

Portfolio

Dachang Liu

Selected Works

2014-2016



My Name is Dachang Liu.

I am a Designer, and a Developer.

I am a postgraduate student
at College of Design and Innovation,
Tongji University,
Shanghai,
China



CDI Soul Smart Space System

PSA Peugeot Citroen - Driving Simulation and HMI Usability Test Platform

PSA Peugeot Citroen - Moonshot Infotainment System

Philips - Lighting Room Mobile

Aerovane Colla-Whiteboard

Other Works



CDI Soul Smart Space System

Duration

Feb.2015 - Jan.2016

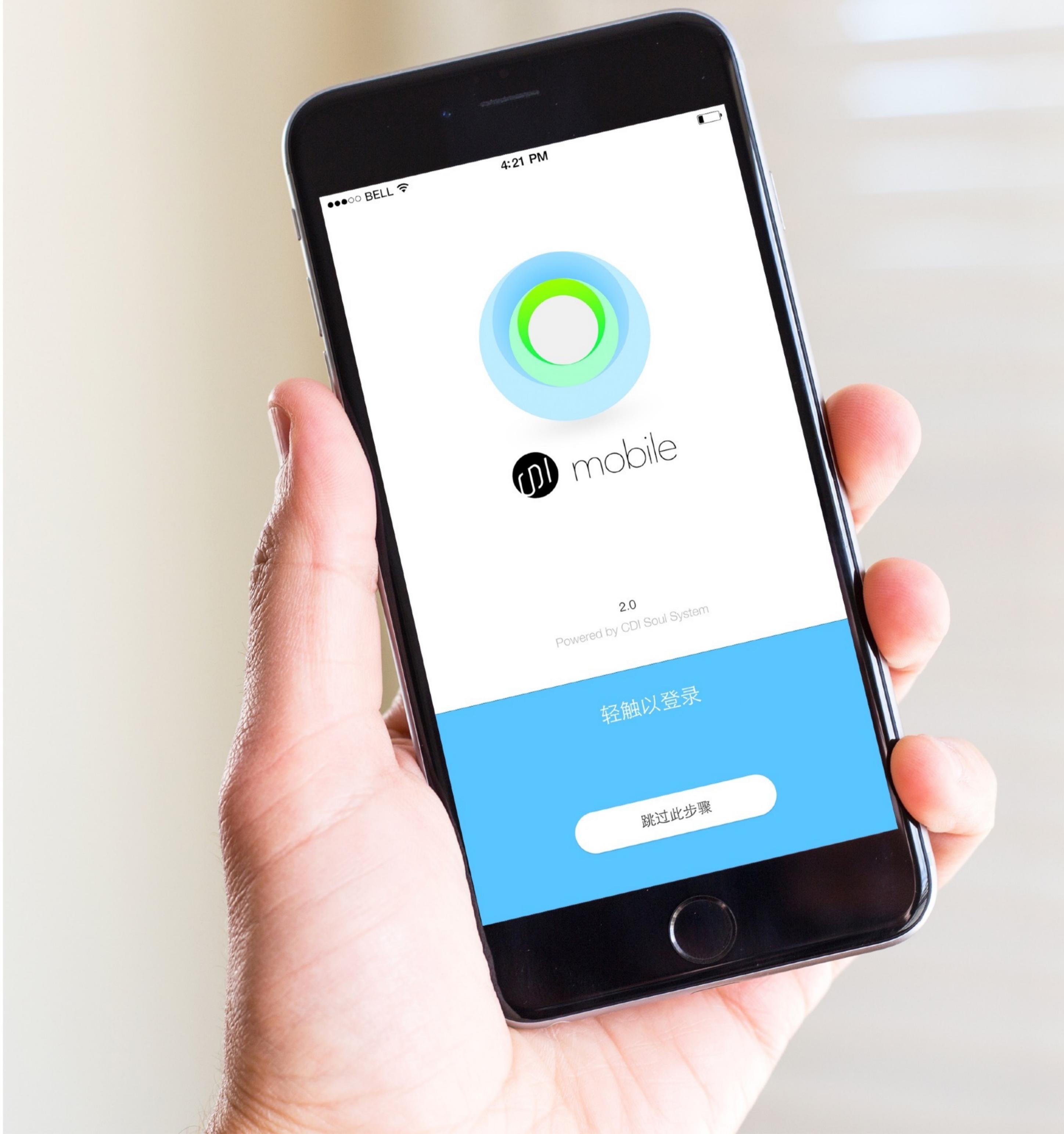
Role in the Team

User Interface Designer, iOS Developer,
Unity3D Developer

Project Cooperator

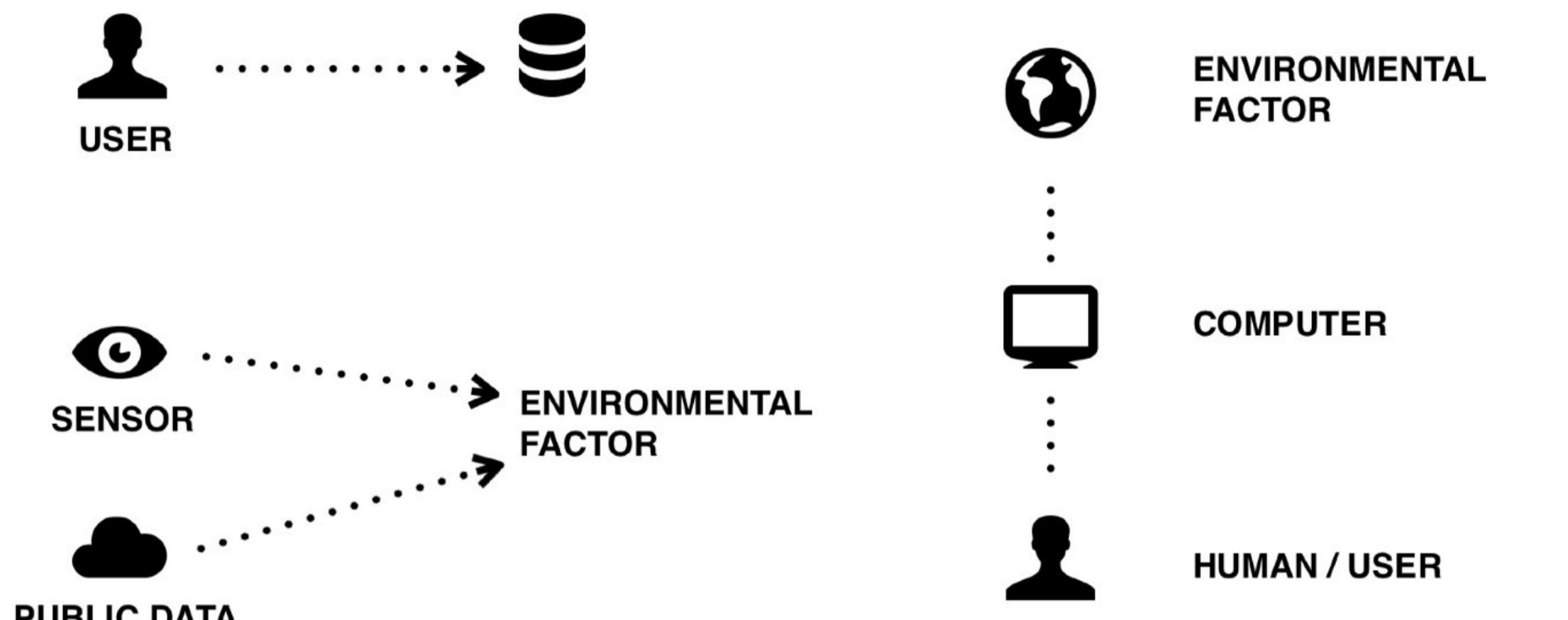
Center for Digital Innovation, TJU

CDI Soul is like the nerve system of the building of CDI (Center for Digital Innovation, Tongji University). The system contains an all-in-one data server, high-performance rendering servers, iPad wall controllers, mobile client application, and complex signal exchangers in order to analyze users' behavior and control the environmental properties of the lab spaces such as access authority, indoor temperature and lighting completely automatically.



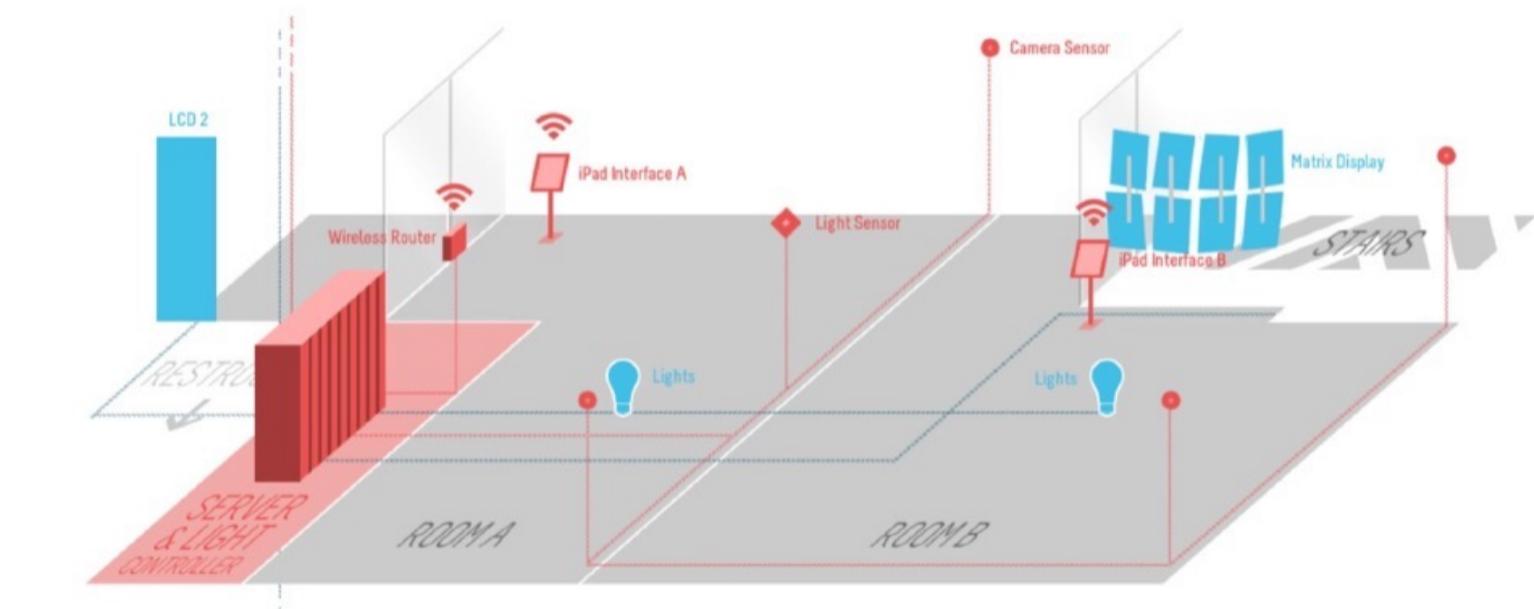
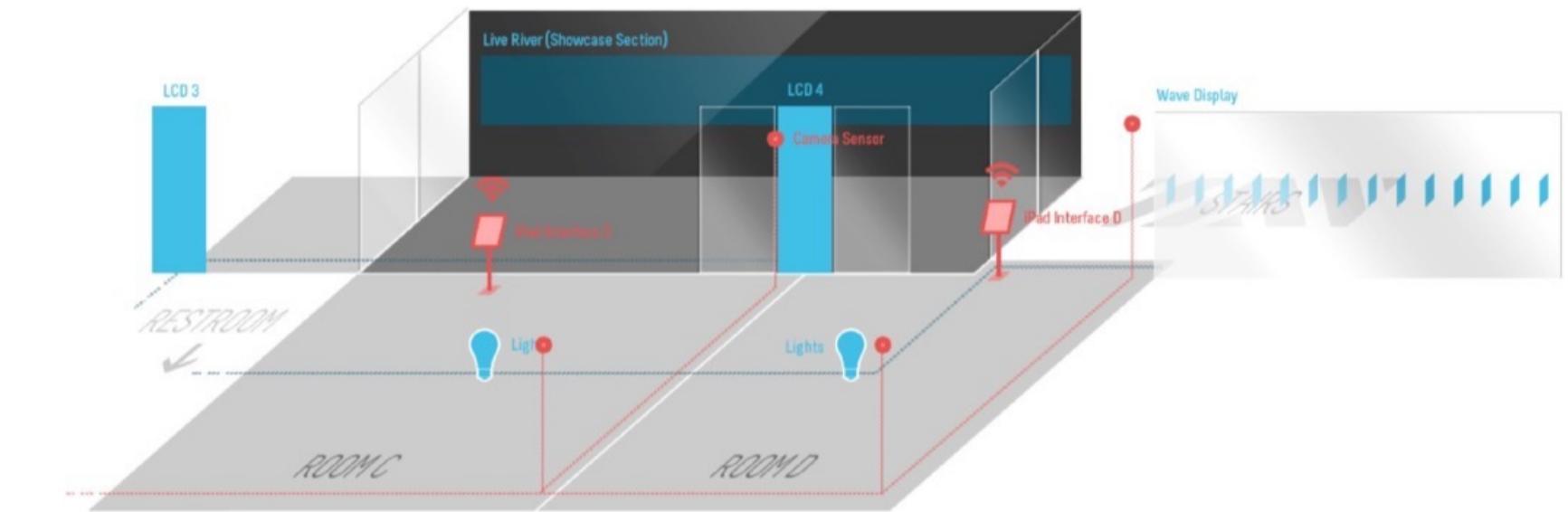
What is behind CDI Soul

Human – Environment – Computer Related Interaction Design



In the designing process of software systems, data as the crucial form of I/O, have long been generated directly in the closed loop of human and computer. With the rapid revolution of the internet of things and the swift growth of public data, environmental factors can now serve as a brand new element in the interaction structure.

CDI Soul provides new ways of interaction for user to control and configure the room facilities(lights, air conditioners, doors) in order to adjust the environment properties such as lighting, in-door temprature and entrance authority. Meanwhile the digital guidance in lab space continuously displays real-time information(location, news, events) to people in the lab environment.



CDI (Center for digital innovation, Tongji University) Spatial Structure and Hardwares

Design Process

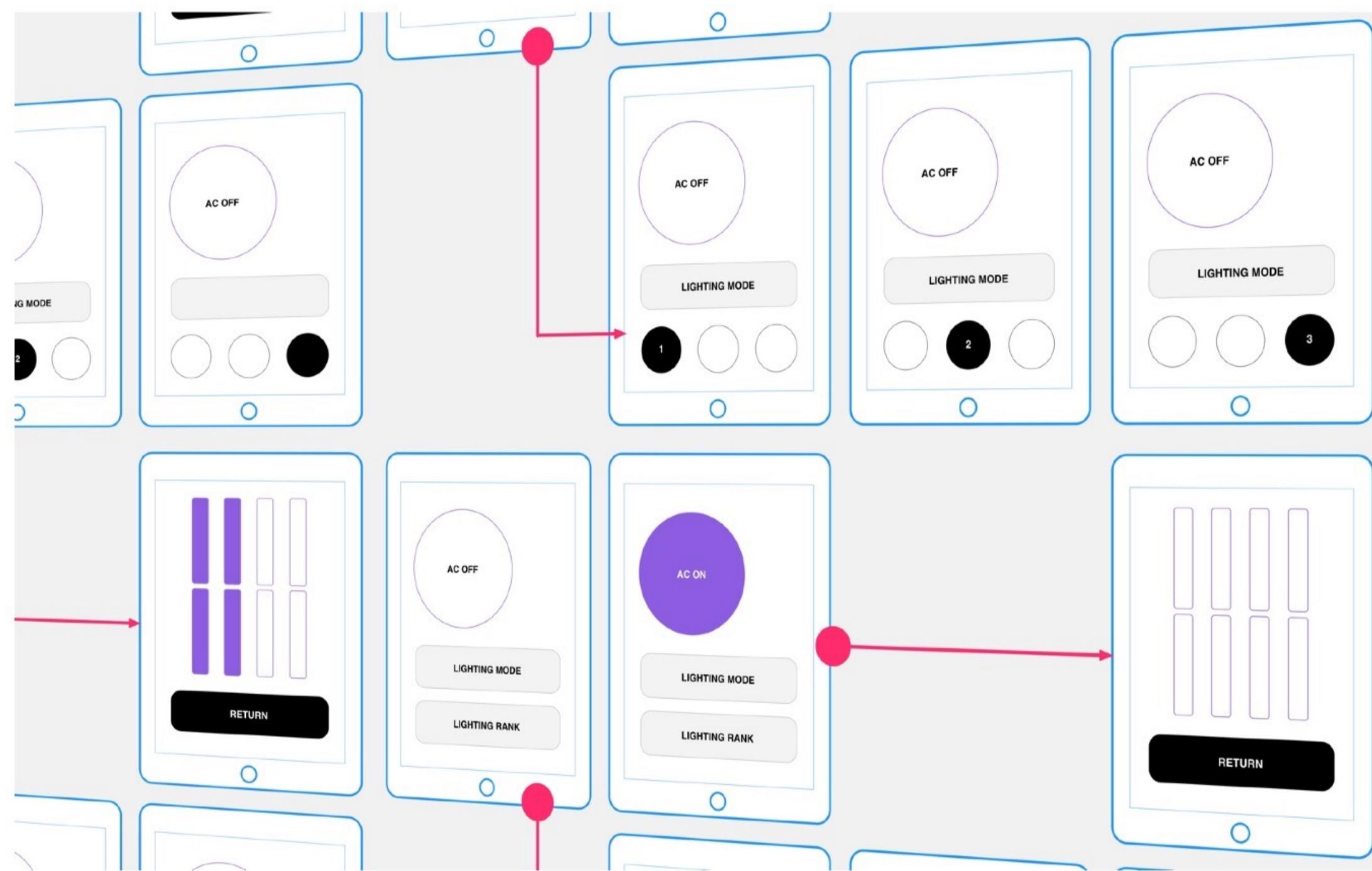
Interaction Framework

	<u>Form Factor</u>	<u>Posture</u>	<u>I/O</u>	<u>Functional Elements</u>	<u>Data Elements</u>
 Wall Controller	iPad Mini	occasionally use	Gesture	Control Lights, Curtains and Air Conditioners	In-door Temperature, Lighting Status, Curtain Status
 Mobile App	Mobile Phone	frequently use	Touch	Control Lights, Curtains, Air Conditioners and Entrances, Check Events and News	In-door Temperature, Lighting Status, Curtain Status, Entrance Status, News and Events Info
 Guidance Displays	19" Monitor 40" Monitor	pass by (corridor) stop for a while (restroom)	Glance	Check Events and News	News and Events Info, Carousel Images

