



# Smart System for Beekeeping in China

Service & Interaction Design

This project presents a smart app and hive design to boost beekeeping efficiency. The app monitors hive conditions, analyzes data, and provides reminders, complemented by a knowledge base and community features. The modular hive includes sensors for smart control and environmental adaptation, built with eco-friendly, durable materials. Together, they drive the beekeeping industry towards intelligence and efficiency.

# BACKGROUND

## News events



The news "Sichuan bee farmer hangs himself in tents" caused a social sensation.

## Investigation by police

Beekeeper hangs himself because a large number of bees died. The cause of death of bees is poisoning caused by overdose of drugs.



## Current status



1. difficult to find honey source
2. difficult to hold bee keeping conference
3. difficulty in selling bee products



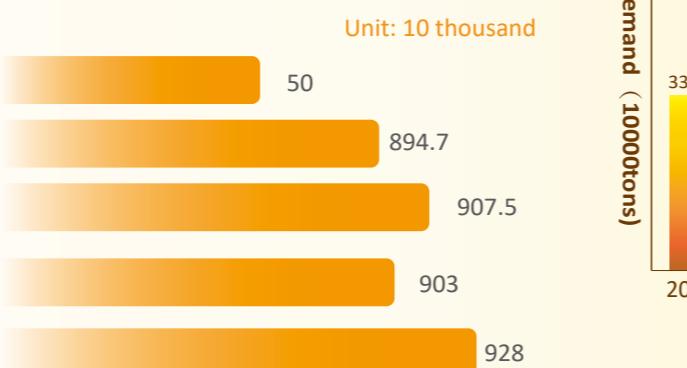
## Inspiration

In view of the current plight of beekeeping, I hope to design a system to serve bee farmers .

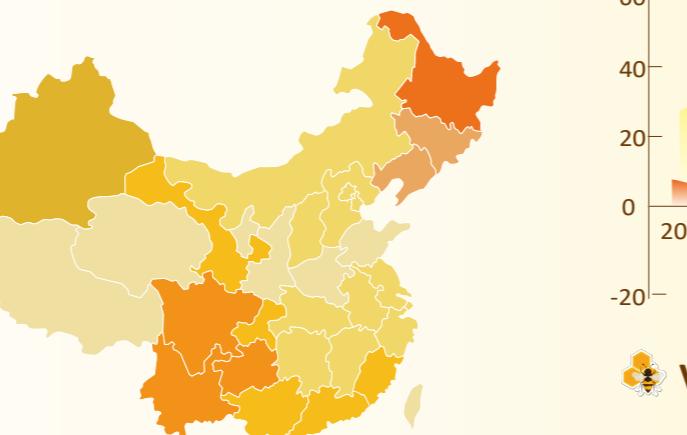
# DESK RESEARCH

## Chinese bee colony

Number of bee colonies keep on rising in China

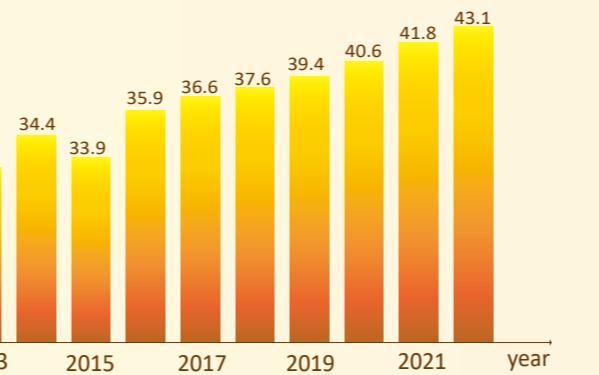


Distribution of Chinese bee colony

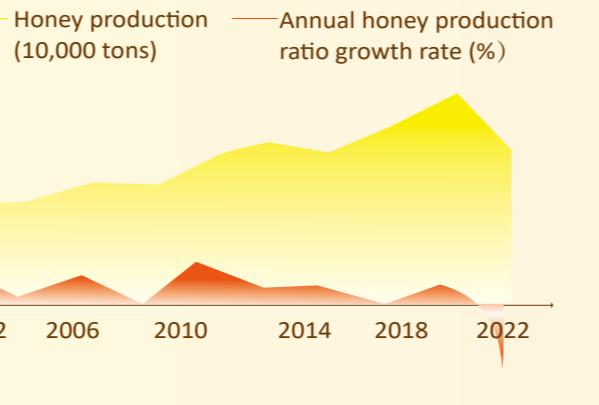


- Italian bee
- Chinese bee
- Xinjiang black bee
- Northeast Black Bee
- Yellow Horned Vespa
- Caucasian bee

## Demand for honey



## Production of honey



## Value of honey

Honey and royal jelly produced by bees are nutritional

Beeswax and Propolis are raw materials for light industry

Bees pollinate crops, increasing yields several to 20 times

## Status quo of beekeeping in China



There are more than 300000 beekeepers in China.



