TANGIBLE MOBILE APP STORE DESIGN FOR CHINA’S NEW GENERATION MIGRANT WORKER

BY

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THESIS

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ABSTRACT

China has the largest numbers of Internet users and mobile phone subscribers in the world, as well as the most extensive peacetime internal migration on the planet. Mobile phone uses play a very important role in migrant responses to alienation and discrimination. There are 150 million to 200 million migrant workers in China, 60% of them are the second-generation migrant workers. They support the nation’s manufacturing and industry. The majority of these individuals is poor and is from rural areas of the country. These young people are currently ignored by mainstream mobile device manufacturers, even though this constituency will be a growing consumptive segment in the future. Thus, my research will target the new-generation migrant workers in China, and concentrates on their mobile lives to best develop a tangible mobile devices application store that will improve their mobile experiences.
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CHAPTER 1: INTRODUCTION

1.1 Who are China’s migrant workers?

China has been the world’s fastest growing economy for three decades. This boom has been fuelled by 200 million migrant laborers, who make up 40% of the urban workforce, having moved from the countryside to the cities (Chen, 2010). They are part of the world’s largest peace time migration. They have made a significant contribution to China’s economic boom.

Figure 1.1: The internal migrant workers in China

However, the lives of these migrant labors are restricted. They do not have official permission to work in cities. Therefore they are employed without labor contracts, forced into overtime, poor accommodation conditions, no health insurance, denied holidays and poorly paid. They were typically employed as construction workers, production line
workers, and workers in some service occupations. They are over stressed and do not have sufficient leisure time.

According to a research report of China’s migrant worker, in the early 1950s, People living outside of urban cities were not allowed to move to the cities because of the household registration system, which tied people to their place of birth, and restricted movement between the regions.

Since the early 1980s, when China implemented economic reforms, workers can apply for new permits of living in cities and millions of people from rural areas were pulled into the cities to find jobs and earn money in the cities. At the same time they wanted to take part in the excitement of city life. However, because of the household registration system, the new workers did not become permanent city residents. Whoever leaves the village to go to the city today has to apply for a temporary work and residence permit. That permit is usually one year long and linked to employment. For this reason, they lack the same rights as the urban residents and are excluded from many urban services.

According to a 2009 national survey on China’s migrant workers (“Research report on Chinese migrant workers” 2009), In 1989, there were already about 30 million migrant workers in China. In 1993, the number increased to 62 million and by the end of 2009 to 229.8 million. 61 percent of migrant workers were aged between 16 and 30. Only 31 percent of migrant workers had gone on to further education after middle school. Migrant workers are usually given labour-intensive, low-skill jobs; they make up 58 percent of all
workers in secondary industries, and 52 percent in the tertiary industries. The proportion of migrant workers in manufacturing industries and in construction reached as high as 68 percent and 80 percent respectively.

1.2 Who are China’s new generation migrant workers?
“New generation migrant” refers to those who were born after the beginning of the 1980s. It is a new social group who grew up under China’s market-oriented reforms and the issues relating to the new generation of migrant workers are the continuation, reflection and development of the issues faced by traditional migrant workers.

Figure 1.2: The proportion of workers and college students among migrant workers
Data from the National Bureau of Statistics shows that there are a total of about 130 million new generation rural migrant workers in China. This marks that the new generation of rural migrant workers has amounted up to one half of China's 230 million migrant rural workers in total and they are coming to play a principal role in China's economic and social development. This new generation of migrants is younger (early 20s), more educated (many have completed high school), and more urban (many “young migrant” have actually lived for most of their lives in cities). Consequently, these migrants are more cognizant and demanding of the rights to which they are entitled, including labor contracts, benefits and services to which their urban peers have access, such as healthcare and low-income housing options. Unlike the previous generations of migrant workers who intend to eventually return to their rural hometowns, these migrants want to settle permanently and carve out futures in the cities (Kim, 2010).

Figure 1.3: Faces of new generation migrant workers
Moreover, many of these younger generation of migrant workers in China aspire to move beyond the factory floor to more ambitious careers, such as managers and entrepreneurs. According to a 2010 study by National Federation of Trade Unions Migrant Workers Task Force, 27 percent of new generation migrant workers intend to start a small business, as compared to only 17 percent of traditional migrant workers; and a greater number of new generation migrants are employed as clerks or other higher-level workers than their predecessors.

