Stage 3
Improve the publicity stage
in the earthquake early warning system in China

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Stage 3
Design Research Project

This time I try to do a project individually with some design tools and methods. And also with the help of my tutor and peers.

It is more complicated than I expect before. Compare to the group project, this time, I have to use more time to get in touch with different groups of people. And I have to make most of the crucial decisions in my project on my own.

It is quite challenging, but I enjoy this process much.

And here, I would like to share my project process with you. I hope you can enjoy it!
Contents
What is the general process of my project?

1. What are the current situations?
   - Why I focus on "earthquake escaping" situation?
   - What are the current problems?
   - Why are these problems exist?

2. How can I feed their needs?
   - (Use analogy) Explore "Why people don't follow experts' advice?"
   - (Insights) What are the users' needs?
   - Brainstorm to get ideas
   - Which idea can work better?

3. Final output
   - Develop the final idea
   - Prototype and test the idea

...
Chapter 1

What are the current situations?

Find the users’ needs through exploring the current situations

1.1

Why I focus on “earthquake escaping” situations?

1.1.1 Choose “alarm system”

In the beginning, I had four ideas.
[1] the alarm system
[2] following effect
[3] travel

I had to choose one of them.

To do this, I started to do quick desk research on these four ideas. As you can see in the picture, I found more information about the alarm system.

So for me:
[1] the alarm system – interesting
[2] following effect – once do it
[3] travel – many exist projects
[4] COVID-19 – many people may do this topic

So why not focus on something exciting and unique?

Therefore, I decided to focus on “the alarm system”.

Quick desk research on the four ideas
1.1.2 Choose "earthquake escaping"

The reason for choosing the "earthquake escaping" from "the alarm system" was much more manageable.

[Fire alarm]
I explored this topic from my own experience – the fake alarm in the student accommodation. After I did some desk research, I found two kinds of warning: one is temperature-based, the other is smoke-based. Due to the price and the installation year, most fire alarm in the student accommodations are smoke based. The temperature-based are recommending to use in the kitchen. I knew it was still an exciting topic, but for me, it became less attractive.

[Earthquake escaping]
"Earthquake escaping" is also a topic which I got from my own experience. I am from an earthquake-prone area. There is an earthquake alarm system in my hometown. But as a user, I felt it sometimes not that helpful.

I would like to explore:
Why I feel the earthquake alarm system is not that helpful?
Is it my bias or real problems?
...

So I chose the "earthquake escaping" as my topic.

Earthquake Early Warning System (EEWS) uses science and technology to alert devices and people before the shaking waves generated by an earthquake arrive at their location.

What is EEWS? 

The parts and stages of EEWS [1]

Part: Science 
Stages: Monitoring + Analysing

Part: Publicity 
Stages: Education + Warning

Which country has this system?

Japan, Mexico, China...

Why EEWS is important?

Save times, save lives [1]


1.2.2 The problems of EEWS

1.2.2.1 The desk research and findings

Based on desk research, I felt maybe the problems of EEWS in China, including:

[Warning]
The frequent alert in the earthquake-prone area gives people a false sense of security. Because the EEWS is a sensitive and automatic system, people who live in the earthquake-prone area can sometimes receive the earthquake warning several times a day. But usually, the earthquakes are not significant, and they don’t need to take any action. It sometimes may lead to a “Wolf Is Coming” situation. People may not take any action when they receive the warning without checking the warning information carefully.

[Education]
People lack earthquake escaping skills[1]. For new residents, the situation even worse.

These are my guess, based on desk research. I cannot make sure these findings are right or wrong. But these true can give me some ideas to start my design research.

1.2.2.2 Compare the EEWS in Japan and in China

After knowing the general information about EEWS and gathering some “findings” from that, I start to explore more about the detail[what kind of service do EEWS offer to the public: through which way? Which group of people do the cover/…].

During the desk research, I found many news and report said that the EEWS in Japan is one of the best EEWS in the world. So I decided to explore through comparison.

<table>
<thead>
<tr>
<th>Warning</th>
<th>Provider</th>
<th>Way</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>ICCL Chengdu Hi-Tech Institute for Disaster Reduction</td>
<td>offline notice/TV/phone/apps</td>
<td>Chinese</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>Formal</th>
<th>Informal</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>in school</td>
<td>book, museum, Life bag, apps [1]</td>
</tr>
</tbody>
</table>

| Compare | China-lower frequency and only after 2018 | Japan: enough offline education+good publicity |


Through these two diagrams, I found:

[Warning]
The platforms that the two countries use are quite similar. But Japan does divide users into different kinds of groups. As people from diverse backgrounds may have different needs, do like this may be more helpful.

[Education]
Formal education is the foundation, informal learning can strengthen people's memories and cover people who have not received formal training.

The earthquake escaping education in Japan start from many years ago. The adults, even the older people, all once receive that. But in China, the full range of earthquake escaping just began after 2008. So this may be the reason that many adults don't know much about it.

