DECO3800

DESIGN PROPOSAL

09/06/2021

# Social tools for elderly

## social tools for elderly help them adapt to the internet age

Make Teams Great Again

A picture containing person, person, outdoor, older

Description automatically generated

<https://unsplash.com/photos/lK0l9pzxLps>

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Research

Table of Contents

[Social tools for elderly 1](#_Toc74130386)

[social tools for elderly help them adapt to the internet age 1](#_Toc74130387)

[Abstract 3](#_Toc74130388)

[1. Overview 3](#_Toc74130389)

[2. Background Reading 5](#_Toc74130390)

[3 literature Review 8](#_Toc74130391)

[3.1 The social dilemmas of older people in the digital age 8](#_Toc74130392)

[3.2 Socialization and physical health in older adults 8](#_Toc74130393)

[3.3 optimizations innovations 9](#_Toc74130394)

[3.4 graphical summary of the literature review 11](#_Toc74130395)

[4. research 12](#_Toc74130396)

[4.1 user requirements 13](#_Toc74130397)

[4.1.1 persona 13](#_Toc74130398)

[4.1.2 interview 14](#_Toc74130399)

[4.1.3 affinity diagram 14](#_Toc74130400)

[4.1.4 user requirements 15](#_Toc74130401)

[4.1.5 persona created 16](#_Toc74130402)

[4.2 design research 18](#_Toc74130403)

[4.2.1 existing system investigation 18](#_Toc74130404)

[4.2.2 solution and design guideline 23](#_Toc74130405)

[4.2.3 stakeholders 25](#_Toc74130406)

[5. Conceptual Design 27](#_Toc74130407)

[5.1 high level description on how system works 27](#_Toc74130408)

[5.2 interaction paradigm 27](#_Toc74130409)

[5.2.1 voice interaction 27](#_Toc74130410)

[5.2.2 vibration interaction 28](#_Toc74130411)

[5.3 Key interface metaphor 31](#_Toc74130412)

[5.4 design guidelines 32](#_Toc74130413)

[5.4.1 simple appearance 32](#_Toc74130414)

[5.4.2 Highlight Key Content 32](#_Toc74130415)

[5.4.3 metaphor instructing 32](#_Toc74130416)

[5.4.4 Unified design / Uniformity of design 33](#_Toc74130417)

[5.4.5 User guidance 33](#_Toc74130418)

[5.5 System requirements 33](#_Toc74130419)

[5.5.1 major features 33](#_Toc74130420)

[5.5.2 secondary features 35](#_Toc74130421)

[6 PROTOTYPES 36](#_Toc74130422)

[6.1 prototype overview 36](#_Toc74130423)

[6.2 prototype design intro 36](#_Toc74130424)

[7 User Test 38](#_Toc74130425)

[7.1 SUS analysis 38](#_Toc74130426)

[7.2 revised conceptual design 40](#_Toc74130427)

[8. Project Plan 42](#_Toc74130428)

[8.1 Executive Summary 42](#_Toc74130429)

[8.2 Milestones 42](#_Toc74130430)

[9. Feedback & Team Reflection 44](#_Toc74130431)

[10. Conclusion 45](#_Toc74130432)

[11. Appendix 46](#_Toc74130433)

[11.1 Interview Session 46](#_Toc74130434)

[11.1.1 Questionnaire Responses 51](#_Toc74130435)

[11.1.2 Average Rating of Each Participant 52](#_Toc74130436)

[11.1.3 Statistical Result of Rate of Each Dimension and Sub Dimension 52](#_Toc74130437)

[11.1.4 Observation Note 53](#_Toc74130438)

[12. Reference List 54](#_Toc74130439)

[images reference 56](#_Toc74130440)

[icon reference 57](#_Toc74130441)

[final report new images reference 57](#_Toc74130442)

[13. SUS Evaluation 58](#_Toc74130443)

# **Abstract**

With the development of science and technology, the flourishing of online social communication and the aging of the population have become a common phenomenon worldwide. Traditional social communication channels have been gradually replaced by newer, digital social communication modes. People who do not adapt to these changes, especially the elderly, are gradually shrinking their social space, leading to mental and physical health problems. In fact, many trendy social platforms cannot fully meet the needs of target users. In view of the cumbersome design and functions, how to quickly adapt to network social networking has become the core breakthrough point to solve these solutions. The basic idea of this proposal is to help users, mainly the elderly, obtain a more comfortable social and social environment in the information age through network socialization.

This study aims to investigate the core needs of target users, mainly the elderly, and build a platform centred on network social networking based on this. The platform will integrate social and interest tracking to create a comprehensive system to address the pain points of target users.

This report conducted an online survey on the social and demand-level backgrounds of the target users, mainly the elderly. The results covered issues including design, functionality, cognition, age, and community service of existing apps.

To sum up, this study conducted an investigation on the elderly who are mainly unable to adapt to digital life based on social software, and designed an auxiliary system based on social help to solve the existing problems.

# **1. Overview**

This report introduces an online social system that is mainly designed for the elderly. The novel features of this application include voice input and output, compendious user interface and virtual assistance, which could provide sufficient technology support as well as optimal social environment.

Firstly, this research investigated the current situation in social media usage of the elderly people by referring to related background information and literature. According to Tankovska (2021), there is a large number of older adults utilizing popular social platforms, however, the majority of these systems are not mainly designed for the elderly but the younger generation, which is because nearly 70% of the users are under 50 years old, leading to most of the functions are designed to meet the younger generation’s requirement. For example, the younger adults are keen on online trade for some second-hand stuff in social media, which could be difficult for the elderly since they may think it is unsafe.

Chou et al. (2013) advised trendy social media to design a simpler and clearer user interface, which could be more elderly-friendly. With the development of technology, people’s socialization has changed dramatically by the popularization of the Internet, especially in the circumstance of COVID-19 pandemic from 2020 when there is social restriction. Moreover, Xu et al. (2020) found that appropriate socializing via the Internet is beneficial for the elderly’s both mental and physical health, specifically in the aspect of slowing down the aging process and maintaining a healthier physical state. Furthermore, Xu also reported that online socializing can effectively reduce the elderly’s loneliness as well as overcome social isolation.

Therefore, there is an urgent need for one application which could meet the elderly’s socializing needs and help them safely keep contact with relatives during social restriction. In order to specifically understand the target users’ needs, this project carried out an interview including questions like what their most expected function of social media is and which part they hope the existing system to remove or add, which could help our team understand the pain points of social media already existed when designing our project. The interview outcome shows the majority of participants mainly use social media to contact friends and family, and their ideal social system should have a compendious user interface with simple functions. Additionally, some interviewees were also afraid of personal information leaking because they often received calls from unknown people after registering on one website.

The interview outcome is used to generate the affinity diagram which can visually present the merits of the project. According to the affinity diagram, two scenarios were then created to apply the project’s features in real life interaction circumstances. The interaction scenarios can give the stakeholders impressive experience, including the target audience, product & service suppliers, system support suppliers (health care personnel, community health care), government and local communities. Shivan Meymo (2017) concluded that the main reason for some elderly who do not use social media is because of insufficient technical support, and some old users often felt stressed when pop-ups and advertising suddenly appear. Kobayashi et al. (2016) carried out research to test how can the elderly utilize social media more fluently and found that voice input as well as output can effectively simplify the process of communication. Furthermore, Thakur and Han (2018) found virtual assistance is an appropriate tool to give the elderly technology support and help them interact efficiently. Overall, the user needs mentioned above are primarily focused when designing our application, which consist of voice input and output, virtual assistance, simplify main functions and user interface, reducing advertising and pop-ups.

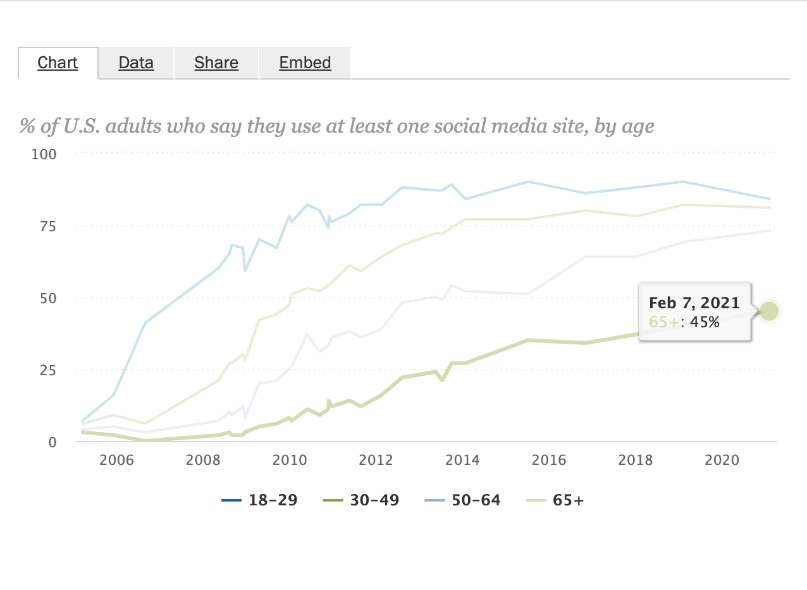
The function and features of the solution are determined after collecting user needs, then the medium-fidelity prototype was constructed for the purpose of receiving more accurate feedback to ensure the feasibility of the project. SUS method has been used to evaluate the usability of application in this process, making participants rate specific features and we got several useful ideas to adjust the interface’s layout such as simpler operation and content description. Consequently, we can improve the fidelity prototype to high.

In addition, feedback and reflection sections were added based on staff’s advice in order to iterate more effectively. Feedback section includes individual feedback about presentation, and each part of the report whilst team reflection introduces the methodology that used during project designing with barriers like COVID-19 to maximize the working efficiency.

In conclusion, this report introduces a product which can provide a healthy, safe, convenient lifestyle and like-minded, harmonious communication environment for the older generation. Voice input and output, virtual assistance, simple functions and compendious interface are all integrated in order to address existing problems in trendy social media and help the elderly effectively interact, so as to reduce their loneliness level and avoid social isolation.

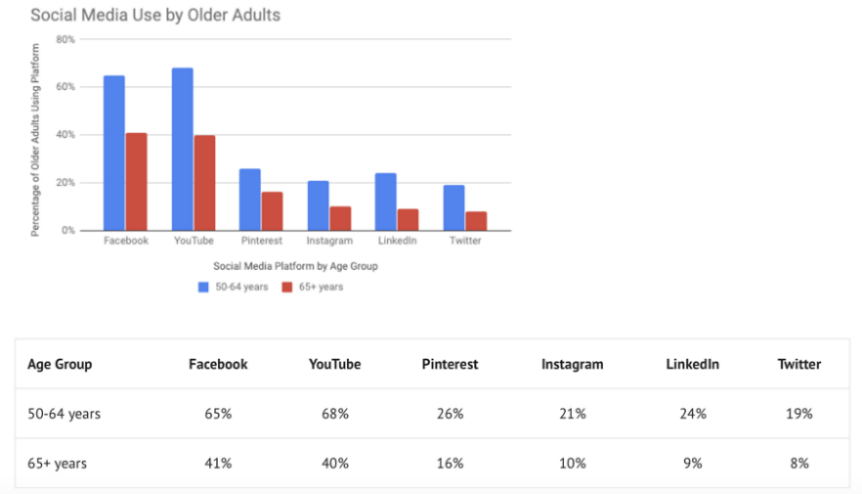
# **2. Background Reading**

Elderly people as an increasingly large cohort of the population, they are spending a considerable amount of time on social networks, and their psychological as well as physical health is a worldwide priority. Hence, it is of vital importance to find out how to help the older adults to engage in the social system and keep fit simultaneously. Coto et al. (2017), claimed that social networks are an essential tool to support the elderly. It is crucial to understand the interaction between elderly population and social media in order to truly address the issues when developing current and future online social networking.



