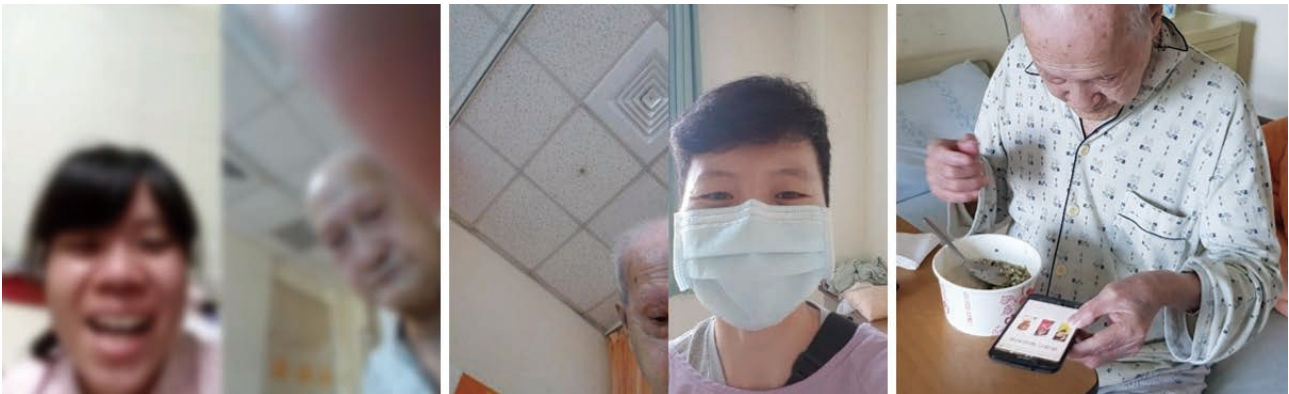


Figure: The elderly participants may not aware of the position of their camera

## 05.8 Takeaways and reflections

1. When an elderly user pushes a button on the screen, they wait for a haptic feedback
2. Elderly people may have less agility on moving finger
3. The massive information on the screen is too complex for the elderly to understand.

### Reflections:

At the end of the testing, A question was asked to evaluate the design concept.

I: Do you want to keep it?

Participant: "No. It will soon open again. They can visit me soon. "

Since he refused to use it, my assumptions are:

1. He is not familiar with the device, touchscreen, and the button on the smartphone.
2. He prefers to meet face to face, video calling is not appealing for him.

## 05.9 Evaluating the current concept from the field (LTC, long term care institution)

After doing some prototype testing in Southern Taiwan, I decided to know more about care institutions in Northern Taiwan and see if people live differently there. Jubo has contact with the care institution, and we made a field trip there.

### Viewpoints from Jubo:

I interviewed the design team in Jubo to understand the industry and the context and tried to look for the possibility of implementing the concept in the context.

Takeaways from the discussion with the design lead in Jubo:

### No enough market push

Currently, there is still no excellent service for family interaction in the context, probably it is difficult to do, or there is no need for this.

### Additional work for formal caregivers

The institution's manager may not have the motivation to have it in the institutions since it may cause more workload and cost.

### Existing solutions for now

Formal caregivers take a picture and send it to their family members.

### Related policy for caretakers' wellbeing in Taiwan

- Happy meal every week: Care institution

can provide some tasty meals for the caretakers to choose, it can be one of the criteria (KPI) when the government grades the institution.

- The residents' satisfaction is not playing an essential part in the KPI from the government. Thus it can be considered as less important tasks to do for the institution.
- a finding we got from the interview with the nurse.

### Observations in the context

The goal of observing in the context is to see the context of use for elderly caretakers.



Figure: Dinner time\_ single table

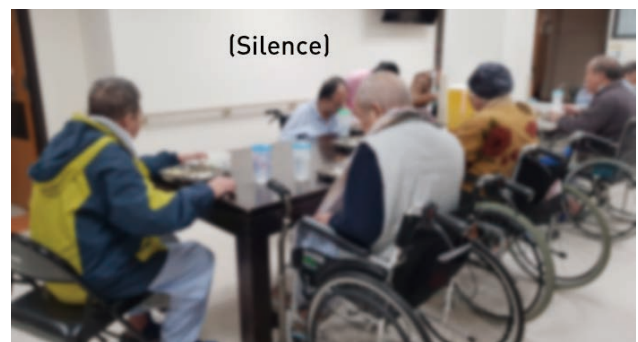


Figure: Dinner time\_ group table

During dinner time, it is quite silent in the room. There are group tables and individual tables in the public space, everyone has their assigned place to sit.

Caretakers in the LTC	(Weekdays)	Young family members
Sit at the dinning table and wait	16:00	working
Get meals	16:40	working
Finish the meal and go back to bed. (most of them)	17:30	transporting to home
Personal activities ( sleep/ chat/ do nothing)	18:00	cook/ eat
	19:00	cook/ eat

Figure: Schedule mismatch

For the time caretakers have dinner, it is quite early. At 16:00, the caretakers were already sitting at the table, waiting for the meals. Around 16:40, they get meals. At 17:30, most of them already finish their

meals and go back to their beds. In this situation, I realize that eating together with younger people might be difficult due to the different lifestyles, but after meals might be the better timing for both of them to call.

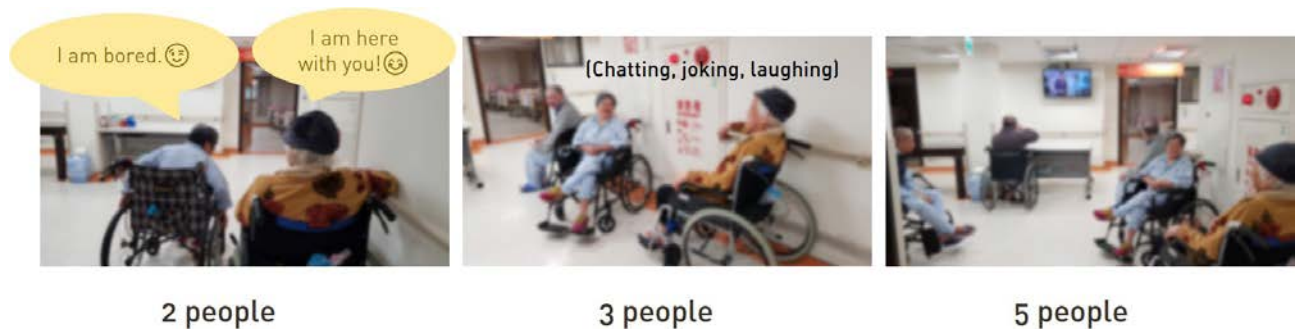


Figure: After dinner chat

After finishing dinner, most of them went back to their bed. One of the elderly caretakers said to another caretaker: "I am bored!" And another caretaker replied to her: "Hey! I am with you!" Then they gathered together, turn on the TV, and chat

together and joking, laughing with us. After we talked for a while, I noticed that more and more people grab chairs and sit next to us.

"The vibe of relaxing from the caretakers makes me feel that it's a better opportunity to implement the design after dinner." - I got a feeling in the context

## Viewpoints from the formal caregiver and nurse

### Interview questions:

Please describe the procedure of preparing meals, and what time do they careful lunch, dinner, or dessert? Is there anything that you need to be more cautious about when offering meals?

Are there also family members come here to accompany them when eating?

How do the residents interact with their family members? Do they use video calling with a smartphone?

Imagine a device that enables the elderly to video calling to their family members. To what extent do you think it can increase the life quality of the resident?

Will you be happy to see the residents use this device? Why?

If residents need help while using it, how much time will you be willing to spend a day assisting them?

What may affect you in a day of working if there are residents who use the device?

### Insights:

#### 1. The need for caretakers to interact with family members:

**Current interaction: Formal caregivers borrow their own smartphones to caregivers for video calling.**

"Sometimes, family members will ask to video calling with the residents. I will use my smartphone and my personal account to call. They talk and see each other, then the family member feels relieved. It lasts for less than 5 minutes." - Formal caregivers in Taipei and Chiayi

#### 2. The need for contacting family members:

##### a. A caretaker who just move in the

institution

##### b. When a caretaker needs their family members to buy something for him/her.

"There are two situations that the caretakers need to contact their family members:

**Need some stuff that needs their family members to buy for them**

**New residents, they miss their family members a lot" - The head of the nurse**

#### 3. The possible effects of having the design concept in the context.

##### Think about the value and the cost

"About the operating cost, it will increase, with the aspect of human resource or the additional electricity output. As long as the chairman thinks it is helpful and agrees on it, it will be fine." – the head of the nurse

##### Caregivers can assist them maximum for 5 minutes.

"I think I can assist them if they have some problem with the device, but maximum for 5 minutes." – A Formal caregiver

It won't be too much work if they know how to use it.

"As long as they can use it by themselves, I think it will not be too much trouble to help, maybe just set up the stand, and turn on." – the head of nursing.

#### 4. Caregivers in Northern Taiwan are mainly foreigners

##### They can't read Mandarin on screen

##### Foreign formal caregivers has the contact with caretaker's family member

I lend my smartphone to caregivers to call their family members - Foreign formal caregiver

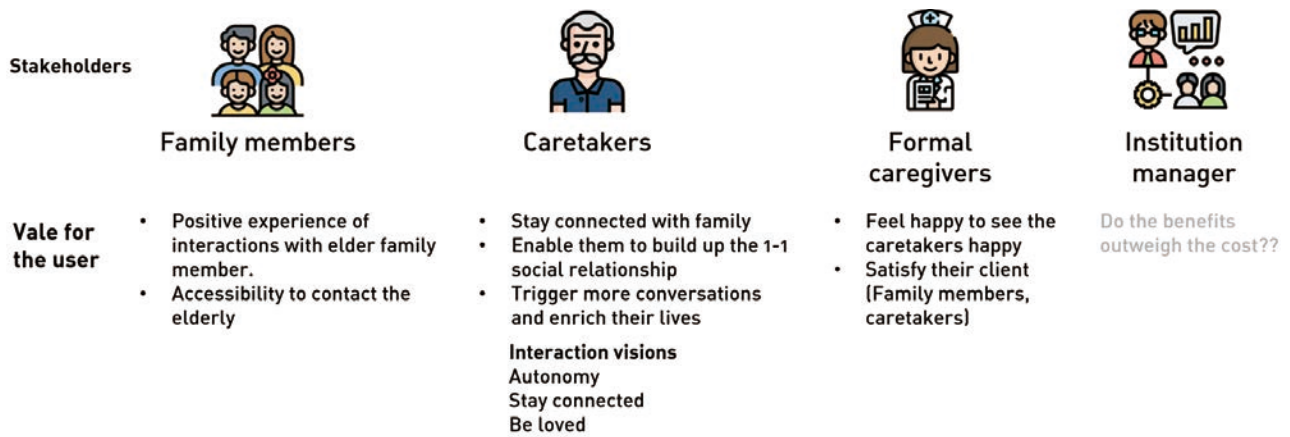


Figure: The value or the stakeholders that the design concept should provide

### Viewpoints from caretakers

#### Current situation: three caregivers have their phone (traditional phone)

"I have a phone that I can call my daughter. It's not the smartphone you young people use." - caretaker 1 (female, 8x years old)

#### Helpless on a digital stuff

"I used to have a traditional cellphone, but

once it was broken, I lose all my contact numbers, and I no longer use it." caretaker 2 (male, 8x years old)

#### A smartphone excludes interaction with family

"Well... smartphones, all of my family members use it, and only I don't use it." - caretaker 1 (female, 8x years old)

## 05.10 Takeaways from the field research in LTC in Taipei

In the field research, we got two critical insights that two essential aspects need to focus more on the design concept.

### The essence of Autonomy

Since the formal caregivers are very busy in their daily work, the concept needs to enable the caretakers to use it on their own.  
- Interview Formal caregivers in Taipei and Chiayi

### The mismatching meal schedule for young adults and elderly caretakers

The current focus of the concept is to design eating together experience for both caretakers and their family members. However, there are different patterns of people's life and rituals. The design concept should be more flexible to fit into the stakeholders' daily.- Observation in institutions in Taipei and Chiayi



### 05.11 Redefine the design goal

From the field research, the concept of eating together could be redefined into a universal way, enable young people to share their daily life moments with an elderly caretaker.

#### Design Goal: "Enable family members and a caretaker to share positive moments remotely."

In the new design goal, two aspects need to consider: The accessibility of the caretaker, and the positive moment. The accessibility of the connection enables

the elderly to catch a call or make one, which is essential for sharing the moment. As for the positive moment, it can be talking like calling a person, but can also be a non-verbal way of interacting with people, just simply share the moment people have.

### 05.12 Story board of the concept

The storyboard shows the scenario of use. In the scenario, the device is something owned by the elderly caretaker, enabling him to use it on his own when he wants to contact somebody.

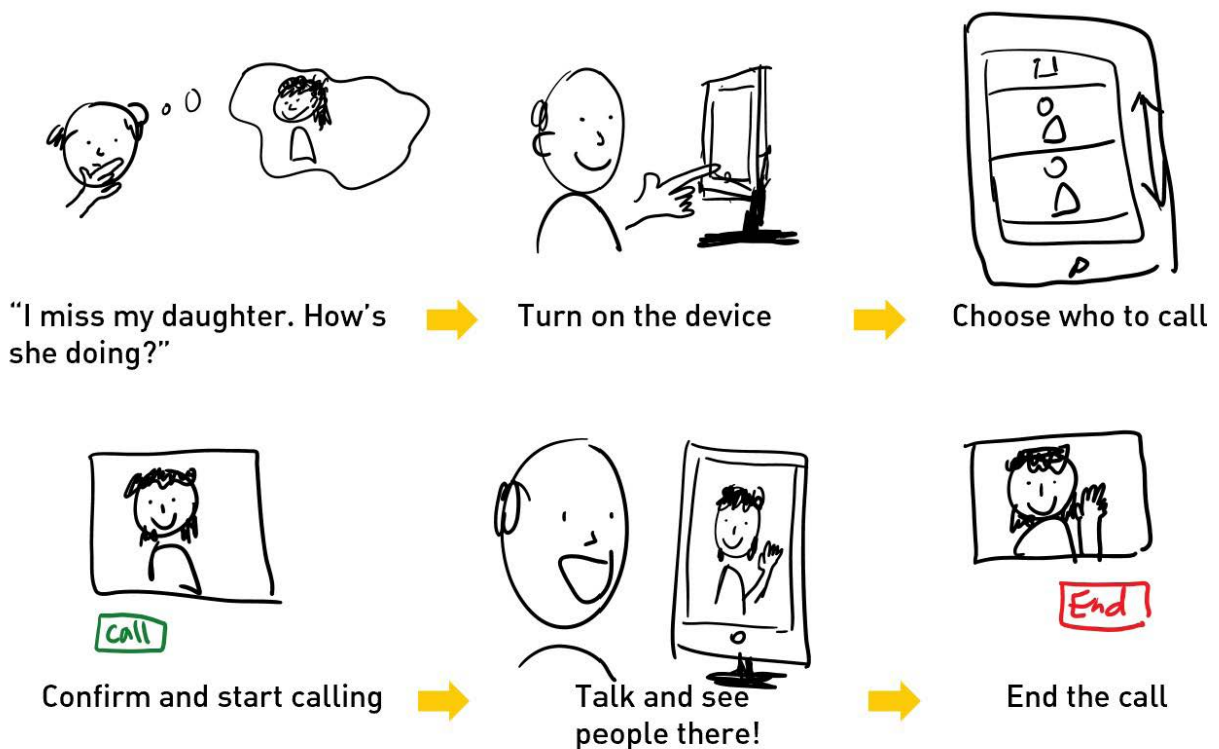


Figure: The concept story board



### 05.13 Ideation on the user interface

From the former user testings, I found that some aspects make it difficult for an elderly caretaker to use a touchscreen.

The touch interface doesn't match their experience of using an electronic device, and the finger's agility also affects the experience of using it.

From the storyboard, there are three tasks that user need to finish with this interface:

#### User tasks:

1. Select the person he wants to call
2. Confirm and send the call
3. End the call



Inspiration form a radio

The first task needs a physical button that enables scrolling.

A radio interface for choosing the channel inspires me to design an interface for selecting people.

### 05.14 Prototype 3: Accessibility

#### Sub-prototype 1. A lot of buttons

The idea is to use buttons that correspond to the screen so users can select who to call. And the green button is for confirming the calling; the red button is for hanging up the calling.

#### Sub-prototype 2. Turning, call, end the call

The second concept uses a turning knob for users to select whom to call. And the red and green button works the same as previous.

#### Sub-prototype 3. Volume, Turning and call, end the call

For the third concept, the confirming and selecting function can be done with the same knob. And the left knob can be used to set the volume.

#### Testing set up

##### Participants:

1. 96 years old, male, live in a LTC institution
2. 8x years old, female, live alone in a small town

##### Participants and their family members:

Before the testing, the screen shows the family members of the caretaker. The family members on the contact list were informed before the test.