1.2.2.3 Questionnaire

Now I had lots of guess and inferences of the problem of EEWS’s public service. I cannot say these are right or wrong based on my understanding. Therefore it was time for me to get in touch with my users. I wanted to know my current findings are right or wrong, so I chose to do a questionnaire to get more answers to the same problem.

How did I start the questionnaire?

People's feeling in earthquake
Which kinds of earthquake did you once experience?
What did you do at that time?
Why did you do that?

People's feeling about EEWS’s warning
Have you once receive the warning?
What did you do? And why?

Receiving earthquake escape education
Which kinds of education did you once receive?

How many people answer it?
Completed: 141
Answer rate: 47%
Average time: 0m56s

Through the results of the questionnairne, I found:

[Correction of my bias]
The quantity of earthquake escaping education may is not the problem
Before I did the questionnairne, I thought the lack of knowledge was a reason for poor dealing with earthquakes escaping. But after the survey, I found many people once received the earthquake escaping education, and some were formal ways, some were not.

[New finding]
The quality of earthquake escaping education may is the problem
Why didn’t the previous education work?
Why don’t people follow the advice from experts?
Many people said they once received the earthquake escaping education, but many chose the wrong answer when asking them what to do when the earthquake happens. It can show that training was not that helpful.
1.2.3 Summary of EEWS’s problems


[2] Adult lack earthquake escaping skills. The previous education didn’t work. People don’t follow the advice from experts.

My feeling for this part

I feel this part is the real start of my project. Some design tools, such as comparison and questionnaire I hadn’t use for a long time, some of them did help me to gather useful information. I could not believe some problems which I guessed before were not the problem. But that’s fine. Because it is better to move my bias away early in the project. And I also found the questionnaire is not a suitable tool to ask the profound question. So in the next step, I’d like to use other ways to explore the ‘why’ behind the problems.

1.3 Why are these problems exist?

1.3.1 The desk research

I started to explore “why” with the second problem: Adult lack the skills of earthquakes escaping. And luckily, I got some idea of exploring it from my tutor at that time.

My Tutor

“It sounds related to the informal education to adults. And the don’t follow experts advice on quite similar to what happen recently.”

Then I started to do the desk research again, especially on informal education. And I feel that there is no need to show all my research process, so I summarize what I gain from this term desk research in this diagram.

My feeling for this part

I had to explore a new field, and I didn’t know what I can gain from it. And I found lots of essays were not related to my focus after I read it. But I also found that even though the topic itself is not connected, the idea and logic inside may be the same. Therefore I felt this research experience also gave me a new way of during design research.

1.3.1 Get in touch with the stuff

After gaining some useful information, I need to figure out whether the information I found was handy. I cannot use my subjective understanding to conclude. So it’s time for me to meet some experts.

**E1**
A stuff from Sichuan Disaster Prevention and Mitigation Education Museum

**ME**
Interviewer

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**ME**
A designer in China
(public service & education)

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**Interviewer**

“What kind of disaster prevention education do you mainly provide to the public?”

“Sichuan based. we mainly provide earthquake escaping education, also include fire, flood, etc. the education ways: exhibition, interaction experience, practice.”

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**Interviewer**

“Who are your primary users?”

“The museum is open to the public. Considering the safety issues, we only accept group visits, and groups of more than 15 people are acceptable. The registered groups are generally: teachers and students, fire brigade, hospital staff, etc.”

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**Interviewer**

“Can I know the Difficulties in carrying out disaster prevention education for ordinary adults?”

“The disaster prevention education provided to employees in companies is mostly conducted through lectures. It is tough to impress, not to mention use in emergencies.”

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**Interviewer**

“In fact, most adults have learned about earthquake escape from TV reports and the Internet. What they need maybe someone to help them identify the correctness of the escape knowledge. Besides, knowing that there is a big difference between the escape method and the actual use, simulation of the real scene is a good method.”

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Some Q&A between me and the staff

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1.3.2 Get in touch with the designer

**E2**
A designer in China
(public service & education)

“The earthquake is a natural disaster. It is a very extreme situation. The efforts of professionals in the field of the earthquake are more needed now. In other words, it is hard for us to design something without a mature technical foundation. For now, earthquake disaster prevention, there are still many flaws in technology development.”

“It hasn’t reached the point where designers can step in to optimize.”

“I would suggest: based on these findings so far, use the idea of case study to analogize similar situations.”

“Broaden the setting of the scene and narrow the target group.”

Designer’s suggestions to my project

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1.3.2 Summary

Then I did a quick summary about what I had at that time. And try to figure out what are the problems that I’d like to explore more.

**Warning**

1. false sense of security

**Education**

1. the previous education didn’t work
   -- people who leave school before 2008 haven’t receive this education
   2. haven’t practice these skill for a long time

2. don’t follow experts advice
   -- the conflict between people’s behaviors and experts advice

The problems + “why”

Compare to <false sense of security> <the previous education didn’t work>, the final one <people don’t follow experts advice> is still abstract. So I felt I need to continue to explore it.
1.4 Explore "why people don't follow experts' advice?"