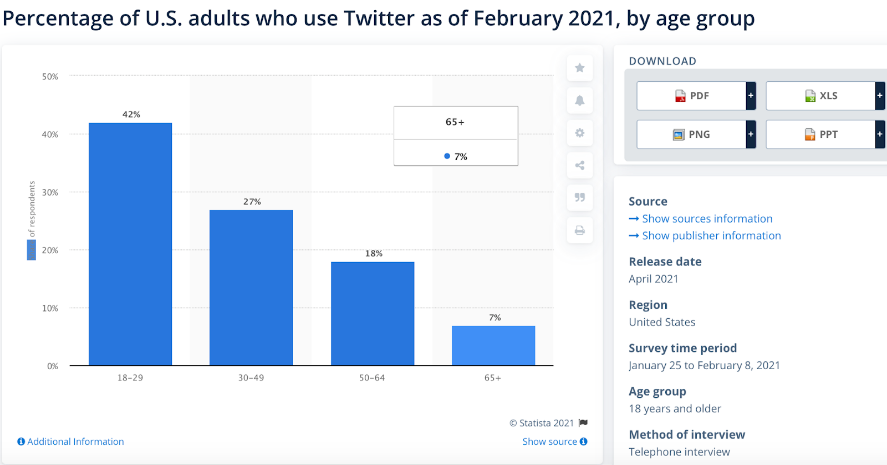
*(Figure 1 - % of U.S. adults who say they use at least one social media site, by age) (Social Media Fact Sheet, 2021)*

The curve above illustrates adults’ use of social media in the United States from 2006 to 2021. It suggests that the number of older adults who use online systems to socialise has increased in recent years in the United States as well as globally, which means social media has become a main channel for the elderly to socialize generally. In addition, according to the data from Senior Tech Club, there are more than 65% older adults using trendy social platforms like Facebook, YouTube, and around 20% of them use other applications such as LinkedIn and Twitter.



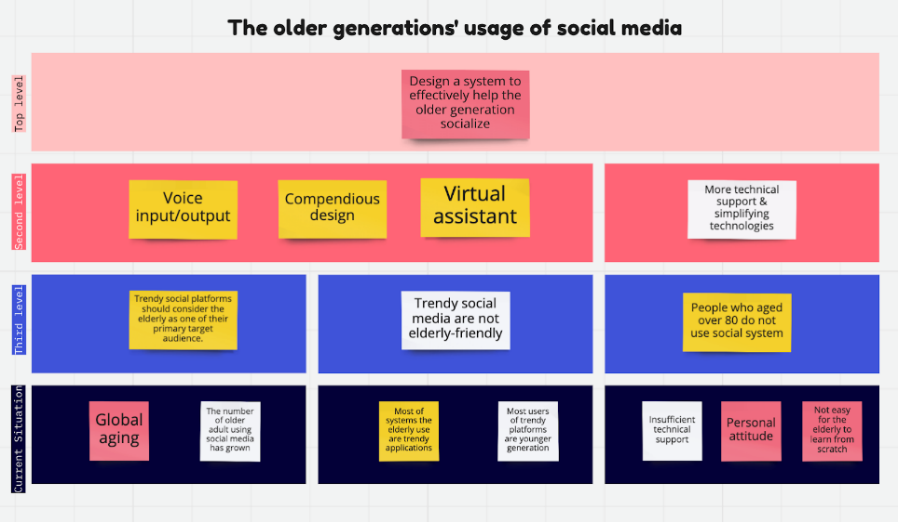
*(Figure 2 – Social media use by older adults )  (Where Older Adults Come to Learn, Explore and Share Smart Technology, 2021)*

The problem is that these platforms’ main target audience are not the elderly but the younger generation. According to Tankovska(2021), Twitter and Instagram both appeal to the younger generation in America. 42% of Twitter users aged from 18 to 29, and 27% of its users are 30 to 49 years old. Only 7% of users are aged over 65 years in the United States. Above statistics are closely related to the user group demographics of the team’s project which primarily target the senior population and will continue to support further analyses unfolded in this report.



*(Figure 3 – Percentage of U.S. adults who use Twitter as of February 2021, by age group) (Social Media Fact Sheet, 2021)*

Furthermore, related research reported that a little proportion of the older generation use social media, specifically those aged 80 or above. Shivan Meymo and Kenn Nyström conducted a study in a retirement house in 2017 (Shivan Meymo, 2017) to find out what are the exact barriers which prevent them from utilizing specific technologies and how to fix this problem. Finally, the research report concluded that insufficient technical support holds a dominating position in this problem. Not only that, but another reason was that the participants of (Shivan Meymo, 2017) expressed a strong rejective attitude towards using social media due to the ideology that they could still survive without using these technologies. In addition, it is also challenging for them to study from scratch as they did not learn some related knowledge in this area when they were young. The suggestion from the author is that investing in applications which could simplify technologies and have a lower barrier for the older generations, which is also the aim that the team are trying to resolve in the current problem space.



*(Figure 4 - Affinity diagram for background) (Produced by team member)*

The affinity diagram clearly illustrates the research part and objective of this project. Firstly, this report analyzed the current situation of the elderly’s usage of social media, which is a global aging phenomenon, and the number of older generations using social media is ever-increasing. Then move on to the third level, this report summarises three aspectives of the same problem at the moment, and some possible ideas are generated at the second level. Finally, the objective of this product is to effectively provide support for the target audience to socialize.

In summary, most trendy social media applications have over-decorated the interfaces with function and design elements to cater the needs of younger users, which are relatively more difficult for the elderly to adapt within a short time due to aged-related diseases such as cognitive decline. It is inevitable that some problems or even dangers happen when older people use social media platforms. For example, the older adults may feel anxious about a pop-up advertising and do not understand where to click to return the original page. Furthermore, it is tricky for them to type in a smart phone with a tiny keyboard. To make this system different from other systems, more special elderly-attractive design will be added.

# **3 literature Review**

**3.1 The social dilemmas of older people in the digital age**

With the advent of digitalization, especially the rise of smart phones, the elderly will encounter many obstacles in the face of emerging communication technologies. A report from the Pew Research Centre indicates," Older adults face many caps when adopting new technologies," (Smith, A. (2014)). Because most means of communication (software, websites, phones, etc.) rely on the ability to see, hear, and read, which means that with increased health and the decline in cognitive and reflexes associated with aging, older people find it difficult to keep up with fast-paced social platforms via modern communication devices. Smith noticed that about two-fifths of older adults say they have "physical or health conditions that make reading difficult or challenging," (Smith, A. (2014)).

In addition, a lack of technical knowledge is also a major factor that keeps seniors from using modern devices to socialize. According to the Pew Research Centre report, about 77% of seniors say they need help learning to use a smartphone or tablet. 56% need help to stay in touch with family through social media such as Facebook or Twitter. However, this does not mean that this phenomenon is only caused by the elderly themselves. Modern devices and social software do not give too much consideration to the elderly group, which is also an important factor that makes the elderly unable to adapt to modern devices and social software. Chou et al.(2013) conducted a user-centred study in Taiwan with the methods of questionnaire survey and protocol analysis, and the results showed that extra attention should be paid to communication standards when designing social networks for the elderly, because the original websites did not give enough further consideration to the elderly. In the study, Chou suggested that newer social platforms like Facebook should be more geriatric-friendly, and that means not just adjusting font sizes, but having a special version that caters to older people's needs.

In detail, the most common problem is that there are many features and complex user interfaces in the system of modern devices and modern social software. In the case of Facebook, developers try to add cool features on every page to attract users, but the complex user interface not only makes it hard for them to find what they want, it also makes it hard for new users to follow. When a user enters a page, it is difficult for them to understand what the main function of the page is in a short period of time, and the redundant content makes it difficult for them to easily interact with the application. When users want to use a function, they must identify and find the target in the crowded component. At the same time, because the complex user interface is designed to contain as much content as possible in a page, the size of the elements in the page, such as text, ICONS, pictures and so on, will become narrow, which greatly increases the user's cost.

These findings suggest that a significant portion of the elderly population is unable to use modern devices and social software to communicate frequently, leading to feelings of disconnection and loneliness that are reported to be harmful.

**3.2 Socialization and physical health in older adults**

In fact, the physical health problems of older adults and lack of social interaction are a closed loop that affects each other and affects the physical health of older adults who lack social interaction. Quinn (2018) argues that social interaction is important, that loneliness and social isolation can have a negative impact on overall health, and that the benefits of using social media in older people extend to all aspects of life.

Hutto et al.(2015), carried out a study in Georgia Tech HomeLab by inviting 268 people aged above 50 to finish a survey about social media usage, and finally found out that the elderly who use social systems are more satisfied with their life and majority of them had accepted higher education. Social interaction is an indispensable factor in one's life. The spiritual exchange and collision brought by social interaction will make people become active, excited and have a sense of belonging. For example, when you roast meat, the only way to continue to provide heat is through the impact of the charcoal, otherwise the charcoal will provide lower and lower heat until the silence. In the same way, a lack of social interaction can lead to a person's mental silence, such as a growing sense of loneliness, which can further affect a person's physical health.

But unfortunately, the lack of social interaction among older people due to the lack of social software is very significant, Meshi et al. (2020), conducted research about the relation between social media usage and social isolation. Participants in this study were 213 people with a mean age of 62.6 years. The results did not identify a relationship between both sides, but their findings demonstrated this prediction. Authors in this experiment advised related researchers intervening the inappropriate usage of social media platforms, to avoid social isolation. Moreover, as life has increasingly moved online during the pandemic, an older generation that grew up in an analogy era is facing a digital divide (NyTimes. 2020). They are often unfamiliar or uncomfortable with apps, gadgets, and the internet, many are struggling to keep up with friends and family through digital tools when some of them are craving those connections the most. This means that a large proportion of older adults have limited social connections, which can exacerbate feelings of loneliness and social isolation among older adults and lead to some more negative effects, since it is worth noting that social interactions are often closely related to cognitive abilities (Quinn, 2018). "The frequency of supportive interactions with others is supportive of the development of dementia and cognitive impairment" (Seeman, Lusignolo, Albert, & Berkman, 2001). A study found a link between social connections and cognitive impairment.

A study on social activity and cognitive decline in Japan suggests that “operating community salons that encourage social interactions, light physical activity, and cognitive activities among older participants may be effective for preventing cognitive decline”, which means that social loneliness is a risk factor for cognitive decline. Without care, without communication, without rich life contents, the elderly will be in a social vacuum. Empty mind and negative feedback can cause your body to age faster. On the other hand, rich social activities can help the elderly to slow down the aging process and maintain a healthier state of body. (Hikichi et al., 2017).