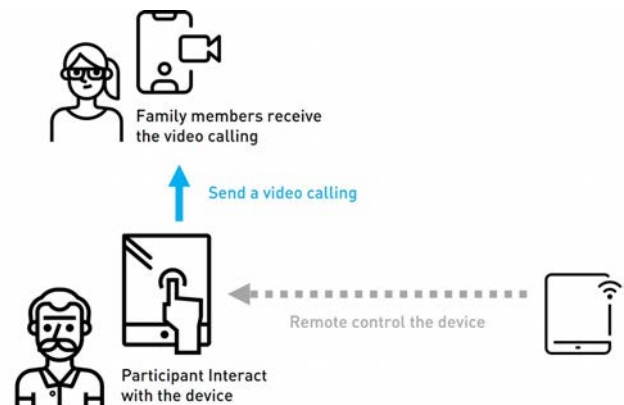


Figure: Testing set up of the device

##### The device:

The test is set up by the Wizard of Oz method. The physical buttons and knobs provide haptic feedback for the user. While the user interacts with the device, a remote control program was used to send the video calling when the participant calls somebody.



Figure: Testing the prototype in a care institution with a caretaker



Figure: Testing the prototype in an elderly participant who lives alone

**User tasks: Select people > Confirm and call > Hang up the phone**



Prototype 1:  
A lot of buttons



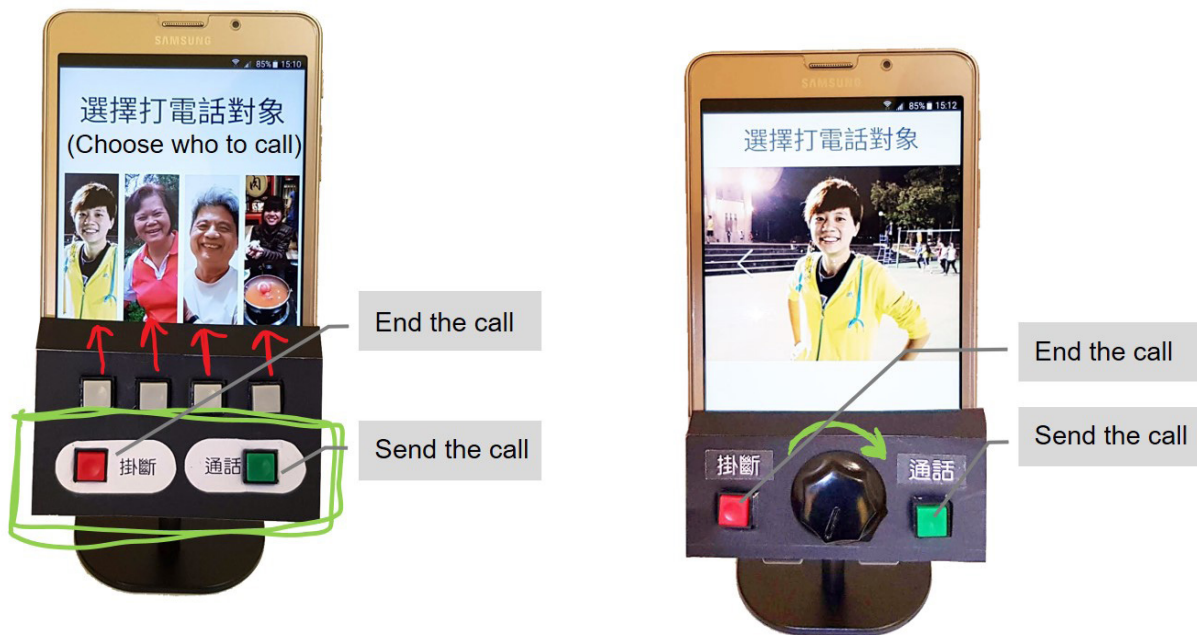
Prototype 2:  
Turning, call, end call



Prototype 3:  
Volume, Turning and call, end call

Figure: Three rototypes for the goal of accessibility

## 05.15 Insights from Prototype 3 (Accessibility)



### Results of interactive prototype testing Prototype 1:

- O: Adopt to the buttons in a short time
- O: Easy to understand to call/ end call buttons
- X: Can't relate the buttons to the pictures at first glance.

#### Observations:

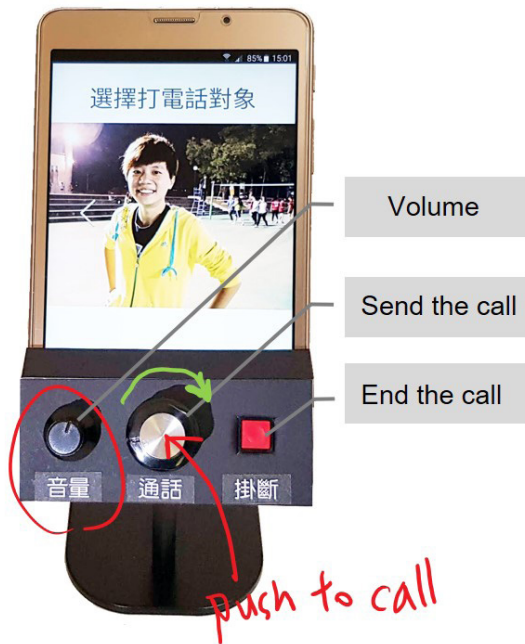
- The first success is quite crucial for the elderly. If they succeed for the first experience, they have more confidence to try the next one.
- Digital screen and physical buttons seem to be separate for the user.
- The literal-and-color way of explaining the functionality works for the elderly.

### Prototype 2:

- O: Can control it well and know the functionality of each button and knob.
- O: Can call people with the intention to ask something
- O: User recognizes the red button as canceling the call
- X: No proper feedback when waiting for picking up the phone

#### Observations:

- He learned from previous prototypes quite quickly.
- He knows that green means to send a call, and the red one is for end a call.



### Prototype 3

O: Enjoyable experience to turn the knob and scroll to select people

?: Didn't use the volume knob

X: The user feels confused when he knows the knob also has the function of calling. It's not easy for him to understand that there are two functions on one button.

#### Observations:

- The way of using a knob is easy to understand for the elderly.
- Only one function on one button/ knob
- He attempted to push the right button to call, probably learned from the previous prototype.

## 05.16 Takeaways from Prototype 3 (Accessibility)

### 1. More confident to try and use a physical button

The physical button works quite well for both elderly participants to understand, try, and finish their assigned task to make a call and end a call with the device.

#### What can be better?

Understandable feedback of the connection  
The participant does not understand whether the calling has been pickup or not:  
When he sent the call, and the screen shows his face, he thought it is already connected, and he started talking.

#### How to receive an "I am busy" message?

When the person he calls is busy, he did not see the text message from the person.



## 05.17 Prototype 4: Non-verbal interaction

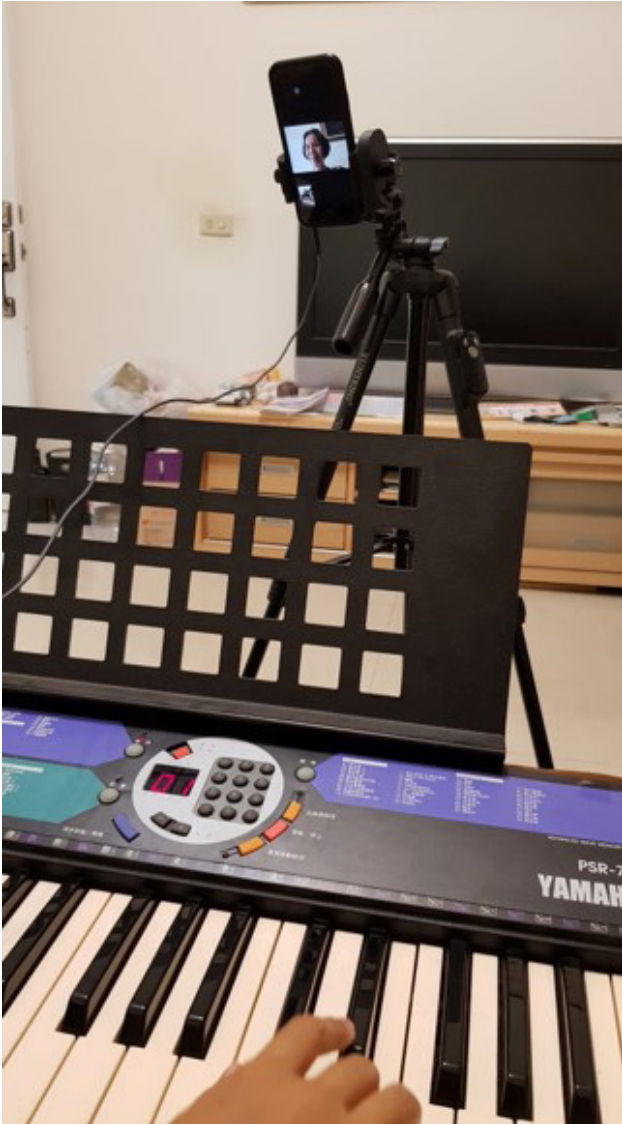


Figure: The testing set up, show the table and facial expressions in the camera.

### **Goal: Do elderly caretaker enjoy the remote non-verbal interaction**

#### **Participant:**

8x years old, female. Live with her family members. She seldom talks, and she loves music.

#### **Procedure:**

1. The participant's granddaughter came to my place, and we do something we enjoy. (We play piano, and I learn a new song from her)
2. The participant's granddaughter video called her grandma, and we positioned the smartphone with a camera stand, which can see what we are playing and also our facial expressions.
3. At the elder participant's home, one of her family members helps her pick up the phone.
4. Start video calling, and we have some open talk and greeting. We play the piano. The participant sees us through the screen.



Figure: The scenario set up, concentrating on the piano playing for around 20 minutes

### 05.18 Insights from prototype 4

- She was reading Sutras, and we were playing the piano. It lasts for around 25 minutes.
- She also enjoys the moment with us and laughs at the same moment when we accidentally broke something and laughed during the video calling.
- She yawned after 20 minutes (Though she also yawns normally)
- We feel that she feels accompanied during the process, and she seems quite happy in the process.

### More questions to explore:

1. Explore what the possibilities of positive moments are.
2. Does 1 on 1, or 1 on 2, or 1 on multiple people (e.g., the whole family members) make the interaction different?
3. What can be the positive non-verbal interactions that family share through this design concept?
4. Will elderly people feel free for a longer video calling?

### 05.19 Takeaways and reflections from prototype 4

#### **Non-verbal positive moments can also be transferred by a video calling for the elderly.**

The way we call has been different from before. We talked much less, with little conversations, a video call can be used to share non-verbal moments.

#### **Reflection:**

The current interaction successfully enables the elderly caretaker to be a part of the enjoyable moment with a younger family member, which is the first success to enable sharing the moment remotely. There are some questions to explore by implementing the design in a family's life.



## 05.20 Conclude from the conceptualization

The testing result iterated the concepts, and new insights gained from the context from the conceptualization process.

The concept starts with prototype 1, video eating, an eating-together-remotely idea. It carried out that the conflict interaction of video calling and eating;

Then, prototype 2, Autonomy, a bit explore about how to simplify the information on a smartphone for the need of contacting people for the elderly, comes out of the usability issue for an elderly to interact with a touch screen.

After two prototype testing, field research in another care institution did for aligning the design concept in the context, which comes out other aspects to consider, the different eating schedule from ages and the limited time for a caregiver for caretakers, which highlights the essence of Autonomy.

It led to the prototype 3, accessibility, to make a smartphone more accessible for an elderly caretaker. In prototype 3, there were three physical interface concepts tested with older adults. One of the ideas successfully enables two participants to call an intended person and successfully reach the goal of

establishing the connection. But when I tested with the usability of the interface, I found many young people are not available to catch up with a call anytime, while elderly people have more free schedules.

Then Prototype 4 explored the possibility of having a non-verbal-shared-moment with the elderly, which was also a success.

Concluding from the prototype testing, For establishing the connection, the physical interface attached on the smartphone successfully enables elderly people to call and receive video calls on their own; For creating positive moments, both verbal and non-verbal interactions enable people to share joyous moments from a distance. The original concept of video eating can push the conversation for an elderly person. However, it may make it too busy on their mouths to call when they are eating.

In this phase, I found that positive moments differ from people; it's difficult to define a common joyous moment based on the current research. So I decide to leave the question to the final testing phase and figure out the answers from users.

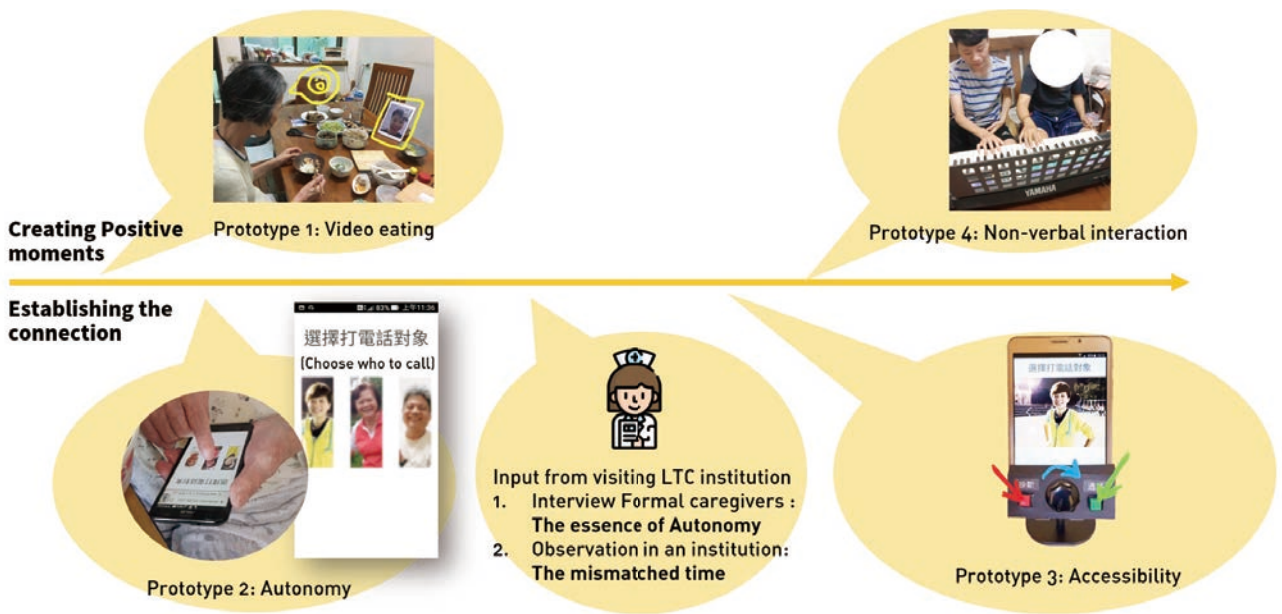


Figure: The conceptualization process

## 05.21 The experience journey map

The experience journey map shows the intended experience and interactions for the stakeholders. It helps to overview the requirements in the physical and digital touchpoints and design for the experience.

		Before the shared moment
<b>Experience of positive moments</b>	<b>Elderly caretaker</b>	<ul style="list-style-type: none"> <li>• A Call was refused by a person</li> </ul>
	<b>Family members</b>	
	<b>Caregiver</b>	
<b>Interactions for establishing the connection</b>	<b>Elderly caretaker</b>	<ul style="list-style-type: none"> <li>• Set and show availability on schedules</li> <li>• Call back later remind</li> <li>• Bettery level: is important to show for</li> <li>• Ass</li> </ul>
	<b>Family members</b>	
	<b>Caregiver</b>	

During the shared moment	After the shared moment
<p>Video eating      Non-verbal interactions</p>	<ul style="list-style-type: none"> <li>• See missed calls and enables calling back</li> </ul>
<p>caregivers to help for charging. ist caretakers to call and setting when needed</p>	<ul style="list-style-type: none"> <li>• Touch screen safe zone on the edge (prevent from mistouching)</li> <li>• Touch Feedback (physically)</li> <li>• A smartphone stand that fits the angle of use</li> </ul>

### **05.22 The two Scenarios**

For family members and a caretaker to share moments, there are two scenarios that users might experience through the design concept. Scenario A shows the initiative of contacting people from an elderly caretaker to family members, and scenario B shows the other way around.