1.3 Why care about them?
In order to understand the problems of the new generation migrant workers, China Federation of Trade Unions set up a special research group to study on the problems of new generation migrant workers. Their report of “2010 Enterprise Cenozoic migrant workers condition investigation and strategy”, using questionnaire to survey 1000 Enterprises in 25 difference cities and point out the key issues the new generation workers are facing.

_The new generation encounters difficulties not only from the economic pressure but also from insecure legal rights. Only 85 percent of them work with a legal contract, which is 4 percentage points lower than the urban enterprises staff and 68 percent out of the contracts signed do not indicate concrete amount of the monthly income. And 17 percent of them do not hold the official hard copies of the labor contracts. (Li, 2011)_
They change jobs more frequently — 2.9 times the previous generation — and 38 percent of them quit the jobs because "little chance for development."

The social security system seems cater very little to their needs in forms of endowment insurance, medical insurance, jobless insurance, employment injury insurance and maternity insurance, respectively 24 point, 15 point, 30 point, 9 point, 30 points lower than the urban enterprises workers. (Li, 2011)

Report also reflects that 36.5 percent are earning lives in dangerous working environments, such as extreme high or low temperature, noise pollution and power plant pollutants. In addition, there are also problems like not enough professional trainings and insufficient emotional care.

1.4 Why design a tangible mobile app store for them?

China has the largest numbers of internet users and mobile subscribers in the world, as well as the most extensive internal migration. The speed of the penetration of information communication technologies among new generation migrant workers is unprecedented.

According to a research by Pui-lam Law, in late 2007, Shanghai had almost 100 percent mobile penetration rate and Guangdong had 84.3 percent. These cities are the filled with migrant workers. Undoubtedly, the ubiquitous mobile phone and smart phone penetration has a significant impact on migrant workers’ social lives. So mobile phone use and mobility became a new field of research.
The new generation migrant workers have become the most frequent mobile users despite their low income. As a great majority of young migrant workers own a mobile phone, it greatly dominates their lives. Since many of them cannot afford a personal computer, mobile phone becomes the only device that brings them information.

Ngan and Ma from City University of Hong Kong did a research in Dongguan in 2008, result show that in addition to using their phones to make phone calls, they would also use mobile phone internet services (36.27%), receive e-mails (21.61%), and search for information on internet (35.59%). This shows that the use of mobile phone is widespread among young migrant workers.

Mobile applications services are widely popular in China in recent years, but most existing services are designed for college student, white collar and business people. Due to the high rate of mobile internet fee, migrant workers cannot enjoy the convenience brought those mobile services. They choose to download apps and media such as music, e-books and videos to computers before they transfer to their mobile phone. There are two problems under such circumstances. First, it is difficult to find the mobile resources on the internet. Second, users cannot easily update their mobile resources very often since many of them do not have personal computer.

Upon the literature review and background investigation, there are many small stalls and shops providing services like downloading mobile phone images and music, as you can see in the figure 1.4. Those businesses owners just need a computer and some mobile
resources to start, and they were making a lot of money. This phenomenon proves the needs of migrant workers. Therefore designing a tangible mobile app store became essential for them.

Figure 1.4: Downloading service on the street (Zhang, 2007)
CHAPTER 2: IDENTIFY THE OPPORTUNITY

2.1 Design process

The process of this design project is followed by Jonathan Cagan’s user-centered integrated New Product Development (iNPD) method. The user-centered iNPD process includes four phases: Identifying the Opportunity, Understanding the Opportunity, Conceptualizing the Opportunity, and Realizing the Opportunity.

<table>
<thead>
<tr>
<th>IDENTIFYING OPPORTUNITY</th>
<th>UNDERSTANDING OPPORTUNITY</th>
<th>CONCEPTUALIZING OPPORTUNITY</th>
<th>REALIZING OPPORTUNITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHOD: Translate SET Factors into POGs</td>
<td>METHOD: Qualitative research establishing value opportunities</td>
<td>METHOD: Ideation based on value opportunities</td>
<td>METHOD: Detailing</td>
</tr>
<tr>
<td>GOAL: One Opportunity</td>
<td>GOAL: Holistic Product Definition</td>
<td>GOAL: One concept</td>
<td>GOAL: Refined Product Proposal</td>
</tr>
</tbody>
</table>

Figure 2.1: The process of this design project

In the phase of identifying the opportunity, the goal is to develop a significant number of potential Product Opportunity Gaps (POGs) and choose the most appropriate one. The result can be an initial scenario and the identification of potential customers. The methods in this phase is using a variety of qualitative methods for identifying and selecting an appropriate opportunity, such as scanning social, economic and technology factors (SET factors) to identify POGs, brainstorming and weighted matrices.
2.2 Analyze the “SET” factors