Bees are mainly kept by family workshops, and they rarely use new equipment for scientific beekeeping.



Chinese beekeepers are lack of awareness of bee pollination to increase yields.



The organizational structure of beekeepers is low and decentralized.



The backwardness of beekeeping equipment restricts the development of beekeeping.

## Beekeepers' dilemma

At present, fruits and vegetables in many areas mainly rely on bees for pollination, and failure to go to bee farms will delay spring propagation.

No money to buy feed.

If the flowering period is missed, sugar can still maintain the life of adult bees. However, due to the lack of pollen, the young bees have been stunted.

The transfer of the colony and the release of bees to collect honey are greatly affected.

## Cooperation between beekeepers and farmers

Beekeeping is often misunderstood as primarily for honey and other products, rather than its crucial role in crop pollination, leading to limited development in China. In contrast, the United States sees rapid growth in using bees for crop pollination, benefiting agricultural yields and quality.

# PERSONA

## Target user: Xiaowei



Hive: 50 Number of Bee: 125000  
Type of bee: Italian bee  
Work route: Hunan-Henan-Shanxi

Xiaowei  
Age: 29  
Address: Hunan, China  
Hobby: playing mobile game; read books

## Work route



# INTERVIEW

## 1. What are your skills to see how bees eat and whether there are diseases and pests?

The **voice** of bees returning from collecting honey is **low**, and the voice of bees going out to collect honey is **short and light**.

Observe whether the **head** can move freely; Observe whether the **wings and feet** are complete; Observe whether the **back and abdomen** are covered with villi and the **abdominal segments** contract regularly.

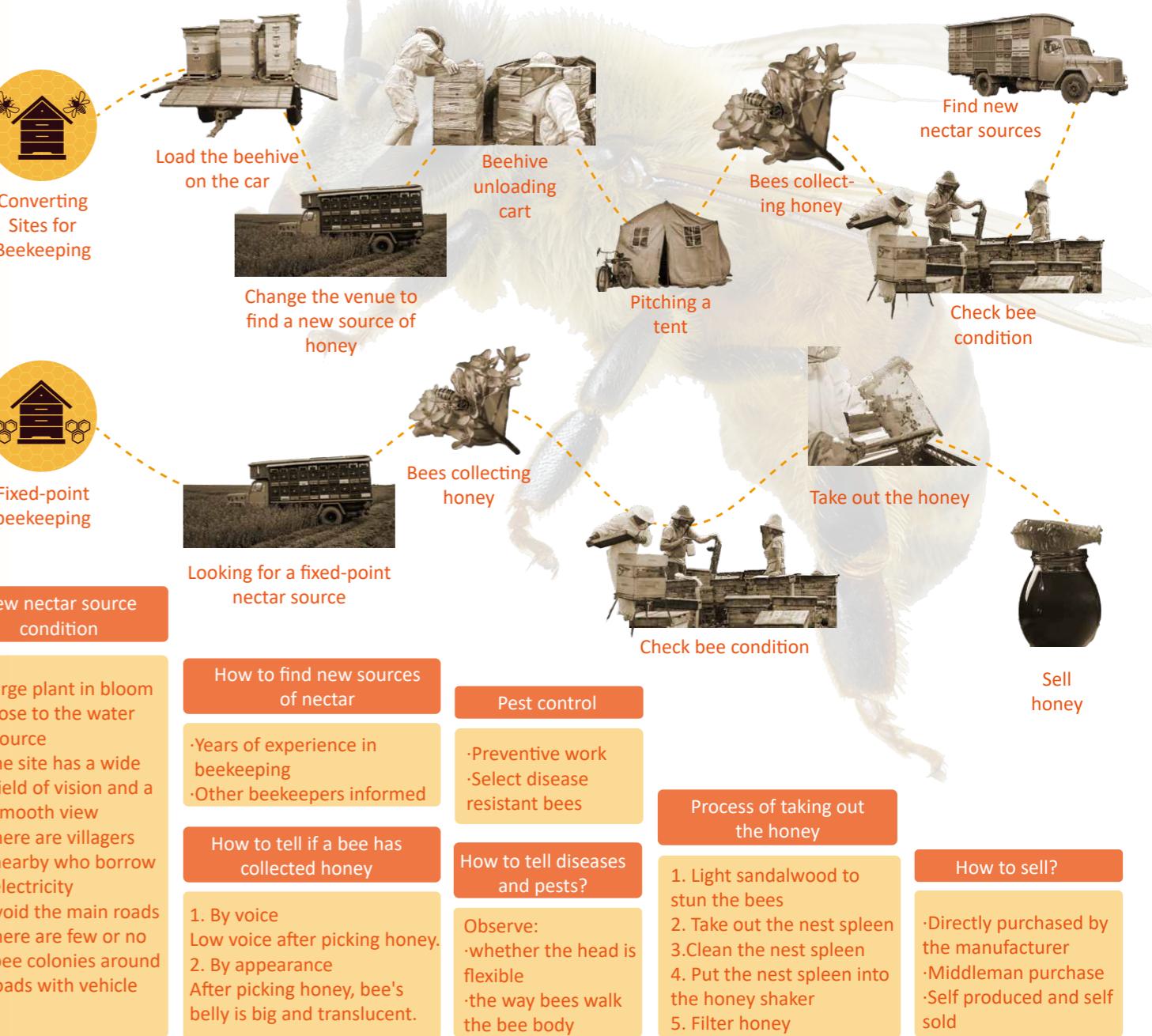
## 2. Why do bees die?

