

CHAPTER 3

Methodology

This is not how you should do quotation marks in Latex — it is ``string'' i.e. single quotes - look on the web

In previous chapters, I introduced the underlying need and relevant literature for the "Keep-in-Touch" Project. However, in order to gain a comprehensive view and a rigorous research into this subject, we need various methods including field study via questionnaire, demographic and psychometric inquiry, and methods from human-computer interaction, such as think aloud, GOMS analysis and heuristic evaluation. By using methods mentioned above, the thesis will investigate on questions including how specifically elders keep in touch with their family and friends recently, what issues elders usually encounter when using modern commercial software to keep in touch with them, etc.

This chapter really needs to start with the research questions and then go systematically through how each of the maps to the design of the questionnaire and the other elements.

I strongly recommend that you create a table with the research questions as Rose and with columns showing the data sources for each of them.

3.1 Questionnaire

One of the goals of this research is to better understand older WeChat users who are identified as elders in China, which using the current standard, draws a benchmark line at 65 years old and above, and identify interface issues for these users through a survey of this cohort. A survey or a questionnaire is a tool that collects the statistical data required for a data analysis procedure that might uncover potential user interface difficulties faced by elderly adult users. These issues will be addressed in this study in order to present solutions that enhance the WeChat interface and to provide older adult users with a significantly improved user experience using WeChat. A quantitative research approach is employed in this study to guarantee that the results are as valid and as feasible. The process entails creating an online survey, collecting quantitative data from a large group of participants, and analysing the quantitative data.

3.1.1 Ethical and Lawful Surveying in China

Being a developing nation, China lags behind developed countries like Australia in the establishment of its legal system, which includes ethical examination that goes beyond the letter of the law. In actuality, on November 1, 2021, during the 2021 National Congress in the Great Hall of the People, China just passed its first-ever data security and personal privacy law, known as the "Personal Information Protection Law (PIPL)".

The Personal Information Protection Law (PIPL), the very first comprehensive piece of legislation on personal information and data privacy in China, is remarkably comparable to the General Data Protection Regulation (GDPR) of the European Union in many areas, according to the Columbia Journal of Transnational Law ¹.

Although the PIPL and the GDPR have many similarities, the PIPL differs from the EU's data privacy legislation in a number of areas that might make it more stringent than the GDPR. For instance, unlike the GDPR, the PIPL has a strong data localization provision that mandates that personal data reaching certain quantities be stored within China and that the transfer of such data overseas be subject to a security assessment by the Cyberspace Administration of China before being transferred (Article 40). The PIPL is silent on the quantity threshold and offers no insight into the nature of the security assessment and its evaluating elements. This means that data acquired from survey questionnaires in China must not go beyond the border of China, nor those data could be saved in international data repositories such as GitHub.

Additionally, The 13th National People's Congress Standing Committee saw the official passage of the Data Security Law (DSL), which will go into effect on September 1st, 2021. It covers provisions that address the usage, gathering, and protection of data in China ², which also plays an important role in this thesis project, especially regarding the preservation of survey results.

3.1.2 Preliminary Need-finding Survey

The primary purpose of the preliminary survey is majorly to acquire elders contact information if they are willing to participate in the future user studies regarding WeChat's user interface.

¹<https://www.jtl.columbia.edu/bulletin-blog/the-personal-information-protection-law-chinas-version-of-the-gdpr>

²<https://www.china-briefing.com/news/a-close-reading-of-chinas-data-security-law-in-effect-sept-1-2021/>

It is worth noticing that the questionnaire is intended to be paper-based. Requiring elders who are not familiar with computer or mobile phone operations to do surveys on digital platforms might be difficult and even inviting for troubles. The questionnaires are printed in advance and distributed nearby supermarkets, parks and plazas where elders usually gather.

You need to say a bit more about where this happened. What city? How did you decide where to place them?

Practitioners would also like to understand the elders' loneliness level before any further study in order to provide comparison if necessary, so I selected 5 related questions from the Revised UCLA Loneliness Scale (Russell, Peplau, and Cutrona, 1980). Short versions of the Revised UCLA Loneliness Scale are validated and already applied in various countries and regions. Using the short questionnaire can reduce survey time - elders might feel uncomfortable when they are standing and writing a questionnaire for more than 5 to 10 minutes. The main purpose of the preliminary questionnaire is to gather contact information of participants who live nearby and are interested and open to further user studies. Therefore, the questionnaire should not waste elders too much time.

The detailed design of the questionnaire is illustrated below.

3.1.2.1 Q1: Please indicate your gender

Q1 is a Multiple Choice Question (MCQ) with potential text from blanks.