“SET” factors refer to social factor, economic factor and technology factor. As a dynamic analysis tool, SET factors map the continuing changing context in social, economic and technology aspects. Scanning the evolving state of these factors helps identify product opportunities. It can be done through secondary sources such as current popular press and newspapers, specialized magazines, and technical journals. Discussions with primary sources can also be revealing along with individual insights. Based on initial research, the author listed the changes that take place in SET, which triggers the opportunities as below:

![Figure 2.2: Social, economic and technology factors and product opportunity gab](image)

2.2.1 Social Factor:

- New emerging social group
- Work as none-skill or semi-skill workers
- Employed without legal contract
• Forced into overtime work
• Denied holidays
• Poor accommodation conditions
• Rent apartment in group
• Relatively low education level
• Seldom recreational activities

2.2.2 Economic Factor:
• Poorly paid (lower than local minimum income)
• No paid vacations
• Expensive apartment rent
• Spent 20% monthly expense in mobile phone
• Expensive mobile internet data fee
• Work without health insurance

2.2.3 Technology Factor:
• Do not familiar with digital products
• Most using featured phones – mobile phones that can listen music and watch videos
• 3G network and WiFi are not popular in China
• More and more mobile phone applications
• More and more mobile phone games
• Popularity of music mobile phone

• More and more mobile multimedia resource

2.3 Discover the product opportunity gap

The process of analyzing SET factors to identify a product opportunity gap is a step to further identify and narrow opportunities as well as help defining the product features. The five possible directions generated from there are what fill the Product Opportunity Gaps. They are policy improvement, education, entertainment, social activities and enhancement of communication. Those five directions need to be weighted from a comprehensive perspective in the next step.

Figure 2.3: Process from SET factors to product opportunities

The result of understanding the evolving state of the SET factors is the identification of Product Opportunity Gaps. These POGs specify all major paths that might take in developing a product.
The goal of this phase is to generate as many opportunities as possible in a short amount of time, to filter the ideas down, and then to investigate each to enable the generation of an initial scenario. The generation of ideas merges initial SET factors analysis with structured ideation. Techniques of brainstorming and ideation are used to generate ideas (Cagan, & Vogel 2002).

By analyzing SET factors, 25 initial product opportunity gaps were identified as seen in Figure 2.4.
Figure 2.4: Identify product opportunity gaps by analyze SET factors

In order to filter the POGs down to a more meaningful number, the list of 25 initial POGs were classified and organized. As seen in Figure 2.5, five possible directions are generated from POGs.
From SET to POGs, the list of POGs must be filtered down to a meaningful numbers.

The initial filter was a combination of common sense, an understanding of the potential resources that might be available to generate useable and desirable product. Those selected opportunities are accommodation assistant, economic apartment, entertainment activity, media consumption, application store, and game store.
2.4 Weight product opportunities

After filtered down the POGs into 6 reasonable opportunities, each opportunity was judged by basic criteria such as time and financial resources, the potential for a useful, usable and desirable product, the potential market size, potential contribution from each member of the team, potential creativity in solving the problem.

This project use weighted matrix to help filter those 6 ideas down further. Each column of the weighted matrix represents an opportunity and each row represents criteria used to judge the opportunity. Each opportunity is rated from 1 (low) to 3 (high) in each category.
Each row can be further weighted from 1 to 3 as to the relative importance of that category versus another. After each opportunity was rated, its value was multiplied by the weight for a given row. Columns are then summed to give an overall numeric value for comparison. The opportunities with the higher values are the ones with more potential.

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>time and financial resources</td>
<td>1</td>
</tr>
<tr>
<td>potential for useful, usable, and desirable product</td>
<td>3</td>
</tr>
<tr>
<td>potential market size</td>
<td>2</td>
</tr>
<tr>
<td>potential creativity</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ATTRIBUTES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>easy to use</td>
<td>3</td>
</tr>
<tr>
<td>functional</td>
<td>3</td>
</tr>
<tr>
<td>stylish</td>
<td>1</td>
</tr>
<tr>
<td>maintain self-esteem</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Accommodation Assistant</th>
<th>Economic Apartment</th>
<th>Entertainment Activity</th>
<th>Media Consumption</th>
<th>Application Store</th>
<th>Game Store</th>
</tr>
</thead>
<tbody>
<tr>
<td>time and financial resources</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>potential for useful, usable, and desirable product</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>potential market size</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>potential creativity</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>total</td>
<td></td>
<td></td>
<td></td>
<td>55</td>
<td>57</td>
<td>26</td>
</tr>
</tbody>
</table>

Figure 2.7: Filtered down the opportunities

After weighted the opportunities, two opportunities are selected for further research, media consumption and application store. After further investigation, the mobile
application store which provide media resources for mobile phone was considered as the best opportunity for its potential for a useful, usable and desirable product.

