

# Sci-M

## Design for Supporting Scientific Exercise Management

individual project  
strategy design  
May 2024



## Background

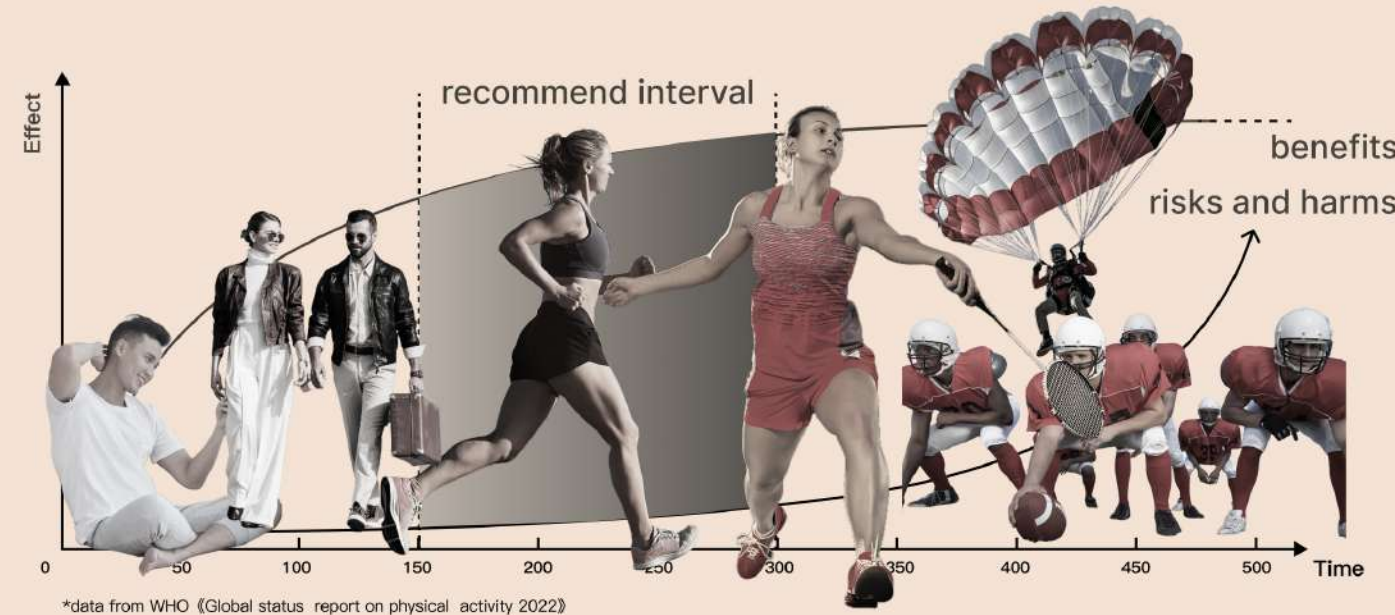
Sports activities benefits individuals' physical and mental health, as well as society, the environment, and the economy. However, data shows that people are facing a physical activity crisis, which brings about certain problems.

### Physical inactivity

Prevalence of insufficient physical activity among adults aged 18+ years in 2022 (age-standardized estimate) (%)

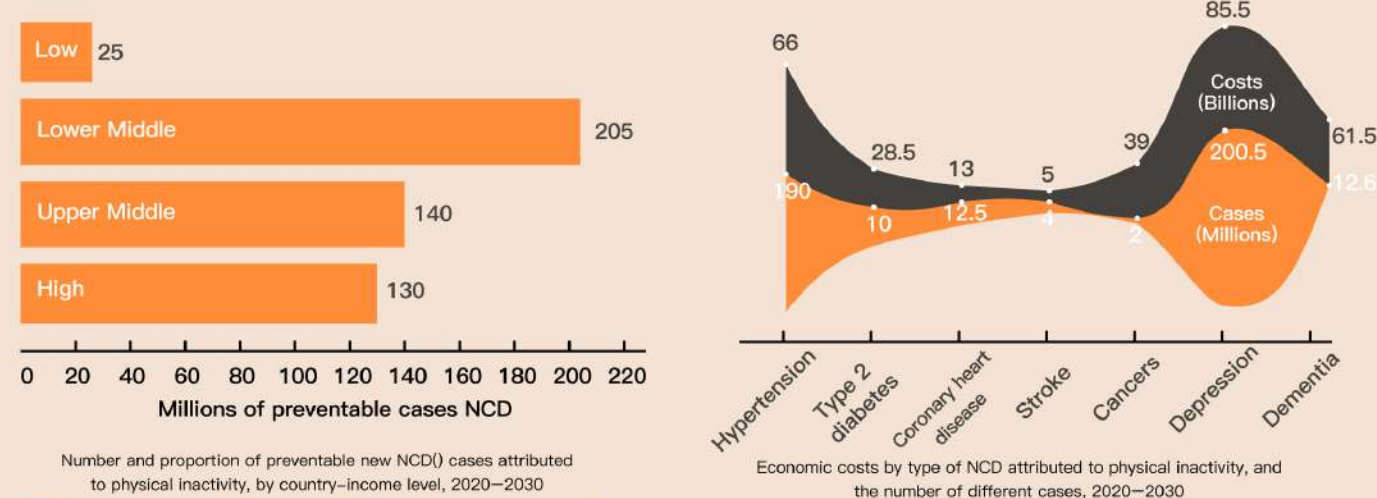


### Recommend



### Problems

Physical inactivity is associated with a range of chronic diseases and premature deaths that carry not just a human but also an economic cost.



### Unscientific exercise

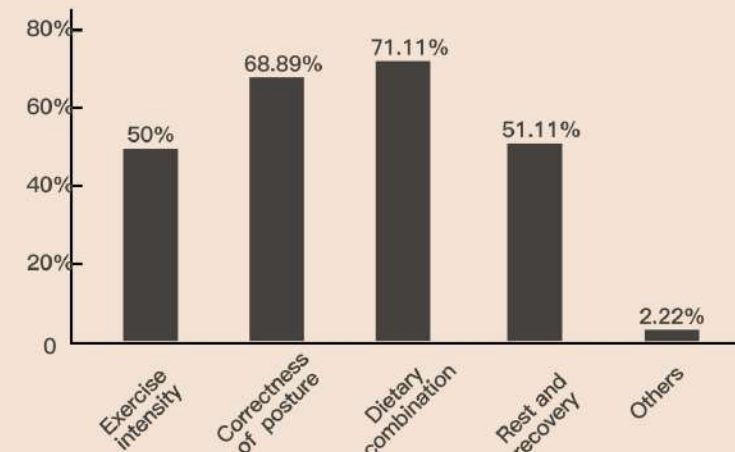
Apart from physical inactivity, many people in the world are suffering from unscientific exercises.