To sum up, improper use of social media is a very important factor that leads to lack of social contact among the elderly, including but not limited to inability to understand how to use applications, forgetting passwords, cumbersome operation procedures, difficulty to use, and perception problems caused by aging of the elderly. This greatly reduces the enthusiasm and ability of older people to try new social software. Over time, as family and friends use new social software more and more, the increasing distance between the elderly and them exacerbates their loneliness, leads to more severe cognitive decline and greatly reduces the enthusiasm of the elderly to try new social software, thus further isolating the elderly from the era in which they live. However, the above research also gives us the direction to solve the problem, which is that by optimizing modern social software, the social opportunities of the elderly can be increased, and the status quo of social isolation can be solved, to prevent and improve the negative impact on health caused by loneliness.

Therefore, we hope to design a communication tool specially designed for the elderly to help them communicate more easily, so as to help them get rid of loneliness and embrace a richer life and a healthier state.

**3.3 optimizations innovations**

For software optimization, it is the most effective strategy to open up the situation through innovation and optimization of interactive mode.

Gamberini designed and developed a game called ElderGame, which uses an interactive interface specifically designed for older people to improve their cognitive and social skills. In this project, the author found that the user's attention, perception, memory, decision-making and so on cognition has a different degree of increase, this suggests that the innovation and optimization of interactive interface based on elders have the positive impact about improving the user to adapt to modern social software or operating interface obstacles facing has important strategic significance. As mentioned above, one of the barriers users face when using modern devices and social software is the gradual decline in perception due to aging, so interface optimizations and innovations based on the needs of older people can greatly "counter" this aspect. (The Eldergames Project, 2014).

There are many examples of interaction innovation based on mature technologies to prove this. Kobayashi et al.(2016) studied how older people interact with younger generations through existing social networks. With a system designed by the researchers, older people can retrieve and transmit voice information with a simple finger operation. In the end, 32 seniors were invited to try out the system, and 26 of them gave it a positive rating. The experiment showed that voice input and output are best for older people. Voice input and output have the advantage of being very easy to use. The user just needs to hold down the button, speak, and release the send. Its advantages are that it greatly reduces the learning cost of the elderly and simplifies the communication process. Thakur and Han(2018) used natural language processing to analyse the expressions, behaviours, and viewpoints of the elderly when interacting with virtual assistants on multiple different machines. They found that interactive virtual assistants can effectively help older people in many ways, such as providing social support, reducing loneliness and reminders. In addition, Bolanos and M also mentioned that as long as these systems are friendly enough, virtual assistants will attack the interests of the elderly and facilitate their daily activities. Alexa, Siri and other virtual assistants are making it easier than ever for seniors to interact with technology. Seniors can learn simple voice commands to communicate with family members, call for help, learn about the temperature outside or listen to music. Some older people have adopted the technology, and they use it to ask questions about the world around them. This interaction, even with a computer, may reduce feelings of loneliness and isolation. Therefore, virtual assistants or virtual pets can be used to accompany the elderly on a spiritual level and help them deal with loneliness.

About the optimisation of interaction, a guideline on interface design for older people says that when designing user interfaces for older people, designers must consider the perception and responsiveness of older people. The guideline suggests that UI designers must consider visual accessibility, such as colour, text, and ICONS, to deal with older people's visual impairments. System interactions are optimized with clear visual cues, such as easy-to-use gestures, to deal with perceptual barriers. (Polyuk, S., 2019).

The increasingly serious problem of aging has aroused wide concern all over the world. Nowadays, with the rapid development of mobile Internet, the elderly has begun to use a variety of intelligent products to maintain social communication and daily independent life, but the elderly's senses are gradually deteriorating. Their physical and cognitive abilities make it relatively difficult for them to adapt to many new technological changes, as well as cumbersome interaction processes based on complex user interfaces, resulting in their inability to use smart devices and software. Therefore, it is very important to improve the interactive experience of the elderly when using the product. The complicated human-computer interaction problems caused by excessive attention to vision and functionality are more prominent in the elderly. Therefore, when designing the user interface for the elderly, this project hopes to consider interaction innovation such as voice input and output to enhance interaction, give full play to the sensory advantages of the elderly, optimize the interactive process, enhance interactive cognition and improve the usability of the product.

**3.4 graphical summary of the literature review**

*Figure5: summary of the literature review*

# **4. research**

Based on the above research, we determine the type of problem and solving direction roughly (**literature review**), but the team still need to solve the problem of the details of the direction to explore, this includes more detail for the target user's understanding and then establish the detailed described user model and the understanding and collection of user’s requirements. The solution will be built based on the model and requirements of the target users.

In addition, the team will explore the implementation of the solution, including the appropriate UI/UX design, such as color collocation, interaction logic layout, etc., the team will analyze similar solutions that already exist, weighing their features and learning from them. Figure6 below shows the specific research flow.

*Figure6: research flow*

**4.1 user requirements**

### 4.1.1 persona

“Personas are fictional representations and generalizations of a cluster of your target users who exhibit similar attitudes, goals, and behaviours in relation to your product.” They can be seen as snapshots of target customer groups with meaningful commonalities or correlations or classifications of target groups, based on user research. (Salazar, K., 2018). The reason to do this is that the differences between web users are a preoccupation that must be clarified. Since differences exist, they need to be described. Personas focus on abstract people, so developers can quickly focus on the target.

In the early stages of product and development, personas are used more often to help developers understand user needs and imagine user scenarios. Product design has changed from producing products for everyone to producing products for some people, thereby indirectly reducing complexity. This also allows team members to abandon their personal preferences during product design and focus on the motivations and behaviors of the target users for product design. The reason is it is much easier for product managers to design products for specific personas than for the fictional things in their heads.

Based on this condition, an investigation about the user was designed and created in order to help designers to investigate the experience, goals, requirements and pain points of target audiences, and these data will be collected and be used to construct several personas which will be used for the further design process. The main form that is taken in the investigation is the interview.

### 4.1.2 interview

In this study, the team used interviews to understand the needs of users because through interviews, users can visually point to memorable content, important content and suggestions for improvement. "Interviews can provide insight into how users perceive a website, an application, a product, or a process." (Prince, K., 2018). This helps the team to collect the user's pain points and identify the user's needs. Another reason is because interviews are a faster and easier way to collect data from users. Below are the interview questions:

|  |
| --- |
| Personal information. Gender, Age, Occupation |
| Q1. Do you usually use online social applications? |
| Q2. What is your intention to use social media? |
| Q3. What social actions do you often take? |
| Q4: Do you want a social communication application designed specifically for the elderly? |
| Q5. If you plan to use social media to change real life, what is your goal? |
| Q6. Do you have any social pain points? |

*Figure 7: interview questions*

Above are the questions that team taken in interview. In these questions,personal information was collected to calculate and analyse whether different ages, genders and occupations would have a significant impact on this product and whether the users of this product are common. By collecting questions 1,2, the likelihood of respondents using similar products can be calculated. The purpose of questions 3 and 4 is to explore the scenarios in which respondents use the same products and the need to use these products, analyse the respondents' preferred social activities, and apply. Similarly, by collecting answers from respondents in questions 5 and 6, some useful features can be applied to the products and a more intuitive understanding of the users' social needs.

### 4.1.3 affinity diagram

Before creating the persona, the results of the interviews had to be summarized and analysed to determine the common characteristics and pain points of the user group. In order to make the analysis results clearer, the team used affinity diagrams to analyse and present the results.

"An affinity diagram is the organized output from a brainstorming session. It is one of the seven management tools for planning. The diagram was created in the 1960s by Kawakita Jiro and is also known as the KJ method.” (Affinity Diagram, n.d.).

The primary use of affinity diagrams is the integration and generation of information about a complex product, process, problem or issue. It is characterized by the ability to express ideas without quantifying them. For teams, affinity diagrams can help teams generate inspiration and ideas from complex problems and can be used at any stage where a large amount of complex information needs to be generated and organized. Therefore, affinity diagrams are ideal for teams to analyse the content of interviews and to summarize the needs of users and prepare for the creation of personas.

Figure 8 show the affinity diagram below:

Diagram

Description automatically generated

*Figure8: affinity diagram of interview result*

### 4.1.4 user requirements

To conclude, this interview found that the majority of seniors use social software less often and just for necessary behaviours, such as the inability to communicate in person. However, older people still have expectations for social software. They hope that they can communicate through the Internet, find like-minded friends, and establish entertainment methods belonging to the older generation. Not only that, but they also raised doubts about social software, believing that most of today's social software has complex functions and popular elements, and is not suitable for the elderly. Therefore, they suggest that social communication applications should be feature-oriented and as simple as possible to help users. Moreover, the messages should be filtered to avoid advertising and fraud.

Figure9 below shows the specific user requirements and relevant functionalities.

|  |  |  |
| --- | --- | --- |
| Goals & pain points | Requirements & result | Feature & functionality |
| Find people who have the same interests. | Want to find like-minded people | 1. Interest categorization |
| Acquire news and avoid topics that are not appropriate for seniors. | Wish to read the content of interest | 1. Targeted push |
| Learn new knowledge to bridge the generation gap with young people. | I want to understand young people's ideas and communicate with them. | 1. Modern & popular information push |
| Safe and secure communication environment, no fraudulent advertising. | Reduce deceptive information | 1. Simple and intuitive user interface design |
| Simple function, easy to use. | Expect simple interactions | 1. Simple and intuitive interaction design |
| Too much information to categorize and search accurately. | I hope I can find the exact information I need | 1. Information categorization 2. Information accurate search entry |
| No privacy. | Desire for private information protection | 1. Simple registration flow 2. Less private information needed |
| Low technique barriers that l can master the app easily | Learn how to use app quickly | 1. User guidance 2. metaphor |

*Figure9: user requirements*

### 4.1.5 persona created

**Graphical user interface, text, application, website

Description automatically generated**

*Figure10: “keeper of contact” Julia.*

The persona figure10 shows above is the typical user “keeper of contact”, as the name suggests, their main purpose of using modern social networking software is to keep in touch with family and friends, but because modern social networking software is not user-friendly for the elderly group, the cumbersome user interface and interaction make it difficult for them to learn how to use it.

Their desire was to use a social software that was easy to use, simple to use and to keep in touch with family and friends.

The team wanted the target audience of "keeper of contact" to be able to communicate with family and friends more easily after using the solution developed by the team.

Graphical user interface, website

Description automatically generated

*Figure11: “aged urchin” Ben*

The persona figure11 shows above is the typical user “aged urchin”, as the name implies, people in this category are trendsetters, often familiar with modern social software and quick to learn new social software. However, given the age-related deterioration of their perception, their experience with modern social software is becoming progressively more uncomfortable.

The complex user interface makes it difficult for them to find the information they need, while the increasing number of features makes it difficult for them to use.

The team wanted the target audience of "aged urchin" to be able to get the same experience as before after using the solution developed by the team.

Based on above, we can make a more accurate description of the **target user/audience** group:

*“The target audience for the team's design solution is primarily seniors who are unable to fully experience modern social networking software due to health-related cognitive impairments; seniors who need help learning how to use modern social networking software due to a decline in their mindset, knowledge base, and learning ability; and seniors who experience barriers to using social networking software due to poor design.”*

The team's design goal was to solve the above user problems by optimizing and innovating the interaction and interface design to solve the user's cognitive barriers; optimizing and innovating the system features to solve the user's learning barriers; and optimizing the interface components (image, text, button and so on) and design to solve the user interface design problems. Figure12 shows the relevant relationship between problems and solutions.

|  |  |
| --- | --- |
| problems | solutions |
| Cognitive barriers | Optimization & innovation on interaction and interface |
| Learning barriers | Optimization & innovation on system features |
| Interface design problem | Optimizing interface components |

*Figure12: relationship between problems and solutions*

Prior to this, the team needed to explore existing solutions as well as suggestions from experienced designers in order to draw on and select design guidelines and styles for the system. The purpose of this is to consider proven solutions, take the best and discard the worst, avoid making some of the mistakes that already exist, and not miss out on good design.

