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A platform for otakus to gradually learn and adapt to social conventions

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CONVENTIONS

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ABSTRACT

Xu, Shang. M.F.A., Purdue University, August 2016. A Platform for Otakus to Gradually Learn and Adapt to Social Conventions. Major Professor: Zhenyu Cheryl Qian.

It is believed that good design should not only satisfy users' needs, but also improve their overall quality of life. Nowadays, with the rapidly increasing amounts of time spent on the internet, more and more people, the majority of them youngsters, claim themselves as otakus since they cut themselves off from face-to-face communication. From my primary and secondary user studies, most otakus have difficulties interacting with strangers in real world contexts, but some do want to expand their social networks. This design hypothesis is to provide opportunities for otakus to meet people and build friendships in real life. The purpose of this thesis is to use design methodologies to accomplish this hypothesis. The objective is to adopt design approaches to enhance the connections among otakus in face-to-face scenarios by incorporating what is learned from research on and with the target group. Based on the analysis of the user group who regard themselves as otakus, my final design adopts a user-centered approach in order to accurately address the problems. Previous otaku studies are valuable and inform this interaction design. Yet with such general information as a guide, it is still essential to identify the otakus users' needs and problems they face in their daily routines. Therefore, I conducted a survey to learn about otakus' social-phobias techniques skills and needs.

The interview data provided more detailed information to identify user requirements and needs. According to the survey data, 79% of otakus are willing to meet more friends in real life, which indicated that most otakus wanted to meet more people in real belief as long as they are able to choose where and when to meet, as if they were playing a game. They lack the face-to-face communication practice with live people in various scenarios.

The mobile phone is the best medium to reach out to otakus; cell phones are the most highly-used electronic device of all screen technologies. Thus, this design thesis developed the mobile app "Say Hey," a social app with a role-playing game format. . "Say Hey" a social app with a role-playing game platform. Using this app, otakus will act as game characters and finish a set of tasks, which involves offline entertainments, including interacting with their physical surroundings. In this way, participating otakus will start to connect the virtual world (mobile application) and the real world (offline activities). By using this app, they will have to collaborate with other people to finish tasks, which will connect them with other players and people in real life, starting a trivia challenge. As a result, the objective is that Say Hey will improve their interpersonal communication skills. The ultimate design goal of this thesis project is to help otakus gradually get involved in real society and frequent interpersonal communications in daily life.

CHAPTER 1. INTRODUCTION

1.1   Background

1.1.1   Definition of Otaku

The term of "otaku" (Azuma, 2009) was used to define fans of a specific Japanese topic, type, or entertainment theme, including train models, animation fans, and fans of idol groups. Nowadays, the definition of otakus is more general. With the evolution of the Internet, the social interactions between people are becoming more often digital. People who indulge in virtual world (Ito & Tsuji, 2012) rather than having an in-person social life can also identify as otakus.

The term otaku is almost synonymous with "nerd" (Galbraith, 2014) Isaconf. within the Japanese cultural context. Nerd is a term used to represent a non-mainstream person who is an expert or enthusiast of some specific field, especially technology. Some nerds also have difficulties interacting with people and building a social network. However, there are still some distinctions between nerd and otaku. Otakus have more specific areas of interest, such as animation and video, rather than simply science or technology. On the other hand, the age groups are different. Nerds have no particular age group. Contrary to nerds, the majority of otakus are in their teens, 20s, or 30s, according to Casey Baseel's (2014) article.

1.1.2   Social Context

According to Ito et al, today's otaku culture tends to draw attention because of popular interest in the fantasy worlds of anime, manga, and games. People typically think of otaku as people who harbor a strong, fanatical sense of attachment to fictive characters, such as cute girl anime characters.

The Nomura Research Institute (NRI) completed two major otaku studies, the first in 2004 and a revised study with a more specific definition in 2005. The 2005 study defined twelve major fields of otaku interests. In these studies, data shows that most otakus spend their money on manga (Japanese comics), with 350, consumers and a $12.97 billion market scale. Idol otaku were the next most popular group, with 280,000 individuals and $9.53 billion in profits (Kitabayashi, 2004).

Table 1. Survey on Enthusiastic Consumers in Japan, From NRI

Field		Population* (thousand)	Market size (1 billion yen)	Major indexes
Comics		1,000	100	- Number of participants in spot sale of fanzines - Circulation of specific magazines
Animation		200	20	- DVD sales per title - Circulation of specific magazines
Idols		800	60	- Size of concert audiences - Sales of first-release CDs
Games	Home-use PC Network Arcade, etc.	570 140 30 60	45 19 1 13	- Number of hours spent playing games - Circulation of specific magazines - Rate of game players who participate in network games
PC assembly	Wealthy Junk	30 20	30 2	- Number of specific parts sold - Sales at PC parts shops in Akihabara - Circulation of specific magazines

* Including overlapping categories
Source: NRI, "Survey on Enthusiastic Consumers in Japan," August 2004.

Otakus spend so much time in virtual environments that they lack real physical world interaction and gradually lose their social skills. From a psychological perspective, they might become depressed due to a series of failed communication experiences within their community. This will cause a vicious circle if no other step is taken to loop them out. Furthermore, Japan's birth rate is also affected by the otaku phenomenon. According to a CNN journal (Kyung, 2012), the Japanese population will shrink dramatically between now and 2060, as otakus show little interest in sex and/or having children. It is not that they are losing their desire in intercourse; instead, they prefer virtual characters as dating mates. Otakus commonly claim that dating real women are more troublesome. As we know, Tokyo is the world's largest metropolis, home to more than 35 million people. It is hard to believe the city's population is now shrinking. However, the Akihabara area--known as a heaven for otaku--provides one clue to the country's hidden problems (Galbraith, 2010). They are a generation of geeks who have grown up through two decades of Japan's economic stagnation; therefore, they have chosen to tune out and immerse themselves in their own fantasy worlds. The popularity of AKB48 is one of the numerous results of this era; the mantra of this idol group is to let fans grow up together with their idols, and even rank their members annually. AKB48 fans from all over the world fly to Akihabara to attend the annual ranking election. This idol fever was broadcast through TV, YouTube, and other various media sources (Galbraith & Karlin, 2012).

Some otakus with more serious social problems are called "hikikomori," a group of people who never leave their homes or interact with world outside their door (Furlong, 2008). Psychiatrist Tamaki Saito (2013) says sufferers are paralyzed by profound social

fears. "They are tormented in the mind," he says. "They want to go out in the world, they want to make friends or find lovers, but they can't." Group therapy is a relatively new concept in Japanese psychology, but self-help groups have become a key method of drawing hikikomori into wider social society. For both Hide and Matsu, the journey to recovery was helped by visiting a charity-run youth club in Tokyo known as an ibasho--a safe place for visitors to start reintroducing themselves to the society (Horiguchi, 2012).

1.1.3 Market Research

As otakus have gradually become a huge potential consumer group, manufacturers and companies are laying emphasis on making profits from otakus by catering to their needs. From an industrial and interaction design perspective, companies such as Nintendo and Microsoft main focus on providing creative products and services for otaku; for instance, Wii and Xbox involve partial physical movement through the game. Those products provide realistic and interactive experiences for users when they play games. From a game design perspective, GAL games (Girl game/Bishōjo game) are becoming more popular in the market due to the specific otaku niche. GAL game is "a type of Japanese video game centered on interactions with attractive anime-style girls." These games are a subgenre of SIMs targeted towards a heterosexual male audience. In GAL games, otakus choose an avatar according to their personal tastes and date different virtual girls as they wish in the game. While GAL games are limited in their audience and dating possibilities, otaku can feel "love," "friendship," and "family" virtually. In this case, we could observe that it is profitable to develop games for pure entertainment that satisfy otakus' emotional and psychological needs. Consequently, the concept that game

designers cater to some of otakus' needs after a thorough study about their characteristics became clear to me. As for profit organizations, designers are obliged to maintain a consistent revenue for their company through launching a series of games, attracting a growing customer base, and fulfilling their needs a step by step so as to maintain profits, rather than designing a product or service that will help otakus exit the virtual world. On the other hand, there has been a trend to use social apps (even dating apps) to meet new people among common people as well. People use social apps to get know their community, including Facebook, LinkedIn, and Twitter. As a result, various social dating apps show up in the app store. From a social app design perspective, these apps--Match.com, Tinder, and Okcupid--are designed for a broad user base (Seufert, 2016). Basically, these apps ask the user to upload his/her profile pictures and supply general information about themselves. Based on the user's location and information, the system matches users accordingly. Let's assume that some otakus realize they have to change their current lifestyle and meet new people; they might be inclined to use social apps others. Yet, due to the uniqueness of otakus, it is often really hard for them to have a smooth conversation with others, making it very challenging for them to use the most common social apps.

After conducting market research, I realized there is a gap between products designed for otakus and those designed for the general public. This gap will be the core of my design. It bridges otaku-specific products with general public products; therefore, it should incorporate features from both categories.

1.2   Define the Problems.

1.2.1   Population and Economic Issues

Addicted to virtual worlds, otakus gradually lose interest in their daily life. Accordingly, this lifestyle contributes to the shrinking Japanese population in the long term. According to "Japan's Population Crisis" by Kavita Karsan (2015), the growing otaku culture is a very important cause of the population decline. Younger Japanese demographics, especially males, prefer having relationships with virtual girlfriends over real girlfriends. Also, the article shows that 250,000 children are born a year in Tokyo, a city with over 35 million people. In 2050, the Japanese population is set to decline by over 30% if this trend continues.

From an economic point of view (Galbraith, 2010), otakus embark on a journey of connecting to the real world remotely via Internet in order to skip the unpleasant trials of experiencing rejection. Beginning with minimal events, such as avoiding daily communications, these otakus eventually lead themselves to economic burdens for their families, as well as the society at large.

1.2.2   Mental Health Problems

A soaring number of young generations are now self-identifying as otaku, although they may only partially fit this category (Qianliang & Lingfei, 2011). The otaku identity includes several criteria. One of the basic features of otakus is that they are active on the internet and relatively inactive and passive off-line, which leads to a rather limited social/personal life. With a common character of self-mockery, they often complain on different websites about why they do not have friends to reassure themselves without

taking effective steps to change. This vicious cycle is evident whenever visiting any otaku Bulletin Board System (BBS).

Modern medicine has not identified whether otakus have severe mental health issues that might influence their behaviors. Some otakus do suffer from social anxiety disorder, which causes them to fear meeting strangers, a relatively common occasion in adult life. After browsing a huge number of online articles written by otakus and gathering quantities of information from my friends who self-identify as "otakus," I concluded the main reason was due to a lack of appropriate socialization. Often their jobs require a significant amount of computer-based work, decreasing their chances of meeting new people and practicing decent social skills. From their perspective, talking with stranger's online or sending emails is quite easy; talking to people and coping with uncomfortable interactions in real life is another story. Despite their desperate desire to find new friends, they have limited opportunities to establish such solid relationships due to their inability to communicate face-to-face.

CHAPTER 2. LITERATURE REVIEW

As a newly-defined and unprecedented human culture group, little academic research has studied otaku despite its thirty year history. Otaku Can be traced back to 1983 (Galbraith, 2015) as a subculture that now exists in every internet-connected region. Hence, my literature review mainly discusses statements from various journals.

2.1   User Characteristics

Understanding otaku characteristics is the priority prior to designing a product for them. As mentioned before, otakus have specific hobbies related to virtual world. Some otakus like manganese and animation, while others are into computer games. Usually, most otakus are addicted to manga, video games, and animation. However, in severe cases, otakus will become trapped in these hobbies and their virtual reality, like the 27-year-old Tokyo man. Nene Anegasaki, who "married" a computer avatar (Kyung 2009).

Most otakus lack interpersonal skills, which isolates them in public. Lacking the experience of an intimate relationship, they become attracted to virtual characters as they find it easier to navigate; these games have certain patterns to arrive at happy endings, compared with a real friend who requires time, attention, and respect to avoid ruining the relationship. Nisan is a branch of a thriving subculture of men and women in Japan engaged in real relationships with imaginary characters (Lisa, 2009). Not limited to

Japan, This phenomenon occurs around the globe. In 2010, a Korean Otaku married his anime body pillow (John, 2010).

Otakus have a strong sense of community, since they often feel excluded from other groups. They seek understanding from their own tribe. This explains why there are many BBS specialized for otaku. The most famous otaku online wonderland is called Nico Nico (Hamasaki, Takeda, & Nishimura, 2008). It is a website mainly focused on videos, with sub-categories such as music, animation, and technology. The main users of the website are otakus; the website features quantitative, specific language terms that can only be understood by otakus. In China, websites such as bilibili.com and acfun.tv are also designed for otakus. The sites have unbelievably strict registration examinations which require new applicants to pass an online exam; only those who demonstrate extensive knowledge of animation, video game, and manga are enrolled as members.

Another important characteristic is that otakus long to meet new friends and potential partners. If you type "otaku needs friends" in Yahoo's search engine, 654 results appear from many otakus seeking friendship. Yahoo answer is only the tip of the iceberg. In different regional BBS platforms, otakus are using different language to articulate their desire for friendship, especially a long-term, thriving partnership. However, they lack the courage and skills to navigate such relationships.

2.2   User Demands

With the fast-paced development of virtual technology around the globe, especially in Asia, it is our objective to improve virtual and real communication experiences based on the current pejorative one. It should be pointed out here that otakus

do have social needs, and new design should address these unique needs using innovative measures.

As I mentioned above, otaku feel more comfortable within otaku groups; this is the main motivation for the inaugural Otaku Expo. In 2015, half a million people are expected to attend the world's first Otaku summit, many dressed as their favorite anime characters. In this Expo, otaku can gather together and talk about their hobbies without feeling like they are being judged. Also, they can meet new people during this activity who share the same hobby as they do. It is not all that different from kindergarten children who gather to learn new knowledge and practice behaviors under the guidance of teachers.

Significant scientific progress has been made regarding the needs of otakus. For example one study utilized a virtual girlfriend hugging users from behind as a program set by computer system. In this case, the user wears a device on their back while watching a monitor. A scenario indicates that the user is waiting for his girlfriend. The user then hears a sweet voice saying, "Sorry for being late!" from headphones or speakers. Within five seconds, the device provides a push that mimics a shorter girl hugging the user from behind. This prototype was extremely well received among otaku users. This equipment was an experiment that begins the work of discovering the needs of otakus. Given any normal daily scenario, this design would be discarded as it was only designed for a very specific reaction. Yet it was successful in catering to the special needs of otakus. Thus, we can conclude that otaku do have certain power in improving interaction development for all homosapiens.

There are several stages in otaku communication skill development. The process could at least be categorized into three core values in my evaluation: the need for accomplishment, the need for harmony, and the need for validation. The need for a sense of community is not included, since that existing otaku life-style is limited partially due to the community common sense that no individual should take action on her/his own. In terms of accomplishment, it was observed during the survey that otakus enjoy reaching game targets in various ways. Also, it should be mentioned that otakus' main obstacle is how to feel at ease when being around other people, which is normal for a shy three-year-old kid. Harmony is necessary to learn without feeling embarrassment, blending the bounds of cozy virtually with reality. Validation is vital, not only for otakus who are making progress in their exiting otaku life-style, but also a key measurement for designers to gauge if their design has worked as planned. It might be concluded that the essential practice of this interactive design is to retrieve otakus ability to react using language, gesture, and posture. Bias against otakus should also be eliminated during the technology process and experience development.

2.3   User Potential

A common opinion on otakus is that they are losers who behave inappropriately in public. However, otakus have untapped potential for human interaction. According to CNN's journal (Robert, 2011), the female readers of CNN came up with eight desired traits in a partner: 1) Access to an unknown world; 2) Fresh date ideas; 3) Trustworthy; 4) Shared obsessions; 5) Enthusiastic conversations; 6) Respect for your sense of values; 7) An expert helper; 8) Dependable. Though some may claim that these expectations sound

unreasonable, I find it interesting how positive the list could become from a different

vantage. Compared to normal sight, in which otakus are observed as individuals, in this

case they are viewed as potential dates. From a female's perspective, otaku could be as

reliable as other people. Long-entrenched biases are brushed aside when pondering the

advantages otakus can bring to female partners. Plus, otakus might be very

knowledgeable in the field of human-machine interaction (Tobin, 1998). In order to

create something relatively new, designers have to focus on the extremes in order to dig

up fresh bones. In this case, studying otakus can definitely provide some thoughtful

insights.

Otakus communicate better through social media than in-person communication,

since the spontaneous reaction component is cut out of the equation. This could be the

very ideal cradle for incubating a new design for virtual communication, as no other

group of people have such desperate needs as otakus. The deeply-rooted conception of

the outside world as embarrassing is the source of otakus' pain; thus, they could be the

very first group of people to innovate ideas for how things should change. By

understanding the phenomenon from their perspective, we may be able to shape the new

world in a ground-breaking way similar to the female readers mentioned above. Otakus,

to a certain degree, are more sensitive than other people--one of the reasons being that

they are suffering from some issues that others cannot feel at all. It is necessary for

designers to take a closer look at their psychology as well as possible reactions.

I therefore focused on creating a virtual journey of discovery by combining games

with real world tasks, using the call of access to an unknown world and fresh date

ideas, though other combinations of the eight qualities works as well. Design has always

revealed itself to the neediest people. Interaction between humans and machines has no better place than otakulized time, as otakus are the cutting-edge group who really understand the virtual experience. By helping otakus and enhancing the gaming experience itself through interactions, this thesis project is meaningful and will create mutually beneficial results. Thus, the interactive potential for this project are unlimited.