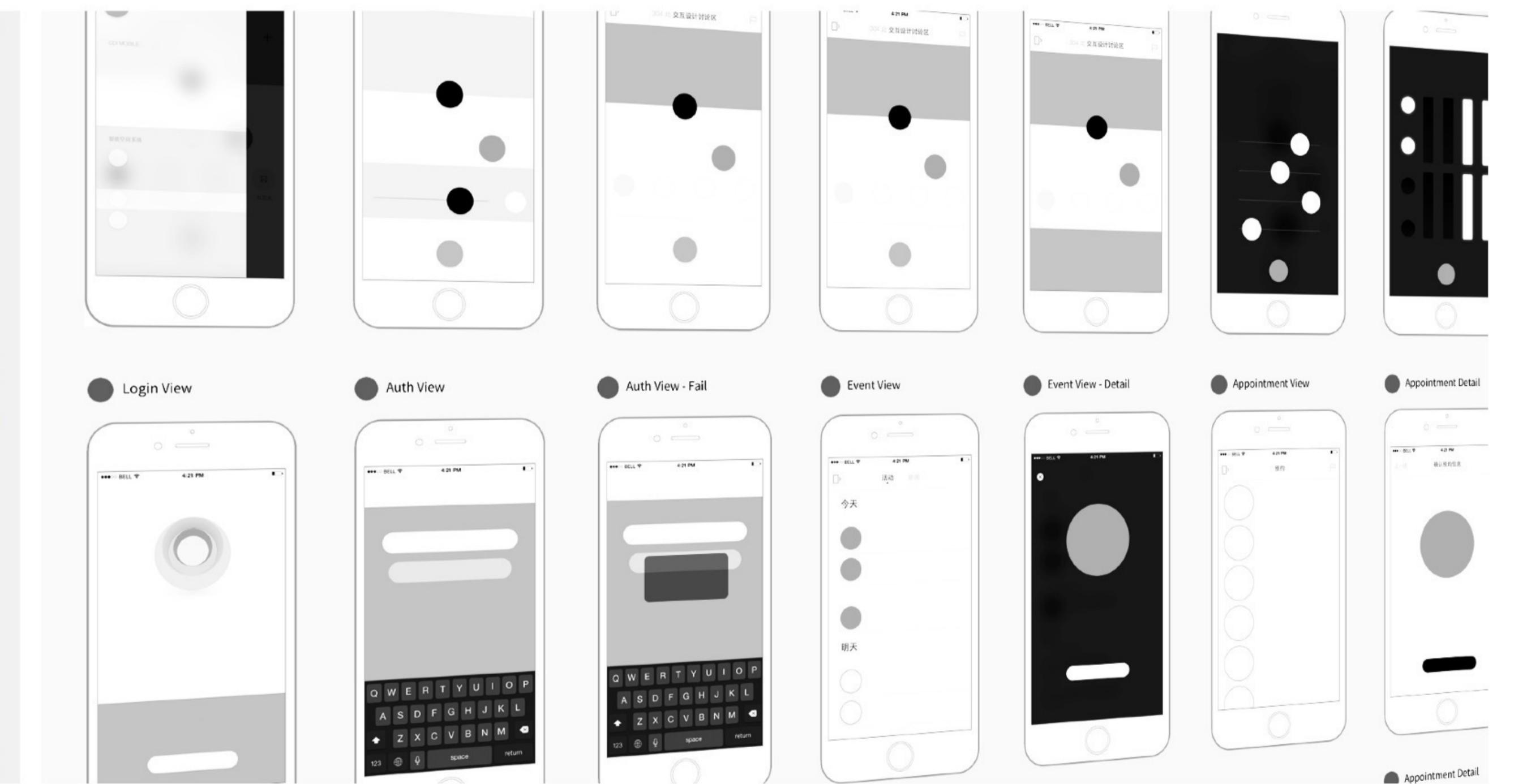
Design Process

Information Architecture, Functional Groups and Hierarchy

After functional elements and data elements were confirmed, the functional groups and view hierarchies were generated consequently. In the process of creating information architecture, we checked validation scenarios through certain key paths in order to test the usability before we started to develop the system.



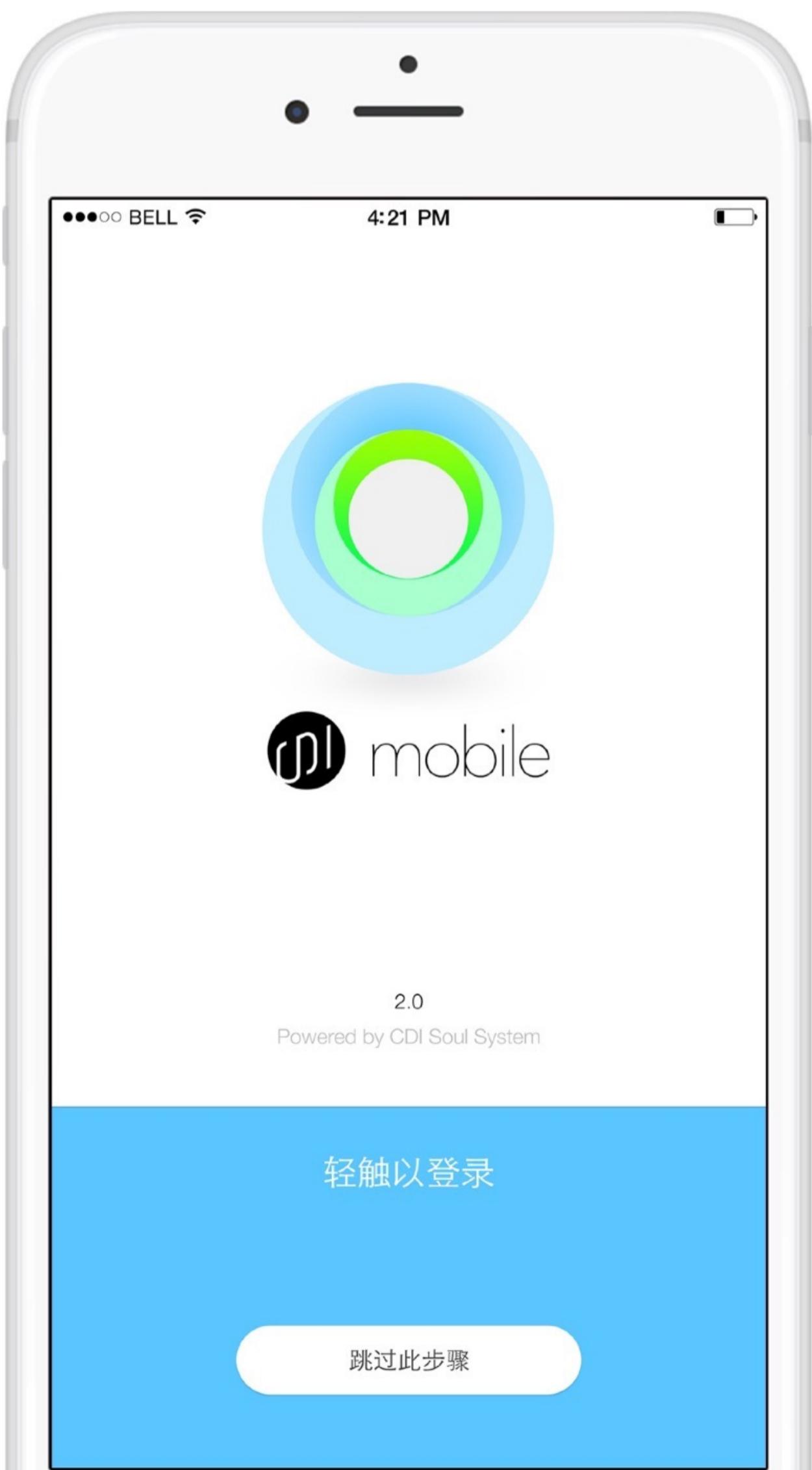
The Information Architecture of CDI Soul Wall Controller