The common reason is that fruit farmers use **pesticides**, resulting in bee poisoning; There are also bees that will easily starve to death if they run **out of food**.

## 3. Have you ever thought about working with some farmers?

Yes, some places have implemented it, but now there are **many imperfections in the cooperation with fruit farmers**, such as the failure to communicate and contact with fruit farmers in a timely and effective manner.

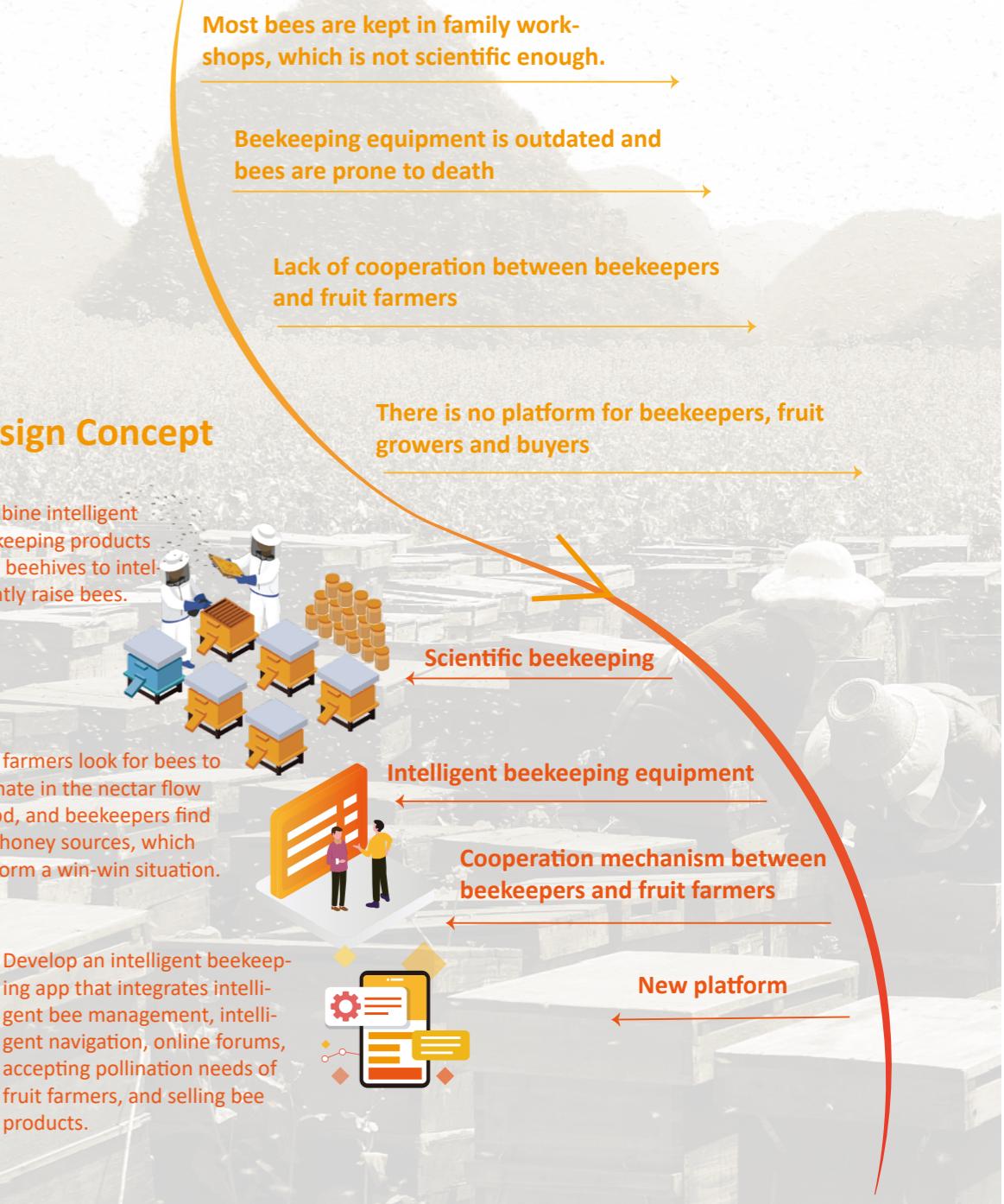
# PROCESS OF BEEKEEPING



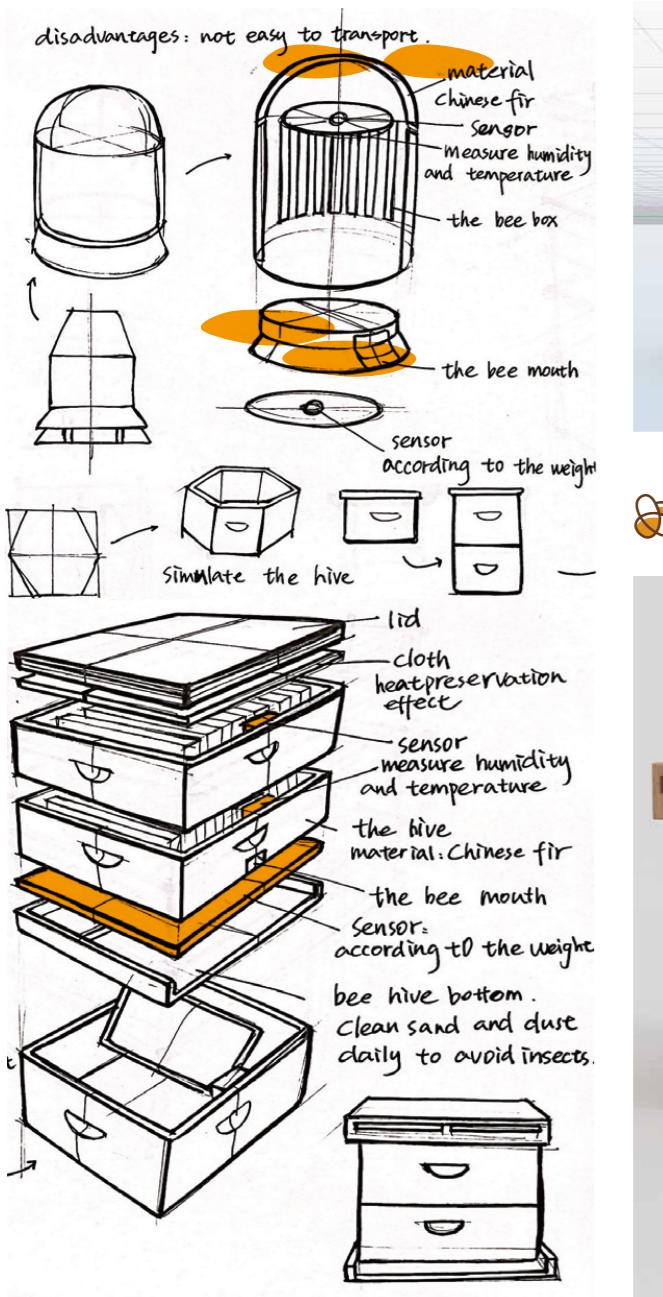
