

HOME AUTOMATION SYSTEM

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ABSTRACT

- Internet Of Things (IOT) is composed of things that have unique identities and are connected to each other over internet It is simply connecting and monitoring various devices and sensors through internet.
- Home automation systems have attracted considerable attention with the advancement of communications technology.
- Home automation is one of the major growing industries that can change the way people live.
- This project aims to implement a voice controlled home automation system using a Wi-Fi and IOT, which is being remotely controlled and monitored by any Android Os smart phone.

INTRODUCTION

- Home automation refers to the use of technology to control and automate various functions in a home, such as lighting, temperature, security, and appliances.
- This can be done through the use of smart devices that can be controlled remotely through a smartphone app, voice commands, or a central control panel.
- A home automation system typically includes a combination of hardware and software that allows users to control and monitor their home remotely.
- This can include smart devices such as smart thermostats, smart locks, smart lighting, and smart appliances.
- These devices can be connected to a home network and controlled through a central hub, which can be a standalone device or a smart home hub built into a smart speaker or other device.

LITERATURE SURVEY (EXISTING SYSTEMS)

There are many different systems available for home automation, and they can vary in terms of the types of devices and features they offer. Here are a few examples of some common home automation systems:

➤ **Smart thermostats:** These devices allow you to control the temperature in your home remotely, using a smartphone app or a web interface. Some smart thermostats can even learn your preferences and adjust the temperature accordingly.

➤ **Smart lights:** These devices allow you to control the lighting in your home remotely, using a smartphone app or a web interface. You can turn lights on and off, dim them, or change their color, depending on the specific device.

➤ **Smart security systems:** These systems include a range of devices, such as smart door locks, security cameras, and motion sensors, that allow you to monitor and protect your home. You can view footage from the cameras and receive alerts when motion is detected.

➤ **Smart home assistants:** These devices, such as Amazon Echo and Google Home, allow you to control other smart devices in your home using voice commands. You can also use them to play music, set reminders, and perform other tasks.

OBJECTIVES

The main objectives of home automation system are to:

- **Increase convenience:** Home automation using IoT allows you to control various devices and appliances in your home remotely using a smartphone or other connected device, which can be very convenient.
- **Save energy:** By automating your home's lighting, heating, and other systems, you can reduce energy consumption and save money on your energy bills.
- **Enhance security:** Home automation using IoT can include security features such as surveillance cameras, door locks, and alarm systems, which can help keep your home safe and secure.

➤ **Improve comfort:** Home automation can also include features that help you control the temperature, humidity, and lighting in your home to create a more comfortable living environment.