2.5 Describe product opportunity

At the end of this phase, the team generate a description of a product opportunity and a scenario. The product opportunity is to improve the new generation migrant workers’ mobile phone downloading experience.

The scenario that related is as follows:

Ken is a 20 years old migrant worker who lives in Beijing. He spends 20 percent of his monthly expense on the phone, but due to the growing demand for mobile music, games and the rise of the mobile internet data fee, he no longer afford to download resources to his phone directly from mobile internet. So he have to use to his friends’ computer to download music and games and then transfer them into his phone. He doesn’t always want to bother his friends and was very depressed about it. He cannot enjoy listening music and playing games on his phone any more.

The product is to help those new generation migrant workers like Ken who have high demand for mobile resources but have trouble to get them. They are the core target group. Review of the literatures were focused on this group’s mobile behavior and lifestyle. The expert advisors for this porject are social sientist who
focused on new media technologies and China migrant workers. It is also important to know about their daily activities and interests.

This scenario above identifies details of the product opportunity:

- **Who:** New generation migrant workers in China
- **What:** Leisure, Information, Connecting, Learning, Playing, Expression
- **When:** Spare time, Work time
- **Why:** Boring, Overwhelming, Eager to learn
- **Where:** at home, in the convenient stores, in restaurant
- **How:** Cable, WiFi, RFID
- **How much does it cost:** 5 yuan 30 songs, 2 yuan a movie

Through the scenario, the author had more clear directions of where to look for gaining a better understanding of how a product may improve this situation. However, there is still no clear sense of what the product might look like, how it going to work, and what material it would be made out of. The opportunity statement and the scenario will continue to evolve.
CHAPTER 3: UNDERSTAND THE OPPORTUNITY

3.1 Methods

The goal of this phase is through primary and secondary research to create an understanding of the value opportunities, and translate the value opportunities into general product criteria. The results include a set of guidelines that help to take actionable insight and turn them into product concepts, an in-depth understanding of the user, further developed scenario and a list of product characteristics and constraints.

The Methods for obtaining and analyzing information from core market, expert users and advisors include primary research and secondary research. In the primary research, interviews and task analysis helped to study ethnography and product features. During the secondary research, lifestyle reference and business model analysis will be implemented to help understand details of the product.

In this phase, the author interviewed a group of new generation migrant workers and reviewed some literature about target group. The goal is to develop a model of behavior that reflects an understanding of the lifestyle and relevant activities of the migrant workers. The author modeled the experience that a new generation migrant worker downloading music in a convenient store after work.

In addition, an understanding of how the service would be purchased is also important. In this project, studying how new generation migrant workers download determines how to
make the product useful. Understanding the aesthetic needs of the young migrant workers helps to frame out the issues of desirability.

3.2 User Interview

Understanding the user is very important in understanding the opportunity. You have seen the overall introductions of the target group in Chapter 1. In this section, the interviews went deep into the lifestyle of the user and overall target user experience. 20 new generation migrant workers were selected for the interview. 30 percent of them were in construction industry, 30 percent were in manufacturing industry and 40 percent were in service industry. They all located around the city of Beijing. The interviews were taken through phone calls. The interview questions are as follows:

- What digital devices do you use to get information?
- How long do you use internet everyday?
- What do you use internet for?
- What mobile phone do you currently use? How do you like it?
- Do you use mobile phone to get online? When and for what?
- What is the things that frustrates you most when you use mobile internet?
- Do you go to internet café? How often and for how long?
- If you go to the internet café, how much money do you spend on internet café?
- If you go to the internet café, what would you do in internet café? Please list three things you did most. In those three things, what can be done on the phone?
- What functions do you think is essential for your mobile phone? Please list four.
• Do you listen music or play games on your phone? If yes, where do you get them?
• If you can download music and games from your nearby convenient store. Would you like to get them and how much would you feel comfortable to pay?
• Please list four places you went most after work in the recent two weeks.
• Please list four kinds of entertainment activities you did in recent two weeks?
• How do you get new information?
• Is there anything else you would like to tell me?