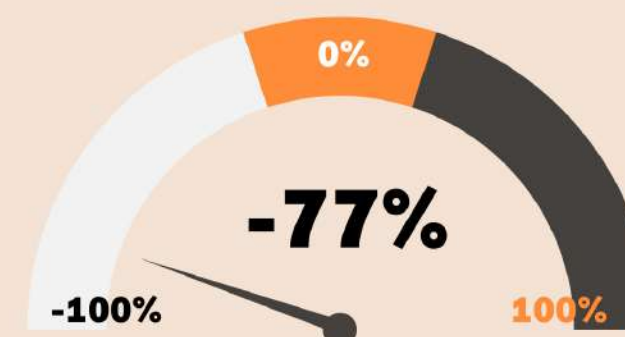
## Survey

I collected 90 questionnaire responses through a survey.

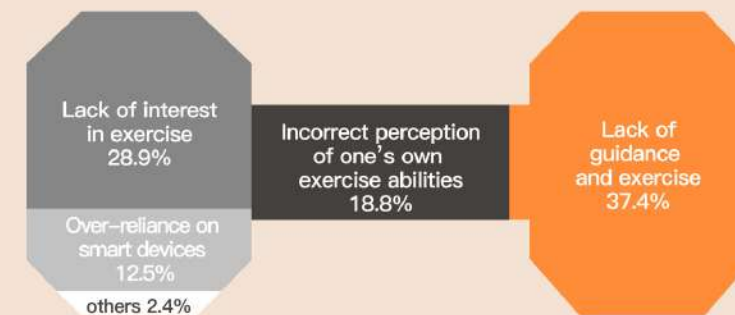
Q1: What aspects of your exercise routine do you think need improvement?



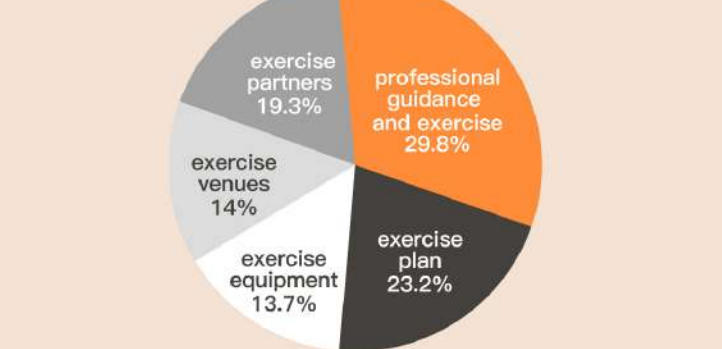
Q2: To what extent do you think you understand scientific exercise?



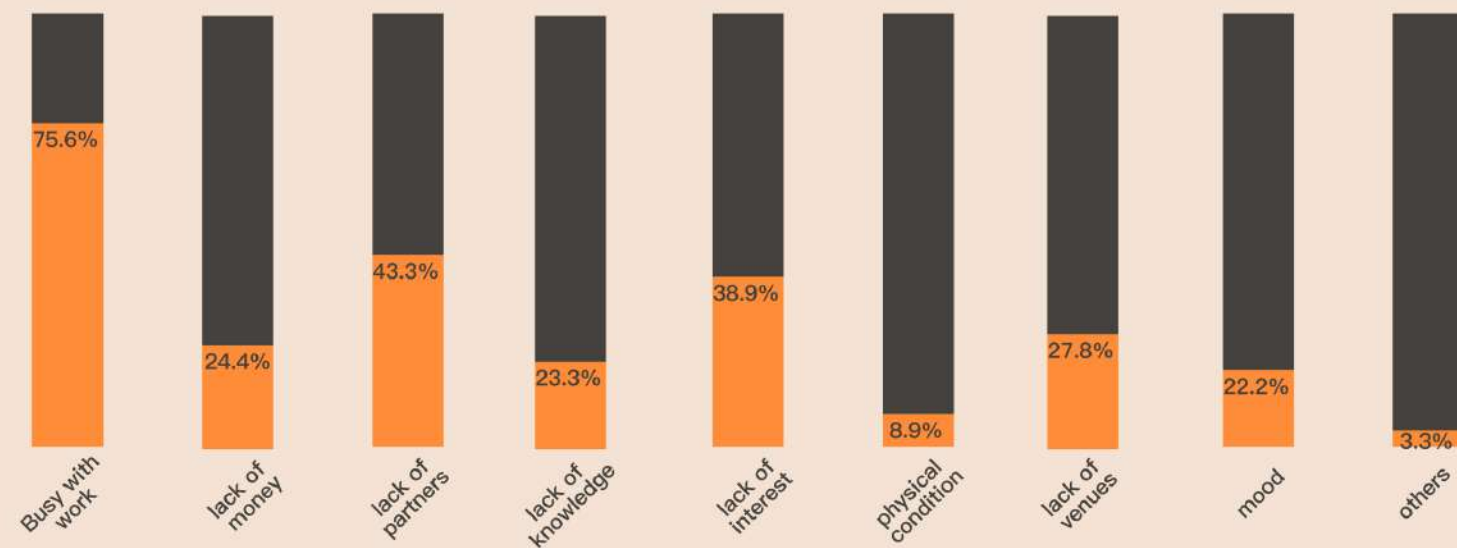
Q3: What factors do you think are limiting the scientific approach to your exercise routine?



Q4: What kind of assistance do you think you need the most during exercise?



Q5: What are the main factors affecting your exercise?



### Conclusion

Survey results show that lack of scientific exercise guidance leads to insufficient and unscientific exercise. Promoting scientific exercise knowledge is crucial.



