GROUP 65 WORK REPORT

Design&Build

# SMART HOME

# CONTENT

FOUR PARTS

You can try it yourself-> www.bupthome.com

PART 1

WEBSITE

**User account & password**

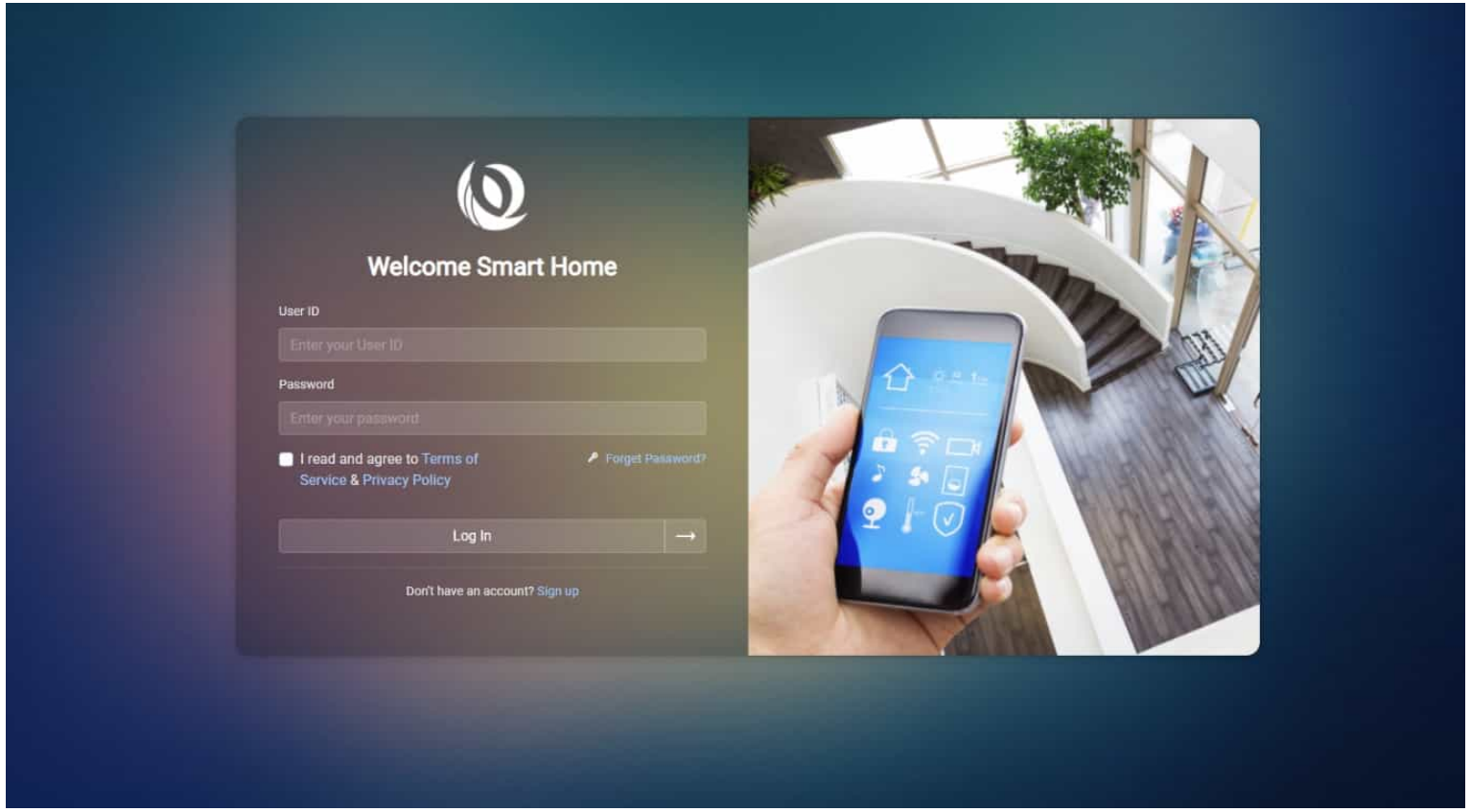
| | | |
|---|---|---|
| User | ID: 202101 | PW: 123456 |
| Admin | ID: 202100 | PW: 123456 |
| Manuf | ID: 202102 | PW: 123456 |

# How do we design the Website

# You can try it yourself-> www.bupthome.com

## Appearance

For the appearance of the website, we do not pursue too many attractive decorative styles, but rather focus on its clear layout, intuitiveness and practicality, which can help customers to easily find what they want, but also to avoid visual fatigue after a long time browsing the website. However, this does not mean that our website is spartan, as we offer users a choice of background colors, allowing them to choose their own style, thus making the user experience better.