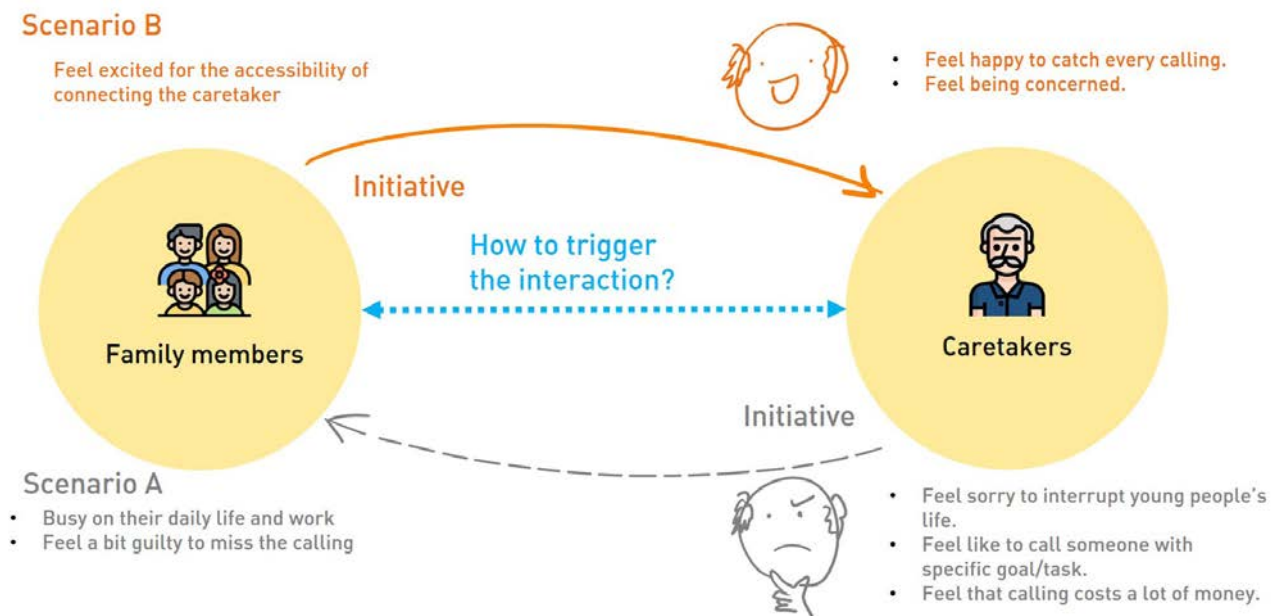
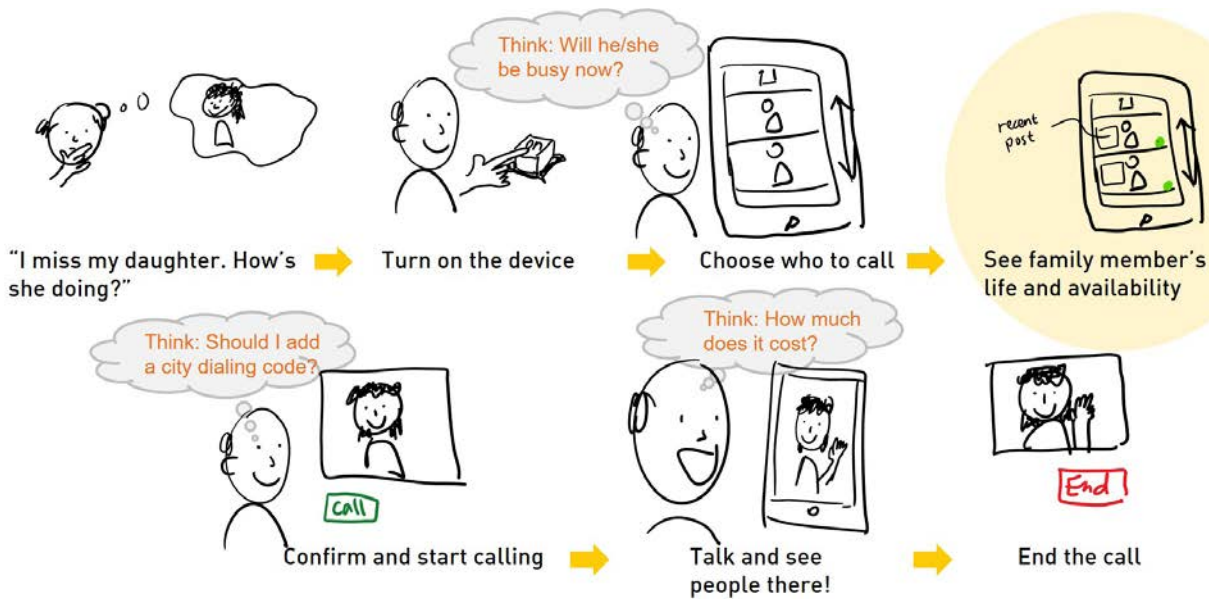


Figure: The two scenarios of the different initiative to trigger the interaction



## Scenario A: Caretaker initiatively contact



### Elderly caretaker:

Feel sorry to interrupt young people's life. Elderly caretakers know that young people have more scheduled routines to do in their everyday lives. So caretakers think twice before they call.

Feel that calling costs a lot of money. Since the experience of using a traditional phone can be easily related to video calling, older adults feel like to talk as much as possible.

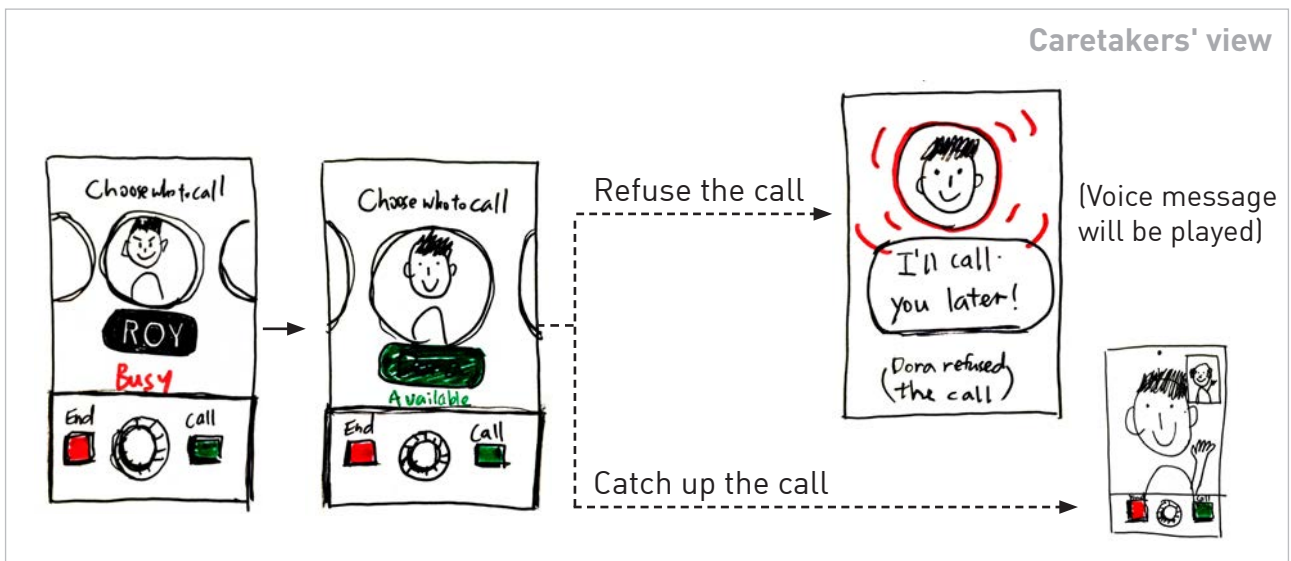
### Family members:

Busy on their daily life and work. Younger family members tend to have tasks to do in their daily lives, work, study, or personal activities.

Feel a bit guilty to miss the calling from a caretaker.

During the testing, many family members mismatch the video calling form the elderly caretaker; all of them call back later.

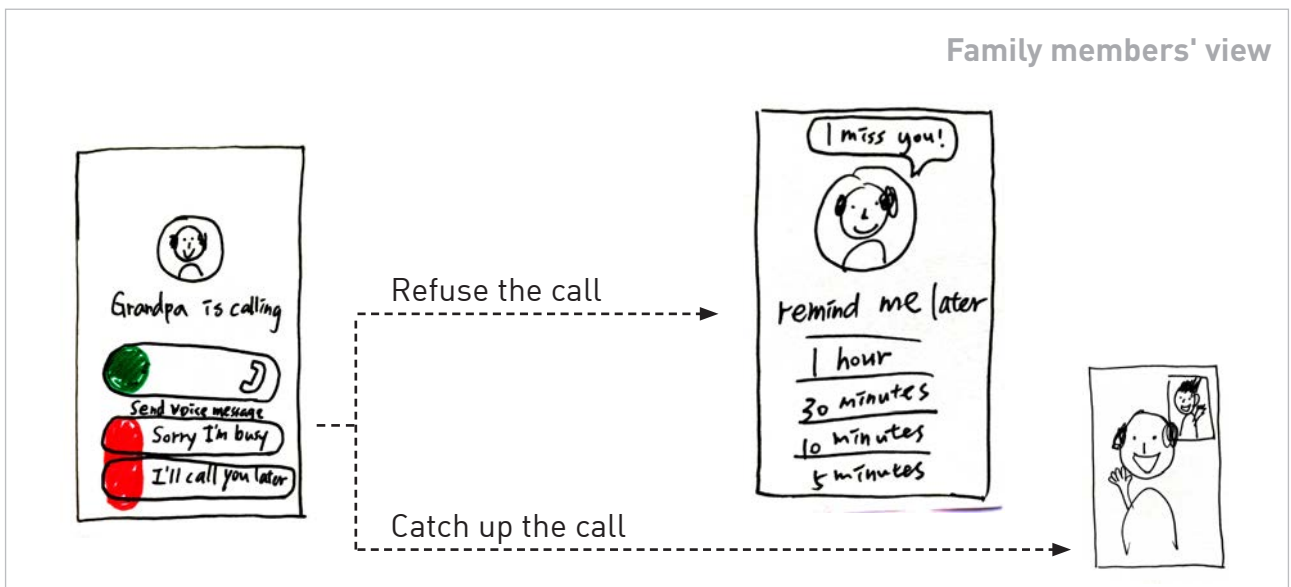
## Wireframe sketches



The scenario shows a calling initiate from the caretaker.

On a caretaker's screen, it shows people's availability when he is scrolling on the screen. After (s)he selects who to call, press the green button to confirm the calling.

If the person catches up the calling, the screen shows the video for both; if the person is busy, the caretaker may receive a voice and message that the person recorded before, and let him know (s)he will call back later.



On the family members' screen, when the calling is from the caretaker, it shows more options to reply. If they are not available to catch the call, they can respond to some pre-recorded message. The pre-recorded

message can let the caretaker know they are busy or let them know they will call back later. If they select to call back, it shows a screen to choose when to remind them to call back later.

## Scenario B: Caretaker passively catch a calling



### Elderly caretaker:

Feel happy to catch every call.

When the elderly caretaker receives phone calls from their family members, they feel happy to catch the call.

Feel being concerned.

Elderly caretakers feel they are concerned when they get callings from their family members.

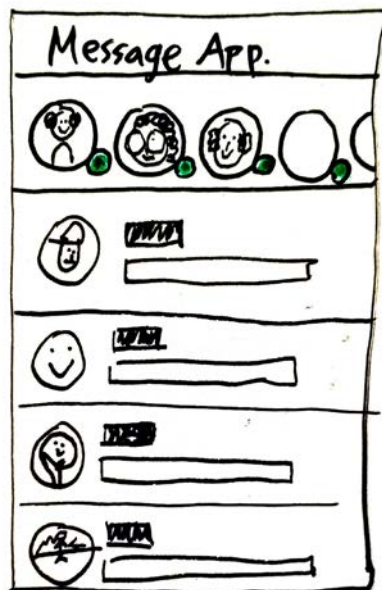
### Family members:

Feel excited for the accessibility of connecting the caretaker

Since most of the elder caretakers don't have any access to the internet world, most of the family members can only interact with them by visiting them or call with a mobile phone. The way to video call with them is an exciting and accessible way for younger generations.

## Wireframe sketches

Family members' view



Send a calling →

Caretakers' view



The scenario shows a calling initiate from a family member.

On a family member's screen, family members can see the caretaker's availability in the messaging app. The information comes from whether the device is connected to the internet or not, and whether the caretaker is using the device.

On a caretaker's screen, they can catch up with the call by pressing on the green button. (S)he can refuse the calling by pressing the red button.

# 06 Exploratory testing

## 06.1 The goal for exploratory testing

The goal for exploratory testing is to evaluate the interaction in the context, and explore the possible scenarios of elderly family members are accessible for video callings from them.

In other words, the exploration questions here are:

- 1) How do the stakeholders interact with the design concept?
- 2) What will be the positive moments they experience?

### **Evaluating the context of the use**

The prototype plays an evaluating test of the design concept, to know more about two aspects:

1. To evaluate the use of the caretaker, see if they can use it on their own, when will they need people's help.
2. Evaluate the scenarios of building a connection with the elderly caretaker if the design concept fulfills its goal.
3. To evaluate the design in a care institution, see how the stakeholders interact with it.

### **Exploring for future scenarios**

The experience prototype helps explore the future scenarios of use and interactions required in the scenarios. It helps to iterate a future scenario of use and the hidden need in future scenarios.

## 06.2 Recruiting participants

### Content of the post

"My current goal for graduation thesis is to enable the elderly to do video calling on their own. The first test was quite a success. The participant successfully called his daughter twice. Now I am recruiting more participants to test it, if you want to receive video calling from your grandparents, don't hesitate to let me know!"

The post of the recruiting info on social media to share with my friends. (299 on Facebook, and 323 on Instagram)

In the end, 31 people reacted to me to show interest

Among the 31 people, 9 of them are willing to ask their family members to test, 3 of them ask for sharing to more people

### Insight from family members

There are several friends and friends' friend are willing to test, some of them are working or studying abroad, others has ) an) elderly family member(s) who lives apart from them.

Some of them share similar experiences of teaching their grandparents and how frustrated they are.

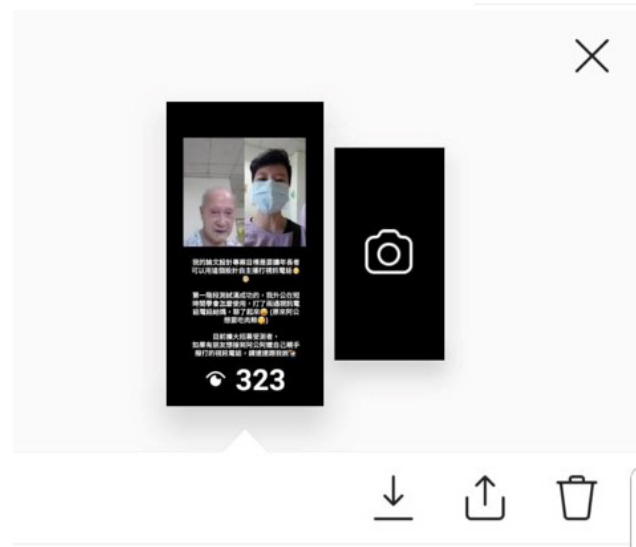
From the results and interests I assume that family members have high motivation to send this device to the elderly caretaker.



299人瀏覽

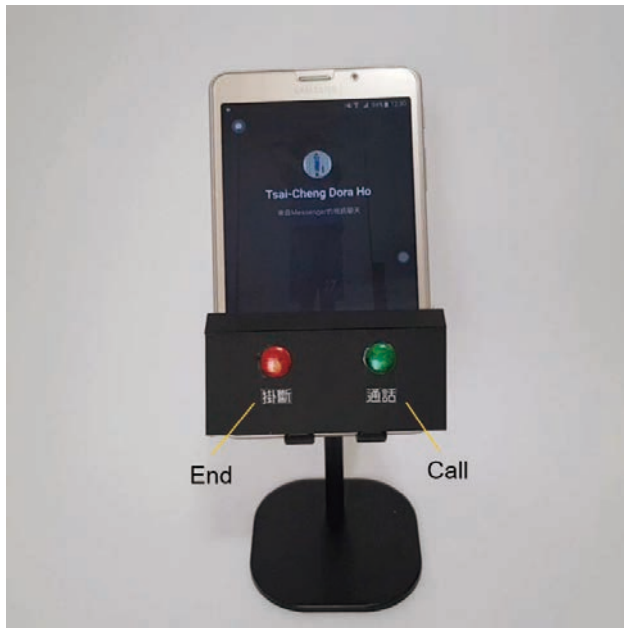


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### 06.3 Prototype 5, A new family cultural



Prototype 5 enables elderly caretakers to catch up with a calling from family members. It only has two buttons, the green one for catching a call, and the red one to end a call. The physical buttons provide haptic when the user press it. It then transfers the signal of pushing the physical button to the smartphone screen. The video calling platform I used for testing is the Facebook messenger since Facebook is a common-used social media to link people, and it is the software among the ones I tried that can work within the time.

There were three prototypes made for this experiment, brought to the elderly participants with instructions and some tryouts.



Figure: The process of making prototypes

## 06.4 The exploratory testing set up

### Participants

There are three elderly participants and their family members in this testing. Two female participants live in their homes, and one male participant lives in a care institution. All of the participants do not have experience of using a smartphone.

Two of the elderly participants' family members have family chat groups and were asked to call them during the week.

### Testing set up

It was one-week testing. An online family group was formed to inform the family members of the new way to contact the elderly and explain the experiment. There were three prototypes made for this experiment, brought to the elderly participants with instructions and some tryouts.