- ☐ Male
- ☐ Female
- ☐ Prefer not to say
- ☐ Others ()

Q1 asks for the gender information of the survey participants. In conservative China, minor sexuality and gender identity, aka LGBTIQ+ people are not widely accepted by the general public. Many Chinese even are not aware of such existence and the LGBTIQ+ social movements abroad. The gender option in China is usually a traditional binary option: Male or Female. Sometimes participants are allowed to choose "Prefer not to say", but most questionnaire designers do not provide this right for participants.

As a Chinese student at the University of Sydney, regulations, and traditions on both the Chinese and Australian sides must be obeyed and respected. Therefore, after careful consideration,

I provided the "Prefer not to say" option and "Others" option, and did not specifically say "Lesbian", "Gay", etc on the questionnaire, because Chinese elders might feel angry once they see "Lesbian" or "Gay" options on the questionnaire as this progressive label violates the traditional Chinese values. Sexual minority people such as gays and lesbians might choose "Others" and specify which category they consider themselves as. They could also choose "Others" and leave the blank empty.

You have done a nice job of explaining the decisions about the options available to the users. You have not explained why you need to know why you need to know the sex of participants. See slide 72 - and the post on Slack on Oct 23.

3.1.2.2 Q2: Are you above 65 years old?

Q2 is a MCQ.

☐ Yes

☐ No

Q2 asks whether the participant is above 65 years old or not. 65 years old is the benchmark in China: if someone is above 65 years old, one will be classified from adult into the elder category. In the population yearbook and national census, China Statistics Bureau specifically classifies the population aged 65 and above as a distinct age group.

A message that says "If you chose no in this question, you may not need to answer all the questions in the survey. If you answer further questions, your answers will not be counted towards the final statistics." is printed below this question. However, this question may be of less value since all participants are asked whether they are 65 years old and above or not orally before they start to respond to the paper questionnaire. Due to the fact that the preliminary questionnaire is distributed via paper, the survey organizer can easily ask this question first to make sure participants fall into the correct category.

I don't understand why you need both question two and three? You need to explain why you need to know people's age.

3.1.2.3 Q3: Please indicate your age

Q3 is a numerical question, which the answer should be an integer.

- I am () years old.

Q3 asks participants the age information. As mentioned above, the number should be above 65 years old; questionnaires with this question below 65 years old will be discarded.

3.1.2.4 Q4: Which phone brand are you currently using?

Q4 is a MCQ and allows choosing multiple answers.

- ☐ Huawei
- ☐ Apple
- ☐ Xiaomi
- ☐ OPPO
- ☐ vivo
- ☐ Honor
- ☐ ZTE
- ☐ Nokia
- ☐ Samsung
- ☐ Others: ()

There's no need to say something might seem irrelevant. It is better just to explain why it is needed.

Q4 asks which brand of smartphone is the elder using. ~~It seemed to be irrelevant to the key purpose of this study, but~~ the brand matters, especially when it comes to whether the smartphone is using the iOS or Android operating system platform.

WeChat has different interfaces and functionalities depending on the operating system it is with. The original aim is to determine which elder uses what version of WeChat: Apple or Android, so that further demo and user tests could be conducted accordingly ³.

3.1.2.5 Q5: Which communication technology are you using to keep in touch with your family?

Q5 is a MCQ and allows choosing multiple answers, as above.

- ☐ QQ
- ☐ WeChat
- ☐ Email
- ☐ Phone call
- ☐ Others: ()

Do you mean thesis? Do you mean this study?

³All screenshot demonstrations are done on Apple devices in this **paper**.

test

This question aims to **prove** a hypothesis and a key argument: most Chinese elders use WeChat, instead of other communication methods, to keep in touch with their family and friends. Therefore, this question is a key question for further result analysis.

Please explain the options made available here – especially QQ - and explain why you chose to make WeChat second on this list.

3.1.2.6 Q6: How many direct family members do you have?

Q6 is both a qualitative and quantitative question.

- ☐ Partner: #()
- ☐ Son: #()
- ☐ Daughter: #()
- ☐ Grandson: #()
- ☐ Granddaughter: #()
- ☐ Other (" "): #()

I don't understand this question what is the participant needs to do? e.g. Is it to indicate how many partners they have?

The participants **and input** numbers into the column. If they have other family memberships that are not listed in the default options, the participant could add themselves in the "Other" option and specify the quantity in the parenthesis after the colon.

3.1.2.7 Q7: How often do you keep in touch with your family member?

Q7 is a MCQ.