Based on the interviews of 20 new generation migrant workers in Beijing, key findings are identified and some insights were come up from there. Figure 3.1 is the key statistics findings from the interviews. In the interview, 60% of them do not have a personal computer, 36% go to internet cafes at least once every 5 days, 21% use the internet every day and 20% of their monthly expense are spend on mobile phone. The list of key findings is shown in table 1 and they are categorized into four groups, user mobile behaviors, problems, user needs and using environment. Eight highlighted key findings in the table 1 helped to identify the product directions in the next step.

![Figure 3.1: key statistics findings from interviews](image-url)
<table>
<thead>
<tr>
<th>USER MOBILE BEHAVIORS</th>
<th>PROBLEMS</th>
<th>USER NEEDS</th>
<th>USING ENVIRONMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making Phone Call, Sending SMS, Listening Music, Taking Photos</td>
<td>The internet speed of cell phone is too slow.</td>
<td>Download music, E-books or video</td>
<td>Located in suburban area where migrant works live</td>
</tr>
<tr>
<td>Music are Downloaded by computers and then copied to the memory card of the phone</td>
<td>The data fee is too expensive.</td>
<td>Need new resources to bring fresh feeling to the phone.</td>
<td>Located in areas near my living or working area, such as convenient store, Shopping malls, Banks, or restaurants</td>
</tr>
<tr>
<td>Music are downloaded from friends' computers or cell phones</td>
<td>Inconvenient to find the data usage</td>
<td>Recharge the phone while connected to the machine</td>
<td>Using the phone during the break of work</td>
</tr>
<tr>
<td>Watching news, Listening music, Chatting on Instant messenger, Playing games</td>
<td>More functions come with more problems. Some software might hurt cell phone memory</td>
<td>Need a well-organized mobile app store</td>
<td>Using the phone on the way home and on bed</td>
</tr>
<tr>
<td>Reading E-books Checking Email Searching</td>
<td>Inconvenient to charge the mobile phone</td>
<td>Besides cell phones, it could also connect with Mp3, Mp4 and GPS</td>
<td>It can be something like ATM machine with a touch screen</td>
</tr>
<tr>
<td></td>
<td>Confused mobile apps.</td>
<td>I hope my cell phone could read and edit word or PDF documents.</td>
<td>There should be someone taking care of it.</td>
</tr>
</tbody>
</table>

Table 3.1: Interview insights
### Table 3.2: Product directions

#### Entertainment Demand
- Use mobile phone to watch news, Listen music, Chat and play games
- Need new resources to bring fresh feeling to the phone
- Providing mobile phone resources such as music, games and videos
- Keep updating the mobile resources and always provide well categorized resources

#### Economical Demand
- The data fee is too expensive
- Inconvenient to find the data usage
- Using wireless internet or internet cable instead of GPRS internet to eliminate the data consuming
- Checking money credit that left in the phone
- Checking the data usage and alert when it almost full

#### Operation Demand
- It can be something like ATM machine with a touch screen
- Inconvenient to charge the mobile phone
- Besides cell phones, it could also connect with Mp3, Mp4 and GPS
- Located in public areas where people need to wait, such as convenient store, Shopping malls, Banks, or train stations
- Kiosk shape with a touch screen
- Charging the mobile phone when you connected to the product.
- Identifying other digital devices such as Mp3, Mp4 and GPS
- Locating in convenient stores shopping stores, shopping malls or nearby his home or working area

3.3 Lifestyle reference

Lifestyle reference is a method that reference to other products, styles and activities from the target market segment. The goal of lifestyle reference is an understanding of what people buy, the context of how people use products, what people value, and what people define as their expectation of quality (Cagan, & Vogel 2002). The basic idea is to identify and surrounded with a snapshot of the customers life, to immerse designer into the world
of user. In this section two mood boards was created to give designer the feel of who the customers are and what he or she wants in a product.

Capture Lifestyle reference is simple, related images can be found in magazines targeting the market segment and internet. For example, Fang Cao magazine is for China migrant workers, Qing Nian Zhi magazine is for post 80 generations and Zhong Guo Nong Min Gong Wang is a website for China migrant workers. From the magazines and websites, products can be identified from feature stories or advertisements.