# User Interview



**Duo Xu**  
35years old  
director

I enjoy outdoor activities because they allow me to connect with nature. But when I walk into the gym and face the equipment, I feel at a loss and embarrassed because I don't know how to use it.

scientific exercise guidance



**Kenan Ye**  
20years old  
student

I rarely workout at all now. Even though I know that exercising is important, I still choose to cut down on exercise time to study because my academic pressure is very high.

fragmented time exercise



**Jinmin Xu**  
28years old  
teacher

I usually do some simple exercises at home following videos on an app because it's convenient. I occasionally take some personal training classes, but they are too expensive.

less expense on learning



**Yuhao Zhang**  
30years old  
bank agent

I rarely exercise. I sit in the office all day long. The oppressive office environment makes me lose the motivation to exercise.

environment for exercise

# Thematic analysis

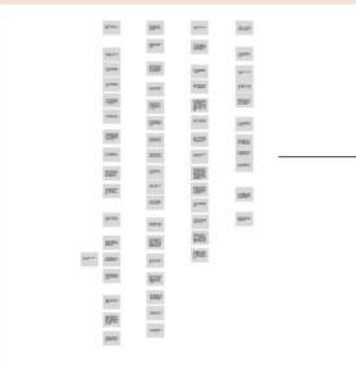
step1 read all user interview texts



step2 describe and categorize the text data based on what it's about (create a descriptive code)



step3 create new code to encapsulate potential themes



step4 evaluate the themes for good fit



**Theme1 sport habit**

- exercise with friends
- using equipment
- no warm-up

**Theme2 insufficient exercise**

- lack of time
- interests
- lack of equipment

**Theme3 understanding of scientific exercise**

- correct posture
- pair with a balanced diet
- from education and Internet
- bring health

**Theme4 unscientific exercise**

- lack of guidance
- unconscious

**Theme5 need**

- motivation
- guidance
- plan
- data

# User Journey

| Time            | 9:00 a.m.                                                                                                                                                                          | 12:00 p.m.                                                                                         | 4:00 p.m.                                                                                                                   | 6:00 p.m.                                                                                       | 7:30 p.m.                                                                        |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Location        |                                                                                                                                                                                    |                                                                                                    |                                                                                                                             |                                                                                                 |                                                                                  |
| Expectation     | Wake up early to do some aerobic exercises                                                                                                                                         | Use the lunch break to go to a nearby gym for a short workout                                      | Do some exercise to relax the body                                                                                          | Hope to simply relax the tired body through exercise                                            | Maintain health and a good physique through workout                              |
| Action          | · Can't get out of bed<br>· Rush to catch the subway to work                                                                                                                       | · Take a nap                                                                                       | · Attend company meetings<br>· Complete work tasks                                                                          | · Entertain with colleagues                                                                     | · Incorrect dumbbell curl<br>· Run on the treadmill<br>· Secretly observe others |
| Thoughts & Mood | <p>"I'm so tired from work in the morning, and the lunch break is so short. I should take a snap."</p> <p>"I stayed up too late last night, so I can't exercise at all today."</p> | <p>"The colleague invited me to eat, and it feels rude to decline, I'd better exercise later."</p> | <p>"After working for so long, my body feels stiff. I really want to move around, but I haven't finished my tasks yet."</p> | <p>"How to use the gym equipment? I'll just run on the treadmill to avoid feeling awkward."</p> |                                                                                  |
| Opportunity     | Provide brief and efficient workout plans                                                                                                                                          | Create a workout environment and provide simple office exercise plans.                             | Recommend local exercise venues for users to enjoy with friends.                                                            | Provide scientific exercise guidance                                                            |                                                                                  |

# Emphathy map & Persona

Based on the conclusions drawn from the questionnaire,user interview and user journey, I created an empathy map and persona.



## White

Age 30

Income \$30k~35k

Job Programmer

Location Shanghai

Attribute

- health-conscious
- curious
- self-respectful
- sociable
- busy with work

## Influencing factors

|  |         |  |          |
|--|---------|--|----------|
|  | Time    |  | Mood     |
|  | Venues  |  | Interest |
|  | Partner |  | Money    |
|  | Health  |  | Guidance |

**SAYS**

- I'm not interested in exercising
- I can't perfectly follow the instructional videos online
- I hope to maintain my physical and mental health and improve my physique
- I'm not satisfied with the surrounding sports facilities
- I really don't have time to exercise
- I don't know if my way of exercising is scientific

**THINKS**

- Why can't I stick to a scientific exercise plan?
- I need to learn scientific exercise knowledge, otherwise I might face exercise injuries.
- How can I lose weight or build muscle scientifically if I don't know how to do it?
- How can I cut down on working time for exercising?

**DOES**

- exercise with good friends
- download sports app but don't consistently use
- do some simple exercises at home by following a video
- go for outdoor activities and experience nature over the weekend

**FEELS**

- anxious
- accomplished
- frustrated
- fear
- happy
- helpless
- lazy
- lackadaisical

**Motivation**

White's motivation for exercising is to maintain his health and keep a good physical shape. For him, exercise helps to relieve the stress brought by work. Additionally, he uses exercise as a way to meet new friends.

**Pain**

- Lack of time for workout
- Lack of professional knowledge
- Lack of interest on exercise

**Goal**

- Exploring an interest in exercise
- Cultivating a regular exercise habit
- Learning and following scientific workout methods



# Ideation

Based on the research, I found that the three main challenges preventing people from exercising adequately and scientifically are time, knowledge, and interest. To address these, the objectives are: making time for exercise, stimulating interest, and imparting relevant knowledge.



Trying out exercise, seeing personal progress and changes, receiving rewards and exercising with friends can greatly stimulate people's interest in exercise.



What are some ways people can learn about exercise?

People often learn scientific exercise knowledge through coaching, internet platforms, and books. I can incorporate these methods into my design to help users gain this knowledge.



How to motivate people to exercise?