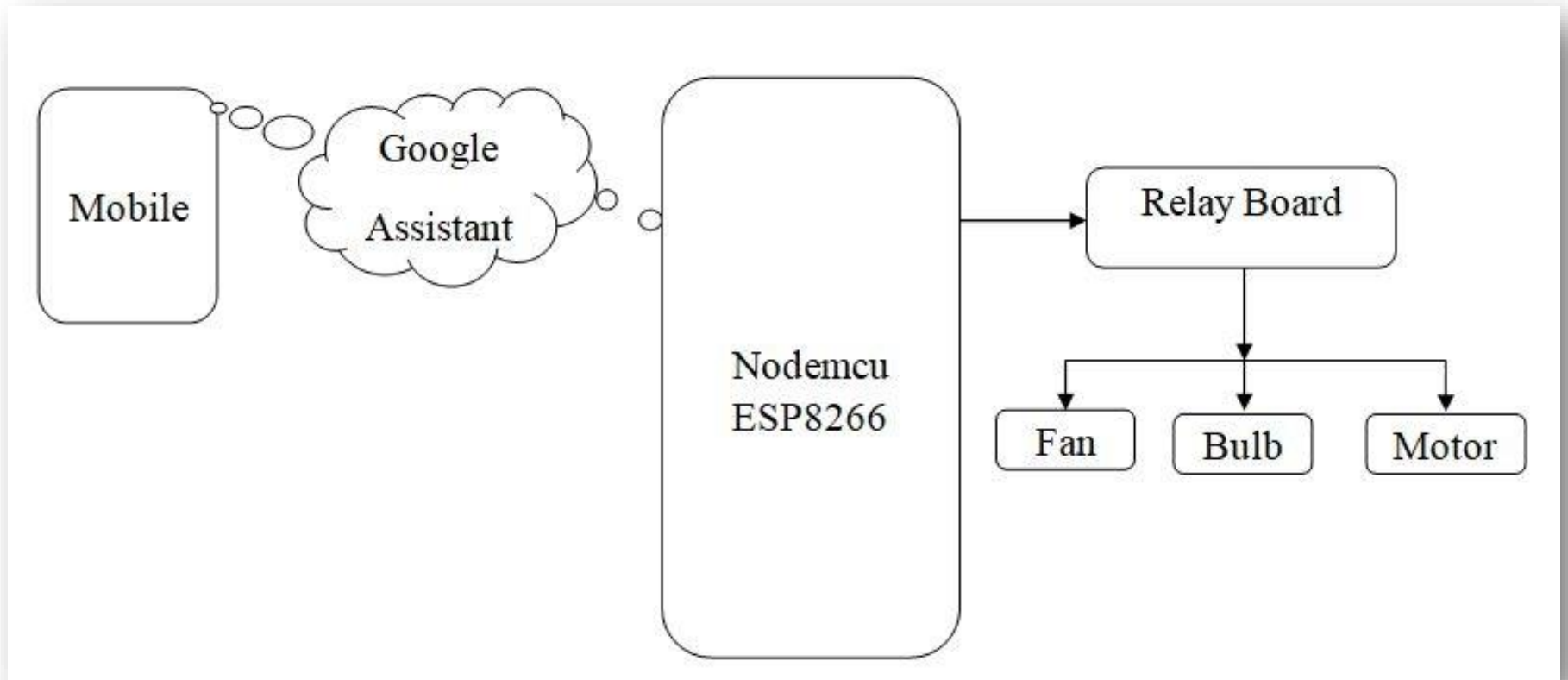
➤ **Simplify daily tasks:** Home automation can make everyday tasks such as turning off the lights or setting the thermostat easier by allowing you to control these tasks remotely or through automation.

PROBLEM STATEMENT

To design and implement a home automation system that utilizes IoT technologies to improve the energy efficiency, security, comfort and convenience of a home, while also being user-friendly, reliable, and cost-effective.

PROPOSED SYSTEM

- In this home automation system, the appliances can be controlled with the mobile application and also with voice commands and also manually.
- Using Blynk application the lights and fans are controlled.
- If anyone enters into the room then the buzzer will activate automatically using MC-38(Magnetic Door Switch)
- Using ultrasonic sensor we can check the status of the water tank and it automatically turns off if 90% is filled.
- By using DHT-11(Temperature Sensor), the fans or A.C's can be controlled based on the temperature.