WEB

# You can try it yourself-> www.bupthome.com

Front end: js，jsp，jQuery，ajax，css，bootstrap

Back end: 9.0.36

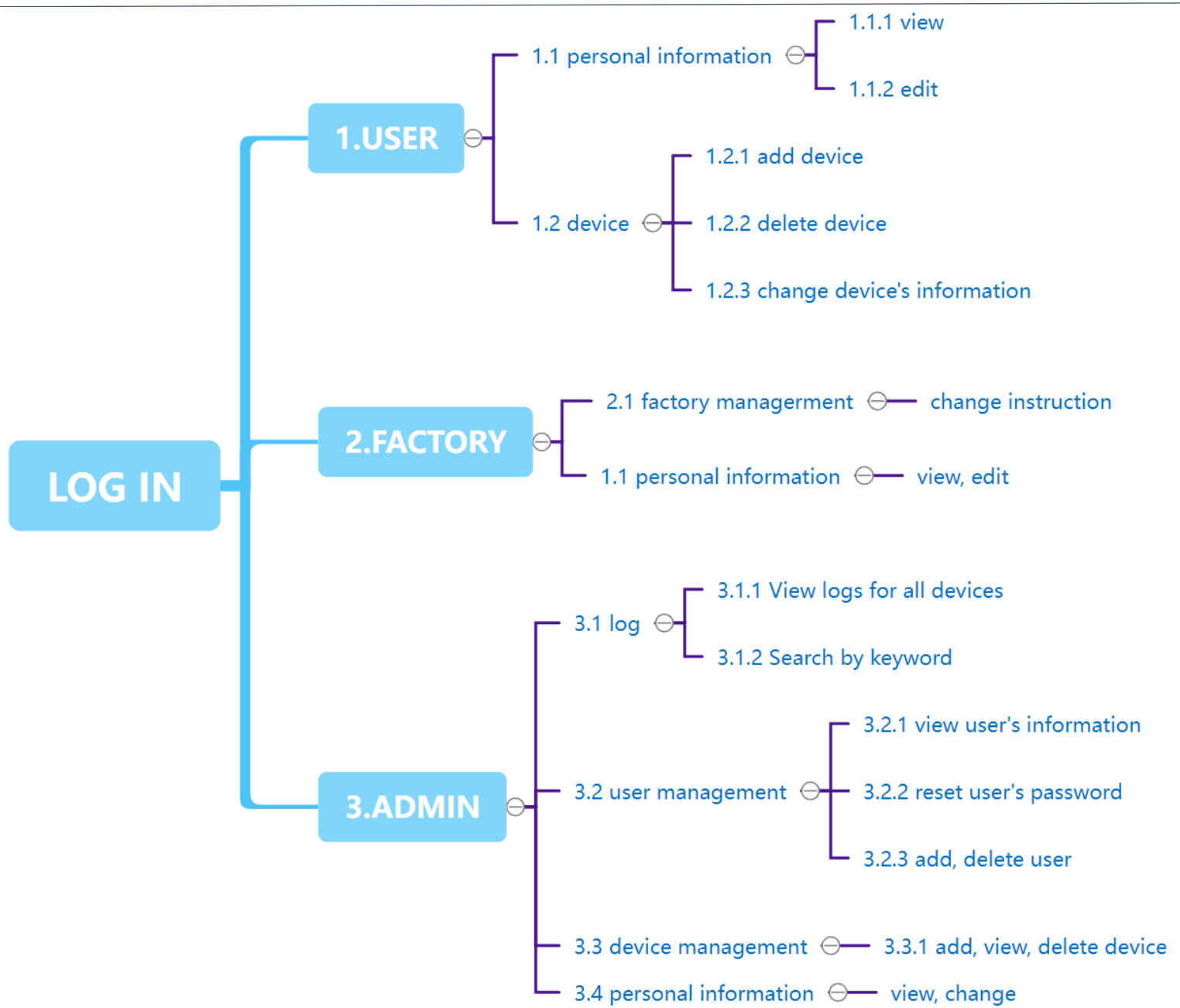

MySQL：8.0

Server : spring boot，mybatis

WEB

# You can try it yourself-> www.bupthome.com

## Logic Design:



# FUNCTION

## Module1 Login

Including Login，Registration and Password Retrieval.