## User Journey Map



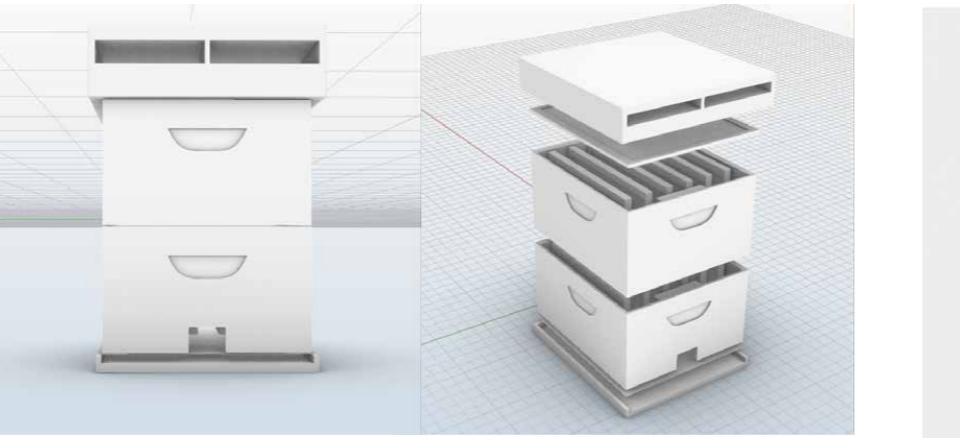
## Define the problem



## SKETCH



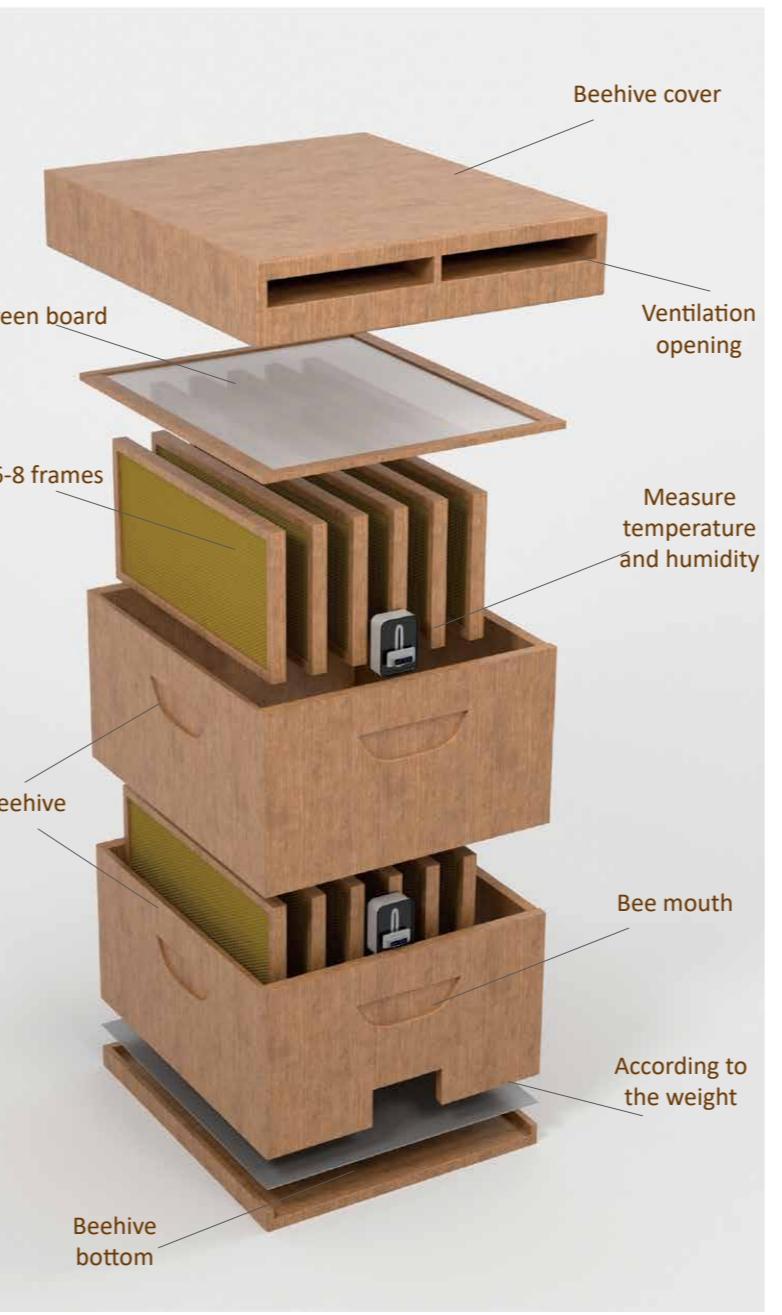
## MODELLING



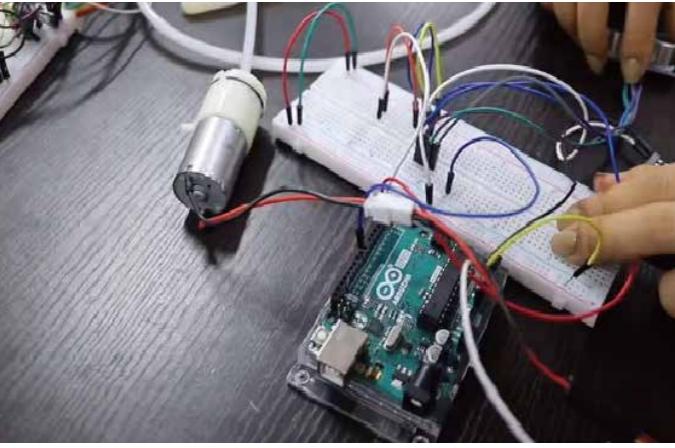
## RENDERING



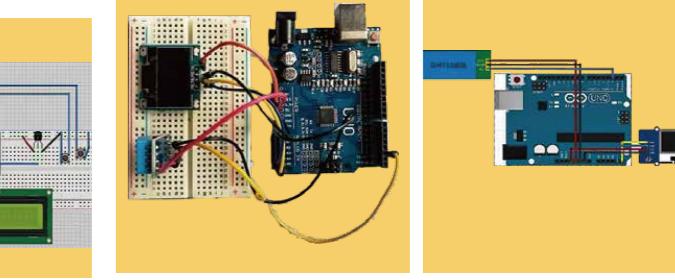
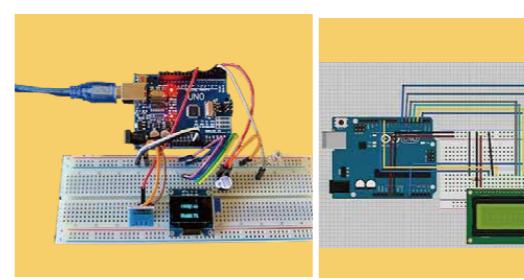
## EXPLODED VIEW