1.4.1 Fail to explore it directly
At first, I tried to explore it under the earthquake topic, but I then failed. The reasons were as follow:

[for get in touch with users]
earthquake is an extreme situation and is not an on-going situation.
It's difficult to let users recall what they did and why they did that in an emergency situation which may happen several month ago.

[for get in touch with experts]
people from government or are the real scientists
They have to work during the working time.
When they are off work, I can’t contact them through the institutional phone number.

The reasons that I failed to explore this problem directly

1.4.2 Analogy
Therefore, I needed to find another way to explore this problem. And I cannot remember clearly about the stuck and lost situation at that time. But finally, I found an idea which I once used in the product design field - analogy[1-2].

The methodology – Analogies
Building Empathy with Analogies; Generating Ideas with Analogies; Transfer findings through Analogies.

1. Earthquake scenario
2. Transfer
3. Some “findings”
Check and develop

My understanding of Analogy and How I use it

1.4.3 The process to find another scenario
1. People don't follow experts advice. So which kind of advice do people follow?

2. Many people do follow the advice from WeChat articles

3. People do share lots of rumors through that. And it is also a situation that people don't follow the advice from real experts

Find the scenario

1. Can I use "many people share rumors through foward WeChat articles" to explore "people don't follow experts' advice?"

2. Let’s check it!

3. I think I can use "many people share rumors through foward WeChat articles" to explore "people don't follow experts advice!"

Check the scenario

1.4.4 Use "people share rumors through forward WeChat articles" to explore "people don't follow experts' advice"

1.4.4.1 Get in touch with people - to know why people share these articles

[interview]

U1  University Student  
24-year-old

U2  Hospital Chemist  
35-year-old

U3  Company Accounting  
49-year-old

U4  Engineer  
44-year-old

to know do they share these rumor articles, if share, why do they share?  
to know how do they know these articles are right.  
to know how they feel if others tell them articles are rumors (what do they do after that)

The detail of interview

[meet experts]

Have a related WeChat public account  
<moment for middle and early old age people>  
Try to reduce sharing rumors situation

The staff from AgeClub  
<service company focus on old people in the next 10 years>

to know the characteristics of this group of people  
to know why people do this  
to know the method that experts once try to improve the situations

The detail of meeting experts
Gain from interview

1. Solve problem rely on themselves
   a. Own privacy
   b. Old enough to solve problems

2. Solve problem rely on their experience
   a. It usually work
   b. Use what I learned to pass the exam

3. Rely on experience > Search on the Internet > Ask others
   a. Less embarrassing
   b. Easier to find the answer
   c. Cause less time

4. The reason of continuing sharing
   a. Not harmful to body
   b. It may help

Gain from meeting experts

1. Middle and early old age people usually do this.
   But some young people also do this.

2. Good at self-learning
   Can use computer/ phone well

3. Trust friends
   Prefer group activities

4. It is hard to change their behaviors
1.4.4.2 Timeline checking through user journey map

To make sure I didn’t miss the important findings through a timeline checking

Gain from user journey map

[1] don’t notice
   People don’t notice they are doing things in a wrong way

[2] don’t check
   Haven’t check the information is right or wrong before they sharing it
1.4.4.3 The findings from "share rumors through forward WeChat articles"

After gathering the findings from desk research and people, I started to organize them in a diagram based on the “stakeholder map.”

In the previous projects, it was ok if my findings were not related to my original focus. Because it may give me some new ideas, and let me look at my project from another side.

But this time, “people share rumors through forwarding WeChat articles” is just a scenario I use to explore the problem “people don’t follow experts’ advice.” So this time, I need to pick the findings related to the question “people don’t follow experts’ advice.”

1. They don’t know they are doing things follow the wrong advice

2. Within a short time limit, they don’t know how to do things correctly

3. They think they still can have a good result even if they don’t follow the advice from experts
1.4.4.4 Transfer the findings back to the earthquake scenario

There was no more design research in this part—just a quick transfer of the findings back.

1. They don't know they are doing things follow the wrong advice
2. Within a short time limit, they don't know how to do things correctly
3. They think they still can have a good result even if they don't follow the advice

findings of “people don’t follow experts’ advice”

1. They don't know they follow the not suitable advice
2. They don't know how to escape within a limited time
3. They think ways which they used to escape are suit to other situations

the ideas of earthquake scenario

1.4.4.5 Check and develop the ideas

Of course, the ideas which I have no cannot be called findings. I still need to check them: can they be the real findings? Therefore, I decided to do some interviews.

Because there’re more than 3 middle-level earthquakes happen in China in July. People still have clear memory about the things they do at that time. So I can do interview!!