- ☐ 3 times per day or more
- ☐ 2 times per day
- ☐ 1 time per day
- ☐ once per 2 days
- ☐ once per 3 days or less

The participant is only allowed to choose 1 option in this question.

who

The main purpose of this question is to identify elders **that** could potentially know the design flaws as well as their loneliness level. If an elderly only contacts their family once per 3 days or less, it means that they could either be so independent that they do not need children's help, **or that they are living with their children on a daily basis**. This question could contribute as a

Is this how a person would interpret the question if they lived with a family member? I also wonder which family member this refers to? Is it all the ones listed in the previous question?

confounding variable for the loneliness analysis, as the UCLA Loneliness Scale is coming later in the questionnaire.

3.1.2.8 Q8: Please select the option that fits you best during the Covid-19 pandemic.

This question consists 4 sub-questions as they are selected from the Revised UCLA Loneliness Scale (1980). As (Alsubheen et al., 2021) examined in her study, the UCLA-4 and UCLA-6 are both valid and robust internal structures, and they could well inform as much information as the original UCLA-20.

Instead of UCLA-6, I chose UCLA-4 in this study, considered that elders might feel more comfortable answering a shorter version of the questionnaire. For more illustrations on the selection of the UCLA Loneliness Scale, please refer to Chapter 2.3.2.

- I lack companionship.
 - ☐ 1 (Never)
 - ☐ 2
 - ☐ 3
 - ☐ 4
 - ☐ 5 (Often)
- There is no one I can turn to.
 - ☐ 1 (Never)
 - ☐ 2
 - ☐ 3
 - ☐ 4
 - ☐ 5 (Often)
- I feel left out.
 - ☐ 1 (Never)
 - ☐ 2
 - ☐ 3
 - ☐ 4
 - ☐ 5 (Often)
- I feel isolated from others.

- ☐ 1 (Never)
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 (Often)

The intuition for this question is that elders recorded their loneliness levels calculated by the UCLA Loneliness Scale. If the elder would like to participate in further studies, one's loneliness level will be taken again right after the study so that the relationship between the elder's loneliness and frequency of keeping in touch with family and friends will be discovered.

3.1.2.9 Q9: Would you like to participate in our future study? You would receive ¥30/hour as compensation for your valuable time. If you are willing to participate, please leave your contact information.

- Name: ()
- Tel: ()
- Address: ()

I had not realised you were paying people. How much is this in Australian dollars?

As the preliminary survey is key to finding elders who would like to take part in further studies, participants are able to log down their personal information if they are interested.

3.1.2.10 Proposed Analysis of Preliminary Questionnaire

As the preliminary survey is simple and easy for elders to complete within 3 minutes at the gate of supermarkets or in the parks, the potential analysis that it could provide is indeed limited. However, the preliminary survey could still answer some of the following questions:

- Correlation between contact time with family and loneliness level;
- Is WeChat the most widely-used application to keep in touch?
- Other potential correlation relations discovered in later analysis.

3.1.3 WeChat Usability Questionnaire

After answering the first research question (RQ1), which is "what are the trending keep-in-touch methods that are frequently used by Chinese elders" as the potential answer will be shown in the result session of the preliminary survey, the further survey will be conducted to partially answer RQ2: "What are the issues with commonly-used telecommunication applications for elders to keep in touch?" To discover the usability flaws of WeChat, a questionnaire on the design ~~aspect~~ of WeChat ~~is~~ written by the author.

3.1.3.1 Q1. Are you above 50 years old?

- ☐ Yes, I am above 50 years old.
- ☐ No, I am below 50 years old.

In this survey, the age limits were loosen from 65 years old to 50 years old due to the fact that the response rate of participants who are above 65 years old are limited, as they are less familiar with the use of electronic survey on WeChat as well.

However, according to xxx

Participants who answered "No" to this question will automatically end the survey by the system, as they are not the primary targets of this study.

3.1.3.2 Q2. Have you used WeChat before?

- ☐ Yes, I have used WeChat before.
- ☐ No, I have not used WeChat before.

This question aims to ~~thieve~~ the sample to ensure that people who answered the body of the WeChat functionality survey actually had experience with WeChat.

If the respondent selects "No," the questionnaire will advance to the screen where you submit your personal information. The survey will remain open since learning whether people use WeChat or not when they are older than 50 may also be a useful piece of information.

3.1.3.3 Q3. How long do you use WeChat per day on average?

- ☐ Less than 1 hour.
- ☐ 1-2 hours.
- ☐ 2-3 hours.
- ☐ 3-4 hours.
- ☐ 4-5 hours.
- ☐ More than 5 hours.