## ELECTRONIC MODULE

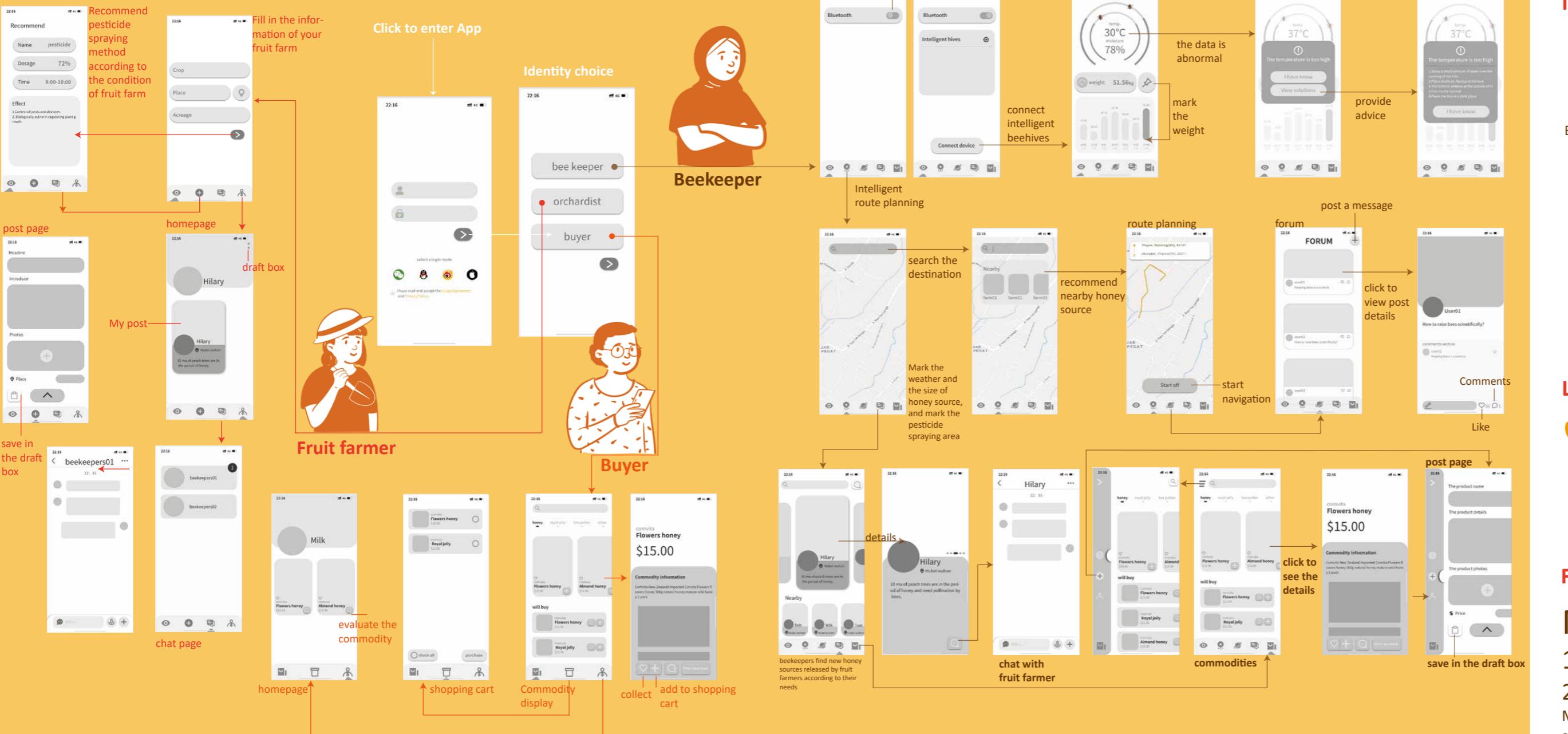


```
/*通过串口显示采集得到的温湿度
printf("\n");
printf("温度:%d%d.%d",T1/100,(T1/10)%10,T1%10);
printf("湿度:%d%d.%d",H1/100,(H1/10)%10,H1%10);
printf("\n");
t=T1/10;
t1=T1%10;
a=(float)(t+t1*0.1);
h=H1/10;
h1=H1%10;
b=(float)(h+h1*0.1);
sprintf(strTemp,"%1f",a);
//调用sprintf函数把DHT11的温度数据格式化到字符串数组变量strTemp中
sprintf(strHumi,"%1f",b);
//调用sprintf函数把DHT11的湿度数据格式化到字符串数组变量strHumi中
GUI_ShowChinese(16,00,16,"温湿度显示",1);
GUI_ShowChinese(16,20,16,"温度",1);
GUI_ShowString(5,20,strTemp,16,1);
GUI_ShowChinese(16,38,16,"湿度",1);
GUI_ShowString(5,38,strHumi,16,1);
delay_ms(1500);
delay_ms(1500);
```



```
int32_t ad_val=0;//AD值
void Get_HX710()
{
    HX710_SCLK_CLR;
    if(READ_HX710_DOUT_PIN) return;
    for(i=0;i<24;i++)
    {
        HX710_SCLK_SET;
        ad_val=ad_val<<1;
        HX710_SCLK_CLR;
        if(READ_HX710_DOUT_PIN)
            ad_val++;
    }
    HX710_SCLK_SET;
    if(ad_val&0x800000) ad_val|=0xFF000000;
    HX710_SCLK_CLR;
}
```