Based on the ideas, I develop two main questions, which I want to know the answer from users.
1. Do people follow the suitable ideas? And why?
2. Do they know different escaping way are suit to different situations? And why?
<table>
<thead>
<tr>
<th>Question</th>
<th>U5</th>
<th>U6</th>
<th>U7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever receive earthquake escaping education?</td>
<td>&quot;I don’t have the formal earthquake education experience. But I learn some ways from the TV and online media.&quot;</td>
<td>&quot;Yes, I received it when I was in high school. We have earthquake escaping practice once a semester.&quot;</td>
<td>&quot;No.&quot;</td>
</tr>
<tr>
<td>Which kinds of information do you trust?</td>
<td>“the accounts such as Chinese Emergency Radio or some Fire brigade accounts”</td>
<td>“advice from the official account”</td>
<td>&quot;It’s hard to say. I would charge it depend on my own situation”</td>
</tr>
<tr>
<td>Which kind of advice do you remember? Are you using that?</td>
<td>&quot;stay away from Unfixed furniture and high building, run to outside.&quot;</td>
<td>&quot;Go to an empty outdoor place, hide under desk.&quot;</td>
<td>&quot;first hide indoor then run to outside&quot;</td>
</tr>
<tr>
<td>Why do you remember these one? not others?</td>
<td>&quot;these are more related to my situation.&quot;</td>
<td>&quot;I practiced these when I was in school for many times. so I can remember it.&quot;</td>
<td>&quot;some people did in this way, and the news said they were right.&quot;</td>
</tr>
<tr>
<td>Are there situations that you find escaping ways are not suitable?</td>
<td>&quot;yes, once I was in the shopping mall. I really don’t know want to do at that time.&quot;</td>
<td>&quot;as I mention before, now I am working. I really want to know the suitable way of escaping in the working High-rise office building. But at the same time, I just don’t want to spend much time on that. these advice may work.&quot;</td>
<td>&quot;for sure&quot;</td>
</tr>
</tbody>
</table>

The findings from the interview:

1. People usually get earthquake escaping advice from the real experts.
2. Some people notice the advice may not suit to their own situations, but don’t want to put effort to find the suitable way.
3. It is difficult for people to remember the different escaping way which suit to different situations.
1.5 What are the users’ needs?

1.5.1 Visually map what I have done so far

My feeling

I don’t know how my audiences feel now. For me, the person who writes it, I feel like I have overcome the difficulty again. When I got through this process for the first time, I didn’t know where I should go next. I even thought I might solve the problem in the “rumor sharing” scenario. Luckily, to help myself remember what I got before, I did a map to visualize what I have done so far. And this map helps to have a clear mind about where to go next. So I’d like to share it with you.

Mapping the process

education
1. the previous education didn’t work
   - people who leave school before 2008 haven’t receive it
   - haven’t practice these skill for a long time
   - the skills are not suitable for current situations
2. don’t follow experts’ advice
   - people don’t know they follow the not suitable advice
   - they don’t know how to escape
   - they think the way which they once use to escape from earthquake are suit to another situations

warning
1. false sense of security: my bias
2. people don’t know the meaning of different warning

Why focus on earthquake escaping?
What are the current problems of EEWS’ public service?

Why these problems exist?
people don’t follow experts’ advice

fail to do it directly

The problems that people meet in EEWS’ public service part

Analogy

Explore the problem “people don’t follow experts’ advice”

Use “share rumors” scenario

Check ideas and develop findings
1.5.2 Process analysis to get users’ needs

Now, I know how the service works, how people feel about it, what people do, and so on. It’s time for me to analyze users’ needs. To make sure I don’t miss the critical points, I do a process analysis first. In the previous design research, I found that people’s pain points are different in different stages.

![Process Analysis Diagram]

The process map
1.5.3 The users’ needs

As you can see in the <users’ needs> diagram, I divided my users into different groups. Because when I started to do the process map which I show on the last page, I found that people do have some general needs:

[18-30] Because they are at different ages and the EWS is a little bit new system, the younger people once receive the formal earthquake escaping education in school.

[over 40] As the design research which I did in analogy-case, they hardly use the public social platform online. The public social platform is the critical platform for current earthquakes escaping informal education.

Therefore, I got two different kinds of needs. One type is General Need, and the other one is Special Need

**General Need**

- **[learning process]** People need to understand information effectively
- **[learning process]** People need to know that escaping methods are different in different situations
- **[using process]** People need to know the meaning of different warning

**Special Need**

- **[over 40]** People need a easy way to get the information
- **[18-30]** People need to learn the skills which suit to current situations
- **[18-30]** People need to practice escaping skills for a while

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<table>
<thead>
<tr>
<th>User Groups</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-year-old</td>
<td>1. People need to get information effectively (information too formal &amp; complex)</td>
</tr>
<tr>
<td>30-year-old</td>
<td>2. People need to know the skills which suit to current situations</td>
</tr>
<tr>
<td>40-year-old</td>
<td>3. People need to know that escape methods are different in different situations</td>
</tr>
<tr>
<td>60-year-old</td>
<td>4. People who don’t use Weibo (TV, usually use Toudao/ WeChat) - hard to find related information</td>
</tr>
<tr>
<td></td>
<td>5. People need to memorize the information which they once learned</td>
</tr>
<tr>
<td></td>
<td>6. People need to practice escaping skills for a long time</td>
</tr>
<tr>
<td></td>
<td>7. The process of memorizing information better</td>
</tr>
</tbody>
</table>

**The users’ needs**

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People need to know the meaning of different warning (the language EWS using is too formal and abstract)
My feeling for this part

I cannot believe I use almost 40 pages to describe how I find the users’ needs. In the real process, I spent more than a month to find them.