### The message to the family members:

Dear \*\*'s family:

This is a thesis experiment in TUDelft, Design for interactions. The goal is to enable elderly people to video call and interact with family members who live apart.

I will put a customized smartphone designed for the grandma, enabling her to catch up with video callings with Messenger. (If you did not add grandma as a friend, please do it before you call)

The experiment will last for a week. I would be curious about how you experience it. I would like to have a short interview with you to hear your story, and if you also have some photos that you can share, I am glad to hear the stories behind.

The images you shared will be put in the thesis if you agree, and the interview will be recorded in the text note-taking process.

## 06.5 Overall result from each of the participants



### Participant 1

**Female, 69 years old.**

**Lives with part of her family members, talkative.**

- Received calls from 1 person, four fruitful callings, 4 missed calls.
- She has lived with her daughter, one of her daughters' family, and her father in a small town for several years. Some of her family members live in other cities, but she has fewer connections with them.
- During the testing, the person called her was in quarantine next to her house, so they cannot meet physically. Her family member assumes she has less motivation to contact people that live in other cities. Two of the family members were added in her contact, and one of the family member videos called her.



**Participant 2**  
**Male, 96 years old.**

**Lives in a Long-term-care institution.**

- Received callings from 8 people. With 13 success callings, 6 missed callings.
- He lived in an institution for five months. He mainly contacts his family members to buy something he needs. Since the Corona situation, his family members can only visit him on workdays.
- With the video calling, he meets some family members he has not to meet for a long time. His primary family caretaker does not use smartphones a lot, so he has more need to do traditional phone call than a video call. He usually does not talk a lot, only when it is about his most exciting topic, he keeps talking about it and remembers the details. He said, "I would prefer a face to face meeting, the video calling is just a flat picture." Though he said this, when family members call him, he still catches up the call immediately, and ask for their current situation.





### **Participant 3**

**Female, 82 years old.**

**Lives alone at home, talkative, Illiterate**

- Received calls from 8 people, with 26 success callings, 33 missed calls.
- The participant's family members are excited about the testing. They have a close relationship with the elder participant. They usually visit her every 1 or 2 months when there is a national holiday or return to their hometown.
- One of the family members call her twice every day; it is usually a short calling less than 5 minutes.
- Some of her grandchildren called her and played with the funny masks on Facebook messenger, and they both enjoy the playful video callings.
- During the testing, the participant tends to stay at home, since she does not want to miss any call.

## 06.6 What went well

### Insights from elderly caretakers

#### *Accessibility on a bed*

The elderly caretakers who live in an institution might lose their mobility of leaving the room, and they are mainly lying on the bed. They are more accessible to the device since they are mainly at the same place.



After the one-week testing, he put the device on the platform next to his pillow



#### *A first success to use a smartphone*

Universal for illiterate people  
The participant is daring to try to tap on the screen and successfully called back.

*"I am amazed that my grandma can use it, even though she is illiterate. I received her callback" – Family members*

#### *The "ownership" of a calling*

Family members used to call the elderly by calling the person who is next to him/her. Since now the video calling is direct to the elderly, family members talk more with elderly participants compared to before.

*"Normally, I video call my mom, my grandma was in the background, I will talk with grandma in a short period. But this time I directly video call her, we talked a lot more than before." -Family member*

#### *More engagement on young peoples' lives*

*"My grandson bought a new cooker recently, I saw what he cook, and I didn't know that he is good at it! Then I shared my tips of cooking with him." - Elderly participant*

#### *A playful experience*

Elderly people enjoy the moments to see family members playing with the masks from Facebook messenger



*"When I was talking with my grandma, I played with the stickers from Messenger, and it made grandma laugh." - Family member*



## Insights from family members

### *Talk with visual reference is easier*

For young people: it is easier to share life visually



*"I talked about cooking and the new cooker I bought recently. With the video call, I can show her the picture that I cooked." - Family member*

A virtual tour with back camera is more interesting to show with caretaker.

*"I like to use back camera to show what I see instead of the front one only show my face. I want to show grandma my life, maybe I can also show her the beautiful scene when I am traveling." - Family member*

### **A tiny and enjoyable moment is better than a long but monotonous one**

Repetitive stories

*"My grandma repeats the same thing again and again. Sometimes I need to remind her that she has talked about this for thousands of times." -Family member*

Just want to see if she is doing well

*"I feel that a video call for five minutes is enough to talk with my grandma. I just want to see her situation, and I enjoy a tiny moment with my grandma." - Family member*

### **Know more about an elderly loved ones' situation**

Know more about the Caretaker's health condition

*"I feel that video callings enable me to see how is grandma doing, not only observe from the conversation but also see her face, know more about her health condition." - Family member*

An economical choice to call

*"During the week, I replaced my daily calling with video calling, calling with the internet is cheaper for me, since traditional phone costs a lot. However, video calling does not need additional costs." -A senior family member who calls his mom everyday*

## Insights from institution context

### *Video call as a tool for caregiving*

An alternative way for a nurse to contact family members

*"The caretaker did not eat anything for almost a day. He needs the fish floss. Otherwise, he doesn't eat anything. He has pushed the service ring three times a day to ask for that. Then I decide to let him video call with his family members to express the urgent need." - Nurse*

Nurse help the caretaker to call his family members to distract his attention.

*"He was impatient this morning. I use the phone to video call family members. It helps to distract the caregiver's attention." - Nurse*

## 06.7 What can be better

### *A mobile phone without mobility*

Some elderly people who have mobility may not stay in the same room all the time, while the device is too big to bring (elderly person who lives at home)

*"She seldom catches the call. Because she doesn't bring it with her, and she may not know the missed calls." - Family member*

Can be pressure to a CT with mobility

*"During this week, my mom stays at home more than usual. She doesn't want to miss a call."*

Low catch-up-rate to connect calls

*"I feel that she misses the video call more than the normal phone in the house." - Family member*

No video calling in important situations

*"I will use the traditional phone when I have something important to talk to my grandma. The connection is more stable." - Family member*

Caregivers and nurses help all the time

*"The caregivers and nurses help for catching up calls for him when it rings. -" Observations*

### *Mind the battery*

The nurse and caretaker will check the battery level and charge the smartphone when needed.

*"It doesn't consume too much electricity. I charged it once for three days." - Nurse*

Assistance from a formal caregiver

*"I check the battery level when I am giving meals, and when I hear it rings, I come to help him for catch up the call. " - Formal Caregiver*

### *A better camera view setting*

See each other with a better look



*I called her in the afternoon, it was a bit dark in the room, but grandma was not aware of it. I asked her to turn on the light. Then I can see her face better. - Family member*

A caretaker on the bed may have a weird camera view while talking



### *Camera Shy*

Less confidence on looking for senior people

*"Oh, I look ugly today, my eyes become smaller after I get old, I don't know why "- (Elderly participant's murmur)*

*"I am sometimes distracted by my look in the small window, I seldom look at a mirror." - Senior family member*

Talk cautiously with a camera

*"I feel I am more cautious with video calling since I can see myself on the screen, think about how old I am. "- Senior family member*

## 06.8 More to explore

### *The trigger of a call*

A picture sent in a family group can trigger calls from family members,

阿嬤現在學會接視訊電話囉~



Translate the message: Grandma knows how to catch a video call now - sent in the testing group

*"I know grandma is beside the phone now, so I call her immediately." -Family member*

### *Active a relationship again*

To active the connection with less-connected people

*"Oh, I know who she is. I raised the child when she is little, but she seldom come after she grow up. Will she call back?" - Elderly caretaker*

### *A bridge to a off-line relationship*

*"After I create the Facebook account for my grandma, many people send friend requests to her. Some of them have not seen her for a long time." - Family member*

### *Interesting interaction with elderly*

*"I seldom call my grandma. With the experiment, I decided to give it a try. I feel it's interesting to video call her grandma." -Family member*

### *A first try of calling grandma*

*The family participant has never called the elderly before. Though he may not have a specific topic to talk about, he called her. - Observation*

## 06.9 Conclude from the testing results

The testing results lead to more design opportunities that contribute to the final design:

### **Establishing calling connections with visual enables family members to share more about their lives while also creating engagement for elderly caretakers.**

Young people highlight their lives by photo-taking from smartphones. The design helps younger family members reference what they are talking about when talking with an elderly person.

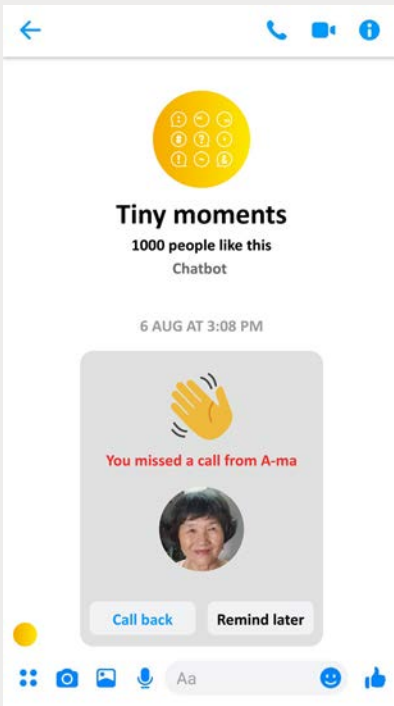
It enables young people to talk more about their lives and triggers positive-moments-sharing. On the other hand, while they share the pictures with stories with an elderly caretaker, s/he can be more engaging to their lives and create more common topics to talk about whether they meet online or in-person.

### **Picture taking together remotely with novelty effects**

Playing with new functions not only entertains young family members but also brings novelty to elderly people. The novelty of experiencing positive moments with loved ones with new and appealing technology enriches their life experience and creates some shared moments and memories with young people.

### **Positive moments can be tiny but fruitful.**

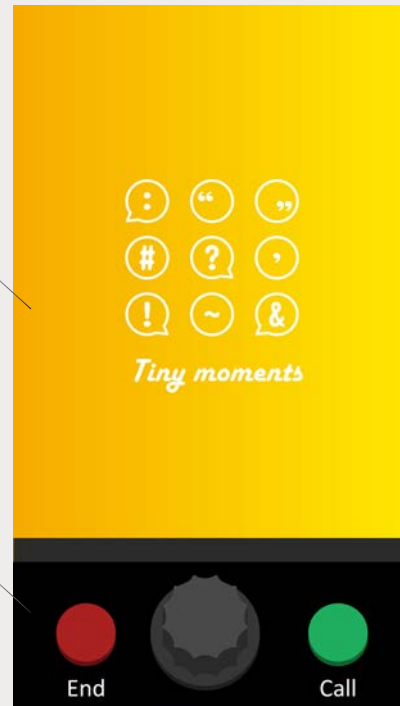
An elderly caretaker may have fewer new memories and stories to share. Some may repeat the same things that reduce young family members' interests.



Family members' interface with chatbot's support

Digital interface

Physical buttons and a knob



A caretaker's device, with a physical interface and a tablet



## 06.10 The final design

Tiny moments is a product-service system design that comes out of the project. It involves a control panel and a software concept. It establishes the connection for elderly caretakers and their families and enables them to be more engaged to experience each other's lives.



## 06.11 The final design experience journey map

The experience journey map shows the intended experience and interactions for the stakeholders. Several new scenarios were generated in the experience map after the evaluation prototype testing.

		Before the shared moment
Experience of positive moments	Elderly caretaker	<ul style="list-style-type: none"> <li>• Send a hello</li> <li>• Receive a message from the person who refuse the call</li> </ul>
	Family members	<ul style="list-style-type: none"> <li>• Call back later remind</li> <li>• Receive a hello.</li> </ul>
	Caregiver	<ul style="list-style-type: none"> <li>• Suggest when</li> </ul>
Interactions for establishing the connection	Elderly caretaker	<ul style="list-style-type: none"> <li>• Set and show availability on schedules</li> </ul>
	Family members	<ul style="list-style-type: none"> <li>• Refuse a call from caretaker with a pre-set message. And set for a reminder to call back</li> </ul>
	Caregiver	<ul style="list-style-type: none"> <li>• Battery level: is important to show for</li> <li>• Ass</li> </ul>

During the shared moment	After the shared moment
<p><b>Suggest for setting a better camera view</b></p> <p><b>Look-younger AR mask</b></p> <p><b>Photo sharing</b></p> <p><b>Picture taking</b></p> <p><b>Best for a call</b></p> <p><b>When needed</b></p>	<ul style="list-style-type: none"> <li>• Show missed calls and enables calling back</li> <li>• Shared memories of the moments</li> <li>• Share pictures in family group (triggers others to contact)</li> </ul>
<ul style="list-style-type: none"> <li>• Touch screen safe zone on the edge (prevent from mistouching)</li> <li>• Touch Feedback (physically)</li> <li>• A smartphone stand that fits the angle of use</li> </ul> <p>caregivers to help for charging.</p> <p>assist caretakers to call and setting when needed</p>	<ul style="list-style-type: none"> <li>• Show missed calls and enables calling back</li> <li>• Charging notifications for managing more phones in care institutions</li> </ul>

## 06.12 Design for future scenarios

The evaluating test with users led to some future scenarios can be in the final design. There were five designs with the scenarios that were visualized with a video for communicating with users and stakeholders.

### 1) Providing for confidence with a better look for an elderly caretaker

An elderly caretaker may feel cautious with a camera. They may not look at a mirror every day like younger people do. Before a call connects, they prefer to prepare for their look. There are three main scenarios I envision.

- Caretakers get suggestions for better camera view if the camera cuts their faces
- Caretakers get a younger face
- Change clothes to the style they feel like to wear outside



Figure. A caretaker gets a younger face that they are satisfied with

- : *Oh, I have more wrinkles here*
- : *I look like an old woman*
- : *What is this? (Click)*
- : *I look young! like a 20-year-old person*

Elderly caretakers will get suggestions for camera position when her/his face is out of the screen for a long time. The screen highlights the caretaker's view and arrow to remind her about a better camera position setting.

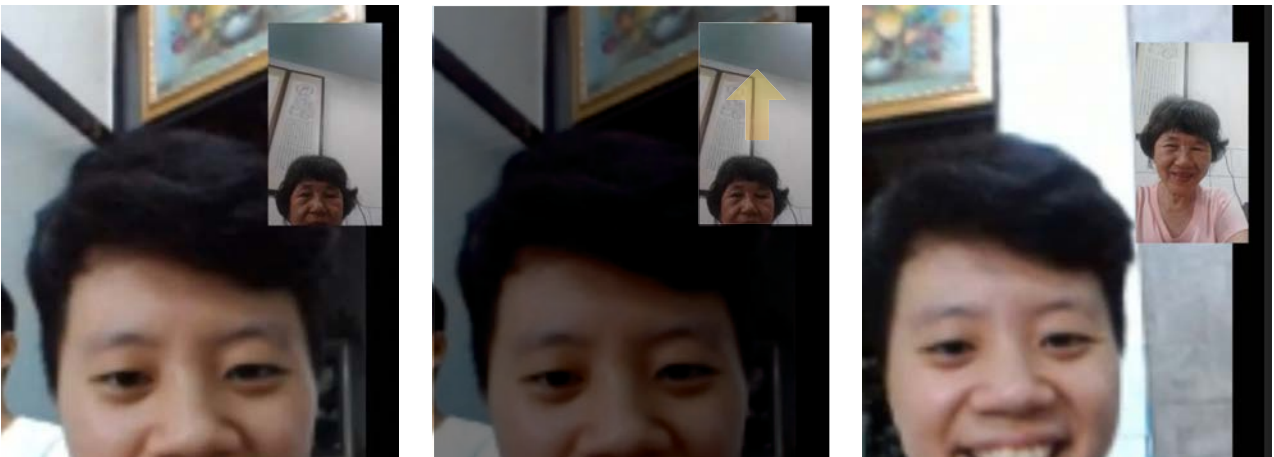


Figure. camera view suggestion for a caretaker: highlight the poor camera view

: *Oh, I am out of the camera*

: *Let me set a better angle for the stand*

## 2) Remote selfie with beautiful scenes

While a family member is traveling, they can remote selfie the elderly caretaker. The remote selfie provides a sense of immersion, enables elderly caretakers to experience the live scene brought by a family member.