Block Diagram of Home Automation System

ALGORITHM

```
#define BLYNK_TEMPLATE_ID "TMPLxfuzxcq8"  
#define BLYNK_DEVICE_NAME "FullRelayConnectivity"  
#define BLYNK_AUTH_TOKEN "XlbLZeu-dsQWL890ibRah  
UW4Winp56e4"
```

```
#define BLYNK_PRINT Serial
```

```
#include <ESP8266WiFi.h>  
#include <BlynkSimpleEsp8266.h>
```

```
char auth[] = BLYNK_AUTH_TOKEN;  
char ssid[] = "Nawaz";  
char pass[] = "Nawaz@2002";
```

```
#include "DHT.h"
#define DHTPIN D0
#define DHTTYPE DHT11
DHT dht(DHTPIN, DHTTYPE);
```

```
#define trig D7
#define echo D8
```

```
int MagneticSwitch = D4;
int Buzzer = D3;
int SensorData = 0;
int SensorValue;
```

```
int depth =20, pinValue;
long cms, t, cm;
```

```
BlynkTimer timer;
```

```
void waterlevel()
{
    digitalWrite(trig, LOW);
    delayMicroseconds(2);
    digitalWrite(trig, HIGH);
    delayMicroseconds(10);
    digitalWrite(trig, LOW);
    t = pulseIn(echo, HIGH);
    cm = t / 29 / 2;
    Serial.println(cm);
    cms=cm;
    long level= depth-cm;
    if (level<0)
        level=0;
    level = map(level,0,depth-3,0,100);
    Blynk.virtualWrite(V4, level);
}
```

```
BLYNK_WRITE(V0)
{
  int value = param.asInt();
  Serial.println(value);
  if(value == 1)
  {
    digitalWrite(D1, LOW);
    Serial.println("LED ON");
  }
  if(value == 0)
  {
    digitalWrite(D1, HIGH);
    Serial.println("LED OFF");
  }
}
```

```
void setup()
{
  Serial.begin(115200);
  Blynk.begin(auth, ssid, pass);
  pinMode(D1,OUTPUT);
  pinMode(D2,OUTPUT);
  pinMode(D5,OUTPUT);
  pinMode(D6,OUTPUT);
  pinMode(Buzzer,OUTPUT);
  pinMode(MagneticSwitch,
INPUT_PULLUP);
  pinMode(trig, OUTPUT);
  pinMode(echo, INPUT);
  Serial.println("DHT11 Test!");
  dht.begin();

  timer.setInterval(10L, waterlevel);
}
```

```
void loop()
{
    // Magnetic Switch Logic
    SensorValue = digitalRead(MagneticSwitch);
    if(SensorValue == 1)
    {
        digitalWrite(Buzzer, HIGH);
    }
    else
    {
        digitalWrite(Buzzer, LOW);
    }

    // Temperature Sensor Logic
    delay(1000);
    float h = dht.readHumidity();
    float t = dht.readTemperature();
    float f = dht.readTemperature(true);
```

```
if(isnan(h) || isnan(t) || isnan(f))  
{  
    Serial.println("Failed to read  
DHT sensor");  
    return;  
}
```

```
Serial.print("Humidity: ");  
Serial.println(h);
```

```
Serial.print("Temperature: ");  
Serial.print(t);  
Serial.println("'C");
```

```
Serial.print("Temperature: ");  
Serial.print(f);  
Serial.println("'F");
```

```
if(t>30.00)  
{  
    digitalWrite(D2, LOW);  
    Serial.println("Fan ON");  
}  
else  
{  
    digitalWrite(D2, HIGH);  
    Serial.println("Fan OFF");  
}  
  
Blynk.run();  
timer.run();  
}
```

WORKING PRINCIPLE

Home automation systems allow you to control and automate various functions in your home, such as lighting, temperature, security, and appliances, using a central control system or a mobile app. Here's an overview of how a home automation system typically works:

➤ **Sensors:** Home automation systems often use sensors to detect and gather information about the environment and the state of various devices in the home. For example, a temperature sensor might measure the temperature in a room, while a motion sensor might detect movement in a particular area.

➤ **Control panel:** The control panel is the central hub of the home automation system. It receives input from the sensors and sends commands to the various devices in the home, such as turning on a light or adjusting the thermostat. The control panel can be a separate device, or it can be integrated into a smartphone app.

➤ **Communication:** Home automation systems use various communication technologies to connect the control panel to the devices in the home. This can include wired technologies like Ethernet or Wi-Fi, or wireless technologies like Zigbee or Z-Wave.

➤ **Devices:** The devices in a home automation system are the devices that are controlled by the system. These can include lights, thermostats, security cameras, and appliances, among others.

SYSTEM DESIGN(UML)