I chose “earthquake escaping” as my topic based on my interests and my understanding of it. It is a good thing because I’d spend a lot of time and energy to develop my design research. But during the investigation, I felt I had my bias on this topic. I chose it because some problems were existing. And this kind of idea was the original bias. Sometimes I felt even I did a lot of primary and desk research, I still cannot leave my bias away, which made me feel frustrated.

Luckily, I still remember in the stage 2 project; Lain once told my group that sometimes we don’t need to overthink, try to do something. Therefore, I tried my best to continue doing my project. When I explore “why people don’t follow experts’ advice,” I read lots of related essays. In one article, the author mentions that humans cannot avoid subjective thinking, and this ability to think is what distinguishes us from other animals, at that time. I felt there was no need to complain about my own bias because it always there. I need to change my way of using my bias or the place to put my preference. And I need to improve my way of thinking logically. So, when I did my project, I tried to read some related design methodology and some finished design projects. And during that reading process, I found how people use Analogy, and then I found a way to continue my project.

Also, in the finding of users’ needs process, I felt it’s quite to keep in touch with my tutor and classmates. They did help me a lot, not only in discussing my project but also sharing their ideas with other things. It can give me access to look at something in their ways. Even though items may not be related to my project, but it can refresh my mind.

Chapter 2

How can I feed their needs?

Develop the design idea based on users’ needs
2.1 Brainstorm to get ideas

2.1.1 Two principles
It’s time to transfer the users’ needs, or we sometimes call them insights. To do this, I gave myself or my thoughts on two principles:

1. **find a suitable way to educate people**
   - Let people remember what to do when the earthquake happens
2. **try to build an appropriate experience for people**
   - It’s hard to change people’s behavior directly. But I knew that people do things highly rely on their expertise. So why not let them change their behavior?

2.1.2 The early ideas
So based on the principles, I started to brainstorm. Then I got some ideas.

- **[online][showing information][EEWS’ warning]**
  - Show the meaning of eews’ warning in the earthquake escaping education video or the explanation images
- **[online][showing information][escaping skills]**
  - Use Scene selection and Timeline to reduce the difficulty of people’s memory
- **[online][practice]**
  - Add an interactive part(video, vote, comment, etc.) in the post
- **[online + offline]**
  - Let people learning these information online, then practice it offline

2.2 Which idea can work better?

2.2.1 Don’t know where to go
After developing these ideas, I tried to pick one from them or develop a new one based on them. But I found even though I developed several ideas, I felt no one could solve all the users’ needs. If no idea can feed all the requirements, how can I choose one from them reasonably?

And I started to think about where the problem was. And I tried to recall what I did when I faced a similar situation in the previous project. And I found I don’t need to solve all the problems at once. I can try to improve the current situation by feeding some needs.

2.2.2 Rechoose the insights

1. **Choose [General Need]**
The general needs are the needs that lots of users have. So it’s much more easy to develop or test later.

   - **[learning process]** People need to know information effectively
   - **[learning process]** People need to know escaping ways are different in different situations
   - **[using process]** People need to know the meaning of warning
   - **[memorizing process]** People need to memorize the information which they once learned

2. **Choose [learning information]**
In the 4 needs, we can see these are 2 needs related to learning part. So I decided to main focus on learning.

   - **[finding information]** before earthquake
   - **[learning memorizing information]** during earthquake
   - **[memorizing information]** after earthquake
   - **[using information]**

The rechoosing process
2.3 Develop the final idea

2.3.1 Get the concept of my final idea

After choosing my focus insight, I tried to develop my new idea based on the users’ needs and the old ideas I had before. And I use the “who/ where/ when/what” structure to help me understand what my idea should include.

[who]
the adults who don’t know what to do when the earthquake happen

[where]
maybe online

[when]
in daily life/ before the earthquake happen

[what]
learn the earthquake escaping methods easily

Design a platform for adults who don’t know what to do when the earthquake happen.

Give them the chance to learn the earthquake escaping methods easily in the daily life/ before the earthquake happen.

2.3.2 Compare the current platform

It’s the first time for me to design a platform to help adults learn earthquake escaping method. So I thought analyzing the current platform may help me to develop my idea.

[1] Platforms are online.
When I search for the platform, I found that most of the learning platforms are online. That’s reasonable. As the design research I did before, people prefer self-learning. And the online platform also can give most people equal access to knowledge.

[2] I didn’t find a platform that has the same focus as my concept.
Some platforms are for kids. Others are warning platform which include education function. That’s also an encouraging finding to me.
2.3.4 Consider for environment-situated learning

One of the critical points for my design concept is that people need to know the different escaping skills suited to different situations.