**4.2 design research**

### 4.2.1 existing system investigation

In the design study, the team explored existing solutions from five of the best social applications for seniors and analyzed their strengths and weaknesses in terms of "features", "interaction", and “usability". These apps are “WhatsApp”, “Skype”, “HouseParty” and “FaceTime”. (A., 2021).

The usability is a user-centered design theory, which mainly focus on whether the design of product is suitable for users’ behaviors and requirements. (Wikipedia contributors., 2021). It can be interpreted as the degree that user feel uncomfortable and stress when using a system or app. The team wanted to investigate the usability of the above applications to understand the factors that make users happy in similar products. In order to reach a more comprehensive conclusion, the team added consideration of the features and interactions of the above applications to help analyze the design aspects that affect usability. Finally, the team will summarize each application using a framework of system acceptability. The system acceptability framework was discussed by Jakob Nielsen, a usability expert, and Ben Shneiderman, a computer science professor, who concluded that the acceptability of a system includes the following elements (Wikipedia contributors., 2021):

1. learnability
2. efficiency
3. memorability
4. errors
5. satisfaction

The following is the introduction about the applications above and their features.

WhatsApp is an encrypted messaging software owned by Facebook, which allows users to make voice calls, video calls and send text and multimedia messages over the Internet. Below are features in WhatsApp:

|  |  |
| --- | --- |
| **feature** | **usage** |
| Instant message, text chat | Social communication / connection |
| Voice chat | Social communication / connection |
| Video chat | Social communication / connection |
| Status – share moments | Social communication & life share |

*Figure13: WhatsApp features*

Skype is a communication software developed by Microsoft, which provides video and voice calls to networked devices over the Internet, and users can also use it to send and receive instant messages, transfer files and multimedia information. Below are features in Skype:

|  |  |
| --- | --- |
| **feature** | **usage** |
| Instant message, text chat | Social communication / connection |
| Voice chat | Social communication / connection |
| Video chat | Social communication / connection |

*Figure14: Skype features*

HouseParty is a social networking service that allows users to chat in groups via video. Below are features in HouseParty:

|  |  |
| --- | --- |
| **feature** | **usage** |
| Video chat | Social communication / connection |

*Figure15: HouseParty figures*

The first step was to analyze and compare the characteristics of these software, and the team wanted to summarize their advantages and disadvantages from these characteristics and apply them to the design.

***WhatsApp:***

From a usability perspective, like figure16 shows below, each feature of WhatsApp is easily accessible through a status bar at the bottom of the user interface, which allows users to quickly access the user page of the desired feature by clicking on it. For those who can't quickly access the status bar through the icons, there are text explanations below each icon in the status bar, which is very user-friendly and guides the user through the system quickly. Another user-friendly design is that for new users, there are text instructions on how to interact with the system on each user page where the feature is located, which can greatly reduce the learning and time costs for new users, and the size of the text instructions is not too small, which is helpful for older people with visual impairments. Therefore, the design addresses the target user's pain points of "learn how to use quickly" and "can't because of cognition impairment" on persona “keeper of contact”.

The downside is that the "Status" page is linked to the "Camera" page in that the "Status" page is used to show the user's life moments and the "Camera" page is used to shoot and post the page, which often confuses users because they need to jump from the "Status" page to the "Camera" page when posting user moments, making the "shoot-post-shoot" process fragmented.

A screenshot of a computer

Description automatically generated with low confidence

*Figure16: WhatsApp Screenshot*

In terms of interaction, WhatsApp allows users to switch between sub-pages through the bottom navigation bar and follow the descriptions of the sub-pages' textual guidance, and its global operation mode is relatively uniform. Users mainly interact with the system in the form of clicks, which is relatively easy for users to get used to, so it can provide a more convenient experience for users.

In terms of features, WhatsApp has the advantage that the cost of initiating domestic and international calls is almost the same (A., 2021), which means that every user can contact their family, friends, etc. as they wish without worrying about the cost of calls, and another advantage is that users can socialize through the computer client. It is worth mentioning that in terms of video calls, WhatsApp allows up to 8 users to participate in the same video call. In addition, WhatsApp also supports encrypted calls, which is crucial for users' privacy protection, and addresses the user's need for "Desire for private information protection".

If we evaluate it in System Acceptance Framework by using 4 point rating; 1 = worst, 4 = excellent, then:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| learnability | efficiency | Memorability | errors | satisfaction |
| 4 | 4 | 4 | 2 | 3 |

***Skype:***

The second software to be introduced is Skype, which is similar to WhatsApp in terms of usability, it also uses the same bottom navigation bar and text guidance on the page, except, Skype uses a global top navigation bar to add some convenient operations (figure17), such as users can quickly search for contacts, groups and messages through the search bar, quickly view notifications by clicking on the "bell", quickly initiate a chat or video conference, etc. Skype integrates the most frequently used features into the top navigation bar interface, which allows users to quickly find the features they need through the top navigation bar without having to switch between user interfaces, compare with WhatsApp, the subpage of Skype contains more content, which means that user need to take more time to be familiar with how to operate them, therefore, the ease of use of Skype might slightly lower than WhatsApp. However, due to those contents in the subpages are the quick entry of functions from top navigation bar which related to the subpage, after user be familiar with these contents, they will be use Skype more easily. Therefore, the ease of use of Skype will lower than WhatsApp in short but will higher in long.

In terms of interaction, Skype's interaction is similar to that of WhatsApp, but because of the top navigation bar, Skype's interaction is more uniform than WhatsApp's, but because of the content in subpage, the interaction will more than WhatsApp’s.

In terms of features, Skype's video calling is obviously more powerful, as it allows more people to participate in a video call than WhatsApp, which only allows up to 8 people to participate in a video call. However, it is worth noting that Skype's number calling service is not free of charge.

A screenshot of a phone

Description automatically generated with medium confidence

*Figure17: Skype screenshot*

If we evaluate it in System Acceptance Framework by using 4 point rating; 1 = worst, 4 = excellent, then:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| learnability | efficiency | Memorability | errors | satisfaction |
| 3 | 4 | 3 | 1 | 4 |

***HouseParty:***

The last software is HouseParty, In terms of ease of usability, HouseParty does a poor job, it does use a design similar to Skype's top navigation bar and bottom navigation bar, but it only uses icons to represent the different sections, without text descriptions, users have to click one by one to try, secondly, in terms of interaction, each sub-page appears in a different way, some sub Some sub-pages are pop-up pages, some sub-pages are just a menu bar, which is a fragmented experience for the user. The consequence of this fragmented experience is that the user has to spend a lot of time remembering what each sub-page is about and how to interact with it. There is no ban for the elderly group who are suffering from cognitive decline or who need help learning how to use modern social software.

If we evaluate it in System Acceptance Framework by using 4 point rating; 1 = worst, 4 = excellent, then:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| learnability | efficiency | Memorability | errors | satisfaction |
| 2 | 2 | 2 | 3 | 2 |

***Summary:***

The following is a summary of the above application studies. The ease of use, advantages and disadvantages of each application are summarized in the following tables, as well as the design guidelines demonstrated by their design.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| App | Usability | Advantage | Disadvantage | Design |
| WhatsApp | High | Unified interaction  Simple and intuitive user interface  User guidance | Features not fully integrated in one part | *Simple appearance*  *Highlight key content*  *Metaphor Instructing*  *Unified design*  *User guidance* |
| Skype | Medium-high ease of use | Unified interaction  Simple and intuitive user interface  User guidance | Slightly complex content in subpage | *Simple appearance*  *Highlight key content*  *Metaphor Instructing*  *Unified design*  *User guidance* |
| HouseParty | Worse ease of use | none | Not unified interaction  Complex user interface | *Highlight key content*  *Metaphor instructing* |

*Figure18: summary*

From the above table and analysis, we can conclude that Skype and WhatsApp have better usability compared to HouseParty, where WhatsApp has higher usability than Skype, but Skype is more user friendly for long term use. In terms of design, they both adopt a minimalist design style, i.e. they use simple colors for the background and use shades of colors to distinguish the navigation bar from the content area; their designs emphasize the highlighting of key content, for example, they both use colors that contrast strongly with the background color to decorate the icons, and at the same time, they use accent colors to emphasize the selection and operation icons, for example, blue color to mark the current Subpages are marked in blue, and actionable components are decorated in blue, etc. (Figure 19: Contrasting colors for icons, Figure 20: Emphasis colors for actionable components); they also use a uniform design, which is reflected in the design of the navigation bar and the uniformity of the interaction (mentioned above, not repeated here).

Text

Description automatically generated with low confidence

*Figure19: contrasting colors for icons*

**A picture containing text, electronics, screenshot

Description automatically generated**

*Figure20: Emphasis colors for actionable components*

Therefore, in terms of design, the team will consider the design guidelines of Skype and WhatsApp because they are effective in responding to user needs in terms of usability.

### 4.2.2 solution and design guideline

Therefore, in terms of design, the team will follow the design guidelines of Skype and WhatsApp, as their designs demonstrate a high level of usability in their category, meaning that the design is not overwhelming and frustrating for the users, but also means that the design is well suited to the needs of the target users of these two applications. In addition, given that the target user groups of Skype and WhatsApp overlap with the team's target audience, the design guidelines and characteristics of the two applications are also applicable to the team's design solution.

Therefore, here are the design guideline of team’ solution:

|  |  |
| --- | --- |
| Design guideline | Relevant requirements |
| Simple appearance | 1. Expect simple interactions 2. Reduce deceptive information |
| Highlight key content | 1. Learn how to use app quickly |
| Metaphor instructing | 1. Learn how to use app quickly 2. Expect simple interactions |
| Unified design | 1. Expect simple interactions |
| User guidance | 1. Learn how to use app quickly |

*Figure21: design guidelines*

For the implementation of the team's solution - the form and features of the solution - the team decided to use social software as a vehicle to carry the features and functionality that meet the needs of users. Compared to the team's systematic approach to optimizing and updating modern social software such as Facebook, the design of a new social software would give the team more room to maneuver. This is because if the team chooses to optimize an existing social software, it means that the team must take the time to deeply understand the system architecture, core business, and carefully consider changes to the software. This is because the software already has an established audience, so if the team's considerations are not precise, it could result in financial and reputational damage to the software.

By developing a new social software, these problems are avoided, and the team can save time by focusing on developing the new system and improving it through user testing, thus attracting a larger audience.

Some of the features of the solution will be based on Skype and WhatsApp, but they are very different from these two applications because Skype and WhatsApp are mainly "user-to-user communication", and their design is very good, but they do not satisfy all the user needs that were identified in the previous research and there are still some issues that we haven’t found solution in Skype and WhatsApp. Therefore, some of features are generated by team based on these unreached issues and user requirements.