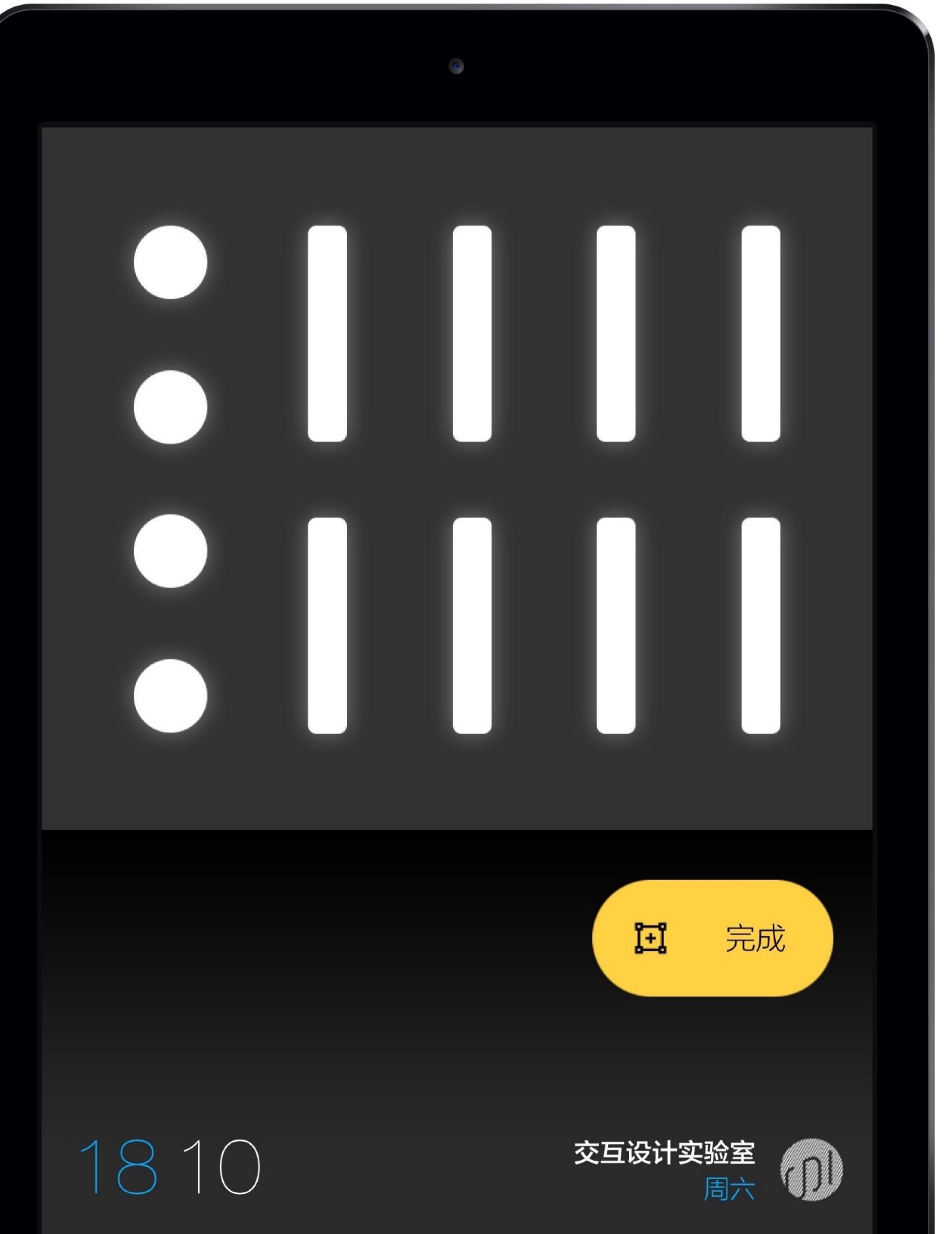


The View Hierarchy of CDI Soul Mobile Application

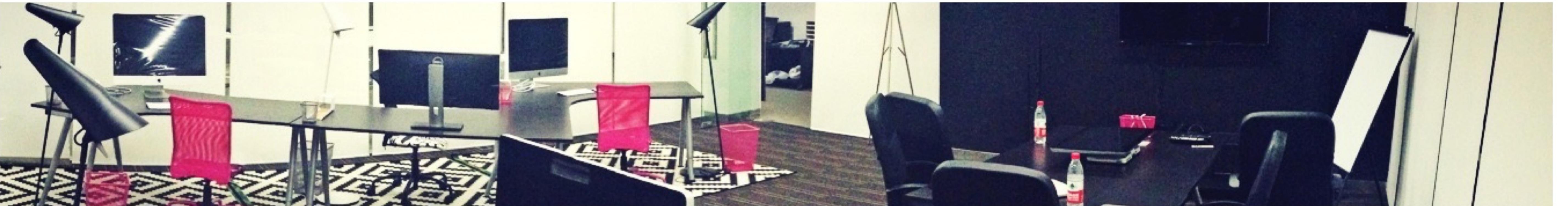
Design Process

Visual Framework and User Interface Design

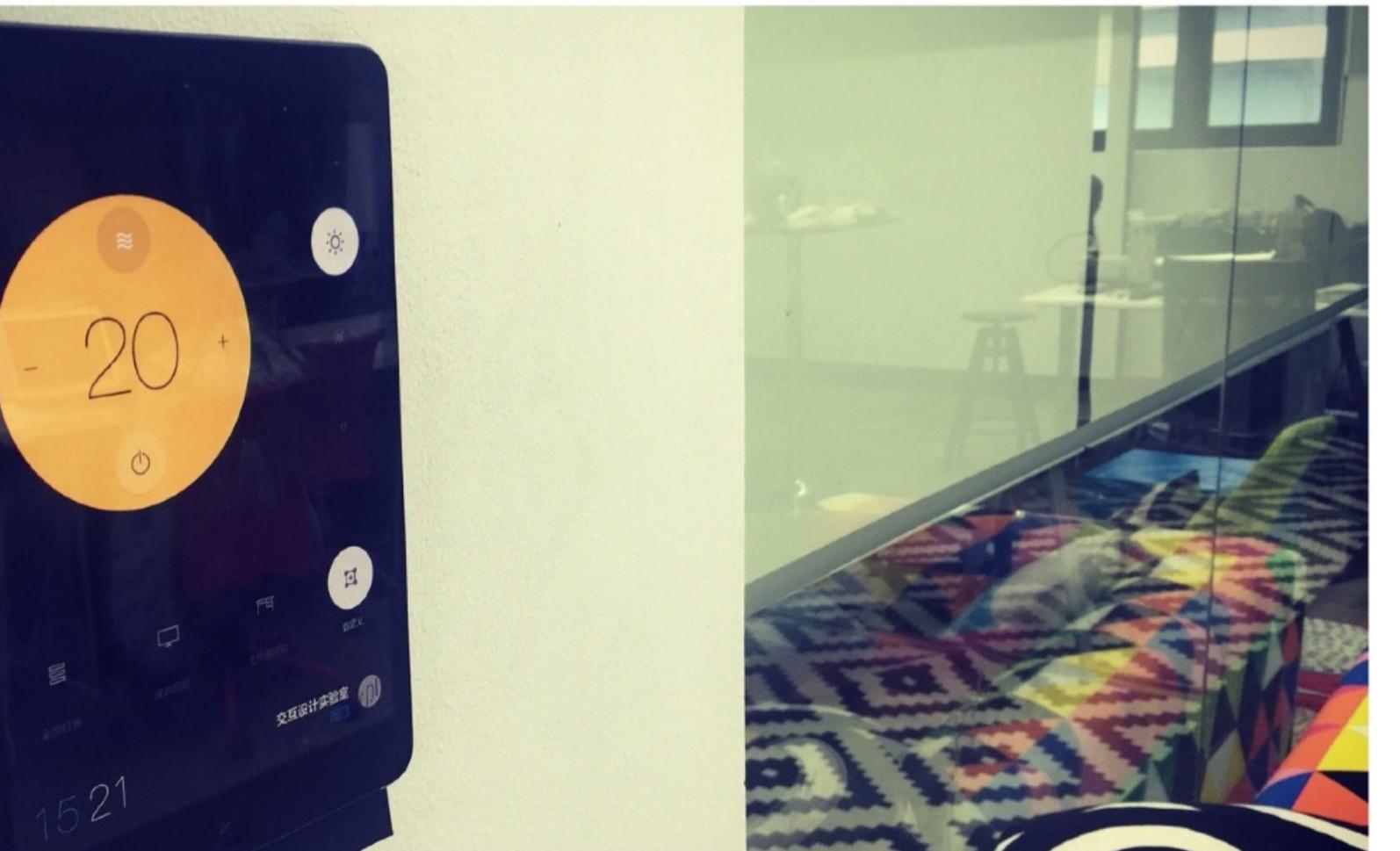




— Develop, Deploy, Launch



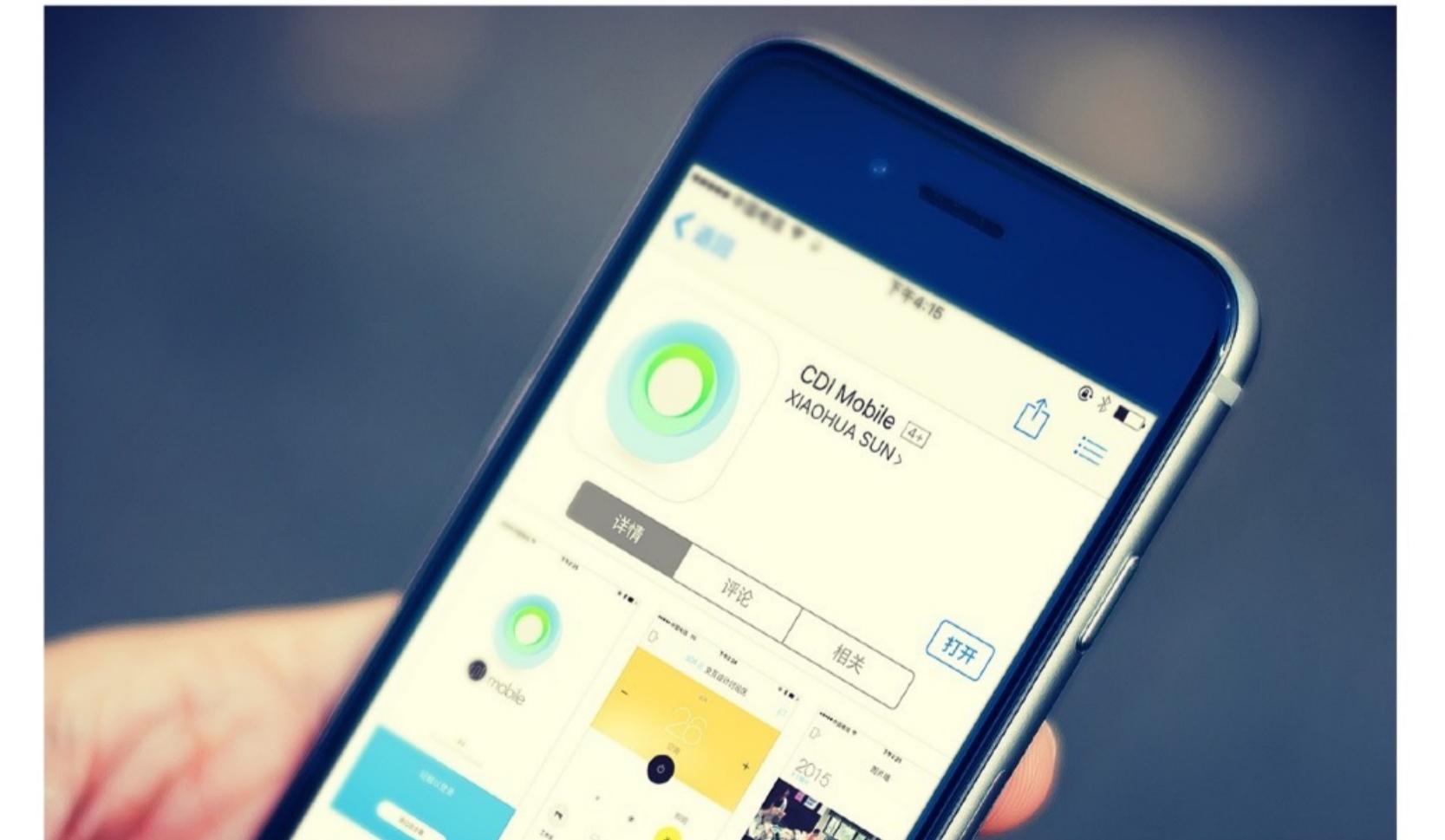
Panorama of CDI Room 304



The Wall Controller in CDI Room 304



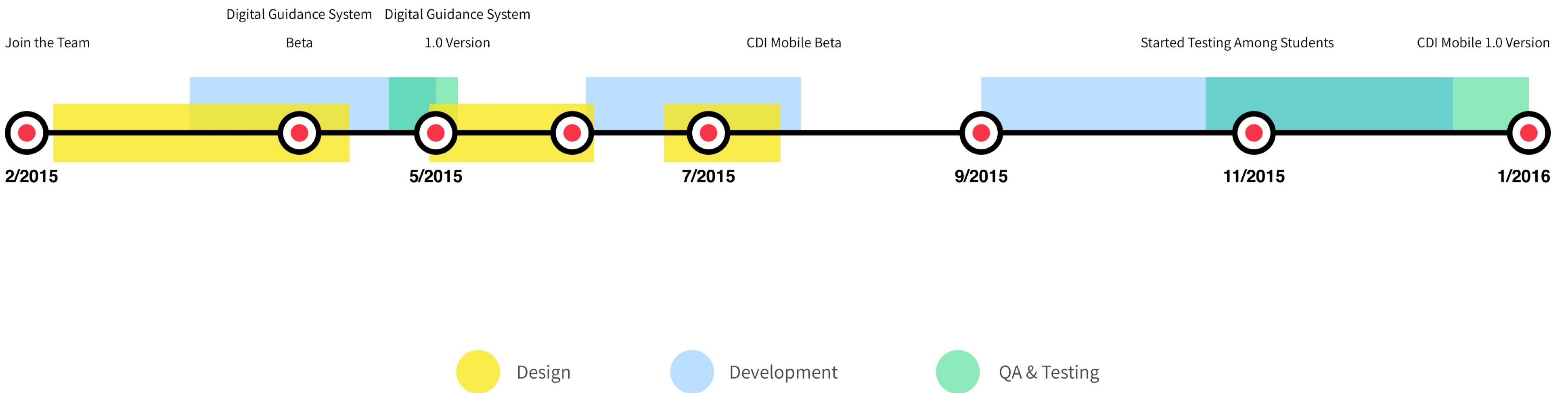
The Digital Guidances are set up behind the mirror of restrooms in CDI



CDI Mobile is available on the AppStore

Develop, Deploy, Launch

Personal Milestone in The CDI Soul Smart Space System



ROCK

Driving Simulation and HMI Usability Test Platform

Next generation human-machine interface research supported by Peugeot Société

Anonyme. Aimed to find a better way to help drivers and passengers

communicating with automobiles in the future.

After the alteration is

finished, we experimented the system on a real DS 4.

Duration

Sep.2014 - Mar.2015

Role in the Team

User Interface Designer

Project Cooperator

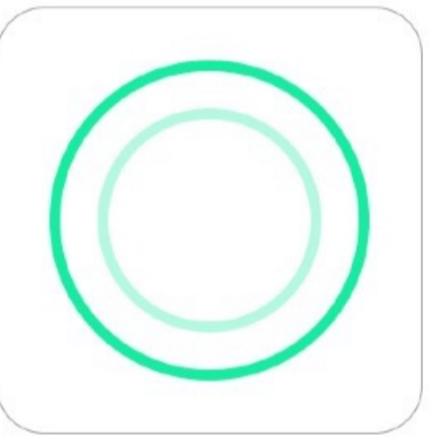
PSA Peugeot Citroen

Exploring the Future of Car HMI

Driving Simulation and HMI Usability Test Platform is a future in-vehicle HMI user-testing platform adapted from a real car. The platform is equipped with a three-screen infotainment and in-vehicle interactive system that composed of large size control screen, digital dashboard and windshield, sandbox and cross-analysis user testing system developed independently by the engineering team.



Infotainment System

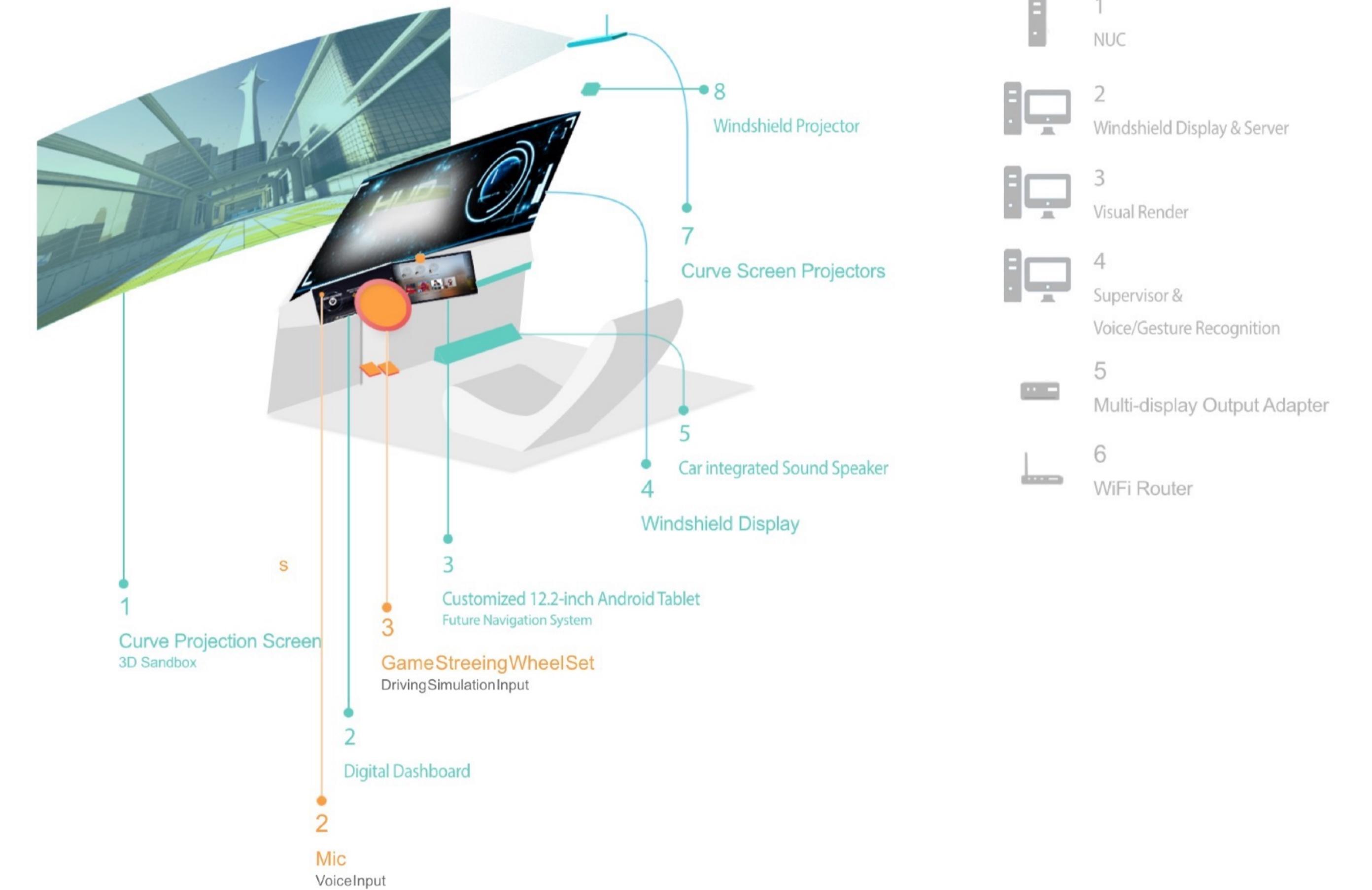


Dashboard



Windshield HUD

As the user interface designer in the team, my work contains several phases including visual study, information architecture, user interface design of the infotainment system, the dashboard, and the Head-up Display.



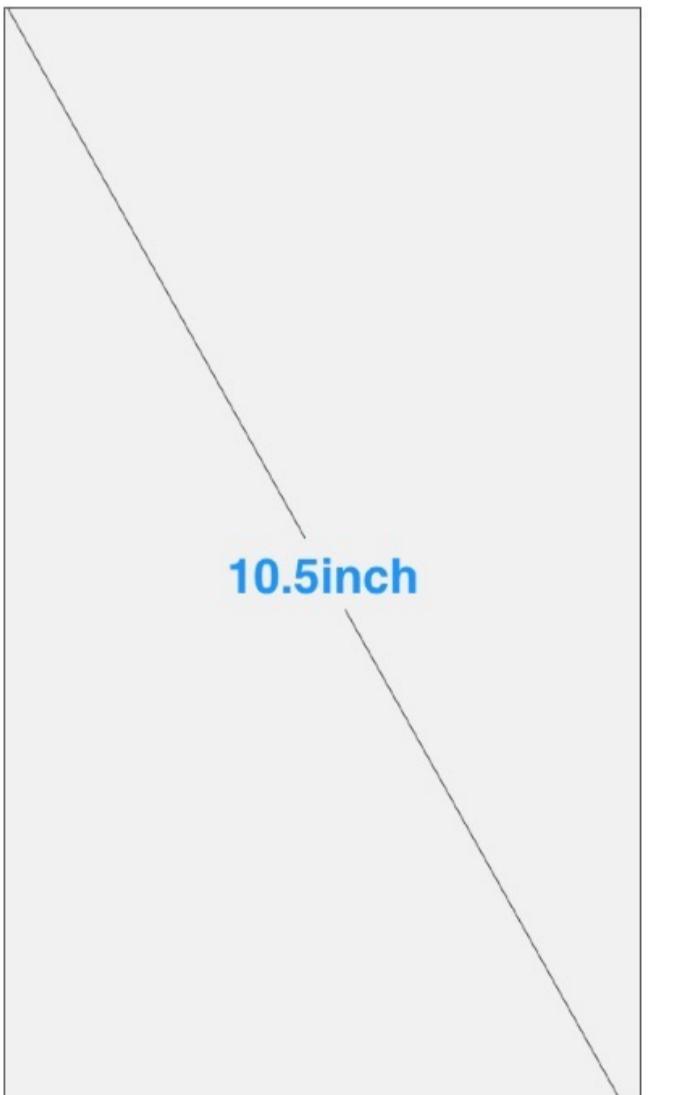
The System Structure and Facilities of Driving Simulation Platform

Formulating the Design Language

System Essentials

Since we took Technological Luxury and Future Commute as the keywords and core concept of design, so we decided not to adopt any existing design guidance, which means we need to develop a whole new design language from the start.

Display



1080px

Color Palette



#1F2436

#d286c6

#5e80ff

#c7d3ff



Gray Scale Map

Typeface

0123456789

Venera

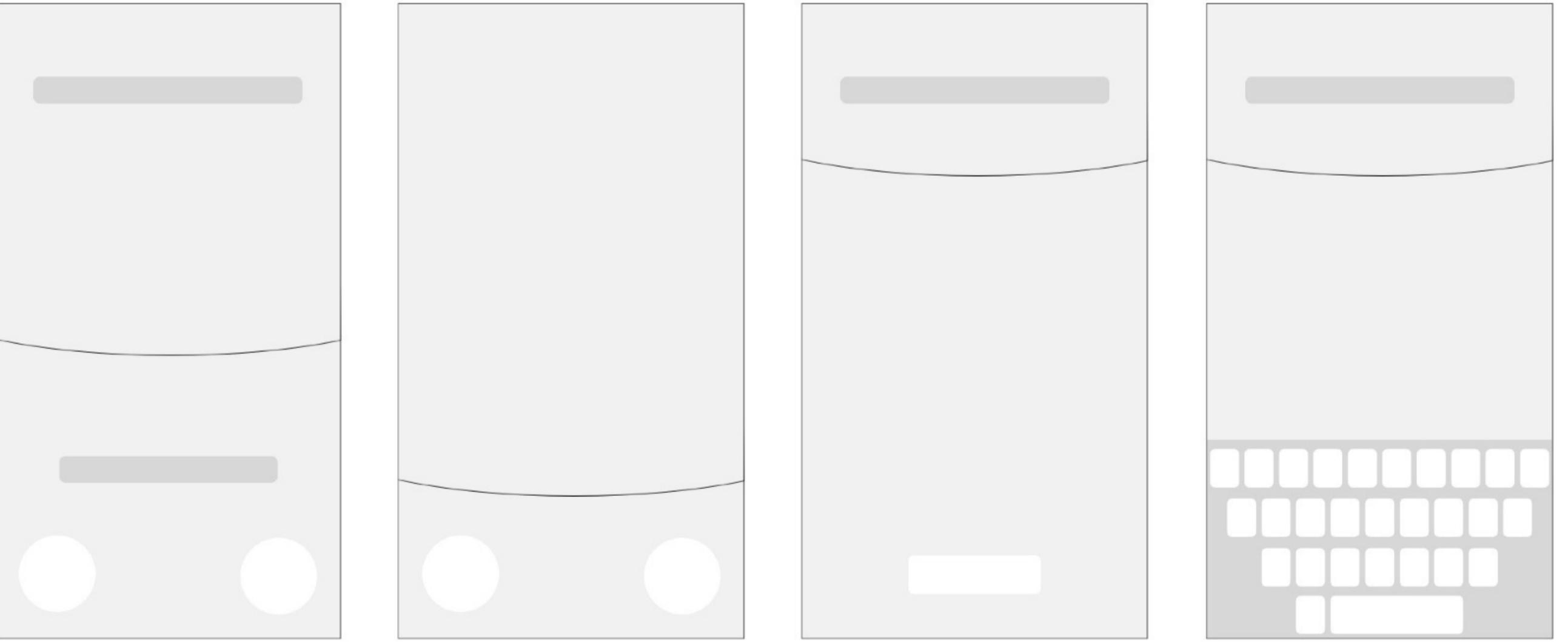
Aa

Source Han Sans CN

Type Size Table

HEAD	BODY	CAPTION	FOOTAGE
80pt	64pt	45pt	32pt

Layouts



Media

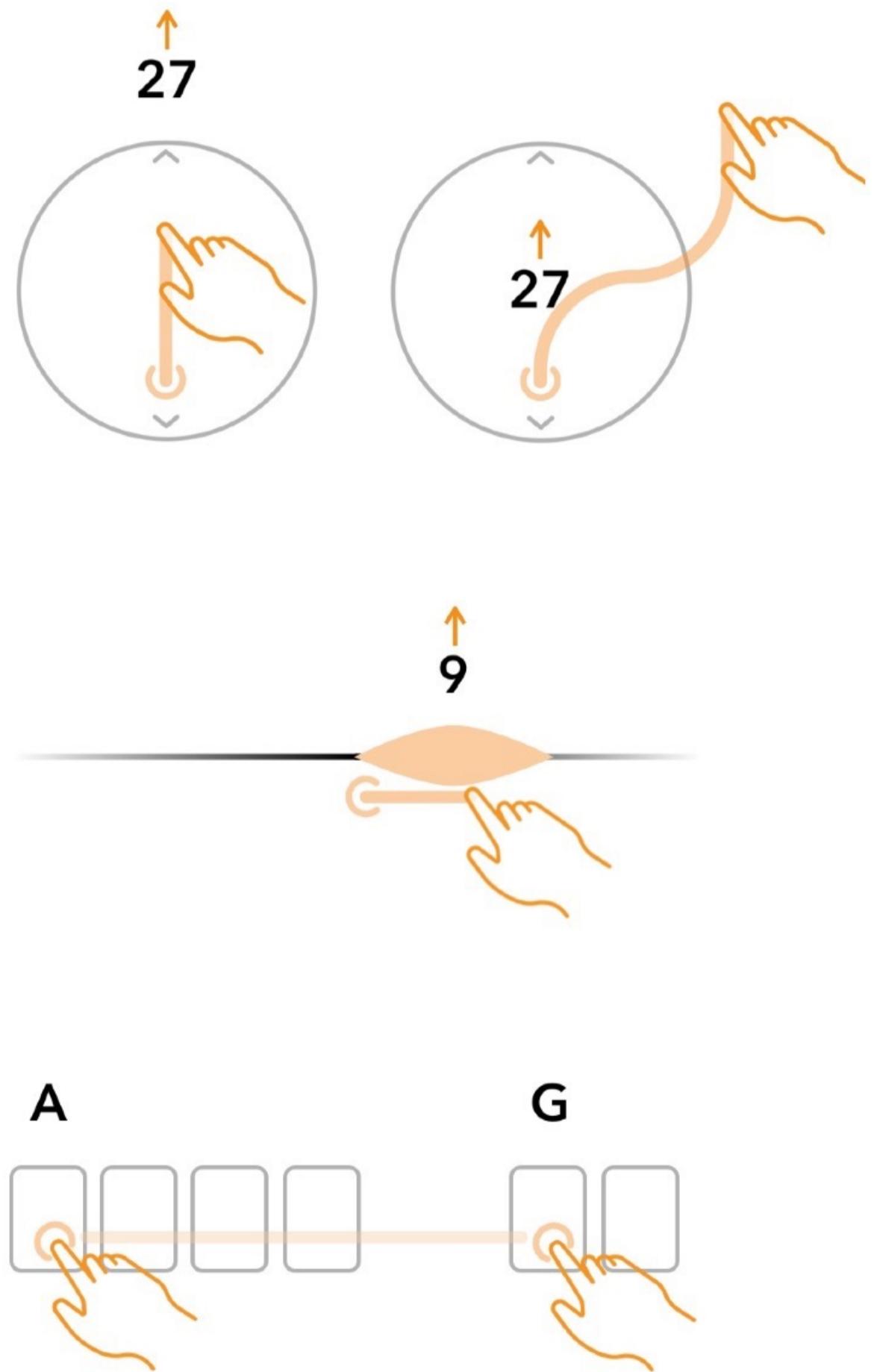
Navigation

Modal

Input Modal

Formulating the Design Language

UI Control Behaviours



Panels and Buttons

Expand the Area of Manipulation

Sliders

Balance the Change Rate with Velocity

Keys and Inputs

Integrate Touch Down with Drag

Low Precision Manipulation

The principle of designing the UI Control behaviours is Low Precision Manipulation. Users need simple ways of interaction, as well as broad manipulating zones especially when driving.