## Module2：User

Including View, modify personal information, view devices,

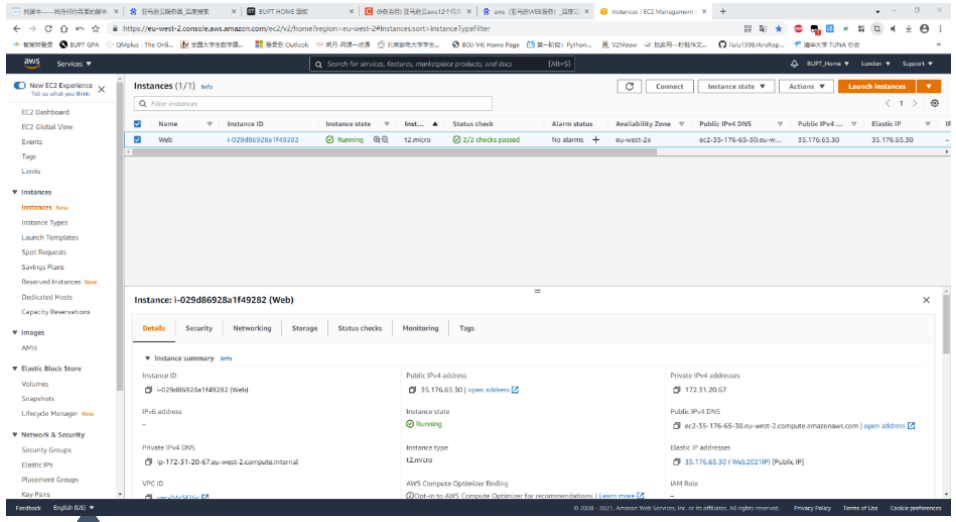
## Module3：Manufacture

Including Add and delete equipment, modify equipment details.

## Module4：Admin

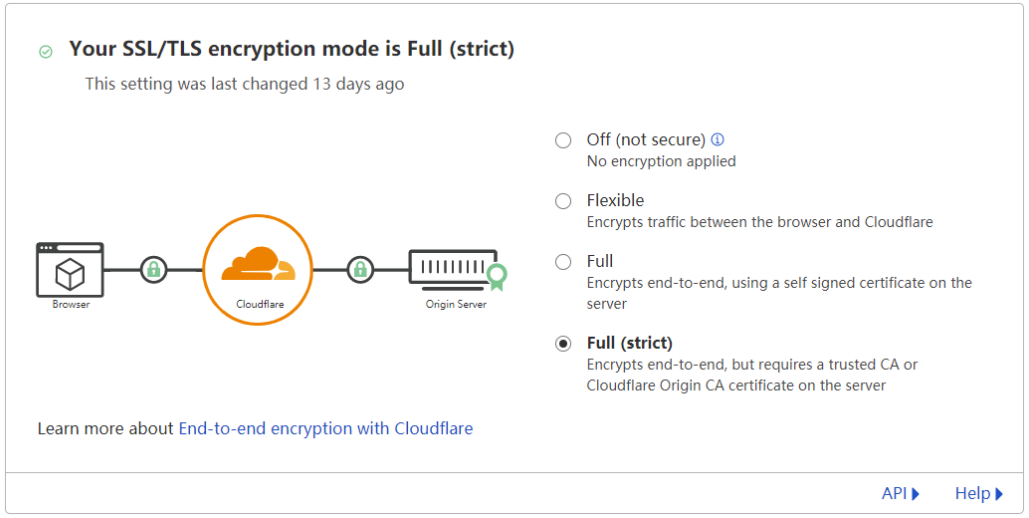
including Add and delete users, manage equipment, and view user equipment data.

