



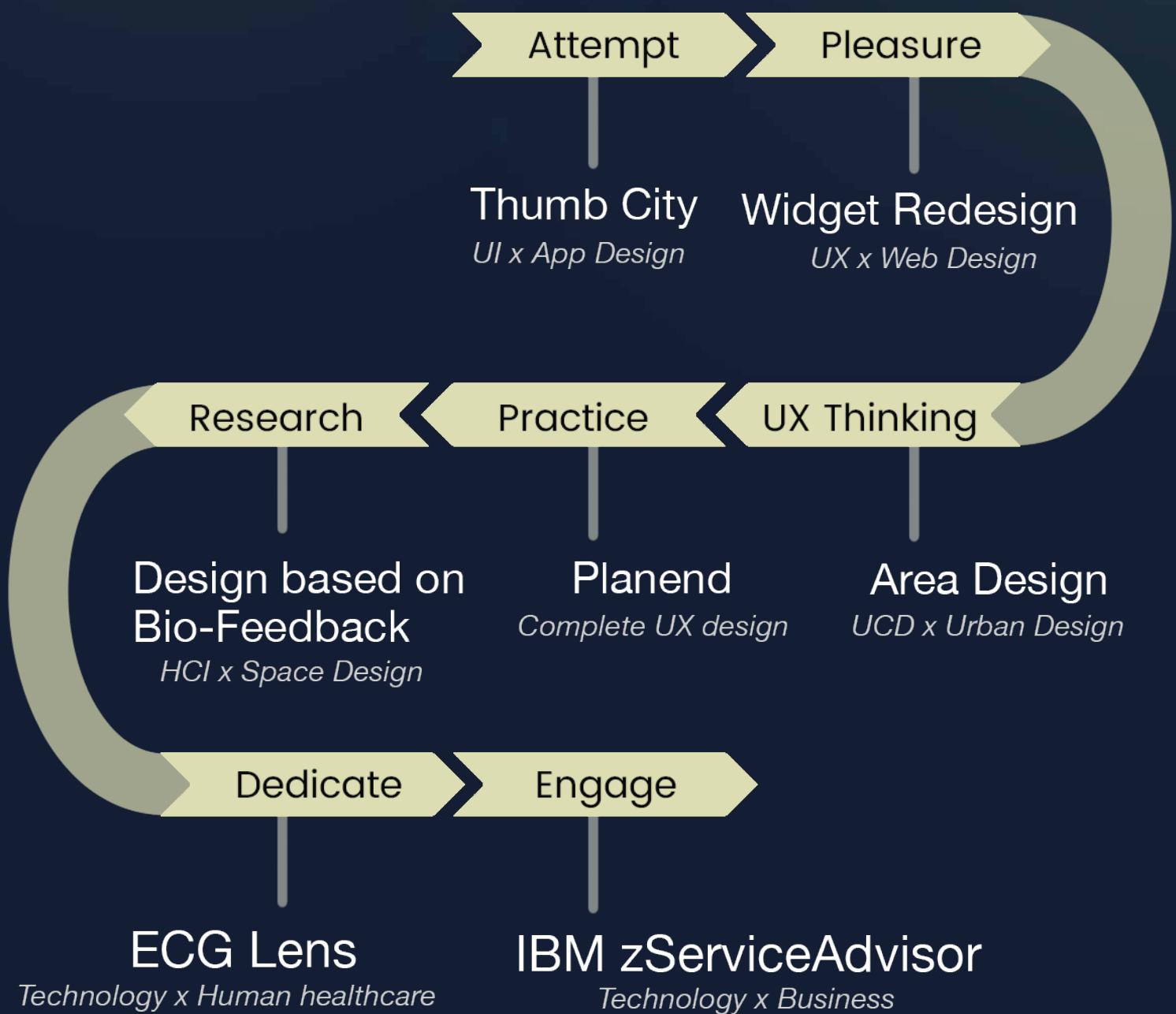
Portfolio

Yuhan Liu

Human Computer Interaction Designer

Check more: emmayuhan.github.io

Content



Technology x Human healthcare

Technology x Business

Thumb City *Startup Project*

MY ROLE
UX design

TIME
2015/10-
2015/12

WHAT I LEARNED
UI Design
Information structure



Students always find it hard to know the latest activities going on on campus. So we designed thumb city, a mobile app aiming to release activities and news on campus for students to remain better updated about college life.

Interview

We interviewed over 200 students from our school, half male half female.

- Q1 Do you have trouble searching various info about school? Describe it.
- Q2 Through what do you get information about what is going on school most?
- Q3 Why do you use this way? What's good and bad about it?

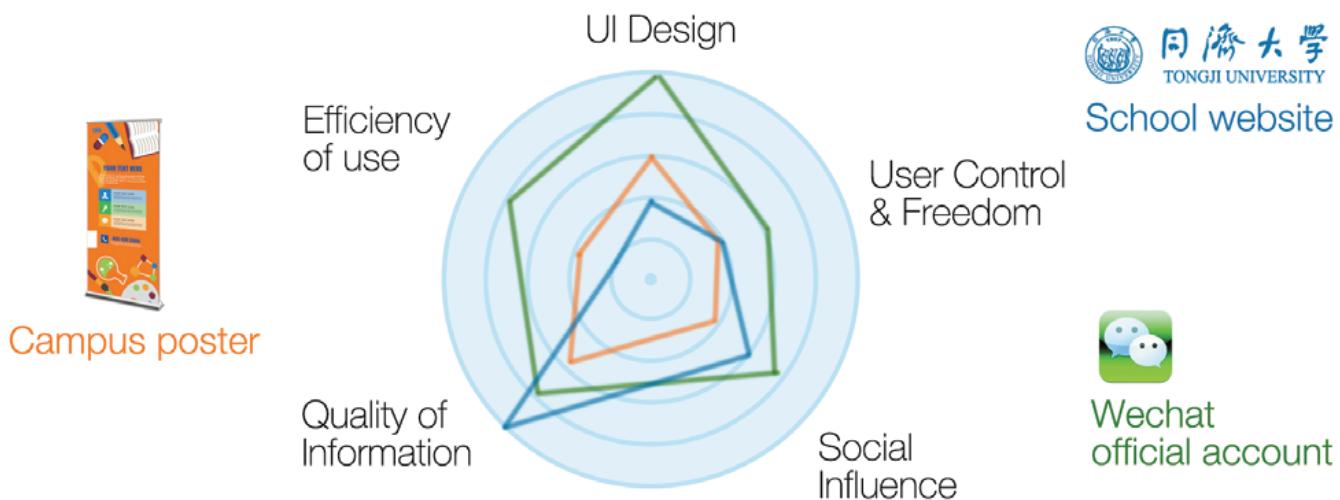
90%
of them said "We have trouble
searching various info about school"



80%
of them said "We have trouble
holding and attending to events"

Competitive Analysis

We made a radar diagram showing competitors strengths and weaknesses in five aspects. We thought **good quality of information** combines with **better user control and freedom** would be an opportunity space to step into.





Persona

Our research led us to develop the following personas which help us focus on users' needs.



Age:24
Graduate Student
Head of Board game school club

“ I want to let more people know our activities and invite them join our club! ”

Key characteristics

- A social butterfly who loves holding party
- An outgoing person who loves meeting new people

Motivations

- Need to hold activities and inform everyone more efficiently
- Make more friends



Age:18
Freshman

“ I usually don't know what fun party's going on campus but really want to join. ”

Key characteristics

- A bit shy and don't have many friends
- Studies hard and lack entertainment

Motivations

- Join parties without always having to ask around
- Need a rest from tiring study by socializing

Key Experiences

Based on the customer interviews and competitive analysis, we decided the key experiences that our product should provide.



Easy to browse and search for events

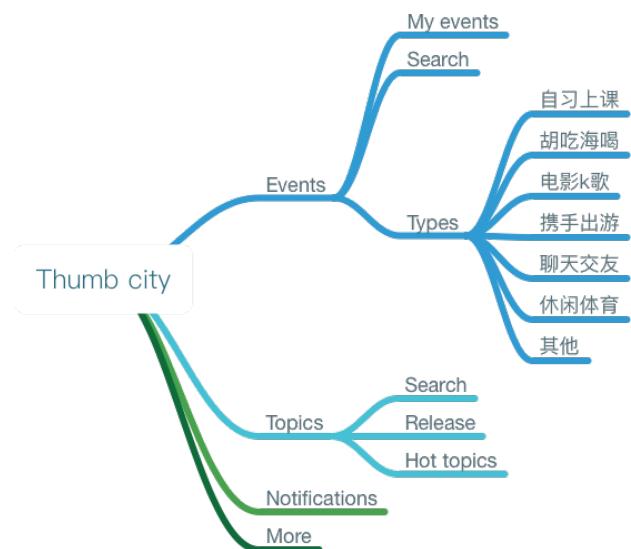


Convenient for organizers and attendants to post



Share with friends and communicate with others

Structure





UI Design

Logo: In China, we call people who use cell phone a lot ‘clan of the thumbs’. Based on this, we decided to name the app ‘thumb city’ since it needs users to tap their phones.

The logo symbolizes thumb and expresses a happy mood.