Scenario: Adjust the Volume



Scenario: Typing

Designing User Interfaces

The Infotainment System and Dashboard

The infotainment system has three main functional groups, including Media, Navigation and Contact. Users can switch into different views under corresponding cases.

The Collaborative Design Framework had also played an essential role in the process of visual style design. The balance and harmony between software interfaces and vehicle interior design was one of the crucial factors that determine the standards. After three rounds of iteration, the desirable outcome had eventually been put together.

Before jump right into development, several drivers were invited to the initial round of user test. We recorded the precise data such as manipulating duration, the proper distance between hand and functional area, we then make further alterations on the layout and motion based on those data.



Designing User Interfaces

The Windshield Head-up Display

The Windshield HUD was a totally different section other than screen-based user interfaces. We analyzed drivers' line-of-sights while driving in order to make sure that graphics and labels will not interfere them.



Navigation

Radio

SMS

Phone

Music

前方拥堵, 请您降速行驶

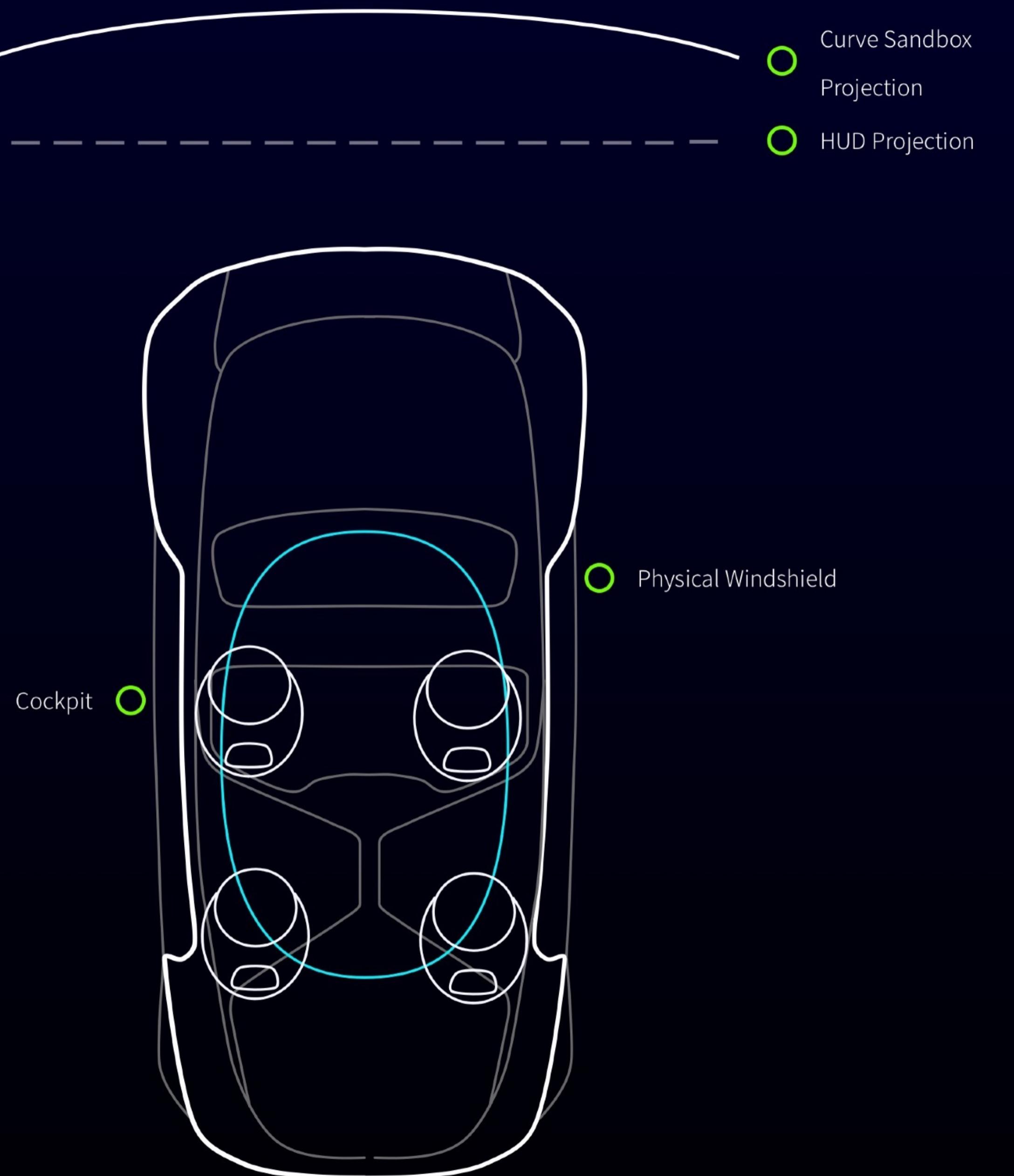
11:02

全家便利店 0.7公里



王健 来电

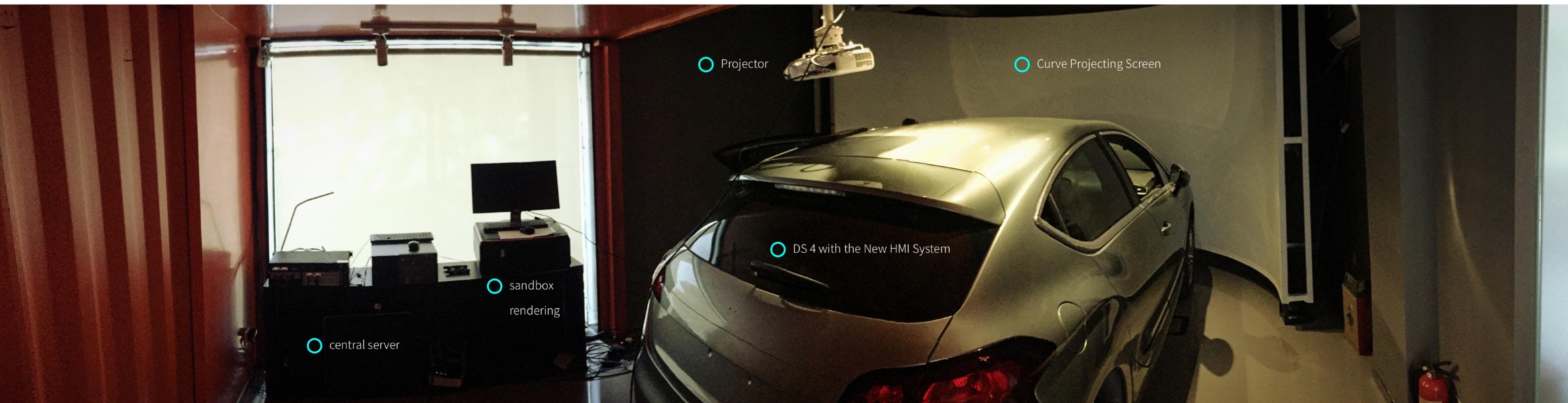
↑ 24°C



Integrating the Platform

Driving Simulation with the Brand New HMI

With the help of engineers from The School of Software Engineering and The School of Automotive Studies, Tongji University, we finished the development of the [infotainment system](#) (based on Android Tablet), the [dashboard](#) (based on Android Tablet) and the [windshield HUD](#) (Unity3D), the [driving simulation sandbox](#) system (OKTAL and Curve Projecting Screen), and a [central server](#) exchanging data between the sandbox and the vehicle. We also altered the [inner structure](#) of the vehicle so that we could replace the original system into the new one. We started to test the platform as soon as the constructions were complete.



Integrating the Platform



The Brand New HMI Installed in DS 4

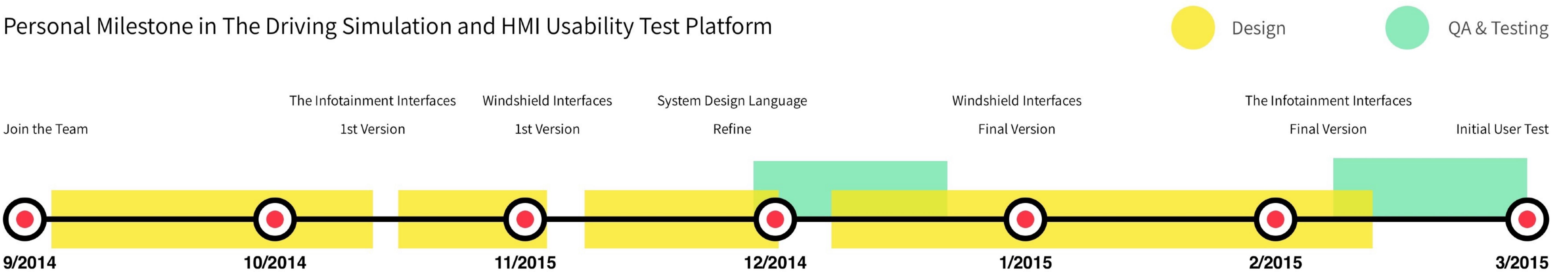


Drivers Doing Usability Test



Sandbox Driving Simulation

Personal Milestone in The Driving Simulation and HMI Usability Test Platform



Moonshot Infotainment System

Duration

Sep.2015 - Present

Role in the Team

User Interface Designer

Project Cooperator

PSA Peugeot Citroen

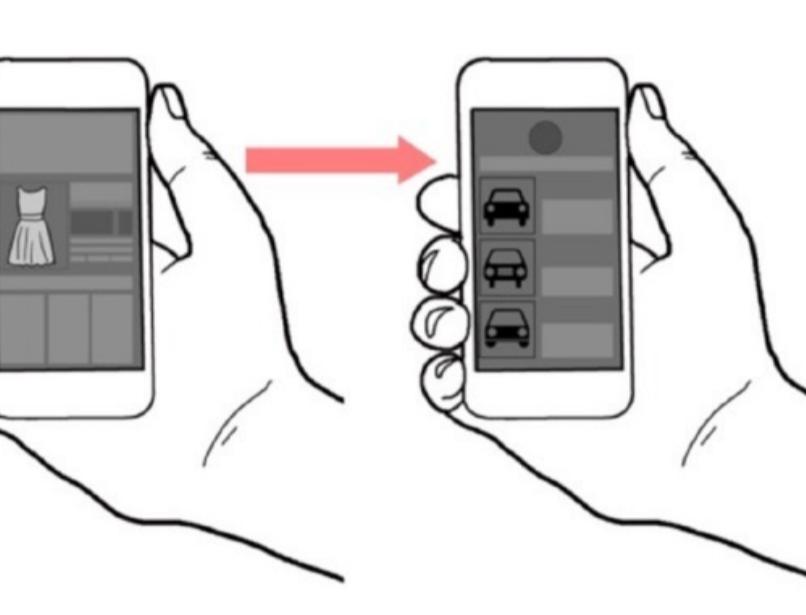
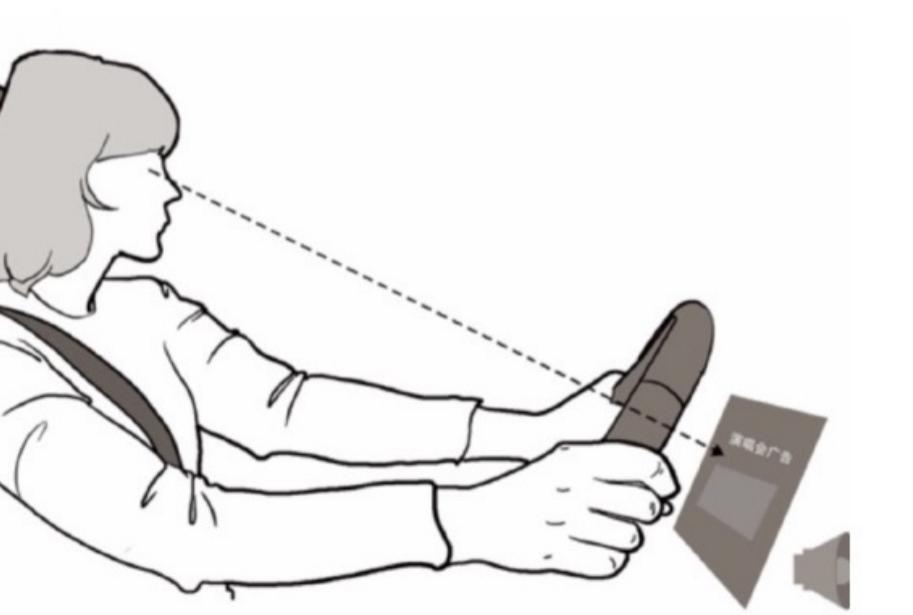
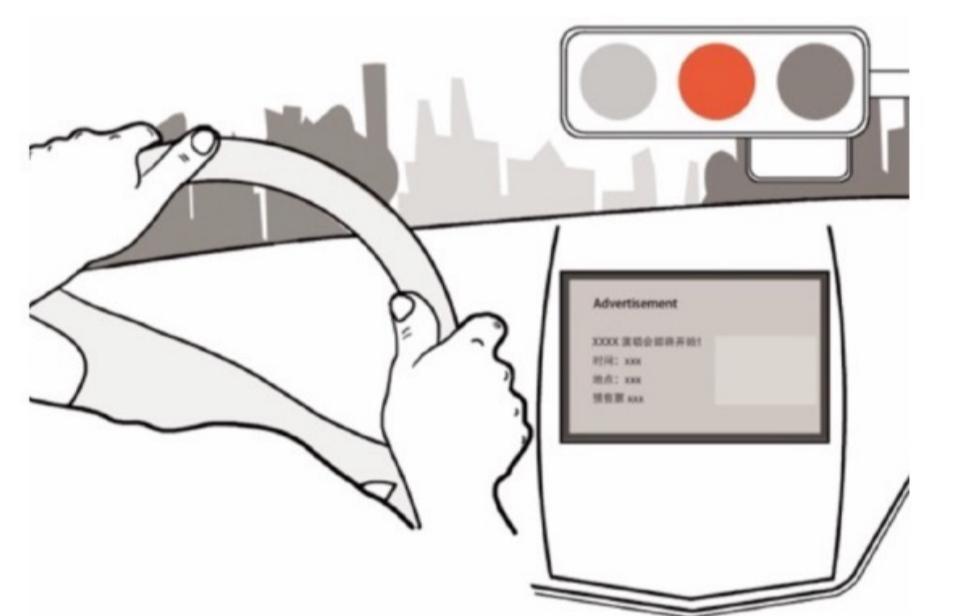
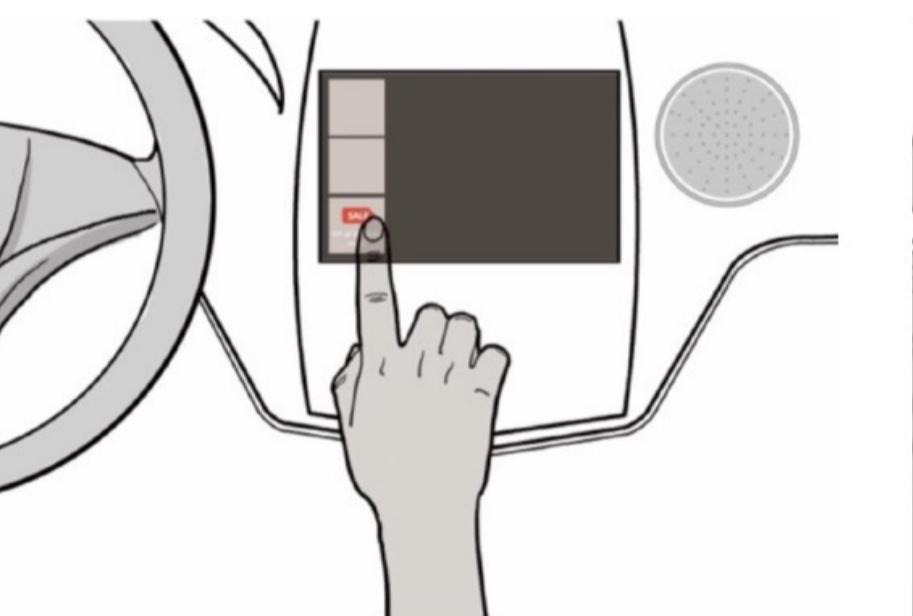
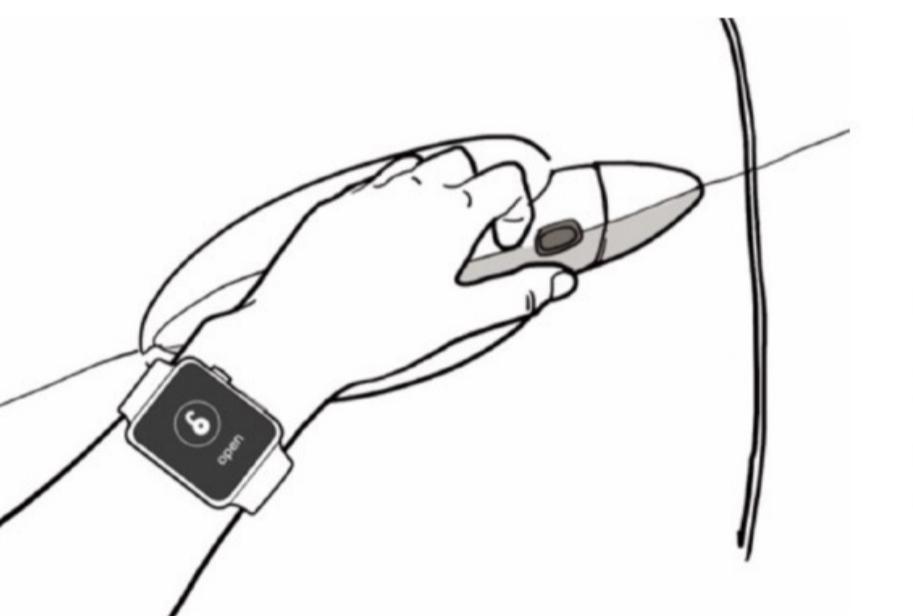
This project aims to explore the framework and mechanism of future car services in terms of third-party applications. We made a showreel film as the final output, it is produced based on well-designed storyboards to demonstrate ideal using scenarios. The infotainment system is the core of the design process as well as the main section throughout the film.