Knowledge

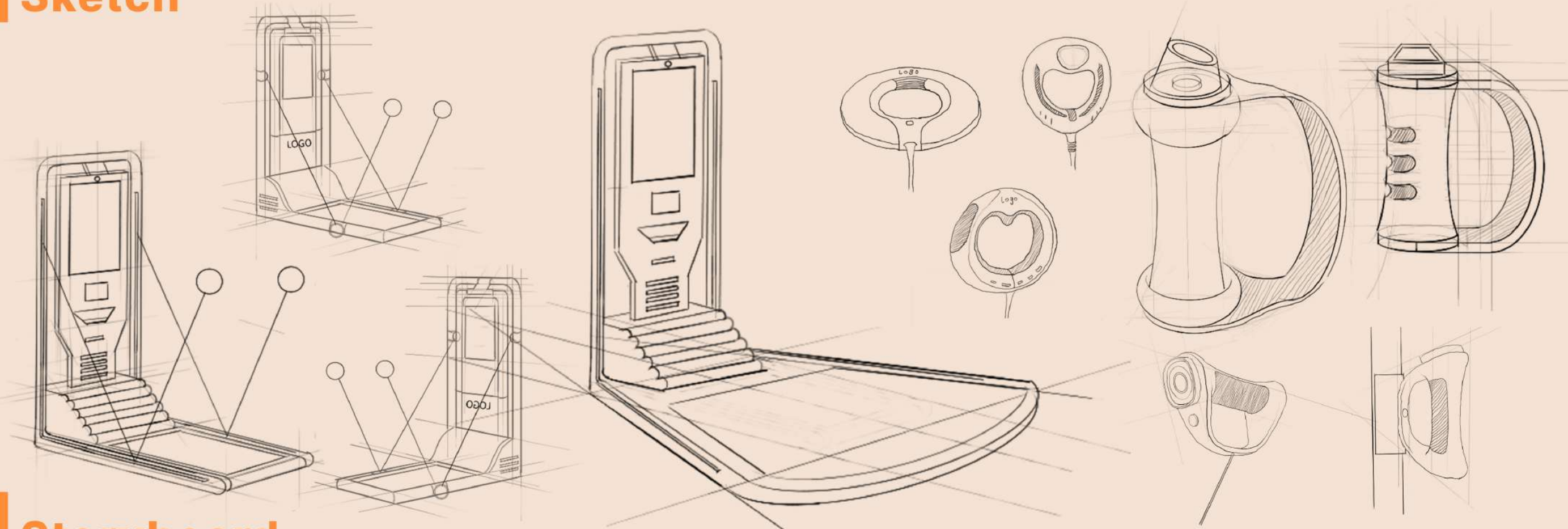
Interest

Time

Based on my observations, public places like subway stations, offices, malls, and private places like homes are all good locations where people can utilize fragmented time for exercise.

Where can people utilize fragmented time for exercise?

# Sketch



# Storyboard



# Test

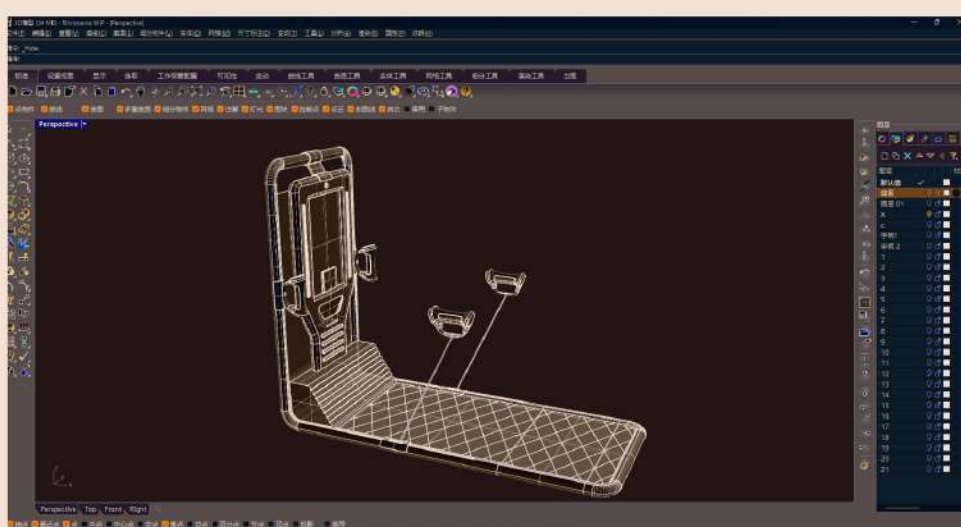
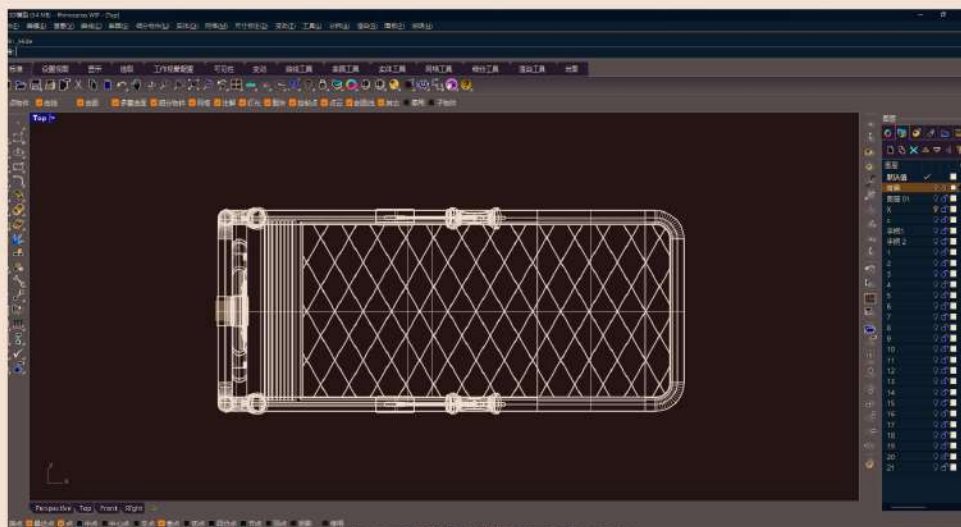
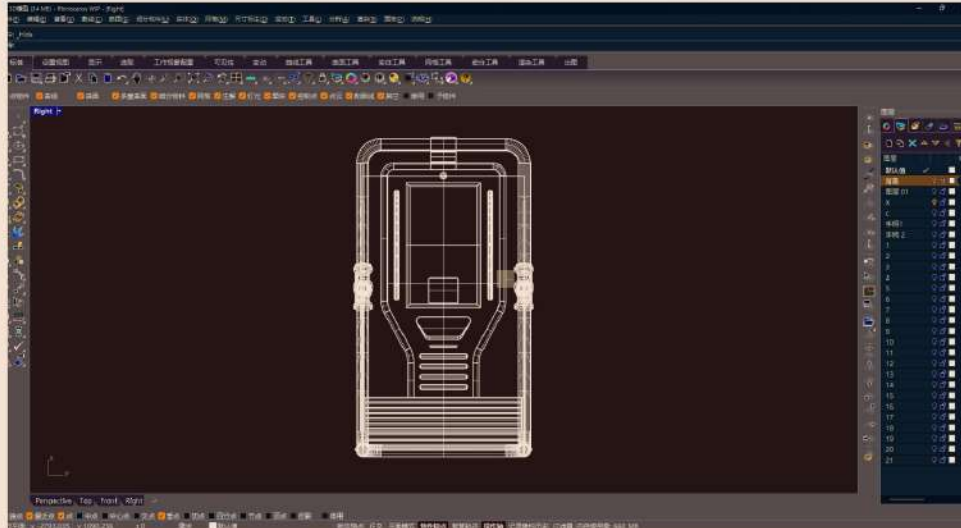
To explore the most suitable handle for users to exercise with, I conducted shape testing using industrial clay and derived the most appropriate handle shape from it.