# CLOUD DEPLOYMENT



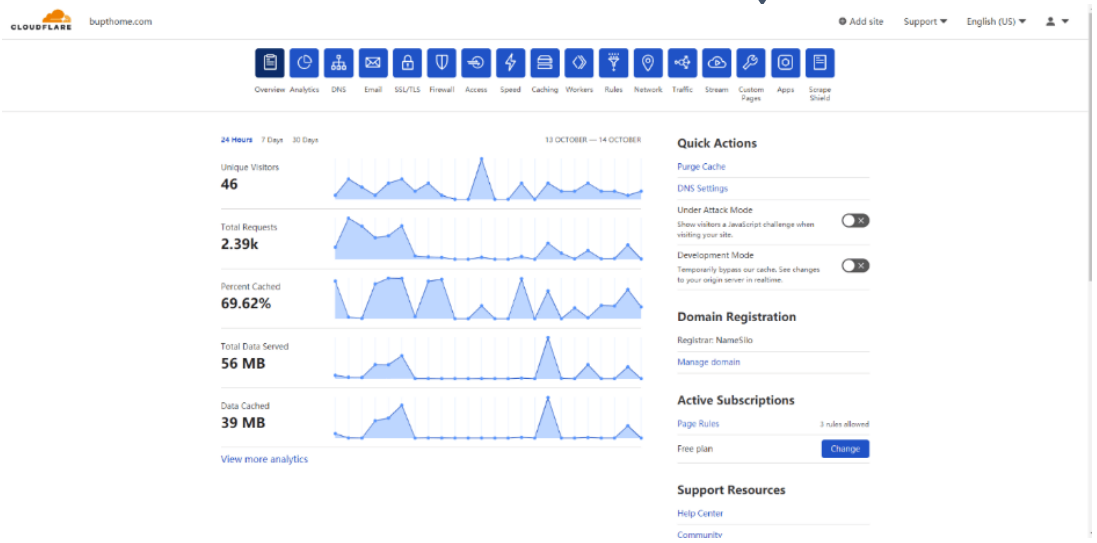

Amazon web services EC2

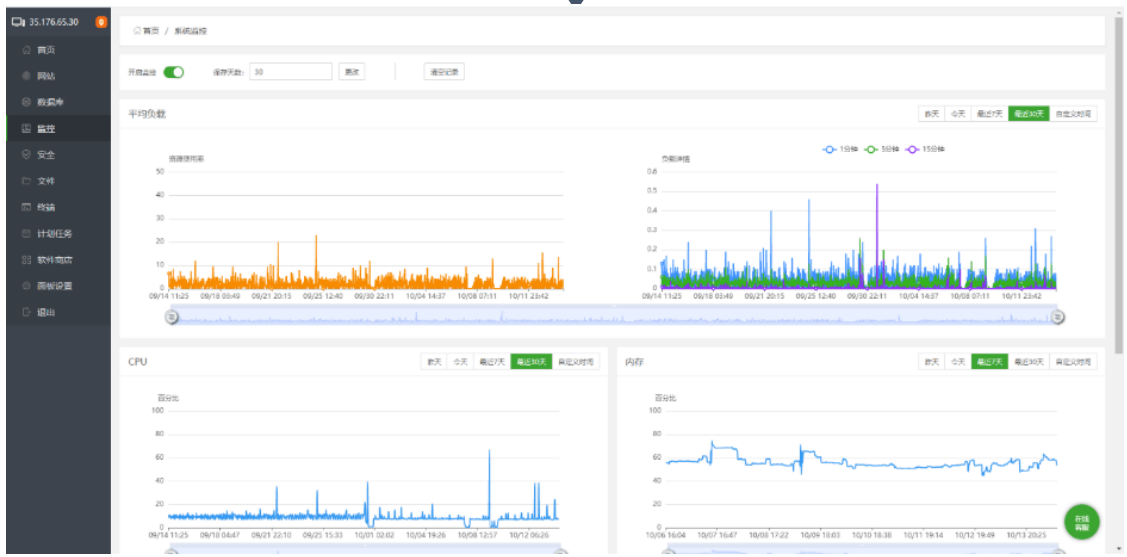
DNS and CDN services




SSL Certificates and HTTPS

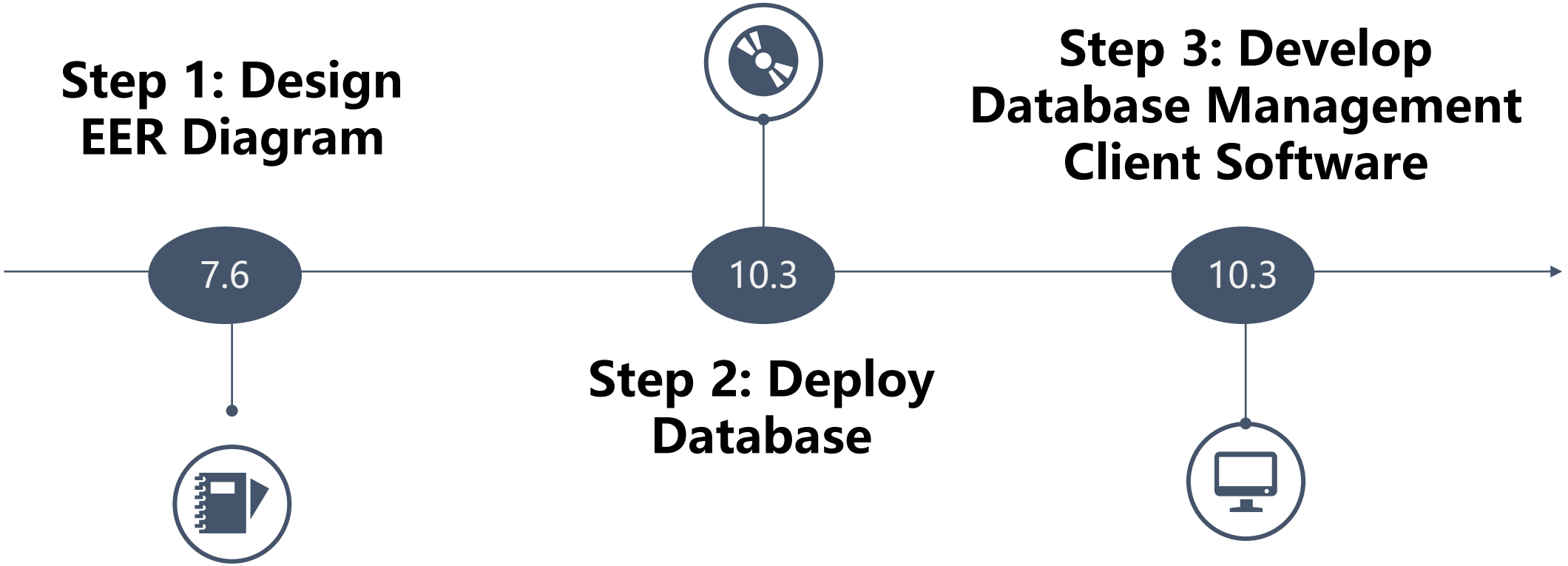
Visual server monitoring panel



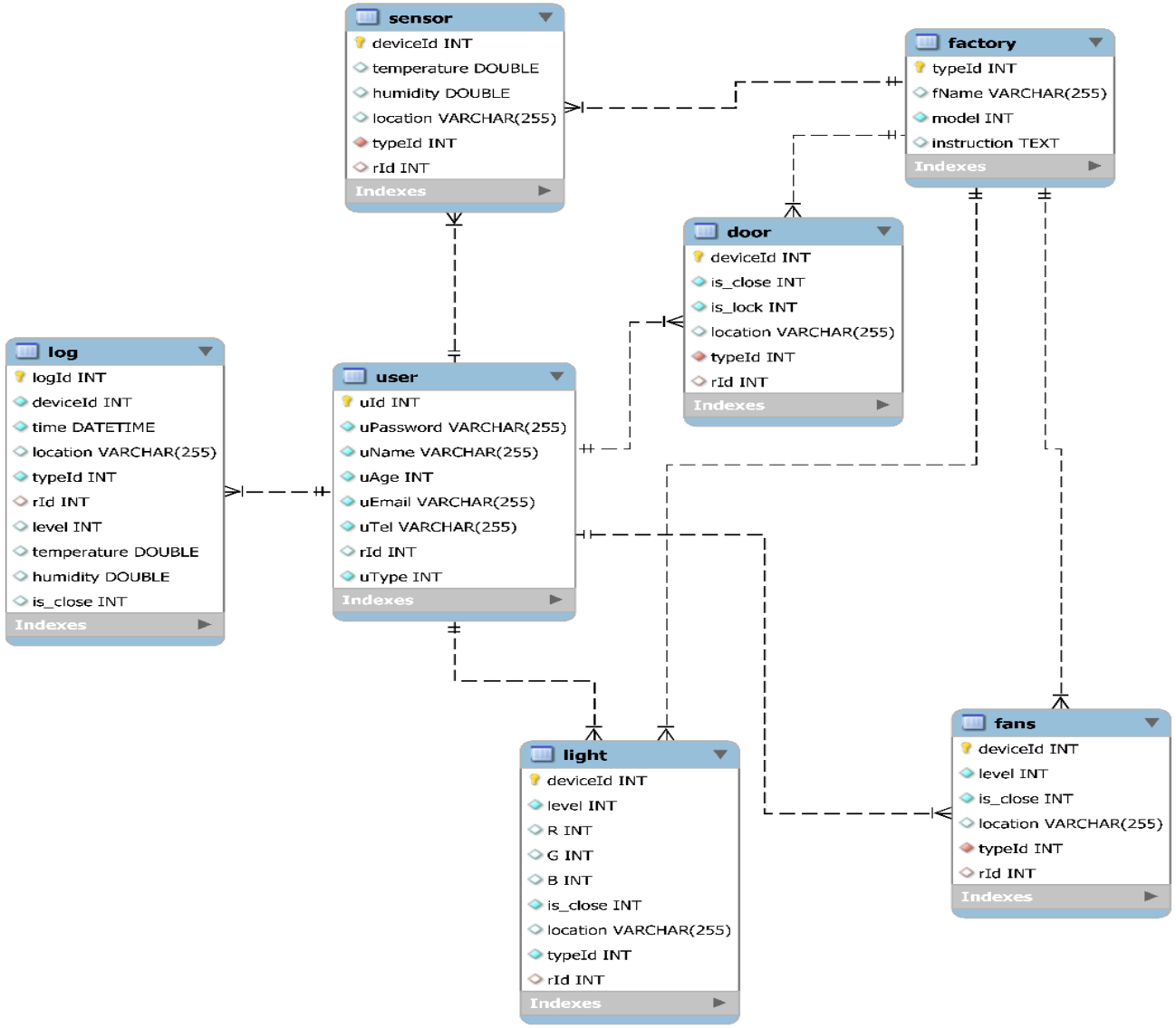

# How do we design the Database

# DATABASE


Step 1: Design EER Diagram
7.6
Step 2: Deploy Database
10.3
Step 3: Develop Database Management Client Software
10.3

# DATABASE

## ER model:



# DATABASE

## Database Table:

| | | | | | |
|---|---|---|---|---|---|
| **User** | **uId** | ***Primary key** | **Light** | **deviceId** | ***Primary key** |
| | uPassword | | | R | |
| | uName | | | G | |
| | uAge | | | B | |
| | uEmail | | | is_close | |
| | uTel | | | typeId | |
| | rId | | | rId | |
| | uTypeI | | | location | |
| **Factory** | **typeId** | ***Primary key** | **Log** | **logId** | ***Primary key** |
| | fName | | | devicedId | |
| | Model | | | time | |
| | instruction | | | location | |
| **Door** | **deviceId** | ***primary key** | | typedId | |
| | is_close | | | level | |
| | is_lock | | | temperature | |
| | location | | | humidity | |
| | rId | | | is_close | |
| | typeId | | | rId | |
| **Fans** | **deviceId** | ***Primary key** | **Sensor** | **deviceId** | ***Primary key** |
| | level | | | temperature | |
| | is_close | | | humidity | |
| | location | | | location | |
| | typeId | | | typeId | |
| | rId | | | rId | |