In summary. The difficulty with meeting new people is becoming a more pervasive phenomenon for otakus and others in the current digital era; accordingly, my design focused on creating an experimental interactive design that would help otakus build stronger relationships with people through the combination of a series of playful online and offline steps that allow them take the initial steps to change and improve their personal and social lives. This design, on the other hand, could also improve virtual experience design, as it is designed for the most cutting-edge group of users engaged in the virtual world.

2.4   Design Hypothesis

From the previous background research and literature review, a design hypothesis was raised. My mobile app platform design should provide more opportunities and methods to help otakus solve their social interaction difficulties by gradually meeting real-life friends in a well-systemized program.

CHAPTER 3. METHODOLOGY

Given that there are many similar design processes, the process I followed is

based on Pabini Gabriel-Petit's thesis (2010), in which I will reference in more detail in

Chapter 5. A graphic created by Ari Weissman's (2014) provides very clear steps of UX

design process and explains Pabini's design process in a very simple way; it also

represents a very popular design process.
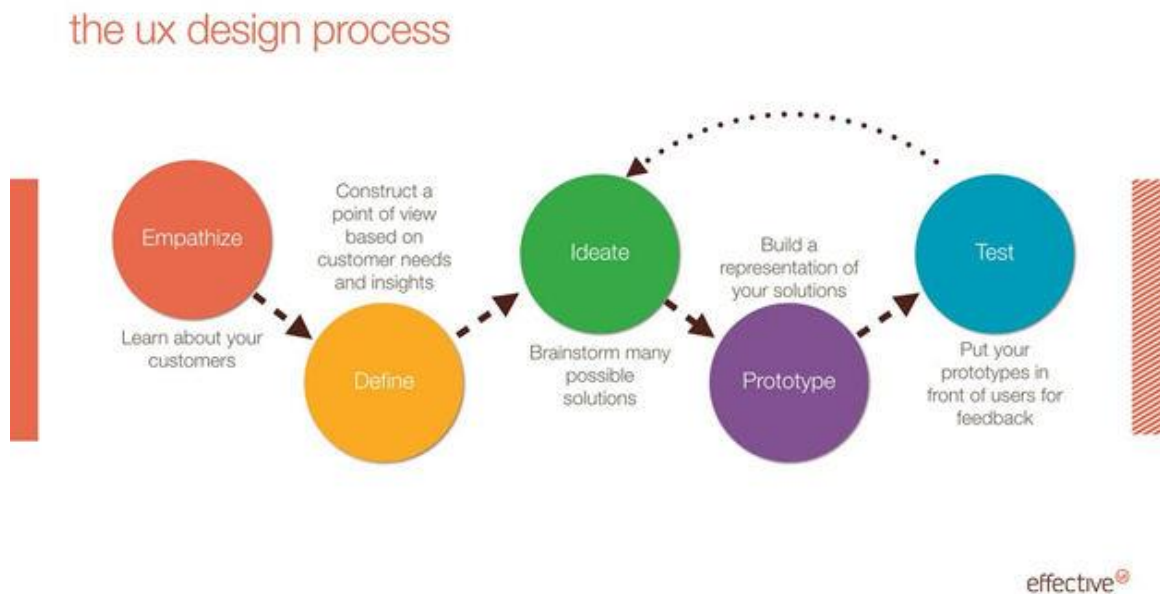
Figure 1 Design process created by Ari Weissman. From Effctiveui.com

There are five stages in this design process, each with their own methodologies;

1) Introducing the user research methodology that was selected, which were surveys and

Interviews, describing the procedure used in collecting quantitative and

qualitative data, and providing analysis results. 2) Design process, based on the

requirements of the first stage, includes brainstorming and refining my concept. Creating

an interaction model and business model to represent my concept, in order to have clear

structure and layout, I developed a Hierarchical Task Analysis (HTA) (Stanton, 2006).

And Wireframe (Unger, 2012) based on the HTA, then proceeded to the prototype

process. 3) Introducing heuristic evaluation following app design. 4) Design refinement

methods based on the evaluation.

3.1   User Study Methods

Adopting quantitative research can generate numerical data, and the results can be

generalized from a large sample population. The methods include various types of

surveys, such as online surveys, paper surveys, and mobile surveys. Here I chose a paper

survey, because people can complete the survey immediately.

Qualitative research provides insights to problems and helps researchers

understand of different topics. These methods include individual interviews,

participation, and observations. In my case, I chose individual interviews to understand

my users' thoughts.

According to Creswell, J. W., & Clark, V. L. P (2007), results are compared and

complemented following quantitative and qualitative data analysis. So, I decided to

collect both qualitative data and quantitative data. The methods of survey and interview

were selected during the initial stage to better understand otakus' needs and their

opinions on specific topics regarding social life. At the same time, those data supported

and proved my previous design. Individual surveys were used to obtain data from otakus

themselves, and their communities, Sample surveys are an important tool for collecting

and analyzing quantitative user data. They are widely accepted as a key tool for

conducting and applying basic social science research methodology. The anonymous

questionnaires I designed provided multiple choice questions for simpler answer

selection; survey data only shows the very surface level of target users' opinions. In order

to deeper probe these opinions, I chose face-to-face interviews with multiple target users

as this could be very significant. The interviews included open-ended questions and let

target users express their thoughts freely and candidly. I received valuable qualitative

data from the interview recordings, which provided more circumstantial information to

identify my user requirements. In Chapter 4's User Research, more detailed research

methods and process will be discussed.

3.2   Design Process Methods

According to the data analysis from my user study, I started to implement the

design process. In this stage, I started by brainstorming five basic ideas, then I picked one

as the final design proposal and refined it. Creating an interaction model can make

audiences understand my concept better; based on the business model canvas created by

Osterwalder.A (2010), I explained the business model for my design. On the other hand,

a Hierarchical Task Analysis (HTA) offered a structured and objective way of

representing users' task performance. Using an HTA chart showed the clear structure of

my design and the wireframe provided a low-fidelity prototype for my interface design.

3.3   Design Evaluation Methods

After finishing the interface design and high-fidelity prototype, evaluation is the next necessary step. There were two parts of evaluations to verify whether or not my design was acceptable to my users. One is Heuristic Evaluation (HE). This process begins with choosing the HE type that best suits my design. After comparison and consideration, Jakob Nielson's HE is the most suitable approach for me, because the 10 heuristics he provided cover all interface design aspects (Nielsen & Molich, 1990). According to Nielson, HE is an effective method for exploring usability problems within user interface design. A small group of experts utilize recognized usability principles to evaluate the design. Based on these 10 usability heuristics, I asked five design experts, who also identify as otakus, to test the high-fidelity prototype of my design and provide feedback.

The heuristic evaluation process was recorded by me, not only the evaluation results, but also the process itself, which could be a very valuable reference for refining my design. According to the previous user study, I concluded with design requirements. Those requirements become the standards and principles with which to evaluate my design.

3.4   Design Refinement Method

Based on the heuristic evaluation results and user requirements checking, I started the process of improving my final design by solving the problems identified by the experts. I added a more detailed design in terms of the micro interaction, so as to provide a better user experience for my target users. Taking into consideration the app's future

development, I created a basic design guide, including typography, color scheme,

element sizes, and icons.

CHAPTER 4. USER STUDY

4.1   Paper Survey

The purpose of the survey was to provide quantitative data to test my hypothesis (Jick,

1979). The survey was composed of three parts: 1) Basic user information, such as age,

gender, employment, career, etc. 2) Multiple-choice questions regarding opinions and

specific topics. 3) Open-ended questions on the strengths and weaknesses they observed

while socializing. I received 52 completed questionnaires in one month after sending the

survey to 73 individuals. Among the 52 respondents, 34 were male and 18 were female.

Their ages ranged from 18 to 32 years old, and the majority were in their 20s, which fits

my vision of the target audience of my design. The survey form is attached as Appendix

A.
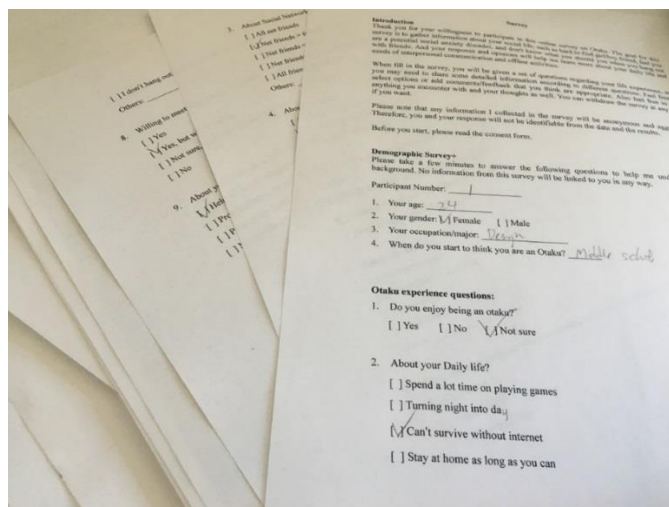
Figure 2. Paper Survey, photo by Shang Xu

The Division of Gender

The Division of Age

■ Female ■ Male

■ 18 - 20 ■ 20 - 30 ■ 30 - 32
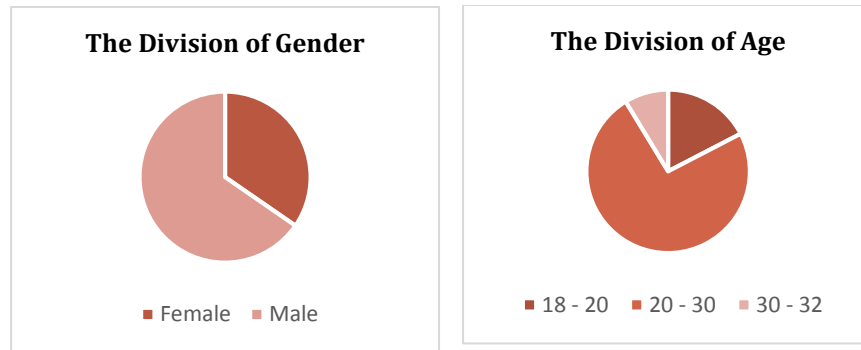
Figure 3. The devision of gender and age

The results of survey didn't exceed what I expected. In order to make my audiences understand otakus better understand otakus in this thesis, I only selected the questions which were most representative of otaku life styles and needs.

About your Daily life?

Stay at home as long as you can
18%

Spend a lot time on playing games
24%

Turning night into day
11%

Can't survive without internet
47%

■ Spend a lot time on playing games ■ Turning night into day
■ Can't survive without internet ■ Stay at home as long as you can
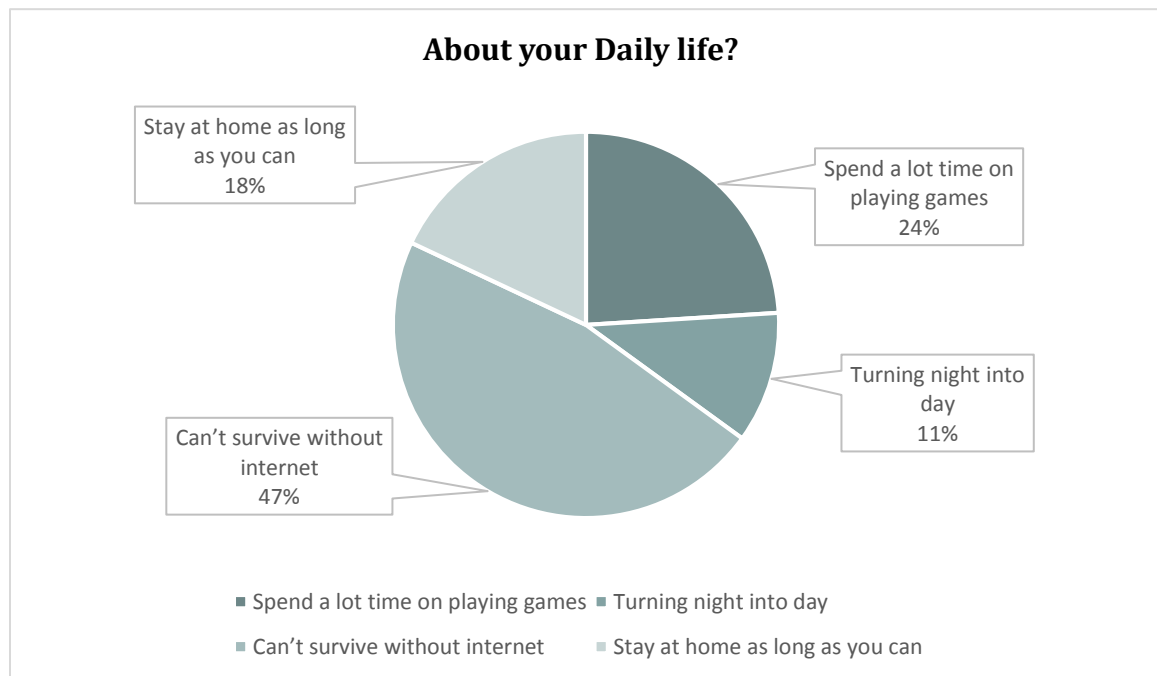
Figure 4. Answer of "About your daily life?"

This caption shows the division of otakus' choices regarding their daily lives. A large number of otakus chose "can't survive without internet," which showed the importance of internet to otakus. Infatuation with the internet also explained why otakus are so immersed in a virtual world. On the other hand, almost all of the products designed for otakus require an internet connection, another possible reason so many otakus chose this answer.
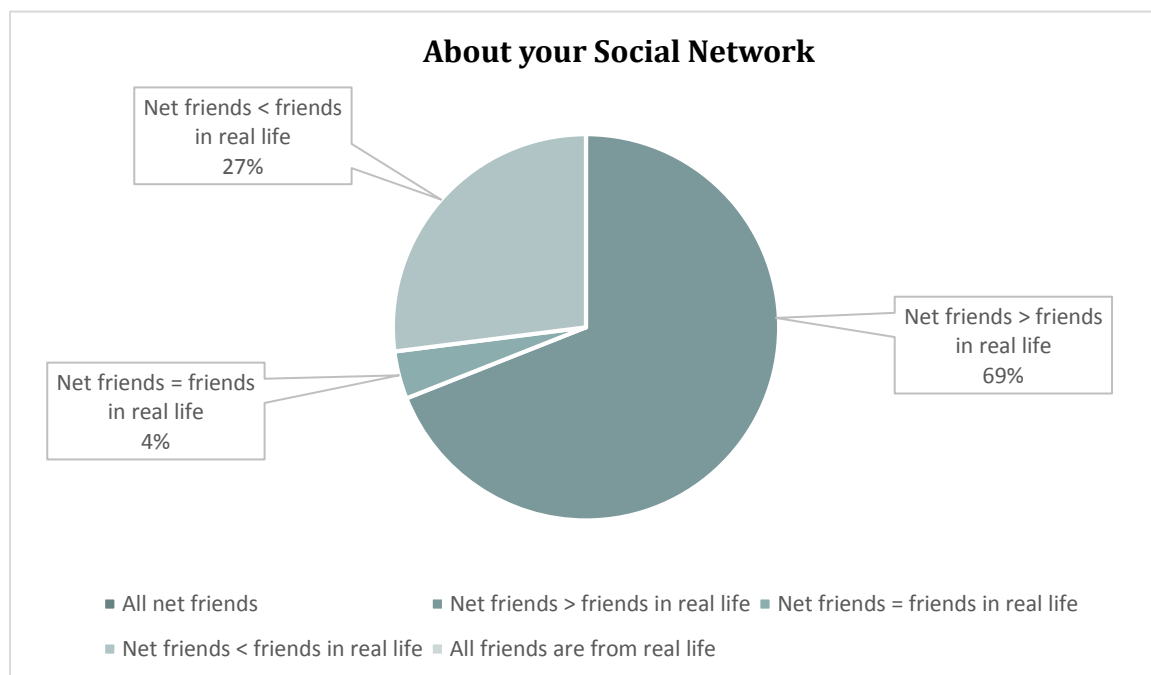
Figure 5. Answer of "About your social network"

Otakus' social networks are not similar to most people. Normal people obtain lots of friends by connecting in person and hanging out with them from time to time. However, from this caption, it is clear that most otakus have more internet friends than real-life friends. Understanding this data was the starting point for me to infer the related causes. My inference is that most otakus meet their new friends while playing an online

game or discussing topics in a BBS. Another inference is that otakus might feel more confident and experienced in chatting with net friends. Based on my inferences, I drew the conclusion that this was a general direction to ask open-ended questions during the interview stage.
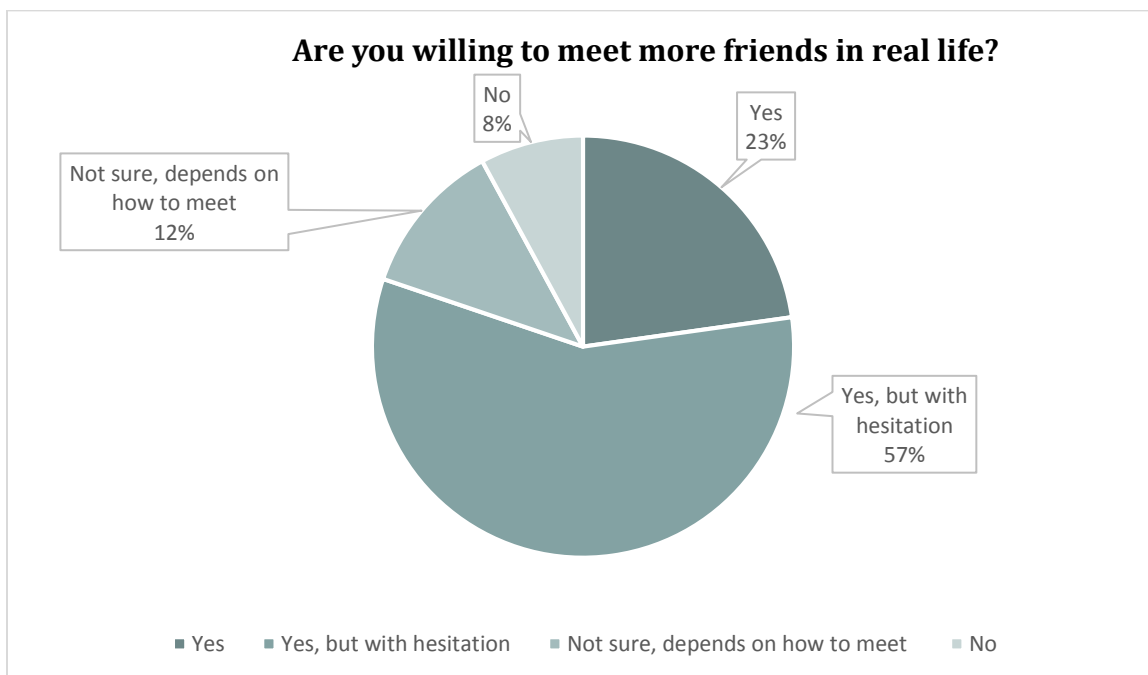
Figure 6. Answer of "Are you willing to meet more friends in real life"

If most of my target users do not want to become more social, my design would fail before even launching. I started this user study because I hypothesized that my target users want to extend their social networks. This question proved that my hypothesis was correct. Although otakus are not good at social interactions, they are willing to meet more people in real life. These results suggest that 57 percent of otakus were willing to meet friends in real life despite their hesitation, which is understandable since shyness is common among otakus. Twenty-three percent showed they were willing to meet real-world friends. That is to say, 79 percent otakus were willing to make friends in real life. It

was a positive data that showed my design would have a huge potential and a large user base. If my design successfully met their goals, it would be of great commercial value.