This question is a multiple choice question where the participants need to choose the length of WeChat use on a daily basis.

Give more details about the design of this question – how this question relates to the research questions and why you chose these options.

3.1.3.4 Q4. How often do you use the following functions on WeChat?

- ☐ Never.
- ☐ Rarely.
- ☐ Once a while.
- ☐ Sometimes.
- ☐ Always.

The 5-scale frequency question assesses the following functionalities for elders to keep in touch with their family and friends:

- Video call.
- Voice call.
- Press to speak.
- Send location.
- Recall message.
- Moments.

Give more details about the design of this question

At this point, I wondered exactly what the survey looks like for the participant. Surely the options above appear for each of these forms of functionality?

3.1.3.5 Q5. Please evaluate the listed functions, from easy to difficult to use.

- ☐ Very difficult.
- ☐ Difficult.
- ☐ Neutral.

- ☐ Easy.
- ☐ Very easy.

Such 5-scale question is also applied on the same functionalities where participants were asked in Q4.

Apart from standard industry questions, more specific questions on functionality details and user experiences are listed from Q6:

3.1.3.6 Q6. Do you know how to switch camera during a video call?

- ☐ Yes, I am aware of that.
- ☐ No, I do not know.

An **older** may want to show the counterpart the surroundings or their superannuation documents so that their family member may see those on the other end of the video call, therefore being able to switch cameras during a video conference is a crucial skill. Elders might simply turn the smartphone to the other direction by using front camera throughout, but if the design of WeChat's interface is easy to comprehend and use, the elders should know how to switch the camera from front camera to back camera.

3.1.3.7 Q7. Do you know how to make font size larger?

- ☐ Yes, I am aware of that.
- ☐ No, I do not know.

3.1.3.8 Q8. Do you know that WeChat has "Care Mode"?

- ☐ Yes, I am aware of that.
- ☐ No, I do not know.

3.1.3.9 Q9. How likely will you recommend WeChat to other people?

- ☐ 0 (Not likely at all)
- ☐ 1
- ☐ 2

- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10 (Very likely)

This question is essentially on WeChat's Net Promoter Score (NPS). NPS is a concept raised by (Reichheld, 2003) which mainly measures customer experience and predicts business growth.

3.1.3.10 Q10-Q16. On Personal Demographics

Q10 to Q16 are questions on demographics, which assesses:

- Age.
- Gender.
- Living status.
- Educational background.
- Monthly pension.
- Living location (city or rural).

The estimated answering time of this questionnaire is around 5 minutes for an elder.

3.2 Persona and Archetype

Personas are fictitious characters that product teams develop in accordance with market research to reflect the many user types who may utilize a company's service, product, website, or brand in a similar manner. Teams may better understand the requirements, experiences, habits, and goals of their users by developing user personas.

Notice the nuanced differences between personas and archetypes. Nielsen Norman Group's Page Laubheimer illustrated the difference between persona and archetype in an Internet post ⁴:

⁴Internet Source: <https://www.nngroup.com/articles/personas-archetypes/>

whether each of those user categories is portrayed as a particular human figure distinguishes personas from archetypes. When creating personas, we create a plausible name, bio, picture, and other personal data. In contrast, when creating archetypes, we exclude these specifics and just refer to the user type by an abstract word that defines its defining behavioral or attitude traits. In this section, I will illustrate the personas we use in the Keep-in-Touch project.

A claim about the goals of a company like WeChat are not relevant to your thesis. What is relevant is that your work has been done in a Chinese context with an interface that is in Chinese in your studies.

Due to international travel limitations and the fact that WeChat predominantly targets Chinese or Chinese-ethnic individuals around the world, personas are aligned with this situation where all archetypes are founded on this concept. We show two typical Chinese elders in the persona section below using their traditional Chinese names, Ailing and Baogang.

Some argued that we should provide persona to other people in the keep-in-touch ecosystem such as the grandchildren, family carers, social workers, etc. However, given that the younger Chinese youth is very accustomed to using WeChat, we decided against include such personas in the set.

3.2.1 Persona A: Ailing the Elder



FIGURE 3.1. Image of Persona A: Ailing the Female Elder

Ailing is a female that is 85 years old. She lives alone and needs her spectacles to see clearly. Risheng, Ailing's late husband, was a carpenter, and Ailing is a retired barber. Hotpot is the

name of the cat that lives with Ailing. She uses the landline even though she has a mobile smartphone because she cannot really understand how the smartphone works and **feel inconvenient**.