After analyzing the current platforms, I found these platforms also offer the skills which suit different locations. So I started to ask myself: what can make my platform unique?

I recalled the previous interview—everyone has the same needs, but their daily routine is quite different. Therefore, I had a conception: as their required skills are entirely related to the environment, the skills they need may be different.

2.3.5 The “final idea”

People's life trajectories are different, and their occasions will be different. It means that a person who is already at work is unlikely to appear at the school gate, and he naturally does not have to learn the escape skills used in school.

So, for environment situated learning, people have different priorities.

[Service provider]
Government/Institution who run EEWS

[Users]
Adults who don't know what to do when the earthquake happen

[Goal]
Let users learn the earthquake escaping methods easily

The final idea: APP + some details for the APP
2.4 Prototype and test the idea

2.4.1 How to provide information

Based on the last diagram, I divided the prototype & test stage to 2 small stages:

[1] how to provide context
   Prototype + test

[2] how to let people map their routine
   Prototype + test

2.4.1.1 How to provide context

For providing the context part, I did a chart to help myself prototype and test quickly.

<table>
<thead>
<tr>
<th>Type</th>
<th>Feeling</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>words only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>designed words</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pictures[1] only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>words &amp; pictures</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

At first, I tried to let them finish the chart. But it is not a face to face testing. And the people who help me to do this usually use the phone. It’s not convenient to change the screen. I changed the way of collecting their feedback. And the results of the test are as follow:

2.4.1.2 How to let people map their routine

For letting people map their routine, I also develop three ideas. And this time, I also asked the participants to read them and give feedback.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Priority</th>
<th>Score</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>U8</td>
<td>[4] words &amp; pictures</td>
<td>9/10</td>
<td>I like [4] most. It is quite clear. I can easily understand what to do. [3] also uses pictures, but it is too abstract. Sometimes, explaining words is more transparent. I can imagine the action follow the description of the terms, and then check my understanding is right or wrong when I look at the picture. That’s why I like [4]. [1] [2] only use words, although [2] tries to highlight something, they difficult for reading.</td>
</tr>
<tr>
<td>U9</td>
<td>[4] words &amp; pictures</td>
<td>9/10</td>
<td>Excellent, visual, and corresponding text description. [2] Simplicity and clear focus. But it is not so intuitive compared to [3][4]. [3] Although taking care of disability is a more tolerant performance, it loses its focus compared with [4]. The first time I saw it, I was a little bit stunned. It’s quite complicated. Because it is earthquake teaching, I think the most important thing is to streamline and highlight the key points. [1] There are so many words! There is no way to start.</td>
</tr>
</tbody>
</table>

Based on the testing, I chose [4] words & pictures as my way of providing context. It can help to learn the skills better. The words are clear and the pictures are easy to understand.
The results of the test are as follow:

### Participant: UB, 25-year-old

**Priority & Score**
- **Type 3**: 10/10
- **Type 2**: 9/10
- **Type 1**: 8/10

**Comment**
"I really like the sketch in type 3. But I am not sure about others. Even though type 1 looks nice, but it has lots of choices. I don’t like it. And it can not help me to recall my daily life. So I don’t think it can help to map daily routine."

### Participant: U9, 19-year-old

**Priority & Score**
- **Type 3**: 8.5/10
- **Type 2**: 8/10
- **Type 1**: 6/10

**Comment**
- **Type 1**: First of all, as a questionnaire, more than four options are not a big problem, but if the layout has no priority, it is not very clear. Then there is the priority of the options. Because the concept of place is too large, it is confusing to have both vehicles and locations.
- **Type 2**: There is nothing wrong with the layout of the options, it is intuitive and straightforward, and the general questionnaire functions are available! But I didn’t quite understand what the question asked me to answer. What does "1-2layer" mean?
- **Type 3**: I like this one! Arrangement and question classification is very intuitive! I don’t think the illustrations are necessary because they don’t help me answer the questions. Unlike the earthquake evacuation explanation, I can understand the general meaning by looking at the pictures rather than the text.

Based on the testing, I chose type 3 (remove the illustrations) as my way of providing context. It is clear and showing the daily routine quite well.

**Feedback**

Before testing, I thought type 1 would be popular because many platforms use this kind to collect people’s interests. With participants’ feedback, I found type 3 was not suitable for my project because it cannot use the priority between the options. With this experience, I feel that testing ideas are essential.
2.4.2 How to reach the audience

I had some ideas for reaching the audience. But I felt it is quite hard to test the concepts. Because of testing the concept, I have to find some participants first, which means I already reach the audience. Test the idea, in daily life, can be a good idea. But it needs time, one or two weeks may not be enough. And of course, I didn’t have such a long time. And I don’t think the publicity of my app should be unique. So it just needs work. Therefore, I decided to collect the current ways of app-promotion. And choose the method which suits my situation.