Which product below do you use most frequently during your daily life?

Computer
20%

Gameplayer
4%

Mobile
76%

■ Computer   ■ Gameplayer   ■ Mobile
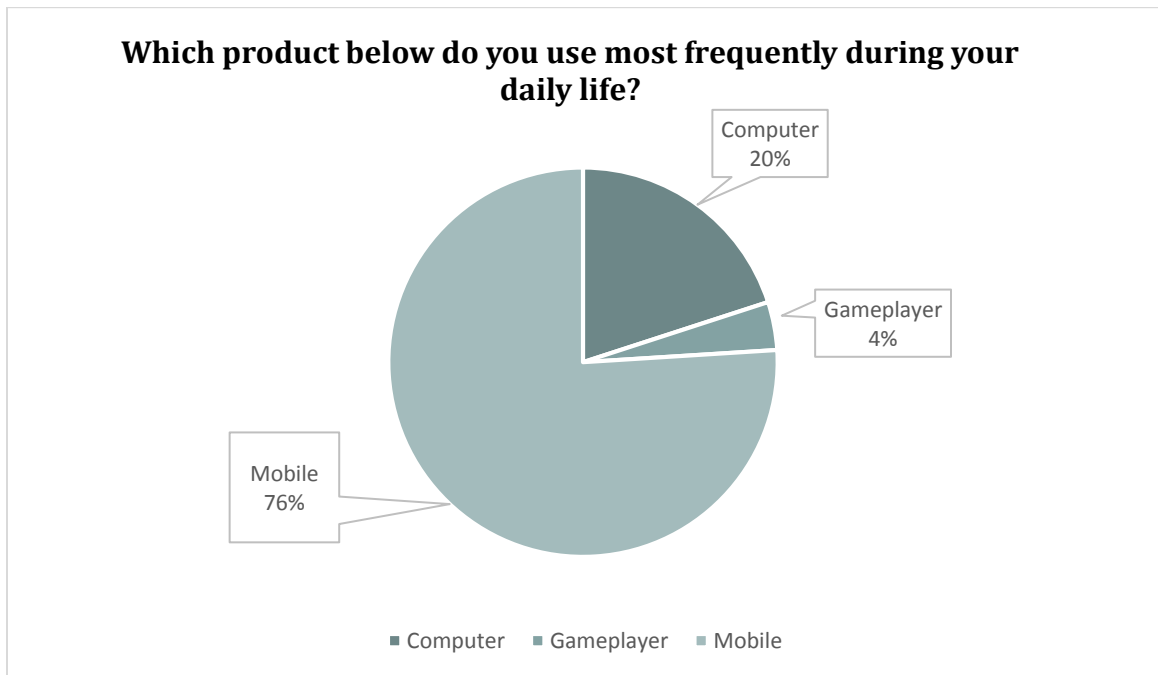
Figure 7. Answer of "Which product below do you use most frequently during your daily life"

In order to figure out which platform to use for my design, I asked about the frequency of product use. Seventy-six percent of otakus chose mobile, and only 20% otakus responded that they use the computer most frequently. Thus, the result of this question supports my hypothesis about designing a mobile app.

Expectations of a social communication app

No specific
expectation
4%

Become
outgoing
23%

Help me to meet
more people and
becomes friends
with them
46%

Provide chance for
me to date with
someone
27%

- Help me to meet more people and becomes friends with them
- Provide chance for me to date with someone
- Become outgoing
- No specific expectation
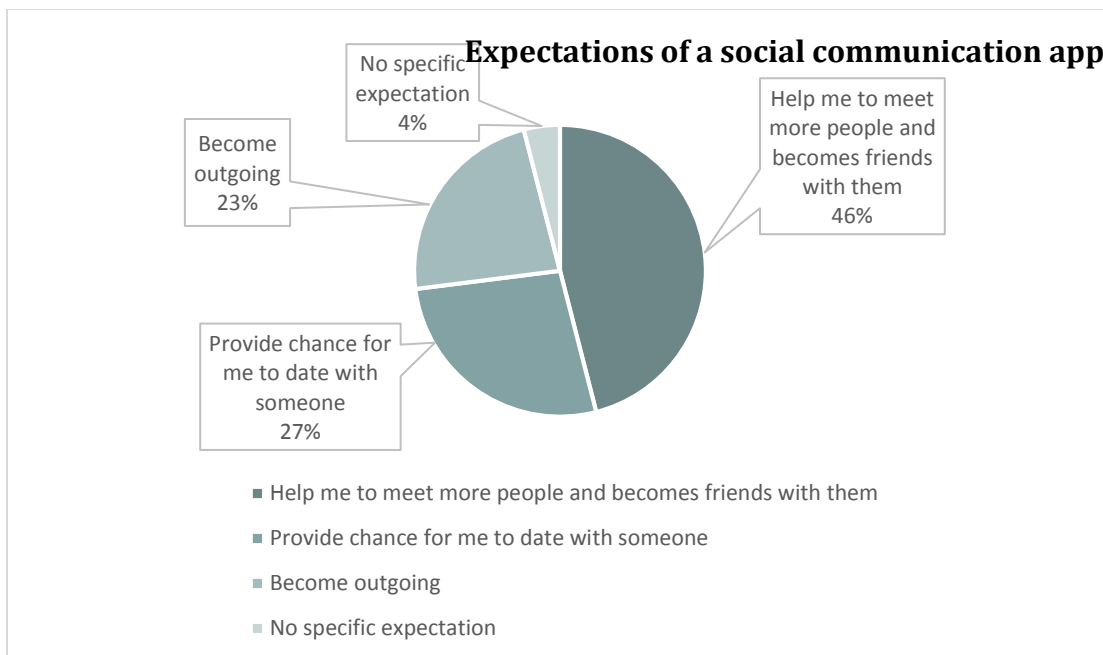
Figure 8. Answer of "Expectations of a social communication app"

Since my design would be focused on social communication app, my target users'

expectations were one of my proposal criteria. By asking questions about otakus'

expectations for a social convention app, I got valuable quantitative data. The data guided

the general function of my app, and offered a design goal. Forty-six percent of otakus in

this study selected "help me to meet more people and becomes friends with them" and 27

percent of otakus selected "provide chance for me to date with someone." instead of

using this app to improve self-confidence, 73 percent of otakus wanted this app to

provide more chances to interact with others and create connections. This outcome

indicated that otakus are longing to extend their social networks, both for new friends and

potential relationships.

Overall, the survey was the first step of my user study; it provided quantitative data and gave me a concise and clear direction to design more open-ended questions, which will be discussed in the following section.

4.2   Interview

The goal of interview is to collect qualitative data to understand my target users' daily life (Burnard, 1991). I interviewed three people who identified as otakus. Before the interview, I prepared over 10 open-ended questions related to lifestyles, hobbies, social networks, and expectations. Also, based on the survey results, additional follow-up questions were included. I recorded the interviews. I also took notes and photos while interviewing them.

Figure 9. User study, photo by Shang Xu

These photos showed how I interviewed the selected otakus and observed their daily routines. In order to protect their privacy, they put on face masks when posing for photos. After I narrowed down my interviewees, three otakus were involved in this on-

site visit and interview: Mr.Tu, Jeff, and Rita. (These names are changed to protect the confidentiality of the interviewees). They were selected because all of them were willing to converse with me without any mental or physical limitations. Before I discuss the results from interview, I want to give my audience a brief introduction to my interviewees.

The first interviewee, Mr. Tu, is a 28-year-old freelancer who lives alone. He has been staying at home after resigning from a previous two-year occupation. My first impression of his place was that the space was flooded with various animation products, exhibition posters, and garage kits. Tu referenced his regular daily routines. It was a bit surprising that Tu is very capable of taking care of himself. He knows how to cook, though he does not cook himself every meal. According to Tu, the reason that there are rumors that otaku lack of self-care ability is due to their laziness. Tu also mentioned that he has a regular life compared to the other otakus. Tu usually sleeps from 2:00am till noon. He then goes grocery shopping in the afternoon because there are less people and shorter check-out waiting times. Tu usually begins to work after his daily chores. The work lasts until mid-night. Tu does not think this lifestyle has caused him any trouble. I asked Tu about the reason he left his former job. Tu answered that the main reason was that he could not perform well at work. He has not sought a full-time job ever since. Sometimes he hangs out with friends for photo shoots and visiting animation exhibitions, or playing video games. When I asked Tu whether he wanted to live in seclusion, his answer was no. Tu indicated that he wanted to make new friends, especially female friends, yet he lacked the necessary communication skills. He could not think of any other plans when a female friend asked him out one weekend.

The second interviewee, Jeff, is 25 years old, employed, and lives with his parents. When I first approached Jeff, he seemed a bit shy. After breaking the ice, Jeff turned out to be quite talkative. Jeff liked technology products. He mocked himself that the most common subjects he talked with his friends were computers and iPhone bugs. Jeff did not think himself as a typical otaku; at least he had a job and somewhat of a social life. Yet he did not deny being an otaku because of the fact that he had a narrow range of friends and most of them are from online game-playing. The main reason he suggested was due to his introvert personality.

The third was Rita, a 24-year-old student living on campus. Rita is an animation figuring collector. Her favorite character is Hatsune Miku, a virtual singer created by Yamaha. When I stepped into her room, the first thing I noticed is there are over 20 Hatsune Miku's figures on the shelf. In order to protect the figures from dust, Rita bought glass cases for each figurine. Rita told me that some of her friends cannot understand why she spent money on the plastic toys instead of girls' stuff, like make-up, clothes, or jewelry. When Rita introduced those figures to me, I felt that she really put her passion on it. She kept explaining that those figures are not just plastic toys; some are made by hand, which is why figurines are always expensive. Besides her infatuation with animation figures, Rita did not seem like an otaku. When I shared this thought with her, she laughed and told me that she is, absolutely, an otaku. She said she has social phobia and gets shy and feels awkward in crowds, even if she is not talking; she only gets talkative when she talks about her interests, such as figurines. Otherwise, she does not know how to start a conversation.

After I got to know the basic background information about these three otakus, I started the interviews, which lasted about 30 minutes. The questions focused on their social and communicative abilities, and their potential gaps in social competence as well. The questions I asked are as follows:

1. *How did you become an otaku?*

2. *How do you feel about being an otaku?*

3. *How do you spend your spare time?*

4. *What are your friends like? (online, real friends, both ok)*

5. *Have you ever considered making more friends in real life? Why or why not?*

6. *Do you have preferences for your friends? Please explain.*

7. *How do you feel about social interaction?*

8. *What is the most difficult part of social interaction?*

9. *Do you use online chatting apps? If yes, which is your favorite? Why?*

10. *Have you ever considered volunteering? Why or why not?*

11. *How many people do you feel comfortable hanging out with? Why?*

12. *Do you pay much attention to coupons or local business discounts?*

13. *Any suggestions for an app that could help you to meet new people and do things together?*
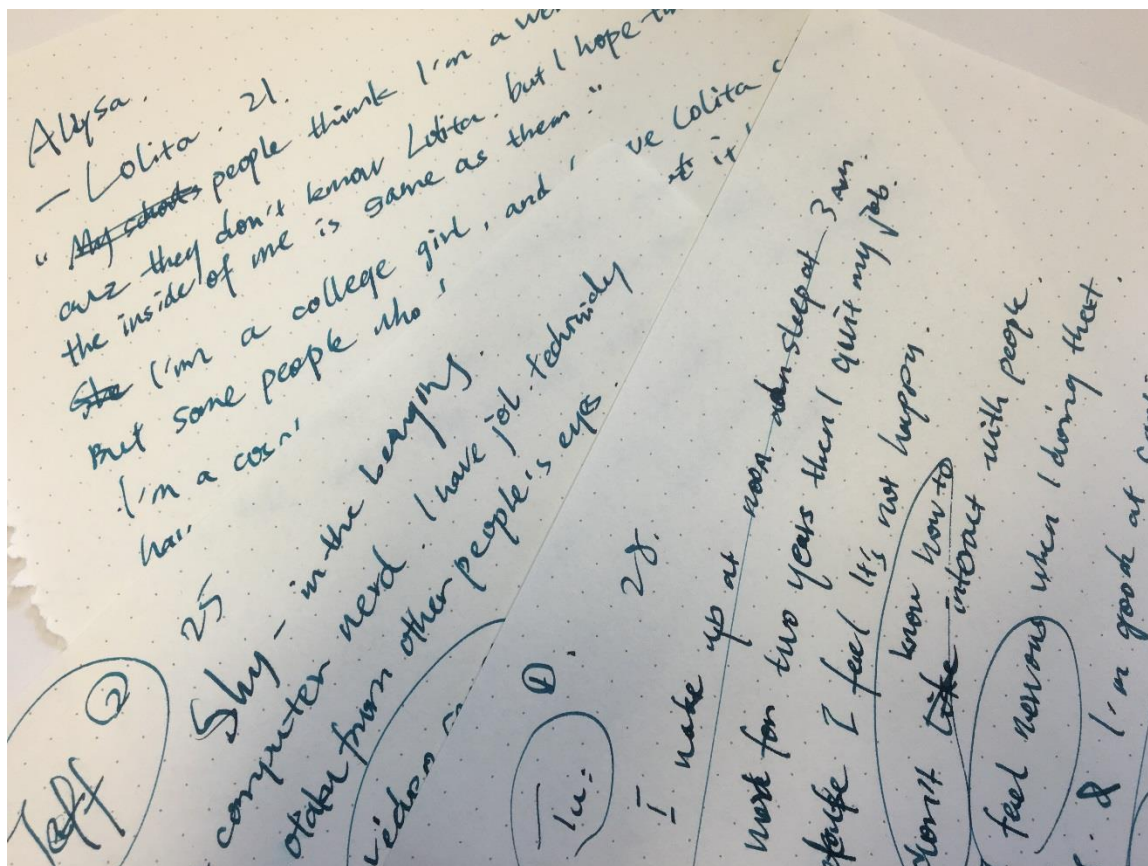
Figure 10. Notes of interview, photo by Shang Xu

I took notes during the interview process. This qualitative data showed how they responded and helped me to compose my design requirements.

Here I selected answers to three questions that showed their thoughts and needs in the most detail. The first question was "*Have you ever consider about making more friends in real life? Why?*" The answers were, unexpectedly, the same: they all claimed that they wanted to make more friends in real life. However, some of them did not have chance to get know new people. My interviewees all feel awkward and anxious in crowds or in the presence of strangers. They do understand that if their social phobias continue there is a limited possibility that they will make more friends in real life. Thus, the

conclusion I made is that my target users are eager to extend their social network, but they need chances or channels. Also, due to the fact that they are really shy and introverted, especially in front of strangers, it is better to make them gradually adapt to the social activities, instead of drastically forcing them into uncomfortable social situations.