Group work / Storyboard / Information Architecture / User Interface Design



Scenarios and Storyboards

Before started designing the infotainment system, we confirmed the major scenes that jointed the showreel film. This was followed by the produciton of storyboards, which basically pinned down the functional elements of the infotainment system.



The Reactive Panel Pattern

Modal View Panel

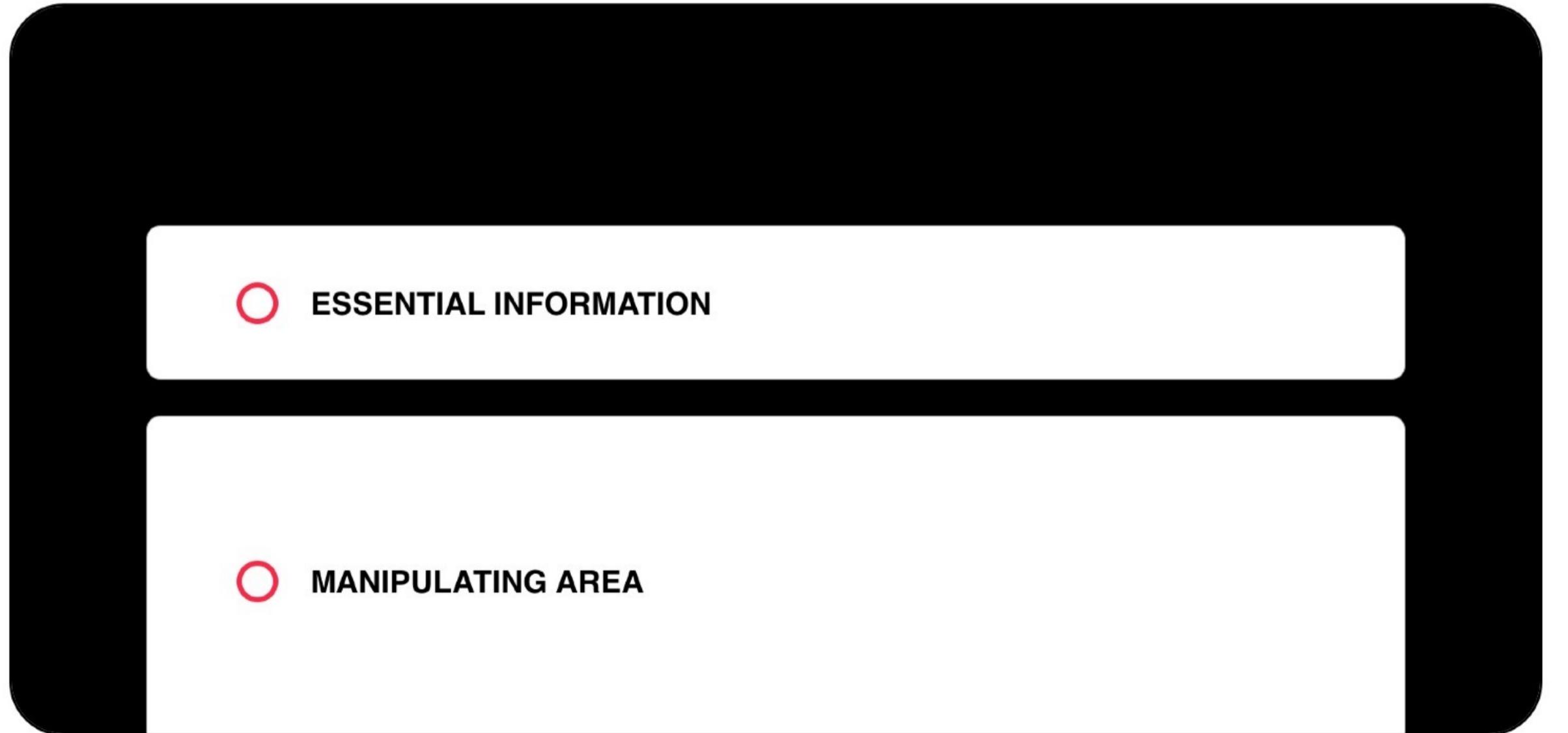
For those applications shows on the infotainment screen discontinuously, a larger manipulation area is displayed.



REMINDER



MESSAGE



Multi View Panel

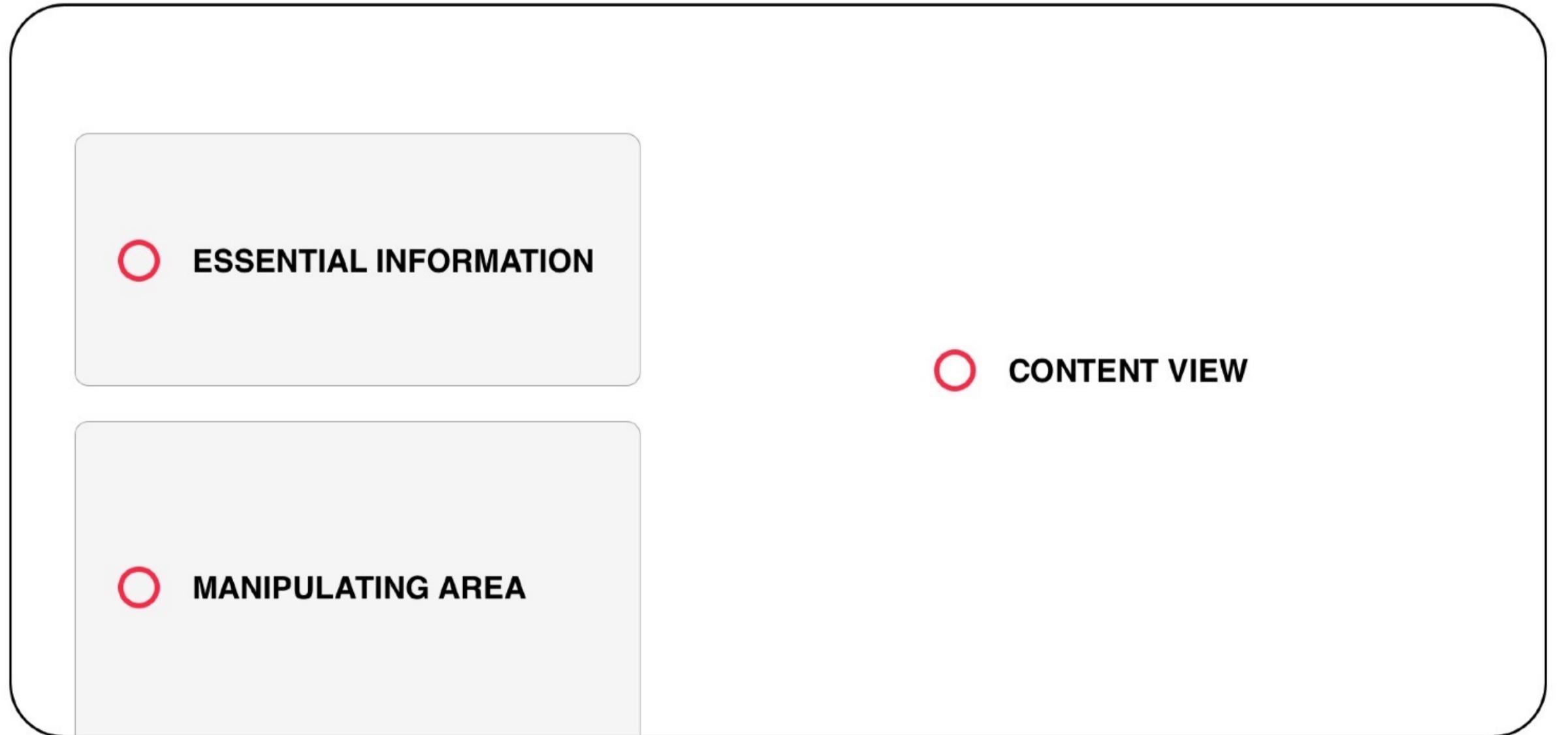
For those applications shows on the infotainment screen continuously, the manipulation area is stucked on the left(cockpit), while content view is displayed as the background view on the lower layer.



NAVIGATION



CAR SHARING

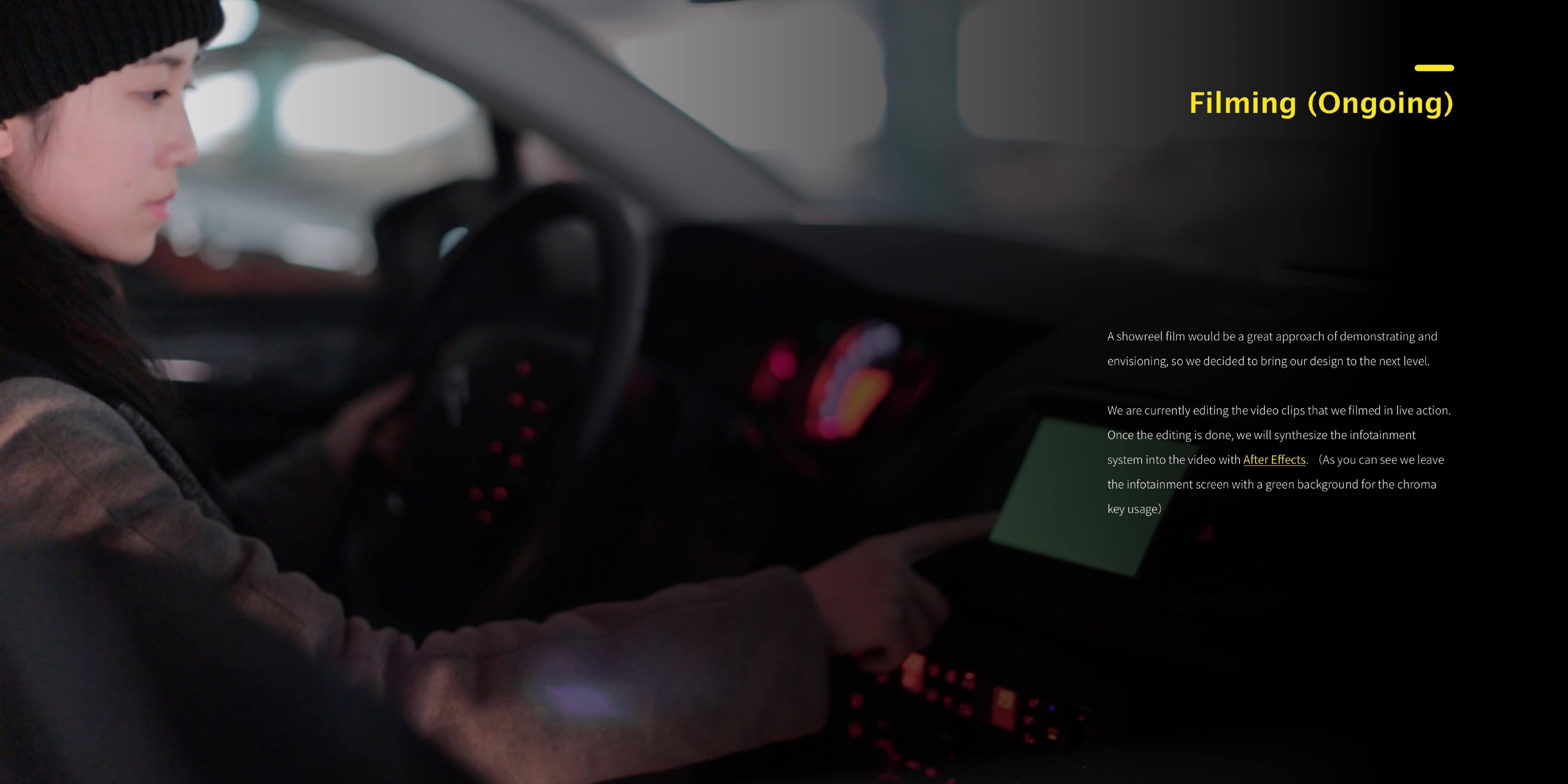


Visual Design

It was essential to keep the integration and consistency of the infotainment system while designing various 3rd party applications. After adopting visual frameworks, it was surprisingly cheerful to see how different apps eventually been put together.

Panels and Buttons (Partial)



A close-up photograph of a woman with short brown hair, wearing a black beanie and a dark, textured jacket. She is seated in a car, looking intently at a screen. The screen displays a colorful, abstract interface with various shapes and colors, including red, yellow, and green. The background is dark, suggesting it's nighttime or the car is in a dimly lit area.

Filming (Ongoing)

A showreel film would be a great approach of demonstrating and envisioning, so we decided to bring our design to the next level.

We are currently editing the video clips that we filmed in live action. Once the editing is done, we will synthesize the infotainment system into the video with [After Effects](#). (As you can see we leave the infotainment screen with a green background for the chroma key usage)

— Philips Lighting Room Mobile

Duration

Oct.2015 - Nov.2015

Individual Work

[User Interface Design,](#)
[iOS Development](#)

Project Cooperator

Philips

Lighting Room is an existing product of Philips. During five weeks of workshop held by Philips and College of Design and Innovation, Tongji University, I ran through a complete redesign process and finally came out with a desirable outcome from design to development.



Individual work / User Research / Information Architecture / User Interface Design / iOS Development

Why Redesign Lighting Room

Context Research - Customer Concerns

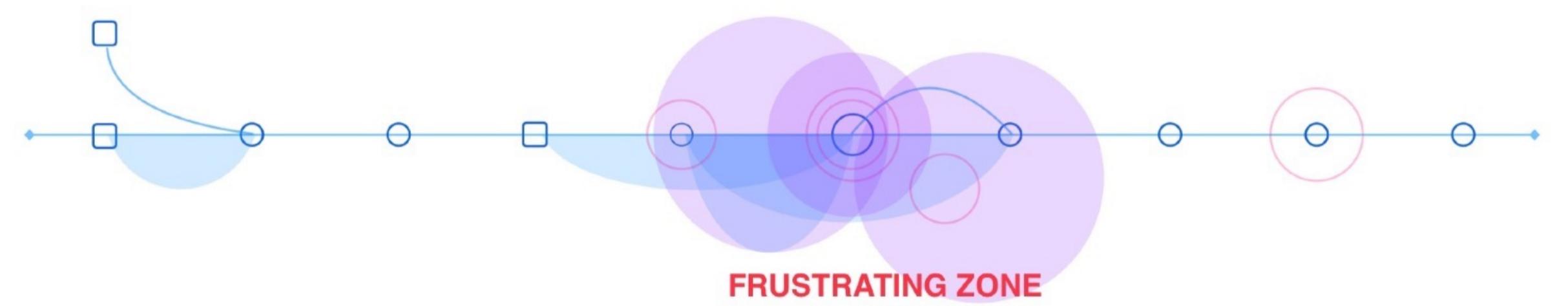
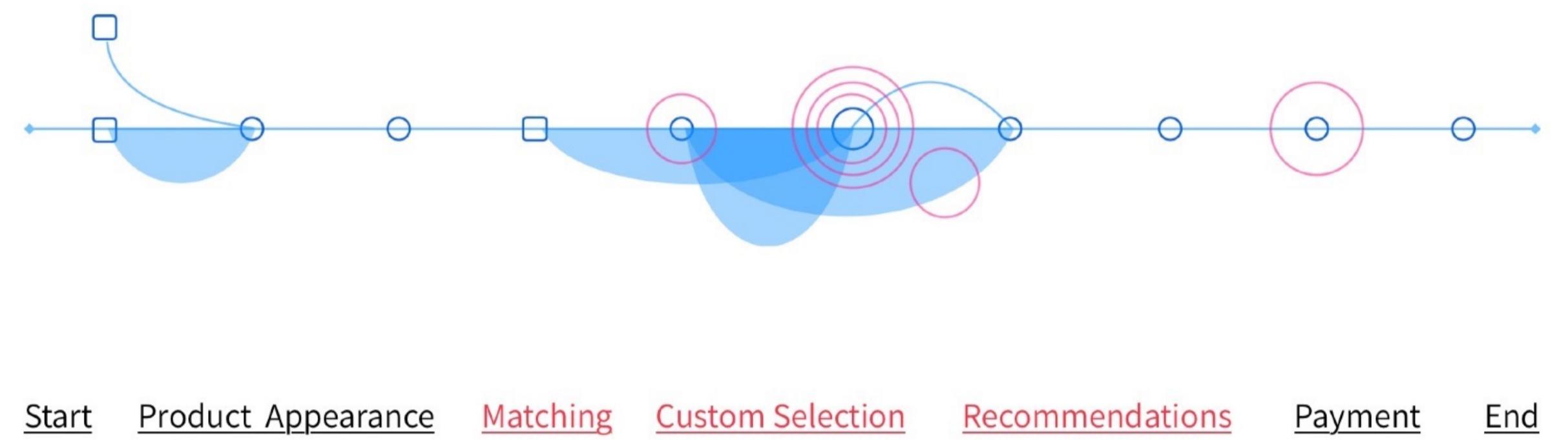
To get a clear vision and a better understanding of what do customers care about when purchasing lightings, I made several field researches to the philips retail store, so that I am able to engage with customers, have a conversation with them, and then summarize their thoughts.



Five Factors Customers Concern Most When Purchasing Lightings

Findings - Define Frustration

When it comes to the current online shopping experience, I chose [customer journey map](#) as the tool to evaluate customers' main frustrations through the whole purchasing process.