Ailing likes knitting, watching classic Chinese television programmes such as "Dream of the Red Chamber" in the 1980s and playing scrabble. However, she does not like to go to the hospital since she is afraid of her blood being taken.

From Ailing's background, we know that:

- Ailing lives **in her age**, just like all other elders;
*What does this mean?
I don't see where you have that in this information provided above.*
- Ailing is living alone and **need assistance**;
- Ailing is not so good at using smartphones.

Ailing's persona represents female elders who are above 80 years old and living by themselves.

You don't actually say this directly – the fact that she has not mastered the smart phone maybe an indication but you need to explain that
This situation makes it much more difficult due to the fact that they **have little or no assistance in dealing with modern technologies**. This type of user is one of the key targets of this study.

3.2.2 Persona B: Baogang the Elder



FIGURE 3.2. Image of Persona B: Baogang the Male Elder

Baogang is 68 years old. He is a history teacher at a small countryside primary school in Guangdong province and is ready to retire in 2 more years. He likes drinking Pu'er tea, playing "go" chess and reading People's Daily. However, People's Daily newspaper has been transformed into a digital version with the sales of paper-based news cancelled nationwide, and he has

difficulties reading them on his iPhone. he does not like walking for a very long time. His wife lives in another city across Guangdong province, and it usually takes him 6 hours to travel home using public transport. But the good news is that Baogang is living with one of his sons.

According to Baogang's profile, we are aware that:

- Baogang wants to visit his wife often, but can't;
- Baogang is not comfortable with modern technology.

The creation of Baogang's persona is reasonable and useful due to the fact that many Chinese are living separately, with different job location base. For instance, many Chinese are originally from the countryside but now working in the cities, especially among the younger generation. This phenomenon is reasonable and common around the world as younger generations might admire and choose colourful city life instead of living in the countryside or the outbacks, thus creating a geographical separation between elders and their children (He and Ye, 2014). In this case, Baogang and his wife is living in different cities purely due to their career.

Do you mean that they represent two important groups of people who could benefit from technology that made it easy to keep in touch with the nearest family

Above all, the Ailing and Baogang represent traditional Chinese elderly in their 80s or 60s, whether they are male or female, living alone or with family. They stand in for the majority of WeChat's senior users, which is in line with the persona's primary goal of expressing and emphasizing the requirements and expectations of the most significant user groups for this study.

3.3 Think Aloud

User experience (UX) professionals frequently employ think-aloud protocols to extract users' cognitive processes, which are otherwise hidden from observers while they interact with a user interface, in order to identify and comprehend UX issues (McDonald et al., 2012).

(Fan et al., 2021) claimed that User Experience issues may be identified by subtle patterns in users' think-aloud verbalizations and speech attributes. These tendencies, however, were only found among young adults. It is uncertain if elderly persons follow these trends. According to the result, whenever elders are having difficulties while using smartphones, their verbalizations frequently include observational remarks, negations, question words, and words with negative

connotations, and their voices frequently have a loud, high-pitched, and rapid speaking tempo.

Such differences have been noticed and given special care of during the think aloud sessions.

You need to add a comment here about the context of that study. I am not aware of literature about use of the TA with

Chinese participants - especially in China, it is quite possible that cultural aspects could give different results.

In this study, think-aloud is conducted through the following procedures:

- 1 Conduct series of user tasks;
- 2 UMUX-lite and open questionnaire at the end;
- 3 Open comments from participants.

3.3.1 User Goals and Tasks

I do not understand this. Depending on the interface being evaluated, they may be many user your tasks.

A total of 4 user goals and 10 tasks are created. **For most user goals, 2 relevant user tasks are** proposed so that HCI practitioners could test whether elder participants could complete the tasks or not, how long could they complete such operations, and what difficulties they encountered when they are performing such tasks.

All user tasks are designed on the basis of relevance and elder's daily requirement. Advanced functionalities, such as forming new WeChat groups, are eliminated from the final user task list.

A reader cannot understand this at this point when you have not yet explained the user goals that you have identified and the use of tasks that you have designed. I strongly recommend you move this table after you have explained those.

| | A | B | C | D |
|----|---|---|---|---|
| 01 | Y | | | |
| 02 | Y | | | |
| 03 | Y | | | |
| 04 | Y | | | |
| 05 | | Y | | |
| 06 | | Y | | |
| 07 | | | Y | |
| 08 | | | Y | |
| 09 | | | | Y |
| 10 | | | | Y |