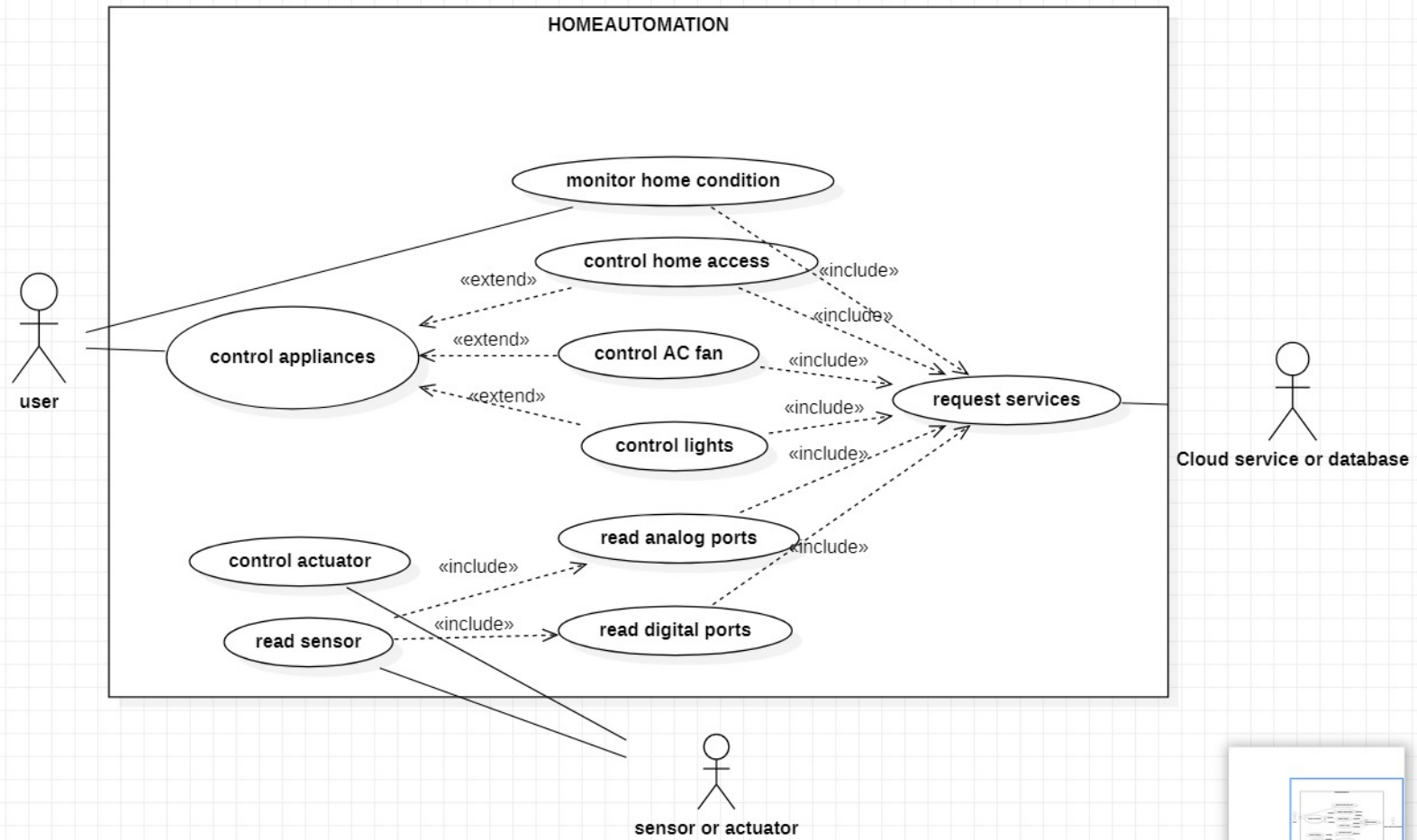


Figure : Use case diagram