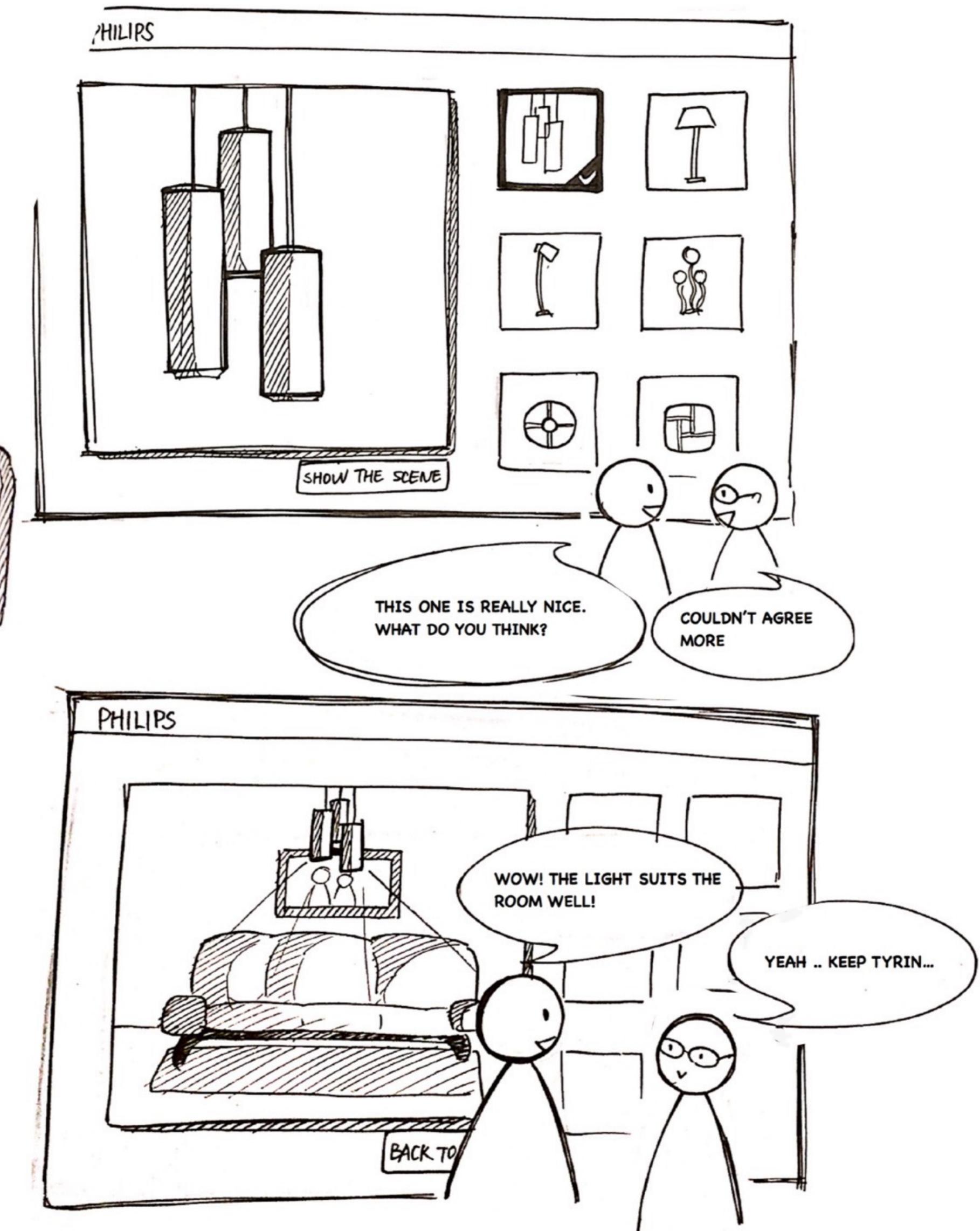
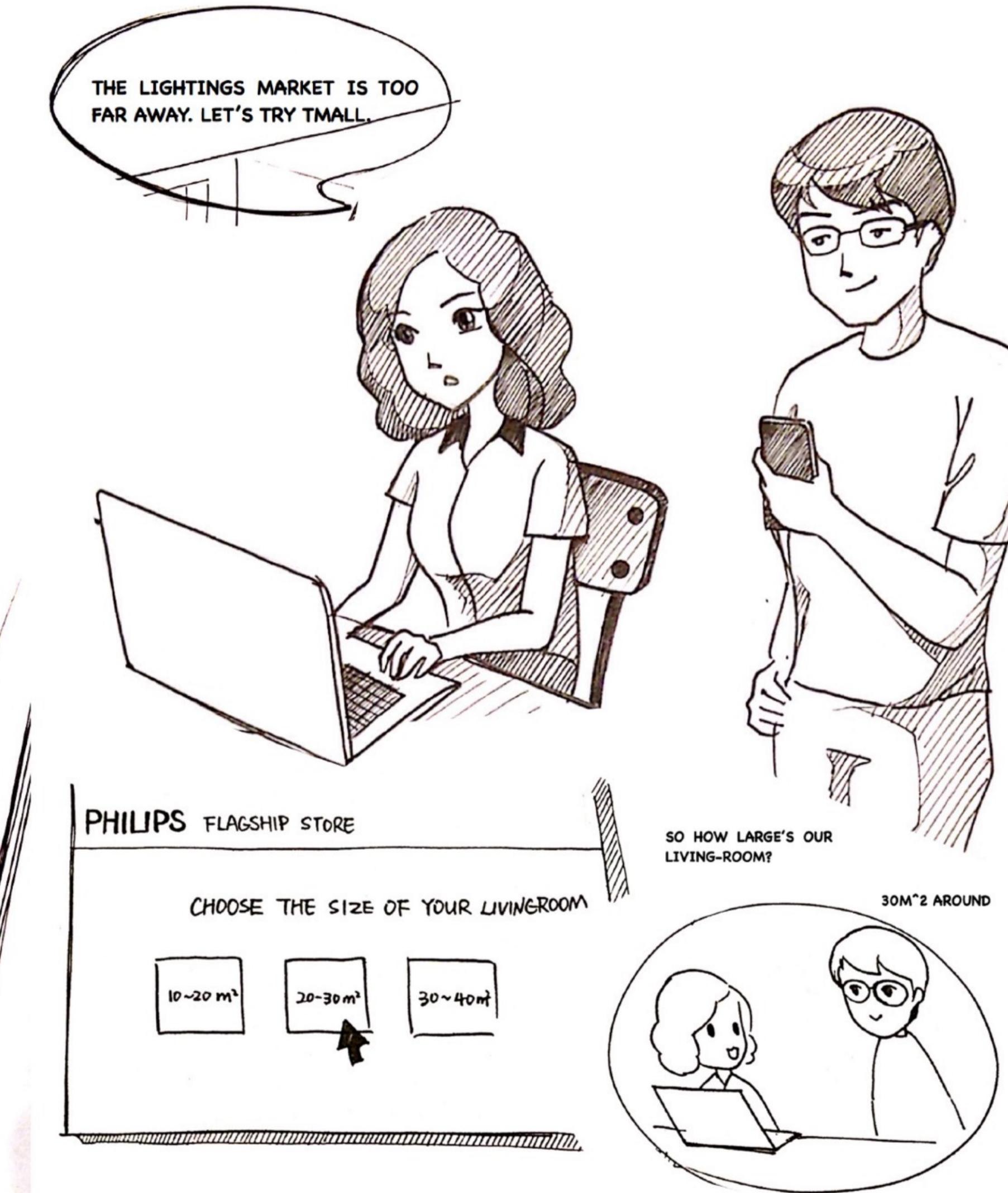
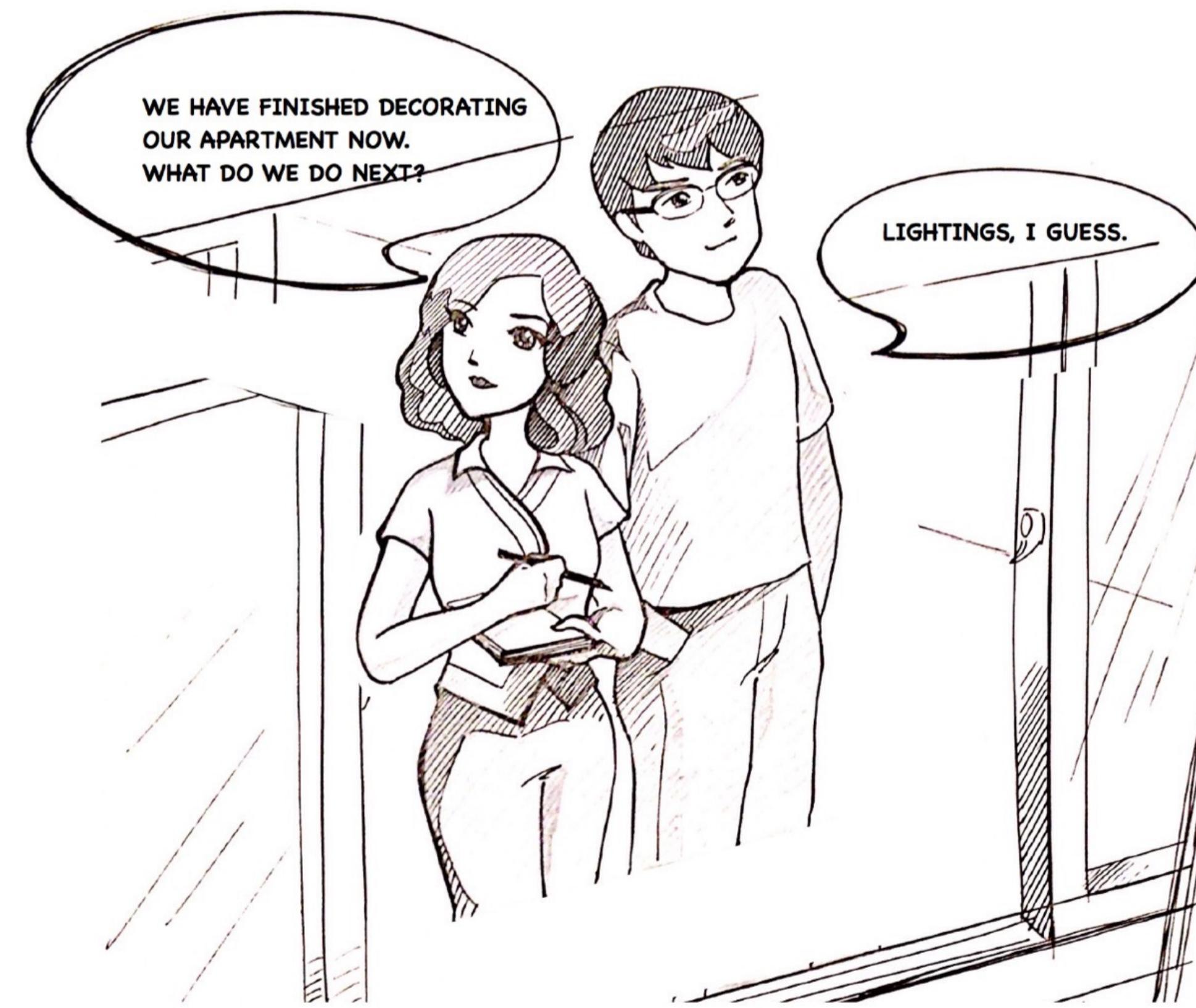


The Emotion Journey Map of Customers Purchasing Lightings Online

Visual Storyboards

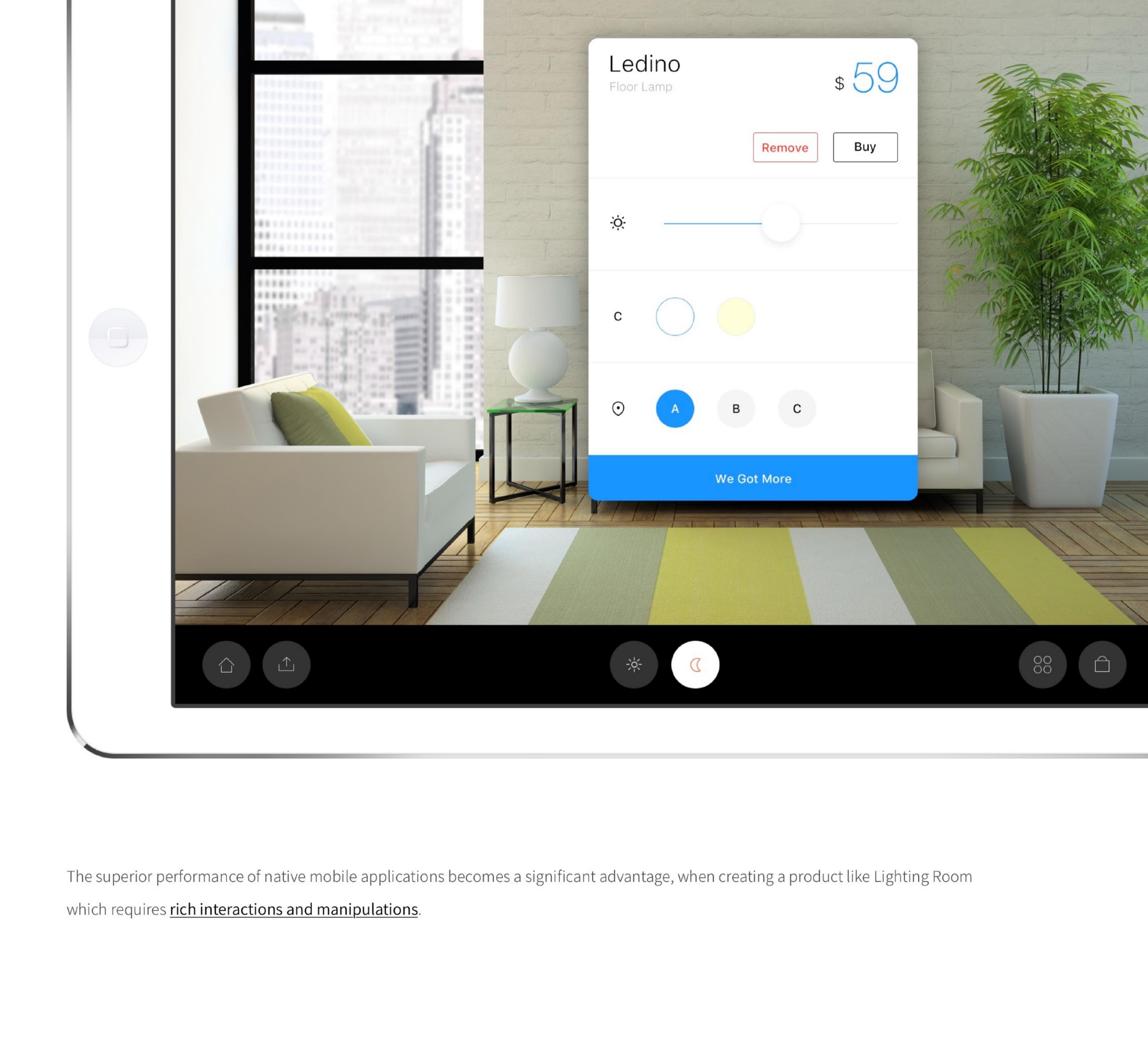
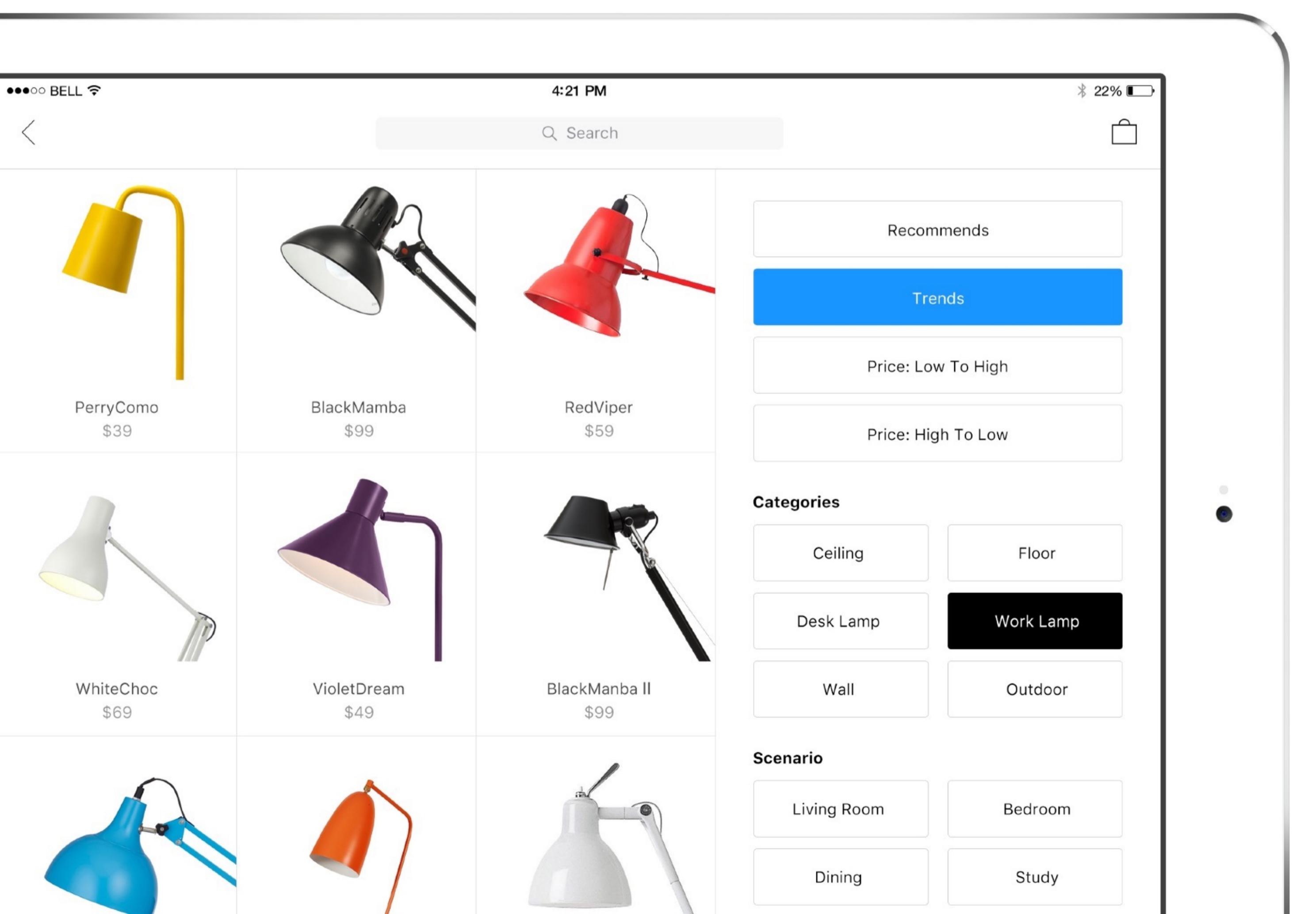
An Optimized Process

In order to achieve a visionary customer journey, a series of visual storyboards was made to describe the complete process of using Lighting Room Mobile.



From Web to Mobile

Considering the idea of creating a flexible purchasing experience, I integrated the lighting room module with the product library together, so that customers will be able to observe the lighting effect at real time, as well as search expected products with an explicit filter system.