Search for events



Search



Types

Events



Main page

Attend/Hold events



Release new event
(organizer)

Attend the activity
(participants)

Release topics



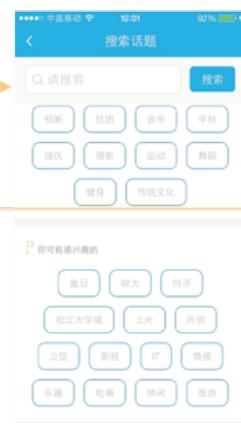
Release topic #2

Release topic #1

Topics



Search & Attend



Search for topic



Attend the topic



Reached more than 10000 users in 3 weeks

Widget Redesign

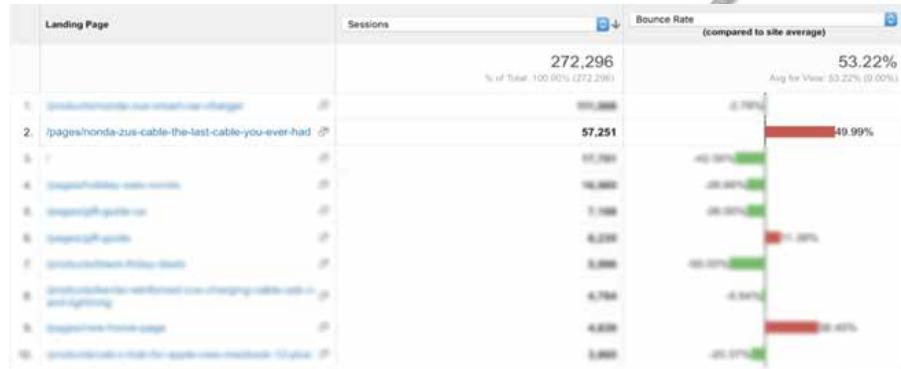
Nonda Internship Project

MY ROLE
UX design

TIME
2017/1 | 1 week

WHAT I LEARNED
UX design based on user feedback

We found it necessary to analyze and refine the purchase interface design based on the fact that the bounce rate is very high at that part.



Problem Defined

- Hard to distinguish different kinds of cables
- Too many steps to purchase

Target



- High conversion,
more business value for company
- Simple steps to purchase the product
- Clear interface

Final Design

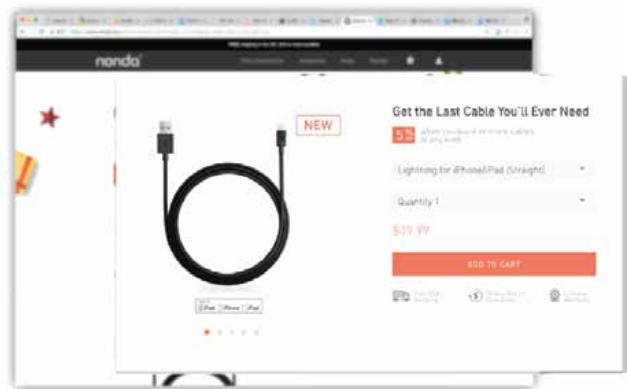


	Conversion	Landing	Add to cart	Purchase order
New design	0.836%	5384	246	45
Original	0.691%	5354	220	37

Current Features

- ▲ List menu, unclear information
- ▲ Similar pictures showing five different cables
- ▲ Old school UI design

Original Design



Iteration



I changed the menu to tab menu for clearer interface. After user testings for the first version, I added small legend to better show different kinds of cables. Then the final design is decided.

Outcome

Big progress can be seen. The redesign of purchase widget brought good result and 20.9% purchase conversion increase.

Contryside Area Design

Undergraduate Project

MY ROLE

UX research & visual design

TIME

2016/9-2016/12

WHAT I LEARNED

Research & user-centered urban design

Overview

This project is a school assignment to design a development plan for the countryside area named Shantang Village covering 37.15km² based on current situation.

User Research

We interviewed over 200 people from different departments in the Village, including governors and residents, and found three main insights.

Industry



Village Director

There's no industry other than rice agriculture
Low income.

History



Residents

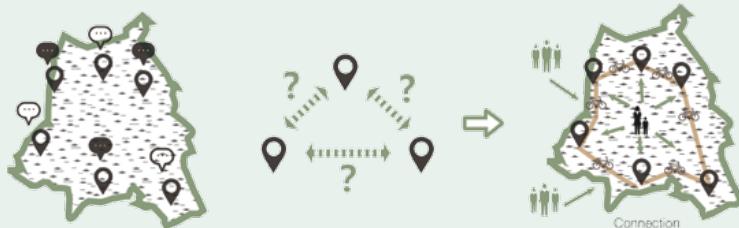
Long history along with the village
across the river but waned.

Living



Residents

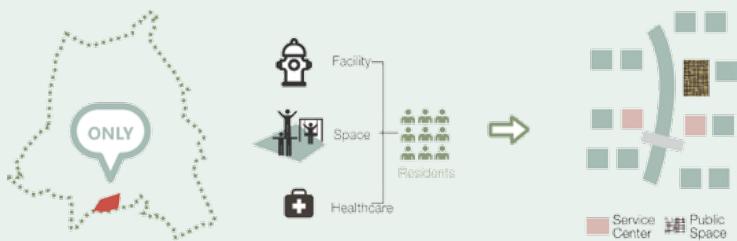
Too few public facilities
Almost no entertainment



As-is Problems

1. Scattered resources

Rich resources are scattered in the village. Without logical connection, they can hardly realize their value.



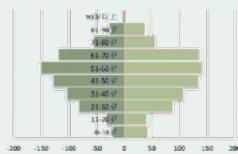
2. Lack public facilities

The only place in the village with enough public facilities is the town center.



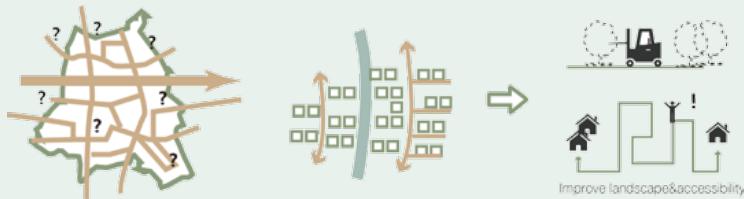
3. Low landuse efficiency

Almost no industry other than agriculture.



4. Aging population

The young go out for work, leaving the old in the area.



5. Disordered road system

Hard to conveniently reach every inch of the area. Besides, the landscape is poor and primitive.

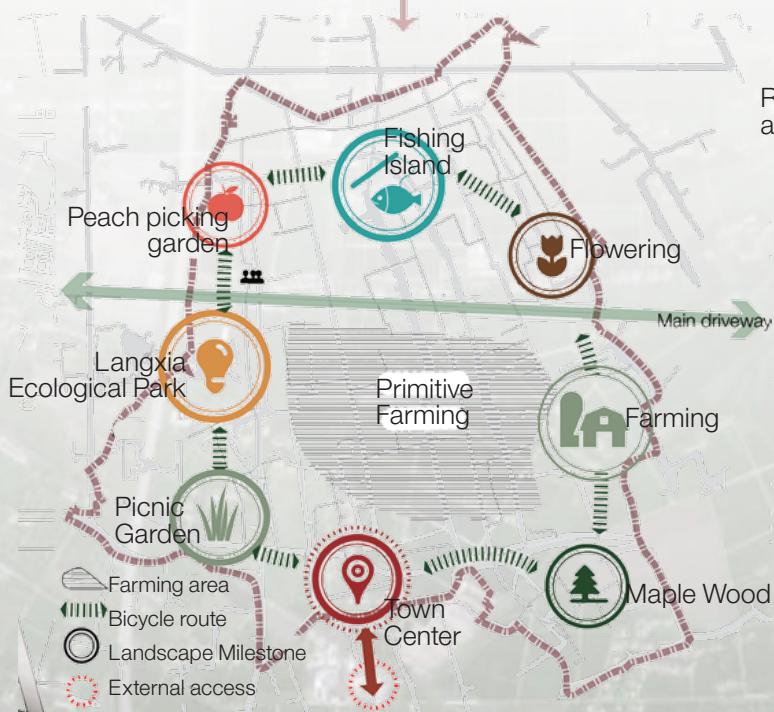


Extant resources



Goal

After research, we decided our design goal -- Take full advantage of extant resources and design a leisure tourism village with agriculture, ancient town, waterside dwelling, etc by designing an 8-milestone bicycle route connecting the village.



Revive ancient street and historic attraction

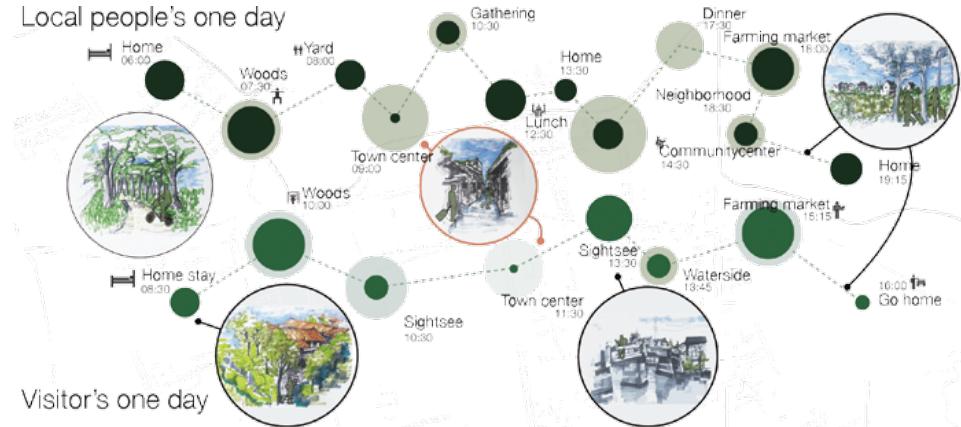
Utilize resources and develop fun farming

Reserve landscape, build good living condition



Area Master Plan

Local people's one day

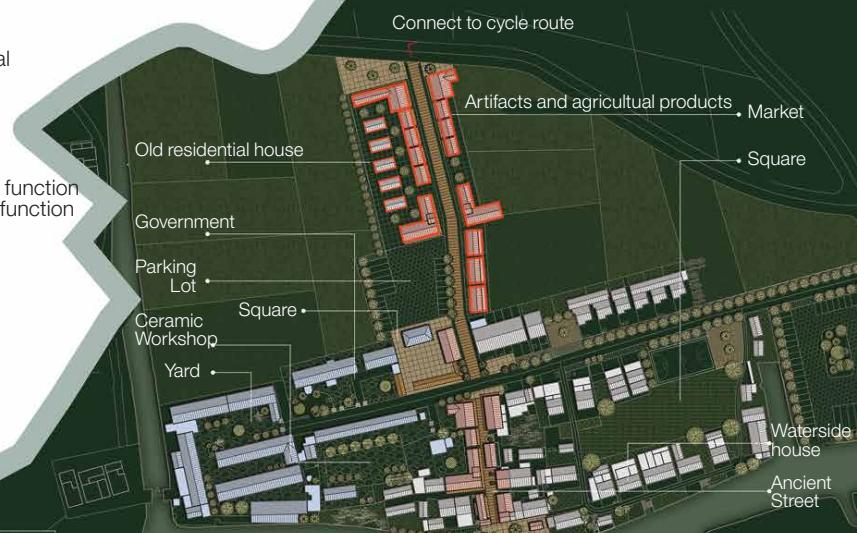
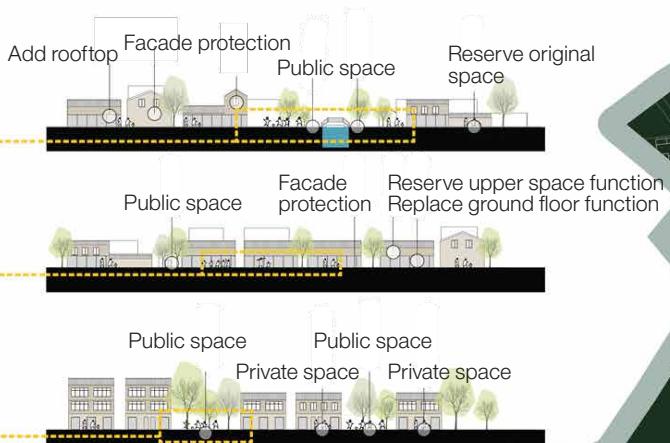


User tracking map

After discussion with over 100 local people, we devised journey maps of two groups of people for detail design.