2.4.2.1 Find out my target users

Keep the target customer in mind can help me reduce the chance of wasting resources. With the design research and idea development, I did before; I already know who my target group is. This time, I’d like to find out where my target demographic spends the most time so that I can focus my publicity on those channels.

<table>
<thead>
<tr>
<th>Offline(place)</th>
<th>Age</th>
<th>Online(app)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mall</td>
<td>18</td>
<td>Zhihu[1]</td>
</tr>
<tr>
<td>Public transport</td>
<td>30</td>
<td>Weibo[2]</td>
</tr>
<tr>
<td>University</td>
<td>40</td>
<td>Billbill[3]</td>
</tr>
<tr>
<td>Office building</td>
<td>60</td>
<td>Toutiao[4]</td>
</tr>
<tr>
<td>Community</td>
<td>60</td>
<td>WeChat[6]</td>
</tr>
</tbody>
</table>

The places that I can reach most of the users: [Mall] [Public transport] [WeChat]

The places that I can reach the majority of the users: [Office building] [Weibo] [Billbill] [Douyin]

2.4.2.2 Existing method selection

<table>
<thead>
<tr>
<th>Promotion</th>
<th>Matching the platform</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set up a website</td>
<td>No</td>
<td>May help, but it cannot reach users directly</td>
</tr>
<tr>
<td>Share on social media</td>
<td>Yes [Weibo]</td>
<td>It can reach to the main user group. May cost a lot</td>
</tr>
<tr>
<td>Get recommendations</td>
<td>Yes [online]</td>
<td>This can prove that the app is reliable and let more people know the app</td>
</tr>
<tr>
<td>Contribute to domain knowledge</td>
<td>Yes [Zhihu]</td>
<td>That’s a good idea. This is also the way that I find the experts for my design research</td>
</tr>
<tr>
<td>Create a video intro</td>
<td>Yes [Billbill][Douyin]</td>
<td>Poster or picture may enough. And it cost a lot</td>
</tr>
<tr>
<td>Start a community</td>
<td>Yes [online][offline]</td>
<td>Though learning is a long-term thing, but there is no need to run a community. But holding activities in the community can be a good idea.</td>
</tr>
<tr>
<td>Develop an email list</td>
<td>Yes [online]</td>
<td>Maybe do this through the message.</td>
</tr>
</tbody>
</table>

Through the ways’ selection, I found there some ideas that I can use in my project. And I also found some forms are for reaching the audience. Some are for keeping the audience. This finding gave me the idea to organize the publicity of my project.

For reaching the audience:
1. Have the short slogan/ nice poster/ clear explanation/ …
2. Share [1] on social media and WeChat
3. Answer the related question on Q&A platform
4. Hold earthquake escaping skill teaching activities in the community/ office building
5. Let “old users” share their feeling of using this app on social media

For keeping the audience:
6. Send messages to users when the earthquake happens
7. [2][3][4]
My feeling for this part

Compare to the users’ needs finding, the idea developing part went smoothly. Even though I had to rethink about insights choosing when I found it was not a good idea to solve all the problems at once. Because no design idea can suit every situation and everyone, any design scheme will have its limitations. All I can do is ensure that my solution meets the primary needs of most target users.

And in this part, I found that get in touch with reality is essential, such as analyzing the real platform or talking with people. It can help me to think about how much I can make sure my solution feed users’ needs and make sure users can have good experience within using the service which I design.

Chapter 3

The final output

Showing the ways of feeding users’ needs through explaining the final output
3.1 The final output

3.1.1 Output's brief

"flee in the quake"
Provide suitable earthquake escape guide which exclusive to you

[Introduction]
"Flee in the quake" is a lightweight earthquake escaping skill learning app. By understanding the type of user’s living environment, the app provides customized, suitable escaping guidance for users. Let users learn the most suitable earthquake escape method in the shortest time.
"If you ever have the experience of not knowing how to do when an earthquake happens; if you have not encountered an earthquake before, but want to learn some earthquake escape knowledge in advance; if you feel that there are many earthquake escape situations and the escape method is difficult to remember; "flee in the quake" app will be your best choice."

[Service provider]
Government/ Institution who run EEWS

[Users]
Adults who don’t know what to do when the earthquake happen

[Goal]
Let users learn the earthquake escaping methods easily

3.1.2 Storytelling

1. Demi
24-year-old
Never experience earthquake before

One day, she saw the news online:
"the big earthquake happen in the nearby province! People quickly run to outside!"

She started to worry what if the earthquake happen in her city.
She thought she needs to learn some earthquake escaping skills.

Then she tried to find the escaping skill online.
And she found these information:
"these 9 pages pdf can help you", "do ... in this situation+images, do ... in that situation++.."
She thought:
"There is too much content, how can I remember it!"
"The description is too abstract, I can't imagine what to do."

Suddenly, she saw a post of "flee in the quake" on the social platform.
The post says:
"If you ever have the experience of not knowing how to do when an earthquake happens; if you have not encountered an earthquake before, but want to learn some earthquake escape knowledge in advance; if you feel that there are many earthquake escape situations and the escape method is difficult to remember; "flee in the quake" will be your best choice."