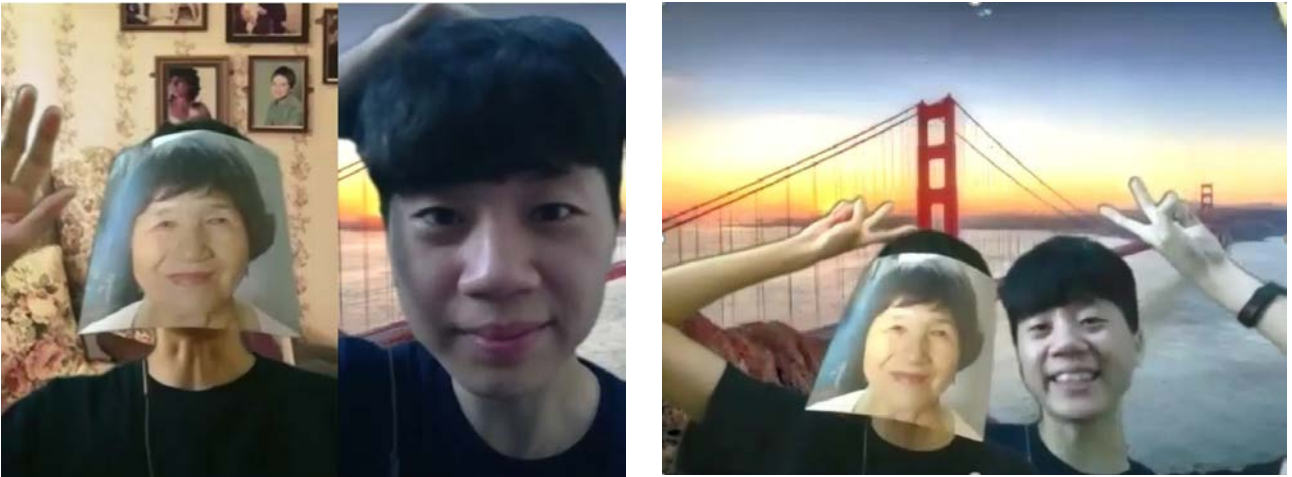


Figure. Remove one of the person's background and put them together in a screen

*:Hey grandma!*

*:Hey Dora! Are you traveling?*

*:Yes I am at Golden Gate bridge, see!*

*:That's beautiful!*

*:Do you want to come here?*

*:Yes, but... no, I can't.*

*:Why not?*

*:I can't take an airplane, too difficult for me*

*:I can bring you here now!*

### 3) Picture as a reference to talk about (Family members)

While they have a video call, a young family member comes up with a photo he took last night and wants to show grandma without ending the call. He uses the photo-sharing in hand function, to show the pictures to his grandma.



Figure. Family members have some pictures want to share at the same time they do video call. He uses hand gestures to pin the picture on the screen.

*:Hey Joseph!*

*:Hey grandma how are you doing?*

*:Are you at the kitchen?*

*:Yes! I am currently learning cooking. Do you want to see what I cook last night?*

*:Yes!*

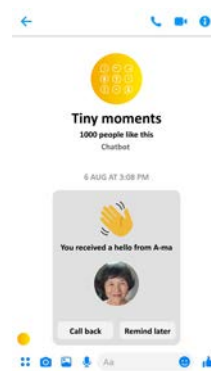
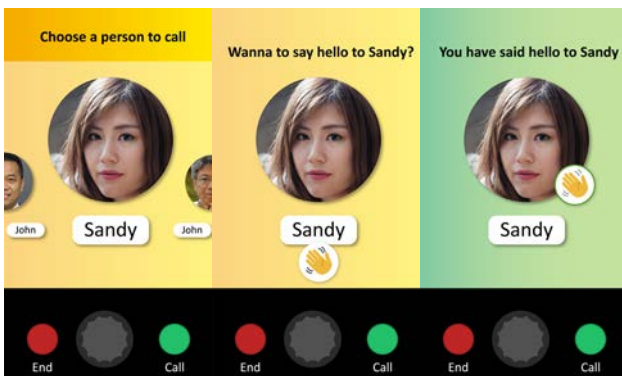
*:See, this is the noodle I cooked*

*:Wow seems tasty! Great job Joseph!*



#### 4) Activate a link again

Some young people may not contact the elderly family member for several years. They may have a less close relationship or have some quarrels before. The design can be a bridge for them to restart a talk by a simple greeting to activate a link again. If it triggers a shared moment for them, the experience plays as a medium to enable them to reflect on the interaction, triggers the change in the future.



*:Wow, is this Sandy? The little girl we lived before!  
:It's she! I have not seen her for a long time!  
:Let me say hello to her*

*:Oh, is this grandma?  
:She is using messenger! So cute  
:Let me call her!*

### 5) Polite refuse when busy

When the person a caretaker calls is busy and refused the call, a chatbot will help intermediately to arrange a calling later.

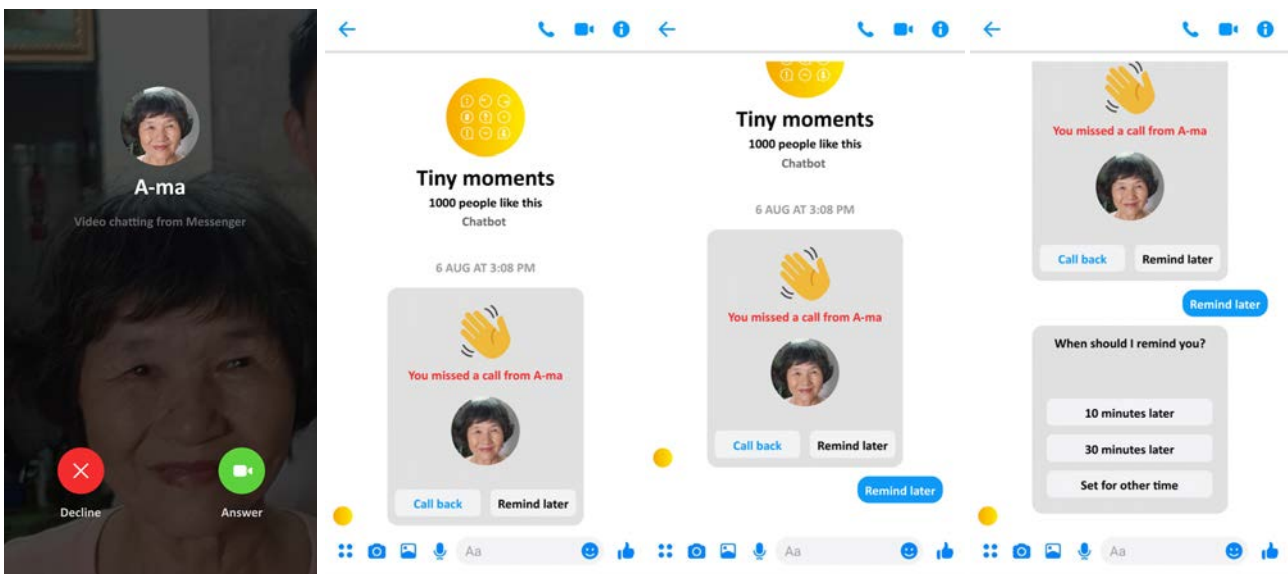


Figure: The process of refusing a call politely

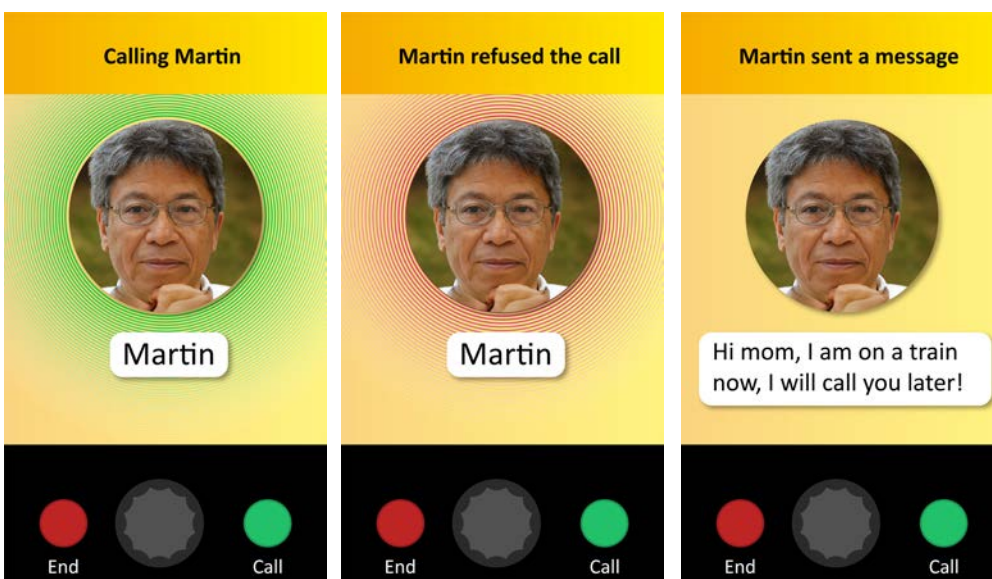


Figure: The process of a call being refused for a caretaker.

#### 6) Set a regular schedule

When the person a caretaker calls is busy and refused the call, a chatbot will help intermediately to arrange a calling later.

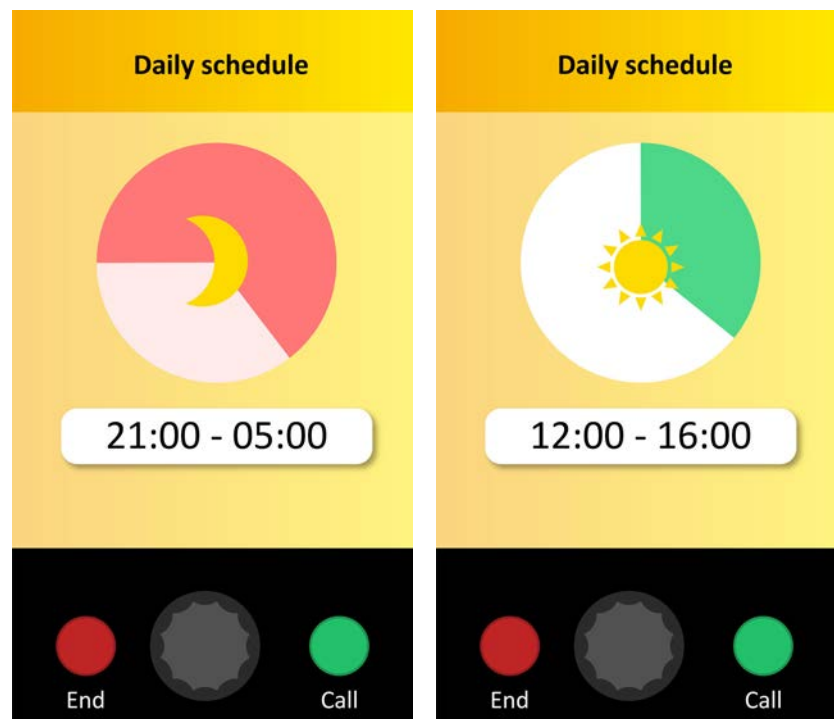


Figure: Elderly caretaker set for the available time for calling

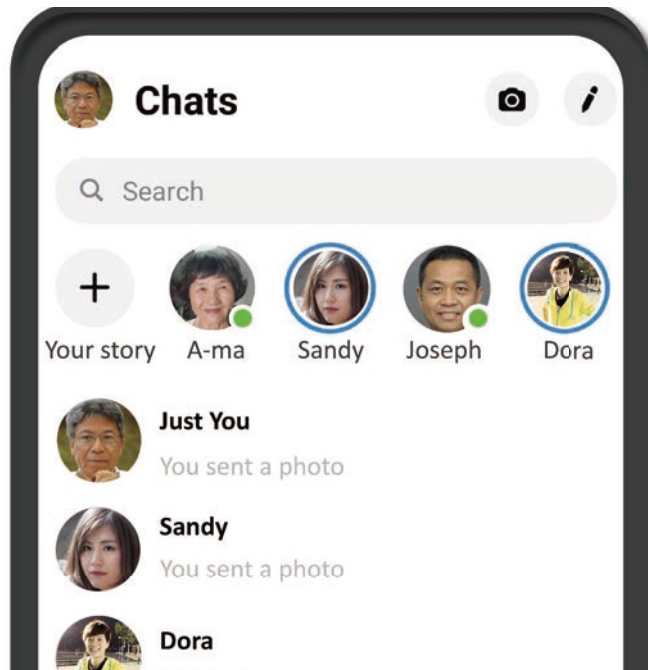


Figure: Family members receive the available information of a caretaker

# 07 Discussion and recommendation

## 07.1 Project Discussions

### **The first successful experience for an elderly caretaker to experience the product plays an important role.**

I think I am lucky to have an elderly participant who dares to try out when she meets the testing difficulty. This case may not be the majority of elderly people.

Elderly people might exclude themselves from new things, especially when it is something that looks high-tech. The first experience of using the product should be carefully designed as well.

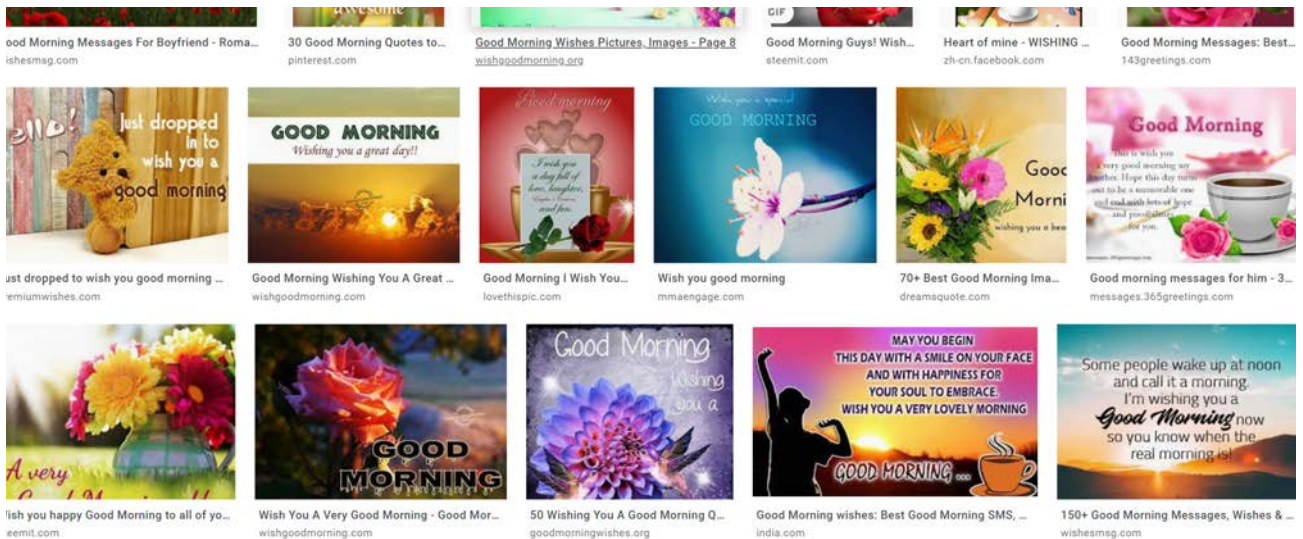
### **The implementation in a care institution**

The testing lasts for one week, and only one patient in the care home has a smartphone. The sense of freshness may attract nurses' and caregivers' attention and help with it. It would be interesting to test in a more extended period and more people in the institution.

On another perspective, the participant who dares to try living alone at her home is autonomy for taking care of herself. However, participants tend to seek help if it is in a care institution instead of solving the problems on their own. It may make the nurses busy if many people in an institution use the device.

### **Who is the buyer?**

The buyers of the experience could be the family members who want to experience shared moments with the elderly caretaker. They are proactive people in a family that can motivate interactions and activities.



### The implementation in a family cultural

After prototype 5, I notice that after establishing the shared moments, some photos took was shared with their friends and family via social media.

The experience can be a positive loop if there are some beautiful shared-moment pictures sent in a family group; other family members would be triggered to do it.

Elderly people may not show on social media regularly. Still, if they do and they interact with young people, it would be a novelty experience for young people to interact with them as well.

On the other hand, it can also be harmful for an interaction that one may not enjoy. People of different ages may have different cultures to interact with. For example, some senior people in some Asian countries, such as India and Taiwan, used to send a "Wish good morning" picture to their family and friends in a personal message or group. Though the interaction is friendly and straightforward, some people may feel disturbed and feel awkward to receive and reply to the greeting.



## 07.2 Recommendations

### The limitation of the project

Due to the Covid-19 situation, research of a care institution was difficult at the beginning of the project. In some situations, I need to find alternative ways to get the data needed for the project. For the evaluation testing, it could be more interesting to test all the participants in different institutions. The results may come out differently since the health situation and the family relationships of each case can affect the results.

### More to explore

For the last testing, I would recommend testing with more people in the care institution and seeing more interactions in the context. It could probably be caretakers talk too much in the shared space, or the caregivers are too busy helping them reach out to the person they want to call. In terms of family members' interactions, I would be curious about how will they experience it for a longer time, will they call more frequently? Will family members visit the caretaker less frequently after he/she is more accessible with video calling? Will these interactions bring a positive effect on the caretaker's wellbeing? Those are some questions I would recommend to explore further.

### Reflect on the usability testing set up with an elderly participant.

When researching with elderly citizens, there are many situations different from a normal process. Some takeaways from the experience of this research may help for further research.

Qualitative data is more accessible to collect than quantitative data.

↑ SUS questionnaires may not work for elderly participants since it is long and may make the elderly participant impatient.

Their attention is precious.

↑ While setting up for the next prototype, I need other people to talk with the participant to keep their attention.

Elderly participants have a stereotype on smart devices that it is complex and difficult

↑ The elderly participant may assume it is complicated and designed for young people, and refuse to learn

The first success experience is essential.