| shape | grip posture | anti-slip | comfort |
|-------|--------------|-----------|---------|
|       |              |           |         |
|       |              |           |         |
|       |              |           |         |



# Modeling & Rendering



The camera can capture the user's movements, and the data is uploaded to the cloud for processing.



Users can receive corresponding stamps after completing the exercise.



The installation has an overall height of 1.92 meters, a width of 0.98 meters, and a length of 2.1 meters, providing sufficient space for user movement.

The dynamic gradient lighting effect will change gradually in response to the varying tension of the rope.



The contact surface of the handle with the palm is made of 304 high-conductivity stainless steel, designed to measure the body's resistance and conductance using Bioelectrical Impedance Analysis (BIA) technology for body fat estimation.

The tension of the handle rope can be adjusted by selecting different levels on the touchscreen.

The overall design was refined through clay modeling tests, making it more ergonomic and better suited to the human body.

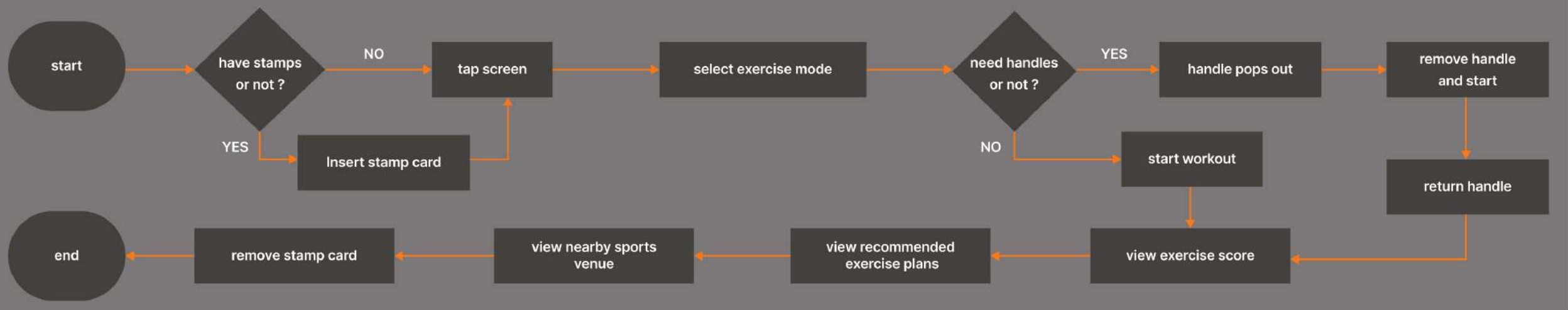


The handle uses internal electromagnetic control for magnetic attachment. When not in use, strong magnetic force keeps the handle securely attached; when the magnetic force is reduced, the handle can slide smoothly.