She was curious about how this app provides this kind of service, so she decided to download this app.
The she started to use “flee in the quake”

(1) Open the app

(2) Finish 5 Q&A

Where are you live?
- Low floor (1 floor and below)
- High floor (2 floor and above)

Which transportation do you usually use?
- Bicycle
- Vehicle
- Underground
- Train

Next

(3) See the customized homepage

(4) Start to learn the escaping skills

[During] Protect yourself
- Seat floor
  - Step 1: Drop
  - Step 2: Cover
  - Step 3: Hold on

[After] Help others

[After] Protect yourself
- On the safety of your family and friends
- In case of emergency, contact your family and friends

Tip:
1. DO NOT run outside.
2. DOF (your name) where you are until the shaking stops.
3. DO NOT get in the elevator.
After using the app "flee in the quake", Demi felt she knew what to do when the earthquake happen.

### 3.1.3 A timeline to show more details

<table>
<thead>
<tr>
<th>Users' behavior</th>
<th>Service provider's behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>See the post</td>
<td>Share &quot;app introducing post&quot; on social media and WeChat</td>
</tr>
<tr>
<td></td>
<td>Upload the app</td>
</tr>
<tr>
<td></td>
<td>Answer earthquake escaping questions on Q&amp;A platform online</td>
</tr>
<tr>
<td></td>
<td>Hold earthquake escaping skill teaching activities in the community/ office building</td>
</tr>
<tr>
<td>Know the app</td>
<td></td>
</tr>
<tr>
<td>Use the app</td>
<td></td>
</tr>
<tr>
<td>Share the link to friends</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Send message to users when an quake happen and recommend user to learn some escaping skills</td>
</tr>
</tbody>
</table>

#### Explain the final output through people-behavior timeline

### 3.1.4 Benefit analysis

<table>
<thead>
<tr>
<th>For users</th>
<th>Function</th>
<th>Benefit</th>
<th>What makes this service unique</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>map the daily routine</td>
<td>get the suitable escaping skills</td>
<td>learn the most suitable earthquake escape method in the shortest time</td>
</tr>
<tr>
<td></td>
<td>offer earthquake escaping skills combine with words and pictures</td>
<td>understand the escaping skills easily</td>
<td></td>
</tr>
</tbody>
</table>

#### Benefit analysis- users

<table>
<thead>
<tr>
<th>For Government /Institution who run EEWS</th>
<th>Provide APP</th>
<th>Benefit teach skills in a vivid way</th>
<th>Benefit let more people learn escaping skills</th>
<th>Benefit Reduce casualties in earthquakes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Allow adult residents to quickly and effectively learn earthquake escape methods</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3.1.5 Reflection

I felt that providing customized earthquake escaping education through the app can effectively reach many users. But I also thought the earthquake escaping education is a long-term thing, but not an everyday item. So maybe an app is too much? I am not sure. Perhaps it can be a [questionnaire + feedback] website. But now lots of people do use phones more than computers.

And as the disaster broadcast app and earthquake warning app both have earthquake escaping skills providing function, can my “flee in the quake” be a new way of delivering surviving skills in these apps? But as design research I did before, people who download the disaster broadcast app and earthquake warning app hardly expect to learn to escape skills from these apps.

Though I felt the “app” might not be the best way to provide the service, but I can clearly explain my idea within it. So I finally chose the app one as my output.

I felt the key output is the service in the app:
[Mapping daily routine+ Customized escaping skills+ Provide clear and easy skills’ explaining]
My feeling for this part

I think having a “deadline timetable” helps me a lot. Besides, this time planning also allows me to give myself feedback in time. When I complete the task earlier than expected, I will affirm my efficiency (actively encourage myself). When proceeding to the next stage of design research but encountered obstacles, I can naturally review the previous design process. Because I have a clear plan for my design process, I can reflect on the perspectives of “what did I do in the previous step,” “what is my goal of the previous step,” and “how does this output help my next design development.” In this project, this way of thinking helped me solve problems many times.

Before I came to GSA to study, I would like to follow the process when doing projects. For example, in the early stage of design, the process of “background research, market research, field research, expert interviews, user portraits...” will be followed. After staying in GSA for a year, I found that I had less time to use a design tool in my design process. I will choose the design method to use based on the goals of the current design stage, but not necessarily use similar design tools. For example, many times, I may skip the persona and directly use the user journey map for user behavior analysis. In this design output, I did not use design tools such as service blueprint or stakeholder map but used timeline presentation + benefit analysis table to explain the output. I feel that using design tools is a way to achieve the design goals. If I can give design methods and principles to design, I don’t necessarily need to use standard design tools. However, when conducting teamwork projects, it is necessary to use some design tools to ensure that all team members have the same understanding of the tasks and possible outputs of this stage, which can provide the efficiency of cooperation.

Bibliography