The questions "*How many people as a group when hanging out makes you feel more comfortable? Why?*" and "*How did you spend your spare time?*" provided me information and gave me useful references to figure out my design process. My interviewees told me that they feel more comfortable when hanging out with 3-10 people. These numbers allow them to avoid awkward "quiet time," and silences. When an otaku is in a group of people, they do not have to try to find a topic to discuss; instead, they can jump into conversations when they want to share their opinions. That was how my interviewees explained their opinions. In their spare time, besides being alone, playing on the computer, watching videos, or other kinds of solo activities, "having meals with friends," "going to animation or game-related activities, such as comic con or game expo" and "play games with friends" are the top three preferred alternative from my interviewees. Those activities became very important elements when I started to create the interaction modeling.

Their responses to another question, "*Any suggestion if you could have an app that can help you to meet new people and do things together?*" were also edifying to my design requirements and future design direction. My interviewees mentioned that if an app could help them meet new people in a comfortable way, they would, without a doubt, use it. So their suggestions can be concluded as the parts: 1) the form of the app. Try to

find the best way to attract otakus and convince other otakus that this app really provides chances for them to make friends. The form could be an online game because most otakus love to play games. 2) If there are some physical rewards that users receive by using this app, it might be more attractive for users. Different physical rewards will draw various user groups to this app. 3) No real profile photo in this app. This can make my target users feel more comfortable when they start a conversation with strangers; it follows their habits when they chatted with strangers in online games or BBS. This suggestion was a breakthrough because the profile photo is the most basic social communication apps. As I mentioned in the Market Research section, the current dating or social networking apps require real profile photos; one reason why otakus do not use them. If this rule could be changed, the apps would be more applicable to otakus. Other suggestions included incorporating a competitive system into this app, limiting the number of text messages, or combining with a sport app.

The interviews provided me with qualitative data and verified my hypothesis. It can be easily concluded from the interviewed otakus that they have a desire to make friends, yet they not desperate enough to come out of their comfort zone and do the ground-breaking social networking themselves. Their lacking social ability not only affects their friendship, but also influences their lifestyles and living habits, which further leads to a set of unusual daily routines. The courage that it takes to push oneself out into the complexity of real life might be a key point in my design, besides creating a non-judgmental atmosphere during the process. In a nutshell, there is a wide spectrum of otaku lifestyles, yet the common point is that they are excluded from networking due to various reasons. A few categories should be set up before I further explore the details of

my design, in order to reach the maximum function that best caters to the needs of my target audience. It seems that a trigger is required at the beginning stage of restarting social networking. The trigger has to be reasonable, arouse the interests of otakus, and be recreational, so that opinions and judgements are not as important as in more formal venues.

4.3   User Requirements

After analyzing the results from the user study, I developed a summary of my design's user requirements. These requirements also became principles of my future evaluation.

The design must have these features: 1) A mobile based app. Quantitative data shows that most otakus use mobile phones most frequently, so a mobile-based app could provide a good media for them to use in daily life. 2) A social communication app that uses a game platform. Both quantitative and qualitative data shows that otakus like to play video games. A game scenario is a good way to attract target users to play. 3) Interesting to use. Otakus users are really picky about digital products, so interesting, state-of-the-art features will attract more users. 4) Provide multiple opportunities for offline activities. Those opportunities and offline activities can lead otakus to gradually adapt to the real world. 5) Provide different methods to gradually lead otakus to interact with other people in real life instead of their virtual world. If one way is not working, there are still multiple ways to make otakus interact with the real world. 6) Visually attractive. If the interface is not attractive to users, they might not want to try this app in the first place.

The design is nice to have: 1) Good cooperation with local business and organization. It is a win-win business model. Both otakus and local businesses benefit from it. 2) Incorporating volunteering activities. Adding more volunteering activities is good for society. 3) Gradually change otakus' life styles. By using this app, otakus' life styles might be changed gradually. 4) Interesting micro-interaction to surprise users. Micro-interaction is a good way to reach the "emotional design" level. To enrich the overall design experience for my users.

Based on above user requirements, I moved to the next stage: design.

CHAPTER 5. DESIGN

My design process was inspired by Pabini Gabriel-Petit. There are two main

reasons why I adopted her design process. Her design process is based on user-centered

design. It is a very good match with my design for otakus. On the other hand, she

provides very detailed instructions and explanations, instruction that is very valuable to

me. According to the design process she introduces in this paper, I followed three stages:

discovery, design, and development. Considering that this design is conceptual at this

point, I will briefly discuss its development in Chapter 6.

5.1   Discovery

Understanding target user characteristics is achieved with usability testing or user

research. According to the data and results, user research helped me to define the

requirements of my product and problems I have to solve.

5.1.1   Learning from the Users

A good design should always consider the users' need. My design should be a

user-centered design. From the process to the final result, I used strict user research to

provide accurate quantitative data and qualitative data for analysis. Also, I reviewed

current existing products in the market for my target user to provide another way to

Compare my idea's advantages and disadvantages. Understanding the target user group provides a significant foundation model of my users.

My user group is otakus, a group of people who are engaged in virtual worlds. They love watching animation, collecting figurines, and playing video games. However, it is difficult for them to connect with the real world. Most of them lack interpersonal skills, and the ability to make friends. However, deep inside of some otakus, they want to make friends in real life.

5.1.2 Modeling the Users

In her book *designing for the Digital Age*, Kim Goodwin (2011) wrote "The most important model is a set of personas, which are user archetypes that help you make design decisions and communicate your rationale. Each persona represents a set of behavior patterns and goals. By designing for these archetypal users, you can satisfy the needs of the broader range of people they represent. Every product decision can be tied back to the personas."Pabini asserts that, "Once you've obtained the best data possible about your product's potential or actual users, your product team can collaboratively develop user profiles or personas—which are fictional user archetypes that are representative of your target users." Based on different type of otakus, I created two personas. Personas are fake characters I created to indicate the different user types (Chang, Lim & Stolterman, 2008). They are very useful to deliver my design goals, requirements, and needs. The personas I created here, based on my pervious user study, generated two different types of otaku. Basic information, such as age and occupation. Are generated from the paper survey. Personality judgement and technology are based on

the characters' bio. The bio was generated from interviews I had with otakus. In order to provide vivid characters, I decided to connect to brands; based on different brands, audiences will have better understanding of which brands otakus most prefer.
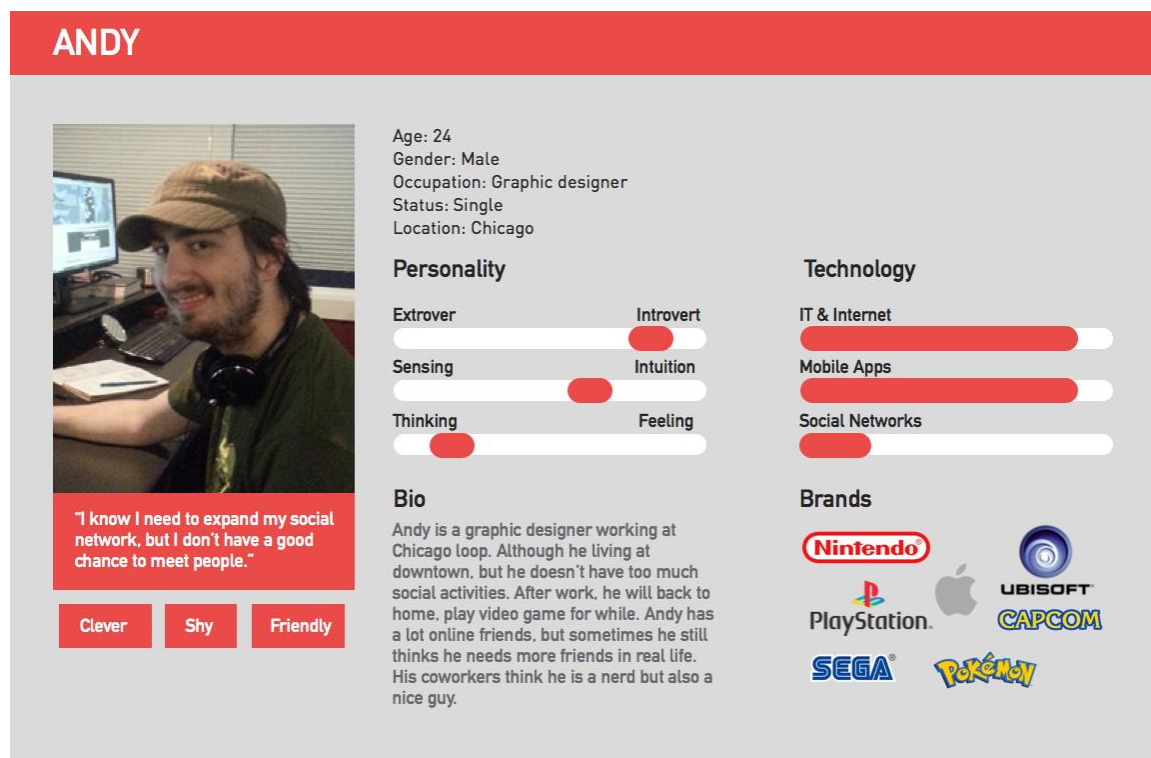
Figure 11. Persona 1, designed by Shang Xu

Andy represented the group of otakus who have jobs in real life, and do not have too different from other normal people. However, this group of otakus still have difficulties with crowds in real life. They still keep some peculiarities of otakus, such as being immersed in video games and social phobias. Especially, the brands related with their life are very similar with other groups of otakus. This group of otakus are the most common otaku group.

OLIVIA

Age: 21
Gender: Female
Occupation: College student
Status: Single
Location: Indianapolis

Personality

Extrover — Introvert
Sensing — Intuition
Thinking — Feeling

Technology

IT & Internet
Mobile Apps
Social Networks

"I just don't like talk with people who seems don't know about otaku culture at all."

Emotional   Cool   Personalized

Bio

Olivia is a college student. From her classmates' eyes, she is a very quiet girl. However, Olivia just don't like to talk with her classmates because she thinks they don't have common topics with her. Olivia love go to comic con to meet and talk with people there. Most time, she will just stays in her room watch Netfilx, Youtube video or drawing some illustration by using her Wacom tablet.

Brands

NETFLIX   SAN DIEGO COMIC CON INTERNATIONAL   WACOM

You Tube

Figure 12. Persona 2, designed by Shang Xu

Olivia represents another group of otakus: they identify as a group and separate themselves from other people. Their reason for isolation from crowds is because they feel more comfortable when they are talking with people who have the same interests. It might be hard for them to find people interested in the same things; if they could not find their "group," they might choose to "stay cool."

There are actually similar characteristics shared by those two personas. It is clear that my target users need a platform to talk with others who understand their hobbies and culture. According to the above information, target users desire to establish more connections and chances with the real world. They need to bridge the gap between the virtual worlds and real world; when users are using my app, they should be able to gain a

lot chances to do off-line activities. These activities not only drag them to go to outside, but also provide opportunities to get know other users and build relationships with them. On the one hand, off-line activities that cooperate with local businesses bring commercial benefits for them. On the other hand, volunteering offline activities bring contributions to society.

5.2 Design

After having a clear understanding of and modeling my users, I started to design my app. The design process was based on my previous experience and sectioned it into 7 stages: brainstorming, concept refinement, interaction model, business model, HTA chart, wireframe and interface design.

5.2.1 Brainstorming

Alex Faickney Osborn said, "Brainstorming is a process for developing creative solutions to the problems (1963)." and is always the good design method to start. Brainstorming can collect different viewpoints and encourage critical thinking. During brainstorming, I can gradually arrive at solutions to problems and design concepts through randomly picked words.
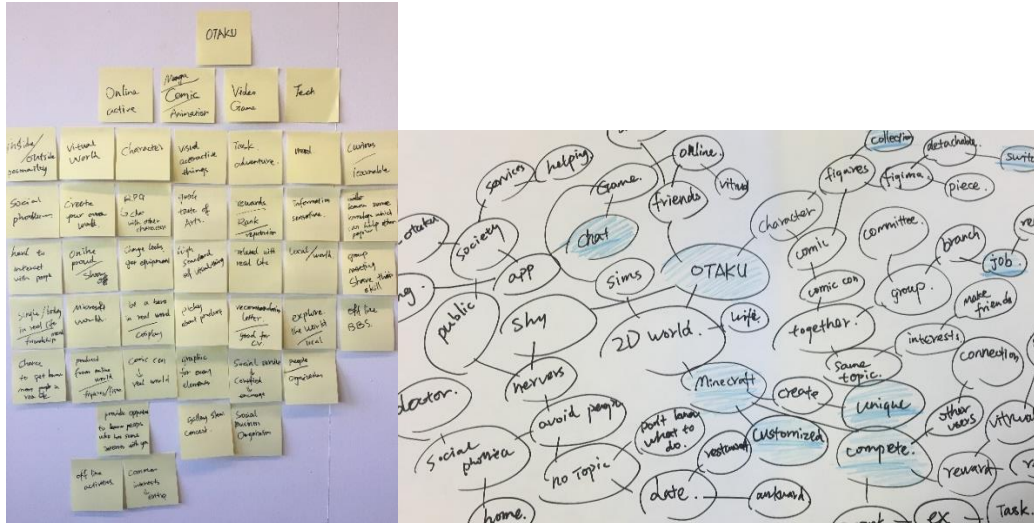
Figure 13. Brainstorming – word cloud, photo by Shang Xu

I started to brainstorming from key words related with otakus, by stating whatever words came up from my mind, then selecting the keywords that interested me the most. Based on those keywords, I extended into six directions. To better interpret my six directions, the images I found online give my audience better interpretations.

Figure 14. Concept 1-3, photo by Shang Xu

Figure 15. Concept 4-6, photo by Shang Xu

According to the above figures, my six directions are: Figure collection, Create city together, RPG game, offline activities, team competition, and electronic pets.

I brainstormed those six directions, refined them into five concepts, and presented to my committee members. The five concepts are: 1) Build your city, 2) Figure, 3) Zoo, 4) RPG game and 5) Team.
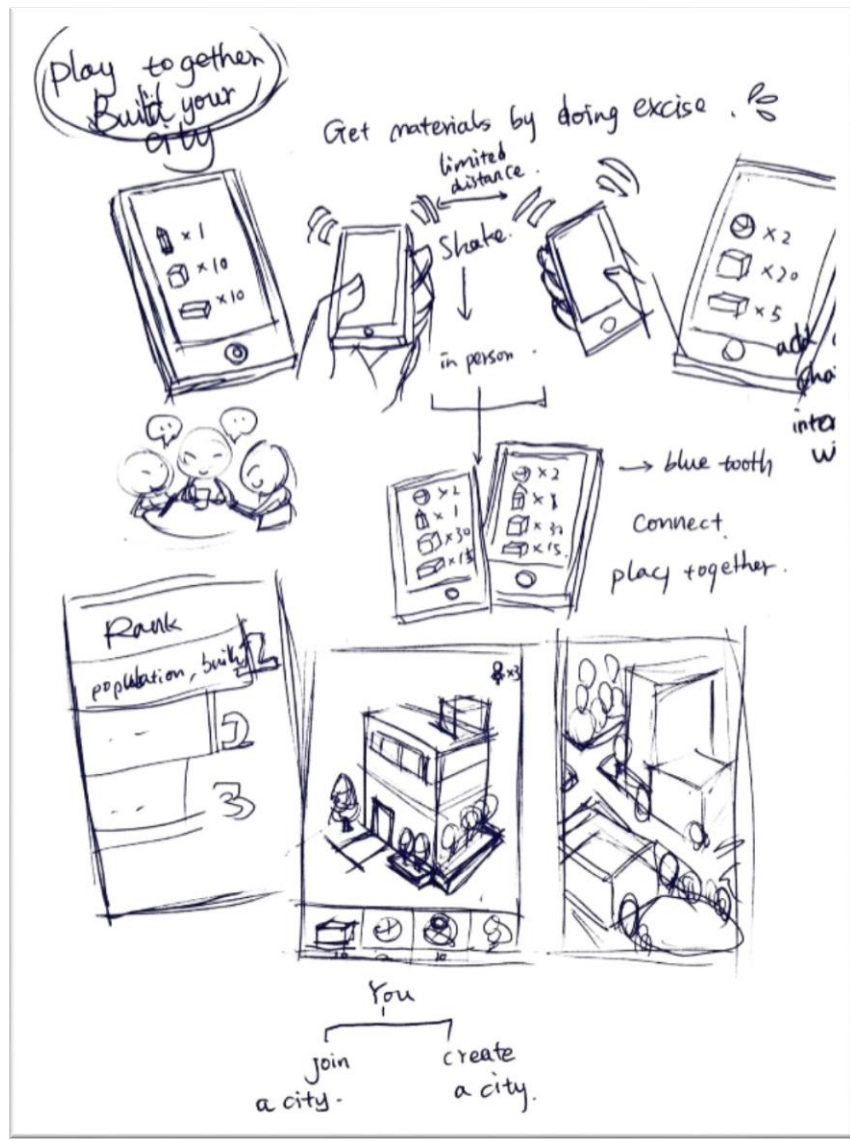
Figure 16. Sketch of "Build your city", photo by Shang Xu