TABLE 3.1. Corresponding Relationship between User Goals and Tasks

3.3.1.1 Goal A: The elder can contact a family member live on WeChat.

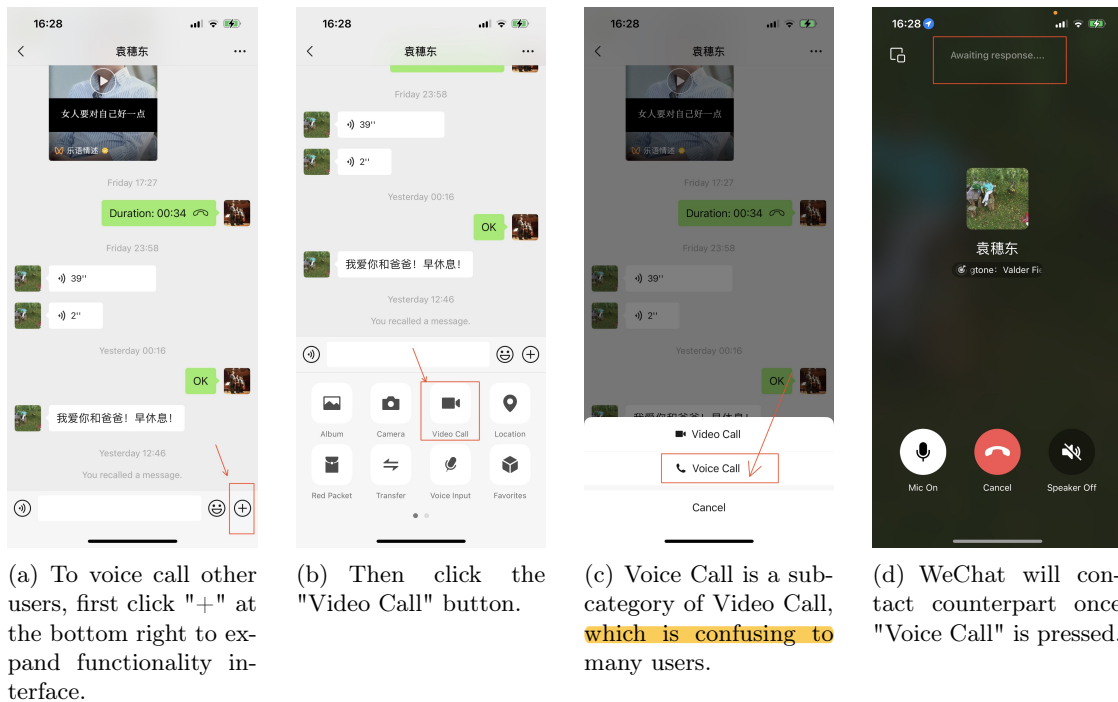
To further test product's usability to fulfill Goal A, the following 4 user tasks are created:

TASK A-01

[WeChat is open and at the main page.]

Suppose you want to call your grandchildren, but you are not well dressed so you don't want your grandchildren to see you in the call. Please use WeChat to call your grandchildren now.

This is the user task that tests elders' ability to click the voice chat button in the chatting interface. As one might discover from the interface analysis in Figure 3.3, looking for voice call is technically tricky in WeChat, as "Voice Call" is a sub-category of "Video Call" as in Figure 3.4. And formal video call is by choosing "Video Call" under the main class "Video Call", which mixes the hierarchy and confused many users from children to elderly.



At this stage of the thesis, you don't know if it is confusing. You could say that it is likely to be confusing. I certainly agree.

FIGURE 3.3. Doing Voice Call with Another WeChat User

TASK A-02

[WeChat is open and at the main page.]

Suppose you want to chat with your grandchildren and see their dancing in front of the phone. Please video chat with your grandchildren.

Task A-02 supplements A-01 so that both voice chat and video chat are covered in this set of user tasks, as both of them are common functionalities that are used by Chinese elders in their daily life.

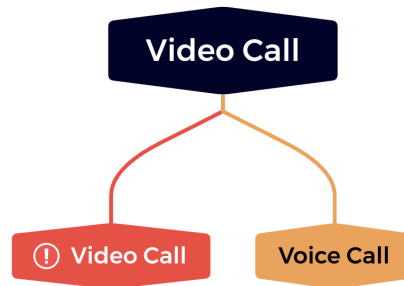


FIGURE 3.4. The Hierarchical Architecture of "Video Call" in WeChat

TASK A-03

[WeChat is in the video chat mode, with the camera facing the user.]

*Suppose you are travelling and the scenery around you is beautiful. Please turn **your camera** and show the surrounding environment to your grandchildren while seeing the grandchildren's facial expression.*

Another functionality that I am particularly interested in user testing is turning the camera back and forth during a WeChat video call. Elders might have some trouble clicking this button correctly. This hypothetical argument is derived from empirical observations at elderly smartphone classrooms as well as at home with my own grandparents.