The following is a summary of the system features:

In the figure below, “resource” means where the feature or generation inspirations comes from, resources can be an actual app, a user requirement, or previous investigation result, etc.

|  |  |  |
| --- | --- | --- |
| **Features** | **resource** | **Brief** |
| Voice chat | Skype & WhatsApp | Unlimited participants in each voice chat |
| Video Call | Skype & WhatsApp | Unlimited participants in each video call |
| Instant message chat | Skype & WhatsApp | 1. Connect through internet, without pay 2. Encrypted chat |
| Share posts | WhatsApp | Share life pieces by using post. |
| Post communication | Optimization of share posts feature on WhatsApp | Collect, commenting, reply comment operations allows in a post. |
| Targeted content push service | Want to read the content of interest (***generated from user*** ***requirement***) | Push contents that user interests in. |
| Modern & popular & fresh content push service | I want to understand young people’s ideas and communicate with them. (***Generated from user*** ***requirement***) | Push contents that popular and content not often followed |
| users are grouped according to interests | Want to find like-minded people ***(generated from user requirement)*** | People select interests and enter an interest circle. |
| Users can communicate with like-minded people | Want to find like-minded people ***(generated from user requirement)*** | People communicate with like-minded people in an interest circle |
| Off-line activities | Cope with audience general issue: alone ***(from previous investigation – Literature Review)*** | The system regularly organizes offline activities, all users can participate |
| Voice input/output | Optimization on message input/output ***(from previous investigation – Literature Review)*** | System record voice from user as input  User can type voice message to listening |
| Voice message convert | Optimization on voice output ***(second optimization on voice input/out for listening issue)*** | Users can convert voice message to text if their listening abilities are not good. |
| Virtual assistant | Optimization on interaction ***(from previous investigation – Literature Review)*** | Virtual assistant to help users learn how to interact with system. |

*Figure22: features overview*

***Novelty features:***

In figure22, there are 13 features in the system, the top 3 features are referred to the existing system (Skype/WhatsApp), and the rest of features are novelty features.

Compare to the existing system WhatsApp, the current system also has features that can share life pieces, however, the post share feature in the current system highlights the “social interaction” aspects. This is for help to make more opportunities for users to communicate with each other so that users will expand their social circle gradually. The reason is that team want to relieving loneliness of users by this design. Despite of the last 3 features, other features are all designed for this reason in more or less, and these features do not exist in WhatsApp or Skype. For example, there are two push services in the system, the “target content push service” is designed to make user feel happy when they see the content that they want, and the “Modern & popular & fresh content push service” is designed to make user keep fresh. These two-push service is designed to prevent users drop into negative emotions or effected by negative feelings.

The last 3 novelty features are the optimization of interaction, the goals that design them is to make interaction easier and ease to learn, which refers to the elements that be used to evaluation usability of a system “learnability”, “efficiency” and “memorability”.

### 4.2.3 stakeholders

The team's design solution involved a total of four categories of stakeholders, namely "target audience", "product & service suppliers", "research institutions" and "Government. "

#### **4.2.3.1 Target audience:**

The previous description of the target audience remains unchanged (**4.1.5**), and the goal of the team's work is still to meet the needs of these user groups (**4.1.4**) and solve their problems, as described in the following description of the target audience:

*“The target audience for the team's design solution is primarily seniors who are unable to fully experience modern social networking software due to health-related cognitive impairments; seniors who need help learning how to use modern social networking software due to a decline in their mindset, knowledge base, and learning ability; and seniors who experience barriers to using social networking software due to poor design.”*

#### **4.2.3.2 Product & Service Suppliers**

A "product & service supplier" is a team solution "supporter" who helps build and maintain a team solution by providing technical, service and production content. It consists of three different roles, "Product Supplier", "Service Supplier", and "System Support Supplier".

***Product Suppliers***

The "product supplier" is the main development team of the team solution, and their task is to implement the system's features to the content provided by the "service supplier". For example, the "service supplier" provides the technical support and conceptual description of the push system, and the "product supplier" needs to build the push system based on this and ensure that it is operational. At the same time, the "product supplier" must perform user tests on the implemented system features and analyse them based on the results of the user tests, after which the results of the analysis are provided to the "service supplier". "The "service supplier" needs to improve the conceptual description of the feature based on the results of the analysis and sends back to the "product supplier" to improve the system feature according to the new improvement plan. The system features will be upgraded according to the new improvement plan.

***Service Suppliers***

"Service supplier" is a technology provider in the solution development process, which includes the provision of technology for system features and design solutions. The "service supplier" provides the technical solutions and conceptual descriptions required for the implementation of the system features to the "product supplier", after receiving the corresponding materials, The "product supplier" builds and runs the system features based on these materials. Another task of the "service supplier" is to integrate the feedback from the user research and to provide updated technical solutions and conceptual descriptions of the system features. For example, if a user gives feedback that the push system is inaccurate, after the "product supplier" analyzes this feedback, the "service supplier" needs to make the relevant algorithms for the push system, After the "product supplier" analyzes the feedback, the "service supplier" needs to optimize the algorithm and architecture of the push system and update the concept description to ensure that the "product supplier" can update the system features.

The work of the "Service Provider" and "Product Provider" is mainly responsible for the implementation, testing and commissioning of system functions during the system development phase. Secondly, their other job is to update the system for major releases, and the "service supplier" and "product supplier" will be responsible for the update of " The "service supplier" and "product supplier" will analyze the problem logs of the system fed by the "system support supplier" and decide whether to improve certain features. After determining, "service supplier" will organize the improvement plan and submit it to "product supplier", "product supplier" will update the system according to the improvement plan.

***System Support Supplier***

The "System Support Supplier" is responsible for resolving issues that arise after the system goes live, such as network problems, code bugs and platform incompatibilities. In addition, the "System Support Supplier" is also responsible for regularly summarizing the problems found, generating a log of problems, and providing feedback to the "product supplier". and "service supplier", "product supplier" and "service supplier " will analyze these logs and therefore consider whether to make major changes to the system architecture in the event of a major release.

#### **4.2.3.3 Research Institutions**

"Research Institutions" are responsible for conducting long-term research on target audiences, which includes changes in attitudes towards the system, changes in social interaction, etc. as times progress. Like the "System Support Supplier", "Research Institutions" generates regular analysis reports and provides them to the "service s". service supplier" and "product supplier" teams, the difference is that this report is a year-by-year analysis of the target audience, and the development team hopes to use this target audience analysis report to determine the future The development team hopes to use this target audience analysis report to determine the future direction of development.

# **5. Conceptual Design**

**5.1 high level description on how system works**

The system is designed to provide a social networking platform for older adults with communication and social requirements and for groups of older adults who cannot fully use modern social applications due to cognitive decline.

The system divides users into different bars through precise matching according to their interests, and users can join multiple interest bars according to their different requirements. In addition, the system allows users to share their daily life through posts, which can be pictures, text as well as videos, in different bars. Users can interact by leaving and replying to comments, giving "likes" as well as favourites. Private chat supports any user to contact each other. Private chat has various forms, users can interact using traditional sending instant messages, or communicate using voice chat or video chat.

The system will also organize a variety of offline activities that can be ordered in the application to help more seniors escape loneliness and get warm in communication.

**5.2 interaction paradigm**

Platform: The designed solution can be used on Mobile device and PC, therefore, it supports “touch interaction” on mobile devices.

### 5.2.1 voice interaction

Voice interaction was chosen because it allows the user to direct the system to complete a task through voice input commands, which reduces the need for the user to manipulate the system interface. For the target audience, especially for those who have difficulty using mobile devices or computers due to physical or cognitive decline, the use of voice input can help them to use the system completely.

The interaction logic of the system is not entirely voice based, but is integrated into the virtual assistant, which the user can bring up to experience voice interaction.

The only voice interaction that can be used without bringing up the virtual assistant is voice conversion and voice message interaction (record, send, listen) when sending messages or typing. Typing is acceptable for seniors but typing on a crowded keyboard is not a good experience for most seniors, especially those with presbyopia. We hope to help seniors communicate more easily online by supporting recording and sending voice messages, voice text conversion and voice message listening.



*Figure23: Voice Message Convert to Text on WeChat*

The function of video will be added in both mobile devices and PC , such as live video chatting, live streaming, video sharing, video player. Moreover, the notification will give user reminder, like vibration, calling, bubble pop-up. The elderly may not have a high awareness of information. The three approaches that above will be adopted to help the elderly receive important information, such as service information, emergency tips and chat information.

### 5.2.2 vibration interaction

Vibrational interaction was chosen because it can effectively help users with perceptual decline to perceive actions through feedback on different actions formed by different dimensions of vibration. The different levels of vibration and sound generated by the electronic motor of the mobile phone will help the user to provide information perception and operational feedback to enhance the experience. In terms of the private chat messages, for instance, strong vibration will have to remind to check the new information, when user is touching the switch button, the vibration of moderate intensity with mechanical voice will remind user that this behaviour is finished, such as when the elderly improves video volume again, the vibration of the system will also be from low to high to help users understand the strength of the current sound. “The world is moving towards smartphones and tablets with fewer mechanical buttons—essentially becoming responsive sheets glass. Haptic feedback is crucial at maintaining a tactile element to these devices, allowing us to feel what’s happening on-screen as well as being able to see it.” (Helyer, 2020).

Graphical user interface, text, application, chat or text message

Description automatically generated

*Figure24: haptic feedback on IOS*

As mentioned above, the vibration interaction is inspired by Apple's vibration feedback design. Unlike Apple's ultimate pursuit of "realistic" vibration feedback, the vibration feedback of this system is stronger because the system has to use more vibration to make the user perceive the feedback of the operation due to the user's low perception ability.

Another possibility is that users may miss notifications when they are not using the app. When they open the application again, the system will display the missed messages in the form of bubble pop-up reminders with vibration. The advantage of this system is that it does not occupy too much display space and can also serve as a reminder function.

Graphical user interface, diagram, website

Description automatically generated

*Figure25 - Bubble Pop-up Notifications on Android 12 New Feature*

**5.3 Key interface metaphor**

***Icon Metaphor***

Using icon metaphor to represent different parts, features, activities, and categories instead of texts or commend lines. There are a lot of successful products that have been using icon metaphors in their systems. The advantage is that users can directly understand what icons represent since their sense widely exists into people’s daily life or experience impressions.

A close-up of a logo

Description automatically generated with medium confidence

*Figure26 - Icon <contact> - Which correctly verified the impression “people” and “phone book” of contact in people’s daily life or experience*

***Animation Metaphor***

Using animation metaphors which can have a ganged effect with vibration and bubble pop-up reminder as the reflection of a user's interaction like when they finished or in some activity. For example, when user finishes a forward message to another in application, an animation “drawing a hook” can be shown in order to imply to the user that the activity has finished.

Graphical user interface, text, application

Description automatically generated

*Figure27: Animation Example One*

For another example, when a task is in process, an animation “loading” can be shown in order to imply to the user that the activity hasn't finished.

A screenshot of a phone

Description automatically generated with medium confidence

*Figure28: Animation Example Two*

**5.4 design guidelines**

### 5.4.1 simple appearance

The interface of the application should keep simple and clean with reasonable and contracted color combination to provide comfortable feelings. Components’ layout should be compendious without redundant elements and using laconic shapes and icons, text description should be accurate to the key points in order to make the user feel comfortable and convenient.

As for target users, complex interfaces, crowded layouts, and redundant text descriptions can cause confusion and affect their experience. Less design means more the emphasis is on highlighting useful content through concise design, and eliminating unnecessary elements is an important step in combining practicality and aesthetics.