Figure 3.2: Living status board
Figure 3.3: Mood board

Figure 3.4: Related product trend
3.4 Technologies research

Due to the penetration of mobile technologies in China, the new generation migrant workers become frequent users. Almost all migrant workers have their own mobile phone and most of them use their phone as a very important entertainment device.

As with other social groups, mobile phones offer migrants a tool with which to enhance their ability to control certain aspects of their daily lives. While mobile phone usage cannot change migrants’ overall disadvantageous socioeconomic position, mobile phones are often a tool for alleviating boredom and evading and mitigating the intrusive and over bearing demands of work supervisors. (Yang, 2008)
In recent years quite a large number of mobile resources such as apps, music, and games have been developed and they became very popular. Mobile brands such as Nokia and Apple are rushing to improve their own app stores. For example, Apple has its apple app store for iPhone, iTouch, and iPad, Nokia has its Ovi store for its smart phones. These application stores provide mobile users a lot of useful resources. However, the new generation migrant workers rarely use them because of their featured phone cannot access to the app store. So in this project, a tangible mobile app store that fit all the major mobile phones is needed and it can be created under current technologies such as touch screen, cable connection and WiFi. It is a feasible, valuable and applicable product that will help new generation migrant workers who do not have iPhone or smart phones to enjoy the pleasure brought by mobile resources.

3.5 Business model analysis

After the primary and secondary research, the business model have been defined and compared with the current Apple’s business model. Apple app store involves a catalog of well-designed applications, games, and utilities. It has been a large success for Apple, developers, and the users. The developers get an easy way to reach users, and the users are just get high quality applications from there. In this business model, customers get apps and contents from app store and pay for them. However, in order to visit the app store online, users have to get an Apple ID and have to pay by credit card. In China, this business model has certain problems.
The Apple app store’s business model never works well in China, especially for new generation migrant workers. First, most of the mobile apps and contend are designed in English and there are not enough resources for Chinese users. Second, users must have a credit card to use the app store, while many of the users do not have a credit card and unable to use them. Third, migrant workers rarely use iPhone because their low income cannot afford it. So they cannot enjoy the convenience brought by the app store. As you can see in the figure 3.7, the tangible app store business plan is to allow customers to pay for shop owner by either cash or credit cards so that the customers of the tangible app
store do not have to use credit card or use a specific mobile phone. This brings a lot of convenience for new generation migrant workers.

![Tangible app store business model](image)

Figure 3.7: Tangible app store business model

3.6 Product definition

At the end of this phase, the product opportunity statement was clearer and the scenario was developed further.
Ken doesn’t have personal computer and most of his leisure activity is using mobile phone to listen music and play games. Because of do not have credit card, he cannot go to any online app store. Also the inconvenience of slow mobile internet speed and the expensive mobile phone data fee limited his leisure experience. He also feel it is difficult to find the mobile resources that fitted to his phone. A device is needed that will help him get access to the mobile internet and mobile resources. The device would look like a self-service kiosk that located near his home or working area.

The product opportunity statement has been improved as follow.

The product will work as a self-service kiosk that is to help new generation migrant workers like Ken downloading mobile phone resources such as music, games and apps. The device would be located in convenient stores, shopping malls or supermarkets which nearby the new generation migrant workers living or working area. Because large number of new generation migrant workers use mobile phone that doesn’t have WiFi, it must have the function of cable connection. The product must also provide well categorized mobile resources for target users.

The criteria for this product was generated and summarized into the following product specifications.
1. The product acts as a tangible mobile app store

2. The basic function of the product is to download music, video, games and other applications to mobile devices include mobile phone, mp3, mp4, GPS.

3. The targeted users are internal migrant workers in China who have a relatively low education level and less entertainment.

4. The product is located near suburban residential areas or factory areas in convenient stores, supermarkets, banks or restaurants.

5. The product would be modular designed. It can be hung on the wall, put on the table and can also stand on the ground.

6. The product would provide three basic categorizes: application store, game lobby and media center.

7. The function of the product would also include personal music recommendation, and recharging the mobile device.

8. The styling features are user friendliness, clean designed and durable.

9. The major competitors are the local music download stall in the street and online application stores.

10. The product should be used in indoors and should have people in charge of it to provide instructions and prevent malicious damage.
CHAPTER 4: CONCEPTUALIZE THE OPPORTUNITY

4.1 Concept generation

After filtering down different ideas generated by brainstorm, the author designed several alternative concepts that can directly or indirectly meet the criteria set up in the last phase. Each alternative concept was visualized by sketches and was listed below:

4.1.1 Alternative concept I

![Alternative concept I](image)

Figure 4.1: Tangible mobile app store alternative concept I

The first concept is a desk device that can connect multiple phones by cable. There are stretchable cables that fit for most main stream mobile phones on the edge of the device.
There is no screen on the device and all the operations should be finished on the mobile phones. It can be used in local convenient store, restaurants or internet café.