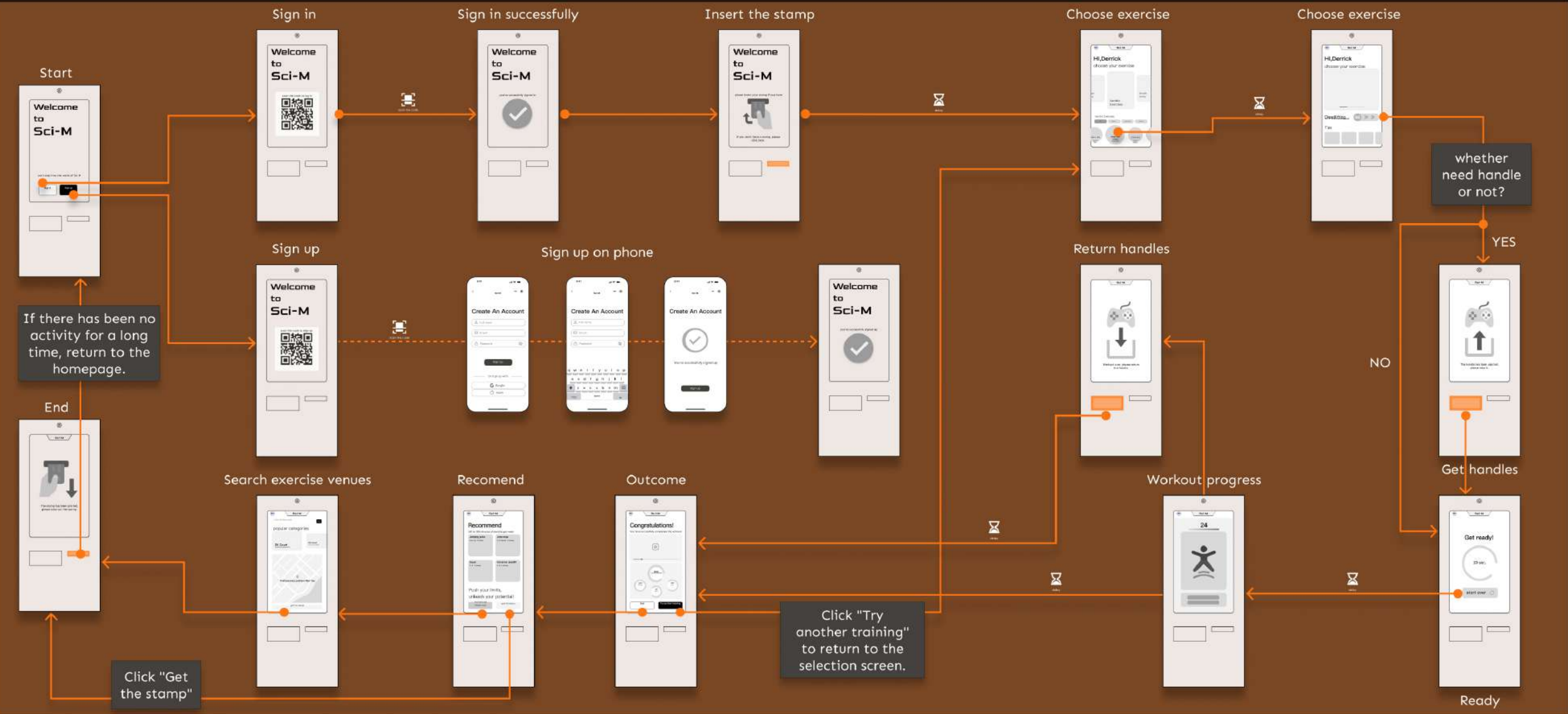


# UI Design

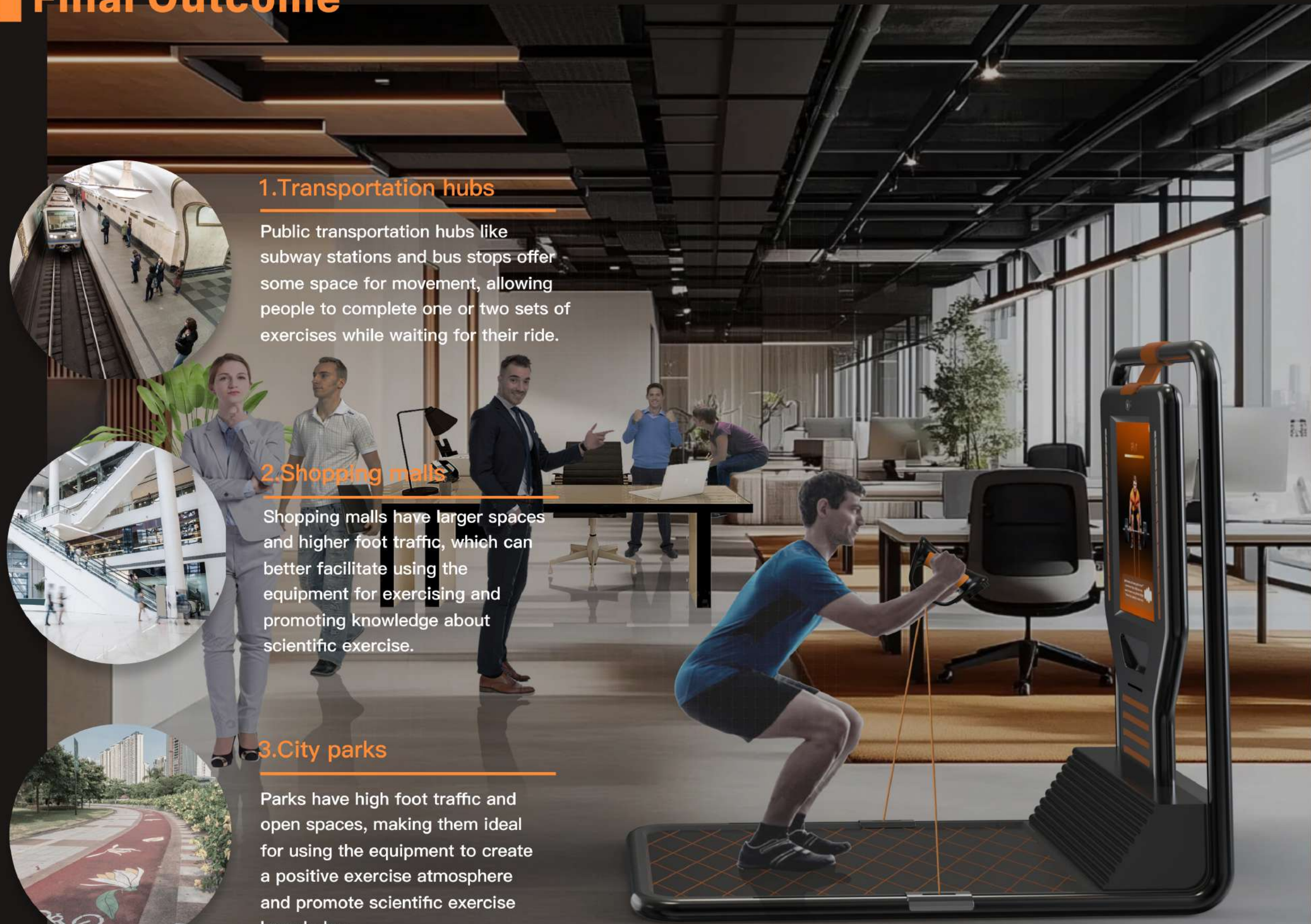
## User flow



## Wireframe flow



# Final Outcome



other scenarios

### 1.Transportation hubs

Public transportation hubs like subway stations and bus stops offer some space for movement, allowing people to complete one or two sets of exercises while waiting for their ride.