The first concept, "build your city," is based on creating cities together. The basic concept for this idea is separating materials by different users. To create a city it is

necessary to use different materials. In order to collect the various materials, they have to gather together and exchange materials. When meeting up for those offline activities, they will have more chances to talk with other people face-to-face.
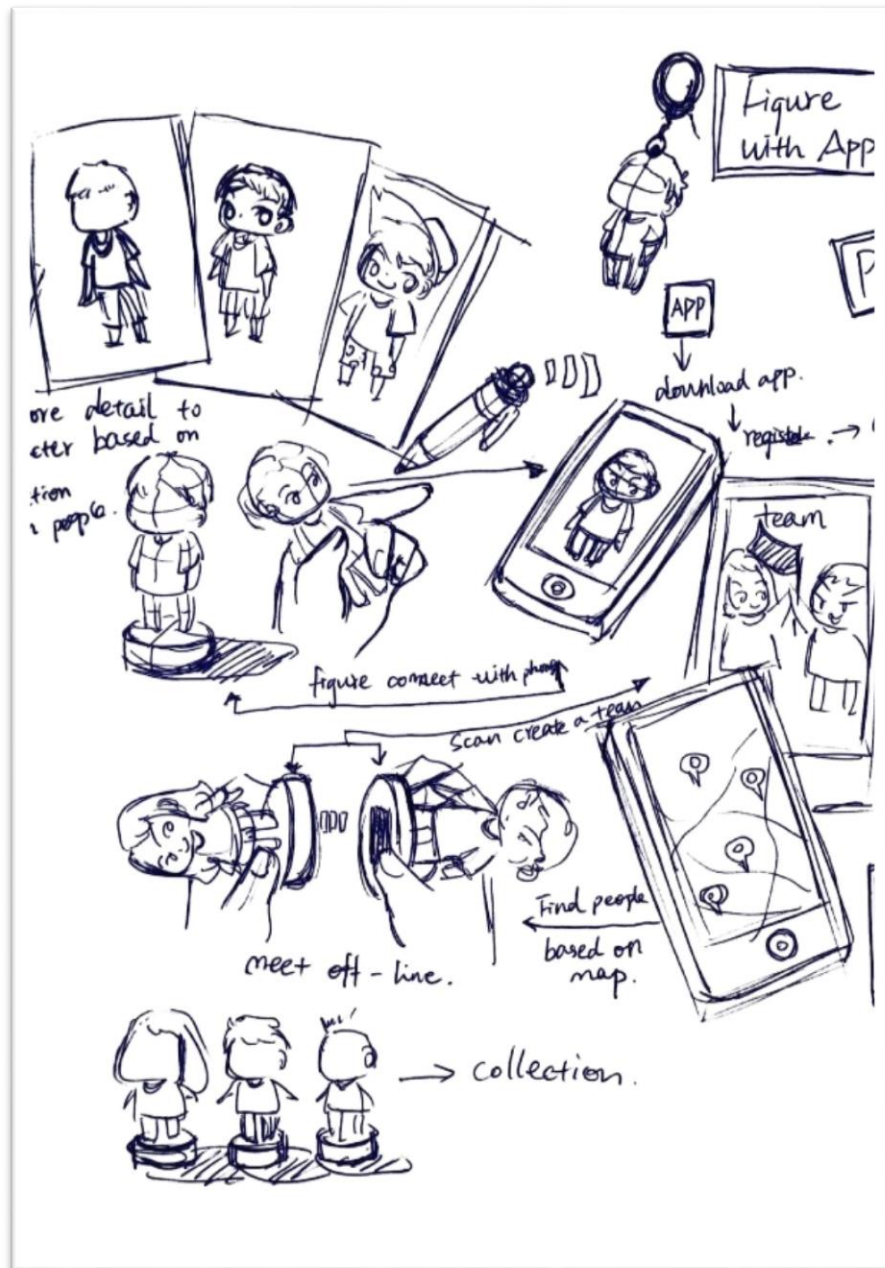
Figure 17. Sketch of "Figure", photo by Shang Xu

The second concept, "figure," is based on the figurine collection direction. In this idea, my target users will get a free nude figure in the beginning. There will be QR codes on the bottom of figures; this figure represents users themselves, so if they want to add another user they have to meet them in person and scan each other's figure. This step could not be done remotely. Users can gain different units for their figures, and they can collect those figures just like they collected animation figures.

Figure 18. Sketch of "Zoo", photo by Shang Xu

The third concept, "zoo," is based on the electronic pet direction. Target users receive random animals in the beginning, and different environments for their pets by upgrading levels. They can also get other animals by adding more friends with other users.
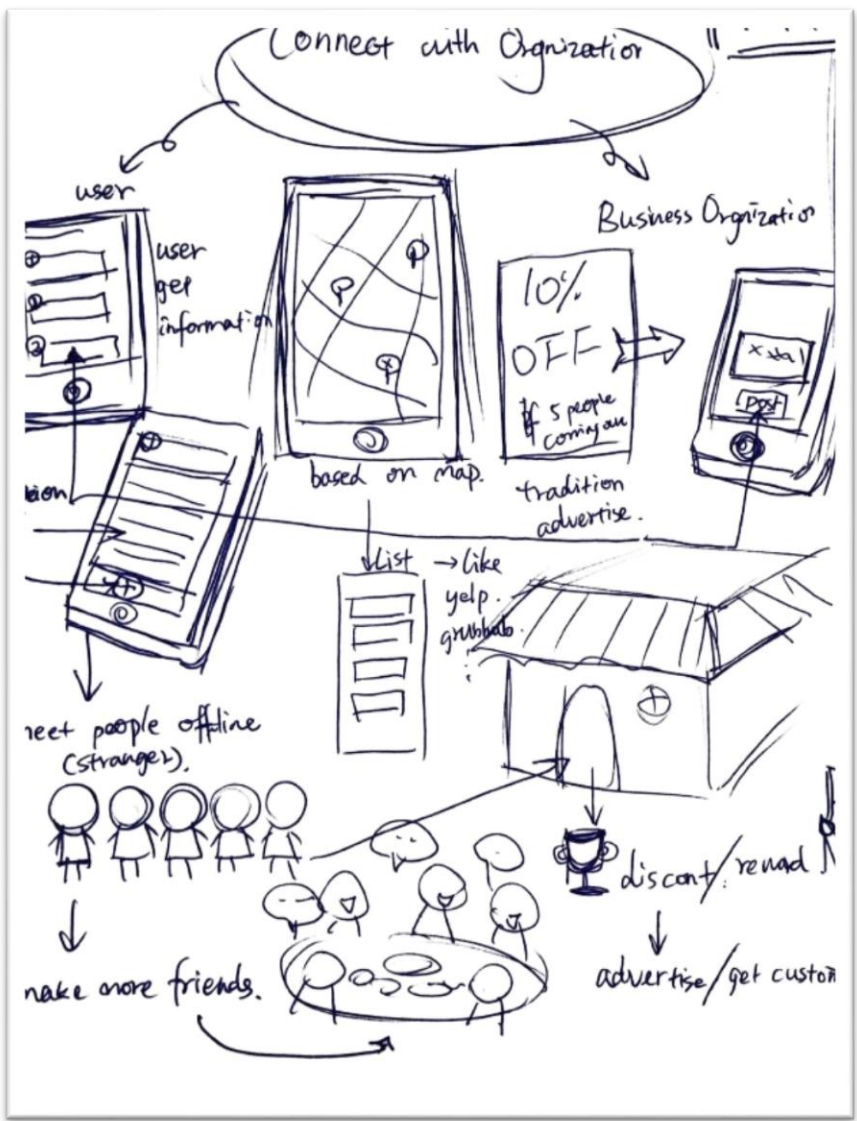
Figure 19. Sketch of "RPG game", photo by Shang Xu

The fourth concept, "RPG game," is based on the RPG game direction. The goal is to make users feel like they are playing an RPG game in the real world. Thus, they will finish different tasks in the real world and earn rewards; during the process of finishing tasks, users will have different chance to meet other users in real life. There will be levels and competition systems in this app.

Figure 20. Sketch of "Team", photo by Shang Xu

The last concept, "team," is based on the teamwork and offline activities directions. Users will be separated randomly and grouped into different teams. There will

be competitions during play with this app, with all the competitions are related to real world interaction. Those activities have different timelines, so users can select whichever most suits them. The winner of each competition can earn rewards and loser will be punished. Compared to previous concepts, this concept is more aggressive.

5.2.2   Concept Refinement

After the presentation of 5 concepts, my committee members decided to pick the 4th idea, "RPG game social communication app" as the one to develop. Based on this concept, I began to refine the basic idea of this concept, and provide more detail to clearly present this concept. The refinements include basic visual requirements, application structures, and app workflows.

Figure 21. Sketch of concept refinement, photo by Shang Xu

At this step, some basic features of my app have been decided as follows: Create your own character: The user will be an active character in the real-world context. Explore: Game map will based on your GPS information. If users want to explore the map, they have to walk or drive to gain access to other areas. Chat online: Provide a comfortable beginning for users to talk to others. Tasks: Provide many choices and opportunities for user to meet people in real life. Task progress: Through the progress of finishing tasks, users will practice their social skills. Special offline activities: Doing social service not only allows user to gain more game rewards, but also rewards in real life, such as a certification or recommendation letter, which is good for their CV. Post task: When a user's level getting higher, they can post a task by themselves; practicing their social skills at the same time invites new users to join. Reward: Keep users using this app and attend more offline activities.

5.2.3   Interaction Model

In order to explain how my app will solve my users' problems and satisfy my users' needs, I decided to create an interaction model. According to Jim Nieters (2012), an interaction model defines the relationship between target users and the product. It shows how does the design interacts with the user in real life and make users stay oriented and understand tasks. It helps the designer to create an overall cohesive structure between the product and target users.

For my interaction model, I focused on attempts to make otakus interact more in the real world. After discussion with my committee members, I developed this interaction model and talked about how my app will provide 8 attempts for otakus to get involve in

the real world. There are 8 attempts that I designed for otakus to connect with physical world.

1) In the cover page, users only can use the photo they took themselves; it should upload from their camera roll instead of a downloaded online picture.

2) If a user wants to change his/her character's clothes or equipment, he/she needs to purchase clothing in the shop. However, the shop might show up on the map in the beginning, so they have to go outside to find the shop.

3) To explore the location of the shop on the map, the user can seek help from others; people who provide help will earn extra rewards.

4) The map area is limited, and based on real geographic information; users have to extend the map area by going outside, such as walking or driving.

5) If a user wants to add another user as a friend in this app, they have to meet each other face to face and scan the QR code. The app will approve adding friends successfully by clarifying the geographic information changes.

6) Limited received and sent messages per month force my users to find ways other than texting to interact with other users.

7) Users can invite their friends to this app to finish task and exchange items. Extra offline activities earn extra rewards.

8) Finishing tasks is the most important attempt I designed for this app. A user can join a random team and meet team members in person to finish a task, and then earn rewards. On the other hand, a user can be the team leader and choose which task he/she wants to finish with his/her team members. This will gain extra rewards since he/she is the core of a team. Any user who reaches a certain level

can post tasks; also, the primary sources are from local businesses and social

organizations.

With these eight attempts, otakus who use this app can have more opportunities to

interact with other users and more chances to deal with people from the real world. The

feedback from this interactive model are quite positive, except that one of my committee

member indicated that I need to clarify what is reward is exactly. The rewards include

virtual rewards and physical rewards. Virtual rewards include gaining experience for

upgrading characters' levels, collecting game money for purchasing accessories, and

unlocking features in the shop. Physical rewards are different in each case, and depending

on the business partners; examples could be coupons or free samples.

5.2.4   Business Model

In order to figure out my design's value in the market and see if there is any

commercial potential in my design, I decided to create my business model by writing

down all parts in the business model canvas, which is one of the most commonly-used

business maps for beginners. To put it simply, the business model is a description to help

organizations achieve their purposes, including business processes and policies. I selected

a business model canvas proposed by Alexander Osterwalder (Osterwalder & Pigneur,

2010).

Based on a question from this canvas, I summarized my business model. The key

partner could be local small business organizations, such as restaurants, and social service

organizations, such as nursing homes and otakus' BBS. Key activities that I imagine so

far include the following: 1) Update app's theme by season: this will bring fresh feelings

for users depending on time changes, and keep my users from getting bored. 2) Provide more tasks. Various tasks can provide multiple choices for users, so they will have the flexibility to choose the task that suits them. 3) Advertise the app in different media and allow more otakus to learn about this app and feel curious about it. The value propositions for this app will be 1) Get users' information for my database; in the era of big data, users' information is a very valuable resource. 2) Understand users' preferences: this is not only significant for me to refine the app, but also provides critical information for local business to get to know this group of people's preferences. 3) Provide important references for researchers who are trying to understand otakus. A key resource for this app will be the IOS platform, internet, and social network. My cost structure is the costs to design and program this app, have servers to support it, and pay the advertisement fees. This app's advertisement will be posted on otakus' BBS websites, game platform such as the Play Station Store, and at local business organizations. These are the channels of my business model. Customer relationships are: 1) Provide chances for users to meet more people. 2) Provide opportunities for users to do things together. 3) Extend users' social networks. 4) Gradually being a part of more social activities. Customer segments include: 1. Otakus who want to meet more people in real life. 2) Users with social phobias who want to practice their social skills. 3) People who are interested in otaku culture.

In order for an app to survive in market, how to make money through the app is the most vital question: the revenue streams in the business model. Users can download this app from the app store without any purchase. However, this app offers in-app purchases, which means if a user want to recharge his/her game money, he/she need spend his/her real money in this game to recharge. Besides, the app will take 1% rebate

from each order. For example, if the task is to ask a group of otakus to go to restaurant and have dinner together, 1% of the total payment will be taken from app. lastly, this app will sell related products, such as figures, stickers, and T-shirts.

5.2.5   HTA Chart

Finishing a hierarchical task analysis (HTA) provides a better understanding of users' tasks. From Peter Hornsby's article (2010), the goals of the HTA chart are clarifying users' primary goals, detailing each step for users from the beginning to the end, and optimizing these procedures. In my HTA Chart, I break tasks down into different subtasks; it is clear that the hierarchy of my design provides a clear structure to create a wireframe. This app's HTA chart is presented below, start from here when the first time login:

0 Register

0.1 Sign up

0.1.1   Enter email/ password

0.1.2   Connect with Facebook

0.1.3   Connect with Twitter

0.1.4   Connect with LinkedIn

0.2 Character create

Start from here except first time log in:

1   Log in

2   Status

2.1 Radar map

2.2 Basic information

2.2 Closet

2.2.1   Check items you have

2.2.2   Preview

2.2.3   Shop (after unlock on the map)

2.2.3.1 Sell/Buy

2.2.3.2 Recharge by USD

2.3 Map

2.3.1   Buildings

2.3.1.1 Check posted task

2.3.1.1.1   Take task

2.3.1.1.2   Send invitation to friends

2.3.1.1.2.1 Friends list

2.3.1.1.2.2 Send default invitation by clicking friends.

2.3.1.2 Check introduction

2.3.2   Shop

2.3.2.1 Sell/buy

2.3.2.2 Recharge by USD

2.3.3   Task board

2.3.3.1 Select task

2.3.3.1.1   Accept task

2.3.3.1.1.1 Scan QR code

2.3.3.1.1.1.1 Get reward

2.3.3.1.2   Send invitation to friends

2.3.3.1.2.1 Friends list

2.3.3.1.2.2 Send default invitation by clicking friends

2.3.4   People nearby

2.3.4.1 Click profile

2.3.4.1.1   Basic Information

2.3.4.1.2   Request to add friends

2.3.4.1.3   Request for battle

2.3.5   Personal location

2.3.6   Goods exchange

2.3.6.1 Post information

2.3.6.2 Request for battle

5.2.6   Wireframe

Wireframe is a significant step in the app design process. It is used to arrange

content and structures for users' journeys when using apps. Wireframe provides a basic

visual representation of interfaces; it allows designer to present proposed functions,

elements, and contents of an interface with rough drawings. A typical wireframe should

include the following: 1) key page elements and their position, such as headers, footers,

and brand elements, 2) elements, such as the sidebar and navigation, 3) tags, links, and

titles for the content objects, 4) The field of contents for images and text, and 5)
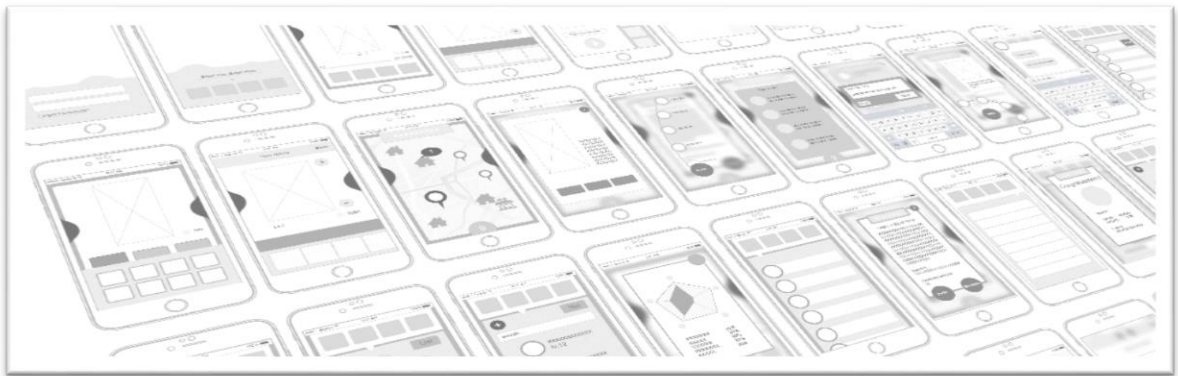
Workflow for interactive units.

Figure 22. Wireframe, design by Shang Xu

The wireframe I designed was based on my HTA chart. During the process of

designing the wireframe, I had multiple plans for how this app will interact with my

target users. Also, in order to provide the best user experience with my apps, I designed

two or three different versions.