Detail Design - Town Center

Based on user map, we designed the detail plan of one of the spots that both local people and visitors would frequently show up at, town center.



Town center renaissance



Activate the town Develop attraction at town center based on historical resources



Yard and square for more interaction

Long green pavement

Ancient bridge •



Tourism reception



Artifacts



Home stay



Agricultural market



Tea house



Resident center



Ceramic workshop

Planend

Workshop Project

MY ROLE
UX Research
& Design

TIME
2016/10-2017/1

WHAT I LEARNED
Complete UX design process



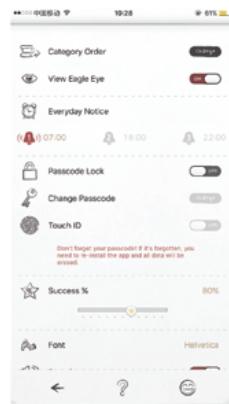
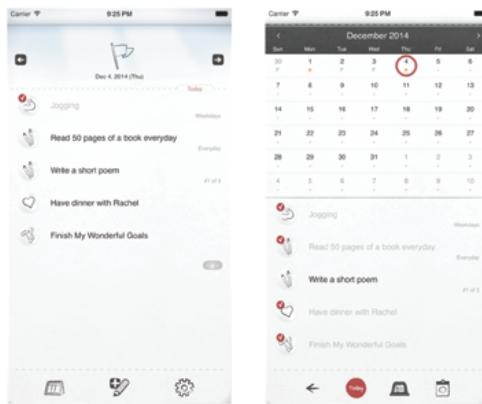
Overview

People lack stamina in carrying out their plans. We found existing countless apps in this field similar and not really useful. So we want to design a new app that can actually motivate users to fulfill their plans.

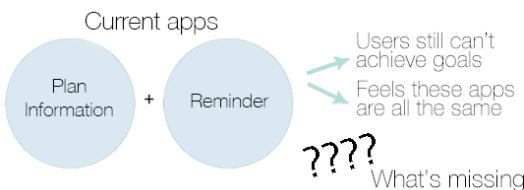


	My Wonderful Goals	Way of Life
Strategic Level- Product Orientation	Help cultivate and maintain the habit	Urge people to develop habits to live healthily
Set target	Pros: • Clear 'Add' button • Editable habit duration Cons: • No way to add description of the goal • Cannot revise the goal	Pros: • Dos & Don'ts goals Cons: • Unchangeable frequency of everyday
Structure Level- Function	Remind Pros: • At most 3 reminders a day	Pros: • Editable time and day to remind
	Record Pros: • 'Pause' button	Pros: • Clear progress bar
	Summary Pros: • Calendar interface • Label layout • Poor interface design	Pros: • Curve diagram • Label layout • Interactive navigation at the beginning • Clear interface design
Expression Level- Interaction design		

My W Goals UI



Way of Life UI



We realize that the current apps are similar and have 2 main features, focusing too much on the plan itself but forgot to motivate the user to persist.



User Research

We want to know:

WHY can't people finish their plans?



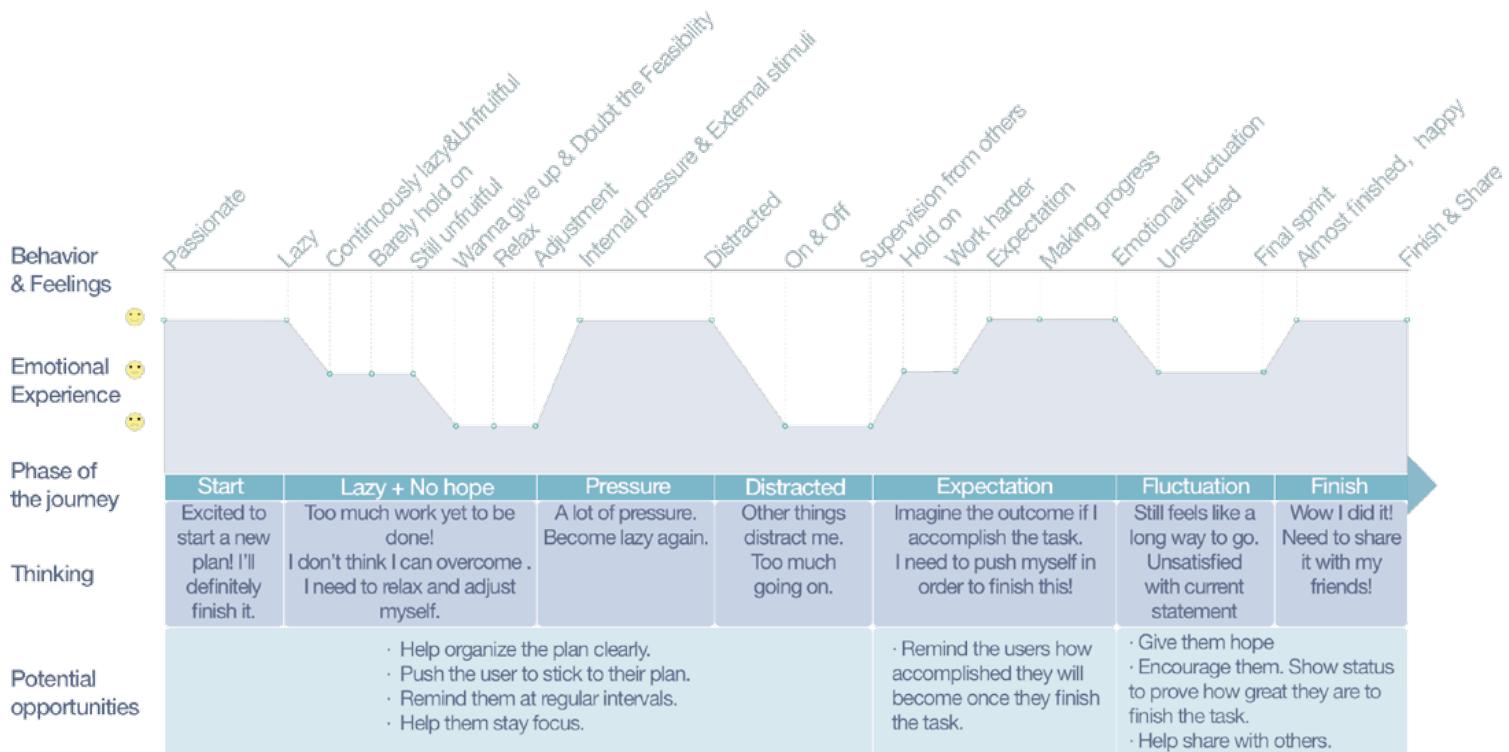
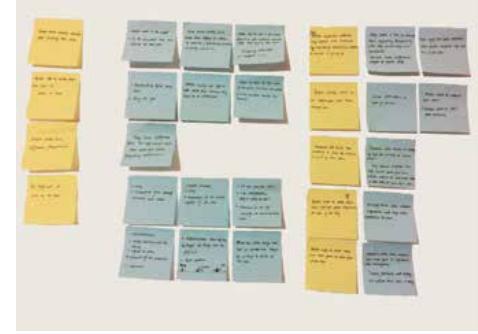
WHAT do they need to persist and finish their plans?

Research methods:

- Questionnaire survey
- Interviews

Current User Experience:

As is shown in the journey map, people who's on their way to achieving their goals often go through quite lots of struggles and up and downs. Many of them give up halfway for the emotional fluctuation. So we found several potential design opportunities.



Key Findings

In order to accomplish the plan, people need to :



Be under pressure
or supervision



Realize the value
of the plan



Set a reasonable
and detailed plan



Ideation

We brainstormed all the functions we think are suitable for this app and classify them.