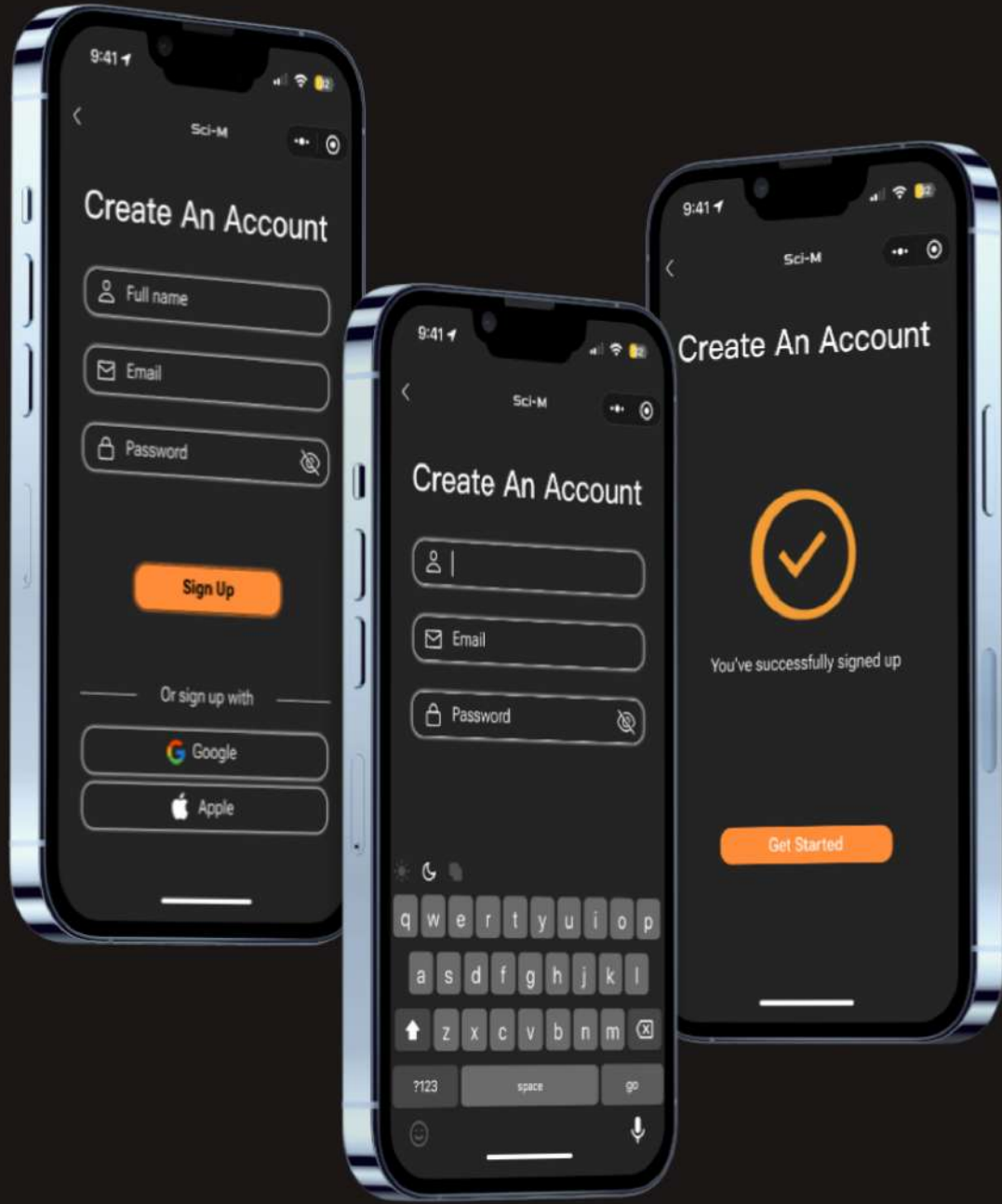
### 2.Shopping malls

Shopping malls have larger spaces and higher foot traffic, which can better facilitate using the equipment for exercising and promoting knowledge about scientific exercise.

### 3.City parks

Parks have high foot traffic and open spaces, making them ideal for using the equipment to create a positive exercise atmosphere and promote scientific exercise knowledge.

## Final design



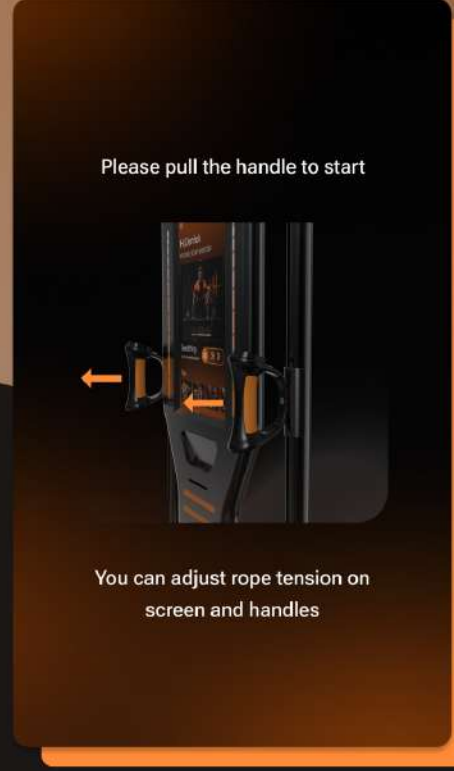
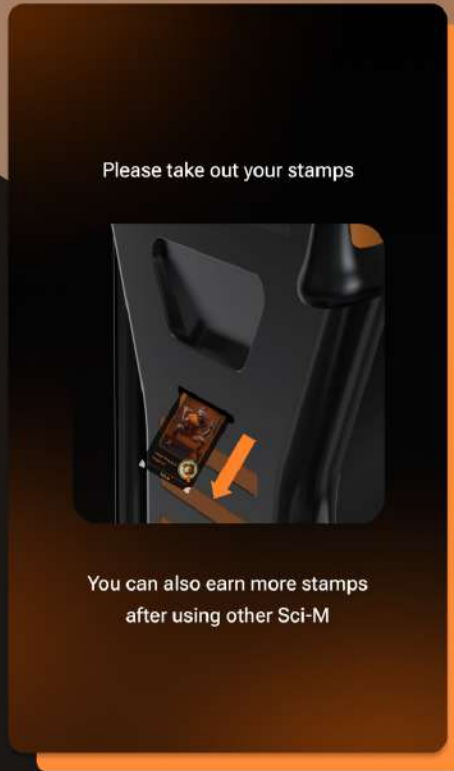
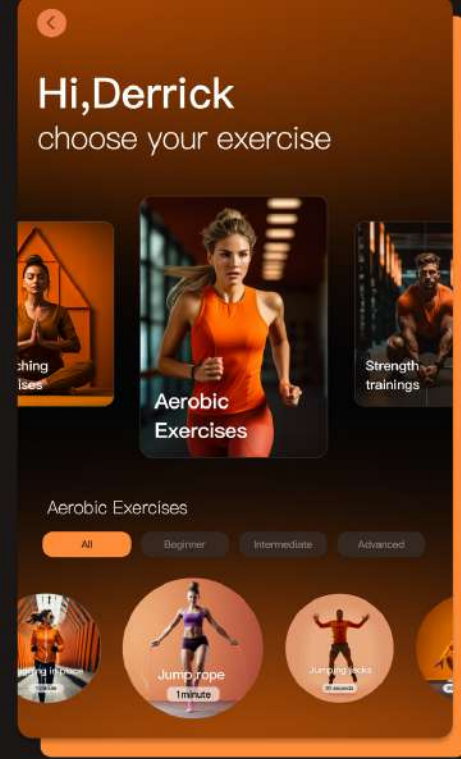
### 1.Sign up

Users can register and log in by scanning a QR code with a mobile applet, allowing them to start their workout.