# APP WIREFRAME



# VI DESIGN

## Illustration



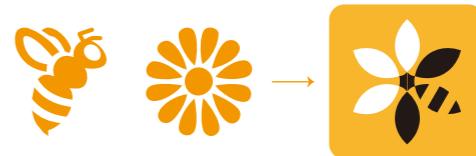
## Color palette



## Icon design



## Logo design



Graphic combination of bees and flowers

## Font specification

Main title Alibaba Sans 36pt

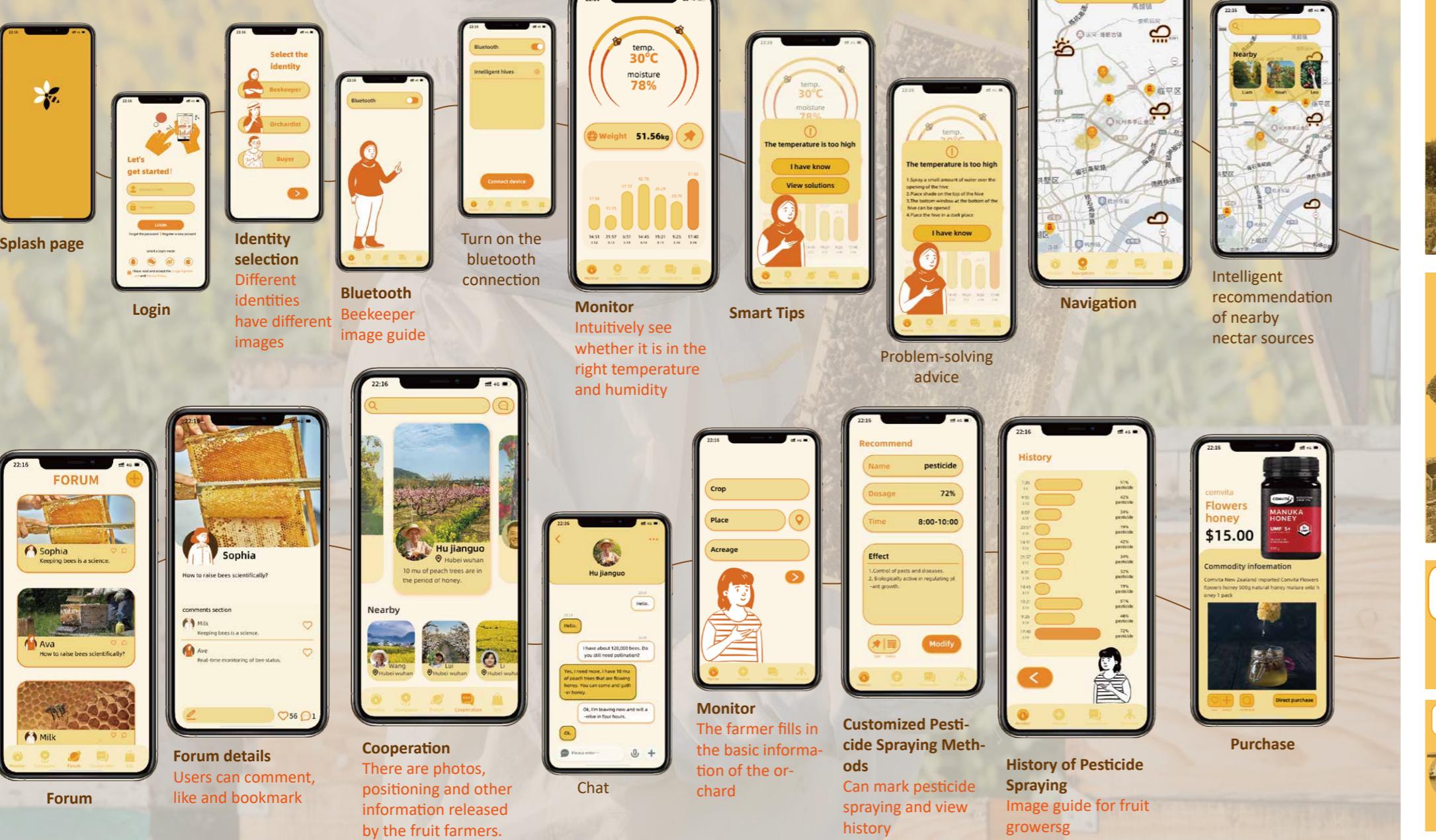
1 level title Alibaba Sans 28pt

2 level title Alibaba Sans 24pt

Main body Alibaba Sans 16pt

Subhead Alibaba Sans 14pt

# 🐝 APP INTERFACES DISPLAY



# STORYBOARD