↑ When they have success experience, they will be more willing to try the next one.

## 07.3 Reflecting on the process of project

### Reflect on the project planning and time management

Since I am taking a more explorative approach, it takes some time to reflect on the testing result and visualize the scenario in the evaluation phase. To enable people to understand the experience well, If I did the project differently, I would move the explorative testing once earlier.

### The strategy of documenting

Working with a digital tool and physical one: Digital tools do help for searching keywords, it helps to document better, but I found I keep less information in my mind with it. It's searchable but not memorable.

When using physical tools, the less mental workload is required; it helps me think and reflect more on how to connect the dots.

### Doing research when I am also one of the users in the context

Be at the moment, and reflect after the moment.

Since I am researching a context that is close to my own experience for now, sometimes it can be overwhelming to play two roles simultaneously (being one of the stakeholders in the context, and being a researcher of this context). I learned to note the feeling I have in the context, and interview people to find some common patterns show in our mind.



### Think about how to communicate to others can help to organize the floating thoughts

Sometimes I missed why and how I got there to come up with the next action, making it difficult for me to communicate with people about the narrative story. From this project, I found that sometimes I forget what I thought and why I make design decisions quickly. I found that thinking about communicating with other people can remind me to see the route and memorize essential things better.

# 08 Reference

- Ahn, J., & Jung, Y. (2016). The common sense of dependence on smartphone: A comparison between digital natives and digital immigrants. *New Media & Society*, 18(7), 1236–1256. <https://doi.org/10.1177/1461444814554902>
- Carol S. Aneshensel; Leonard I. Pearlin; Joseph T. Mullan; Steven H. Zarit; Carol J. (n.d.). Profiles in Caregiving: The Unexpected Career. Retrieved February 26, 2020, from [https://books.google.nl/books?hl=zh-TW&lr=&id=zo2WxJBa0csC&oi=fnd&pg=PP2&dq=aneshensel+caregiving&ots=yyTWhGmOgJ&sig=OXMujEs4rca3B7SXRv5dxP3bVrg&redir\\_esc=y#v=onepage&q=aneshensel+caregiving&f=false](https://books.google.nl/books?hl=zh-TW&lr=&id=zo2WxJBa0csC&oi=fnd&pg=PP2&dq=aneshensel+caregiving&ots=yyTWhGmOgJ&sig=OXMujEs4rca3B7SXRv5dxP3bVrg&redir_esc=y#v=onepage&q=aneshensel+caregiving&f=false)
- Chiou, C. J., Chang, H.-Y., Chen, I. P., & Wang, H. H. (n.d.). Social support and caregiving circumstances as predictors of caregiver burden in Taiwan. <https://doi.org/10.1016/j.archger.2008.04.001>
- Janze, A., & Henriksson, A. (2014). Preparing for palliative caregiving as a transition in the awareness of death: Family carer experiences. *International Journal of Palliative Nursing*, 20(10), 494–501. <https://doi.org/10.12968/ijpn.2014.20.10.494>
- Khalaila, R., & Cohen, M. (2016). Emotional suppression, caregiving burden, mastery, coping strategies and mental health in spousal caregivers. *Aging and Mental Health*, 20(9), 908–917. <https://doi.org/10.1080/13607863.2015.1055551>
- L. Parameswaran. (2017). Who Cares? Redesigning Caregiving | Lekshmy Parameswaran | TEDxIESEBarcelona - YouTube. In Ted talk. [https://www.youtube.com/watch?v=Qil8M2xs\\_xQ](https://www.youtube.com/watch?v=Qil8M2xs_xQ)
- Linderholm, M., & Friedrichsen, M. (2010). A Desire to Be Seen: Family Caregivers' Experiences of Their Caring Role in Palliative Home Care. *Cancer Nursing*, 33(1), 28–36. <https://doi.org/10.1097/NCC.0b013e3181af4f61>
- Report: Transformation – Studio D Radiodurans. (n.d.). Retrieved July 7, 2020, from <https://studiodradiodurans.com/pages/transformation>
- Sawatzky, J. E., & Fowler-Kerry, S. (2003). Impact of caregiving: Listening to the voice of informal caregivers. *Journal of Psychiatric and Mental Health Nursing*, 10(3), 277–286. <https://doi.org/10.1046/j.1365-2850.2003.00601.x>
- Shwu-Chong Wu; Kun-Yang Chuang. (2001). Aging in Place: the Direction of Taiwan Long-Term Care Policy in the 21st Century (在地老化：台灣二十一世紀長期照護的政策方向). *Taiwan Public Health Magazine (台灣公共衛生雜誌)*, 20(3), 192–201. <https://doi.org/10.6288/TJPH2001-20-03-05>
- Wiles, J. L. ., Leibing, A., Guberman, N., Reeve, J. ., & Allen, R. E. S. (2011). The Meaning of “Aging in Place” to Older People. <https://doi.org/10.1093/geront/gnr098>
- Yi-Yin Lin, C.-S. H. (n.d.). Aging in Taiwan: Building a Society for Active Aging and Aging in Place.
- Gilroy, R. (2007). Ageing societies: myths, challenges and opportunities By Sarah Harper. *Area*, 39(2), 250-250.

Chan, A. (2005). Aging in Southeast and East Asia: issues and policy directions. *Journal of Cross-Cultural Gerontology*, 20(4), 269-284.

Lian Heng. (2017). *The General History of Taiwan* (Vol. 86). Wunan Book Publishing Co., Ltd.. (Original work published 1918).

Li Xianzhang. (1978). *Taiwan Folk Literature Collection*. Taipei. Shepherd Tong Publishing House. (Original work published 1936).

Buchenau, M., & Suri, J. F. (2000, August). Experience prototyping. In *Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques* (pp. 424-433).

Diener, E., Lucas, R. E., & Scollon, C. N. (2009). Beyond the hedonic treadmill: Revising the adaptation theory of well-being. In *The science of well-being* (pp. 103-118). Springer, Dordrecht.

# 09 Appendix

- A. Project exploring process**
- B. Project Brief**
- C. Patient Journey map of home care**
- D. Interview participant descriptions**
- E. Concept Sketch**



## Appendix A. Project exploring process

	Goal	Exploratory question	Activities	Outcomes
Exploration	Explore the context	What is the caring context in Taiwan?	<ul style="list-style-type: none"> <li>• Interview Informal caregiver and the related organizations</li> <li>• Observation in the context</li> </ul>	<ol style="list-style-type: none"> <li>1. For a Informal Family Caregiver(IFC), distinguishing love and care and make a balance is important</li> <li>2. Meaningful interaction in caregiving is needed</li> </ol>
	Problem framing	How can we create meaningful interactions for a caretaker and a Informal Family Caregiver?	Analysis the data	Bring the positivity back the role of being a family member for an IFC
	Find Design opportunity	What are the different aspect for a home care and a institution care?	<ul style="list-style-type: none"> <li>• Observation in home-care and institution-care</li> <li>• Juko.health interview</li> <li>• Related organization interview</li> </ul>	<ol style="list-style-type: none"> <li>1. Both are accompanied by unfamiliar person</li> <li>2. Lose the accessibility to people in institution caer</li> <li>3. Time spend by a caregiver is much less in institution</li> </ol>
		<ul style="list-style-type: none"> <li>• How to establish meaningful connections between family members and the elderly caretaker?</li> <li>• What is the nature of family interaction?</li> <li>• What can be the moment for elderly caretakers to enjoy doing with their family?</li> </ul>	Interview caretakers, informal family caregivers, formal caregivers	<ol style="list-style-type: none"> <li>1. The hope of caregiving</li> <li>2. Hedonic treadmill and the happiness drop (Diener, Lucas,&amp; Scollon,2009) after a in-person meet with family members</li> <li>3. Autonomy &amp; Accessibility for caretakers can lead to a win-win situation for caretakers and caregivers</li> <li>4. Eatinf as a universal topic to all age</li> </ol>
Conceptualisation	To explore the interaction of video calling with an elderly	How will elderly people interact with a video eating experience?	Prototype 1: Video eating	<ol style="list-style-type: none"> <li>1. Camera position affects engagement</li> <li>2. Video calling is a push for elderly to talk</li> <li>3. People feel like to fill the silent moments</li> <li>4. Talk with a screen works for the elderly</li> </ol>
	To explore a interpretable way on the screen	How can we enable elderly people autonomously to make a video call?	Prototype 2: Autonomy	<ol style="list-style-type: none"> <li>1. When a elderly user push a button on the screen, they wait for a haptic feedback</li> <li>2. Elderly people may have less agility on moving finger</li> <li>3. The massive information on the screen is too complex for the elderly to understand.</li> </ol>
	To explore the context in Northern Taiwan		Evaluating the current concept from different institution (LTC, long term caring institution)	<ol style="list-style-type: none"> <li>1. The essence of Autonomy</li> <li>2. The mismatching meal schedule for young adults and elderly caretakers</li> </ol>
	To explore the usability of physical buttons for elderly people to make a call.	How to enable elderly people to interact with a touchscreen?	Prototype 3: Accessibility	<ol style="list-style-type: none"> <li>1. Physical buttons and a knob works for an elderly people to select a contact person on the list, and make a call</li> <li>2. Red and green button can imply "Yes"/"No" for elderly user,</li> <li>3. Family member may refuse the call when they are busy, they send text message but the elderly can't see it.</li> </ol>
	To explore the possibility of having a non-verbal way of interact with the elderly	How will elderly people interact with video calling without talking, but a non-verbal way to share moments remotely?	Prototype 4: Non-verbal interaction with video calling	Non-verbal positive moments can also be transferred by video calling to an elderly.
Evaluation		What will be the new culture if we enable an elderly caretaker to catch a video calling from family members?	Prototype 5: A new family culture	<ol style="list-style-type: none"> <li>1. The ownership of the callnig increase the time people talk with an elderly caretaker</li> <li>2. For young people, to chat with visual reference is easier</li> <li>3. In care institution, formal caregiver use it for distract caretaker's attention and help the caretaker for better communicate with family members</li> </ol>

# IDE Master Graduation

## Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

**! USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT**

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

### STUDENT DATA & MASTER PROGRAMME

Save this form according the format "IDE Master Graduation Project Brief\_familyname\_firstname\_studentnumber\_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !



family name Ho 4132

initials \_\_\_\_\_ given name Tsai Cheng

student number 4845951

street & no. \_\_\_\_\_

zipcode & city \_\_\_\_\_

country Netherlands

phone \_\_\_\_\_

email t.c.doraho@gmail.com

Your master programme (only select the options that apply to you):

IDE master(s):  IPD  Dfl  SPD

2<sup>nd</sup> non-IDE master: \_\_\_\_\_

individual programme: \_\_\_\_\_ (give date of approval)

honours programme:  Honours Programme Master

specialisation / annotation:  Medisign

Tech. in Sustainable Design

Entrepreneurship

### SUPERVISORY TEAM \*\*

Fill in the required data for the supervisory team members. Please check the instructions on the right !

\*\* chair Marieke Sonneveld dept. / section: AED

\*\* mentor Froukje Sleswijk Visser dept. / section: DCC

2<sup>nd</sup> mentor \_\_\_\_\_

organisation: \_\_\_\_\_

city: \_\_\_\_\_ country: \_\_\_\_\_

comments  
(optional)

⋮

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..



Second mentor only applies in case the assignment is hosted by an external organisation.



Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

### APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

chair Marieke Sonneveld date 29 - 04 - 2020 signature 

### CHECK STUDY PROGRESS

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: 21 EC

Of which, taking the conditional requirements into account, can be part of the exam programme 21 EC

List of electives obtained before the third semester without approval of the BoE

YES all 1<sup>st</sup> year master courses passed

NO missing 1<sup>st</sup> year master courses are:

name Colinda van der Bunt date 01 - 05 - 2020 signature \_\_\_\_\_

### FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked \*\*. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content:  APPROVED  NOT APPROVED

Procedure:  APPROVED  NOT APPROVED

comments

name Monique von Morgen date 11 - 05 - 2020 signature \_\_\_\_\_



Creating shared positive interactions between a family and a caretaker project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date \_\_\_\_\_ end date \_\_\_\_\_

**INTRODUCTION \*\***

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

• Jubo.health

Jubo.health is an information service provider based in Taiwan for long-term caring institutions aiming to connect people by connecting data. The current service they have is to let the formal caregivers get information about the caregivers in the institutions and also provide the caretaker's family members the health data about their elder family members. Their current challenge is to develop an intervention to enable an elderly caretaker and family members to live apart but feel like together.

• Aging in place

Taiwan will encounter a super-aged society by 2025(Yi-Yin Lin, n.d.), the Ministry of Health and Welfare in Taiwan has implemented a new act, Long Term Care 2.0, to respond to the aging society. One of the goals is to enable older adults to grow older at their home and community, so-called aging in place(Shwu-Chong Wu; Kun-Yang Chuang, 2001). Aging in place has been an excellent choice for the elderly to enjoy their life, it creates a feeling of connection with family and their familiar surroundings(Wiles et al., 2011).

To age at home, it is common to hire a foreign caretaker to take care of the elderly at home in Taiwan(Chiou et al., n.d.), and some also have a family member become an informal family caregiver(IFC), to coordinate and accompany with the caretaker (Linderholm & Friedrichsen, 2010). To age in an institution, there will be formal caregivers and healthcare professionals, the family members can visit them if they have time.

• The interaction with family members

In a home caring context, one of the family members will take the role of an IFC, who represents the big family for providing care to the caretaker, will assist the foreign caregiver, and coordinates the family members' opinions to make decisions. The different roles have made interactions different.

For an IFC, the workload can be intense since it can be a 24/7 with no experience and uncertainty(Janze & Henriksson, 2014). Previous research described it as an "Unexpected career" since the IFC seldom prepared for the new role (Carol S. Aneshensel; Leonard I. Pearlin; Joseph T. Mullan; Steven H. Zarit; Carol J., n.d.). Also, most of the caregivers regard caregiving as a full-time job, with the responsibility of their loved one's life(Sawatzky & Fowler-Kerry, 2003).

For family members, many young people don't live in their hometown after they start their studies, work or new family life, elderly people who live in their home town have less opportunity to interact with their offspring.

For a foreign caregiver, though they do not have a blood relationship with the caretaker, she/he spends the most time with the caretaker, and also live with the whole family for several years.

• Information technology service for family interaction

In the service system of LTC institutions, Jubo.health currently provides an information platform for the formal caregivers showing the caretakers' health situation in the institution. With this information, the formal caregiver can provide messages to the family members and let them feel more relieved.

However, the current information the family members can receive is mainly the figures such as blood pressures, heartbeat, etc., which only shows the signs of life. Jubo's current challenge is how to use information technology to enable the elderly who live remotely with his family members to keep connect with their family members and healthcare professionals.

• The quality of prolonged life

In this context, I have the vision to bring more shared positive moments with family members and the elderly. I believe the meaning of caring for a loved one is not only to prolong a person's life but also to have a meaningful experience and interaction with the loved people when caring. The goal of design the following: "Creating shared positive moments for family members and the caretaker with quality interactions."

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introduction (continued): space for images

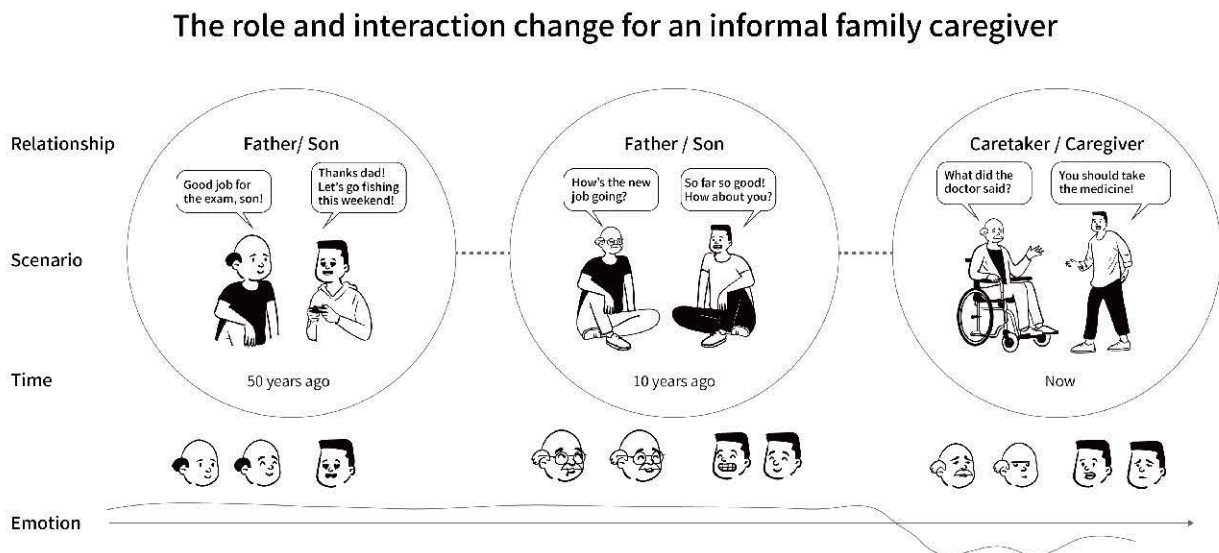


image / figure 1: The role of interaction change for an informal family caregiver

- What are the nature relationships people have in families in Taiwan?
- What are the positive interactions for an elderly and his/her family members?