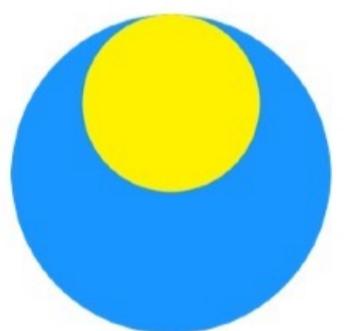


The superior performance of native mobile applications becomes a significant advantage, when creating a product like Lighting Room which requires rich interactions and manipulations.

From Design to Code

Rapid Prototyping

"No designer wants to spend weeks putting together something only to be told that it can't be done." Once I came out with the initiative satisfying design, I soon started developing the demo application then iterated with design together.



AD-Hoc Testing

After finished develop the beta version of Lighting Room Mobile, I archived the app then pushed it to 35 users (fellow students on the workshop), gathered their feedback as the motivation to polish the product.

The screenshot shows the Xcode interface with the storyboard and code editor open. The storyboard displays a product view controller for a desk lamp. The code editor shows the implementation of the `ProductViewController` class, specifically the `shopButtonpressed:` method. The code uses spring-based animation to transition between different states, such as opening a shopping cart or changing lamp settings.

```
48
49 - (IBAction)shopButtonpressed:(UIButton *)sender {
50     [UIView animateWithDuration:0.5
51         usingSpringWithDamping:1.0
52         initialSpringVelocity:0.0
53         UIViewAnimationOptionCurveEaseOut
54         ^{
55             _maskImage.alpha = 1.0;
56             _shoppingCartView.alpha = 1.0;
57             _shoppingCartTopConstraint.constant = 0;
58             [self.view layoutIfNeeded];
59         }
60     ];
61 }
62
63 - (IBAction)shopCancelButtonPressed:(UIButton *)sender {
64     [UIView animateWithDuration:0.5
65         usingSpringWithDamping:1.0
66         initialSpringVelocity:0.0
67         UIViewAnimationOptionCurveEaseOut
68         ^{
69             _maskImage.alpha = 0.0;
70             _shoppingCartView.alpha = 0.0;
71             _shoppingCartTopConstraint.constant = 100;
72             [self.view layoutIfNeeded];
73         }
74     ];
75 }
76
77 - (IBAction)singleProductButtonTapped:(UIButton *)sender {
78     _singleProductScrollView.transform = CGAffineTransformMakeScale(1.0, 1.0);
79 }
```

Aerovane Colla-Whiteboard

Group work / User Research / Information Architecture / User Interface Design

Aerovane is designed for those designers who need to **work collaboratively**. Designers are able to share design resources, make real-time comments and modifications, trace back to previous design version, and organize files using various kinds of filters with the help of Colla-Whiteboard. The whole interaction framework adopt the design language that is specifically **targeted on large size screens**, and the demo is developed with Unity3D and has been usability-tested for two rounds.

Duration

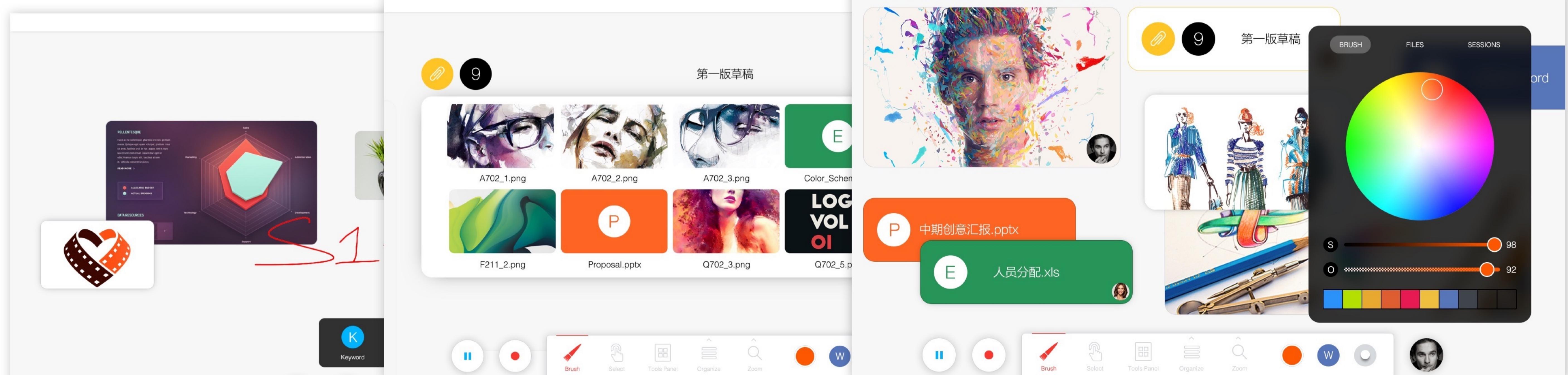
Dec.2014 - Nov.2015

Role in the Team

User Interface Designer,
Project Manager

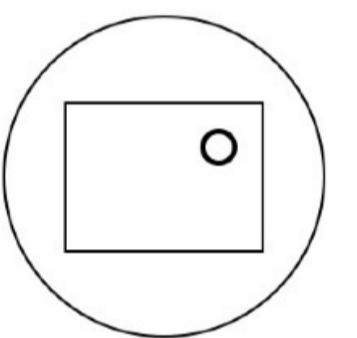
Project Cooperator

School of Sino-Italy, TJU



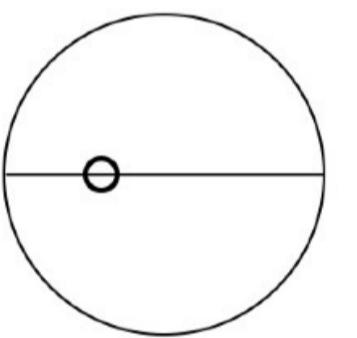
The Ideation

Collaboration has always been a significant issue between designers. Unlike engineers, designers often require higher flexibility and indeterminacy of the collaborate-working environment. It also explains the primary reason to design Aerovane, to make a conceptive tools for designer to share their inspirations.



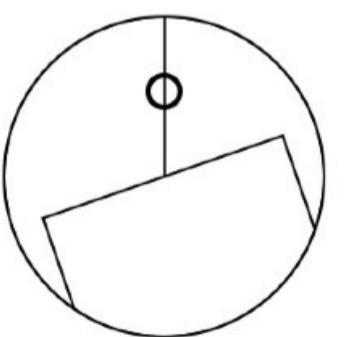
Canvas

A boundless canvas where designers can write&draw, or put any content on.



Timeline

Track back to previous design version by using the timeline.



Filepool

A broad collection of design resources supported by powerful searching system.



The Style Guide

Designing large-size-screen based user interfaces (with touch based interactions)

could be a real challenge. After rounds of deliberation had we finalized the system style guide.

Colors

Primary Colors



#2B92F9 #277FD8 #2BB7F9 #4CCB00 #42B100 #7ED321 #FF6522 #EF4E08 #FF8C22

Gray



#777777 #9A999A #CCCCCC #DEDEDE #F9F9F9

Typography

Primary - 12pt to 42pt

Roboto Aa Aa Aa

Regular Medium Bold

Paragraph - 16pt to 18pt

Calibri Aa Aa

Regular Bold

Link Styles

System Menus



Normal
#1895FF

Hover
#FB3547

Visited
#6995C8

Inactive
#464646

Iconography

Icon Outlines



Mark Favourite Settings Panels Pins Search

Icon Bases



Normal Filled On Panel

UI Elements

Buttons



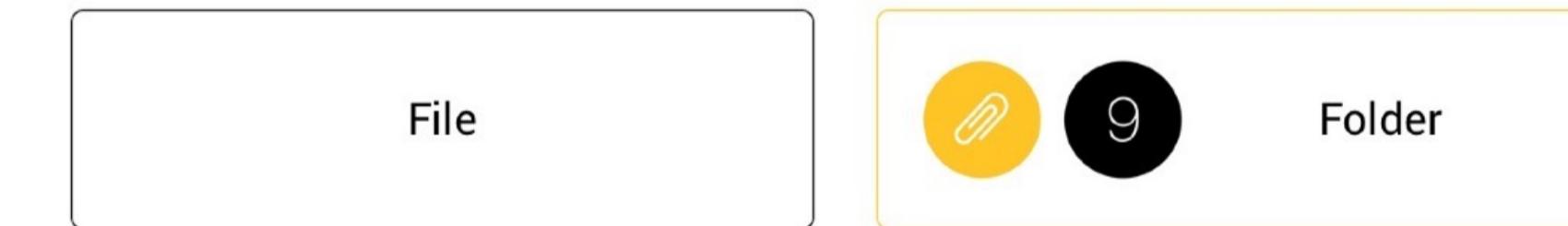
Normal Pressed Inactive Self-Hold

Self-Hold Buttons



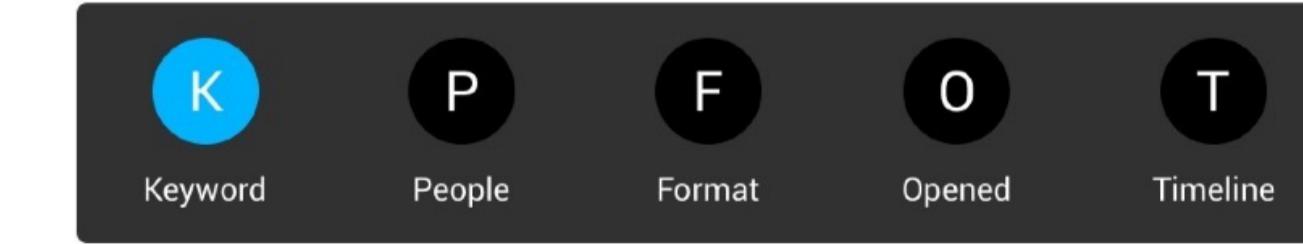
Normal Pressed Inactive Self-Hold

File Cards

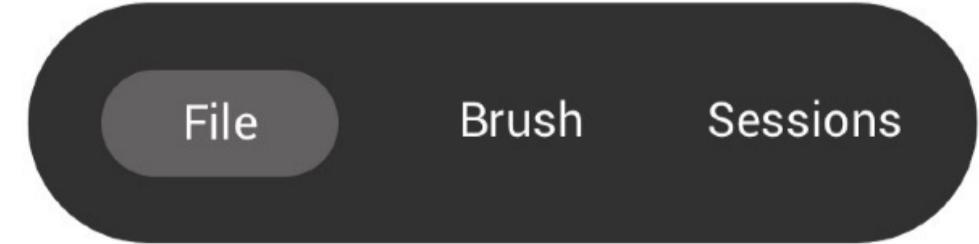


Normal Folder

Tool Bars



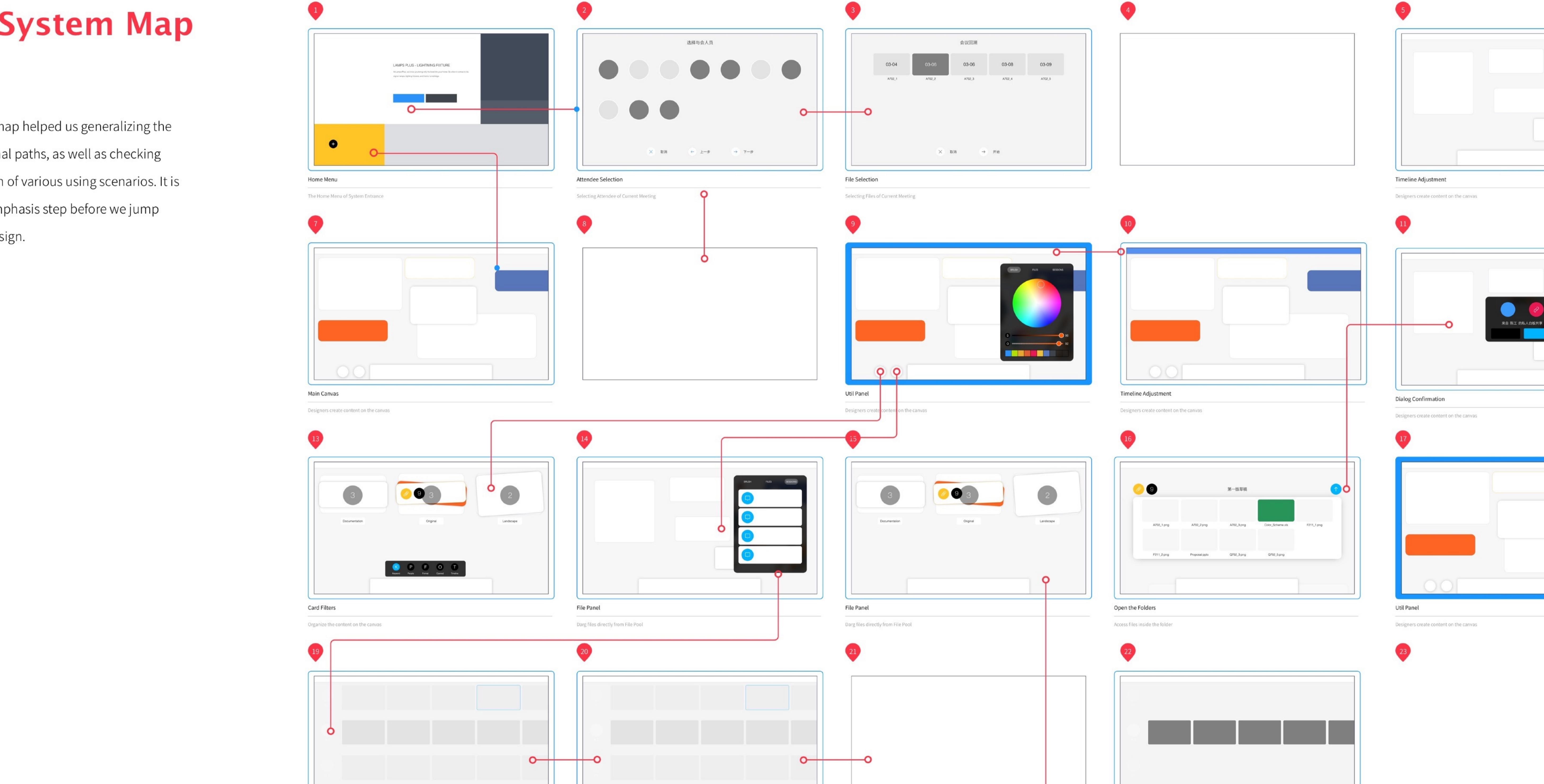
Bottom Bar



Panel Section Bar

The System Map

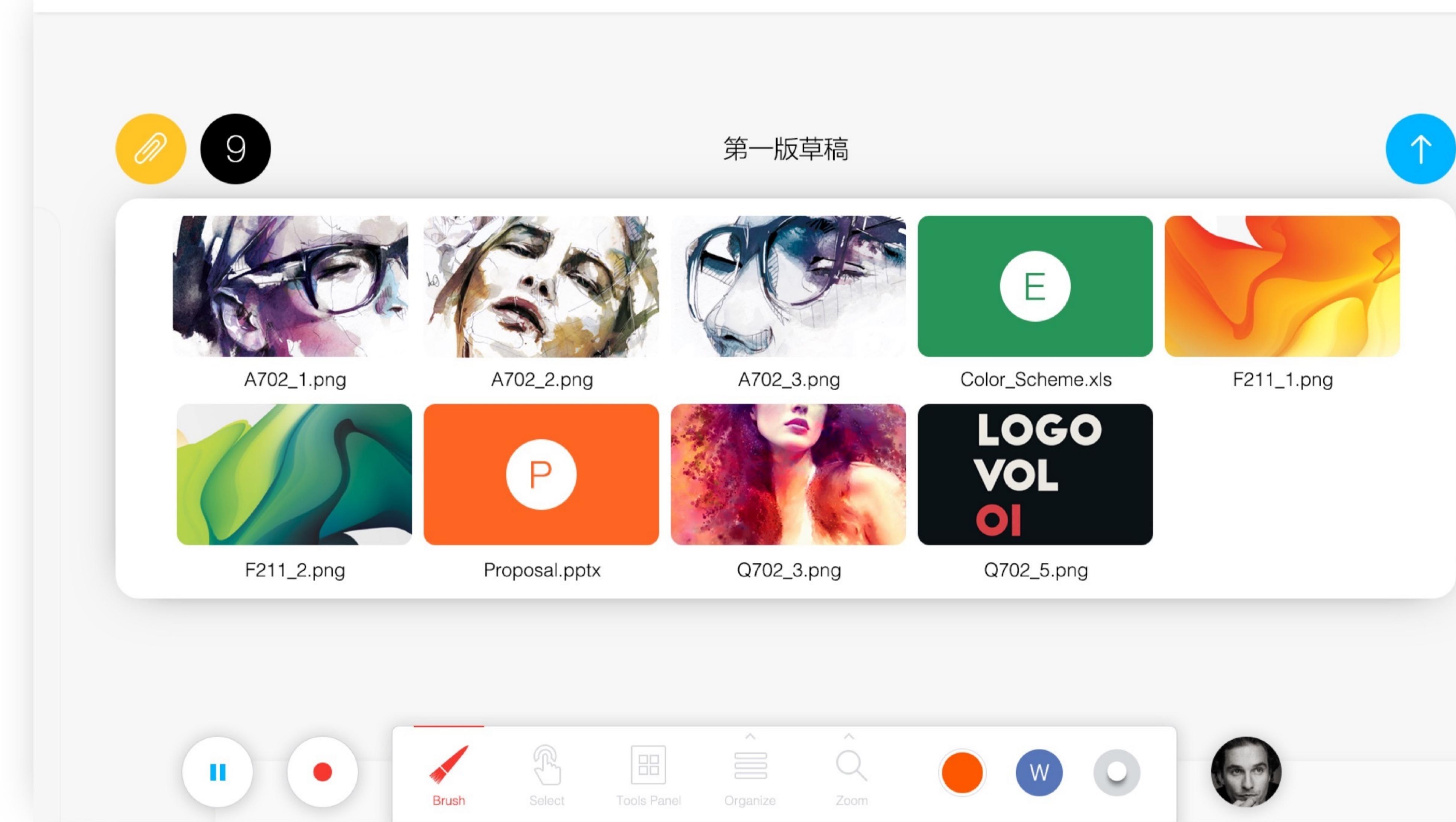
The system map helped us generalizing the core functional paths, as well as checking the validation of various using scenarios. It is always an emphasis step before we jump into Hi-Fi Design.



The Prototype

Once the design phase had ended, we soon developed the Aerovane prototype with Unity3D. Since Unity3D provides the cross platform compleiable feature, we were able to deploy and test our demo on different OS.

We chose Hisense LED75XT900X3DU (75 inches) as our display, then we adopted a PQLabs multi-touch screen over the top of the display, so that users could interact directly in front of the digital canvas with their hands.



Other Works

I love creating. From tiny to jumbo.

I Design and Develop Apps

Apple WWDC 2014 Student Scholarship Winner

I was one of the three students from P.R.China who was nominated to attend WWDC 2014.

Three Apps Available on the AppStore

I have three years experience on designing and developing iOS applications, seeing through from iOS6 to iOS9, I enrich my design and develop skills all along.



TimePie



EV-Car



CDI Mobile



I Build Interactive Devices

'Zen'

'Zen' is a multimedia interactive device that combines [chinese traditional culture art](#) with computer vision & video mapping technology. The device consist of several sensors, two projectors (one for video mapping and one for visual output) , solid models and a desktop program as visual output developed in C#. Users can interact with this device through different ways such as [body gestures and voice](#) then get the corresponding visual feedback.

Duration

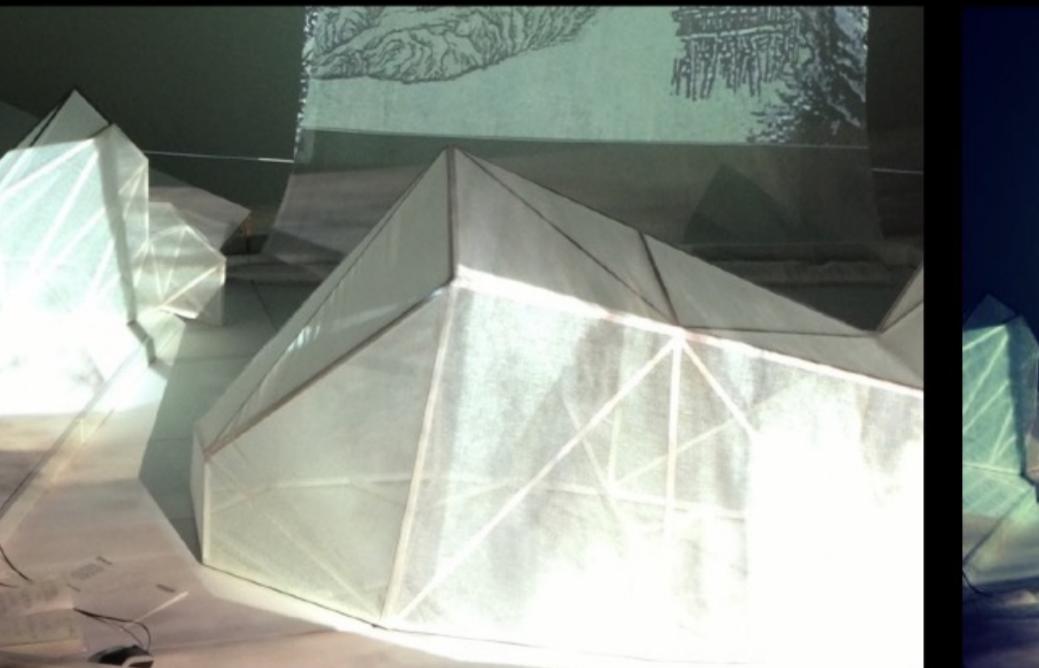
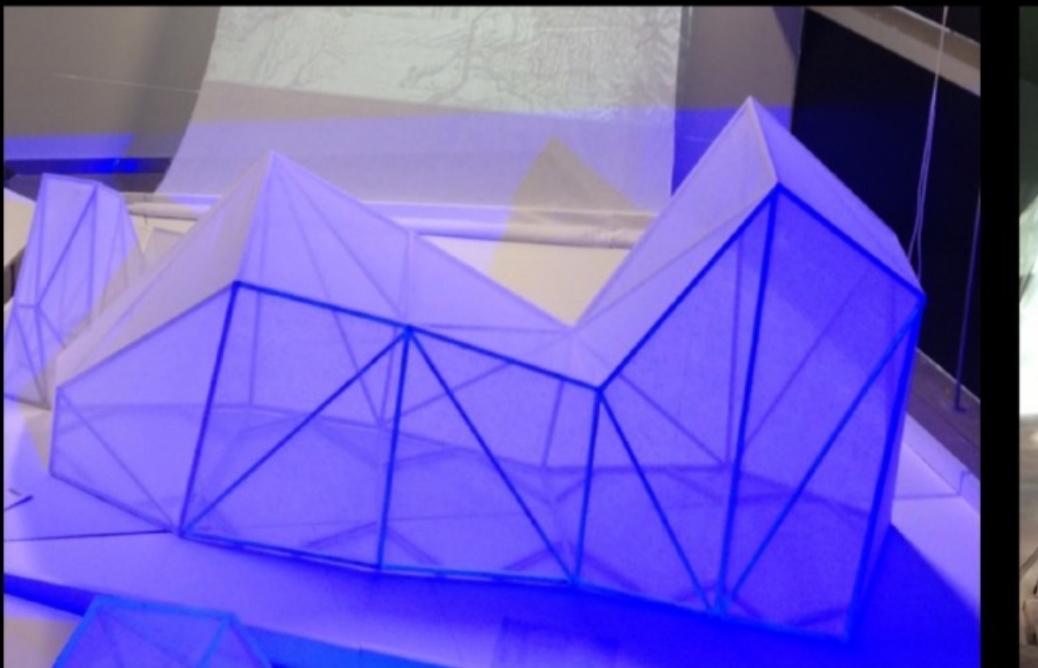
Aug.2014 - Nov.2014

Role in the Team

[Visual Designer and Developer](#)

Project Cooperator

Miugo Digital



Modelling and Video Mapping

Kinect Interaction Programming

Final Prototype





'Mu Dan Yin Yang'

'Mu Dan Yin Yang' is another multimedia interactive visuals we made. We used Microsoft Kinect to capture the body gestures and movement of the actor, then we fetched the [depth graph image](#) and the [skeleton data](#), filled it with our visual content, then export the final visual effect through projectors to the audiences. The show was held in Shanghai International Fine Art Festival 2014.



Duration

Aug.2014 - Oct.2015

Role in the Team

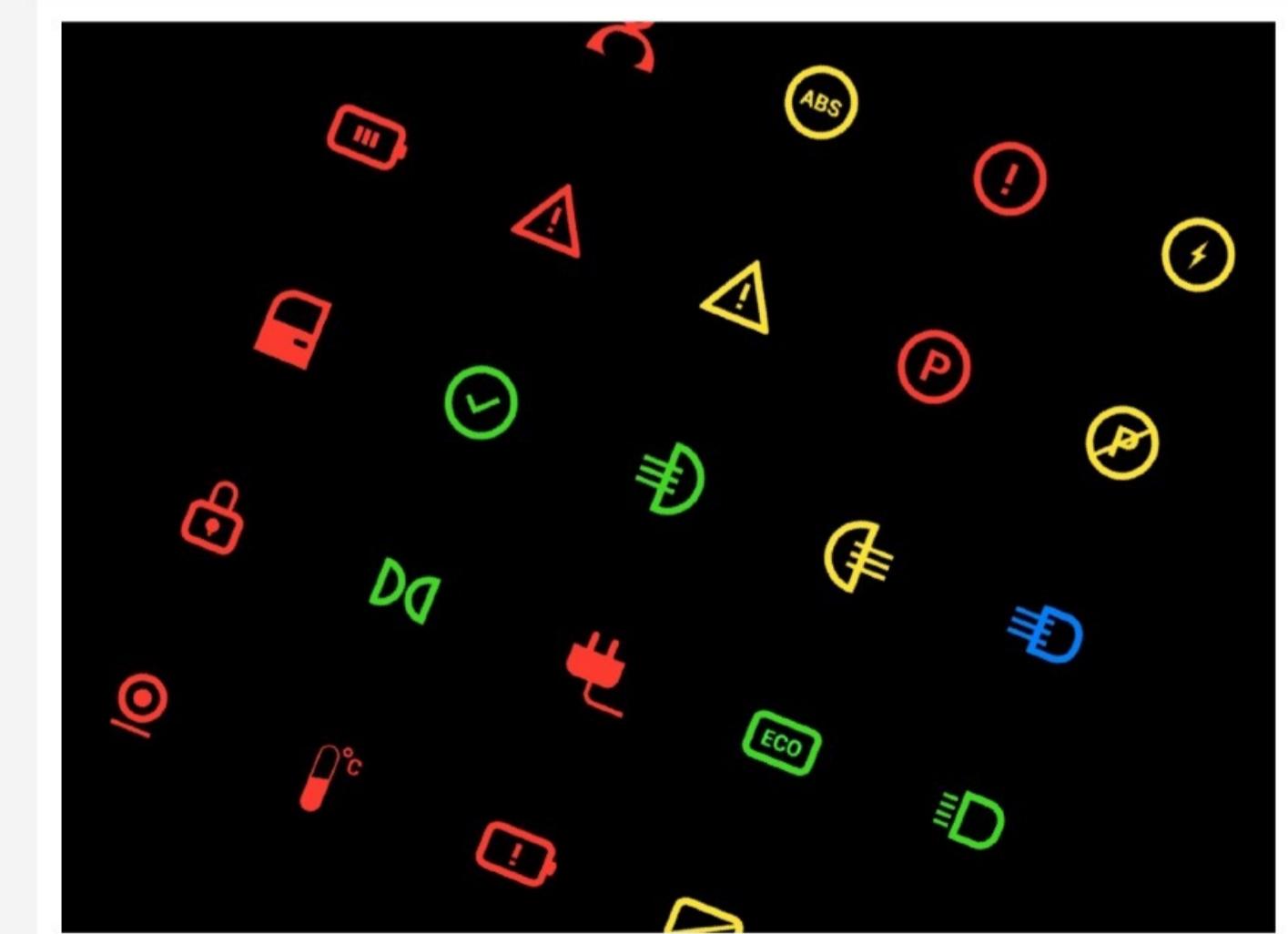
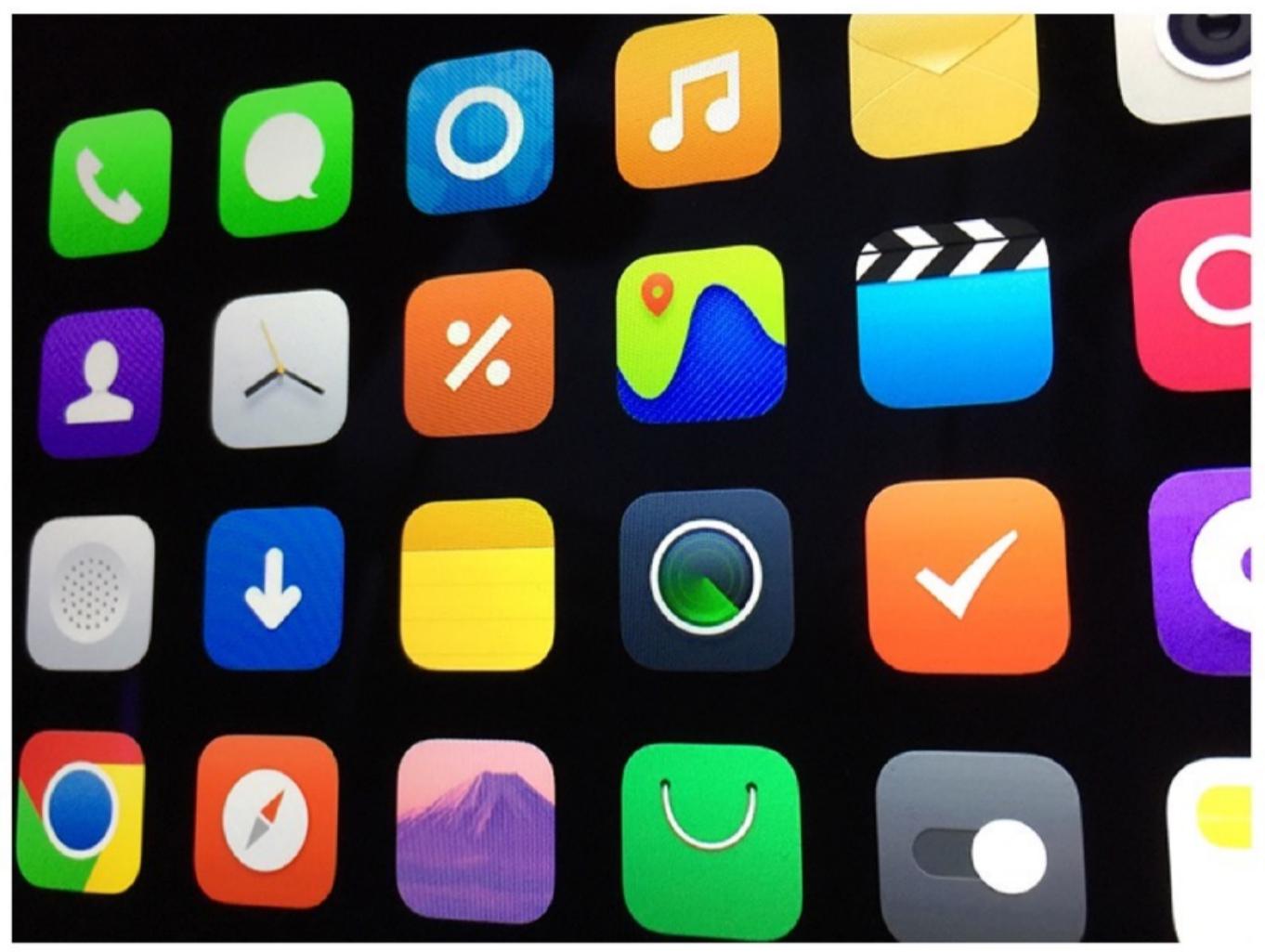
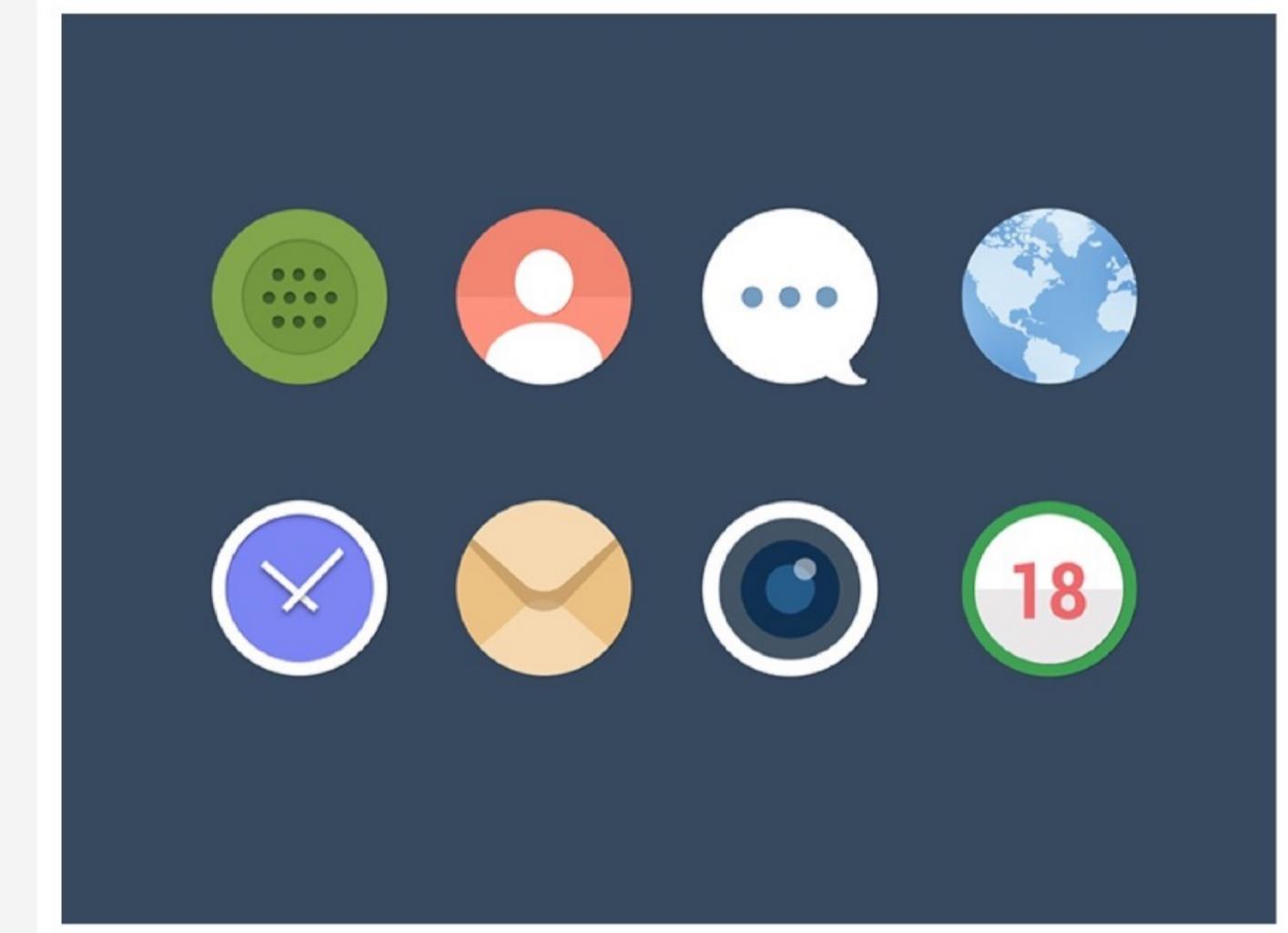
[Visual Designer and Developer](#)

Project Cooperator

Miugo Digital

I Make Brandings and Visuals

Creating Icons and Graphs have always been one of my personal favourite. Truth is I started from making Iconography and designing logos as an one hundred percent engineering student four years ago, since I wanted to become a designer as well. Now I accomplish the goal and I am eager to move on.



**And There's
More To Tell**



DACHANG LIU

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EDUCATION

Bachelor of Engineering

Software Engineering (Media, Art & Science), College of Software Engineering, Tongji University, 2011-2015 GPA 4.8/5

Master of Art

Interaction Design, College of Design and Innovation, Tongji University, 2015-present Average 90.72/100

AWARDS

Apple WWDC 2014 Student Scholarship

One of the three students from P.R.China

Shanghai College Student Scholarship

Top 2%, Ministry of Education of Shanghai, P.R.China

Outstanding Student Scholarship (2012, 2013 and 2014)

Top 10%, Tongji University, three consecutive academic years

Outstanding Graduation Award of Undergraduates

Top 10%, Tongji University

PROFESSIONAL SKILLS

Design Skills

- Software User Interface Design
- Graphic Design
- Human Machine Interface Design
- Product Service System Design
- Interaction Design

Engineering Skills

- iOS Development (Swift and Objective-C)
- Unity3D Development
- Arduino

Platforms and Tools

- Photoshop
- Xcode
- Infinity Designer
- Sketch
- Unity3D
- Form

Thank You

I would love to say thank you for viewing this portfolio.

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