This alternative concept has the advantages of being small and convenient. It can be easily placed in a compact space such as a convenient store, and each store could have several devices to serve customers at the same time. In addition, this design is not complicated and will effectively reduce the manufacturing cost. However, the disadvantages of this design is that it is not easy to operate since there is no screen on the device, all the operation have to finished on the users’ mobile phone.

4.1.2 Alternative concept II

Figure 4.2: Tangible mobile app store alternative concept II
In this concept, the device has individual block for each category. For example, in one block, you can download music, and in another block, you can download games. In this way, a user can easily find what they want. The device is hanging on the wall, and is big enough to allow several people to use it at the same time. The advantage of this concept is that those individual blocks clearly communicate to the customers of what the device can do. Also the device is large enough to catch people’s eyes that will help bring more users, while the drawback to this design is that the process of downloading is complicated when the users want to download different resources since they have to unplug from one cable and plug into another.

4.1.3 Alternative concept III

Figure 4.3: Tangible mobile app store alternative concept III
This tangible app store concept is a standing device with a touch screen similar to that of an ATM machine. The users can use cable or WiFi to connect with this app store to download mobile resources. The users can search and browse mobile apps by the touch screen. The small table under the screen provides a place for users to rest their hands when they hold their phones.

In this method, the product does not only meet the users’ expectations but also offers flexibility in installation locations because it does not have to be put on a wall or a table. And it has the potential of being modular designed. It can be hung on the wall, put on the table and also stand on the ground. The drawback of this concept is that only one person can use it at each time. Users have to stay in line to wait for it.

4.2 Form development

Based on the alternative concepts discussed above, form development was conducted. Started by sketching different standing kiosks, several concepts were selected.
Figure 4.4: From development

Figure 4.5: From development
After sketches, a quick sketch model was built to help develop the form. The scale is 6 to 1 and it is made by medium-density fiberboard. As you can see in figure 4.5, the model cannot work and some details were ignored. However it is clean and simple. The purpose of this sketch model is to understand the proportion the product. The details will be developed later.
Figure 4.7: Sketch model

Based on the sketch model, a full scale model was developed to study the scale and the dimension of the design. It also helped designer to understand the interaction between the user and the product. As you can see in figure 4.6 below, the model is made by foam board and it is 5’1” tall and 1’8” wide. The height of the screen can be adjusted to a suitable position by moving the slot on the back. One problem of this model is that the screen is not easy to read because it is vertically placed. In the further development, the design of the screen needs to be modified so that users can read comfortably. A hinge on the back of the screen can be applied to adjust the angle of the screen.
Figure 4.8: Full scale model

4.3 Design solution

4.3.1 Storyboard:

This is a storyboard of using the tangible app store. When user gets to the app store, the first thing is to drag out the cable that fit his or her mobile phone from the box under the
screen. Then plug the cable in the phone. After connected, use the touch screen to search for favorite music or apps. When find the resources, download them to the device, disconnect it and enjoy the new music and apps.

Figure 4.9: Storyboard

4.3.2 Modular Concept:
The product has two individual parts. As you can see below, the screen and the table works together as the top part and it can be disassembled from the standing part. In this way, by simple adjustment the product can be hung on the wall, put on the table and can also stand on the ground, as shown below
4.3.3 Features:

The basic function of the product is to download music, video, games and other applications to mobile devices including mobile phones, mp3, mp4 and GPS. It uses cable to transfer data, so it is quicker than wireless or 3G internet. The product will provide three basic functions: application store, game lobby and media center. The application store is where you download utilities or social networking apps. The game lobby is where you download mobile games. The media center is where you download music, videos and E-books. The functions of the product also include personal music recommendation and recharging the mobile device. After you first use this app store, the machine will keep record of your using history and guess your personal interest. When you use it next time, it will provide resources that you might be interested in. In addition, the product is modular designed. It can be hung on the wall, put on the table, as well as
stand on the ground. This tangible app store would stay indoors and would have people take care of it to provide instructions and prevent malicious damage.