5.2.7   Interface Design

After I finished my wireframe, I moved on to the most important stage: interface

design. My target users are groups of people who are extremely familiar with technology

products. They have extensive experience with different screen-based products, such as

computers, mobile phones, or PlayStation. In other words, they have good aesthetic

senses. Considering this characteristic, I decide to put most of my effort into interface

design to create an app with attractive interfaces. To approach the goal, my process is to

separate interface design into three interactions.

5.2.7.1 First Version.

The first version basically followed the wireframe. For the color scheme, I chose

red, grey, and medium grey. Red represents passion and grey can balance the overall

interface. For typography, although it is an IOS app, I combined it with Android apps'

features – used a Roboto font series, a Google default font, and put the navigation button

on the top. I drew a game style illustration as my login page. However, after finishing the

primary visual design for my app and analyses, I conclude with the pros and cons of my
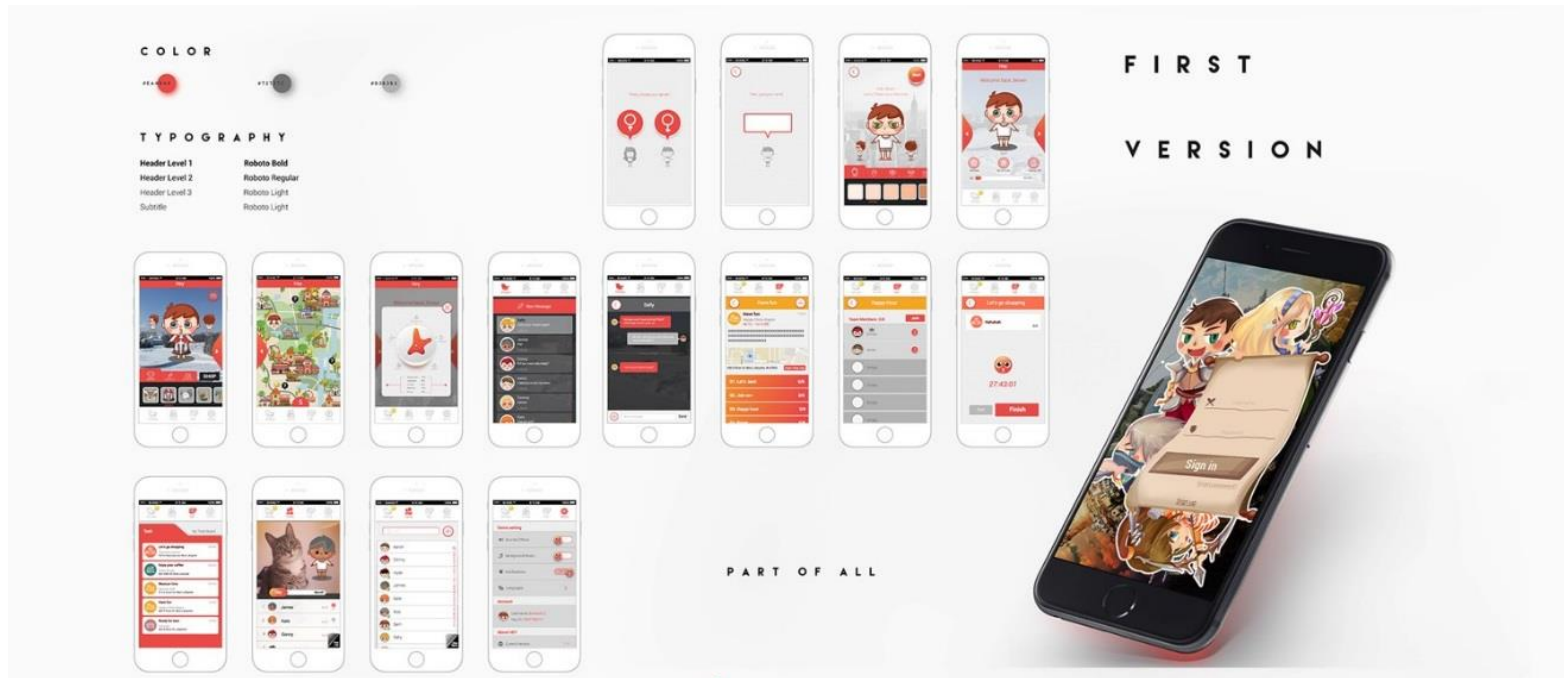
desig

Figure 23. Frist version overview, design by Shang Xu

Pros of this version: 1) Followed wireframe logically. Based on wireframe, this version of the interface strictly follows logic. 2) Icons make sense to target users. In order to better brand my app, I designed all of the icons myself. It's important to me that the icons can be interpreted accurately.

Figure 24. Navigation icon design, design by Shang Xu

This figure shows my icon design for the primary navigation tab. All of the icons followed circles and the angles are calculated accurately.
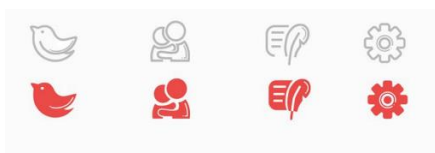
Figure 25. Navigation icons refinement, design by Shang Xu

These are final version of those icons. From left to right, they represent: message, friends, task and setting. I choose line style to show the icons in normal status, they are not very obvious but still easily recognized. When users press down the icon, it changes to red, the primary color. The red color will be filled into this icon, so that it brings a big visual contrast for the user.

I designed some operation icons to be consistent with other icons.

Information: Close: Back: Start:

Figure 26. Operation icons, design by Shang Xu

Most of those operation icons follow IOS style, and the location also follows the IOS design guide, because I want to maintain some traditional user interface design elements. The start icon is quite different, because that can give the user a visual notification about the function of icons.

Closet icons: In this app, since I do not have too much text in my interface design, making a graphic immediately identifiable is crucial. Here, I combined my knowledge from infographic design class, and created icons to show different categories in the closet. They have a unified design style with the other icons.
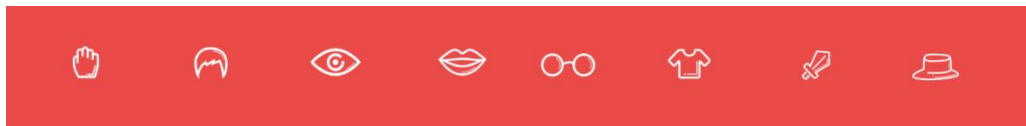
Figure 27. Other icons, design by Shang Xu

After I finished my design and showed it to my target users, all of them identified the meaning of the icons. I did very detailed illustration of different elements. Elements are very important visual units in my design. To present an attractive interface, elegant elements are necessary. Thus, I designed different building type icons to represent different kinds of local businesses and social organizations. Also, I don't want to use the current map format or template for my design; in order to match the same design style with building icons, I decided to create a flat-design style map.

Figure 28. Line of building icons, design by Shang Xu

For buildings' icons: this is the line structure of building icons. I got some references from Oleg Beresnev, a very famous graphic/UI designer from Brazil. Each building has a label; after reviewing them myself, I changed part of my outline icons and created the final version of those building icons.

Figure 29. Building icons, design by Shang Xu

For the color choice, I considered using different groups of color to fill my outline, which means different buildings have different color groups. By separating the color group, user can still recognize the icon if they zoom out; if they zoom in, they will see the detailed building icons.

The app map will be shown based on real location GPS information. I want to design a map which consists of my building icons and a parallel world for my target users. I chose an illustration style with flat-design style to present this map to my target users.

Figure 30. Map design, design by Shang Xu

The map that I designed simplified all the elements in a traditional map, such as traffic information, roads, and geographic information. It looks like a game design style.

The tress on the map will be changed by seasons and location. Overall, this app only provide users very basic geographic information. For more detailed map information, the app will link to a third party map app, such as google maps or apple map.

There are some other visual elements in this app, such as gender icons, emoji choice bar, and emoji: In most applications, choosing gender involves just two tabs or a scroll menu, which are boring and not creative in my opinion; an application wants to catch people's eyes from the beginning. The design of gender choice is very important to me. So I designed two grey illustrations and two gender icons.
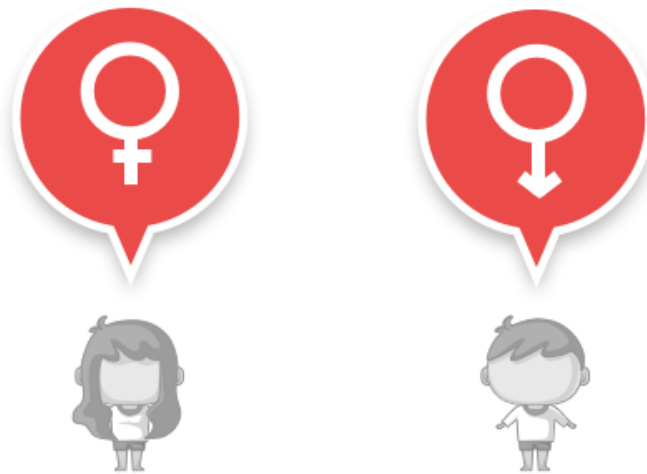
Figure 31. Gender icons, design by Shang Xu

The emoji bar is one of the special interactive figures in my app. When users have to make decisions, in most apps they just click yes or no. However, I think clicking this action does not make users feel surprised, so I opted for this emoji choice bar. To achieve a better visual result, I changed this emoji bar after the first version:
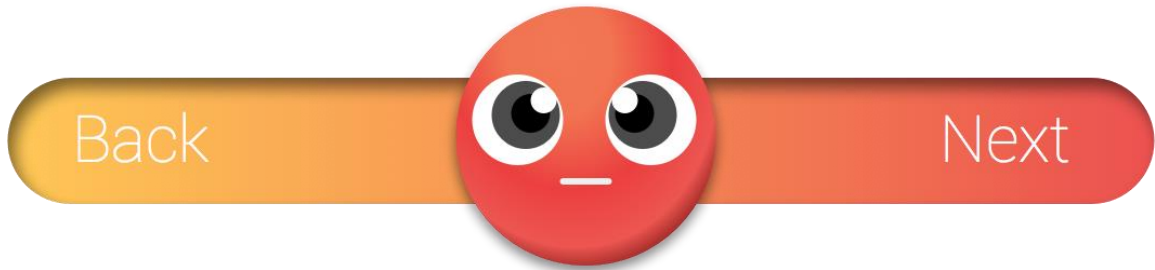
Figure 32. First version of Emoji bar, design by Shang Xu

Figure 33. Second version of Emoji bar, design by Shang Xu

Changes: Added more reelection to makes the graphic more fresh and vivid to the user; highlights make color looks less strong. Dodged dark colors and shadows makes graphic looks cleaner. I changed the font from light font to bold font, which makes the text easy to see. When users press the emoji slide bar, the emotion of the face will be changed, and if user drag it into different choices, the emoji's face will be changed into different emotions.

The emoji is a very popular element in communication apps; to brand my design, I designed a series of emoji:
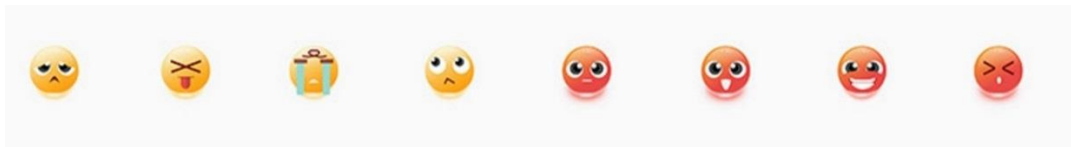
Figure 34. Emoji, design by Shang Xu

With the above element design. I assume that my target users will feel this app is full of visual details worth exploring. Those elements also improve micro interaction in my design.

The potential problems of this design are as follows: 1) Login page doesn't match the whole design style. For this version, I mainly used the illustration style to represent the login page; however, this interface did not show any primary colors, which make the login page lack connection with other pages. 2) Navigation bar move to top might be inconvenient for user. From my previous design thinking, I tried to create a creative user experience from the feedback I received for after the user selected the tab of navigation bar. However, according to the fingers stretched image (2014), it is not a good user experience and it will make my target users' fingers feel stretched.
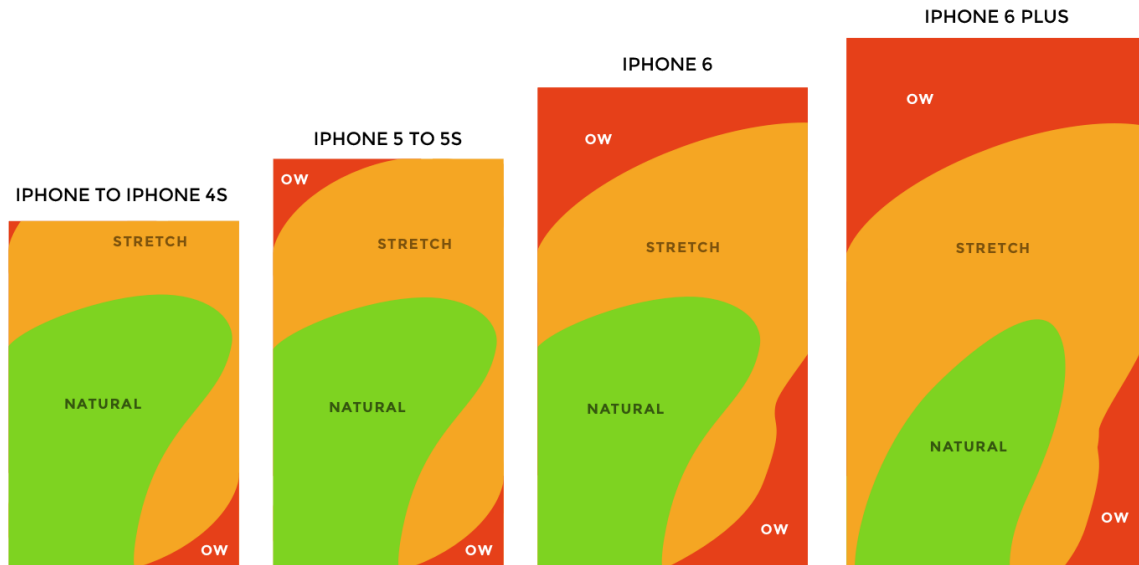
Figure 35. How much you will have to stretch your thumb to use iPhone, by Thorin Klosowski

From this figure, it is clear to understand how stretched users' thumbs will be if I put the navigation bar on the top. 1) Colors are too strong, especially dark grays. The medium grey is the primary color for my app background. This color is too heavy, especially combined with red and dark grey. It is hard to distinguish the important information from the interface. On the other hand, there is no color contrast on the page of building icons on the map because all the colors show 100 percent transparency and every icon has strong color. This will make it difficult for users to follow the information and be visually taxing. 2) There is no consistent design language of these interfaces. All the pages for this app seem different: different icons shows same function and different interactive methods lead to same page. There is no consistency in the first version; this will only make the user feel very confused and result in a negative experience.

5.2.7.2 Second Version.

Based on the results of my self-analysis of the first version, I designed this second version. The pages seems cleaner, more consistent, and elegant. The pros and potential problems are as below:

Figure 36. Second version overview, design by Shang Xu

Pros: 1) Fixed the color problem. I changed the dark grey into white for my primary color selections, and I use white as my primary background color. This helps the whole interface look very elegant and clean. Also the information can be easily followed. Visually it looks much more relaxed compared to the first version. For the map, I reduced the purity of the map page and only kept the origin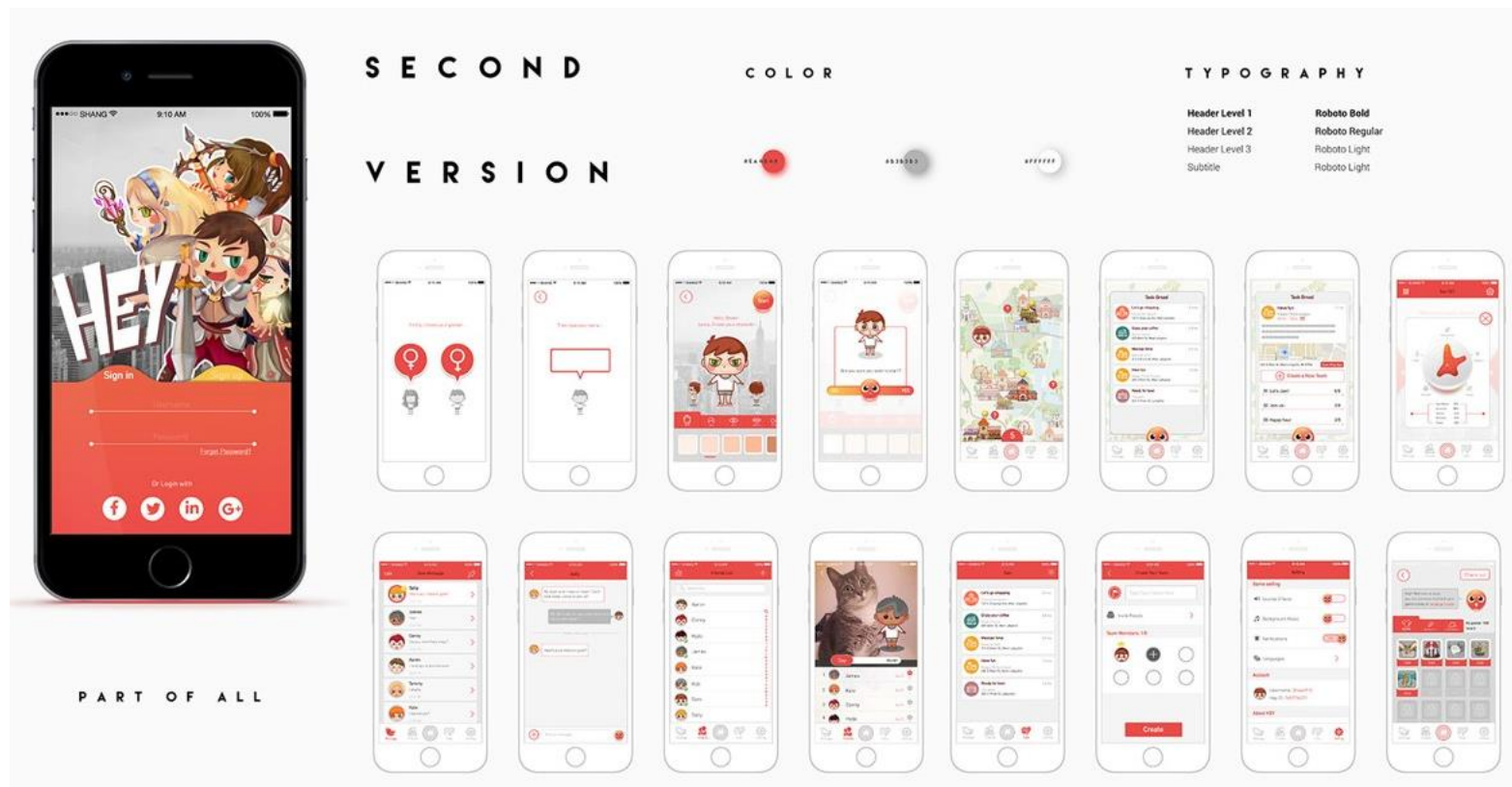al purity for the buildings with notifications. This change highlight the important information and makes users catch that information first and avoids confusion. 2) Move navigation bar back from the top to the bottom. This change follows users' previous user experience habits. Also, it avoid users' fingers feeling stretched and the associated inconvenience. This does not confuse users if nothing changes while they are selecting tabs on the navigation bar. 3) More micro interaction and pages added. Micro interaction can surprise users, so in my second version I added motion graphics as my micro interaction. I hope this will be another feature to attract my target users and improve their user experience. Also, to achieve the work flow from HTA chart, I tried to add more pages to give users a fluent structure of this app.