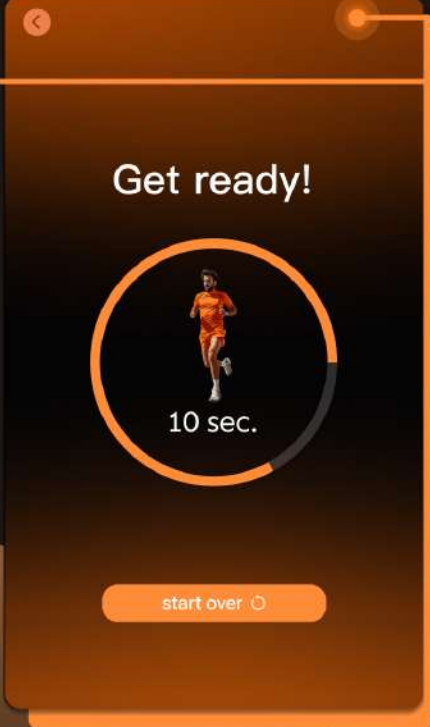
### 2.Mode Selection

Based on recommendations from Harvard Medical School, I divided the device's exercise modes into three categories: aerobic exercise, strength training, and stretching, each with various sub-exercises and difficulty levels.



users can obtain stamps and pull the handle by instruction

### 3.Warm-up

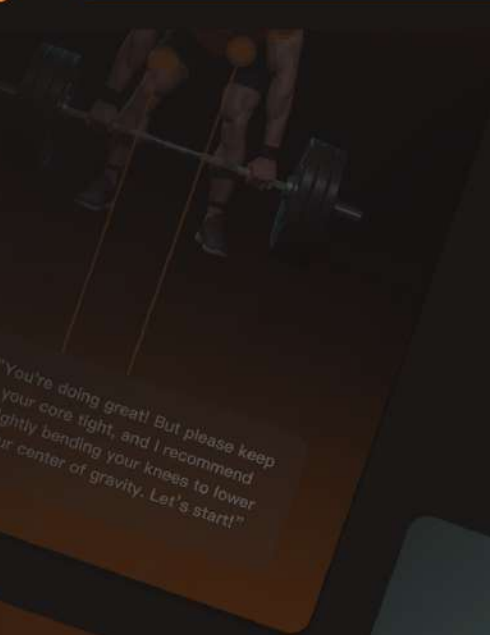


During the warm-up phase, the interface provides visual and textual explanations of exercises, including intensity levels and common mistakes, helping users grasp key points before their workout. Users can then follow on-screen demonstrations to perform warm-up exercises, fostering good exercise habits.

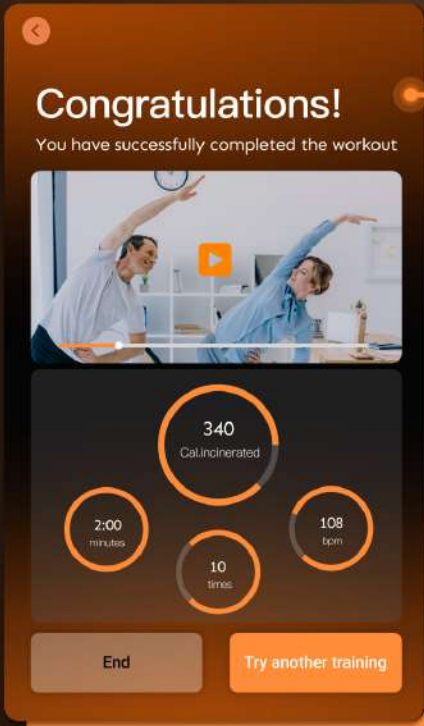


### 4.Exercise with AI

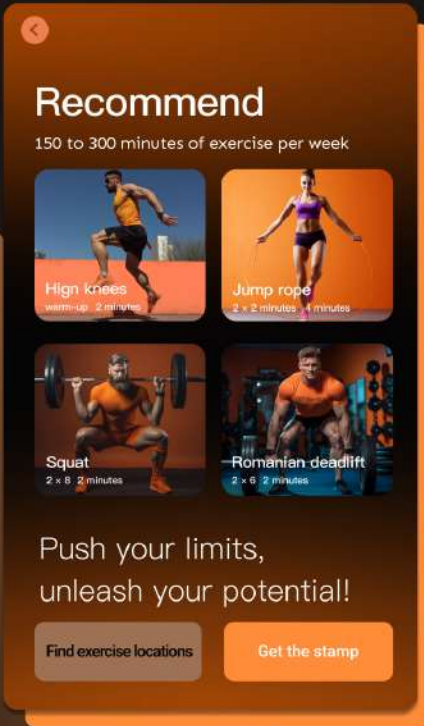
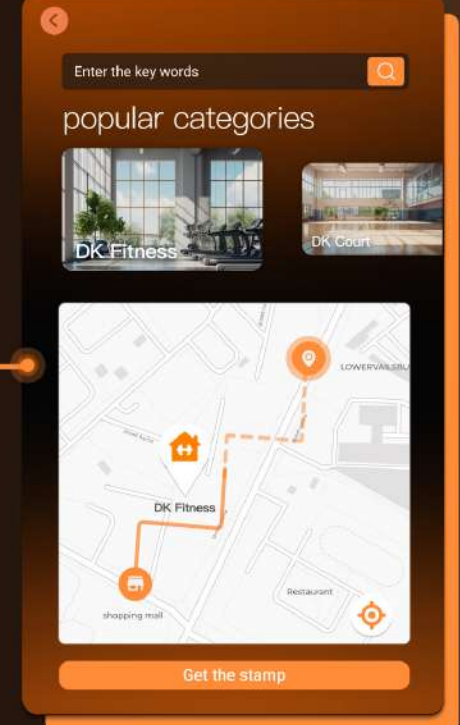
The device uses motion capture and multimodal AI to analyze user movements. The AI provides demonstrations and analysis to help users understand key points and motivates them throughout the workout to complete their training.



### 5.Workout Evaluation



This feature offers users video playback of their workouts and related data, enhancing their understanding of performance.



### 6.Smart Recommendations

Using post-workout data and body fat measurements, the AI provides personalized exercise recommendations to help users train effectively and build good habits.

take out the stamp



### 7.Sport Venues Search

The device suggests nearby sports venues and offers a search function to help users find suitable places for their activities, allowing them to continue enjoying the joy of exercise.