TASK A-04

I don't recall you mentioning the smart phone classrooms to this point in the thesis. I know you've told me about your experience in those classrooms. I think you need to add a short section earlier in the thesis explaining that one of your message for need finding was to volunteer for these classrooms.

[WeChat is in the video chat mode.]

Whether you have received messages from other people while you were chatting with your grandchildren

*Suppose you want to check whether **you received** new messages from others when **you are still** chatting with your grandchildren. Please check new messages while keeping the video call on.*

To complete this task, the elder has to press the "zoom-out" icon to temporarily leave the video call page and return to the main WeChat page. **Again you need to provide your evidence for this.** **This task is considered one of the most difficult user tasks by the author and experts.** The author anticipates that many elders could encounter difficulties in this task, whether **it's** the delay of the completion or failure in completing the task.

However, this task is proposed and kept in the final task list due to the frequency with that elders might have to use this functionality. For instance, the elder might want to send a picture to **one's grandchildren** while doing the video chat. To do so, the elder has to quit the video chat page to go back to the main page so that the elder could send the image. But the elder might want to keep the video call on so that one could chat with **one's grandchildren** about the picture in the video call.

~~Therefore, Task A-04 is a useful functionality that should be tested in think aloud studies.~~

3.3.1.2 Goal B: The elder can send messages to family members on WeChat.

Goal B consists of 2 user tasks:

TASK B-05

[WeChat is open and at the main page.]

Are missing — that has a different meaning.
Suppose **you missed your grandchildren**. Please send “I miss you so much” to your grandchildren.

Sending text messages to one another is one of the plainest and most commonly-used functionality, as it represents the essence of WeChat’s asynchronous communication ability. Although the author suspects no failure in the completion of this task, many elders are not familiar with the keyboard functionality as Chinese characters could be input in various ways, including Pinyin (Rome characters), Wubi (five-stroke input method), Shouxie (hand-written with auto-recognition), etc. However, keyboard issues for elders are beyond the scope of WeChat, therefore input-related difficulties will not be discussed in this study.

TASK B-06

I'm a bit confused by this because I would've expected you could use dictation?

[WeChat's status is right after last task is completed.]

Do you mean changed your mind?
Suppose you then **felt shy after** sending the message. Please pretend that you did not want to send the message and take it back.

Sometimes elders may want to recall messages they wrongly send to other people. For instance, if elder just found that **one** just sent a picture of grandchildren’s maths homework to neighbour instead of the teacher, the elder could then recall the message and send it to the right people.

3.3.1.3 Goal C: The elder can share public articles on WeChat.

Goal C consists of 2 user tasks as before:

TASK C-07

[WeChat is showing an article.] **Can you include a screenshot of this?**

Suppose you are reading the article “Coke Zero Considered Harmful”, and you thought your grandchildren need to know this. Please share this article with your grandchildren.

Sharing articles on WeChat is yet another popular function that people often use.

TASK C-08

[WeChat is showing an article.]

Suppose you liked this article and want all of your WeChat friends to know. Please share this article to everyone publicly.

"Moments" could allow content posters to show all friends one's open posts such as daily activities in both text and picture format. In Moment, the user could also see other users' posts as well.

3.3.1.4 Goal D: The elder can share locations with family members on WeChat.

Sharing locations is a vital skill for elders, especially when they cannot describe their current place when they get lost. WeChat allows users to both send static pin location as well as sharing real-time location with built-in map function.

Goal D still consists of 2 user tasks:

TASK D-09

[WeChat is open and at the main page.]

*Suppose you are at a new supermarket called “Meat Federation” and you want to tell your grandchildren to come here and help you **Carrying?** **with grabbing the** heavy vegetables. Please share your current location with your grandchildren so that he or she could come and look for you.*

This task aims to test WeChat's usability of real-time location sharing.

TASK D-10

[WeChat is open and at the main page.]

Suppose you are at home and you know a flower shop nearby. Your grandson asked you about a nearby flower shop and you want to share the shop's location with your grandson on the map. Please do that now.

Sending static location allows the user to **pend** other locations that the user is currently not at. When the elder is at home, one can still push other locations, such as "Canton Tower", "Meat Federation Supermarket", or "Château Star River Guangzhou" to other users.

3.3.2 UMUX-lite

(Lewis et al., 2013) invented UMUX-lite by shortening the original UMUX questionnaire and discovered that the UMUX-lite seems to be a promising replacement for the SUS when using a 10-item instrument is not preferred.