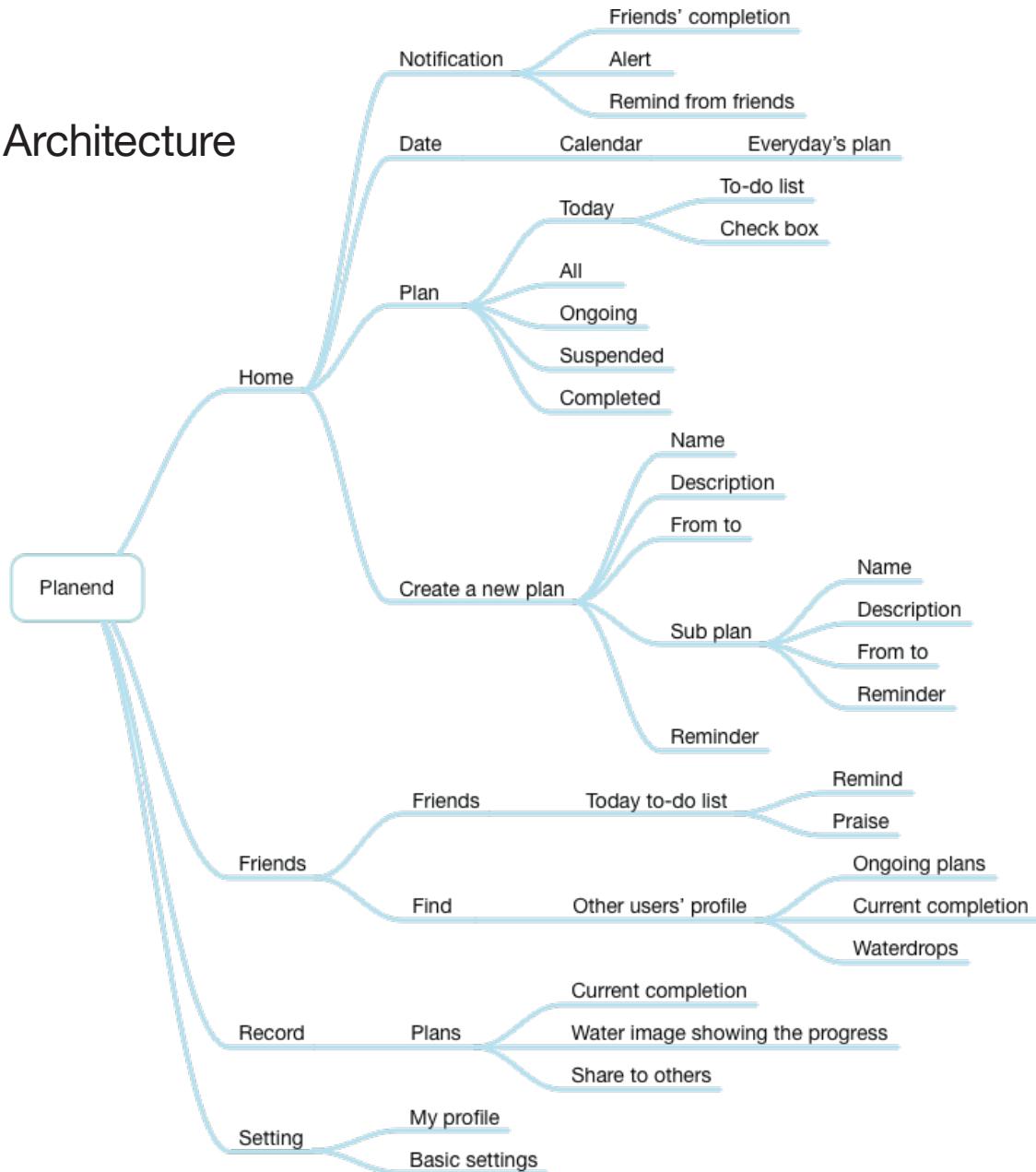
Then we chose some of them to be core features of our app.



Core Features

- 1 Have plan friends
- 2 Incentives & Punishments
- 3 Decompose the plan
- 4 Record, show status

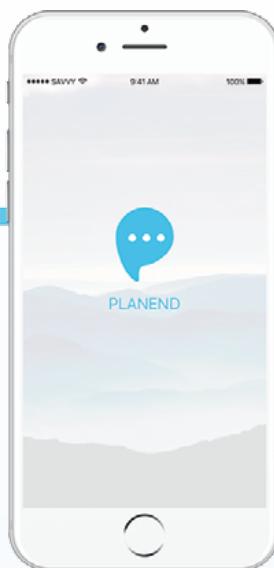
Information Architecture





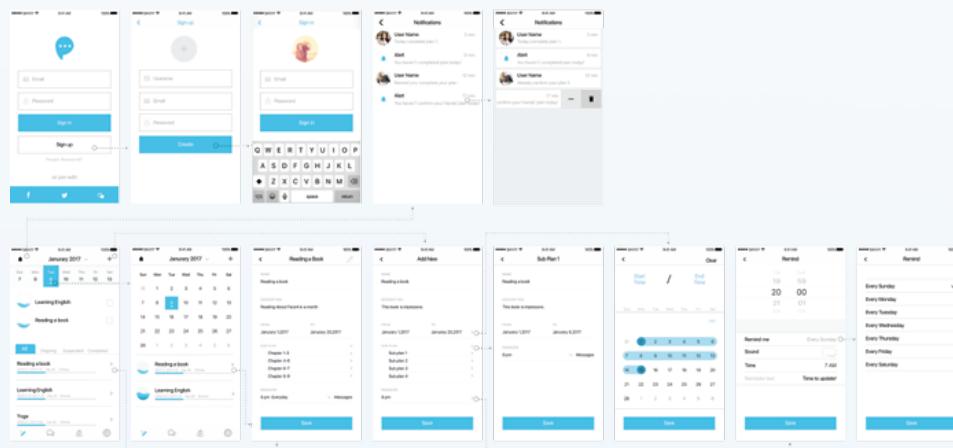
Final Design

Make plan end



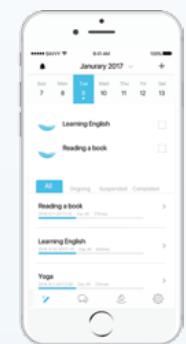
With plan friend

Wireframe

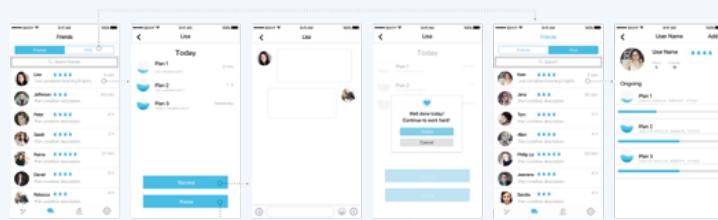
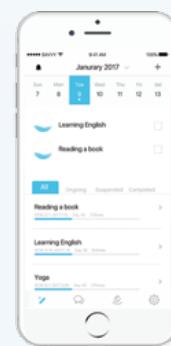


After two rounds of usability test, we decided the final interface design.

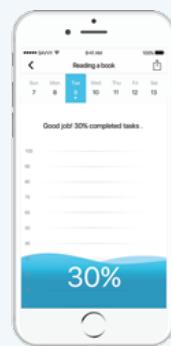
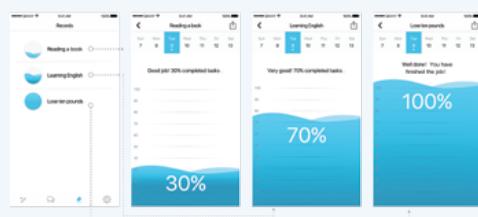
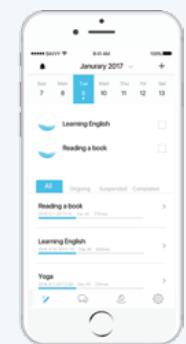
Home:
Calendar
To-do list
Plan list



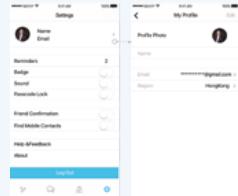
New Plan:
Create sub plans
that motivates users



Plan Friends:
Check their plan
completion
Water drops as
overall completion



Record:
Water shows the state-
ment vividly
Praise and encourage-
ment



Built Environment Experience Assessment and Design via Bio-Feedback

Research Project, NSFC

MY ROLE

Research assistant

TIME

2017/3-2017/8

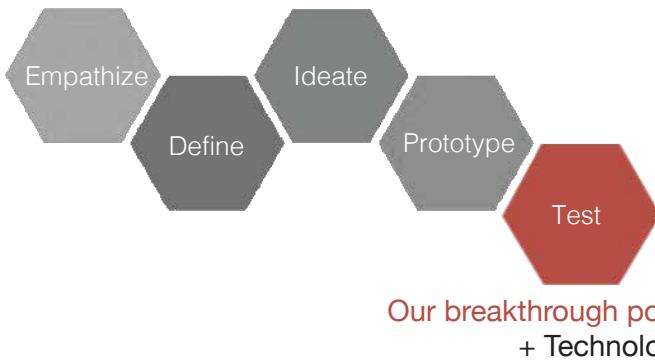
WHAT I LEARNED

Experient thinking

Design based on human factor

Overview

In this research, we introduce a new technique, affective mapping assessment based on bio feedback, which can be used on environment experience evaluation and lead us to the right design strategy.



Design Thinking Process
Reveals the deficiency of environment space design: it lacks technical approach and user testing.



(1) EKG, (2) EEG, (3) facial EMG, (4) skin conductance and skin temperature, (5) respiration. Each biosensor transmits its measurements to an "on-board" recording device (6), which again is linked to an ordinary laptop or computer.

Objective



Outdoor environment measurement



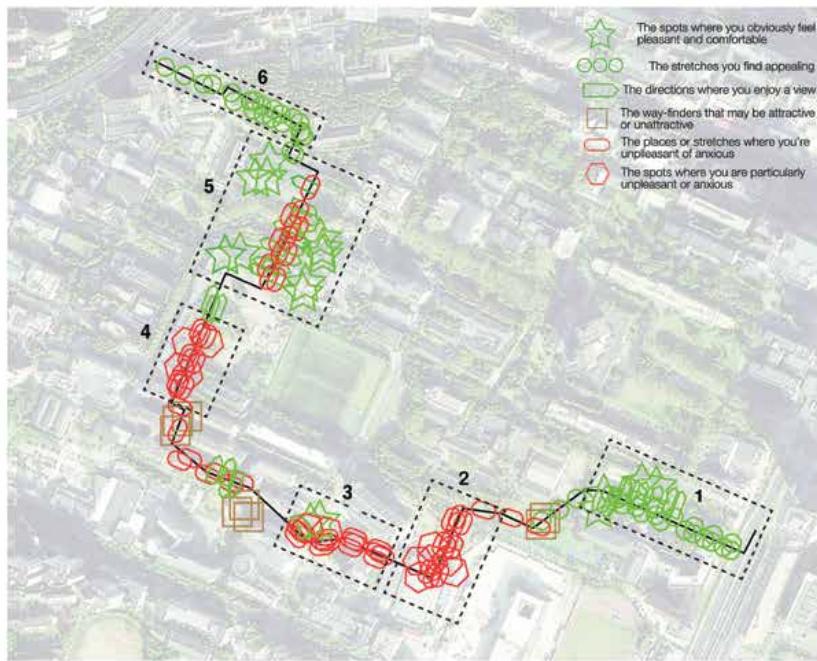
- 1 Small street with trees between playgrounds
- 2 Small footpath through green space with monument
- 3 Footpath between tall building and parking lots
- 4 Major road crossing, medium traffic
- 5 Sino-German campus plaza with wide open spaces between buildings
- 6 Dormitory buildings alley
- 7 Street through green space
- 8 Small alley along dorms and green spaces

The participants were asked to take a fifteen-minute walk across Tongji University campus in Shanghai with the experiment instruments.