Figure 4.11: Product features
4.4 Product dimensions

After the design solution was developed, research was conducted to study human factors and tangible app store’s dimensions. Figure 4.11 and 4.12 shows the measure of man and woman.
Figure 4.13: The measure of man (Tilley, 2001)

Figure 4.14: The measure of woman (Tilley, 2001)
Figure 4.15: The dimension of the tangible app store

Figure 4.16: The dimension of the tangible app store
CHAPTER 5: EVALUATION

5.1 Self-evaluation

After the product development stage, the design was evaluated with the full size model made in Chapter 4. This phase includes 3 steps, self-evaluation, user-evaluation and future research. In self-evaluation, some practical types of justification were conducted concerning value proposition; market size, timing, and positioning.

From Wikipedia, developing a value proposition is based on a review and analysis of the benefits, costs and value that an organization can deliver to its customers, prospective customers, and other constituent groups within and outside the organization. The six stages to analyze the value proposition in this study are as follows:

1. Market: new generation migrant workers in China
2. Customer experience: the experience of downloading mobile resources in a tangible app store
3. Offering: a unique mobile downloading experience that is not limited by mobile phone types and mobile data expense
4. Benefits: new generation migrant workers will drive the mobile media service to a greater market
5. Differentiation: the new market will expand the mobile media service
6. Proof: the existing local mobile music and game download stall in the street have already prove the concept
5.2 User-evaluation

After self-evaluation, the design was brought to target users for user evaluation. Liu was one of the interviewees in the previous phase. She participated again in this stage to help the author get feedback of the new product’s usability. She has been in Beijing for 2 years and works as a waitress in a restaurant. She uses mobile phone a lot to play games and listen to music. She mentioned that she would like to use the product if it is available, because the product can not only provide resources to her mobile phone but also reduce her mobile phone bill and save money. She likes the idea of putting the devices in convenient stores or supermarkets, because she goes there every day after work. During the break of working hours, she and workmates usually play games on their phones or just sleep. The product would bring more leisure and entertainment to them. She was also concerned about whether she needs to wait in a long line or not. Another interviewee Jun was a delivery man, he said he would like to use the product, because it would provide new music to his mobile phone and Mp3. He mentioned that the most frustrated thing of using mobile internet is the slow speed. The product can help him download resources faster. He was also concerned whether the device can bring virus to his mobile phone or not. If the device can provide antivirus function, he would love to use it.

5.3 Future research

In this project, the author attempted to explore a solution to solve the problems of new generation migrant workers in China. The key point in this project was to use design method to find the users’ needs. The design here is still at a rather rough and conceptual stage. Many details were not fully developed. To make it into production, more development on the product detail is needed, especially in the user interaction design area.
Also, due to the limited time of this project and my capability, I omitted the software interface and a full working prototype.

The purpose of this project was not only to design a product for the new generation migrant workers, but also to evoke thoughts and inspirations. There is still much more can be done to improve new generation migrant workers’ lives.
CHAPTER 6: CONCLUSION

In rural China, migrant workers have left their hometowns and flooded into cities seeking to improve their social and economic life. This migration exposes them both opportunity and unfamiliar environments. Under such circumstances, mobile phone uses play a very important role in migrant responses to alienation and discrimination. Through exploring Chinese young migrant workers’ mobile behavior in daily lives, the author found that leisure was the biggest issue for most young migrant workers. The tangible mobile application store can help migrant workers to gain more leisure and multimedia entertainment. According to integrated New Product Development process, the project went through SET analysis, product opportunities identification, user interview, lifestyle references, technologies research, business model analysis, ultimately leading to the concept generation.

A summary of the major values of this thesis are as follows:

a. New generation migrant workers living in big cities complain that they do not have convenient ways to download mobile resources. Slow mobile internet speed and expensive data fee limited their mobile experience. This thesis provides a solution to these problems by providing a tangible mobile app store device located in local convenient stores.
b. This thesis is in accordance with the rigorous iNPD process, through five chapters start from background introduction, identify the opportunity, understand the opportunity, all the way to conceptualize the opportunity and design evaluation. It set up an example of using iNPD process as a design methodology when developing new products.

c. The apps, music and games in mobile phones provide the migrant workers with endless entertainment. In addition, those mobile resources allow migrant workers to relieve the pressures of work and passively challenge the power hierarchy in the modern regime. Therefore Mobile phone use has been deeply integrated into their daily lives. This thesis not only creates one solution to improve their mobile lives, but also can be used to help inspire more design and services for young migrant workers.

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