## Creating shared positive interactions between family members and a caretaker

- How does a family informal caregiver adopt to his/her new role?
- How can we provide a positive experience of caring at home for the elderly who live in an institution?

- What is the daily ritual(routine) for an elderly caretaker?
- What can be the touchpoints for the interactive moment?
- How can we enable the elderly to feel like keep in touch when they are not here?

image / figure 2: The sub-research questions of the project



**PROBLEM DEFINITION \*\***

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

- The interaction of an IFC

There are some barriers to the quality interaction between an IFC or a family member and an elderly. First, for the IFC, the intense stress of caring with a loved one can lead to low qualities of interactions between an IFC and a caretaker. Previous research indicated that an IFC feels that they have the social responsibility to hide their negative emotions in front of a caretaker (Linderholm & Friedrichsen, 2010). The suppression of low mood causes the lower mental health of the caregiver (Khalaila & Cohen, 2016). With Long Term Care Plan 2.0 in Taiwan, part of IFCs' workload can be shared by formal caregivers or the daycare centers. IFCs can focus more on providing the quality of interaction with their loved ones.

- The interaction of a family member who lives apart

It's also hard for the elderly to interact with family members who live alone. First, a smartphone is not what they are familiar with, but that is the leading portal and the handiest way for family members to receive a message (Ahn & Jung, 2016). Also, the health situation of the elderly differs from each case. It's hard for them to use a single device to fit all circumstances. As a result, the quality of interactions between family members and the elderly becomes lower.

- The diversity of positive interactions

The definition of "positive interactions" differs between people. There are different ways to express concerns to family members in Taiwan. Some like to talk and share a lot, while some prefer to sit and stay calm. It's essential to find the nature of family interactions and bring insights to the intervention.

**ASSIGNMENT \*\***

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... . In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

Design a concept for creating shared positive moments between family members and elderly caretakers who live apart with his/her family in Taiwan.

In the caregiving context, I saw an urgent need to increase the quality of interaction with the family members, to make the prolonged life of the elderly more meaningful. The design goal is: "To creating shared positive moments between family members and elderly caretakers with quality interactions."

- The design opportunity:

Jubo.health has the strength of developing information technology services. They are looking for an intervention in a smart room for the elderly, which can provide a sense of connection with their family members. The design intervention will be something that can enable both family members and the elderly to interact remotely also enriches the interaction experience when they meet face to face.

For the final deliverables, I expect the prototype can be testable with the users, and iterate with the testing results. The deliverables are as following:

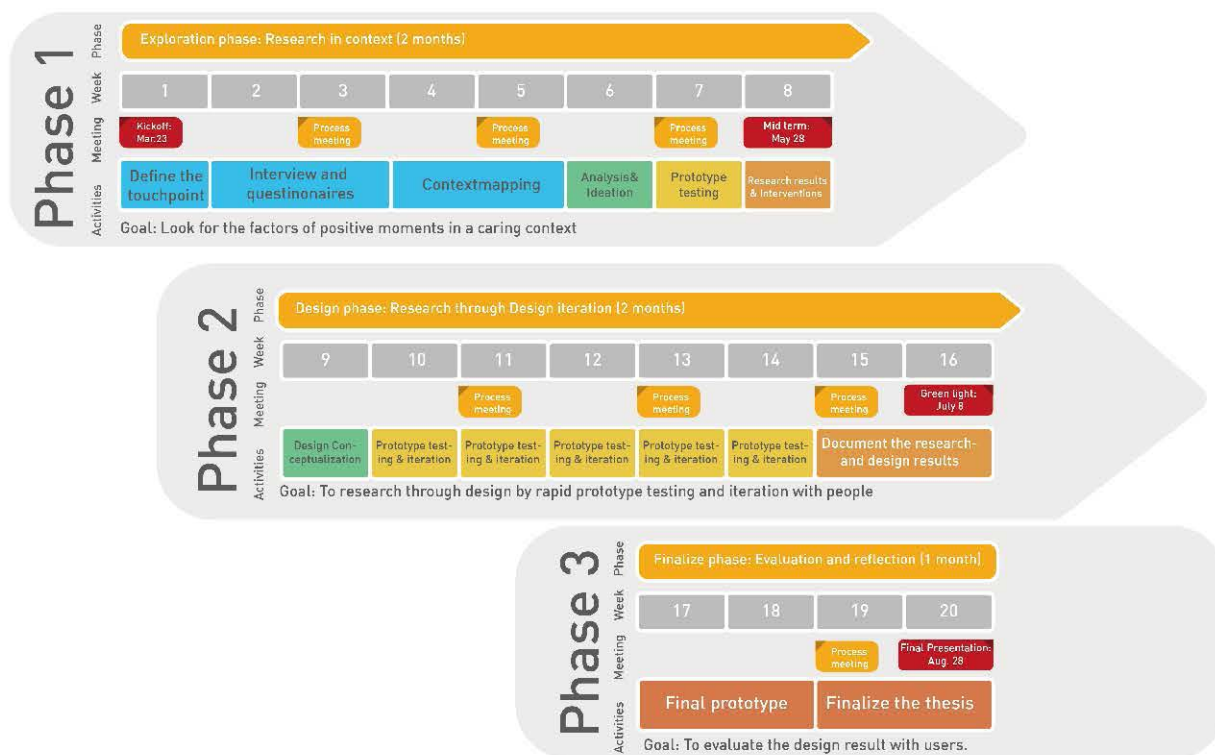
- The journey map in an elderly caregiving context that describes the stakeholders, interactions, and user needs.
- A prototype and a service blueprint of the concept.



### PLANNING AND APPROACH \*\*

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date \_\_\_\_\_ end date \_\_\_\_\_



The assignment will be developed in Taiwan. The research activity includes three parts, the exploration phase, design phase, and the Finalizing phase.

For the exploration phase, there are some research questions need to be explored.

- What are the nature relationships people have in families in Taiwan?
- What are the positive interactions for an elderly and his/her family members?
- How does a family informal caregiver adopt to his/her new role?

In order to find a feasible way of creating positive moments in a caring context, I will use qualitative design methods to collect the data and use a journey map to show the results of the analysis and design opportunities in this context.

For the designing phase, I will do prototype testing and iteration with users during the process. For the evaluation phase, I expect the design solution(s) can be tested in the context and gain feedback from users, and to iterate the design based on the research. The research questions were defined as following:

- How can we provide a positive experience of caring at home for the elderly who live in an institution?
- What is the daily ritual(routine) for an elderly caretaker?
- What can be the touchpoints for the interactive moment?
- How can we enable the elderly to feel like keep in touch when they are not here?

For the finalize phase, I will do the final prototype and document the process of the research and design process.

### MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... . Stick to no more than five ambitions.

From the literature review, I see some common points that I experience in my life. My grandfather started to need 24/7 caring for half years ago; after that, my parents and my uncles take turns to take care of him after some of them retired from their works. As a caregiver, he needs to coordinate the communication with family members and healthcare professionals (including doctors, nurses) (Figure. 4). I observed the context in my family ,and I hope to bring some positiveness in this context, and I believe there should be something designers can do in this context.

Through the graduation project, there are some learning goals that I want to achieve:

1. To enhance the research ability, and to conduct practical research activities efficiently in a limit time with Contextmapping skills I learn from TUDelft.
2. To use iterating approach and develop the project with the insights and feedback from users.
3. To gain some experience of collaborating with company and figuring out the common area of my interest and the industry needs.

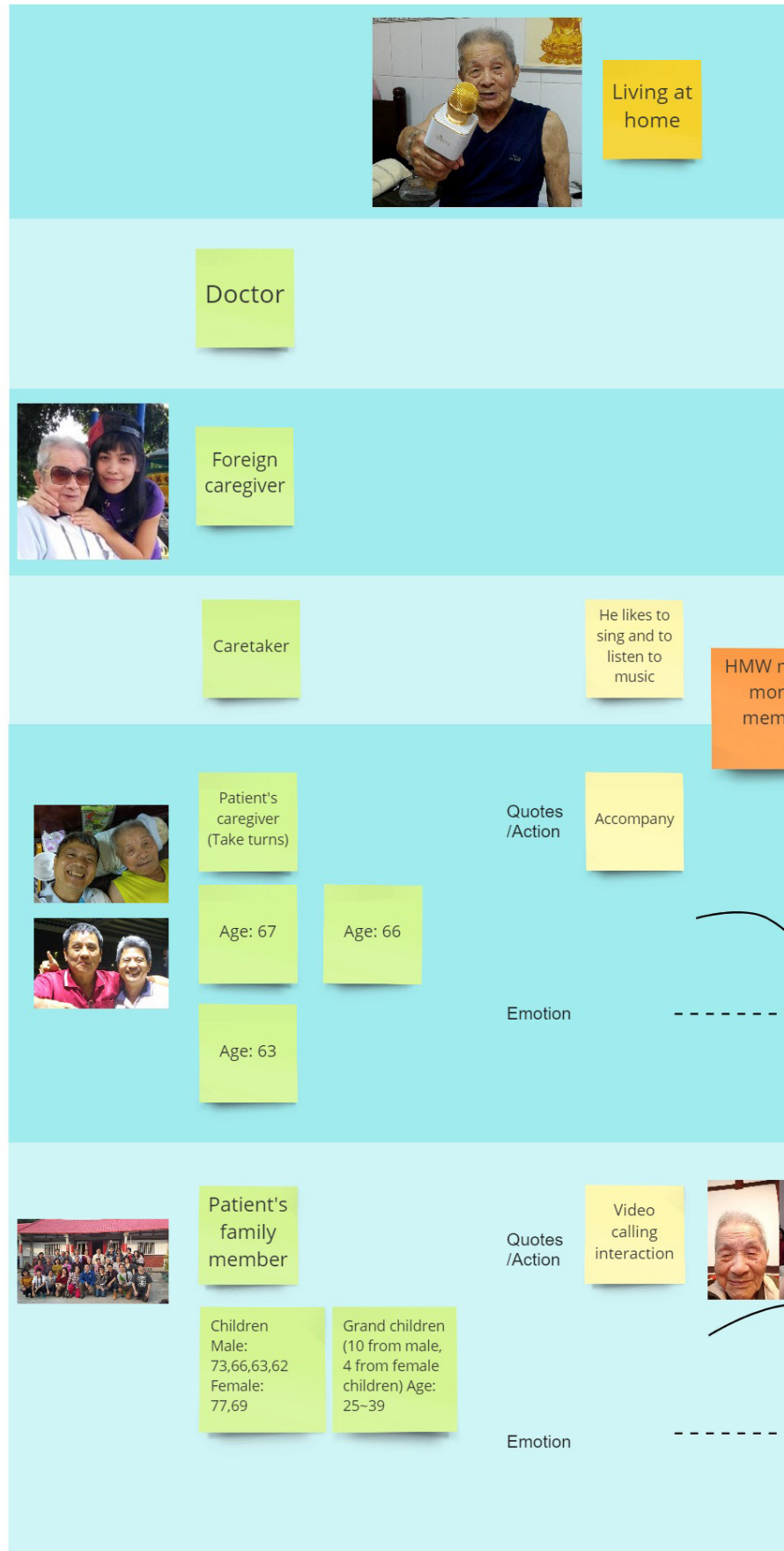
There are some opportunities and limitations to do this project in terms of personal situations. There are some opportunities for me as an international student to do this research here. First, I know more about the cultural- and social norms in the Eastern world. I will do the research in Taiwan and I think it's interesting to see some cultural differences that we can learn from each other. Second, I have been designing for the elderly for four years; the understanding of the area and the know-how of doing research and design with the elderly has been accumulated in the process.

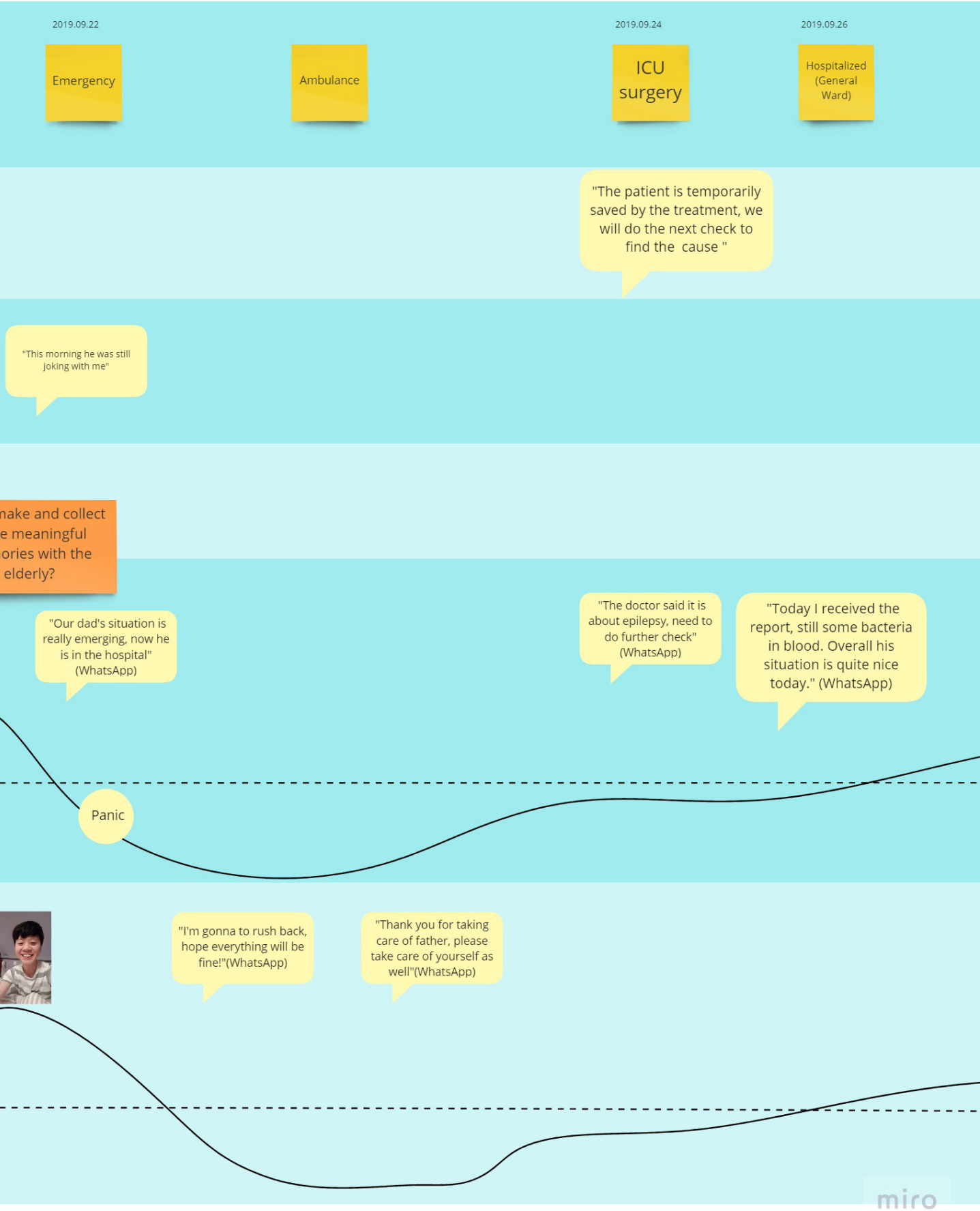
### FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