Phenomenological Interview

After interview to the participants, the following map can be drawn to present the general emotional distributions. We can see 6 makeable zones on the map. The pleasant emotions mainly distribute in zone 1, 5, and 6, whereas people felt unpleasant in zone 2, 3, 4.

Phenomenological Interview



" Wow! The experiment is on! I'm so excited. What will people think about my equipment? It's very funny. Look! There're so many guys playing sports! I feel energetic!



" There're so many guys playing basketball over there. They're energetic and I want to join them and play with them.

" The buildings stand like a high wall which makes the space a bit crowded and I feel uncomfortable. Eww that's terrible!



" After the rain the fallen leaves scattered on the ground and there're so many water pools and even trash. What a mess!



" The traffic is so heavy and I really need to be careful.
" I'm going to cross the road and I feel a little nervous.



" On my left side is the girls' dorm. The trees far away from me hide the end of the road.
" It's near the Southwest Lawn, there must be many people. I hope that they don't notice that weird guy with the awkward equipment.



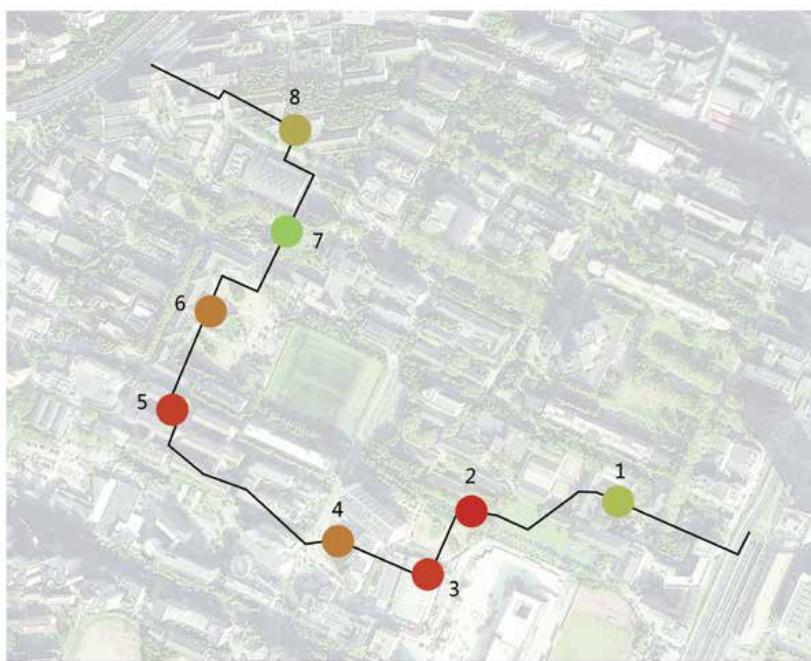
" The southwest lawn always make me feel peaceful. I'm glad to walk through there.



" Almost destination! This journey is about to end.

Psychological Scales

Based on the grades the participants scored, a map has been drawn to show the assessment of the 8 spots. Red for arousal and green for valence, the higher the grades are, the deeper the color is.



The map indicates that in Spot 1, 7 and 8 the grades of both arousal and valence are high, which means those spots brought mainly positive influence on the participants' emotion.

2, 5 don't cause clear changes in mood. Other spots are all higher in arousal than valence which means they bring negative stimuli.

	Arousal					
	Participant 1	Participant 2	Participant 3	Participant 4	Average	
Spot 1	8	6	6	7	6.75	
Spot 2	3	3	2	3	2.75	
Spot 3	6	7	6	6	6	
Spot 4	9	9	8	9	8.75	
Spot 5	3	4	4	4	3.75	
Spot 6	5	7	6	7	6.5	
Spot 7	8	7	7	8	7.5	
Spot 8	7	6	5	6	6	
Valence						Product
	Participant 1	Participant 2	Participant 3	Participant 4	Average	(Arousal+Valence)
Spot 1	7	5	6	7	6	40.5
Spot 2	3	3	2	3	2.75	7.56
Spot 3	1	2	3	2	2	12
Spot 4	3	4	3	2	3	26.25
Spot 5	4	3	2	3	3	11.25
Spot 6	5	4	3	4	4	26
Spot 7	8	7	7	9	7.75	58.12
Spot 8	5	7	6	5	5.75	34.5

Bio-sensory measures

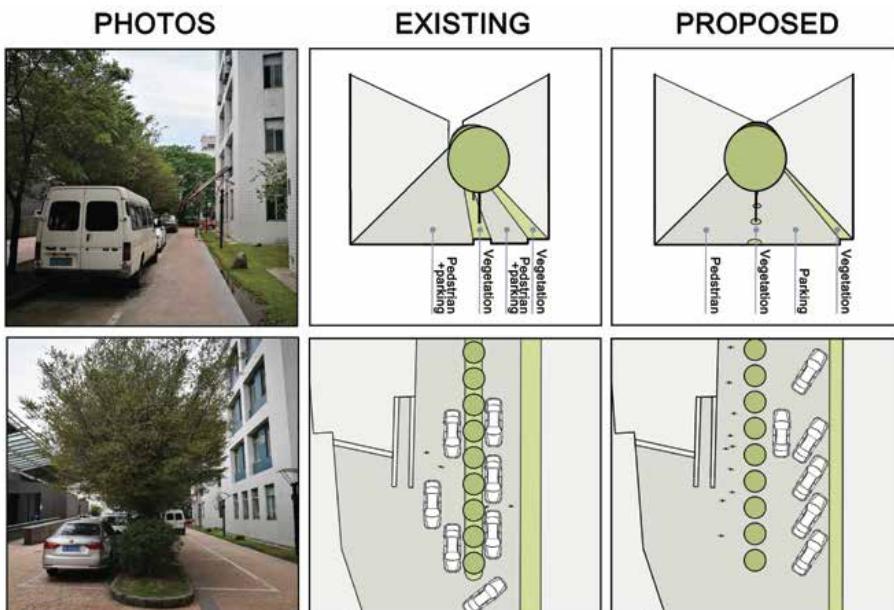
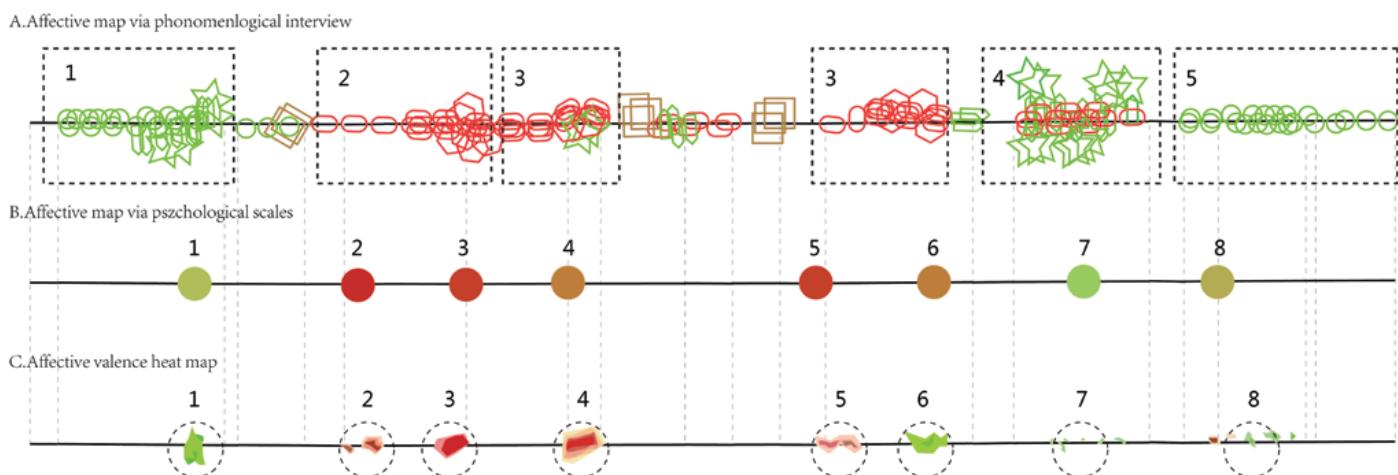
After thorough analysis of the usable datasets of each walk, they were depicted via the time- and GPS-stamp in a GIS-based heat map. Unpleasant emotions show comparably higher magnitudes than pleasant ones.

Tension Spot	Reason
3 4	Bad environment design, narrow space Heavy traffic
Relaxing Spot	Reason
6.7	People's activity and interaction



Comparison & Result

The comparison among the bio-sensory and the two traditional interview methods indicated that this new developed method is to some degree valid. This new method can reveal participants' emotional reaction to the environmental design effectively.



Design Suggestion

Based on our new method, we can come up with certain design suggestion to improve current user experience.

We redesigned Spot 3. We organized the space of pedestrian and parking by moving the trees toward the building, so pedestrian and cars won't interfere with each other.