### 5.4.2 Highlight Key Content

Key features, components, and content of important functions should be highlighted to remain visible so they can be easily found and used. The system should emphasize the main components of each page, especially the actionable parts. For example, if a page has "Close", "Back", or "Confirm" buttons, the title of each section should be highlighted to attract the user's attention, this will help the user understand the general layout of each page, the function of each component and how to interact with the system within the page. One effective way to highlight important components and content is to use a colour that clashes with the background colour of the page, such as a bold black font for the title on a white background, or a bright yellow colour for the button on a blue background, etc. For target users, whose perception is decreasing due to health reasons, it is especially important to highlight key components and content on each page to help them learn how to use the system faster.

### 5.4.3 metaphor instructing

Metaphor represents meaning more intuitively than context. It can guide the user to quickly learn how to interact with the user interface, and the more familiar the user is with using the system, the easier it is to predict what to do next and to explore new features of the system. Through previous research, we found that a significant portion of target users feel overwhelmed when faced with a new application interface and have difficulty learning how to use them, which is rooted in the inability of each component of the user interface to inspire in the user's mind. The simplest way to use metaphors is through icons, where an anthropomorphic or figurative icon can be used to suggest the user's past experiences, or through animations, such as contraction animations to suggest a click, arrow animations to suggest how to Another way is to use animations to hint at the user's past experience.

### 5.4.4 Unified design / Uniformity of design

Uniformity of design is also important to reduce user learning costs. Uniformity of design includes uniformity of content interaction across pages of the same design, e.g., menus popping up in a bottom-up manner on each sub-page or vibrating consistently each time a button is pressed. Uniform design also includes uniformity of appearance, such as the layout of each sub-page being generally similar, so that the user can quickly know how to use a new sub-page even if it is his first time trying it, and because of the uniform page design, past experience with how to interact with the system on other pages can be applied when faced with the new sub-page. The advantage of a unified design is that it makes the system "memorable" and makes the user's experience with the system completer and more efficient.

### 5.4.5 User guidance

For new users, the most difficult thing about a new user page is not knowing how to get started, especially for the target group of users of the system, whose cognitive decline due to health reasons amplifies this dilemma, in fact, most of them often need help to learn how to use a system. Therefore, a user guide is necessary for new users to quickly learn how to get started quickly. For this system, user guides should be permanent, because given the specific background of the user community, they are slow to learn how to use a new system and inevitably take too long to learn a part and forget how to interact with the system before, at this point, user guides can help them to quickly recall, and it helps them to It serves as a refresher.

**5.5 System requirements**

### 5.5.1 major features

***Socialization and Community Building***

Socialization and community building are the most essential features that are used to generate our underlying architecture for the system. The community is built by group classification which aggregates users based on common interests at the system level. Socialization promotes users to share their life pieces, experiences as well as think of futures to like-minded people, friends or others. These features provide users a platform for communication, making friendships and multiple opportunities to participate in a variety of activities.

***Accurate Match and Private Connection***

Private matching user recommendations and private connections are the most important communication channels that provide opportunities for communication and friendship between individuals and individual users. This is one of the key features that allows users to expand their communication in a more flexible way, and it enriches their private network as users can make decisions from a wealth of resources and then take a chat or follow. Private matched recommendations are different from traditional content-based filtered recommendation systems in that they are more flexible and sophisticated to avoid the problem of ending up with no content to be pushed because of long term filtered recommendations.

The way that system takes to solve the issue is to take the combination of inverse algorithms to help and promote users to expand their communication circle actively. The core of the recommendation system is to take the combination of traditional recommendation, cross-domain recommendation, and inverse recommendation in order to meet more users in relevant and different domains/interests in the use of the system gradually.

Text, timeline

Description automatically generated

*Figure29: Cross Domain Recommendation Goals*

Table

Description automatically generated

*Figure 30: Goals in the Literature*

Over time, while retaining the essence of accurate matching "finding like-minded users", it gradually expands users' interests through snowballing, so that users are not limited to the initial interest content, but gradually encourages them to explore new interests, match new users, and get more communication opportunities.

***Activities Organizations and Popularization***

Multiple offline activities are another feature that enhances user communications. People are not only willing to share their lives on the Internet, but also hope to narrow the distance between people through activities.

This feature deepens the life of online communication through real life activities, and online communication is also a promotion and promotion of offline activities. A complementary closed loop will better provide users the close-knit experience of social communication.

As for users, offline activities avoid the "sense of distance" in online social networking. Offline activities can better shorten the distance between users and the community and users and their online friends, thus eliminating the "unreality" and making online and offline life an integrated experience rather than separate parts.

### 5.5.2 secondary features

Features will focus primarily on user experience and improvement.

***Push Service***

Information notification, system notification and algorithm-based recommendation push service will be integrated into the push service of the application. The application will access the API of the mobile operating system to achieve push at the system level. At the same time, when the user uses the application, the system will push to the user at the application layer.

Missed messages will be recorded and notified via ‘Bubble Pop-Up Reminder’ when the user opens the app. Vibrations and animations are considered as metaphors used in notification as a way to get the user's attention, which mentioned before.

Diagram

Description automatically generated

*Figure31: Push Service*

***Applications of Vibrations / vibration interaction***

Vibrations are primarily used to enhance the effects of animations and notifications and implicit feedback on user action. By adjusting the motor of the mobile device, the system adopts different vibration amplitude to give feedback according to different user actions to achieve the function of hinting and reminding the user. Because the real world needs feedback, when people walk, the sound of walking is the feedback of the movement of walking, applied to the software level, vibration is the feedback simulation of each movement of the user. The advantage of this feature lies in the improvement of the operation experience of the system, so as to provide users with more sense of operation and reality and enhance users' perception of each interaction on the system.

***Applications of voice / voice interaction***

For the installation of the voice interaction system, the main services of the voice interaction system will be concentrated in the virtual assistant, which includes the global search and retrieval of system information, the recording of user-related information, and the encapsulation of the evocation portal for all system features. The user can use his voice to command the voice assistant to experience any feature of the system and search for any desired information within the system.

# **6 PROTOTYPES**

**6.1 prototype overview**

The design style of the prototype is taking “material design” as the design style, since the feature of “material design” like “high contrast color usage”, “shadow usage” are highly suitable for the design guideline "highlight key content", and the rich component and the regular design style are suitable for the design guideline “unified design”. In the prototype design, we use fixed top navigation bar and bottom bar, component to make the system to reach high level consistency.

Since the "material design" design style is theoretically highly compatible with the team's design guidelines, the team wanted to show as much aesthetic design as possible in the prototype to determine if the "material design" design style can be truly integrated into the five design guidelines set by the team. Therefore, the team used "material design" for the first prototype, which has a fidelity of "medium-high fidelity". prototype.

**6.2 prototype design intro**

Graphical user interface, application

Description automatically generated

*Figure32: home page*

Figure32 shows the main page of interest club, it is combined with the top navigation bar, the bottom navigation bar as well as the content display area at the middle. The bottom navigation bar has three icons, which represents notifications, home and club house pages. Users can press each icon to enter different subpages, and the relevant icon which represent the subpage will be highlighted, as figure33 shows above, the icon “home” is highlighted which means that user now at subpage “home”. The top navigation bar will exist at each subpage. User can use the search bar to search contents in each subpage or press the “menu” icon to open the menu. The menu shows user’s profile, and the button of virtual assistant, user can press the button to awake virtual assistant to take voice interaction.

At the middle, which is the space that shows page contents, such as in figure32, it displays posts from authors that user follows. The size of each post are large rectangular, they takes a large area because of that they are the only content that need to be displayed, and should consider the visual cognition issue of target audiences.

From the overall perspective, the user interface only shows the post cover, text description, and some quick actions, which is in line with the design guideline "simple appearance", in addition, the icons for quick actions are deliberately chosen to represent the common icons for actions, such as the function "Post Like" is represented by a red heart icon. The red heart often means "like", and when new users use the system for the first time, this symbol will give them a hint about the function behind this icon, which refers to the design guideline “metaphor instructing”.

From a design perspective, the team used shadows to differentiate each post and bright yellow against the blue background color to highlight the user's page, in line with the design guideline "highlight key content".

Graphical user interface, application

Description automatically generated

*Figure33: secondary page*

Above are the secondary page of system, secondary page is the pages that appears from subpage, they cannot be assessed by bottom navigation bar, which means that they can only be opened in each subpage by operations, however, they can be accessed by voice command through voice assistant.

The design of each secondary page is same, which refers to the design guideline “unified design”. The design of each secondary page is combined with top bar and the content display area.

For aesthetic reasons, the background of the top bar is an image related to the content of the second level page, and there are some necessary action icons on the top bar, such as "back", "next", etc. These action icons are different depending on the needs of the second level page, for example, there is no action icon in the first level page in Figure 33, but there is an action icon in the second level page, because the second level page is the "next page" of the first level page, so its top bar has a "back" action icon, this design reflects the design guideline “simple appearance”.

In addition, the title of the top bar of any secondary page is in the same position and in the same font, which reflects the design guideline "unified design". But more than that, in the content display section, there is a text explanation of what to do on the page, which is designed to help new users get used to using the page more quickly. Below the text description is the content that needs to be displayed, this design reflects the design guideline “user guidance”. This also reflects the design guideline "unified design". In addition, in order to maintain consistency, all secondary pages will have a white background color for the content display, with the content displayed in black, and bright colors for components that need to be manipulated, such as buttons, which in this system are mainly purple.

*The above is an introduction to the prototyping style, a complete prototype can be found at the following link in Adobe XD:*

*https://xd.adobe.com/view/63921808-10ff-4a64-bc58-369b7088c91a-36c1/*

# **7 User Test**

In order to test the user acceptance of the solution created by the team and to improve the design, the team organized a user test, which was conducted mainly using SUS (System Usability Scale).

The System Usability Scale (SUS) was developed by John Brook in 1986 as a theory for evaluating the degree of usability of office systems.

**7.1 SUS analysis**

***SUS background:***

The SUS has since been found to be useful in evaluating many products and services, such as hardware devices, software, websites, etc. System usability scales are typically Likert scale questionnaires with 10 dimensions and 5 response options. The scales range from strongly agree to strongly disagree.

***SUS information expected:***

The team expects to be able to obtain response values for each participant from the SUS questionnaire as well as the SUS score. After participants have completed the scoring, follow-up interviews will be conducted with some participants to obtain complementary responses for subsequent analysis. Therefore, transcripts are also provided for the SUS. The SUS result can be found at Appendix – User Test.

***SUS questionnaire participant selection:***

Since they had different a total of 10 participants with completely different backgrounds, social status, occupations, and experiences with modern social communication applications were selected to participate in this evaluation process. They were asked to experience the prototype and fill out an evaluation questionnaire, and they were expected to reflect on their attitudes towards, and acceptance of, the current system, and their feedback was seen as a snapshot of the target audience's opinions about the current system, which is why these 10 participants were selected to participate in this session.

***Analysis:***

The following SUS scores about the system were evaluated by these participants:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RP1 | RP2 | RP3 | RP4 | RP5 | RP6 | RP7 | RP8 | RP9 | RP10 |
| 70 | 75 | 65 | 75 | 72.5 | 90 | 77.5 | 87.5 | 65 | 85 |

*Figure34: SUS score of each participant*

As we can see from Table 34, participants 3 and 9 gave the lowest score of 65, while participant 6 gave the highest score of 90, and overall, the scores of the participants fluctuated considerably.