# DATABASE

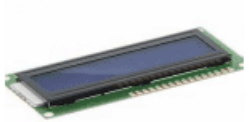
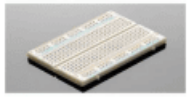
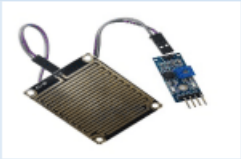
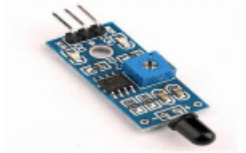
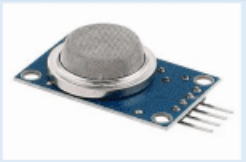
01 The relationship between users and devices. Each user can have multiple devices, but each device corresponds to a unique user. The two tables are connected by user id.

02 The relationship between logs and devices. Each device can generate a series of records and record them in the log table. However, each log record corresponds to only one device.

03 The relationship between manufacturer and device. Each manufacturer can have multiple devices, but each device corresponds to a unique manufacturer. The two tables are connected by device id.


# How do we design the hardware

# Circuit Components

| No | Components | Image | Comments |
|---|---|---|---|
| 1 | Arduino UNO R3 |  | Serve as main board<br>In charge of part which need to be connected to server. |
| 2 | Arduino UNO |  | Serve as assistant board in charge of part which do not need to be connected to server |
| 3. | ESP8266(ESP-12F) |  | WIFI model. In charge of Data interaction. |
| 4. | LCD 1602*A |  | 16-pin 1602A LCD Display the Temperature and humidity |
| 5. | DHT11 |  | Detect outside temperature and humidity |
| 6. | Breadboard*2 |  | installed for netter layout of the wires |
| 7. | MH-RD |  | Raindrop module, |
| 8. | Light sensor |  | Detect the lightness. |
| 9. | Fan |  | A module which represents the electric fan. |
| 10. | Collision sensor |  | Responsible for detecting window closure. |
| 11. | Infrared sensor |  | Simulate person enter the room. |
| 12. | Buzzer |  | An alarm device warns the safety. |
| 13. | RGB light |  | Control the light indoors. |
| 14. | Flame sensor |  | Detect infrared light emitted by flame |
| 15. | Smoke sensor |  | Detect the smoke |
| 16. | RFID |  | Access control system |

# Function Design

## 1. Fundamental Function of the Smart Home Hardware Model

- Built-in smart home system

- Quick changing on the Internet
- Operating on the IoT or using Bluetooth to control the status of the elements

- Multiple functions based on the original requirements

# Function Design

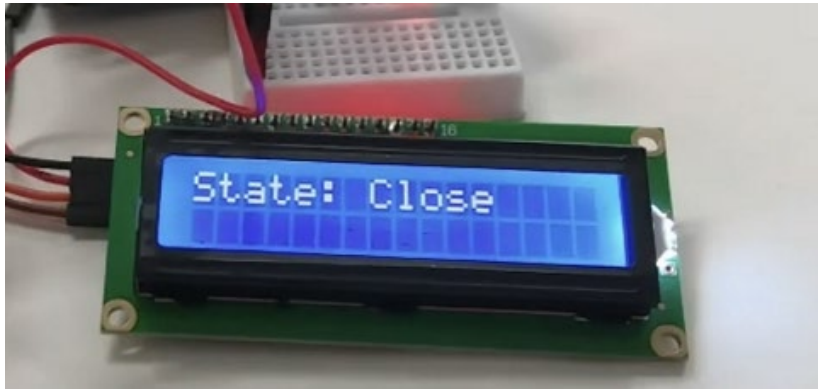
## 2. Humidity and Temperature

- Measures and displays indoor humidity and temperature
- Real-time data & visualised

## Function Design

## 3. Doors and Windows

- Doors and windows status check




# Function Design

## 4. Doors and Windows

- Controlling the brightness of the lights and display the brightness of the lights on the screen.
- Away-from-home alarm mode
- automatic light switch mode
- light off mode and
- brightness adjustment mode

This is designed to meet the lighting needs of the user in a variety of different scenarios.