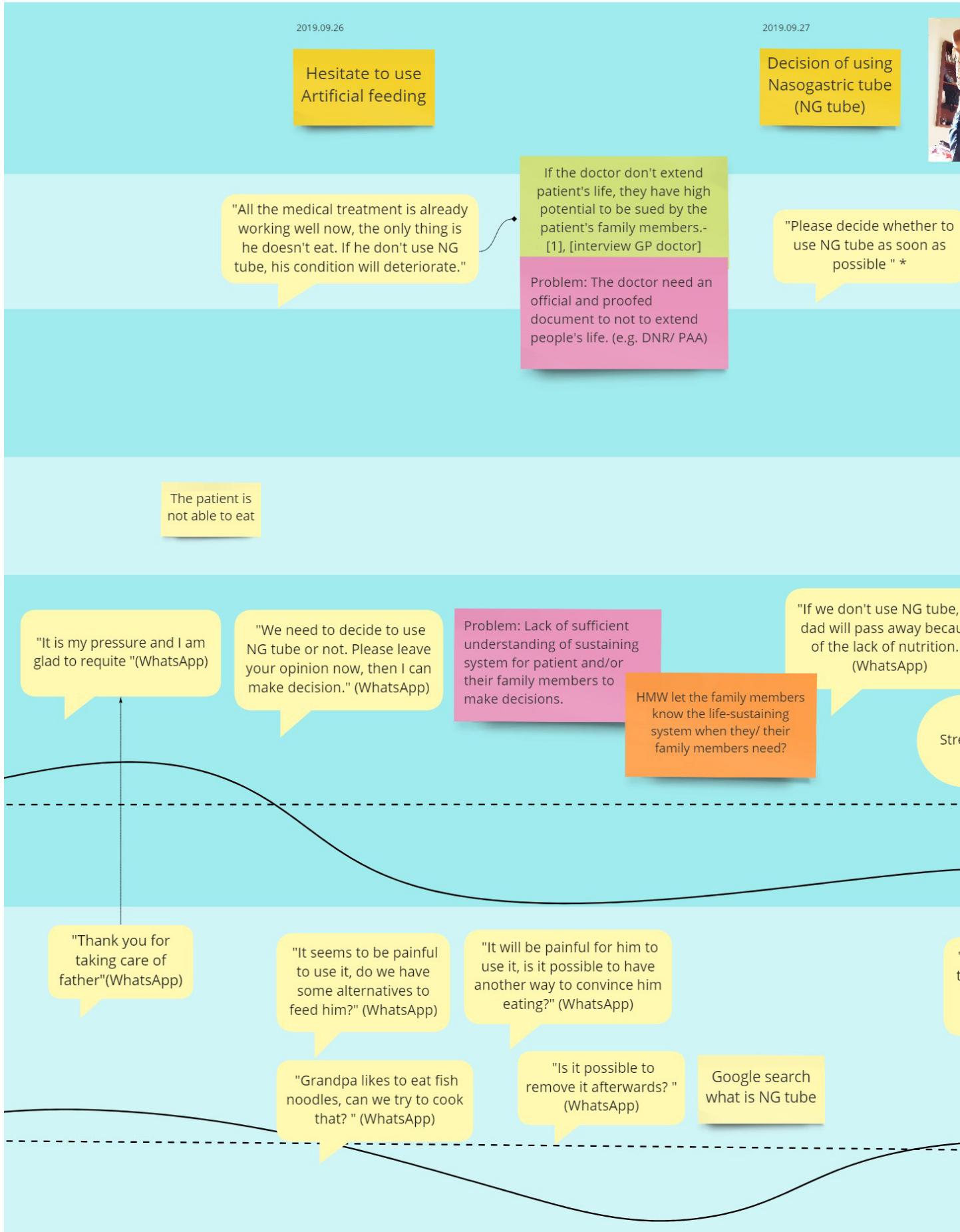
## Appendix C. Patient Journey map of home care

- User quotes / actions
- Problem defined
- Design possibilities (How might we..)
- Literature/ Interview expert











2019.09.27

### Discussion of using NG tube

2019.09.28

### The resistance of a NG tube

\* About asking patient('s family) to use NG tube.

"Normally the doctors can decide to use it if needed, but now the social value system changes, we are more respect the patient now." [interview GP doctor]

"Well, it is normal for a patient to remove it, we just need to insert the tube again. It is actually a good news that he still have the power to remove it." (By the doctor)

The patient's hands are trapped to prevent from removing it.

our

use

"

Problem: A tough decision to decide a loved one's life.

"If we don't use it, our dad will pass away because of the lack of nutrition..I can't bear to let him go, so.. as a caregiver, I decide to use it.. Please, if you have anyother opinion, let me know as soon as possible..." (WhatsApp)

" Almost all family member will decide to use NG tube, because the first thing they think is that the patient will die if they don't use it." - [1]

"It's already the fifth time for him to remove the tube..." (WhatsApp)

essful

"We have no choice but to use it, for the reason of supporting his life" (WhatsApp)

Problem: communications between family members [Interview doctor]  
- Educated level  
- Different perceptions on the situation

"It's already the fifth time for him to remove the tube..." (WhatsApp)





Negotiation with the patient



Got Infection and was sent to the hospital.

"I need to brush his teeth but he doesn't want to open his mouth."

The foreign caregiver is sick 2019.12.30

Problem: Caregivers suddenly need much more physical activities and have more mental stress after leaving the hospital.

The patient removes the NG tube frequently 2019.10.04

"How long should I wear this glove? (limited his hands moving)" (told to the caregiver)

"Can you help me to remove the glove? " (told to the caregiver)

"Sometimes I doubted my decision of using Nasogastric tube." (Murmur)

"1 month and we need to take a new one..If you can eat on your own then we don't need to use this." (told to the patient)

"I feel sorry to trap your hands, but I am afraid you will forget and to remove the NG tube. Tomorrow morning I will be here and we can remove for a while." (told to the patient)

"Since the emergency happened on Sep.22, our dad's situation is much lower. Caregivers will be more stressful and need more physical activities." (WhatsApp)

"Our father had... was just sent to emergency room... too worry." (WhatsApp)

Self-blame

"We should believe it is the best decision." (consolation)

"We should also learn what Shelly do everyday, she was too tired recently.." (WhatsApp)

Discussion about end of life

Caregiver's conversation

Doctor asked about the preference for end-of-life: At home or in hospital

"It will be important for you and your family members to discuss do you prefer to keep the last breath in hospital or at home." (the doctor told to the caregiver)

"There are different process to die in the hospital and at home. If we choose to die at home, the doctor needs to go there to conform." [Interview GP doctor]

"I feel I am ready to die but I can't." (Chat with the caregiver)

"When I was little you taught me to adopt to new thing with any effort. We shouldn't give up"

"We need to learn not to be panic with the situations, when we can make good decisions."

"Our father is already really old, it's important for us to discuss where to go at the moment he pass away, in case the chaos happened at the moment" (WhatsApp)

"I would like to choose to go back home, also fits the elder generation's expectation" (WhatsApp)

HMW discuss the end of life with the elderly?

## Appendix D. Interview participant descriptions

There are 12 people participated in the first part of interview

- **Informal Family Caregiver (IFC) (2)**
- **Family members (FM) (7)**
- **Formal caregiver (FC) (3)**

### Family Member(FM):

#### FM (1) (C Chen)

Male, 26

Has four of his grandparents.

He lives in the same city with them.

Relationship with grandparents: Feel like friends

Visit grandparents every weekend.

Sometimes drives to travel with them.

Sometimes share food with them.

Quotes:

"Sometimes I will share some picture or video I saw interesting on social media with them. "

"Sometimes they can understand, but sometimes they can't get it. But it's fine, we enjoy the chitchat we have."

#### FM(2) (Y. Tien)

Female, 26

Live with her grandma.

Her grandma has depression for 10 years.

Quotes:

"When many family members come, she will be very happy, but when they leave, she will be depressed a lot. For her birthday party, the alternative is to ask family members to call her in different time (The days before her birthday), so that she can be happy during the call, and not being too sad when people leave."

#### FM(3) (C Tsui)

Male, 29

Live remotely with his grandparents.

Grandma can use smartphone, grandpa doesn't.

Quote:

My grandma uses a simplified smartphone, she also went to a lecture for learning how to use it. She can edit some photos of familymembers and send to others saying "good morning!".

"The ritual of my grandpa is to cook.

They often ask if I have meals yet.

We don't have additional topic to talk about.

"

#### FM(4) (S Wu)

Female, 26

Has two grandparents, grandma live in institution, and grand father lives at home.

Quotes:

"My grandma uses a simplify smartphone. I will call them, asking have they eat meals yet?"

**FM(5) (C Yen)**

Female, 26

Has no grandparents, live with husband, near her mother's home, but her father lives far away and seldom come back.

Quotes:

"For my relationship with father: I feel like he is a senior person and I need to respect. When we meet face to face, we eat at a restaurant."

"Feel independence is important for her and her family relationship."

**FM(6) (S Chen)**

Male, 26

He has all of his grandparents, but he doesn't live with them. He visit them on weekends.

"I visit my grand parents once every one or two weeks. Everytime I visit him, we have lunch or dinner together."

"After my grandma got sick, their relationship get closer, because they are more chairdish their relationship."

**FM(7) (Y Chen)**

Female, 26

She shows many concerns to the elderly, not only to her grandparents but also to the neighborhoods.

Quotes:

"Everytime I visit my grandma, I can see in her eyes that she feels full of hope! "

"When I meet grandma face to face, I can feel the positive emotional contagion."

"My grandma doesn't have motivation to do the rehabilitation. She only do it when I hold her hand, and encourage her. Last time I was there with her for 4 days, Her situation improved a lot!"

"I also keep contact with the previous foreign caregiver, and she wants me to marry to her son"

**Formal Caregiver(FC):****FC(1) (S Wu)**

Female, 26

She worked as a nurse in an institution.

"For some case, the family send every meals here, but some family seldom come. If I have time I will give more assistance to those who are alone, to be accompany with them."

**FC(2) (Yu)**

Female, Aged 56

A formal caregiver in a hospital.

Daily tasks: Feeding, cleaning.

Some patient live for few days, but some may live for a month.

Quote:

"If one can use smartphone, they will contact their family members, but if they don't, Their family member will call me, and I will take my phone to the patient and let them talk to each other."

"Some people can't hear clearly, I will use video calling for them to talk with their family members"

**FC (3)(M Kuo)**

71 years old. 19 years experience of caregiving

Before being a caregiver, she took care of her mom for 2 years, and then she got the license of formal caregiver.

Her main work is to get some short cases from hospitals, for some surgery or to take

over some IFC's work for few days.

Quotes:

"There was a grandma said: I found that you treat me better than my daughter. I feel that I am just doing my job, to express my concern."

"Once I helped a grandma to clean her foot, she feels so happy and has a long time not having clean foot."

**Informal Family caregiver(IFC):****IFC(1) (Tien's mom)**

Her mother and father lived together before, but her father passed away last year. Then she invites her mother to live with her, and she take cares of her. Her mother is physically healthy, can eat and walk on her own. Her mother has `depression, that is the greatest difficulty for her to take care of her.

**Quotes:**

"Grandma likes to see many people at home, doesn't like to stay at home lonely. But she doesn't talk to much, and prefer to stay there with us."

"IFC: If she go, I feel sad; but if she is alive and unhappy, I ....(cried)"

"Sometimes hear grandma whispering: God, please bring me away"

"Grandma eats less and less. I feel that she feels guilty to eat too much without contributing in this home. I will feel very happy if she eats more."

"The happy moment to interact with her is physical contact, once we took a walk after dinner, I hold her hand with me, though we didn't talk, I feel I am with her."

**IFC(2)(Yu)**

She takes care of her husband's mom for ten years. The caretaker has dementia and depression. Though she said she has not an emotional bonding with the caretaker, she feels that it is necessary for her to take care

of her because of her husband.

**Quotes:**

"Actually my husband and I don't talk a lot with her, but her daughters can talk a lot with her, and hug her, and also play Mahjong with her on weekends."

"I feel that it's my duty to take care of my husband's parents. "

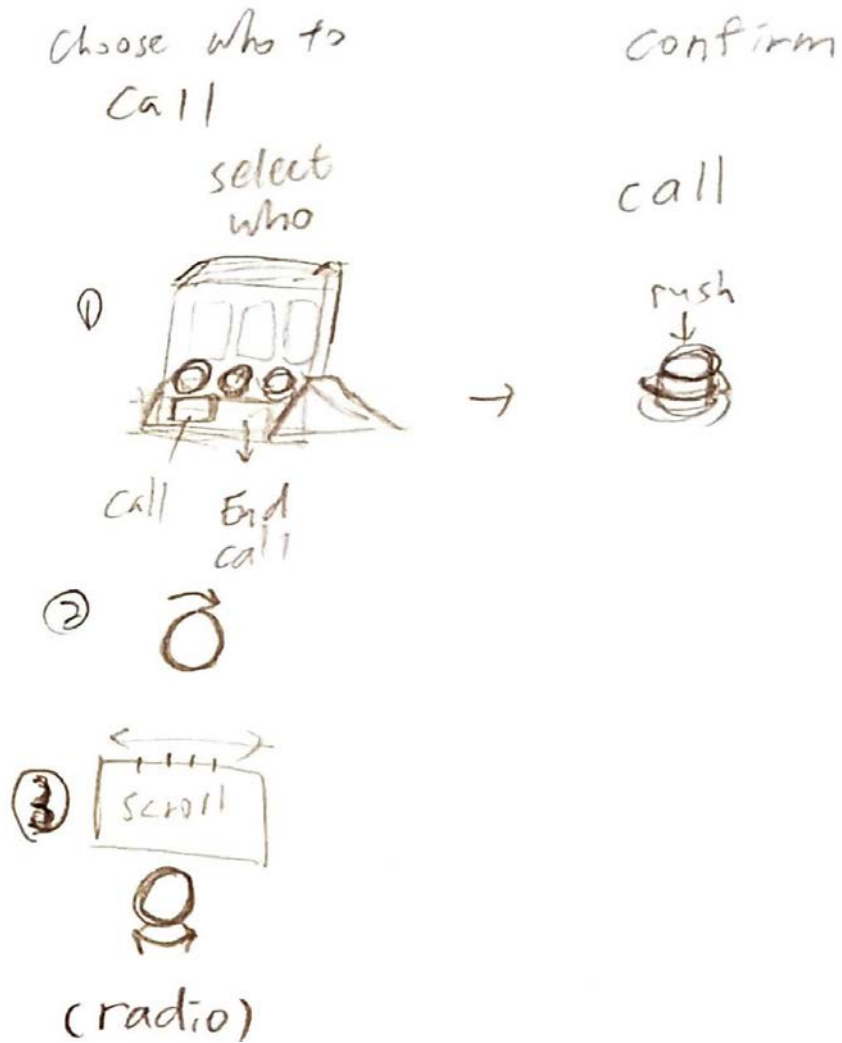
"After her situation turns worse, she seldom reply us. She only reply one question: do you want to eat steamed bread? (Her favorite food)"

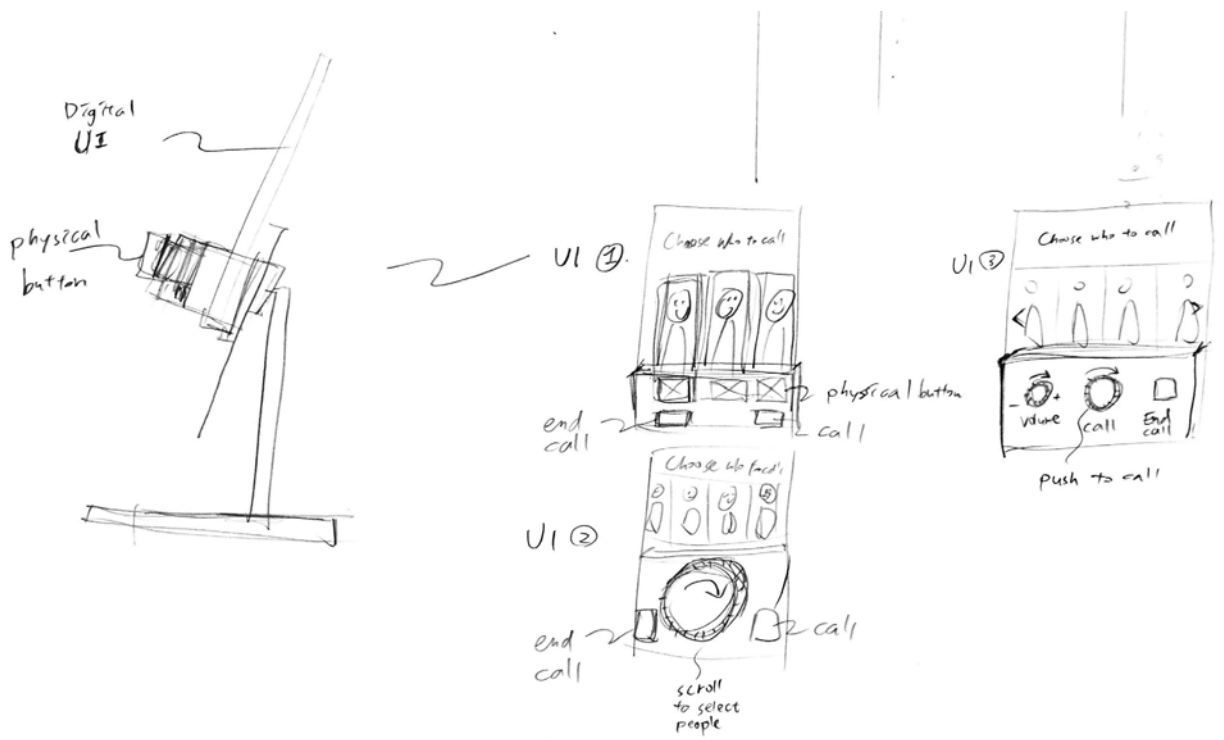
"I feel that I lose the opportunity to have my leisure time with my son because of the caregiver's work. Sometimes my son will also take care of her. "

"I feel that I've already done all the work that I should do."



## Appendix E. Concept Sketch







**Thesis of Tsai Cheng Ho**

**Establishing shared positive moments  
between elderly caretakers and their families**