Released article

Built-Environment Experience Assessment and Design via Bio-Feedback

Zheng Chen, Sebastian Shultz, Yuhua Liu, Ling Yang

Time Architure 2017-9

Article number:

1005-684X(2017)05-0024-005

Abstract:

Wearable sensors, artificial intelligence, and internet of things are changing the interactions of us and future generations with our environment and others profoundly, and thus offering new opportunities and challenges for built environment design. This paper introduces a new quantification technical approach, affective mapping based on biological feedbacks. This technique uses mobile bio-feedback sensors such as skin conductance, electroencephalogram(EEG), electrocardiogram(EKG), facial expression muscle electromyography(EMG), skin temperature, respiration, supported with geological position service(GPS) via satellite and Wi-Fi, to measure and assess environmental experience outdoors and indoors. The technique facilitates identifying environmental stimuli which trigger positive and negative affection, and then lead to design renewal strategies.

Key words:

Experience computing, Human factor design, Multi-sensory experience, Affective mapping, Built environment



MY ROLE
Research & Design

TIME
2017/6-2017/9

WHAT I LEARNED
Healthcare system & research methods
unity of technology and design

Problem

In China, there are 280 million patients with heart diseases, death rate caused by heart diseases is the highest. Total hospitalization expenses reach 90.9 billion CNY in 2015.



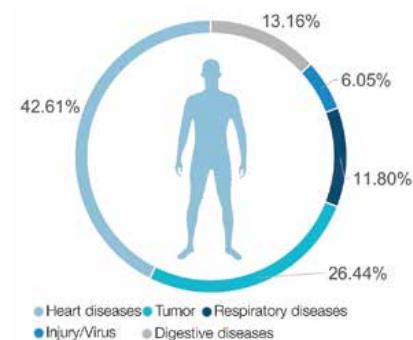
Patients are unable to provide first hand data of heart attack when seeing a doctor



Non-expert patients don't really understand the situation



Too many patients while not enough doctors



Solution

This smart app, ECG Lens connecting single-lead ECG detection devices for non-expert patients with heart diseases, offers real-time ECG detection, basic intuitive judgement and report based on artificial intelligence.



Accuracy

Disease prognosis based on artificial intelligence API



Convenience

Customized 24/7 heart disease detection at home



Safety

Early warning for patients

Competitor

Our product will fill the market gap in existing ECG products with its technology and good user experience.



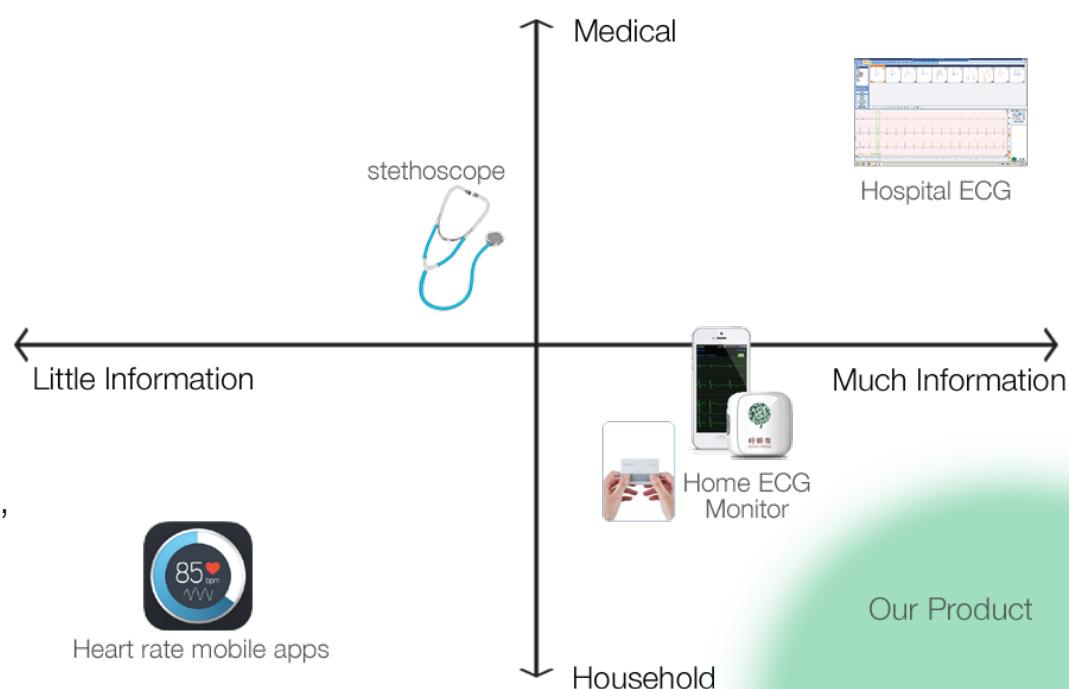
Heart Rate Apps
Real-time monitoring
heart rate only
Trends

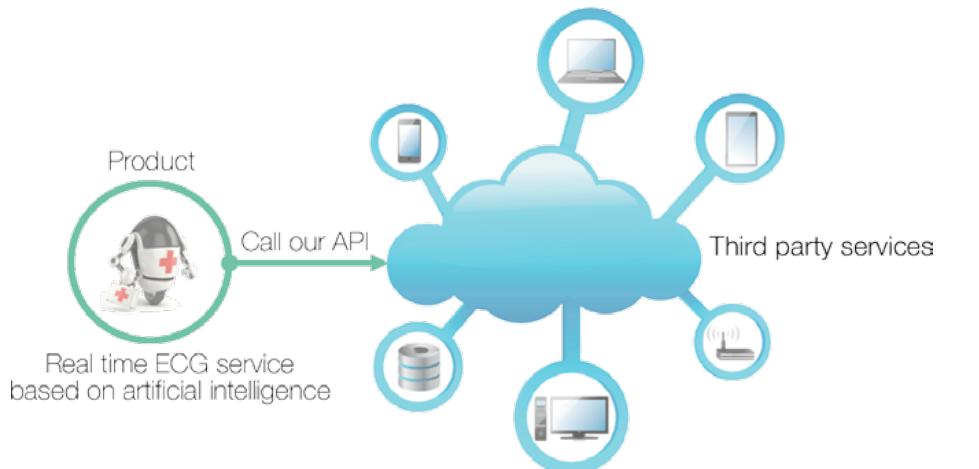


Home ECG 'Friend'
Single-lead ECG
No intuitive report
Hard to understand



Home ECG 'Handheld'
Smart hardware
Share to others
Hard to understand





Normal equipments

Offer more accurate information on phone or iwatch

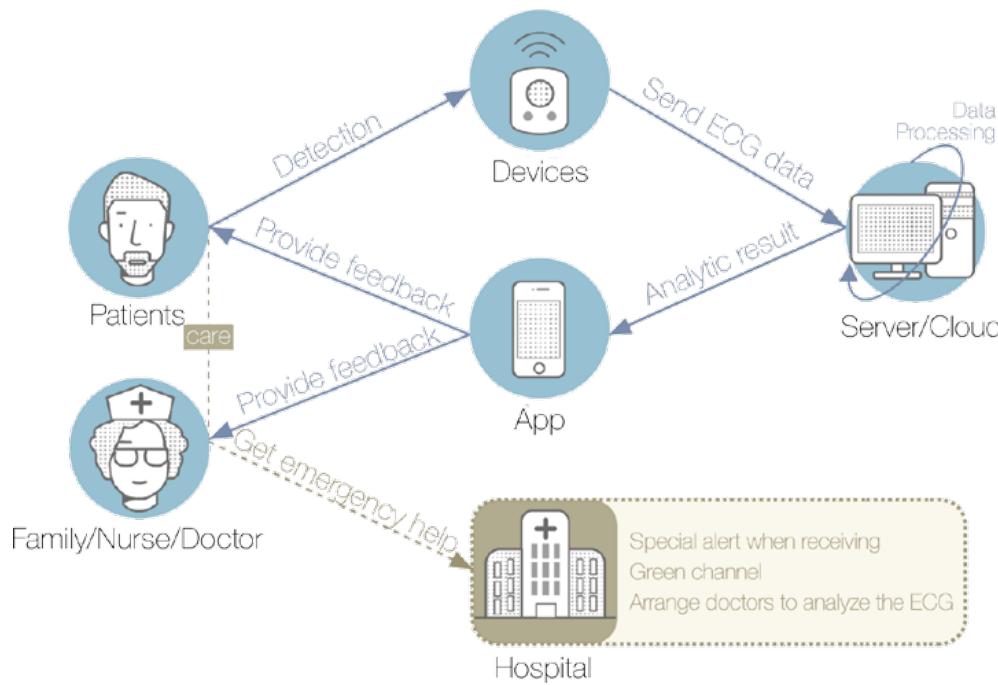
Home used ECG devices

Help people make correct judgement



Professional devices

Help reduce doctors' workload



Smart API

Our API based on artificial intelligence can quickly define several heart diseases from the ECG.

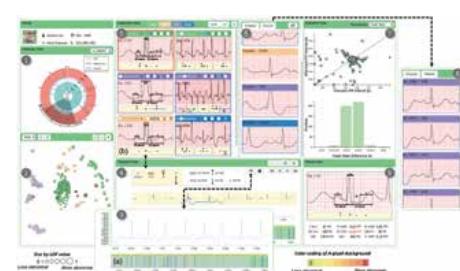
Business Model

- Artificially intelligent ECG Prognosis API combined with data visualization

Every time a third-party service uses our ECG Prognosis API, we will charge it for one RMB, and we will also offer monthly and yearly service.

- A smart app for patients with heart diseases

Our product is easy to operate with adequate insights for regular people utilizing data visualization and technology.



Algorithm validation system prototype

Data Visualization

I designed the unique visualization in the app to ensure it is user-friendly.