The participants should rate the following evaluations selected from UMUX:

- WeChat's capabilities meet my requirements.
- WeChat is easy to use.

The participants will be given a 5-scale option series, align to previous study.

3.3.3 Open Questionnaire

The participants also need to answer the following open questions:

- What was the best thing about WeChat?
- If you could change one thing in WeChat, what would it be?
- Any other comments?

These questions are answered at the end of the study.

Add an explanation of why these questions are useful.

3.4 Cognitive Walkthrough

We also conducted a Cognitive Walkthrough (CW) study which assesses learnability part of usability. According to (Hartson and Pyla, 2012), it is beneficial to use both analytical and empirical usability methodologies simultaneously. Analytical techniques, in particular, enable the investigation of a system's inherent qualities, which empirical techniques cannot assess.

In order to simplify the study and reduce workload for elderly experts, we will conduct the Compact Cognitive Walkthrough (CCW), invented by (Spencer, 2000), by asking the below questions after each step of a task were completed:

- Would our persona know what to do at this step?
- If the persona does the right action, do they know they have made progress toward their goal?

The information on persona is indicated in Section 3.2. The project invited two experts on WeChat who have daily average exposure to WeChat of 3 hours and above to participate in the study. Experts are expected to perform **in one of two** personas provided by the study group, namely Ailing or Baogang, to critique and gain insights into the flaws of the WeChat interface.

Do you mean perform the cognitive walk-through, considering one persona?

3.5 Heuristic Evaluation

Heuristic evaluation is a usability inspection technique for electronic device software that aids in locating user interface usability issues (Nielsen and Molich, 1990). A small group of testers will analyze the interface and utilize it to complete typical activities. Any usability issues they run into are then noted by the testers. Although it has significant drawbacks, heuristic evaluation is a useful method for identifying issues with a user interface. For instance, using a small number of assessors may not always be sufficient to identify all usability issues, but enough to identify the major design flaws for developers to fix and could improve product usability significantly.

One of the most classical and popular set of heuristic is Neilsen's Heuristics⁵. Table 3.2 outlines ten fundamental rules of interaction design by Jakob Nielsen. Due to the fact that they are general rules of thumb rather than particular usability requirements, they are known as "heuristics", instead of "rules" or "benchmarks", etc.

⁵Internet Source: <https://www.nngroup.com/articles/ten-usability-heuristics/>

| | |
|-----|--|
| 1. | Visibility of system status. |
| 2. | Match between system and the real world. |
| 3. | User control and freedom. |
| 4. | Consistency and standards. |
| 5. | Error prevention. |
| 6. | Recognition rather than recall. |
| 7. | Flexibility and efficiency of use. |
| 8. | Aesthetic and minimalist design. |
| 9. | Help users recognize, diagnose, and recover from errors. |
| 10. | Help and documentation. |

TABLE 3.2. Nielsen's 10 Heuristics for Interactive Design

(Al-Razgan et al., 2014) also outlined a methodical process for transforming design advice and guidelines for touch-based phones into heuristics aimed for senior citizens. All 13 of their proposed heuristics are listed in Table 3.3. The 13 heuristics are divided into 3 major parts: look and feel, interaction, and functionality.

| | |
|---------------|---|
| Look and Feel | |
| | 1. Make Elements on the page easy to read |
| | 2. Easy Recognition and accessibility |
| | 3. Make clickable items easy to target and hit |
| | 4. Use the elderly language and culture; minimize technical terms |
| Interaction | |
| | 5. Provide clear feedback on actions |
| | 6. Provide preferable gesture for elderly |
| | 7. Provide elderly with information on launcher/elderly status |
| | 8. Use conventional interaction items |
| | 9. Ergonomics design |
| Functionality | |
| | 10. Provide functions that reduce the elderly memory load |
| | 11. Elderly does not feel lost or stuck (Elderly control and freedom) |
| | 12. Prevent error from occurrence |
| | 13. Provide necessary information and settings |

TABLE 3.3. Al-Razgan's 13 Touch-based Mobile Heuristics for Elders

However, Al-Razgan's heuristics could be boiled down to the original Nielsen's heuristics. Further details on this topic will be illustrated in Chapter 5.

In this project, similar to the WeChat usability questionnaire, which also serves as a validation tool, we will employ heuristic assessment as the consolidation analysis after concerns with WeChat are found and highlighted through doing think alouds and cognitive walkthroughs.

At this point, I'm not sure which heuristics you plan to use. If it is the original Nielsen ones, you need to explain the value of the second set found a set involving challenges for older users.