## 5. Ability to Communicate with Data Access Software

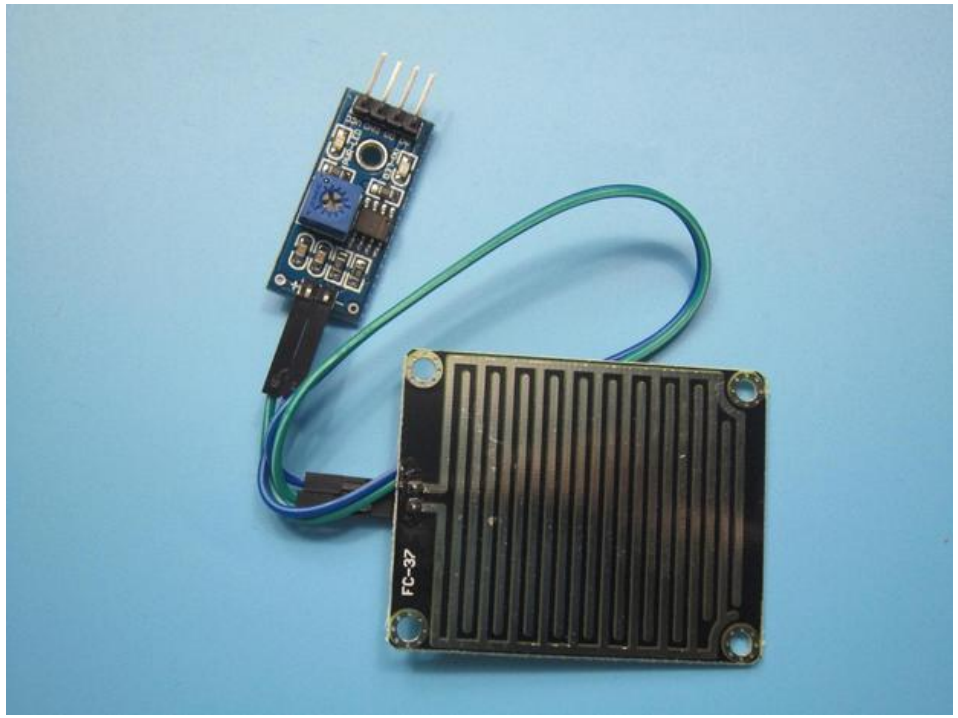
Both Bluetooth and IoT can be used for data access software. IoT is more recommended because it is designed with many visual parts. Data transfer in IoT is not only suitable for many situations, but is also more suitable for modern needs. When using EMQX and MQTT for auxiliary transmission, the json format is used instead of plaintext mode because JSON allows for more versatile data transmission and JSON can meet the requirements for sending data from the IoT side to the hardware port.

More sensors and components are being used to better meet the needs of the smart home. Users can experience the complex functionality and wide range of applications of this system from the use of these components.

# Function Design

## 6. Raindrop Sensing

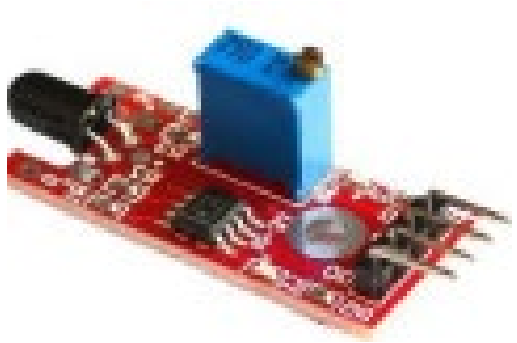
The raindrop sensor is realized by the raindrop sensor, and the user can feel whether it is raining outside without leaving the house, which is used to help the user decide whether to carry an umbrella.



# Function Design

## 7. Smoke Alarm and Flame Alarm

Users can observe smoke and flames on the IOT side. These functions meet the room’s requirements for fire safety and indoor smoking bans.



# Function Design

## 8. Fan Equipped

Through the relay and battery, a small fan is designed, and the user can control the fan to cool down.

# Function Design

## 9.Access Control System

An access control system is designed. The user can add an electronic card for the access control by himself. When the electronic card is not stored in the system, the system will not respond. Only when the registered electronic card touches the RFID access control system, the system responds.

PART 4

GROUP WORK

# How do we work together

# THANKS FOR LISTENING

GROUP 65 WORK REPORT

Design&Build