- ECG Visual

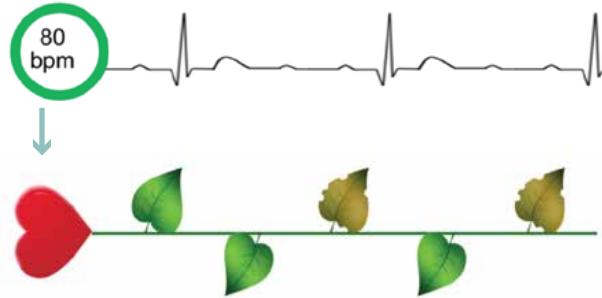
1  = 1 Heart Beat

 Normal beat

 Atrial premature beat

 Ventricular premature beat

 Atrial fibrillation and flutter



- Weekly Trend Visual



7 tree branches show
7 day ECG records

Persona



Aaron

Gender: Male

Age: 58

Occupation: College Professor

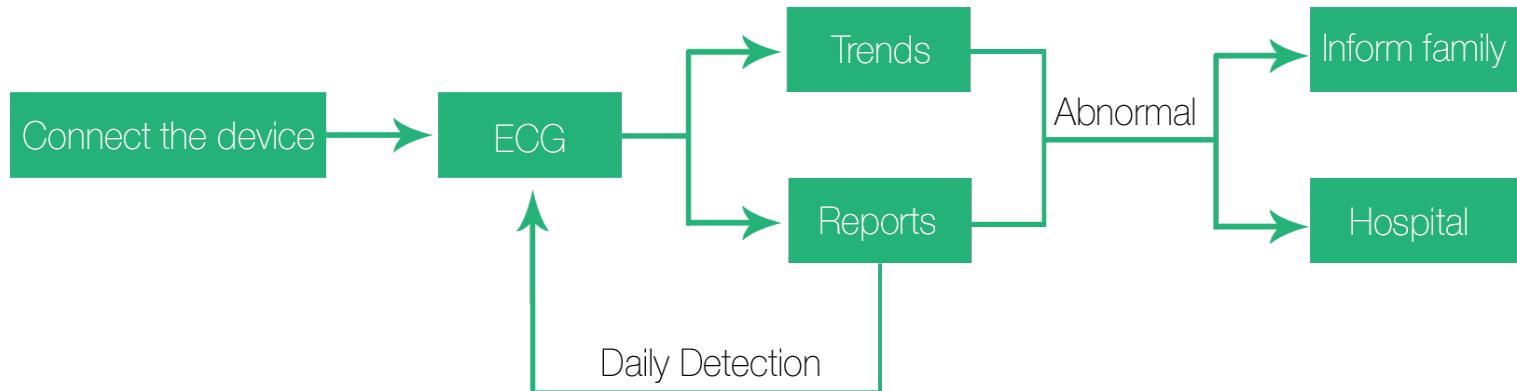
Health: Chronic heart disease
- Atrial fibrillation

Pain Points:

- Frequently visiting the hospital for ECG detection is tiring and the results remains the same
- Unable to understand the ECG detected by home portable devices

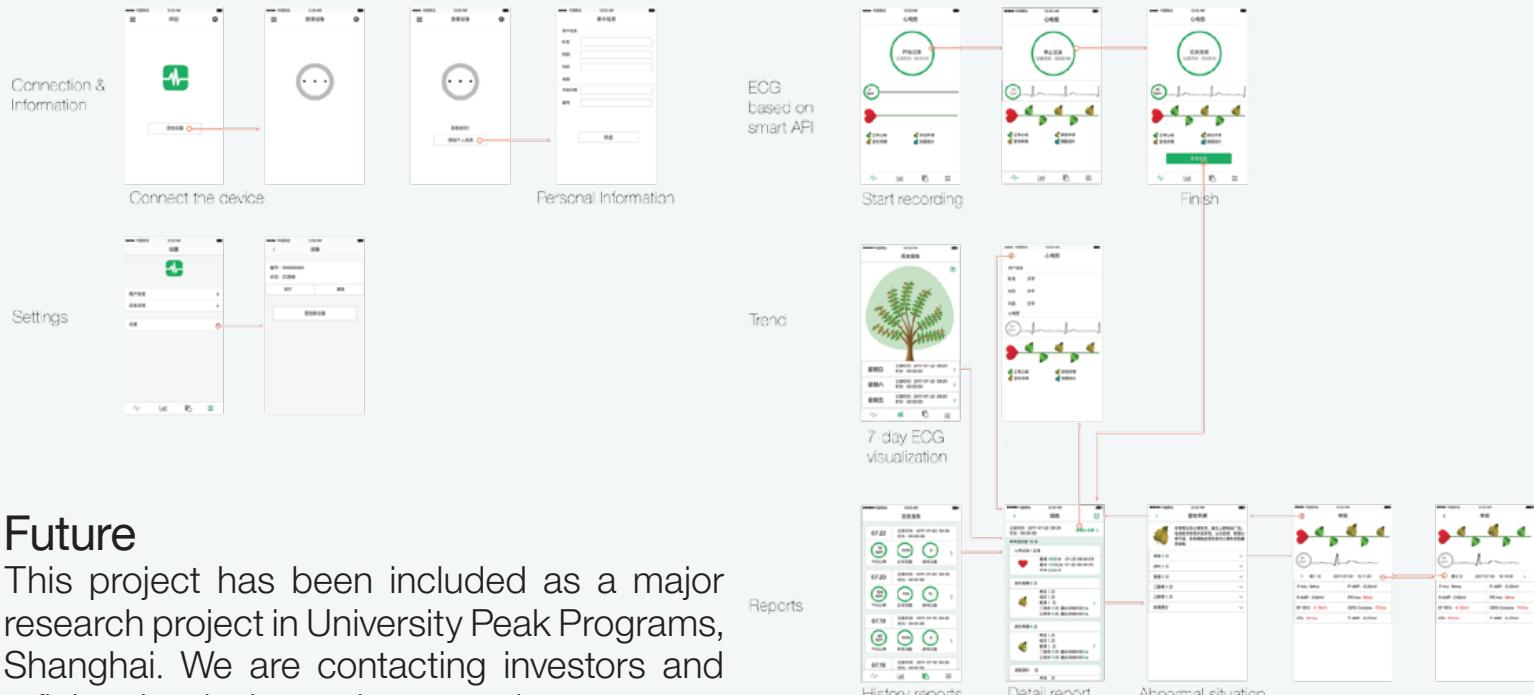
Goals: I want to detect ECG regularly at home since it's a chronic disease, and get a basic report that I can understand.

User Flow



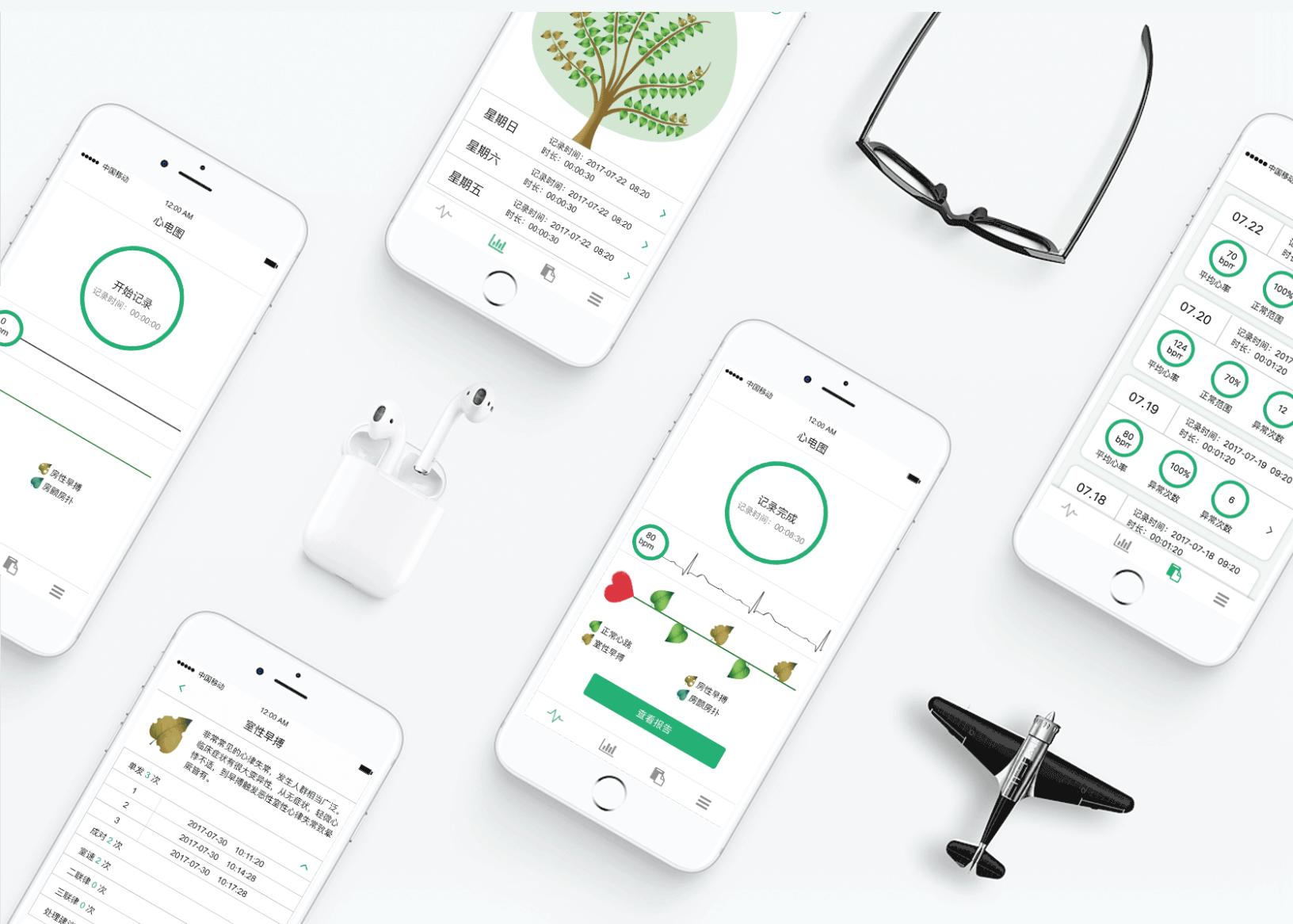


Wireframe



Future

This project has been included as a major research project in University Peak Programs, Shanghai. We are contacting investors and refining the design at the same time.



IBM zServiceAdvisor

IBM Internship

MY ROLE
UX Design

TIME
2017/10-2017/12



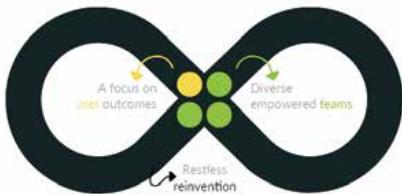
IBM Studios

WHAT I LEARNED

How a real-life client-centered business project works

The Loop

Understand the present and envision the future in a continuous cycle of observing, reflecting, and making.