Potential problems: 1) Roboto font is not well suited for this app. As a default font designed by Google, the Roboto font series does not look good in my app design, so I decide to change the font and see if there is any other third party font instead of using the default font for IOS app, which is San Francisco. 2) Still lacking pages to represent the full structure of this app. Although I added several pages to this app, it is still not enough. I have to add more pages that show the entire HTA chart workflow. 3) Missing step back choice. Some pages have no options for users to go back if they press the button that lead

them to the current pages. This is a very critical mistake, and it will cause users anxiety and diminish their confidence in this app.

5.2.7.3 Third Version.
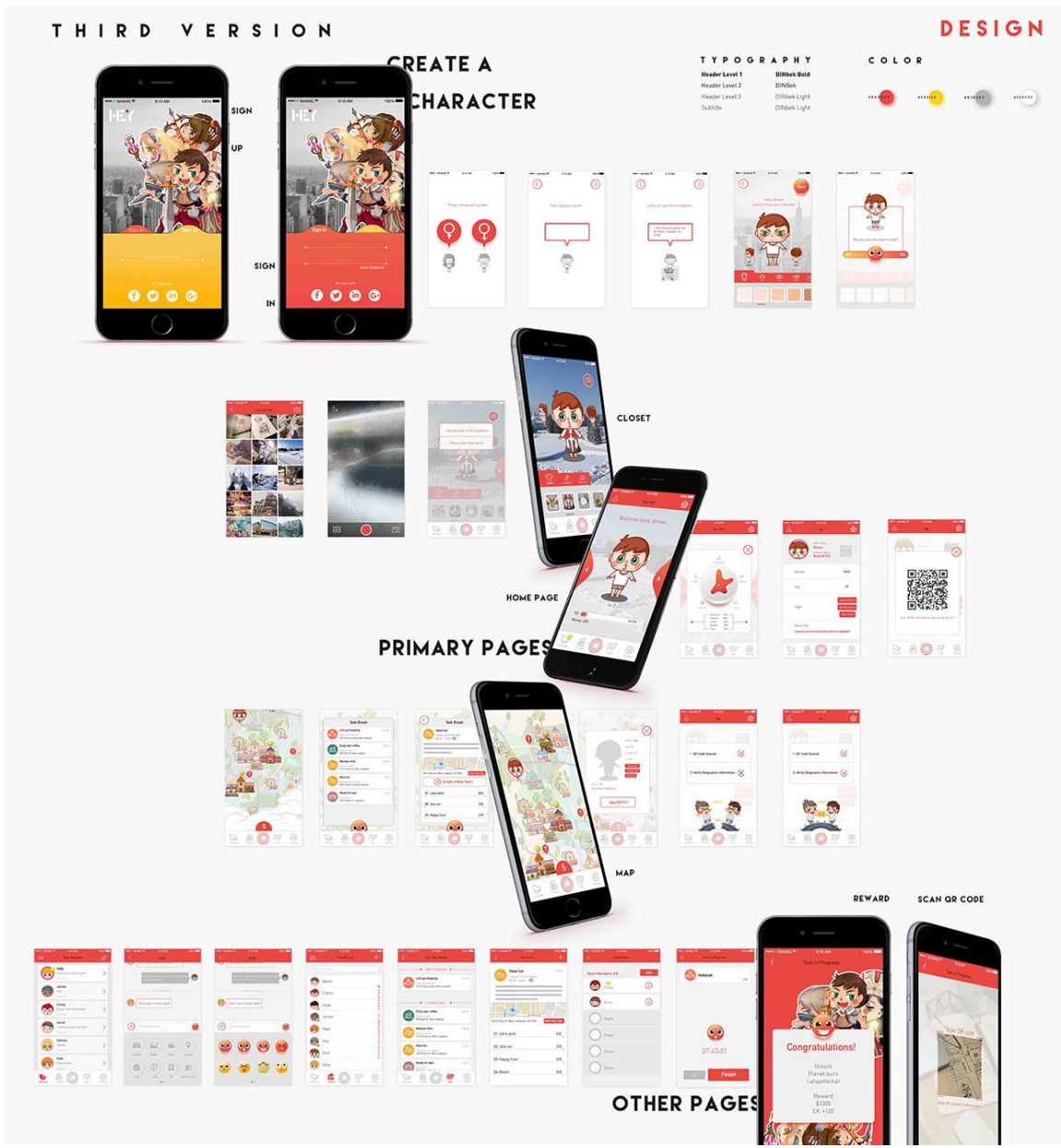
Figure 37. Third version overview, design by Shang Xu

Compared to my previous two versions, the third version is more complete. Based on all the feedback from the previous versions, I addressed all of the problems. The changes are: 1) Change the primary font from Roboto series to DIN series; with this third party font, it better presents and brands this app. 2) Add yellow as the fourth primary in this app; combined with red, it brings more energetic feelings to my app and has mostly been used in notification, so it stands out from red and can be easily noticed by users. 3) More pages added, such as loading pages and rewards page; the extra pages not only complete my HTA chart, but also give users step-by-step app instructions. 4) Fix all the problems from the user experience part. In the third version, I make sure all the pages provide options for users to return to the previous pages. This third version is very flexible in its interactive potential.

After finishing the third version, I have enough pages to create a prototype for my target users and experts to complete the heuristic evaluation.

5.3 Evaluation

Adopting suitable evaluation methods can improve my design. I conducted two evaluations on my prototype to assess its performance: a heuristic evaluation and a user requirements "evaluation." Heuristic evaluation is an efficient evaluation methods compared to other evaluation methods. It can provide quick feedback, it is less time consuming, and it costs less money. On the other hand, having suitable heuristics provides good measurements for evaluators. As the previous chapter mentioned, I based my design requirements on my literature review and user study. In order to verify if my design satisfies target users' needs, the design must be evaluated according to the user

requirements. This is not a formal evaluation; it is an assessment I conducted to gauge if my design matched the design requirements I set up before the design process.

5.3.1 Heuristic Evaluation

Based on Jakbo Nielsen's explanation,* heuristic evaluation is one methods of usability evaluation; it helps the designer to identify usability problems in interface design. The evaluators should be experienced designers who can judge the interface design by following standard usability principles (defined as "heuristics").

In my heuristic evaluation, I used Jakob Nielson's 10 usability heuristic for user interface design as my evaluation principles. The Heuristic evaluation form is attached as Appendix B.

5.3.1.1 Heuristics Selected.

The principles of my heuristic evaluation strictly follow Nielson's heuristic. Although they are 20 years old and focus on a website-based interface, his principles cover every perspective in interface design, from usability to aesthetic. All of these principles could be very valuable references for my evaluators to measure my design. The principles are below (Nielsen & Molich 1990):

1) Visibility of system status

2) Match between system and the real world

3) User control and freedom

4) Consistency and standards

5) Error prevention

6) Recognition rather than recall

7) Flexibility and efficiency of use

8) Aesthetic and minimalist design

9) Help users recognize, diagnose, and recover from errors

10) Help and documentation

5.3.1.2 Experts & Process.

This heuristic evaluation was conducted with five experts who consider themselves otakus. Every evaluator had over three years of design experience and all of them have been otaku since high school. They were asked to individually evaluate the design prototype based on Nielsen's principles. Also, the severity ratings has been attached in the evaluation form. Based on the numbers zero to four, zero means no problem and four means a redesign is necessary. Severity ratings indicate which problems are the most serious and prioritizes the problems. According to Jakobs's thesis (1992), three key factors decide the problem's severity rating: 1) frequency, is it a common problem? 2) Impact, is it easy for users to overcome? 3) Persistence, is it just a one-time problem that users can overcome if they know about it? Experts can rate the app by following this severity rating chart. The duration of this evaluation is about 30-45 minutes. It was a face-to-face evaluation; after experts finished evaluation, they submitted it to me directly.

Table 2. Evaluation overview

Evaluators	Background	Duration	Date
1. LL	Motion graphic designer with 4 years' experience in design. Otaku for 6 years	35 mins	03/01/2016
2. JP	Graphic designer with 6 years' experience in design. Otaku for 10 years.	30 mins	03/04/2016
3. TD	User experience designer with 5 years' experience in design. Otaku for 5 years	40 mins	03/04/2016
4. XY	Visual communication design student with 2 years' experience in design. Otaku for 3 years	42 mins	03/05/2016
5. TY	Industrial design student with 4 years' experience in design. Otaku for 6 years.	32 mins	03/05/2016

5.3.1.3 Results.

Overall, the results from the heuristic evaluation are positive; however, experts still found several problems. The severity ratings chart is as follows:
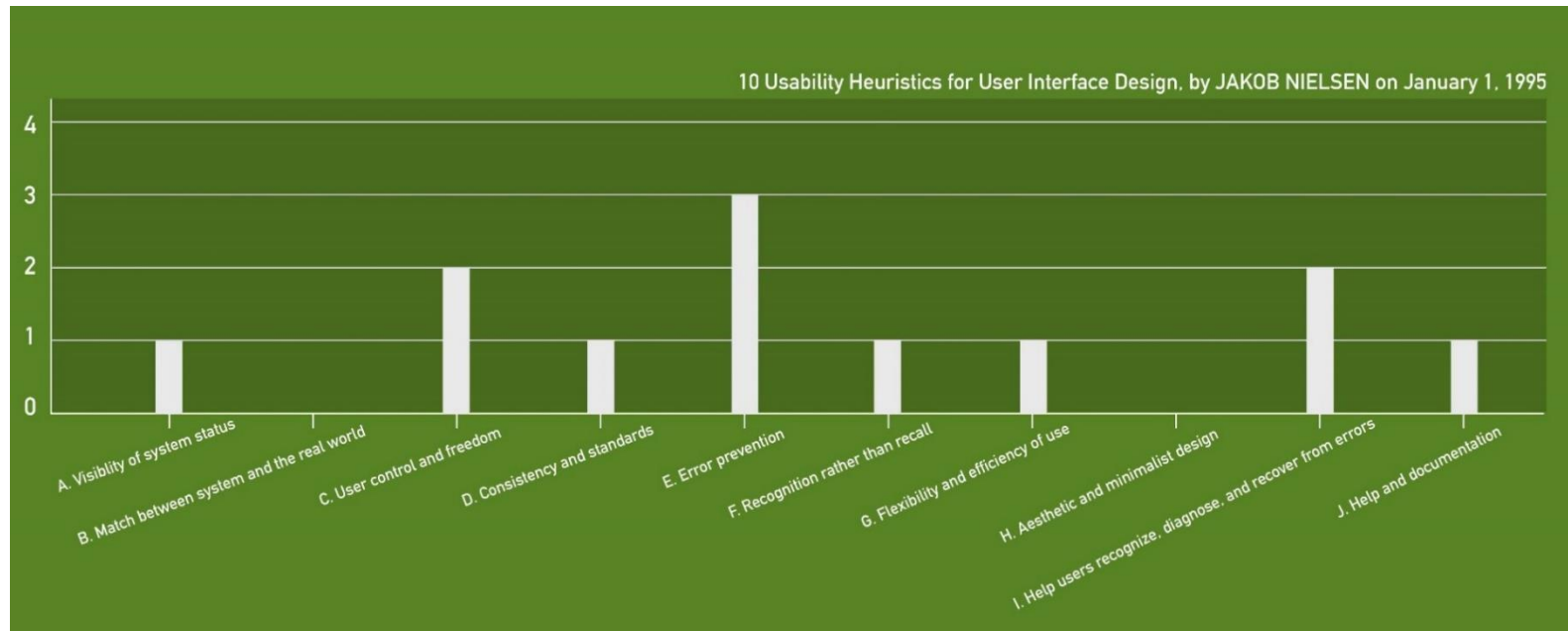
Figure 38. Severity ratings chart, design by Shang Xu

From this chart, it is clear that my experts found the largest number in "Error Prevention," then "Help Users Recognize," "Diagnose And Recover From Errors," "User Control," and "Freedom". The detailed problem findings are in the chart below:

Table 3. Outcome of Evaluation

Problems	Evaluators	Heuristics	Severity
1. There is no notification or visual hint to notify user about new items in closet. E.g. when user purchases new items from store, there is no notification to user which one is the newest.	#1. #3.	A	1
2. When user creates a character, there is no process bar to let them know which step they are at and how many steps are left. E.g. when user is creating a new character, they just follow the instructions step by step, but there is no visual hint or process bar to notify user of their progress.	#5	C	2
3. User can't go back to change the basic settings of their character after first login. E.g. after first login, if user wants to change the basic feature of the character, there is no way to achieve it.	#1. #3. #5	E	3
4. User can't leave the group before tasks start. E.g. if a user joins a group by accident, there is no way for them to leave, although the task hasn't started yet.	#2. #4	E	3
5. There is no introduction before creating the character. e.g. when user uses this app for the first time, there is no instruction for them to read or to understand how to play with this app.	#3. #5	F	1

Table 3 continued

6. Shop is hard to find after user explores wilder map area. E.g. if a user explore a very wild area, and there is only one shop, it might be very hard for a user to find it through a wild area map.	#4	G	1
7. No night version. E.g. the background is white in color, which will be very bright at night, and harmful to users' eyes.	#5	I	2
8. Lack of conformation page. E.g. before leading user to next page or step, this app should have a conformation page to avoid mistakes in user operation.	#2	I	2
9. Lack of notification if user reach the edge of the map. E.g. when users reach the edge of the map, they might feel confused about why the map cannot be expanded.	#4	J	1

To sum up, there is no specific problem that will cause me to redesign any part of my app. All the problems that experts found can be fixed quickly and easily. Based on the heuristic evaluation result, I refined my interface and moved on to the self-evaluation.

5.3.2 User Requirements "Evaluation"

As I mentioned before, user requirements becomes another principle for me to evaluate my app. The user requirements help me to decide if my design solves my users' problems and match their needs or not. The evaluations are based on the refined version after heuristic evaluation. The list shows the results of a user requirements evaluation:

Table 4. Outcome of User Requirements "Evaluation"

Requirement	Result
1. A mobile based app	An IOS based app This app design is based on IOS design guide
2. A social communication app under a cover of game	It covered by an RPG format. User will play as a virtual character in this app, and finish "tasks" provided by local business organizations with other players. Also, in this app, multiple features are similar to RPG, such as shop, ranking, and attributions. From the overall feeling, it is looks like an RPG.
3. Interesting to use	Compared to traditional social apps, the game format might make users more interested. Plus, those micro interactions in the app will make it interesting to use. This app is not finishing an online task; it is more interesting in that it provides a platform to finish tasks and gain rewards in the real world with other users.
4. Provide multiple opportunities for offline activities	The tasks depend on different local businesses and organizations; if more businesses and organizations join this app, it will bring multiple opportunities for target users to do offline activities. Other functions, such as exchange items and gifts, also provide chances for users to meet other users in person.
5. Provide different methods to gradually lead otakus to interact with other people in real life instead of virtual worlds.	Different businesses and organizations provide different activities, so there will be a lot of choice for otakus to choose the way they make friends.
6. Visually attractive	The polished visual elements and interface of this app satisfied users' aesthetic. The self-branded icons and emoji make the interface looks even more attractive.