What most people recognized was that the mean score on the System Usability Scale (SUS) was 68. Comparing this average score with each participant's SUS score, we can see that eight participants scored higher than the average SUS score and two scored lower than the average SUS score.

In order to further confirm the target audience's attitude toward the system, the SUS scores were converted to the corresponding adjectives for further analysis, and these adjectives were converted based on the SUS scores, from "excellent" to "poor".

Therefore, based on the SUS scores, a table was created to convert each participant's scores into the corresponding adjectives (Figure 35). According to Table 35, we can see that the adjectives converted for each participant's score are positive adjectives, even for the two participants with the lowest scores, so we can assert that the system has a fairly good usability.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RP1 | RP2 | RP3 | RP4 | RP5 | RP6 | RP7 | RP8 | RP9 | RP10 |
| Fairly good | good | Fairly good | good | good | excellent | good | excellent | Fairly good | excellent |

*Figure35: converted SUS score of each participant*

Although these adjectives are all positive, it is easy to see that three respondents rated the adjective "Fairly good", which means that there are still some problems with the system that could affect the level of usability. Therefore, in order to further explore what the problems were, the team created a problem map and analyzed the problems through the problem map and the feedback from the participants in the follow-up interviews.

Chart, waterfall chart

Description automatically generated

*Figure36: SUS score distribution diagram*

Figure36 shows the distribution of SUS scores. To find out the origin of the problem, we need to observe the distribution of outliers in each question, and from the figure, we can see that in the odd number of questions (negative questions), the score of question 7 is concentrated between 3 and 4. Question 7 is about the ease of use of the system, and some feedback from the users showed that some of them thought "I think this system is not user-friendly for beginners, I need some time to figure it out", and participant 1 thought "This system works well, but I need some time to get used to it. ", which means that it is still difficult for new users to get familiar with the system quickly. However, considering that questions 2 and 3 were about the use of the system, and that the scores for questions 2 and 3 indicated that most users did not consider the system to be a complex system, but did respond to question 7, I think that the user orientation of the system may not have been effective, considering that the system has built-in user orientation. It is also worth noting that question 8 had an outlier from participant 6, who said that "the color scheme of the system is not friendly, and she often feels uncomfortable", and also that some people did not like the blue background, which means that the system is not visually friendly enough.

Overall, the usability of the system is good, but there are still some issues that affect the user experience, so some design guidelines need to be changed.

**7.2 revised conceptual design**

Based on the analysis of the above assessment, the team identified some potential problems with the system that could affect the user experience. In order to further meet the needs of users, some conceptual designs will be updated.

***Design guideline:***

Based on the analysis of the prototype, some design guidelines need to be changed. There are reports that because the system is not clear for novices, they still need to spend time learning how to use the system.

The first is that the system has built-in user guides on some pages, but text alone is not enough, and the second is that even though the system uses some familiar icons to suggest how users can interact with the system, it still pales in comparison to the lack of text. Therefore, in order to solve this problem, we will add a new design guide "Beginner's Guide", different from the previous built-in user guide, the system will automatically show a demo similar to a course for new users, users can then simulate the interaction in the demo, learn how to use the system. This lesson is kept in the system database and can be reviewed by users through the virtual assistant.

Another user guide "metaphor instructing" needed to be supplemented, so a new design guide "text description on icon" was added to solve the problem of confusing users with some icons.

In addition, users have also commented on the uncomfortable color scheme of the system, so a new design guideline "user needs" will be added to urge the design team to listen to the users in the UI design as well.

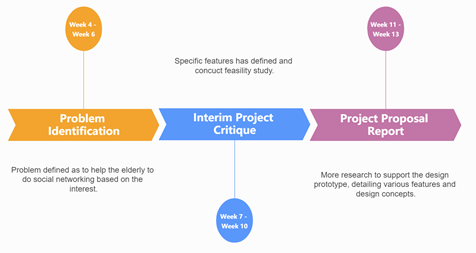
The other design guidelines remain unchanged, as no problems have been revealed so far, and they can still be used as a guide for future designs.

***System requirement:***

Some new features have been added. In addition to adjustments to the design guidelines, a feature called "theme customization" will be added, based on the color scheme that some users have mentioned. The system will be built with a series of color schemes, so that users can freely choose their favorite theme, and this feature will be connected to the voice interaction system, so that users can set the theme with one click through the virtual assistant. At the same time, given that some icons will require text descriptions in the future, for those who can interact with the system metaphorically without text descriptions, the system supports the user to set their own text descriptions of whether or not to open the icons and the user guidance previously built into the system.

**8. Project Plan**

**8.1 Executive Summary**



*(Figure 37 – Timeline for the Project Process)*

In this project proposal, through the exploration of various problems and the analysis of core values, problem identification is determined as a social application for the elderly. Based on personal interests, it helps the elderly to improve ability of network socialization through information sharing, hobby matching and various auxiliary functions. Moreover, in the interim project critique stage, the research direction is aimed at improving the popularity and attractiveness of product. Conduct feasibility investigation through user prototype evaluation and improve design concept to better meet user needs. Finally, many detailed functions and specific problem descriptions were improved, and more research was used to support the design concept, especially the design prototype.

**8.2 Milestones**

|  |  |  |
| --- | --- | --- |
| Week 4 | •   Problem identification (focus on social impact) | Project team formed, through analyze the personal problems of all team members, came up with several feasible design concepts, focusing on the information cocoon room and the physical and mental health of the elderly. |
| Week 5 | •       Identify the project problem and core values  •       Research existing products  •       Establish initial design concept  •       Assign tasks to team members | The project problem has identified to help older people socialize and matching communicators based on interest.  The purpose is to enhance social functions and add features such as videos, pictures and function orientation, so as to avoid obstacles caused by such features as too small font and complex function for the elderly.  Referenced application: Facebook. |
| Week 6 | •       Make low fidelity prototype  •       Group discuss details and improvements  •       Prepare presentation  •       Finish problem identification report | After completing the draft of the report, according to the feedback from presentation to improve and discuss the details of the problem in order to complete the problem identification report. |
| Week 7 | •       Enter the terms of interim project critique and collect feedback from the last phase  •       Evaluation user needs and do more research about design concept  •       Group discussion on how to improve popularization and attraction | The product description has been improved in order to avoid user feeling of age discrimination. |
| Week 8 | •       Group discussion with product iteration and special features to attraction  •       Do more research on existing products and analyse features  •       Prepare presentation  •       Design medium fidelity prototype | Through research, the features of the product are improved and detailed in order to increase the attractiveness of the product and attract users to give up the familiar product and use this new one. |
| Week 9 | •       Do more research on user needs and conduct interviews  •       Through user feedback to make improvements and future direction | Conduct the HCI evaluation method, including TAM, evaluate the low fidelity prototype, analyze the data results. |
|  | •       Generate medium fidelity prototype  •       Finish the report of interim project critique | According to the data analysis of user feedback, make improvements on the prototype and find research support. |
| Week 11 | •       Enter to the stage of project proposal, collect feedback from last phase  •       Improve target user research  •       Group discussion on improvements of design concept | The final stage focus on solutions of how to solve problems and find the good ways. |
| Week 12 | •       Improve research in terms of prototype design and make improvements  •       Discuss the availability of stakeholders and conduct research support | More research has been studied for support purpose, and details has been improved, in terms of feasibility study, conceptual model and prototype. |
| Week 13 | •       Prepare presentation  •       Finally improve the project design proposal | Review the whole project for reflection and detail improvement. |

*Figure 38 - Design Process & Deliverables*

**9. Feedback & Team Reflection**

In the phase of interim project critique, feedback indicated that the overall aspects of the report were good, however, there was still a need for a high-level description of the solutions and effects of the problems, mainly included in the literature review. Feedback indicated that the literature support for our project was reasonable, however, they were scattered, and the literature did not correlate with each other's conclusions. Therefore, in this regard, we will improve the overall content of the report to ensure that the context and logic of the report are smooth and can relate to the literature support between different conclusions. In addition, there were some gaps in the literature supporting key findings, and feedback indicated that we needed to investigate existing technologies and indicate whether the design concept met these requirements. In consequence, in the project proposal report, we will conduct more research on these advanced interaction paradigms and design concepts, looking for missing requirements and inspiration for improvement. For instance, there is a SUS evaluation has been conducted in the conceptual model to better defined the acceptance of the system and user bias. In addition, the feedback also mentioned that our design conclusions and values were recognized, however, there is not a good explanation for why we reached such conclusions. We agree with this feedback, and it has been improved in the report, especially in the design prototype, such as reference of the functionality of questionnaire and whether it is useful to improve design concepts. To conclude, the main purpose of this iteration of report are focused on doing more research that help users better understand the design ideas.

In order to study how to achieve a successful design proposal, and design for the application of social impact, our group has carried on the various aspects of exploration and found that today's society to the mental health of the elderly protection still exists defects. Nowadays, despite the social software is popular, the elderly still has serious social problems and generally report that they cannot keep up with the trend of the times to adapt to online social networking. Therefore, our team determined the problem core of the design project and referred to popular social software such as Facebook to create an interest-based online social application for the elderly. In the early stage of problem identification, our main research direction is to meet the needs of the elderly, such as easy-to-use technologies, easy-to-understand functional guidelines and information patterns that are easy for the elderly to interact with. Each member was assigned their own tasks, including literature research, prototyping, and field research. We communicate on Zoom, Team, and other communication software through weekly meetings to discuss newly discovered problems and feasible solutions. In this way, every member of the team was required to express their own views, which gave play to their personal thinking ability and helped us to complete the product design more effectively. In the middle stage, in order to better develop the product's popularity and attraction to users, we developed the ability of interview. Everyone interviewed users to collect the evaluation opinions of the prototype. In consequence, we not only strengthened our interview skills and communication methods, but also learned for better team cooperation. Finally, the problems of the project were mainly defined in the literature research, hence our team developed the research ability and actively sought all kinds of effective information to help improve the design concept and support the interaction paradigm. However, even though we had half the internal members and half the external members, most of the teamwork was done online under the influence of COVID-19. Therefore, there is a certain efficiency problem in the communication of team members, due to the reason that the communication is not timely. At the same time, the activities of the team could not be carried out collectively, which had a certain impact on our design feedback. Therefore, our group meetings are all conducted by online video meeting or voice. If a member is absent for some reason, the leader will make timely communication to make up for the progress and ensure the normal work of the team.

**10. Conclusion**

This report aims to determine the design process of social applications for the elderly, including research, iterative process, and prototype. In general, the project mainly focuses on the needs of the elderly and creates social software suitable for the elderly according to their living habits. It combines easy-to-use features and interesting topics to help seniors make friends through the internet and enjoy the fun of social media application. Through user feedback and design iterations, the project has now completed a design proposal and will proceed to program development in the future. Not only that, in the future development, it will focus on the development of elderly care services, such as health check, insurance business and strive to achieve the universalization of the elderly's social network, therefore the elderly can integrate into the social trend and no longer feel lonely.