Observe
Drive business by helping users achieve their goals.

Reflect
Stay essential by treating everything as a prototype.

Make
Move faster by empowering diverse teams to act.

IBM Design Thinking

IBM Design Thinking is a human-centered framework to solve users' problems at the speed and scale of the modern digital enterprise.

What is zServiceAdvisor

The IBM z Service Advisor mobile App is a smart z Systems software maintenance solution with a mobile App client. This app assists administrators of zSystems software to easily access z Service information from IBM.

(IBM z System: a information management smart system for cognitive business)

This is a side project of my internship.

Due to a confidentiality clause, I cannot show the main product, IT Operation Automation I worked on, which is a data management system.

The Key

Lead teams to great user outcomes using scalable framework for team alignment.

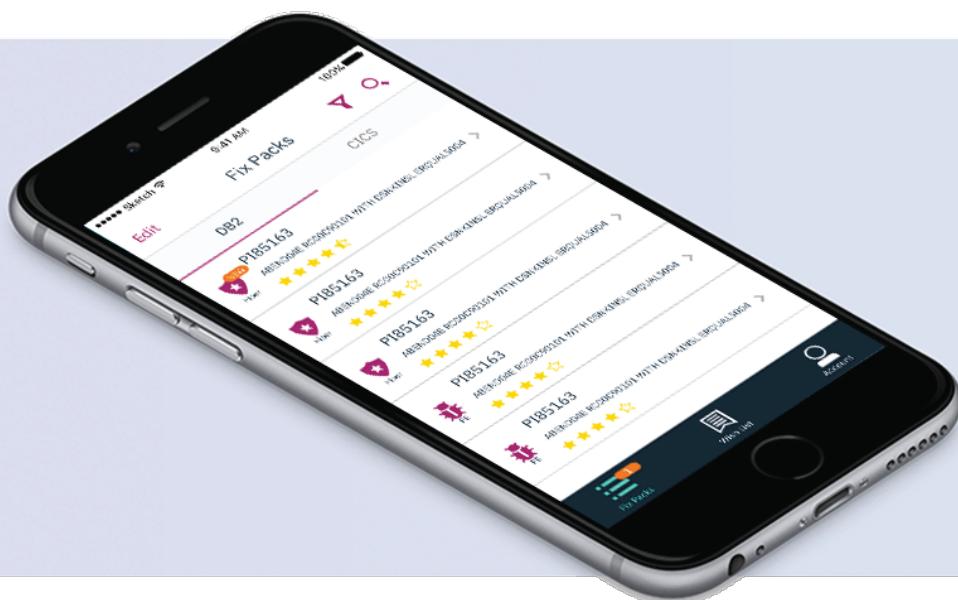
Invest for market outcomes

Hills
Focus your project on big problems and outcomes for users not just a list of feature requests



Envision the user experiences
Sponsor Users

Help you design experiences for real target users rather than imagined needs



Targeted Audience

- IT Operations/ System Administrators
- Operations Manager/ IT Senior Manager



Linda

IBM z systems operation manager from a global bank

As an operation manager in a global bank, Linda's role is to manage system z. Her daily work is operating the system to ensure its maintenance. When she's out of office, she always needs to access the system administration easily.

Goals

Making sure system is up and running

Keeping infrastructure at a healthy spot

Making sure upgrading fixpack does not break apps

Behaviors

Installing new software releases and system upgrades

Evaluating and installing patches

Resolving software related problems

Current Problems

1

Customers spend huge effort trying to achieve optimum maintenance on mainframe software

- Otherwise the cost is very high
e.g. a China bank experienced half day outage due to missing an HIPER fix pack

2

Understand the impact of each fix packs is difficult for customers

- Some customer pay near 1M US\$ to IBM for the fix packs review service
Every maintenance level is most likely unique to the customer and environment

3

Mainframe software maintenance and package building is a long slow process

- Manual intensive process for the most part

4

The skills are diminishing in the market

Objective



Access to z system service information from IBM

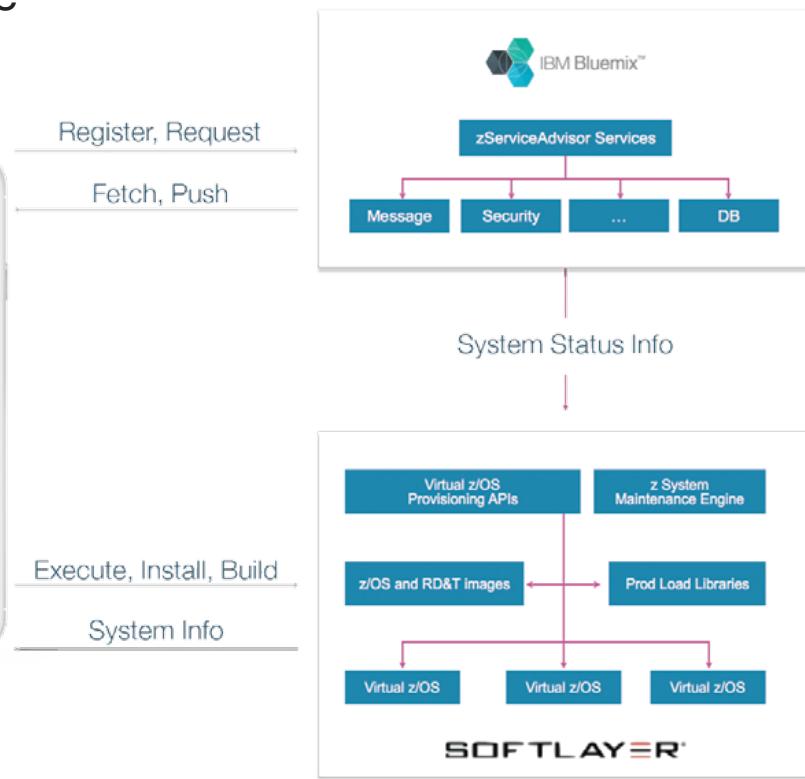
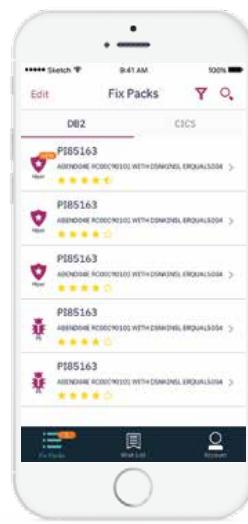


Understand the status/risk of customer systems



Maintain customer systems wisely to minimize the risk of system outage

Architecture



Advantages

1 Prebuilt levels with one touch

- Cloud based download
- Maintenance is pre-built and pre-checked
HOLDDATA processed/filtered and collated as a single PDF file
RSU(Rocommended Service Upgrade) level
HIPERs+PEs
SAP levels
Ability to generate custom levels
- Download popular levels running at other sites
Safety in numbers
Crowd testing



2 Fix Packs

- Push latest fix packs for urgent maintenance

Alert

HIPERs

PEs

two main system fix packs

Business Benefits

Save the resources and cost spent on manually reviewing fix packs to keep the system on a healthy state

Reduce the risk of outage or business impact because of unable to install critical patches in a timely manner

Save the resources on performing the system maintenance.



3 HIPERs/PEs

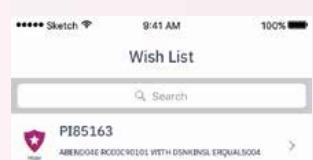
- Answer to the users' question
‘Which HIPERs do I apply?
Is this a bad one?
What is the trigger?
Do I use the function?
Have I already hit this problem?
Is a local bypass available?
Have a lot of customers hit this problem?

- Rating missing HIPERs

Analytics to define current real time risk of HIPER

- Number of customers actually hitting the issue
- Rated assessment by technical experts

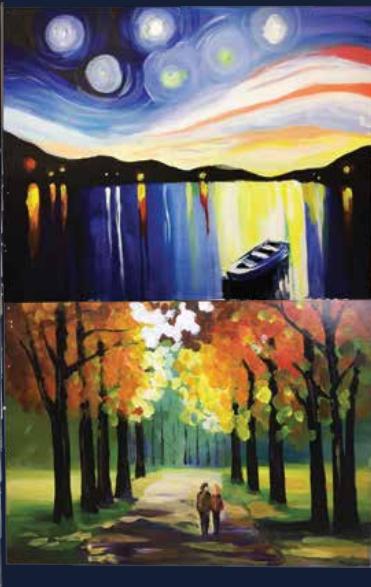
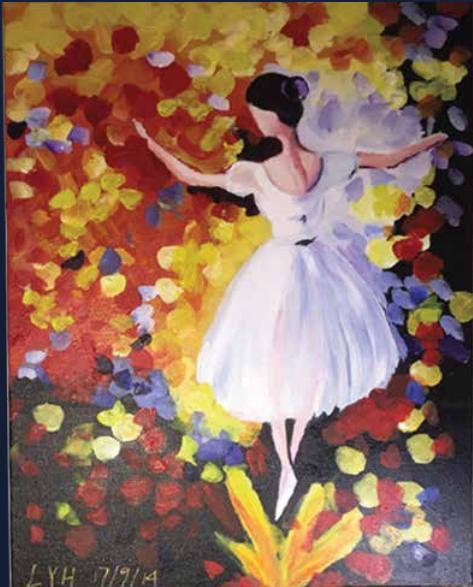
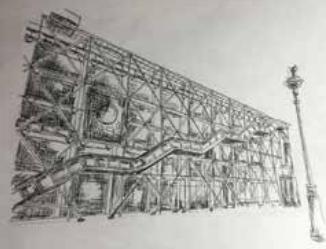
Ability to filter HIPERs by impact/rating



4 Wish List

- Add the suitable fix packs to wish list
For later use on z system
Pick the HIPERs or PEs that are important to users

Other Works...



Thanks for viewing my portfolio!
If you want more details, please visit my website:
emmayuhan.github.io