Table 4 continued

1. Good cooperation with local business and organization	Can't verify this before the app starts running.
2. Gradually change otakus' life style	With the 8 attempts mentioned on interactive model part, I believe otakus will gradually change with this app.
3. Interesting micro interactions to surprise users	Elements such as the loading page, sliding bar, and emoji improves micro interactions in this app. I assume my users will be surprised by playing with this app.

Overall, my design matched my user requirements. Some requirements, such as "good cooperation with local business and organization," cannot be verified before launching the app.

5.4   Final Design

I finished my final design after wrapping up the analysis and two rounds of evaluations. The problems found during the heuristic evaluation have been fixed. However, other problems, such as if this app can successfully cooperate with local organizations or not, haven't been verified yet, so I will address this aspect in Chapter 6. Here is the figure that shows my final interfaces.
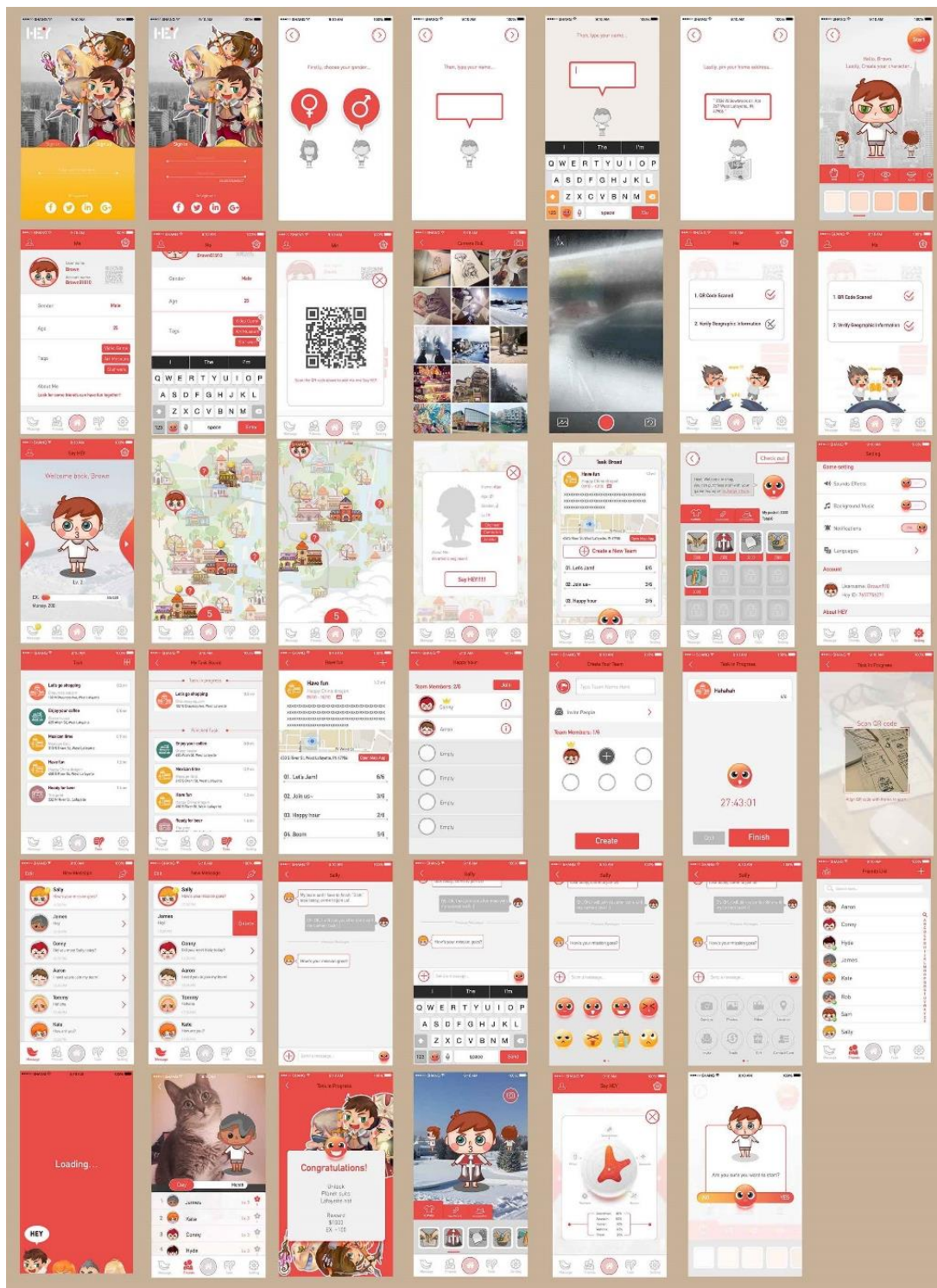
Figure 39. Final interface, design by Shang Xu

5.4.1   Design Guidelines

Design guidelines present the overall standards and rules of interface creation. It

provides a simple guide to reference when moving to the development stage, and it

provides a clear style guideline for cohesive future design (Galitz, 2007).

The name of app, Say Hey, has been decided. This name encourages users to "say

hey" to this real world and interact more with people in real life. Considering the

potential of future development and collaboration, I prepared a brief design guide for Say

Hey, including its typography, color scheme, and icons. The design guide outlines the

app's consistent design style, layout, and graphic elements.
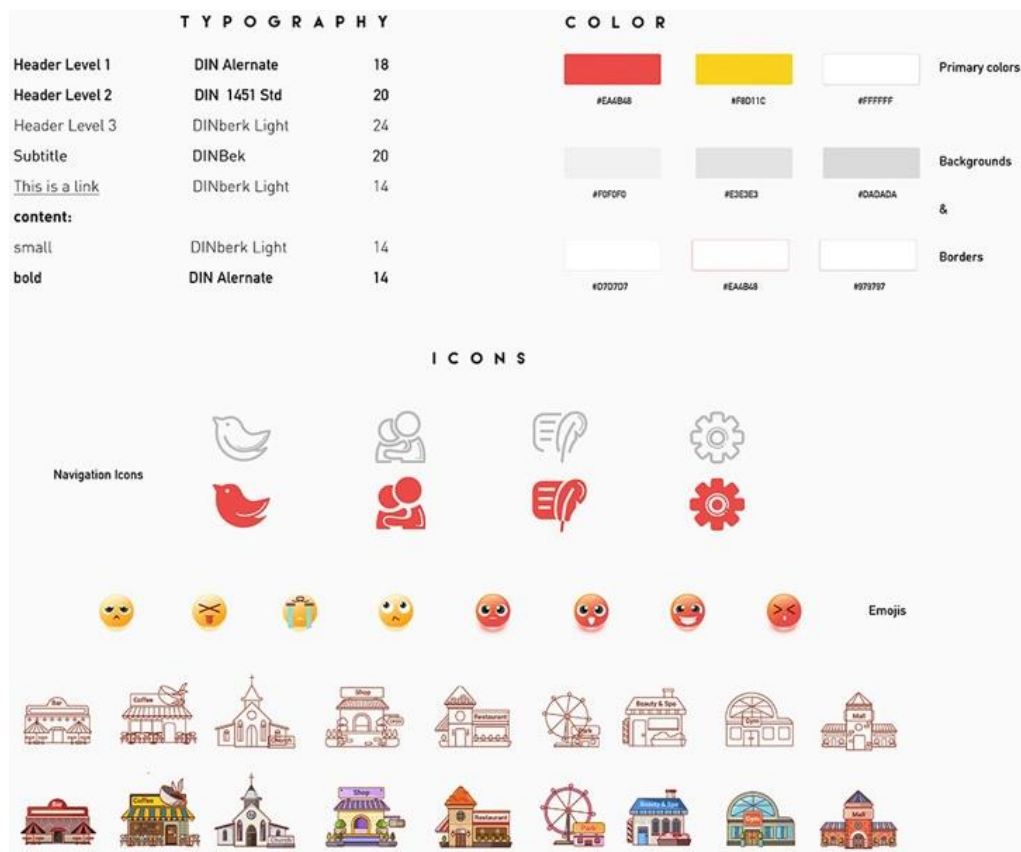
Figure 40. Design guide, design by Shang Xu

Instead of using an IOS native font, I chose a third party font to better represent my branding. All the typography are from the DIN series. I used different thicknesses to separate different text information. For a color scheme, I selected not only the primary color, but also background and border colors. The design guide and future interface design provides the standard for the app's invention. The icons in design guide provide the visual style standard for future design.

CHAPTER 6. CONCLUSION

This research was based on my design hypothesis that by providing a suitable

platform, otakus are able to gradually interact with more people in real life. My

understanding of this unique target group helped me to define their lifestyles, and

provided valuable inspirations designing my user study template. During this research, I

improved my understanding of users' needs and the missing parts of the open loop of the

whole eco-system by using different user study methods to collect qualitative and

quantitative data for analysis. Moreover, the requirements derived from user study

became the principles with which to evaluate my design. By rapid iterating, I was able to

rectify the unforeseen bias of my established system, therefore pushing my design

forward.

Say Hey is a social application that is designed based on the previous research,

which supported my design hypothesis. The goal is to provide a platform that helps

otakus to meet more friends in real life. *Say Hey* is covered by an RPG game format,

which is not as common as other games. From the user experience perspective, I designed

Say Hey to follow users' previous interaction habits, so that the workflow is easy to

understand while playing with this app. The interface of *Say Hey* is relatively visually

attractive and it provides detailed illustrations and icons. After two rounds of evaluations,

The results were positive, which made me feel confident that *Say Hey* satisfied my original design requirements.

As for future expectations of *Say Hey*, I would imagine it forming a whole eco-system got it. For example, a local business could potentially benefit from this game. There would be a lot of commercial benefit to joining *Say Hey* as partners, providing physical places and/or objects during the game. In this app, the game would provide a platform for local organizations to advertise by posting "tasks" on *Say Hey*. Meanwhile, based on the tasks accepted by local users, I can analyze local preference data, which could lead to future strategies for the local stores. As for non-profit organizations, *Say Hey* could be helpful in that some tasks are related to social services. *Say Hey* could attract more otaku users to enroll in the game since the task is low-profile and has limited connection with the society human group. Through this process, *Say Hey* not only increases total users, but also addresses unsolved labor-oriented social services. As for the users, they have more time to communicate with people. For instance, one task might be providing company to senior citizens at local nursing homes.

There are two types of users here. The first group is the targeted otaku. They could gradually fit into the flow of commutation in the reality, as well as bridging the distances between their potential otaku friends. The second hidden group is the group that would be attracted by the novel form of this game, maybe attracted by the benefits of partnership with local businesses; for example, the usage of Yelp. Therefore, *Say Hey*'s user is not just limited in otakus, people who are not otakus also can use this app. Besides, the scale of business will bring huge potential benefits to more cooperation that

can be built between the app and different businesses organizations. And more users means larger benefits to society.

I would bring in more current modes into the future development of this application. For example, by changing the map interface according to each season, so as to keep the virtual freshness to users. Besides this, some thoughts I have are creating items in apps of different themes to encourage users to obtain the physical items. A brief example would be setting different themes in different continents and/or countries, or to publish holiday-oriented, limited versions. After users achieve the object items in the game, they could also purchase the physical items in stores, so as to provide an extended game experience. In terms of developing souvenirs, I would intend to develop products that share same virtual elements, not only to enjoy financial income, but also to promote the app itself.

However, *Say Hey* still remains a game concept, which has certain limitations. I had not yet verified my opinions on business models. In the meantime, local tasks might fail to attract otakus, which will weaken the attraction of the game, even if the game could provide opportunities for otakus to interact with the real world. These need to be proven after *Say Hey* is live.

In a nutshell, *Say Hey* is a simple prototype so far, which will necessitate more effort before its full potential is revealed. This app would solve the needs of otakus meeting friends, as well as bring favorable advantages to local economies and society at large.

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APPENDICES

Appendix A   Paper Surveys

Introduction

Thank you for your willingness to participate in this online survey on Otaku. The goal of this survey is to gather information about your social life. Your responses and opinions will help me learn more about your daily life and needs regarding interpersonal communication and offline activities.

When completing the survey, you will be given a set of questions regarding your life experiences, and you may need to share some detailed information. Feel free to select options or add comments/feedback that you think are appropriate. Also, feel free to add any thoughts or comments as well. You can discontinue the survey at any time.

Please note that any information I collect in the survey will be anonymous and aggregated. Therefore, you and your response will not be individually identifiable within the data set and results.

Before you start, please read the consent form.

Please take a few minutes to answer the following questions to help me understand your background. No information from this survey will be linked to you in any way.

Participant Number: _____

1. Your age: _____
2. Your gender: [ ] Female   [ ] Male
3. Your occupation/major: _____
4. When did you begin to identify as Otaku? _____

Otaku experience questions:

1. Do you enjoy being an otaku?

   [ ] Yes   [ ] No   [ ] Not sure

2. Which option best describes your daily life?

   [ ] Spend a lot time on playing games

   [ ] Turning night into day

   [ ] Can't survive without internet

   [ ] Stay at home as long as you can

3. Which option best describes your friend groups?

   [ ] All net friends

   [ ] Net friends > friends in real life

   [ ] Net friends = friends in real life

   [ ] Net friends < friends in real life

   [ ] All friends in real life

   Others: _____

4. About Loneliness

   [ ] Barely feel lonely

   [ ] Sometimes feel lonely

   [ ] Feel lonely all the time

5. How do you feel about your life style?

   [ ] It is Ok

   [ ] This is not right, but I don't want to change it

   [ ] I want to change but I don't know how to do

   [ ] I am changing my life style

6. About your income?

   [ ] From my parents

   [ ] Parents support part of it

   [ ] Freelance job

   [ ] Full time job

   Others: _____

7. If were hang out with your friends, what is your favorite place?

   [ ] Comic con

   [ ] Game EXPO

   [ ] Offline activities

   [ ] I don't hang out with friends if unnecessary.

   Others: _____

8. Are you willing to meet more people in real life?

   [ ] Yes

   [ ] Yes, but with hesitation

   [ ] Not sure, depends on how to meet them

   [ ] No

9. What would you expect of a social convention app?

   [ ] Help me to meet more people and becomes friends with them

   [ ] Provide chance for me to date with someone

   [ ] Practice my social skill

   [ ] No specific expectation

Appendix B   Heuristic Evaluation

Resource: 10 Usability Heuristics for User Interface Design, Jakob Nielsen, on January 1, 1995

Introduction

Thank you for your willingness to participate in this evaluation on my mobile application. The goal for this evaluation is to do a heuristic evaluate of my mobile application design based on principles I provided and find different user experience and user interface issues. Your response and opinions will help me learn more about my target users' preference and needs, also helps me to refine my current design,

When fill this evaluation, you will be given 10 design principles, and based on each principle, you have to score my design and write problems you found. Feel free to select options or add comments/feedback that you think are appropriate. Also feel free to add anything you encounter with and your thoughts as well.

Please note that any information I collected in the evaluation will be anonymous and aggregated. Therefore, you and your response will not be identifiable from the data and the results.

Before you start, please read the consent form.

Demographic Survey

Please take a few minutes to answer the following questions to help me understand your background and travel experience better. No information from this survey will be linked to you in any way.

Participant Number: _____

5. Your age: _____

6. Your gender: [ ] Female   [ ] Male

7. Your occupation/major: _____

8. What are your hobbies?

9. When do you start to think you are an Otaku? _____

Heuristic Evaluation

Severity Ratings	
Rating	**Definition**
0	No problem (Nothing need to worry.)
1	Cosmetic problem (Have worries, but do not need to do change.)
2	Minor problem (Could be better to do slightly change for this part.)
3	Major problem; important to fix (Should be better to take consideration to redesign this part.)
4	Usability catastrophe; imperative to fix (Must redesign this part.)

Figure 41. Severity Rating of HE

10 Usability Heuristics for User Interface Design, by JAKOB NIELSEN on January.

1. Visibility of system status

The system should always keep users informed about what is going on, through

appropriate feedback within reasonable time.

0 ☐   1 ☐   2 ☐   3 ☐   4 ☐

Problems you find:

2. Match between system and the real world

The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

0 ☐   1☐   2☐   3☐   4☐

Problems you find:

3. User control and freedom

Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

0 ☐   1☐   2☐   3☐   4☐

Problems you find:

4. Consistency and standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

0 ☐   1☐   2☐   3☐   4☐

Problems you find:

5. Error prevention

Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

0 ☐   1 ☐   2 ☐   3 ☐   4 ☐

Problems you find:

6. Recognition rather than recall

Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

0 ☐   1 ☐   2 ☐   3 ☐   4 ☐

Problems you find:

7. Flexibility and efficiency of use

Accelerators -- unseen by the novice user -- may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

0 ☐   1 ☐   2 ☐   3 ☐   4 ☐

Problems you find:

8. Aesthetic and minimalist design

Dialogues should not contain information which is irrelevant or rarely needed. Every

extra unit of information in a dialogue competes with the relevant units of information

and diminishes their relative visibility.

0 ☐   1☐   2☐   3☐   4☐

Problems you find:

9. Help users recognize, diagnose, and recover from errors

Error messages should be expressed in plain language (no codes), precisely indicate the

problem, and constructively suggest a solution.

0 ☐   1☐   2☐   3☐   4☐

Problems you find:

10. Help and documentation

Even though it is better if the system can be used without documentation, it may be

necessary to provide help and documentation. Any such information should be easy to

search, focused on the user's task, list concrete steps to be carried out, and not be too

large.

0 ☐   1☐   2☐   3☐   4☐

Problems you find: