

## PROJECT 01

# RIPPLES

An interactive art installation inspired by water ripples, bringing new vitality to the scene while bringing customers to the mall

"Ripples" is an interactive installation I created for my graduation project, inspired by the source of life, Water.

The background of the project is to create a commercial space proposition, combining the existing space and the crowd. I'm curious on how art installations and the Mixc's brand image can be combined with commercial spaces.

Installation Design  
Interaction Design

Individual Project  
April – June, 2019

## BACKGROUND

### Project Site

The Mixc Chongqing



### Age Ratio of Consumers



Mostly 18-30 years old



The ratio of youth is more than 70%

### Reasons Why People Visit the Mixc

(Number of samples: 50)

Shopping	25
Dining	15
Leisure	7
Others	2

### Current problems at the Mixc



Homogenization

Most of the complex looks the same

Online Mall

Convenient online shopping

Pandemic

Travel restrictions

### Mixc's Existing Strategies

#### Changing business strategies

Increase the advantage industry of the mall and abandon obsolete projects

#### Expanding commercial scale

Expand the area in order to increase the influence

#### Optimizing business environment

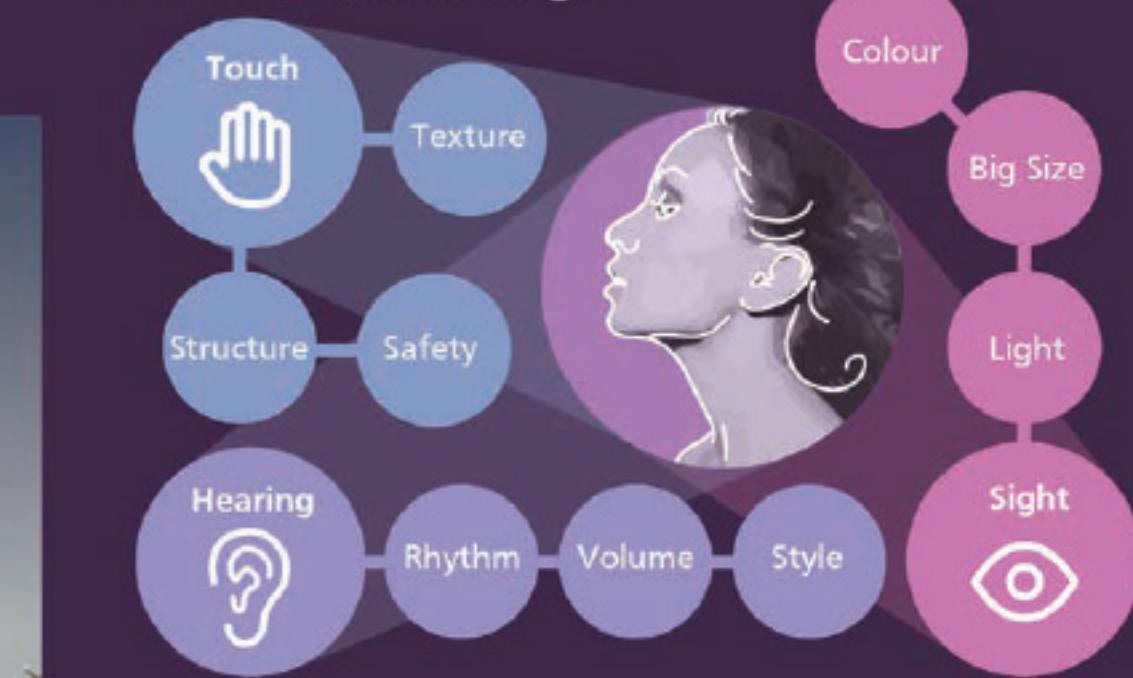
Improve the customer shopping experience

### Insight

The Commercial Complex is facing a gradual increase in the predicament, guests are being snatched by other commercial carriers. If they want to further their ambition, they must attract sufficient customers.

## CONCEPT RESEARCH

### Five Senses Design



### Materials (Degradable & Recyclable materials)

- Translucent Glass
- Hollow Cylindrical Foam

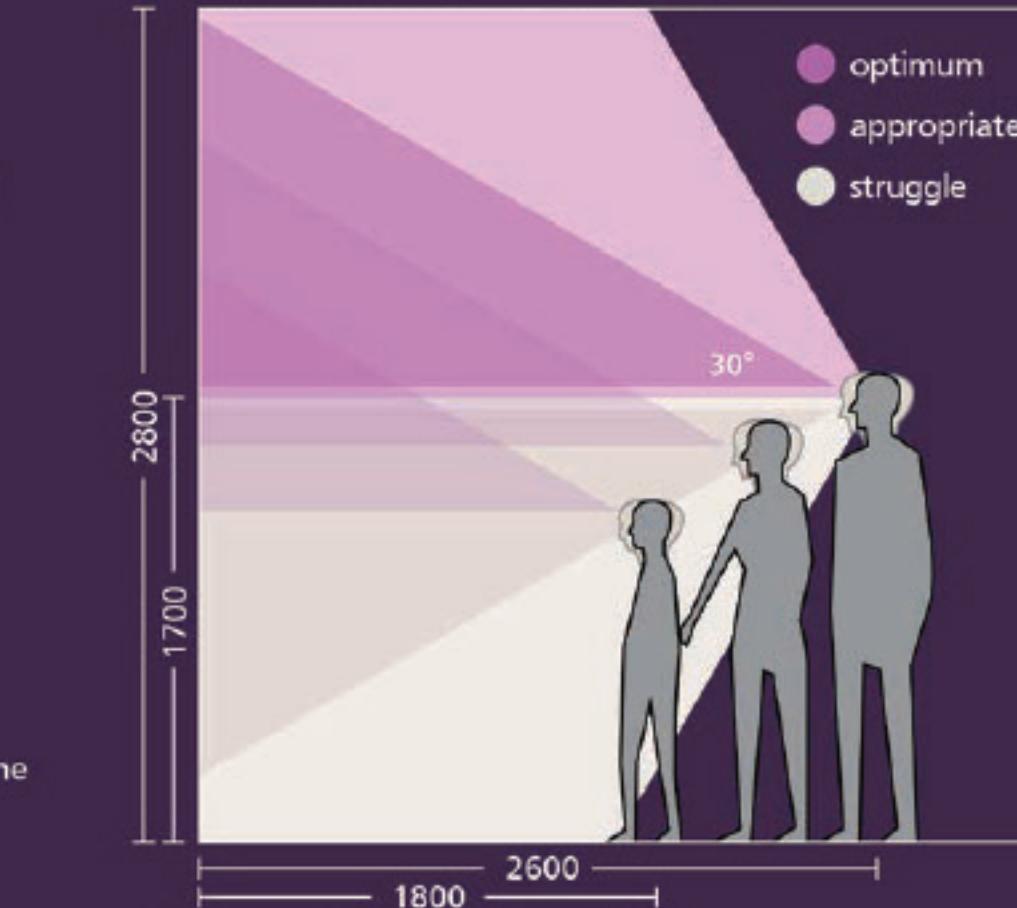


### LED

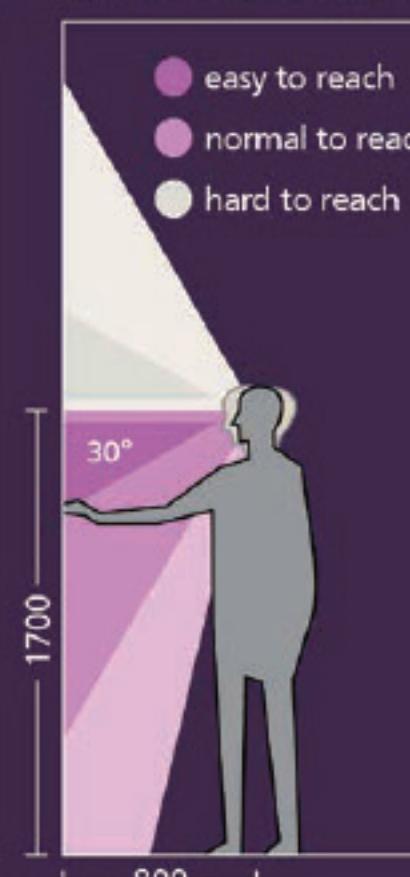


### Sight line & Volume control

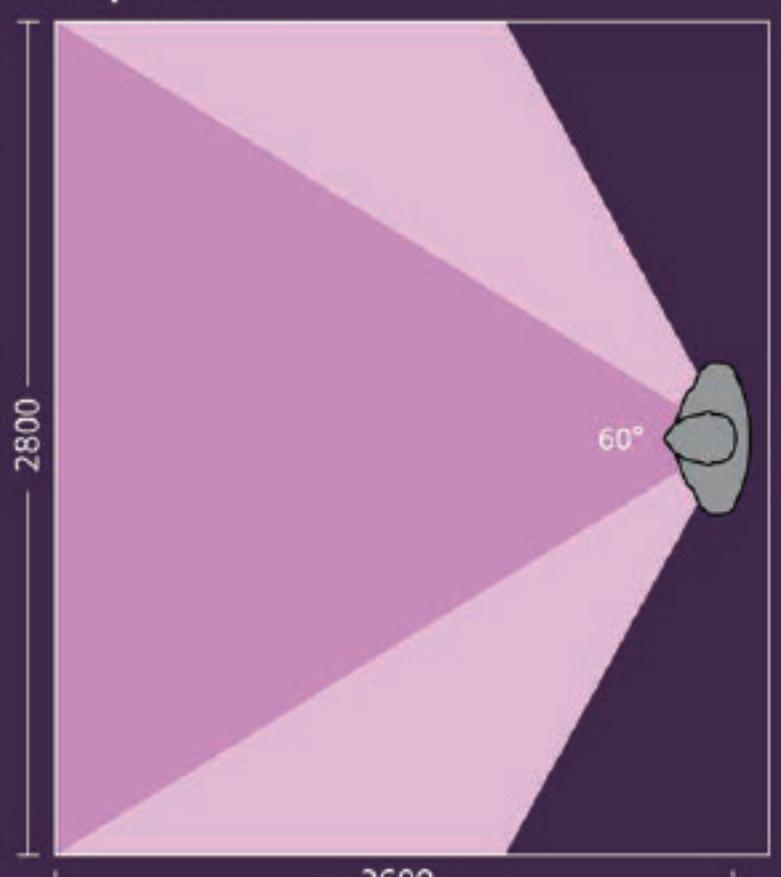
Optimal height & distance



Close interaction

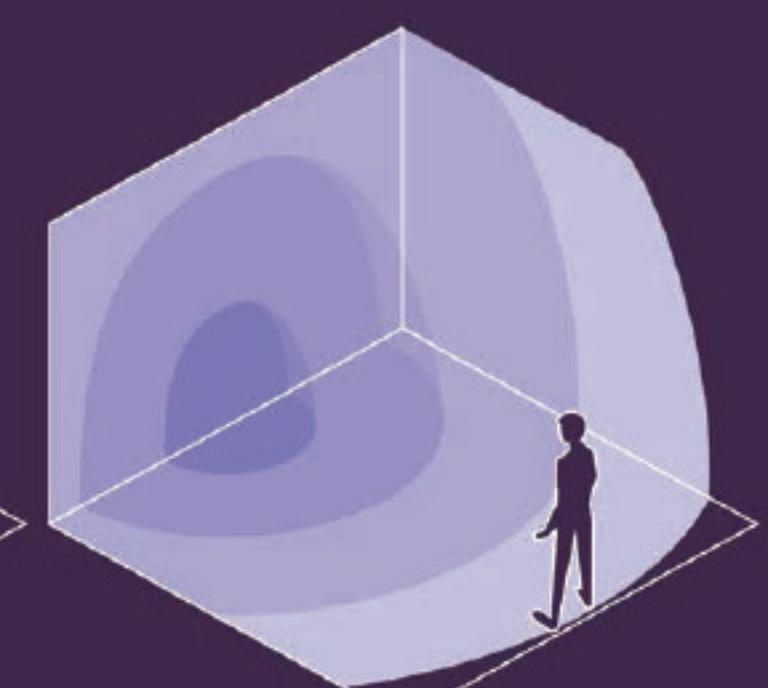
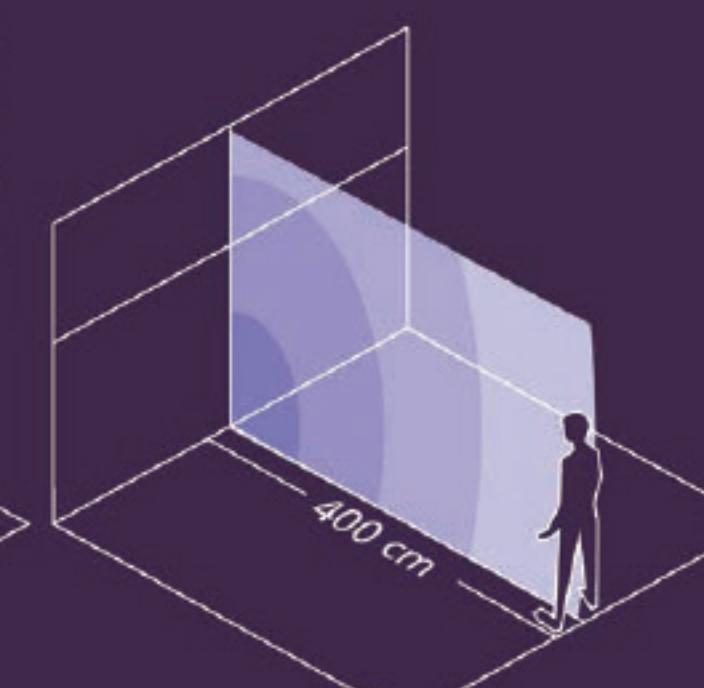
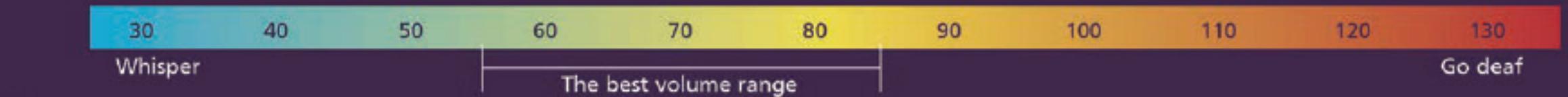


Top view



### Optimal sound radiation range

To achieve the effect of attracting pedestrians, I tested the volume decibel change of the voice under the change in distance.



# IDEATION

## Source of Inspiration



The junction of two rivers



Flood in Chongqing

Rain season



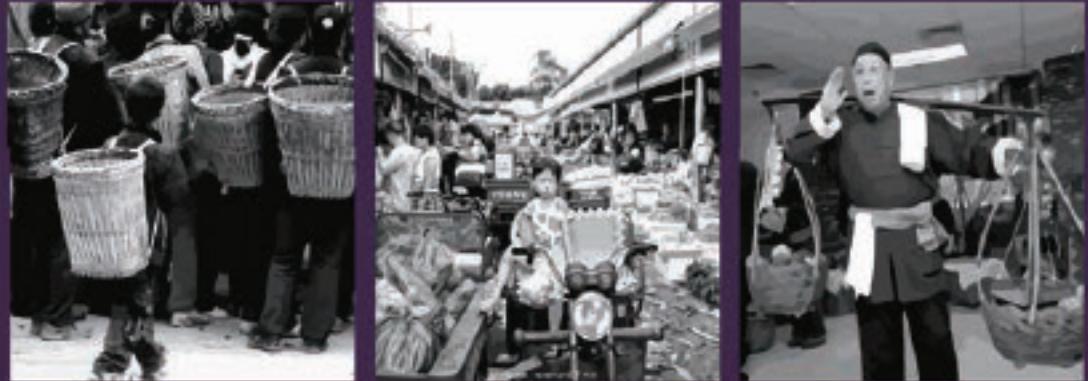
Water occupies an alienable situation in the hearts of the Chongqing people. The confluence of the two rivers in Chongqing contributes to Chongqing as one of the most important transportation and economic hubs in the Yangtze River Basin.

## Key words

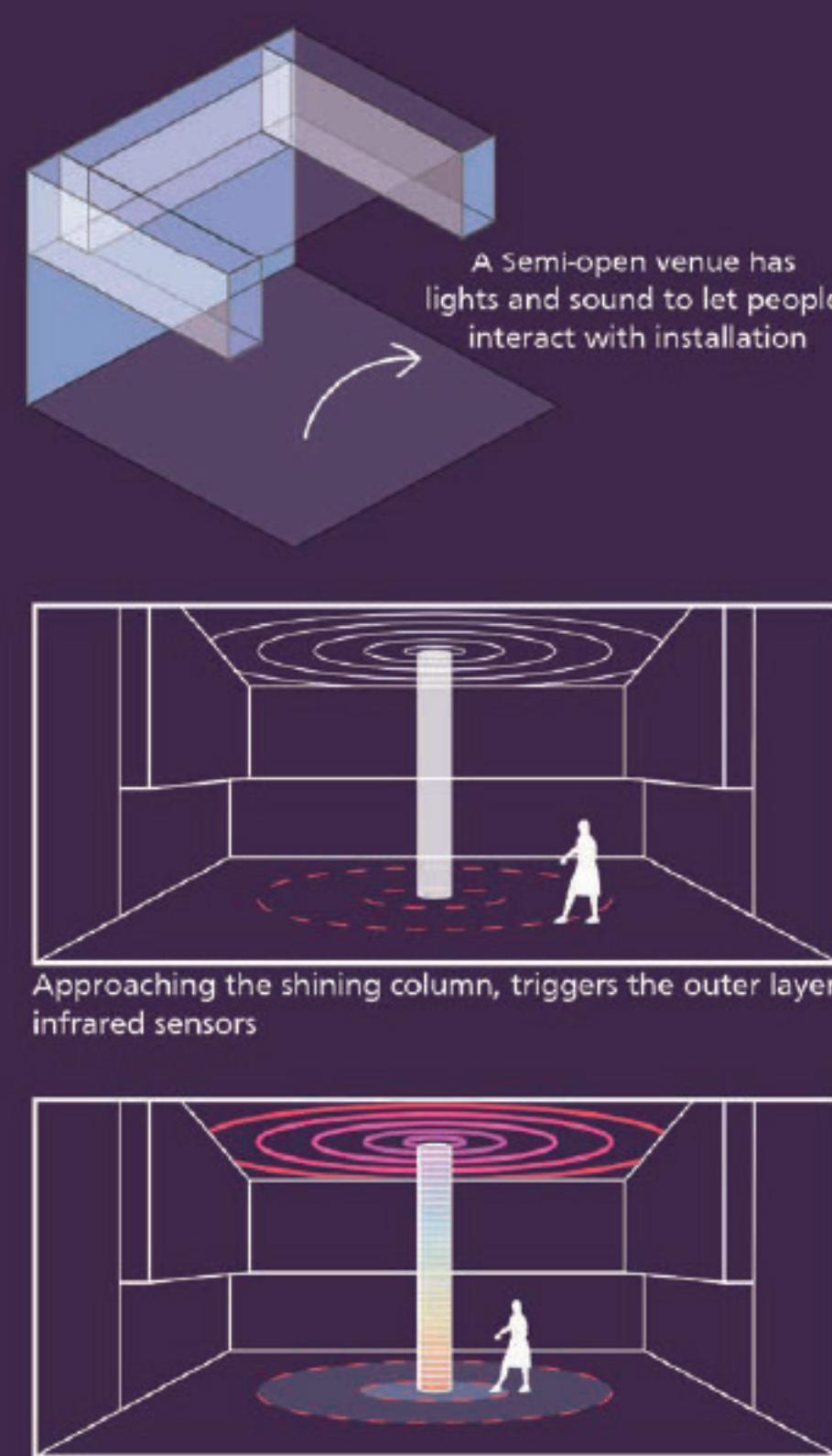
River, Water drop and Ripples



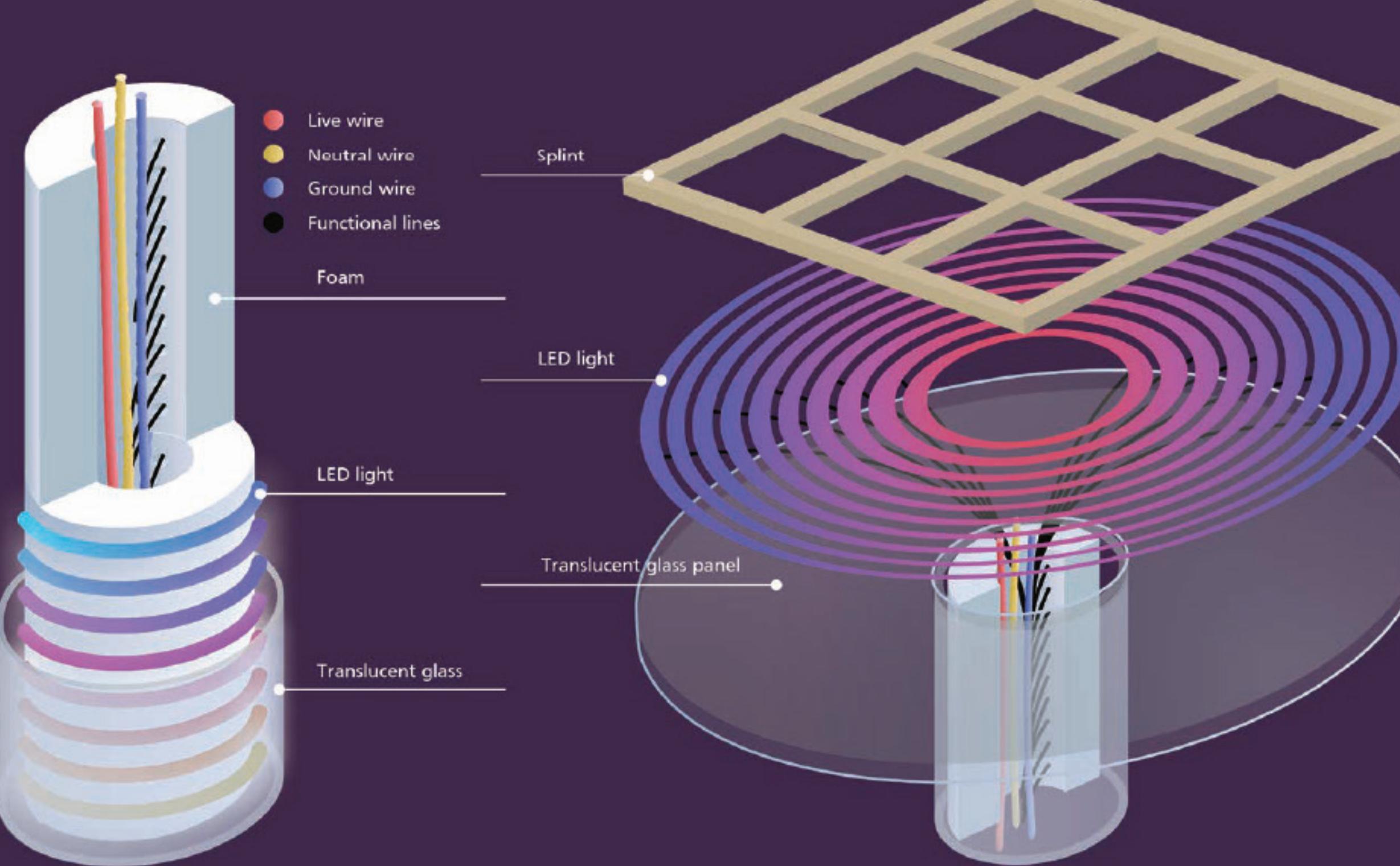
## Chongqing Ganchang culture, Gathering and Huckster



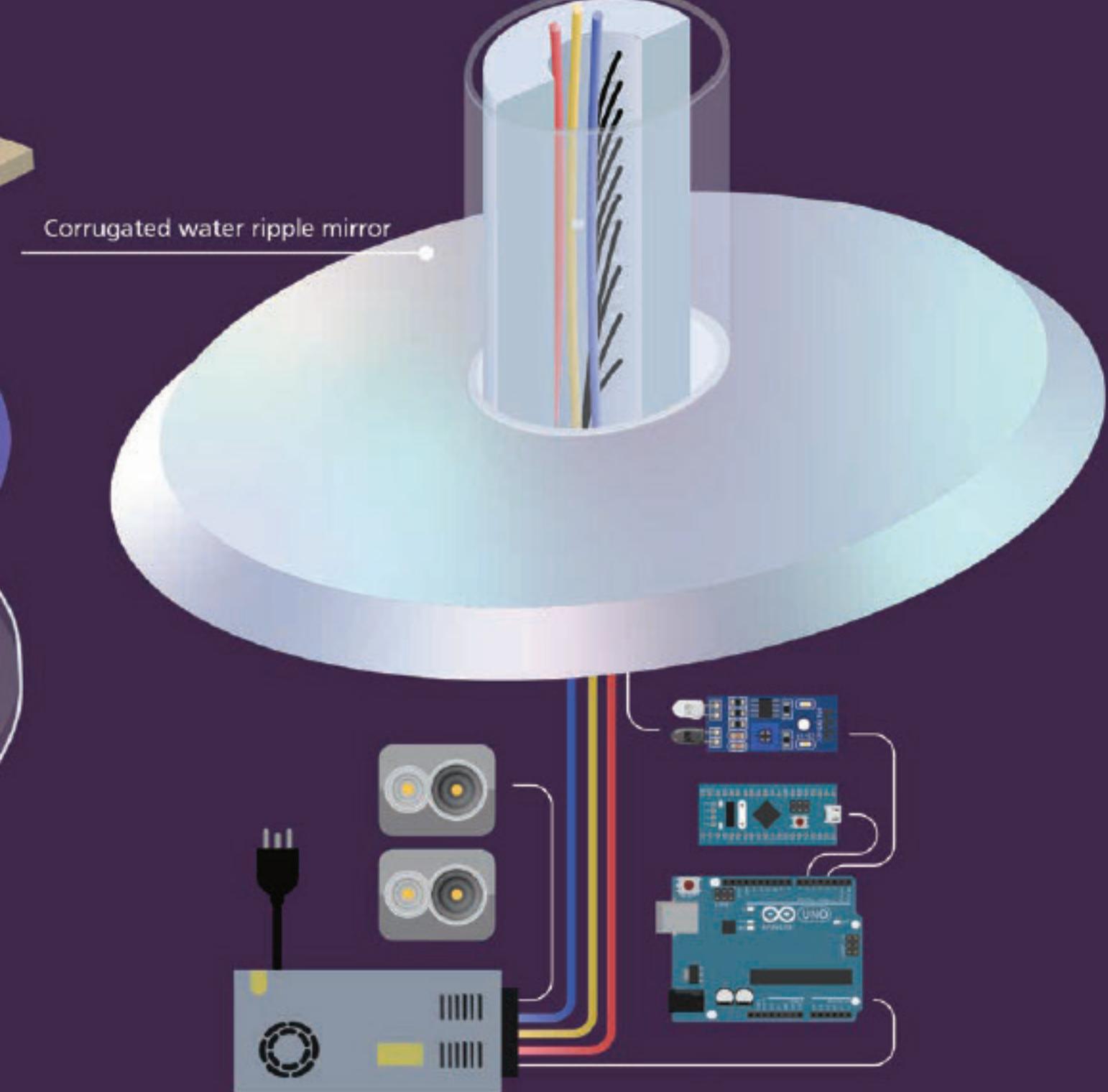
## Sketch



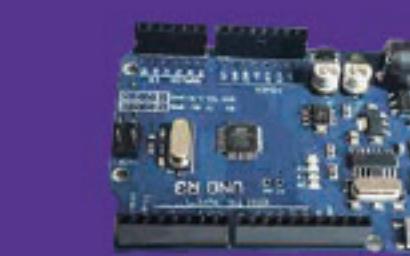
## Internal Structure



## Exploded view



## Components



### Arduino UNO

Data collected from Infrared sensors transmitted to here  
Control input and output

### Bluetooth Module — HC05

Insert on Arduino UNO R3 and transmit data collected from Infrared Sensor

### Infrared Sensor

To support interaction mode by detecting people's movements

### Bluetooth Speakers

Hiding under the column to make interactive noise

### LED Strip Lights

Total 40 strips of LED lights are attached to the foam. Colour change in all spectrum.

### Power Supply

To convert alternating currents to direct currents

## Arduino Coding

### To play interactive sound

```
char val;
void setup()
{
    Serial.begin(38400); //蓝牙模块就波特率为38400
    pinMode(13, OUTPUT); //板载LED灯引脚
}
void loop()
{
    val = Serial.read(); //读取串口缓冲区的数据
    if (val == 'n') //当接收到的数据为'n'
    {
        digitalWrite(13, HIGH); //点亮LED灯
        Serial.println("LED ON!"); //串口输出LED ON!
    }
    else if (val == 'f') //当接收到的数据为'f'
    {
        digitalWrite(13, LOW); //熄灭LED灯
        Serial.println("LED OFF!"); //串口输出LED OFF!
    }
}
```

### Detect the movements

```
#include <IRremote.h>
int RECV_PIN = 13;
#define LED_1 24
#define LED_2 25
#define LED_3 26
void setup()
{
    Serial.begin(9600);
    // 使能接收功能，接线端子自动唤醒
    Serial.println("enabling IRin");
    irrecv.enableIRIn(); // start the receiver
    Serial.println("enabled IRin");
}
void loop()
{
    if (irrecv.decode(results)) //检测是否接收到红外信号
    {
        Serial.println(results.value, HEX); //输出接收到的红外信号
        irrecv.resume(); //准备接收下一信号
        delay(40);
    }
}
```

### Ripple-like LED lights

```
#include <FastLED.h>
#define LED_1 24
#define LED_2 25
#define LED_3 26
CRGBPalette16 palette[1];
void setup()
{
    FastLED.addLeds<NEOPIXEL, LED_1, 256>(leds, NUM_LEDS);
}
void loop()
{
    for (int i = 0; i < 25; i++)
    {
        led[i] = CRGB(255, 0, 0);
        FastLED.show();
        delay(40);
    }
    // 清除
    for (int i = 0; i < 25; i++)
    {
        led[i] = CRGB(0, 255, 0);
        FastLED.show();
        delay(40);
    }
    // 清除
    for (int i = 0; i < 25; i++)
    {
        led[i] = CRGB(0, 0, 255);
        FastLED.show();
        delay(40);
    }
}
```

## AE Special Effects



# FINAL OUTCOME



## Assembling



Connect the wood framework, and then wrap the light strips on the wood splints to stabilize the whole structure, otherwise the top structure will not support the weight of the translucent glass.



The distance between each light strip on the cylinder has to be accurately measured, and the wires need to pass through the cylinder to reach the position of the controller below. I used an electric drill to empty the middle of the cylinder so that the wires would not be exposed during the exhibition.

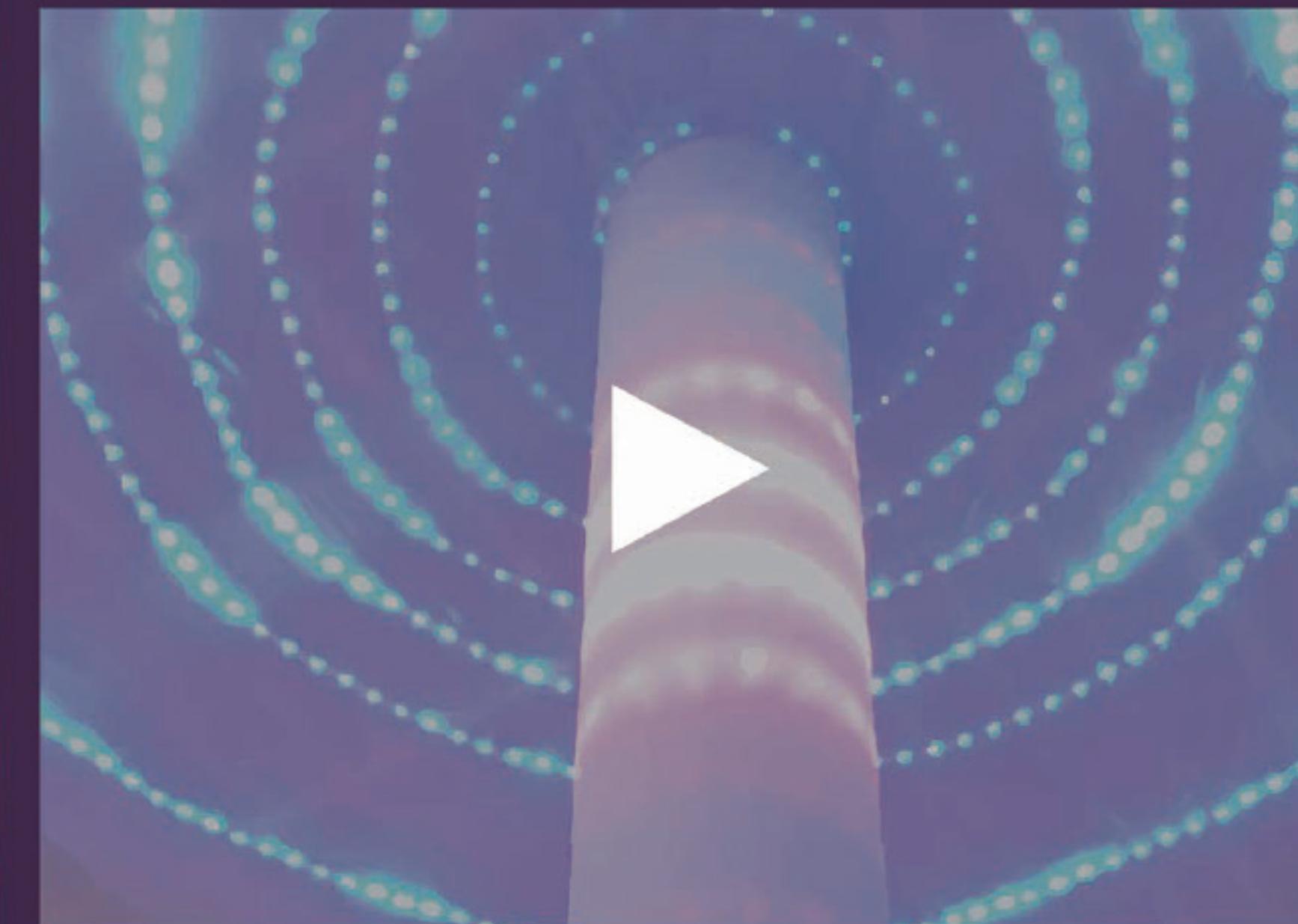
## On-site installation

The glass is easy to break during transportation. Before arriving at the scene, I divided the whole structure into three parts, the top, the middle and the bottom. The middle part of the column needs to be welded at the venue, and the upper and lower parts need to be accurately measured. If not, the whole structure cannot be aligned at the end.

## LED testing



## Video



<https://vimeo.com/740371309>

## Feedback



Deng Dan  
24 Years old  
Senior

The way you set the interaction makes me feel comfortable. In many other interaction installations, I have to stand in a specific circle and make a specific gesture. But here, the only thing I need to do is wander and watch.



Xia Yin  
22 Years old  
Sophomore

The audio drags me back to 1999, hahaha. My father used to take me there, Jiaochang Kou, the largest gathering in urban Chongqing. I think this is the most attractive element for me in this installation.



Ma Rui  
24 Years old  
Sophomore

The ripple-like LED has attracted my attention. It's really beautiful. I think it's genius to add the old gathering's audio to this on ground experiential art piece. It's also very interesting to interact with. I can enjoy the entire day. It's really fun!

## Conclusion

### Application of Smart Sensors

There is a clear and promising future of technology applied in art installations. The Commercial Complex needs cutting-edge technology to enhance the experience for customers.

From this project, I learned a lot of arduino and Lighting materials in this project, which will be of great help to my future creations.

### Proactive interaction

With deep research on human sentiment and intention, people would like to stay here and encourage more people to come.

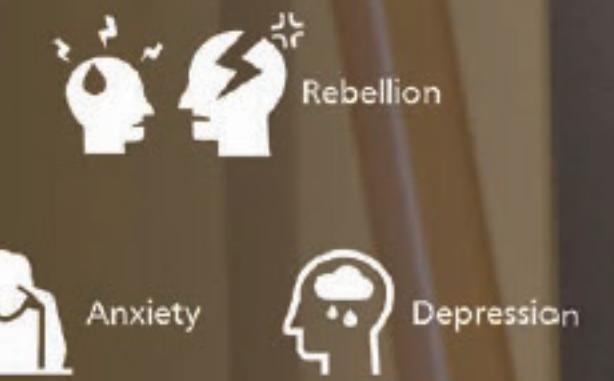
## PROJECT 02

# TOP STUDENT

"Top Student" is a pencil sharpener installation that can detect a users' approach and sharpen pencils automatically. Its rotational speed will increase as you get closer to it, but it won't work if you "push it too hard".

## Why I made this installation

I grew up in a society that encouraged competition among Chinese students. My parents, like other parents, tried everything they could to improve my academic performance since I embarked on Primary school. In China, every Chinese parent wants their child to be the top student in the class, but they pay little attention to their mental health. I want to show audiences this phenomenon because I think it is worth being faced head on.

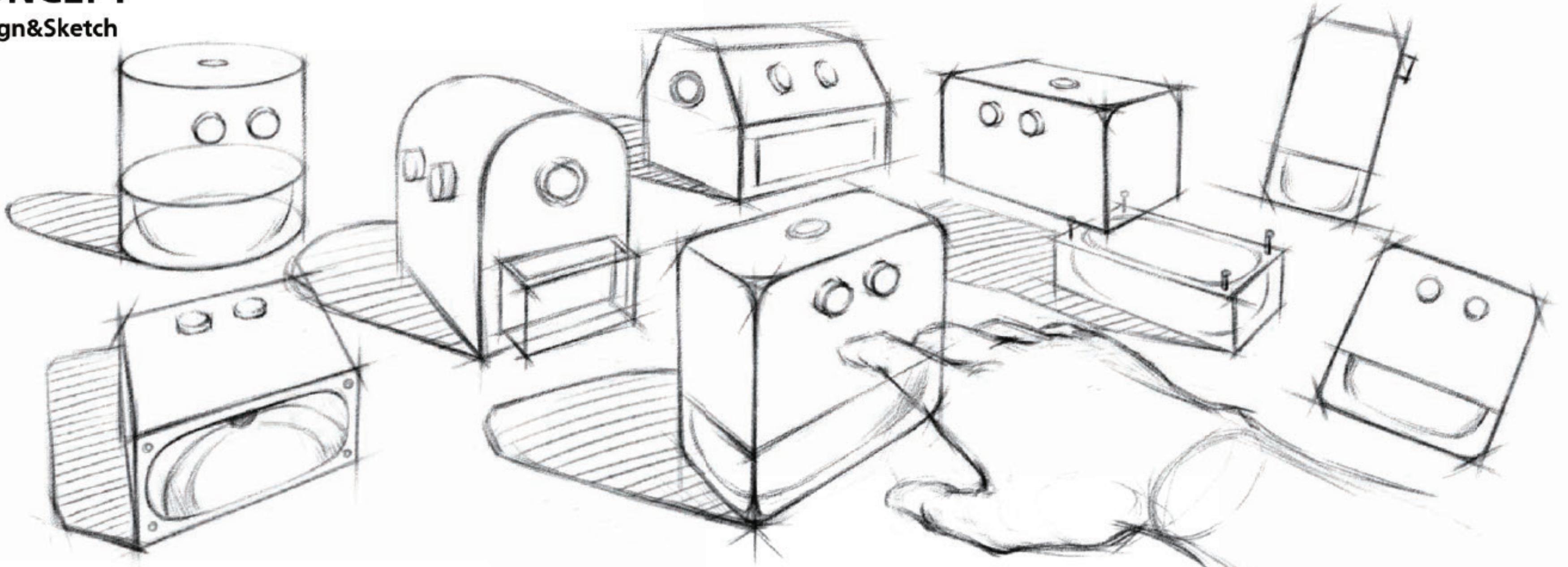


Speculative Design  
Interaction Design  
Product Design

Individual Project  
July — September. 2022

## CONCEPT

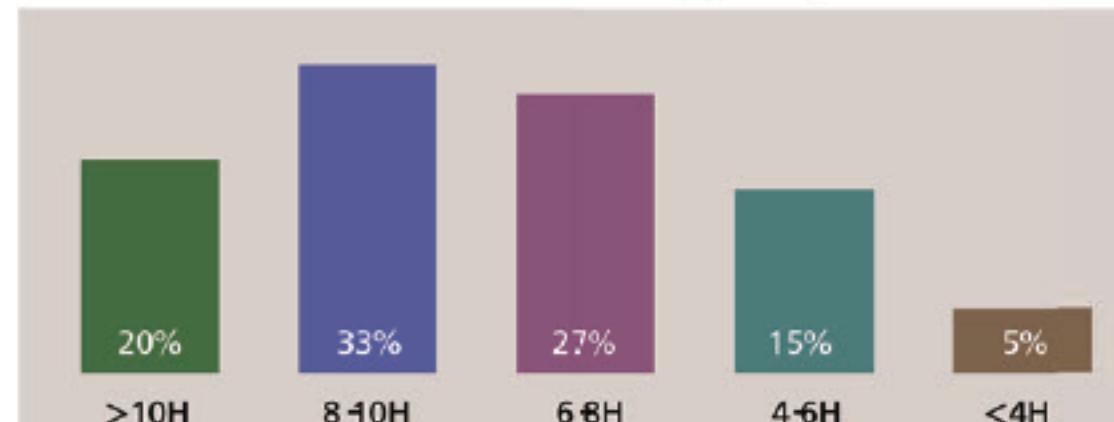
### Design&Sketch



## What are Chinese students facing

- More and more students are entering the competition  
China has the largest number of students in the world
- Rising study pressure among Chinese students  
Parents stipulate that they have to get a great score in final exam
- Rising incidence of mental illness  
Chinese parents believe good grades can change their destiny

## How long they study every day

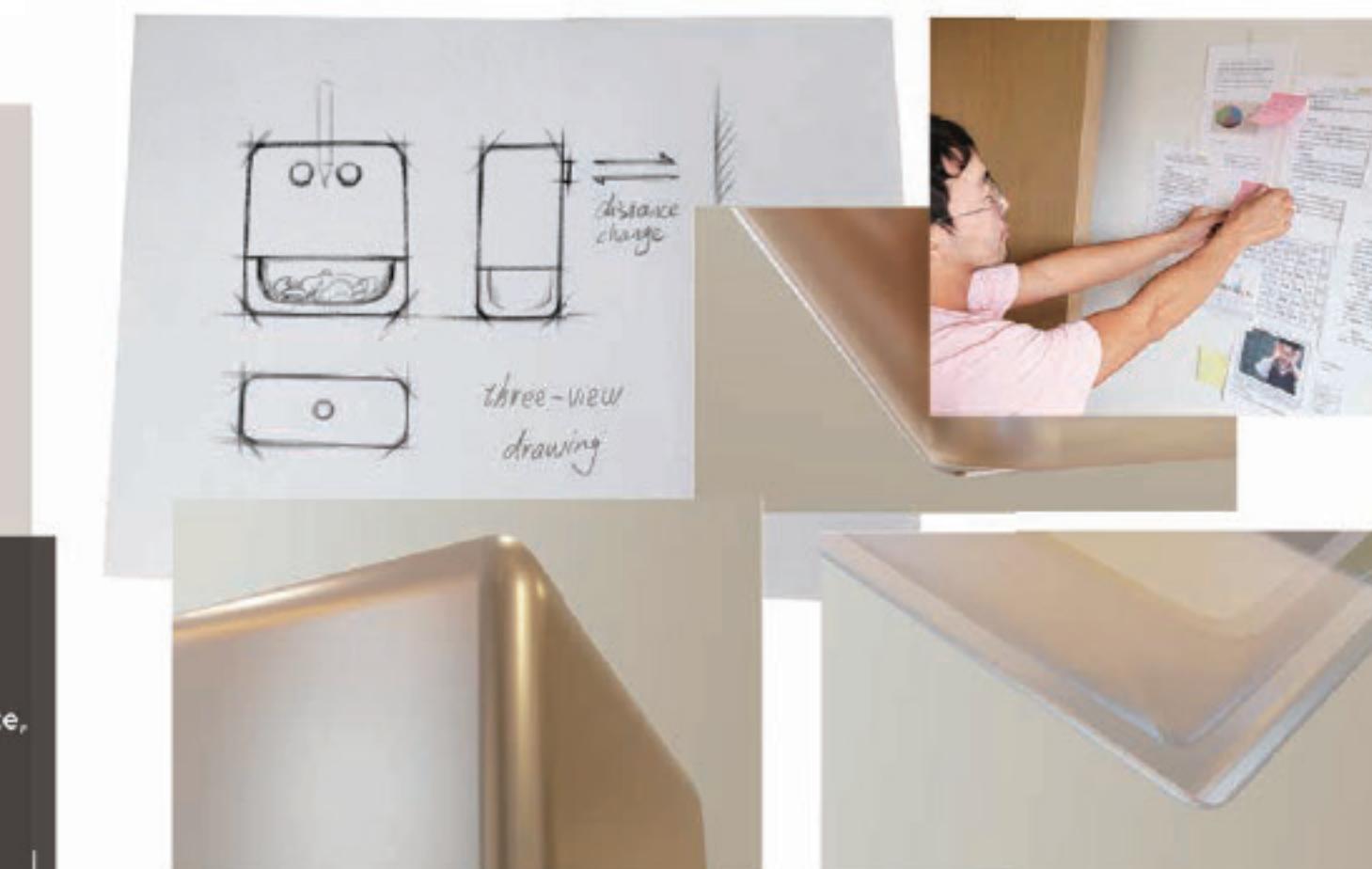


### Initial Idea

Using installation art to give the audience an interactive experience, and using abstract expression methods, provide audiences with a different perspective on this social phenomenon.

## Metaphor

As a necessary stationery for students, pencil sharpeners have their functional properties. I compared it to the law of operation of this society, and the student is the pencil. The students all strive to abide by this social norm, sharpen themselves, and become top students. Without other options, they dive right in and unknowingly cut off too much of their beautiful leisure time. Parents always want their children study harder, like sharpening the pencil, shaping their children as the person they want them to be — the Top Students. Sometimes children rebel, don't listen to their parents when they feel too tired. They break, they depress, they need some time to heal themselves.



## Research Wall

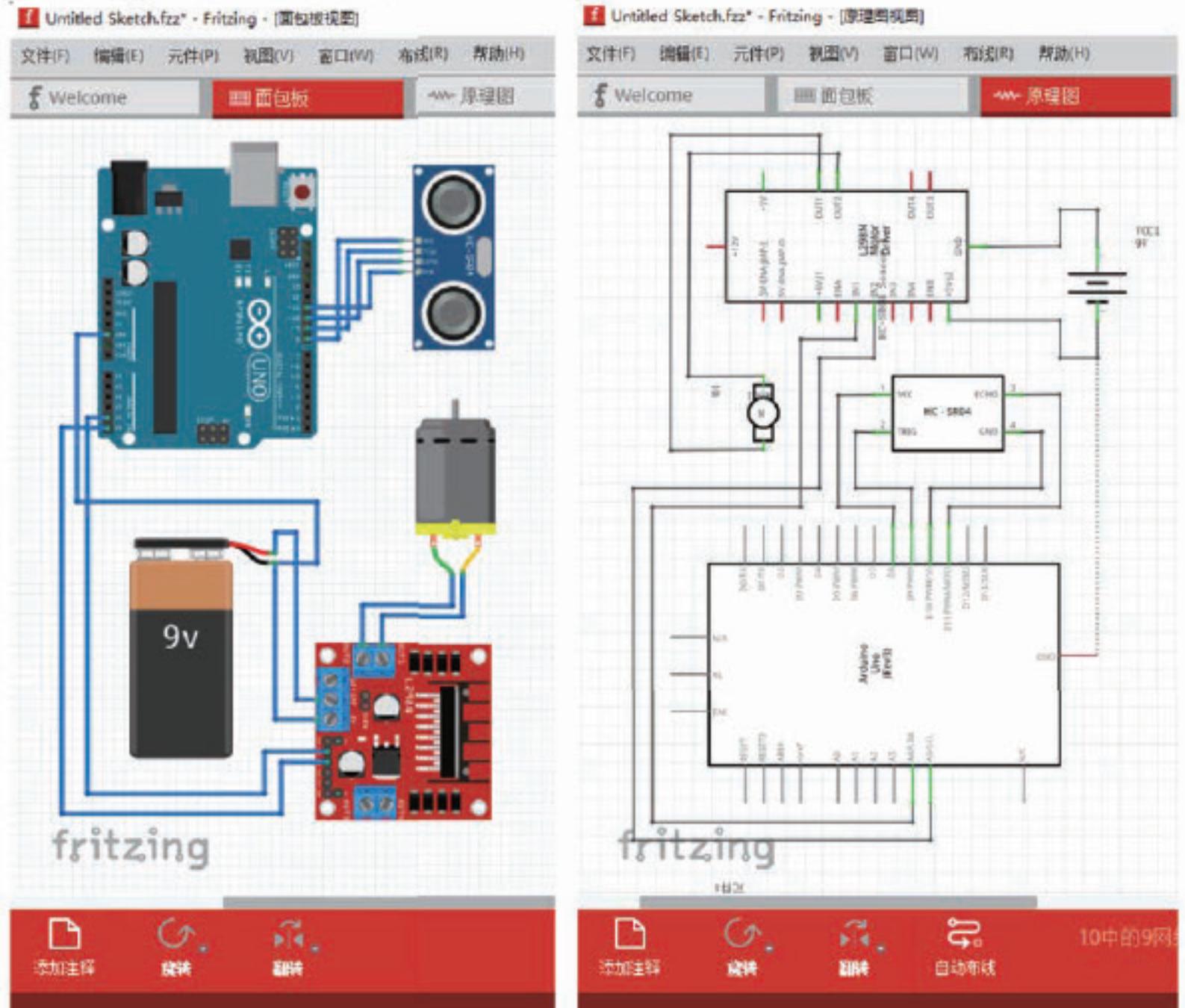


# OUTCOME

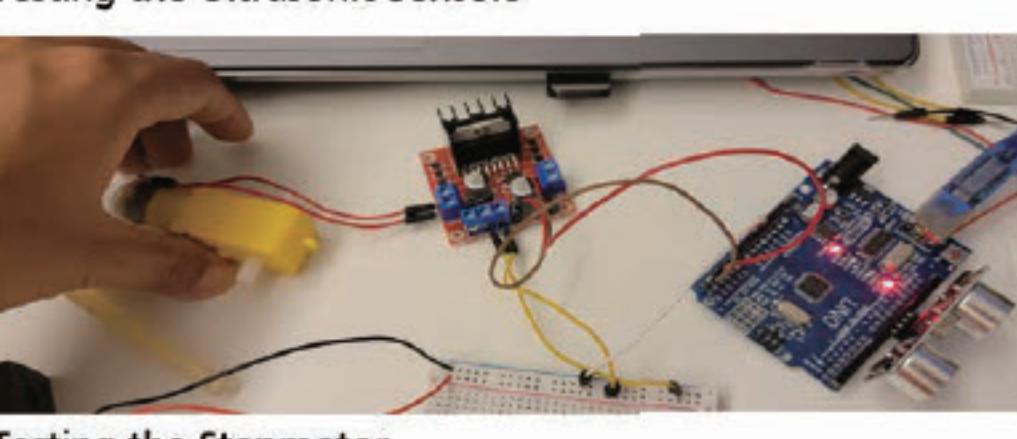
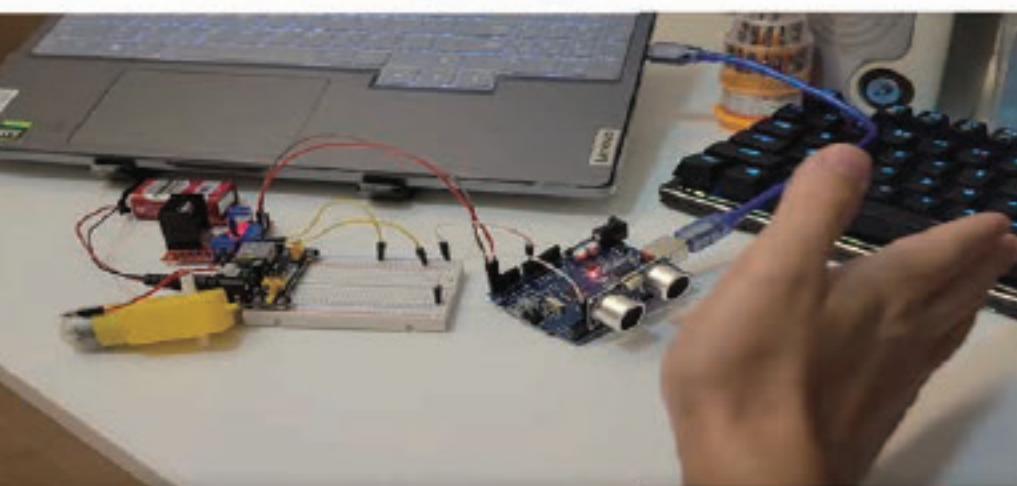
## Components



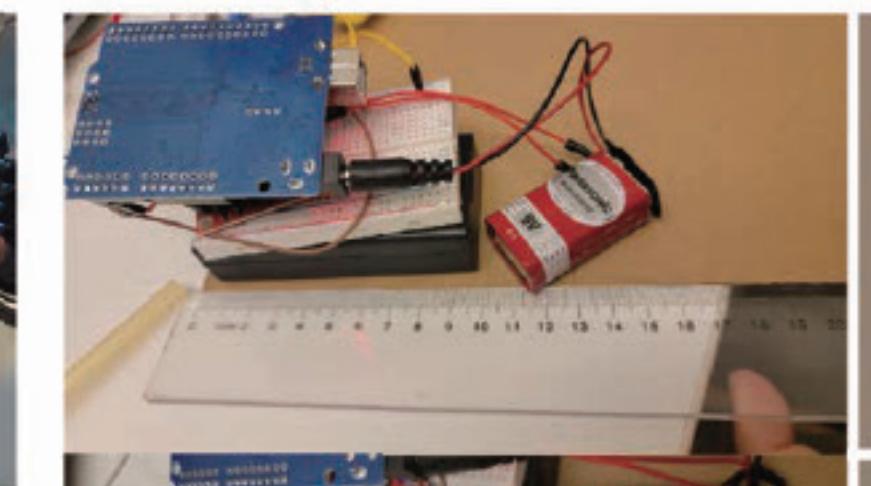
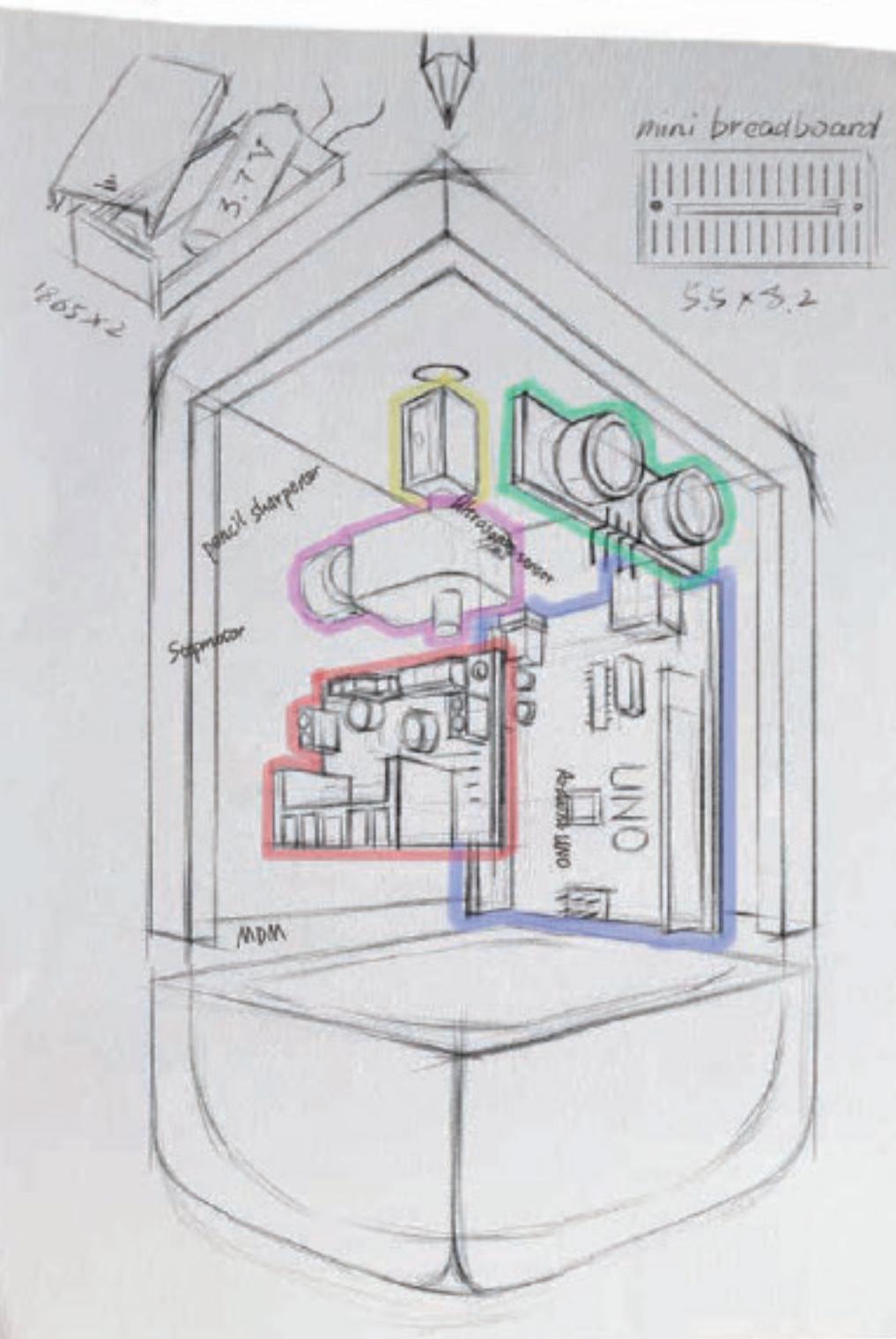
## Fritzing Circuit Schematic Diagram



## Assembling



## Decomposition Draft of The Installation



**Step 1**  
Measure the dimensions of all components and the volume of space they require.

**Step 2**  
Glue the pencil sharpener to the stepmotor.

**Step 3**  
Cut out the shell of the installation along the measured dimensions.

**Step 4**  
Reserve three holes for the pencil entry and ultrasonic sensor.

**Step 5**  
Leave enough room for pencil shavings, and glue all components in place.

**Step 6**  
Finished!  
Connect the battery and try to sharpen my pencil.

## Coding

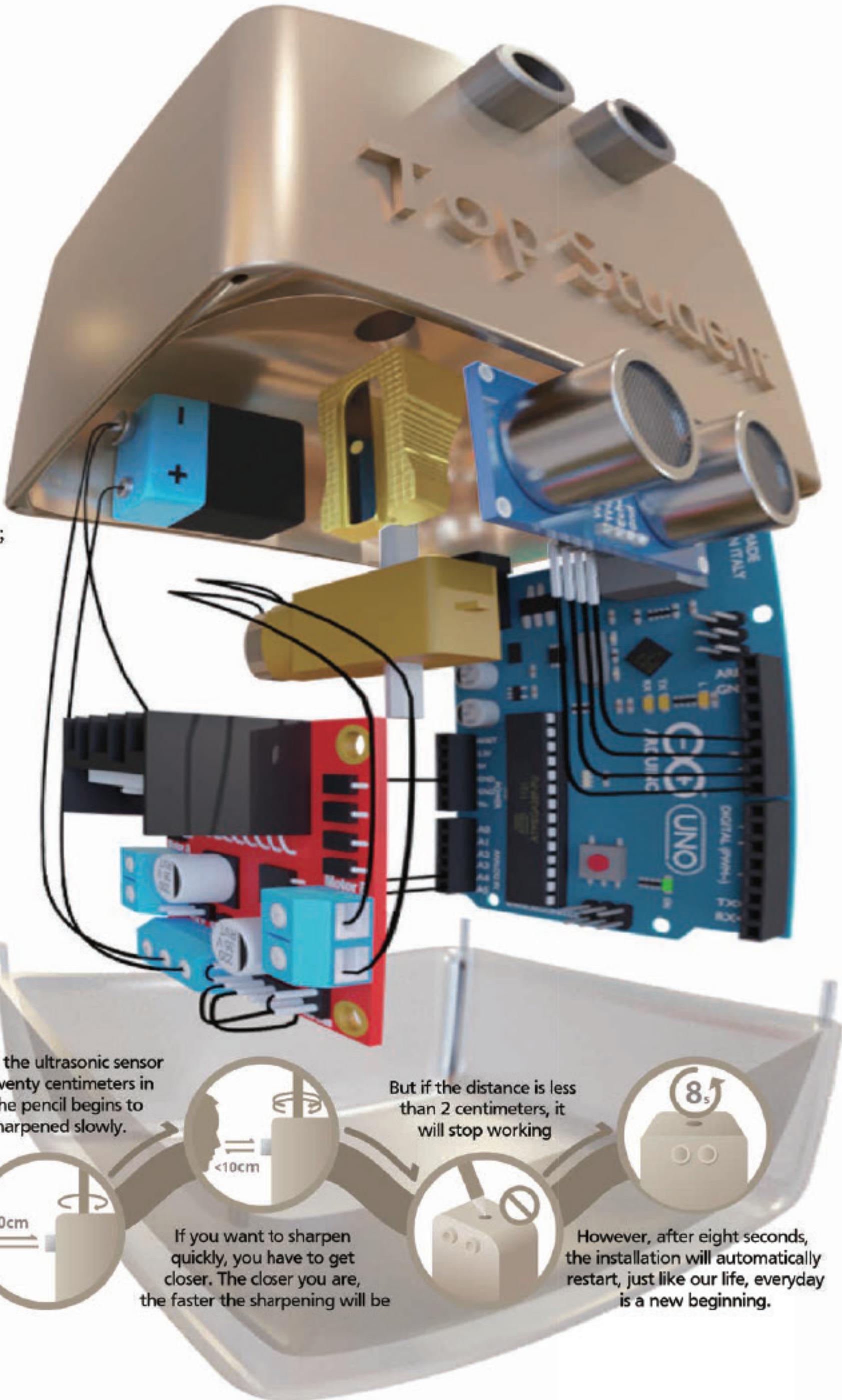
```
void setup() {  
    Serial.begin(9600);  
    pinMode(A4,OUTPUT);  
    pinMode(A5,OUTPUT);  
  
    pinMode(8,OUTPUT);  
    pinMode(9,OUTPUT);  
    pinMode(10,INPUT);  
    pinMode(11,OUTPUT);  
  
    digitalWrite(8,HIGH);  
    digitalWrite(11,LOW);  
}
```

```
void loop() {  
    digitalWrite(A5,LOW);  
    digitalWrite(9,HIGH);  
    delay(100);  
    digitalWrite(9,LOW);  
  
    int t = pulseIn(10,HIGH);  
    int d = t*0.034/2;  
    Serial.println(d);  
    delay(500);  
}
```

```
if (d>20){  
    digitalWrite(A4,LOW);  
}  
else if (d<=20 & d>2){  
    digitalWrite(A4,HIGH);  
}  
else if (d<=2){  
    digitalWrite(A4,LOW);  
    delay(8000);  
}
```

## Use Process

Approach the ultrasonic sensor within twenty centimeters in front, the pencil begins to be sharpened slowly.  
But if the distance is less than 2 centimeters, it will stop working.  
Put the pencil in the sharpener installation  
If you want to sharpen quickly, you have to get closer. The closer you are, the faster the sharpening will be.





## PROJECT 03 LIBRARY AR APP OF SICHUAN FINE ART INSTITUTE

An app delivers a more efficient way to borrow books and provides other relevant services on campus for students and teachers.

This project was designed for the Huxi campus library of Sichuan Fine Arts Institute during my volunteer experience as a librarian. Users in the library can use this app to search for books and scan the QR code on the book to obtain relevant information and borrow it. In addition, the app offers an interactive VR indicating arrow to assist users finding books.

### Aims:

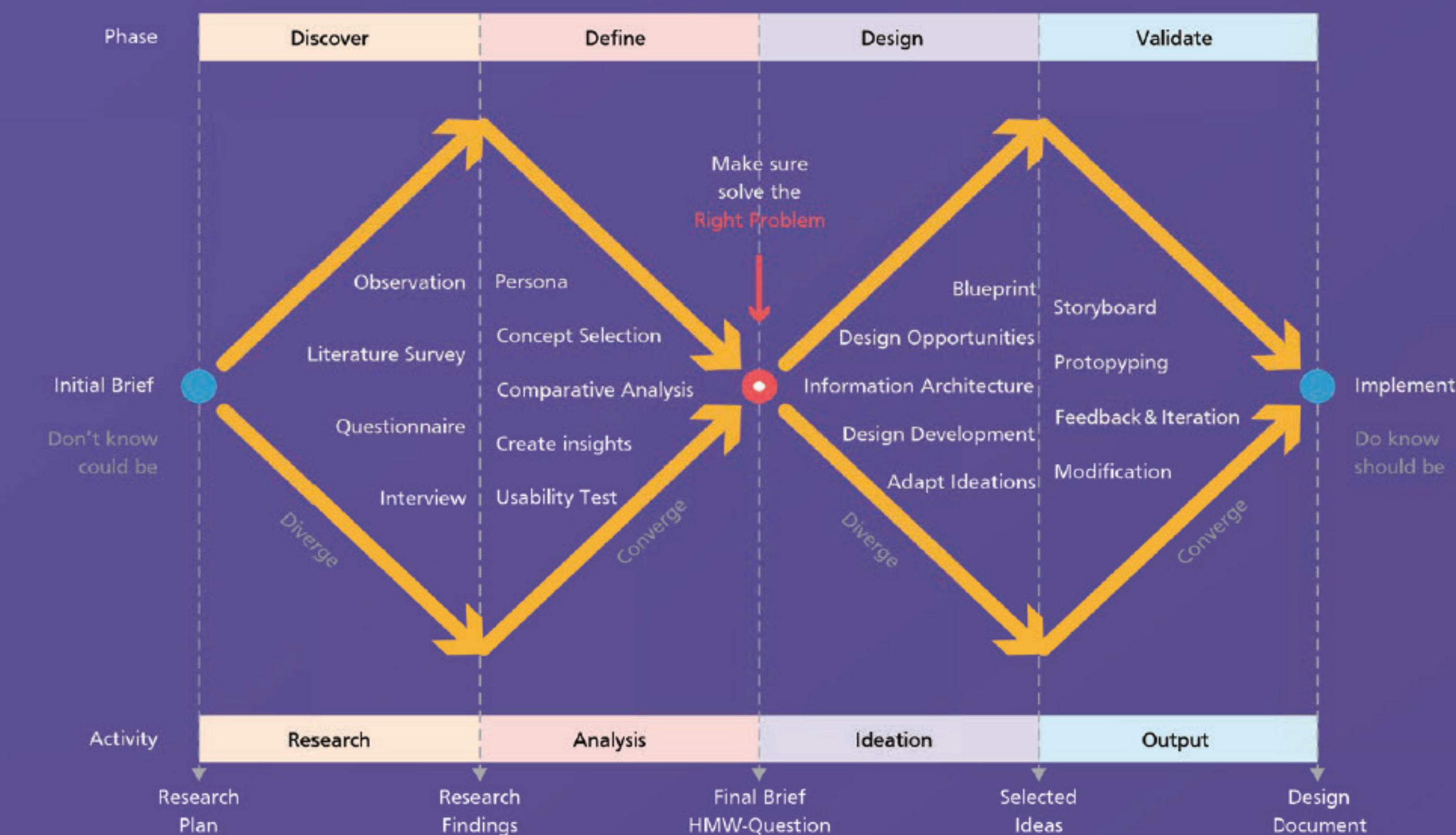
- To improve the efficiency of the working process.
- To augment users' AR experience during the visit.
- To enhance the efficiency of book delivery.

Interaction Design  
Service Design  
UX Design

Individual Project  
January — May, 2019

## METHODOLOGY&RESEARCH

### Double Diamond



### SWOT Analysis

Strength	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> <li>• The library covers an area of twenty thousand square meters. More than 4 thousand students on campus have the necessity to use the library.</li> <li>• The library is sponsored by the government, so there is no need to think about beneficial issues.</li> <li>• The library provides a wide range of resources for us to conduct in-depth research.</li> </ul>	<ul style="list-style-type: none"> <li>• The library app is very limited in personalization.</li> <li>• The library is too big to find resources users need.</li> <li>• Lack of space for users to exchange ideas.</li> </ul>	<ul style="list-style-type: none"> <li>• Sichuan Fine Arts Institute has realized that students need a better experience of borrowing, reading and studying in the campus library and has increased its focus on redesigning the service app.</li> <li>• Guangzhi Library 2019 Upgrading Project has proven that intelligent transformation can help libraries enhance their efficiency.</li> <li>• Sichuan Fine Arts Institute needs a good case of student-oriented system to flaunt their cutting-edge campus environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Some students will not choose to go to the library when they can acquire resources online.</li> <li>• The most popular trend among students is downloading PDF versions of books, which only takes a few minutes compared to borrowing books from the library that can take up hours.</li> </ul>

### Geography



### Demography of Sichuan Fine Arts Institute

From the Huxi campus report, an average of 800 users visit the library every day. The overall age structure is biased towards campus students and the remaining people involved were teachers and professors, accounting for nearly 10% of the users.

### Walking distance from the library on campus

The library is surrounded by several picturesque green landscapes and a lovely pond. People like to walk around it, as it is located in the centre of the campus because it is easy for everyone to come by. For anyone who wants to visit it, it takes less than 10 minutes to walk to the library.

### The Main Functional Areas



# INTERVIEWS&CONCEPT

## Vision



**Deng Dan** Age: 26

Position:  
Undergraduate in game design at  
Sichuan Fine Arts Institute

It may be helpful to scan the QR code to locate the book we need in  
the library. I struggle to search for the books I want sometimes.



**Li Maoan** Age: 38

Position:  
Staff of the Huxi campus library of  
Sichuan Fine Arts Institute

I have been working here for over two years. I'm tired of answering  
recurrent questions over and over again. We want a better service  
system to serve our users.



**Mr. Jones** Age: 36

Position:  
Teacher of animation design at  
Sichuan Fine Arts Institute

As a teacher, I use this library a lot, and I think the app may be able to  
add intelligent voice explanation capabilities to serve foreigners.

## Questionnaire

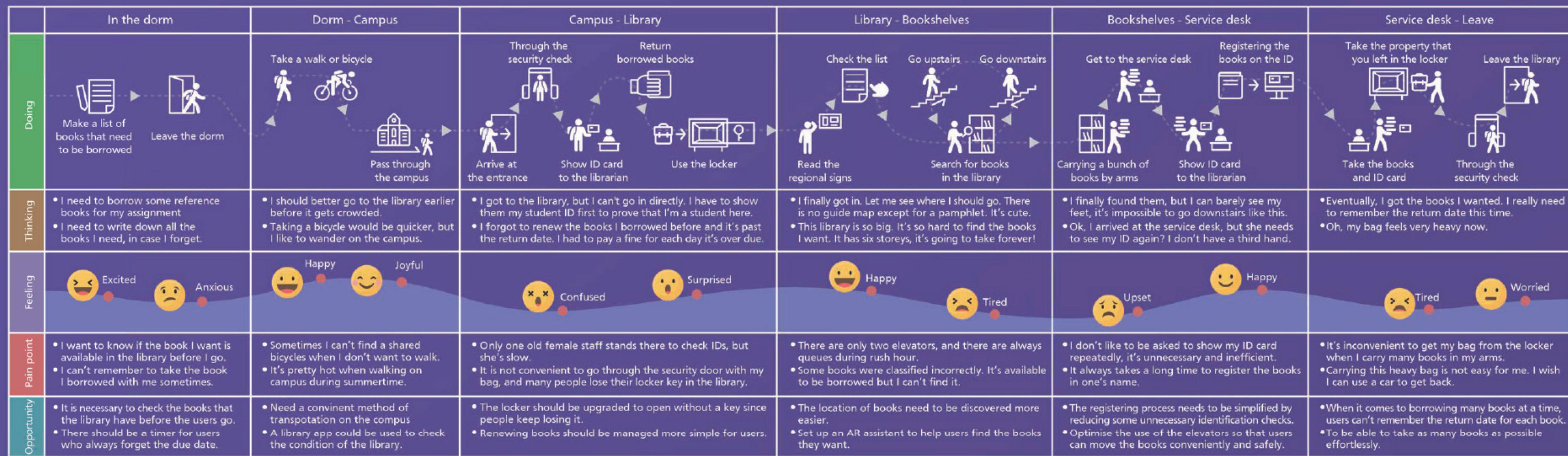
This questionnaire was distributed to 50 people (male 22, female 28) who  
were in the library. It mainly focused on the AR assist and people-oriented  
system built for the library.

Why do you come to the library?	How often do you come to the library?
Self study	Everyday
Borrow books	More than two times a week
Do research	Once or twice a week
Meet friends	A few times a month
Kill time	Depends on mood

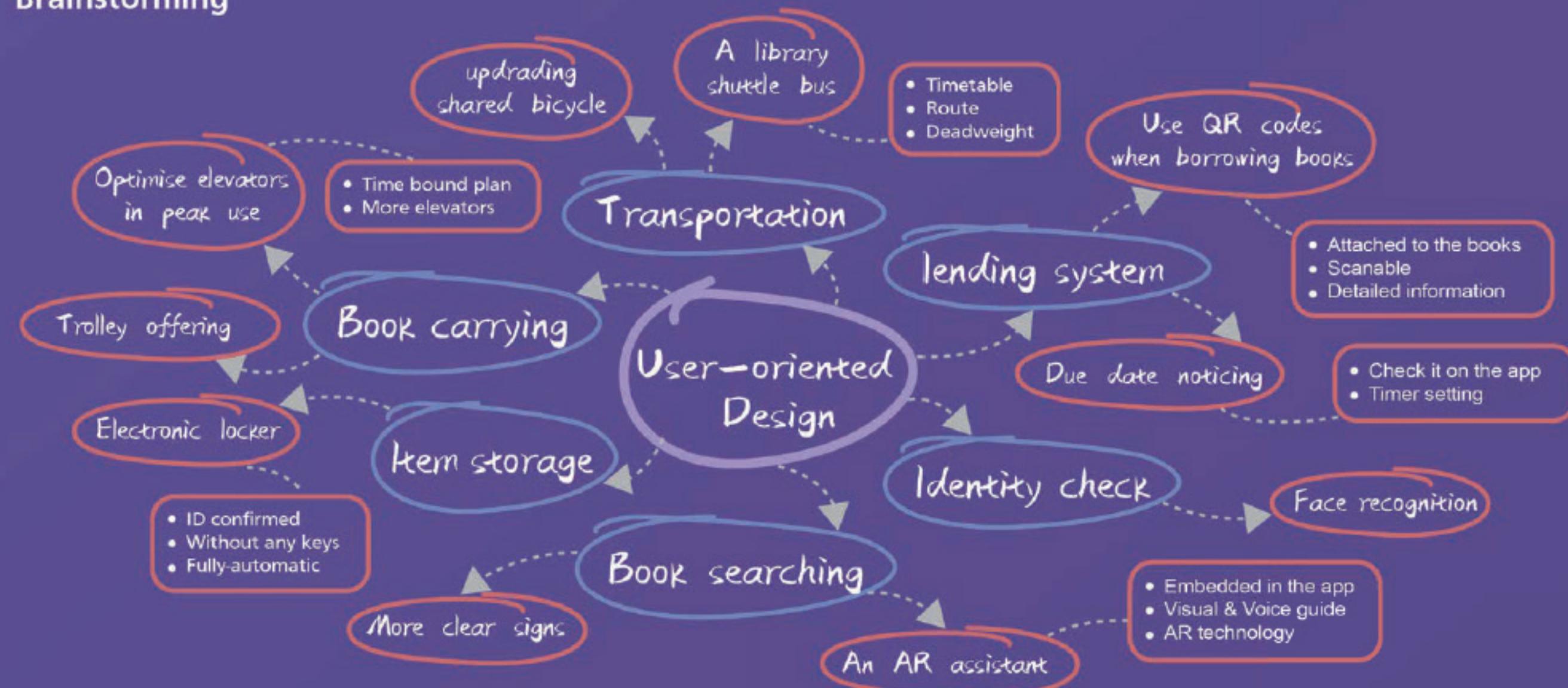
When it comes to upgrading the system, in which aspect do you  
think the library has the opportunity to develop?  
(How Might We bring an efficient library to users?)

- Make it more fun and interactive, increasing users' immersive feelings
- More accessible information should be seen on the app before we use the system.
- Add a sense of modern intelligence. Users like to be served by technology.
- How about making more signs in different sections of the library? It is too complicated.
- Make it easier for the staff to work in the library, because they are constantly inundated with questions from visitors.
- More rooms should be made for people who need to have a conversation with others.

## User Journey Map



## Brainstorming



## Concept Selection

### Concept 1

- Arrange the shuttle bus to run on the campus loop every day. Students and teachers can use it for free at any time to help them carry books.
- The app can locate the location of the shuttle bus and the time it takes to arrive at the nearest address in real-time, so users don't have to wait.

### Concept 2

- Students and teachers complete registration online. After verifying the identity through the app, there is no need to verify the identity again when entering the library.

### Concept 3

- The augmented reality assistant will lead you directly to the location of the books after you enter the books you want to find, saving you time for searching.

### Concept 4

- A QR code is attached to the back of each book. After scanning the QR code, the user can get detailed information about the book and the historical borrowing records. In this way, you can meet friends who share the same interest in the books and allow students to discuss together.



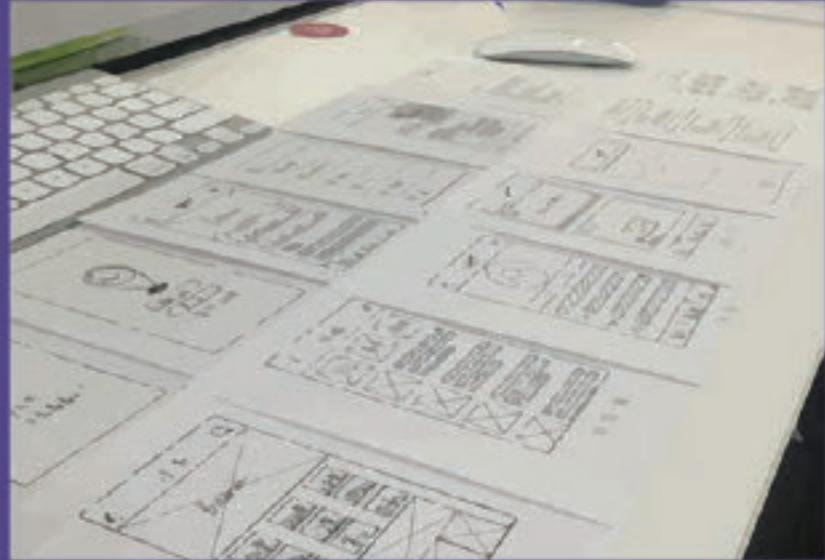
# FINAL DESIGN

## Service Blueprint

Customer Journey

	Set off	Transportation	Access	Search	Loan Registration	Success	Leave
User Actions	Download and open the library app to check the available books in the library and make a list. Check the location of the shuttle bus to avoid waiting.	Go to the library using the shuttle bus, enjoy the beautiful view of the campus and get off the bus at the library stop.	Gain access to the library, through the face recognition device. Use the library app to open a locker. Scan the QR code to return the books.	Enter the name of the book in the search bar on the app. Wait for a second, the AR assistant will show you a three dimensional arrow which points to the location of the book. Follow the guide to the location and it also shows you the relevant books on your trip.	When you reach the book you want, you can register the book by yourself. Just put the QR code of the book in front of your phone and scan it. It would be recorded under your name automatically.	Take the books you borrowed and reopen the locker to take your bag, put your books in the bag and go through the security door.	A due date timer is set by itself. Check the location of the shuttle bus. Put your bag and books on the bus then take it till you get your place.
Evidence	App store The library app Real-time updated system	Campus shuttle bus Positioning system Route planning	Face recognition system Electronic locker Fast return process	Library positioning system AR technology Likes and recommends	QR code Phone Scanner Upgraded register system	Electronic locker Fast security control Face recognition system	Delivery service Positioning system Return date reminder
Line of Interaction							
Front of Stage Interactions	Description of the books and the library information	The real-time location of the shuttle bus is showed on the app	Provide users fast access experience through technology	The AR assistant helps users work more efficiently. Provide intelligent recommendations	A convenient self-service lending system Fast book lending experience	Provide intelligent, efficient process	Provide convenient service, Provide reminder
Line of Visibility							
Back of Stage Interactions	Upload the library information and service details	Map display Vehicle tracking Bus arrangement	Face registration Recognition system Statistics on the user	Book arrangement Equipment development AI algorithms	Self-service lending system Information arrangement Equipment maintenance	User management Develop the identity testing	Feedback system User information arrangement
Line of Internal Interaction							
Supporter	App designer Marketing specialist Frontend developers Backend developers	Shuttle bus Vehicle supplier Bus driver Other relevant staffs	Technology developer Develop tool Equipment supplier System manager	Voice supplier 3D designer Information management staff QR code sticker	App designer Technology developer Information entry staff	Locker supplier Security equipment supplier	Applet developer Shuttle bus Locator

## Low-fidelity Prototype



### 1. Interface

Some aspects of the app's interface design could be improved, such as layout, proportion and navigation. We should not design the operation process to be complicated.

### 2. Legibility

For legibility, it's very important that information be easy to tell apart. Clear icon images are convenient for users to understand fast where to go.

### 3. Connectivity

Each function in the software is applied around the library, making it easy for users to reach and connect.

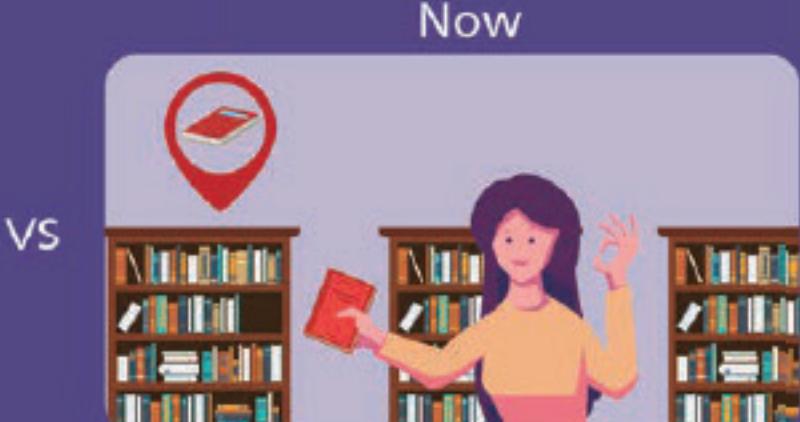
## User testing



## High-fidelity Prototype



## User Benefit



VS  
Can't figure out the sections and always struggle to find the books

The AR assistant would locate the books and no more time wasted



VS  
There are always queues during rush hour, and books are heavy.

With just a simple scan, the book is borrowed under your name.



VS  
A lot of people keep losing their locker keys in the library

Using electronic lockers, takes away the inconvenience of keeping keys safe



VS  
Books are too heavy to carry on the way back

With a shuttle bus, books can be delivered anywhere on campus

## Advantage

- Through the QR code, the whole process of borrowing and returning books becomes very smooth and fast.
- With face recognition, users do not have to repeatedly verify their identity information throughout the process.
- AR assistant makes even the longest book-finding process smart and efficient.

## PROJECT 04

# OLMMUNITY

Most countries in the world are confronting the problem of population ageing. The elderly cannot be looked after properly. Currently, the population ageing is getting severe. Many elderly are living alone.

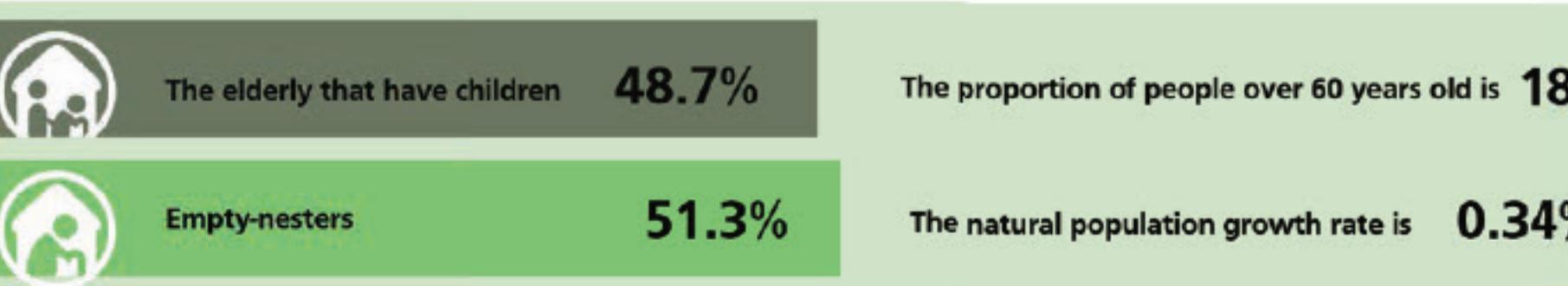
The aging of the population involves an increasing number of elderly and a shortage of newborns. Therefore, most elderly are doomed to look after themselves. Especially those who cannot afford a care worker.

- There are many problems that we urgently need to solve:
- How can we satisfy the empty-nesters' emotional needs?
- How can we improve their life quality?
- How can we enable the single elderly to have sufficient resources to take care of themselves?

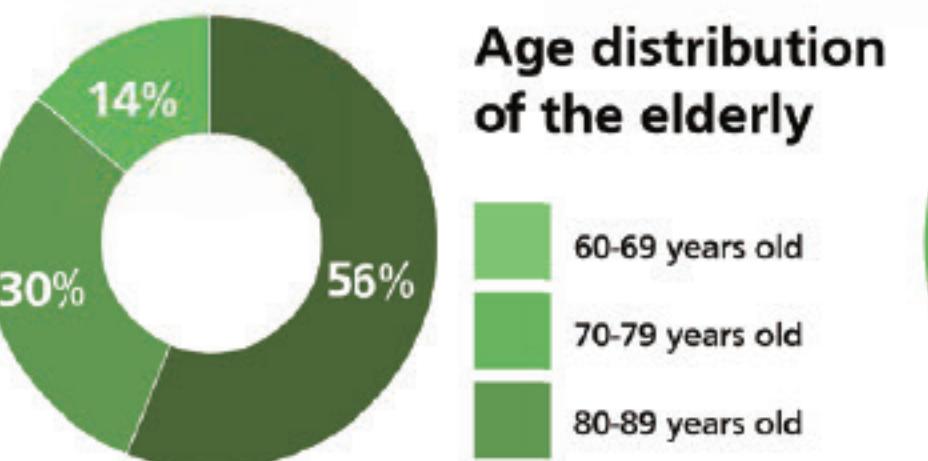
Service Design  
UX Design

Individual Project  
March. 2022

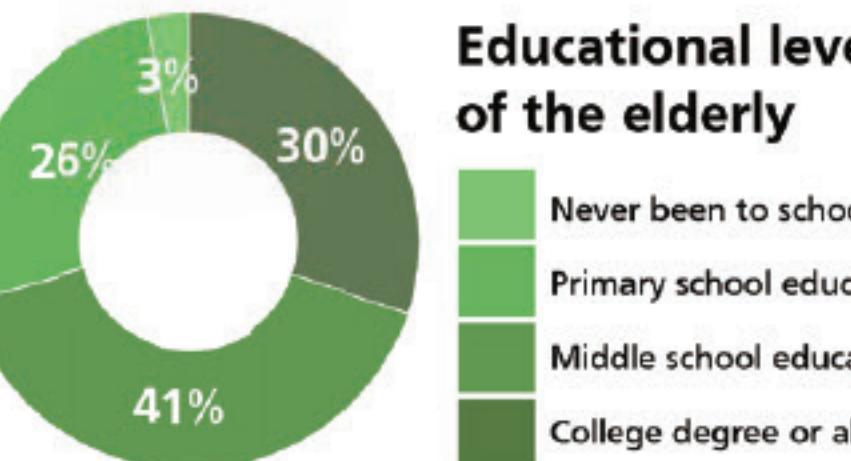
## BACKGROUND RESEARCH



### Consequences of population aging



The elderly population aged 60 to 69 accounts for a large proportion, and these people have little self-care ability



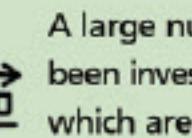
The education level of the elderly is generally low, and that's why they are bound to be targeted by scammers.

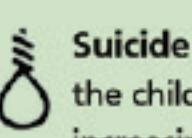
### 241,000,000 People over 60 years old

51.3% of elderly population are empty nesters and 16% are childless

The current level of market-based investment and operation of pension funds is low, with less than 20% of the funds in the market

Rural pensioners receive less than \$200 per month per capita

 A large number of pensions have been invested in bank term deposits, which are under long-term pressure to depreciate in value

 Suicide rates among the childless elderly are increasing every year

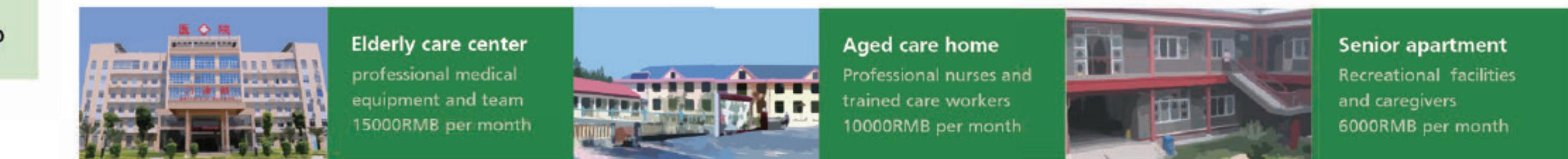
### Insight

According to the survey data I collected, empty-nesters account for 51.3% of the elderly population and it leads to many significant issues in the elderly population. For the contemporary elderly population, financial issues are a hassle for them.

## EXPLORATORY RESEARCH

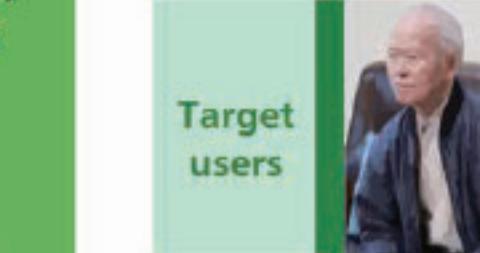
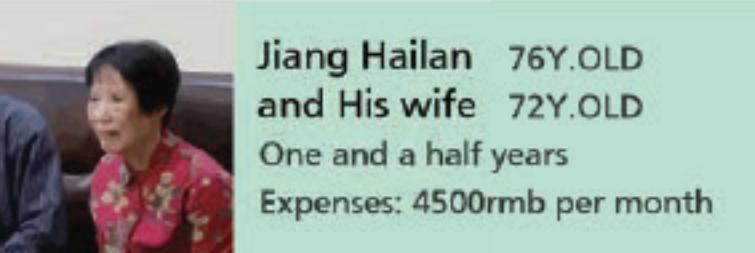
### Field research

I investigated several elderly stakeholders and observed their backgrounds and interpersonal relationships. Through interviews, I obtained and sorted out the overall portraits of the elderly. I learned that the elderly who live alone have many inconveniences in the social aspect. Some elderly go to nursing homes, and some go to rehabilitation centres, but they don't always live there. The main reason is the high level of consumption because they cannot afford it in the long term.



### Interview

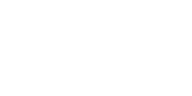
I interviewed the hospital's care workers, nurses and elderly and find out many problems in their daily life.

<b>Target users</b>	 Jiang Hailan 76Y.OLD and His wife 72Y.OLD One and a half years Expenses: 4500rmb per month	 Care worker ZhuMin 41Y.OLD No medical experience Been doing this job for two months Wage: 2400rmb per month	 Nurse MaRui 29Y.OLD 7 years nursing experience New to this hospital Wage: 5000rmb per month	<b>Problems</b> Suffering from brain atrophy and hemiplegia Half-disabled and half-deprived Mainly accepting daily living care and health monitoring  Mainly care for half-disabled elderly Manages the daily activities of the elderly, such as taking a bath, eating and taking medicines, etc.  Responsible for the medical problems of half-disabled elderly Manage the safety monitoring of the elderly, medication for health checkups.
<b>Stakeholders</b>				The number of employees is not enough, and most people are reluctant to take care of the elderly.  Wages are too low, compared to other service industries, caring for the elderly is more difficult.  Nursing workers lack professional knowledge, and they are basically on the job after a few hours of training.  Young nurses are more willing to go to big hospitals, and nurses in there are generally older than other hospitals.

### Questionnaire

To better understand the current status of elderly people. I published a survey questionnaire in Hubei TCM Hospital. I chose a group aged from 60-75 to investigate living conditions.

1.What do you think the cause is of the aging problem?

 Low / declining birth rate 20 votes

 High cost of raising a child 11 votes

 Young people cannot make enough money 14 votes

 Inflation 9 votes

 Increased awareness of self-fulfilment 15 votes

2.How many people in your family can support you?

 4 2 votes

 3 7 votes

 2 18 votes

 1 22 votes

 0 17 votes

### Summary (What do they need)

Longing for company

When their children grow up, they will move out of the house and live on their own. In China, most people spend very little time with their parents after starting work.

Enough money in the future

As prices continue to rise and the currency continues to depreciate, the elderly are worried that their current savings are not enough for the rest of their life.

Secure life

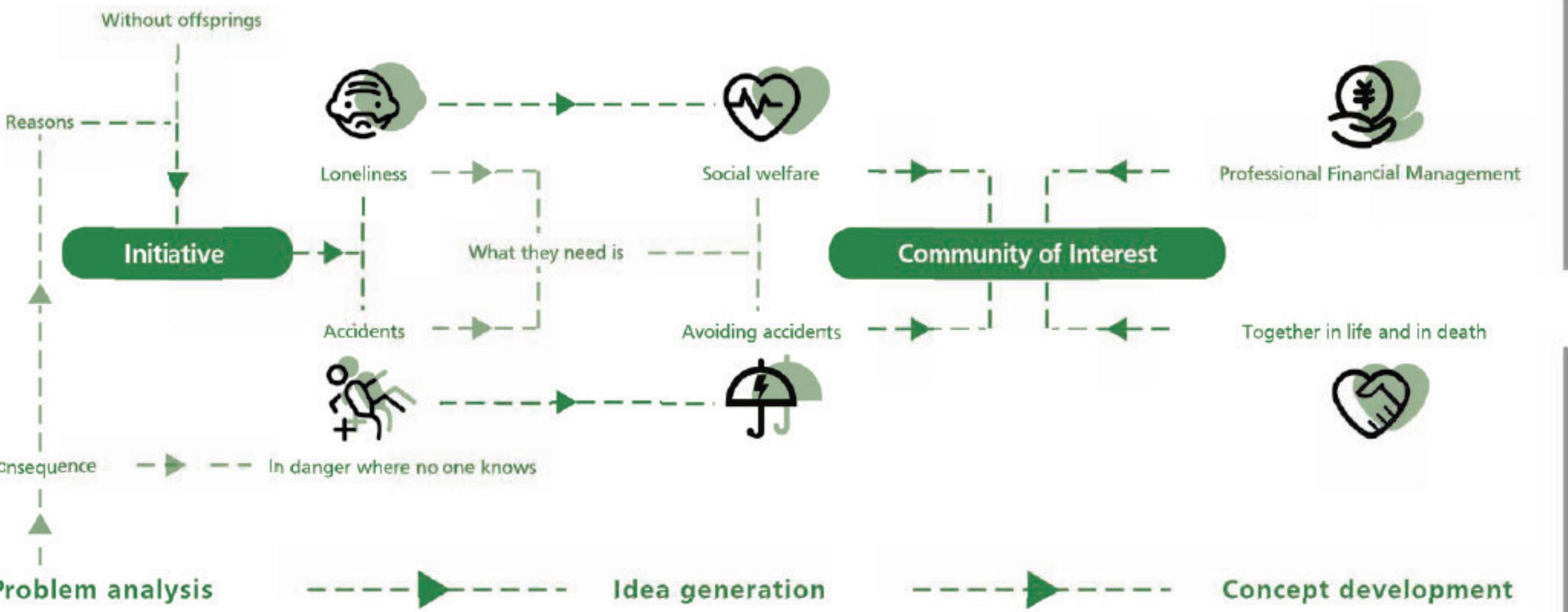
Many elderly people have lost their children, and many elderly people's savings have been defrauded by scammers. The elderly need a secure life.

# CONCEPT

## Competitive Analysis

	Brands	Alipay	PingAn Bank	Golden Butler	Doctor Lilac
Features					
Action List	✓		✓		
Private Service	✓	✓	✓	✓	✓
Weekly/Monthly Report	✓	✓	✓	✓	✓
Data Visualization	✓	✓	✓	✓	✓
Ranking	✓	✓			
E-Shop	✓	✓			✓
Customization			✓		✓
E-Community	✓				
E-Wallet	✓	✓	✓	✓	
Safety	✓	✓	✓	✓	✓
Usability	<p>Readability, Hierarchy, Visualization, Data Precision, Financialization</p> <p>Alipay (blue), PingAn Bank (orange), Golden Butler (green), Doctor Lilac (red)</p>				
Strengths	Large platform/ Many users/ Comprehensive	High financial/ High professional	Customized service/ Focus on health investment	Professional in medical field/ Large group of Doctors	
Weaknesses	Complicated operation process/ Small fonts	Few pension investment program	No user comment/ No direct feedback from customers	Expensive	

## Brainstorming



### Problem Statement

In the future, with the increase of the elderly population and the reduction of the proportion of young people, the number of elderly people living alone/single elderly will inevitably increase.

The shortage of labour force will become a hindrance to the development of the society, and the problem of old-age care will become more serious. The country and society need more service personnel for the elderly, otherwise social conflicts will become more and more serious.

### Target Group

It is not only the elderly that needs to care about their own interests, the society also need to care for the elderly. That is our obligation to support everyone who gets old.

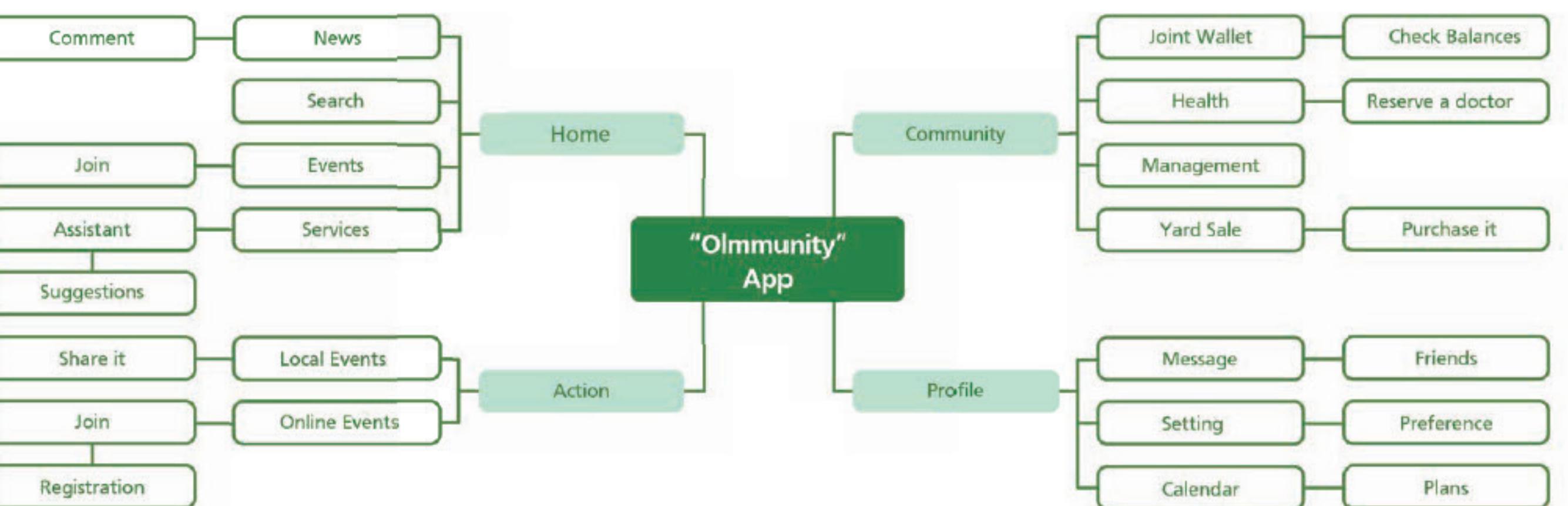
So, everyone needs to take this phenomenon seriously. Caring for the elderly is caring for ourselves.

### Purpose

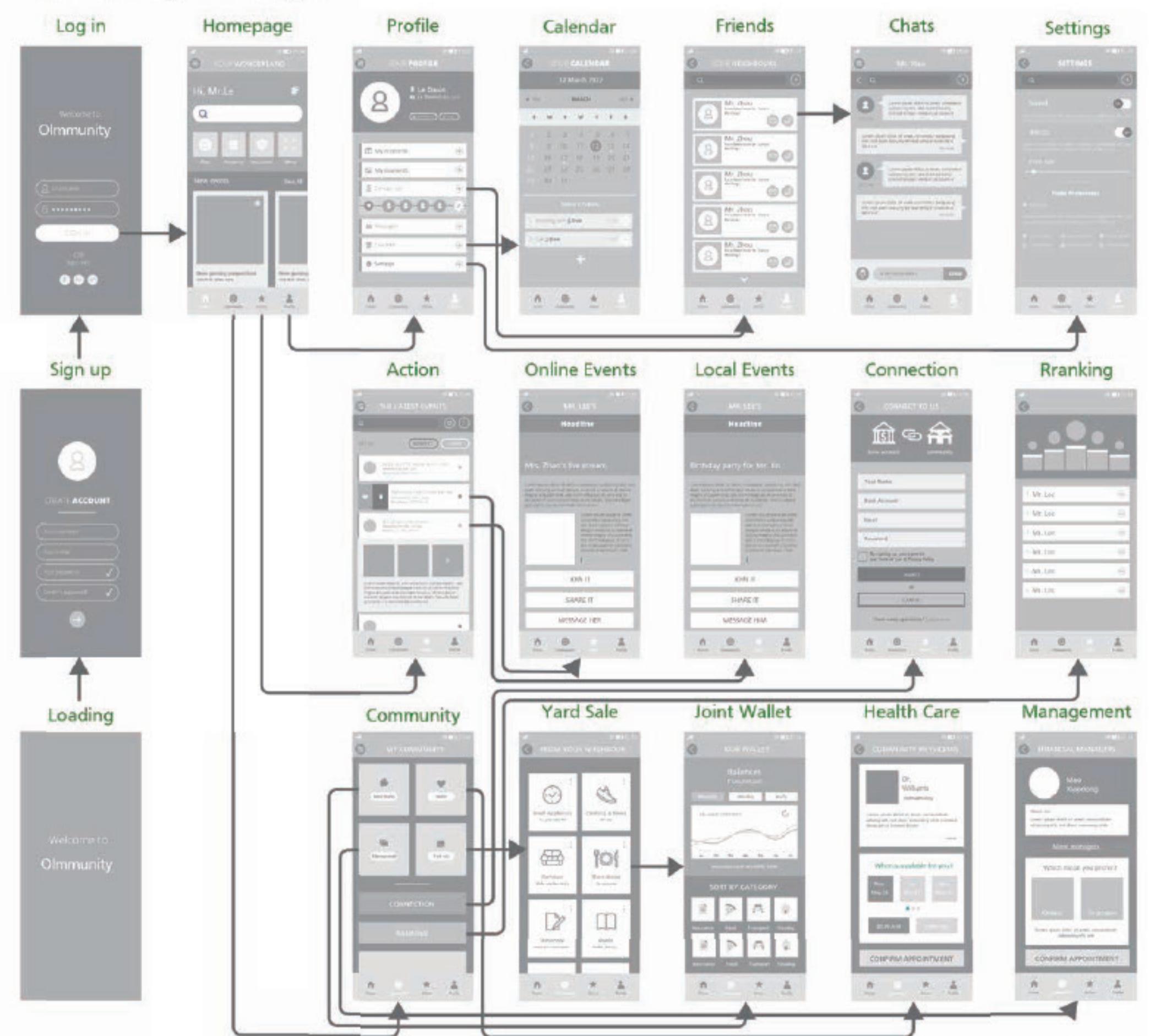
Establish a common community, so that the elderly without children can get help, and at the same time, the relationship will no longer be limited to blood relations, but the whole community. In that way, the elderly can feel the warmth of human affection.

Shared interests, shared life and death

## Information Architecture



## Low-Fidelity Prototype



## Prototype Testing

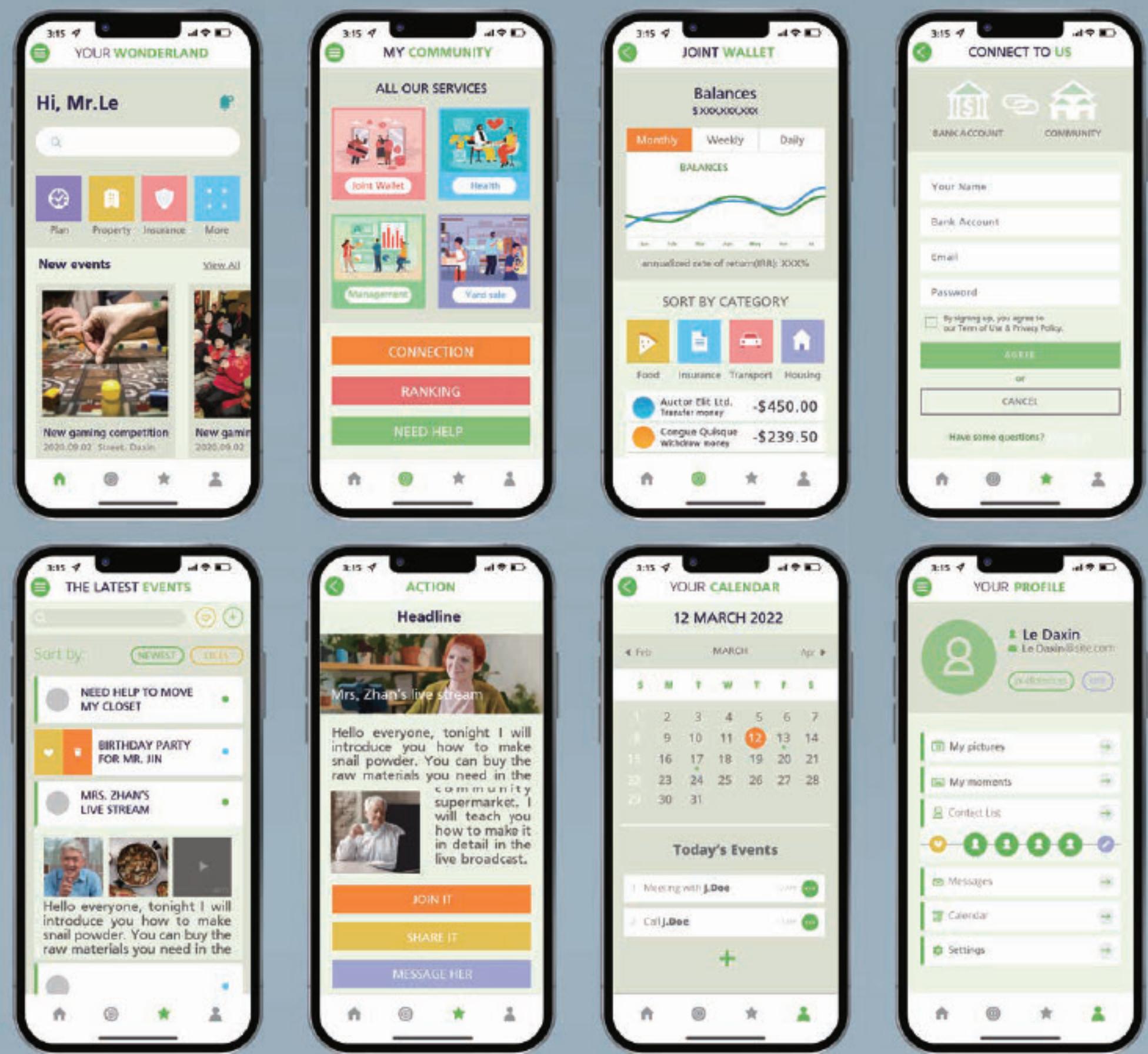


- Advantages**
- This app forms a community that like a joint venture firm connects everyone physically and mentally.
  - The relationship between every person in the community can be very relaxed and trustworthy.
  - Instant health check for everyone in the community.
  - Yard Sale sector benefits the Joint account.

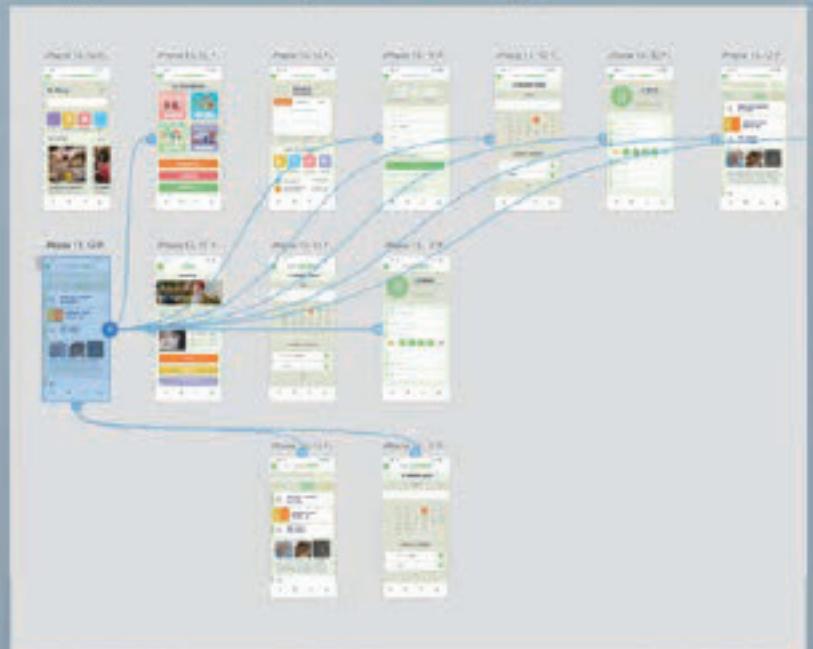
- Problems**
- The joint wallet should provide the detailed information about every expense and return.
  - This app needs a logo.
  - Fonts are not big enough.

# FINAL OUTCOME

Main function interface



High-Fidelity Prototype



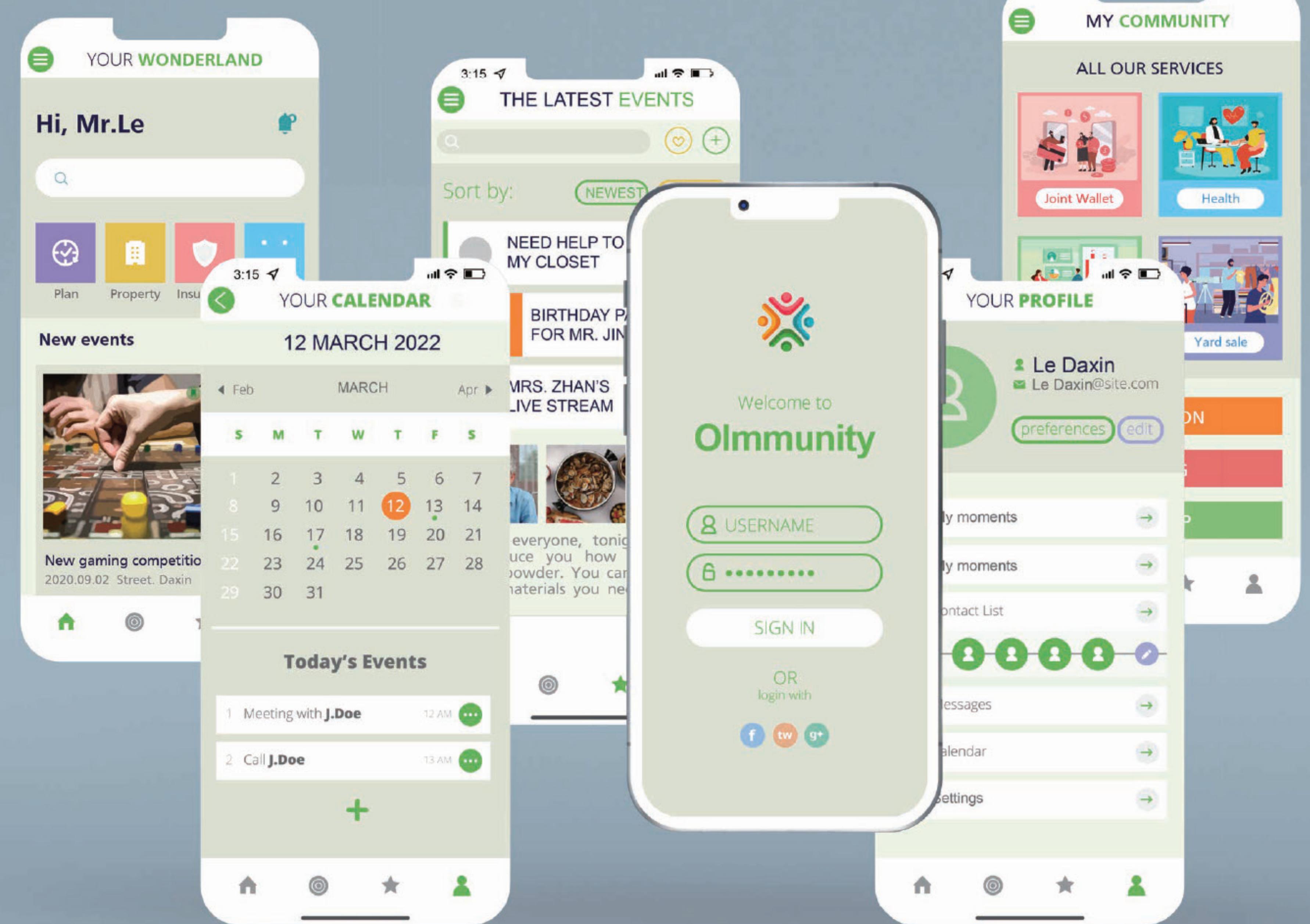
User feedback

**Mr. Lu**  
40 years old, Chef  
1 child and wife  
2 old parents

I can see the profounding impact that this app will bring to the elderly community. They need more help to be taken care of. I hope one day I'll be able to find somewhere I can feel belonging if I can no longer take care of myself.

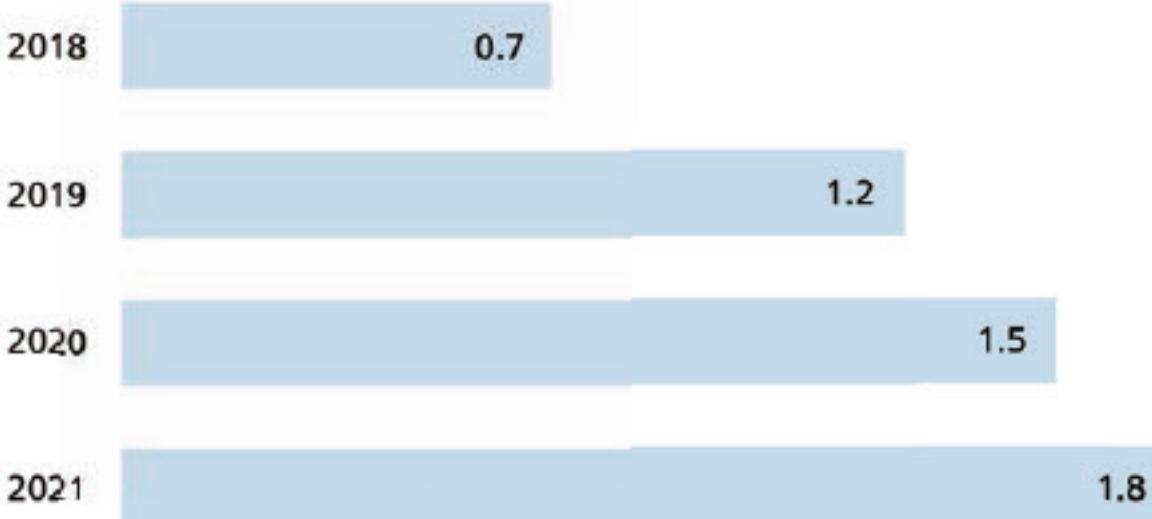
**Mr. Zhang**  
69 years old, Retired  
4 children, widower

I have four kids, but I do feel lonely sometimes. Who knows, maybe one day all my children will leave me. I cannot predict the future, but I think this is a good idea to build solidarity in the community.



# RESEARCH

## Global Market Size (billion USD)



The Ministry of Health of China requires tertiary rehabilitation hospitals to be equipped with rehabilitation training equipment, and secondary rehabilitation hospitals to be equipped with motion control training equipment. The purchase of rehabilitation training equipment by hospitals has become a rigid need.

## PROJECT 05

### SITS

A rehabilitation training system provides patients a good personalized treatment. Relieve doctors and nurses from countless data filing work flow.

Scenario interactive training system (SITS) is the latest human-computer rehabilitation equipment produced by Buffalo Intelligent Rehabilitation for TCM hospital of Hubei Province. Patients can achieve multi-functional rehabilitation training goals by completing game tasks.

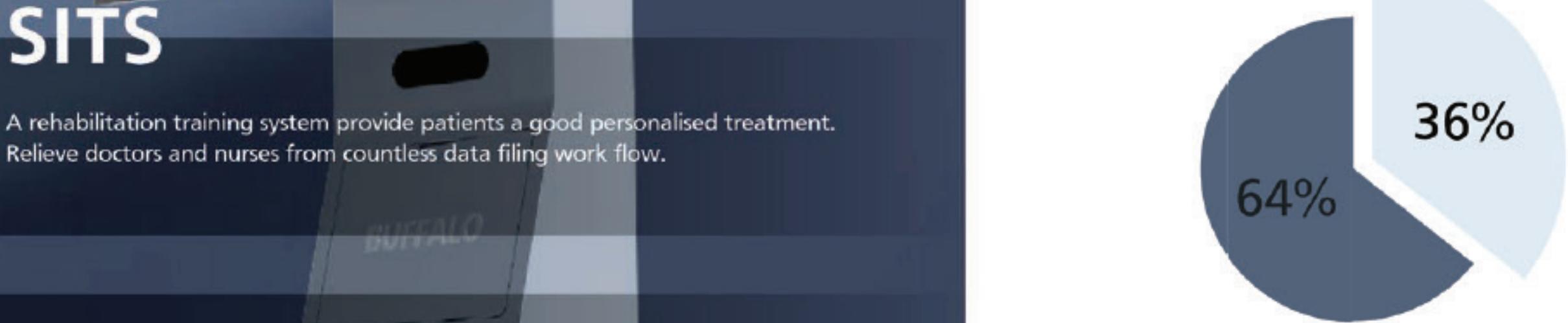
It not only brings fun to the patients but also provides the training data for each session so that doctors can conduct targeted treatment for patients.

Interaction Design  
Product Design

Team Work  
Game Design, Product Manufacture

#### My Roles

User Research, UI/UX design, Kinect Coding, Product Appearance Design



The prevalence of musculoskeletal disorders in the elderly over 60 years is 36%, with a prevalence of 23% in men and 49% in women.

 ≈ 1.71 billion people worldwide have musculoskeletal disease

Musculoskeletal disorders have different incidences in different areas and countries. China, a country with the largest population, has been suffering from this disease for a long time.

#### Insight

The prevalence of musculoskeletal disorders increases with age, and this problem is bound to become more severe in the foreseeable future. Hospitals' procurement of rehabilitation training equipment will become a rigid demand.

## Interview

### 1.What do you value the most in rehabilitation training?

“From my perspective, I think targeted rehabilitation training is one of the most important features.”

“As a son, I hope my mom gets the best treatment. The most valuable thing to me is safety.”

“I think quick and effective training is what all patients need. I want to get back to being healthy as soon as possible.”

“I like that rehabilitation training has timely feedback. I'd like to check my condition at any given moment.”

### 2.What is your biggest concern about rehabilitation equipment?

“My muscles are very weak and I am worried that I will not be able to use the rehabilitation equipment properly.”

“I have tried many other rehabilitation training sessions before. Does this equipment really make a difference?”

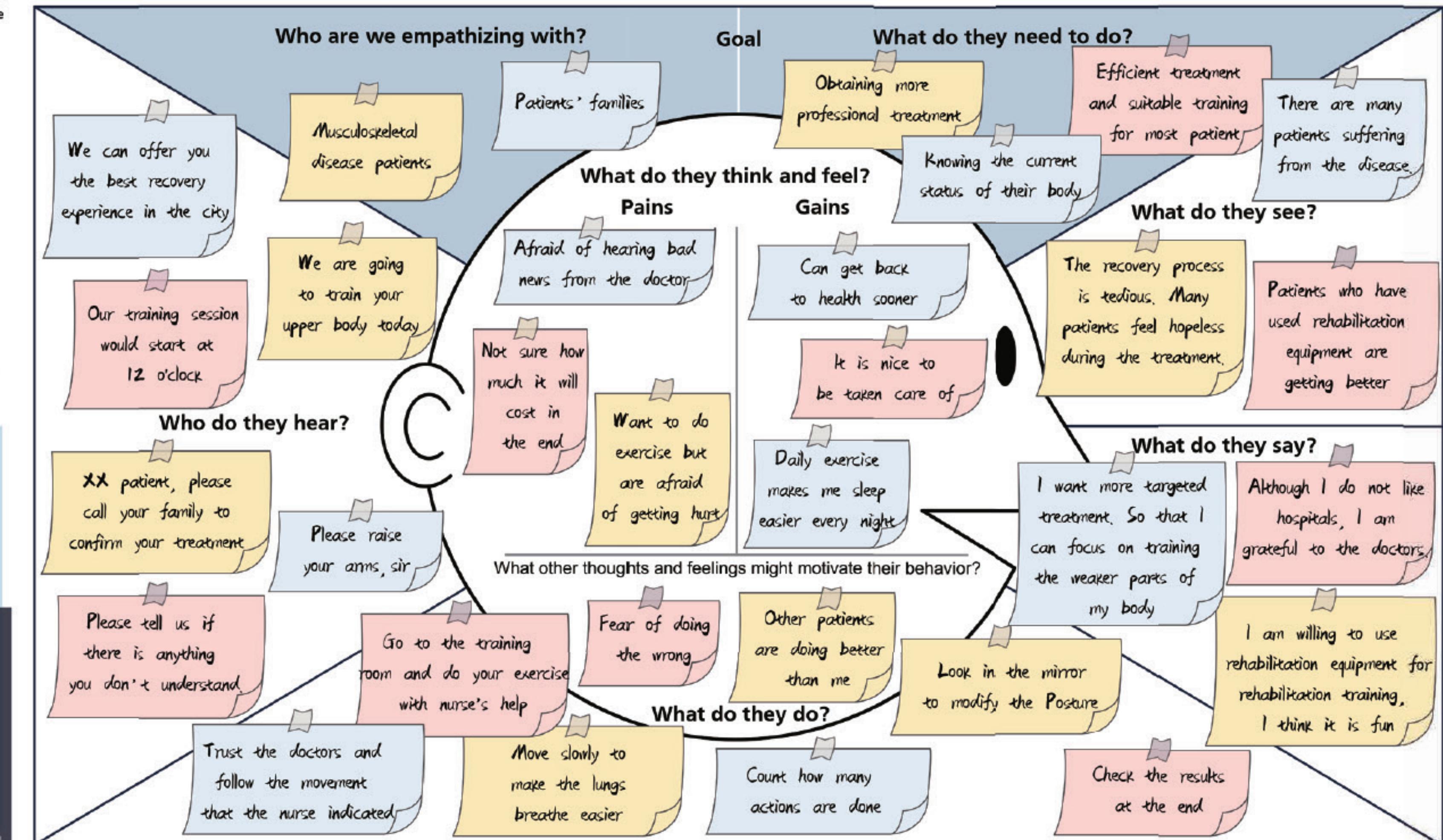
“I think money is the biggest concern for me. I believe most of the patients are not very rich, so we care about the cost.”

“I'm more worried about whether it's safe for children and whether they're too short to use it.”

## Summary

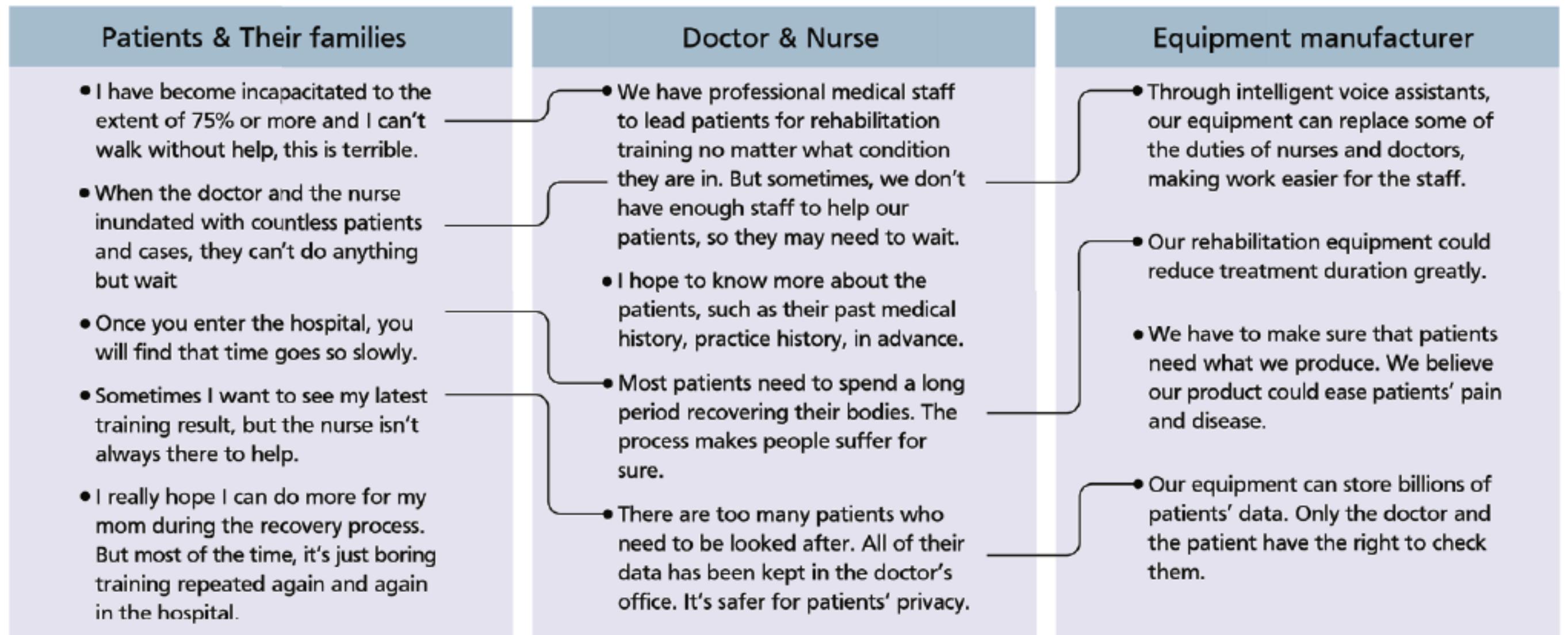
- Everyone's situation is different and everyone requires a different treatment plan.
- Patients like to know the real-time condition of their bodies when doing rehabilitation training.
- The treatment process is always tortuous, and the patients want to relieve the torment of the training.

## Empathy Map

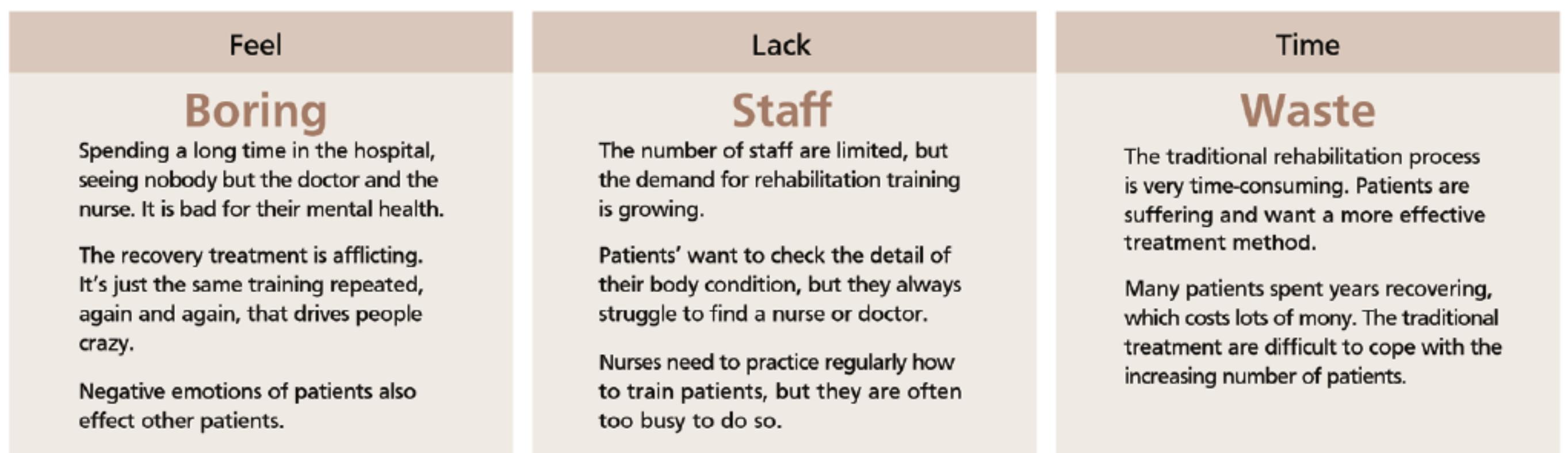


# ANALYSIS

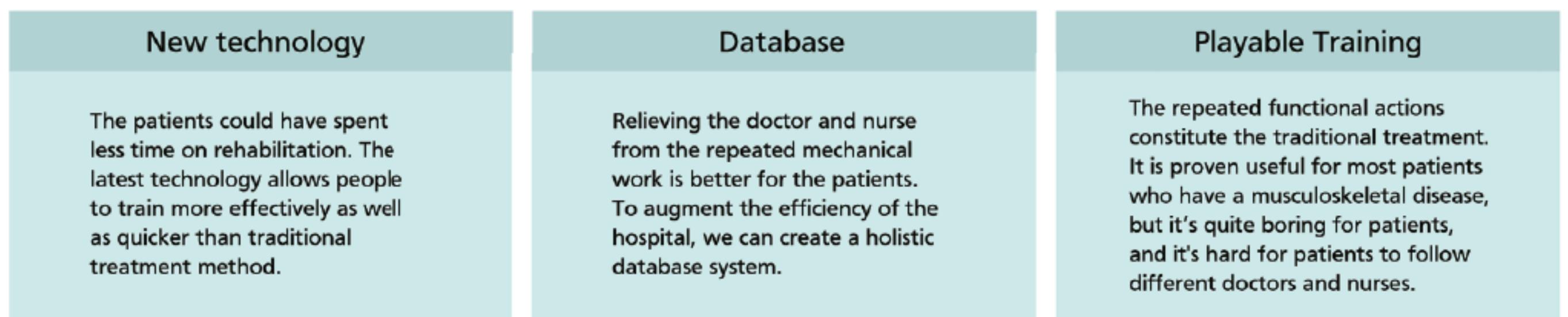
## Perception Gap



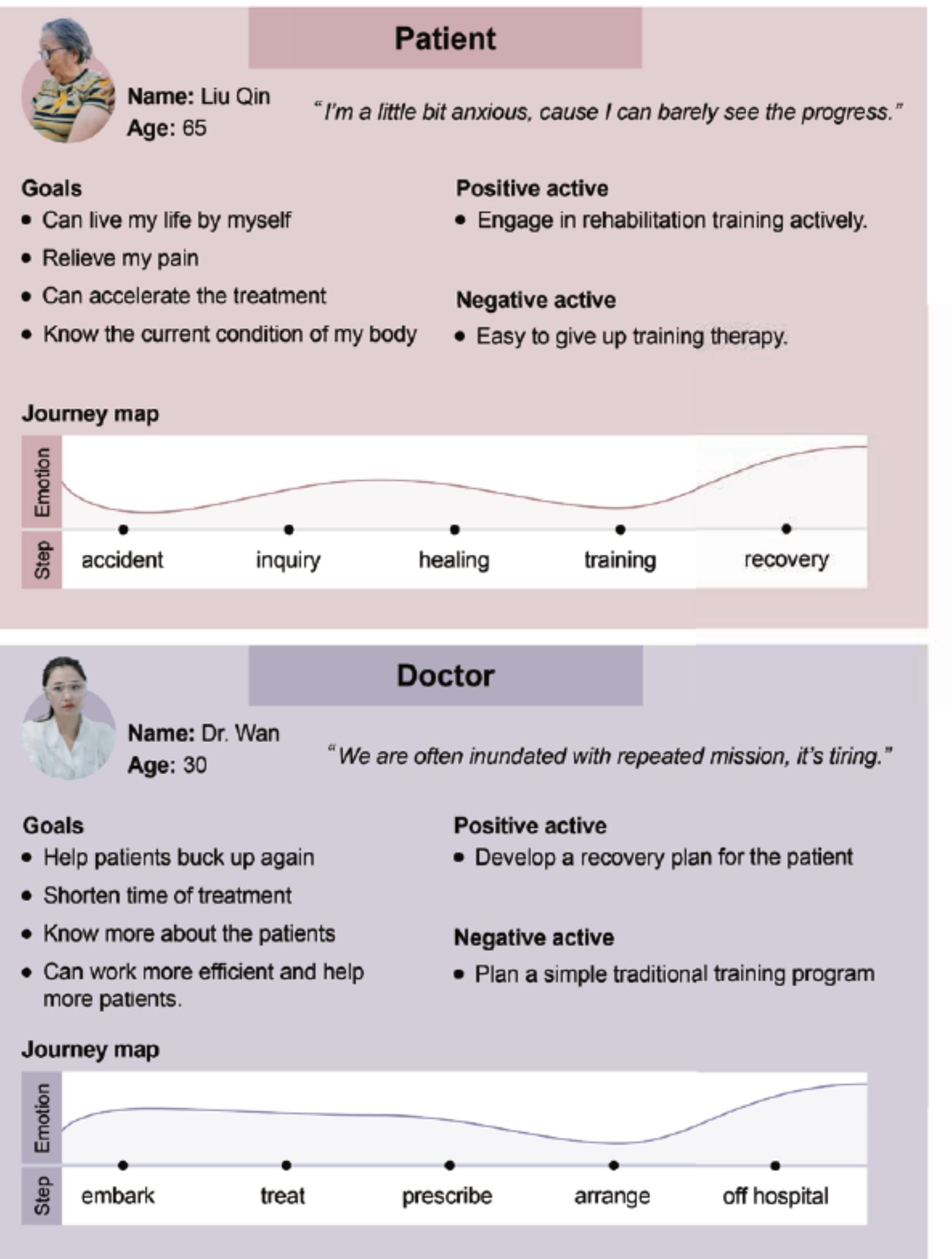
## Main Pain Point



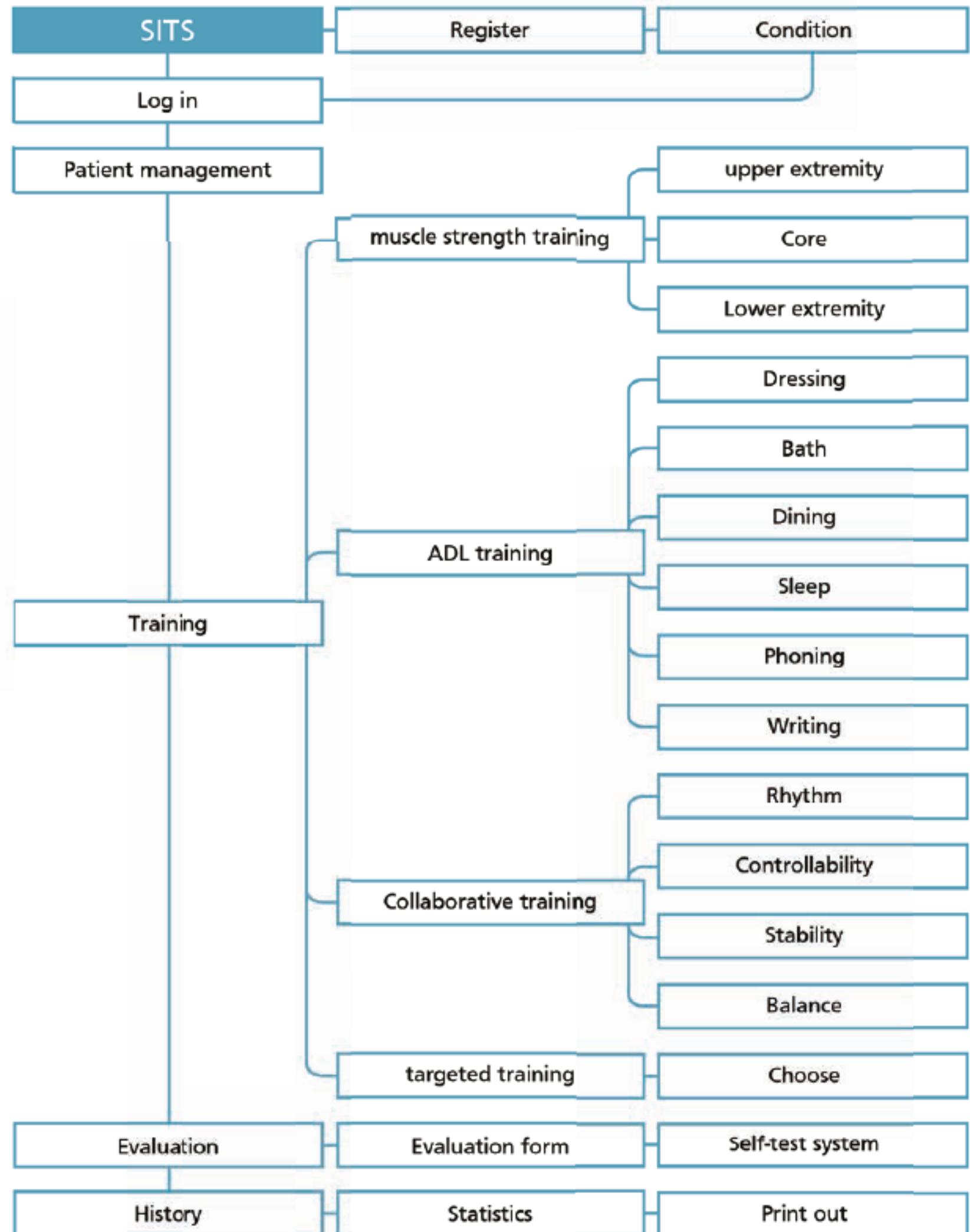
## Opportunities



## Persona



## Information Architecture



## How Might We

How might we help patients get a better experience of treatment?

To help doctors and nurses to reduce their unnecessary work, so that they should have more time to look after the patients.

To improve the efficiency of the hospital and augment the usage of technology.

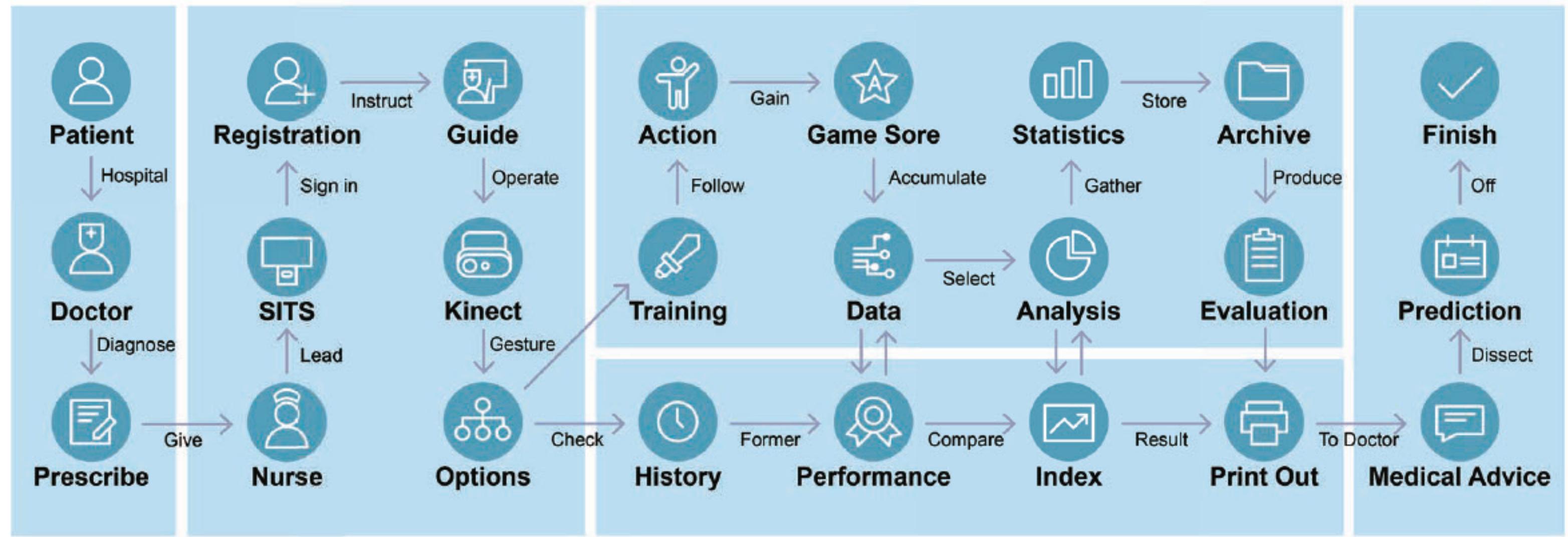
To change the current rehabilitation training session to be more fun and everybody would love to do it.

To make patients get the better ADL(activities of daily living) training.

To establish the new equipment's credentials of improving the process of patients' rehabilitation.

# FINAL DESIGN

## User Flow



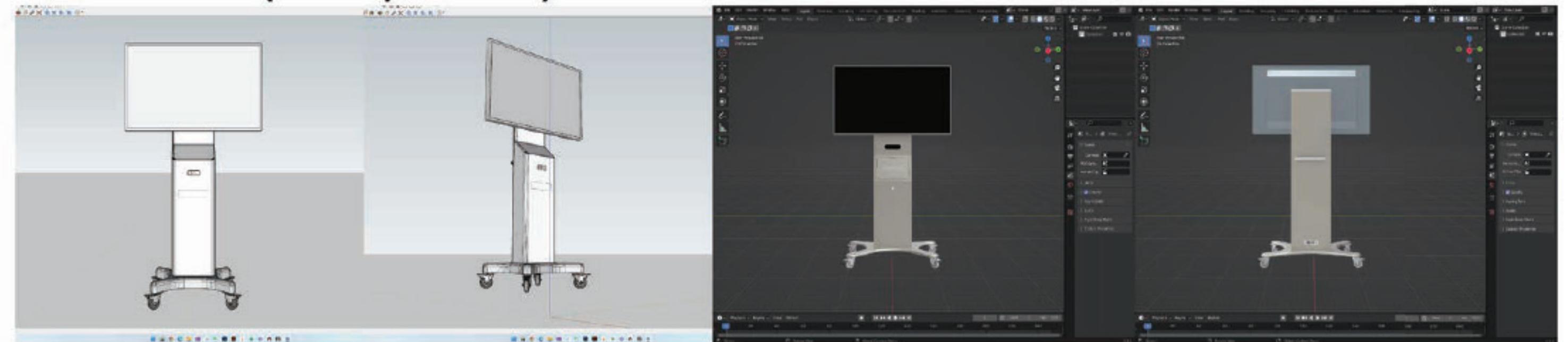
## UI Design



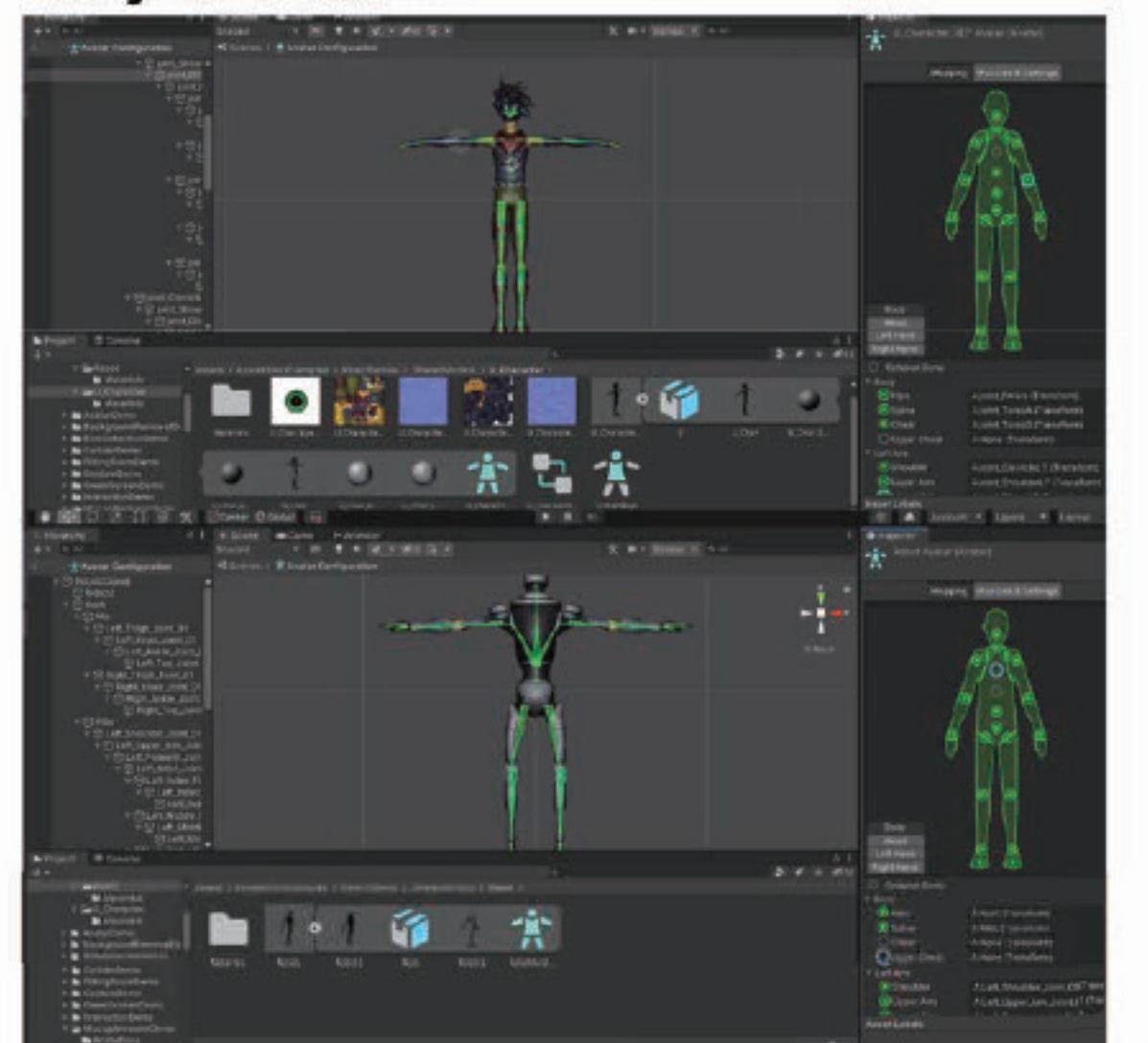
## Game Design



## Product 3D Model (SketchUp & Blender)



## Unity 3D & Kinect



## Coding

```

Get body space position
public class eBodyPositionController : MonoBehaviour {
    ...
}

Kinect Bone tracking
public class MyController : MonoBehaviour, KinectFeatures.GestureListenerInterface {
    ...
}
  
```

## User Testing



## Feedback

**Interaction**  
It's an excellent intellectual assistant for our staff, and it gives our patients impressive training experience. I think every hospital should have this good helper.

**Treatment**  
My doctor told me this is good for my treatment. After training on it for one month, it really works. I find my legs have become more flexible since I used them.

**Benefit**  
SITS has received very good responses, patients have received more effective treatment, and the doctor's treatment process has become easier.