# **11. Appendix**

**11.1 Interview Session**

**Interview Sheet**

|  |  |
| --- | --- |
| ID | 001 |
| date | 29 April - 4 May |

|  |  |
| --- | --- |
| Question ID | Question |
| 001 | Do you usually use online social communication app? |
| 002 | What is your intention on using social media? |
| 003 | What social actions do you often take? |
| 004 | Would you like to have a social communication app specifically designed for seniors? |
| 005 | If you planned to use social media to make change in your real life, what would your goals be? |
| 006 | Do you have any pain points on social communication? |

Interview Detailed

**No.1**

Name: Steven Li

Gender: Male

Age: 60

Occupation: Businessman

Q1. Do you usually use online social communication app?

Less.

Q2. What is your intention on using social media?

Communication, chat, browse information.

Q3. What social actions do you often take?

Send messages, online chatting, and receive news.

Q4. Would you like to have a social communication app specifically designed for seniors?

Yes.

Q5. If you planned to use social media to make change in your real life, what would your goals be?

Can find the same interests of users and have the opportunity to chat offline. A platform that focuses on what older people like, so that they don't worry about topics that are different from young people.

Q6. Do you have any pain points on social communication?

Different preferences, backward information, unable to keep pace with the times.

**No.2**

Name: Carol Cheng

Gender: Female

Age: 53

Occupation: Dental assistant

Q1. Do you usually use online social communication app?

Yes, I usually use Messenger, WhatsApp and WeChat to communicate with my friends and family members. My family members are all in Malaysia so I use WhatsApp to contact them every day. And I met many Chinese friends, so I downloaded WeChat to reach them conveniently.

Q2. What is your intention on using social media?

Well, keeping connection with people that I think is important for me is one of my intentions. And using social media can let me know the status of others and I can give care if someone is in tough condition.

Q3. What social actions do you often take?

I always go to church on Sunday, and I can meet new friends in church. And also, sometimes the church holds some activities that I would like to join like a jumble sale, drawing class and concert.

Q4. Would you like to have a social communication app specifically designed for seniors?

I like this idea, using this app I can talk to people who have the same situation as me, for example I got hysteromyoma a few years ago. I was scared because at least it is similar to cancer. But I met my neighbor who is almost the same age as me. She got the same disease as well and she told me. Hysteromyoma is very common when women age, not big trouble. Her words give me encouragement. So, I think it is good to build a social communication app for seniors.

Q5. If you planned to use social media to make change in your real life, what would your goals be?

Well, learning more knowledge that I want to learn is the most important goal for me. The second thing is making friends, meeting people who have the same interest.

Q6. Do you have any pain points on social communication?

Yeah, leakage of information, like my phone number, I always got trash messages and calls from strangers.

**No.3**

Name: Howard John Austin

Gender: Male

Age: 68

Occupation: Environmental Specialist

Q1. Do you usually use online social communication app?

No. I hardly ever use social media to socialize. I usually send email or messages to contact with family members and friends.

Q2. What is your intention on using social media?

Mainly for selling or buying something, like Facebook. Also, sometimes I use modern social applications to read news.

Q3. What social actions do you often take?

I have already retired and take no social actions, just keeping in touch with family members.

Q4. Would you like to have a social communication app specifically designed for seniors?

Yes, I’d like to. It would be an optimal way for people like me to make friends with similar interests, and I believe this kind of application could help me to cut the time.

Q5. If you planned to use social media to make change in your real life, what would your goals be?

1). Can easily find someone who has common topics with me.

2). Will not give any information about me to other organizations.

3). I can master this application in a reasonable time. (Low technical barrier)

4). There is a Privacy Button which won’t let anybody have access to my information after I   press it.

Q6. Do you have any pain points on social communication?

Almost all of the social applications will give you something like a reading recommendation, which makes me scared since my information and privacy was loosen.

**No.4**

Name: Diana

Gender: Female

Age: 65

Occupation: Used to be a real estate agent

Q1. Do you usually use online social communication app?

Yes, I am using several trendy social systems such as Facebook, Twitter and LinkedIn.

Q2. What is your intention on using social media?

I am used to utilizing these social media mainly for communicating with my guests and colleagues. Furthermore, to find something interesting and recreation.

Q3. What social actions do you often take?

Go to church, have a party with family members nearly every fortnight.

Q4. Would you like to have a social communication app specifically designed for seniors?

Of course. I have retired so I can no longer use these trendy applications for working. Hopefully, such an app can meet my needs for only socialization.

Q5. If you planned to use social media to make change in your real life, what would your goals be?

1). Close to family members especially the younger generation.

2). If I want to buy something like second-hand furniture, social media can give me some useful advice.

3). An effective tool for learning as well as entertainment.

Q6. Do you have any pain points on social communication?

1). False advertising and fraudulent information.

2). Important information stolen. (Receive call harassment after registering an application)

3). Frequent notification service (Email, text). When I unsubscribed, it came back again after a couple of days.

**No.5**

Name: Terry

Gender: Male

Age: 58

Occupation: Restaurant owner

Q1. Do you usually use online social communication app?

I am more comfortable using these new technologies, but I do not use them as frequently as young people, and sometimes I encounter some problems in using them.

Q2. What is your intention on using social media?

By socializing online, I feel like being with my friends, reducing the feeling of loneliness. I see my friends every week, every time... I hear their voices, know they are here, know them Beside us, I feel so happy.

Q3. What social actions do you often take?

Chat with friends and learn some life skills.

Q4. Would you like to have a social communication app specifically designed for seniors?

I don’t know, I think I just need to be simple and easy to understand.

Q5. If you planned to use social media to make change in your real life, what would your goals be?

I hope to be able to communicate face-to-face with my friends, learn how to dance, and best be able to learn yoga with my friends.

Q6. Do you have any pain points on social communication?

There is too much content displayed in the interface, and a large number of advertisements are not easy to watch.

Questionnaire Spreadsheet

Legend Comparison Table

|  |  |
| --- | --- |
| Legend | Question |
| PU | perceived usefulness |
| PEOU | perceived ease of use |
| SN | subjective norm |
| EXP | experience |
| OQ | output quality |
| IMG | images |

Ps: Job relevant and result demonstrability are considered as the reference in analysis process.

**Questionnaires**

|  |  |
| --- | --- |
| Dimension | Question |
| PU/IMG1 | I agree that use this app can improve my personal image somehow |
| PU/IMG2 | I agree that my social image could be increased in communication circle |
| PU/EXP1 | I agree that this app can bring me motivation on reaching my purpose in the long term. |
| PU/EXP2 | I agree that my experience using this app is smooth without large uncomfortable feelings. |
| PU/SN1 | I agree that I will recommend this app to my friends or family in the future if it’s development circle is finished. |
| PU/SN2 | I agree that this app can increase my life quality. |
| PU/OQ1 | I agree that this app can increase my communication circle. |
| PU/OQ2 | I agree that this app can solve my lonely feelings. |
| PU/UQ3 | I agree that this app makes my life rich. |
| PEOU1 | I agree that this app is easy to use. |
| PEOU2 | I agree that I can add friends, share my life with posts easily. |
| PEOU3 | I agree that I can input and output with ease. |
| PEOU4 | I agree that I can understand each app interface easily. |
| BI1 | I agree that I will use it in the future. |
| BI2 | I agree that I will use it frequently. |

[close] Thanks everyone for joining this session today! I am so appreciative for your contributions, have a good day!

**Data Analysis Steps:**

1. Make charts of responses in the spreadsheet to show contribution and average values
2. Set benchmark as the evaluation standard to analyse average values.
3. Summarize the observation records to reach further information.

### 11.1.1 Questionnaire Responses

**Spreadsheet of Responses from Questionnaire**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dimensions | Questions | RP1 | RP2 | RP3 | RP4 | RP5 |
| PU/IMG1 | I agree that use this app can improve my personal image somehow | 2 | 2 | 1 | 3 | 1 |
| PU/IMG2 | I agree that my social image could be increased in communication circle | 3 | 2 | 2 | 2 | 2 |
| PU/EXP1 | I agree that this app can bring me motivation on reaching my purpose in the long term. | 2 | 2 | 1 | 3 | 2 |
| PU/EXP2 | I agree that my experience using this app is smooth without large uncomfortable feelings. | 2 | 3 | 2 | 3 | 2 |
| PU/SN1 | I agree that I will recommend this app to my friends or family in the future if its development circle is finished. | 2 | 2 | 1 | 2 | 2 |
| PU/SN2 | I agree that this app can increase my life quality. | 2 | 3 | 2 | 3 | 1 |
| PU/OQ1 | I agree that this app can increase my communication circle. | 3 | 3 | 2 | 2 | 2 |
| PU/OQ2 | I agree that this app can solve my lonely feelings. | 2 | 3 | 1 | 3 | 2 |
| PU/OQ3 | I agree that this app makes my life rich. | 2 | 2 | 2 | 2 | 2 |
| PEOU1 | I agree that this app is easy to use. | 3 | 3 | 3 | 4 | 2 |
| PEOU2 | I agree that I can add friends, share my life with posts easily. | 3 | 4 | 3 | 3 | 3 |
| PEOU3 | I agree that I can input and output with ease. | 3 | 4 | 4 | 3 | 3 |
| PEOU4 | I agree that I can understand each app interface easily. | 4 | 3 | 3 | 3 | 2 |
| BI1 | I agree that I will use it in the future. | 2 | 3 | 2 | 2 | 1 |
| BI2 | I agree that I will use it frequently. | 2 | 2 | 1 | 2 | 1 |

### 11.1.2 Average Rating of Each Participant

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Participant | RP1 | RP2 | RP3 | RP4 | RP5 |
| Average rating | 2.47 | 2.73 | 2.0 | 2.67 | 1.87 |

### 11.1.3 Statistical Result of Rate of Each Dimension and Sub Dimension

Statistical Result

|  |  |  |  |
| --- | --- | --- | --- |
| sub-dimension | mean | median | mode |
| PU/IMG | 2 | 2 | 2 |
| PU/EXP | 2.2 | 2 | 2 |
| PU/SN | 2 | 2 | 2 |
| PU/OQ | 2.2 | 2 | 2 |

|  |  |  |  |
| --- | --- | --- | --- |
| dimension | mean | median | mode |
| PU | 2.1 | 2 | 2 |
| PEOU | 3.15 | 3 | 3 |
| BI | 1.8 | 2 | 2 |

**Evaluation Benchmark**

|  |  |  |  |
| --- | --- | --- | --- |
| sub-dimension | mean | median | mode |
| PU/IMG | 2.0 | null | null |
| PU/EXP | 2.0 | null | null |
| PU/OQ | 2.0 | null | null |
| PU/SN | 2.0 | null | null |

|  |  |  |  |
| --- | --- | --- | --- |
| dimension | mean | median | mode |
| PU | 2.0 | null | null |
| PEOU | 3.0 | null | null |
| BI | 2.0 | null | null |

### 11.1.4 Observation Note

**Participant 1:**

[33s taken]

Home page - press the navigation to display interest bars - select a interest bar - find the feature

**Participant 2:**

[25s taken]

Home page - press the navigation to display interest bars - select an interest bar - find the feature

**Participants 3:**

[2mins taken]

Home page - scroll down -scroll up - press the recommended interest bar - back to home page - find correct navigation - press the navigation to display interest bars - select an interest bar - experience the feature

**Participants 4:**

[32s taken]

Home page - find correct navigation - press the navigation to display interest bars - select an interest bar - experience the feature

**Participants 5:**

[1min 12s taken]

Home page - scroll down -scroll up - press the “followed” navigation - back to home page - find correct navigation - press the navigation to display interest bars - select an interest bar - experience the feature

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# **13. SUS Evaluation**

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