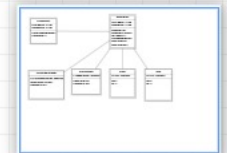
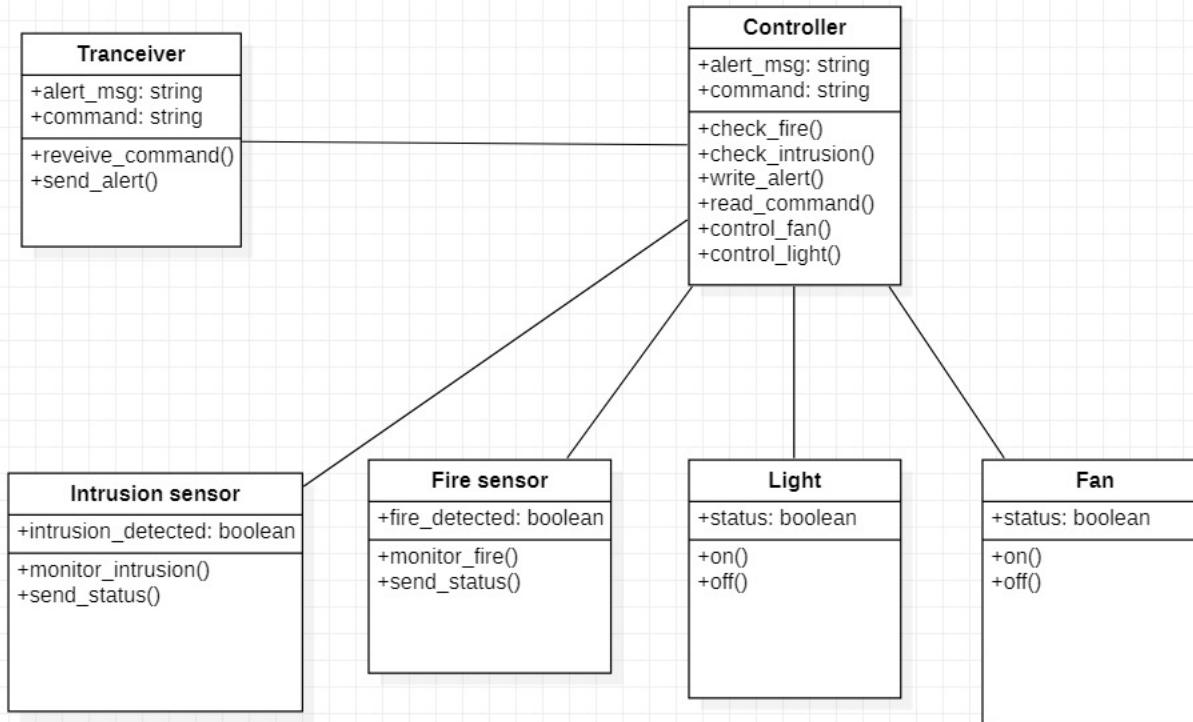


Figure : Class diagram

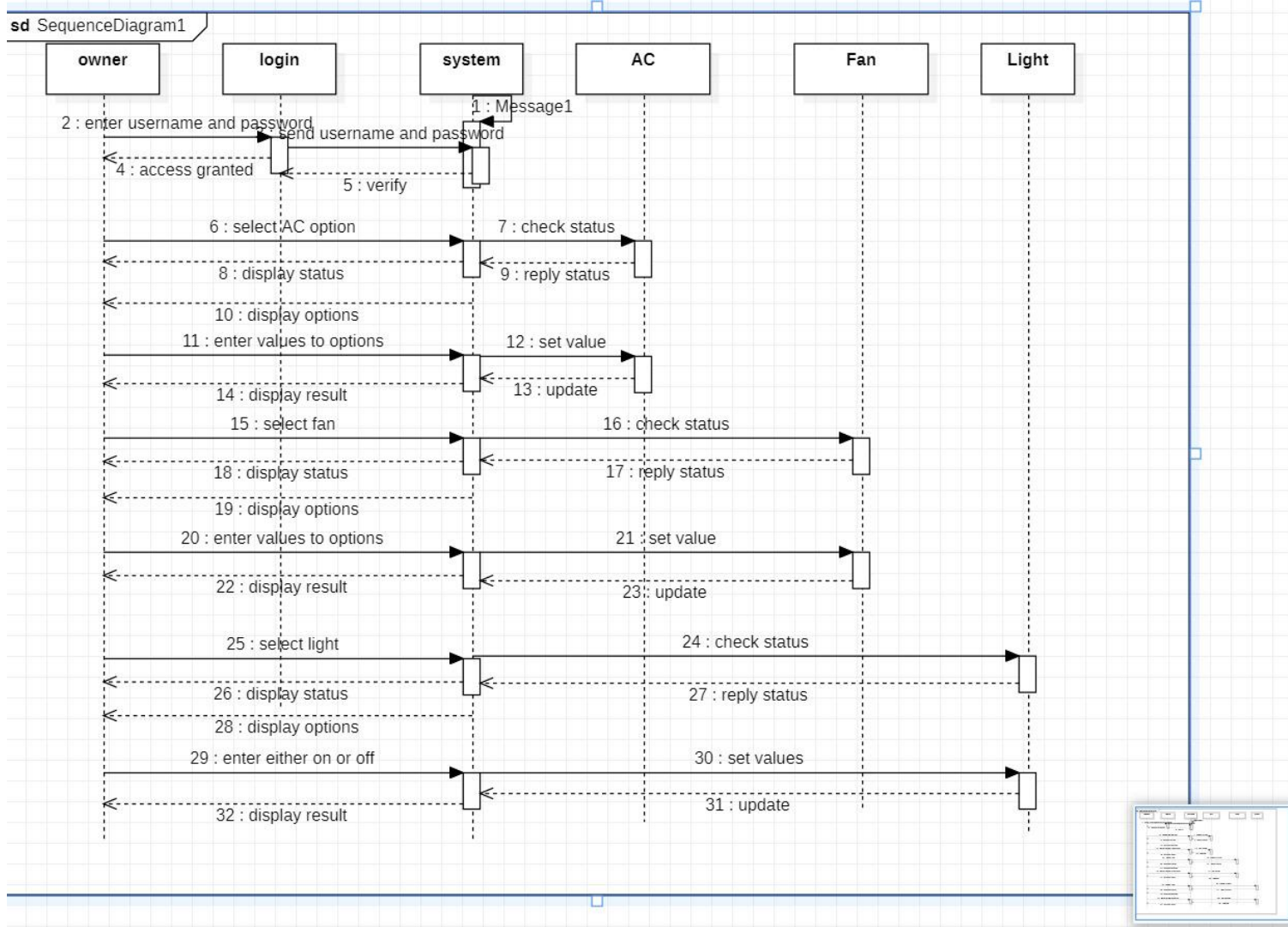
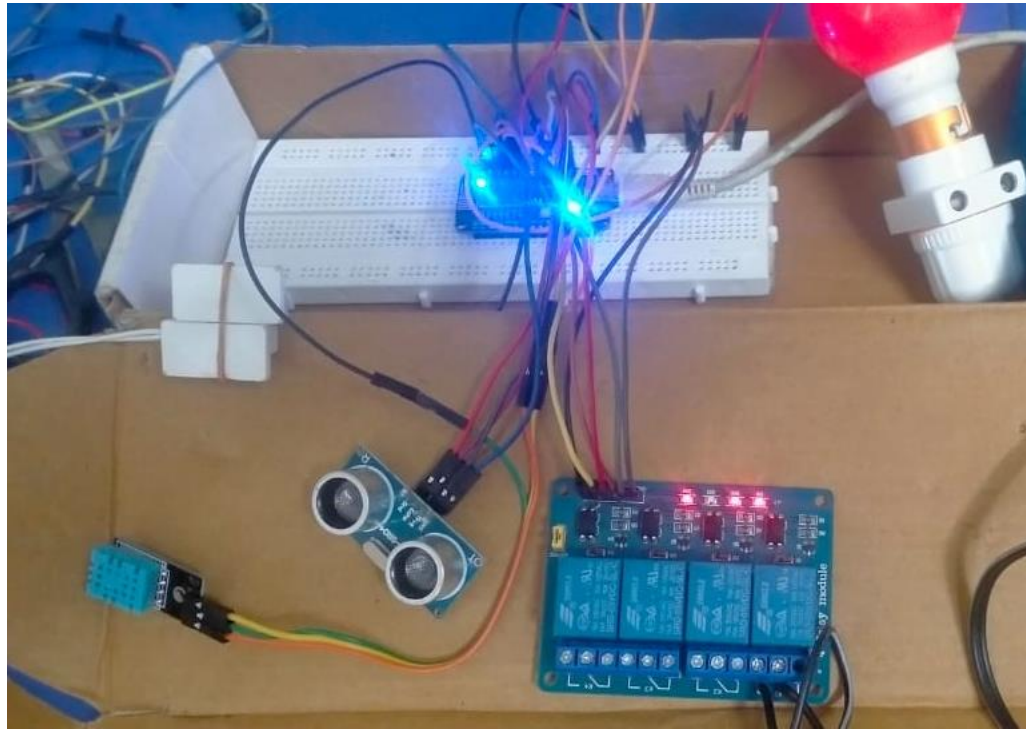
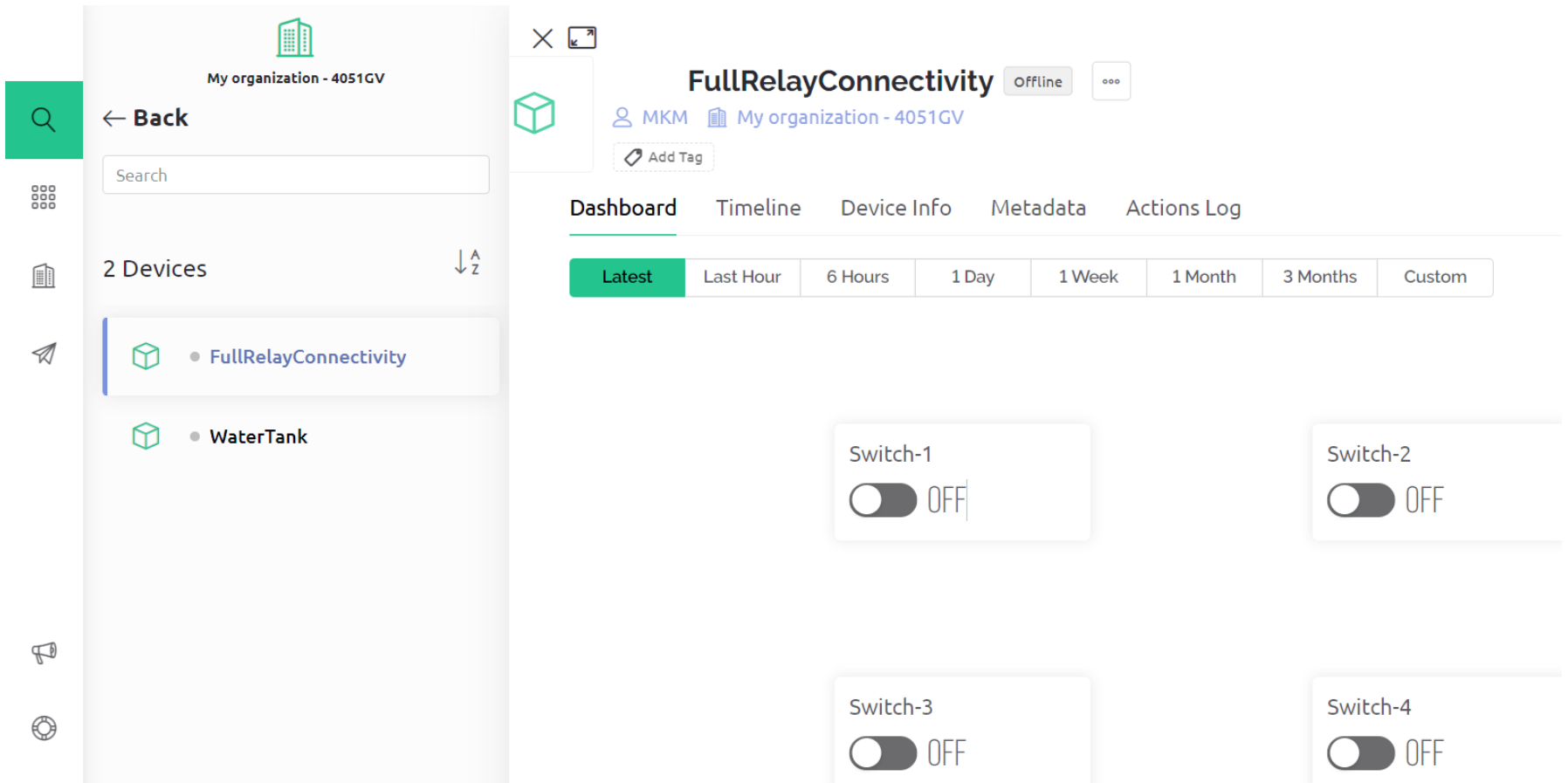


Figure : Sequential diagram

RESULT ANALYSIS



Hardware connections of the home automation system



Blynk website from where the appliances are controlled

CONCLUSION

Our IoT based proposed system reduces the burden on the users or in simple terms it reduces the work that has to be done by the user to automating household appliances. Their effective usage helps people make their life simpler. It is highly advantageous to old or aged people and mankind with very high busy schedule in life. Our proposed system is also helps to reduce the electricity. The proposed system also helps in monitoring the device or able to check the status of the device using the mobile app. Overall, the development and adoption of home automation using IoT is likely to continue to grow in the coming years, offering numerous benefits to homeowners.

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