ASSUMPTION UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF BASIC SCIENCE

PHYSICS LABORATORY REPORT

CE4301 FUNDAMENTAL OF INTERNET OF THINGS

PROJECT SMART IOT FARM

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SECTION 641

DATE 25 October 2022

Semester 2/2021

Introduction:

The Internet of Things (IoT) has the power to change the world we live in; better efficient enterprises, connected automobiles, and more informed urban populations are all part of the IoT condition. Regardless, utilizing innovation such as IoT in farming may have the most impact.

As a result, the goal of this project is to develop and implement an automatic embedded critical role for irrigation, fertilizer, and water spray systems. Various characteristics, such as working times and data recordings, are controlled by the microcontroller. The ESP32 microcontroller is used to read configuration data from Firebase via a mobile application that analyzes, receives data from all sensors, and operates all the systems.

Apparatus:

Android studio, ESP32, Firebase, Node-red

Producer:

Android Studio:

The mobile application consists of five screens.

- Menu Screen

The first screen, as illustrated in Figure 1, is the screen menu. ON/OFF Button: This button is used to turn the controller on and off automatically. The status of the controller will change to AUTOMATIC: ON when it is in automatic mode. The user can choose from 1-38 for the date parameter and 1-38 for the start date. The buttons CONFIG, MANUAL, and MONITOR are used to access the config, manual, and monitor screens, respectively. The LOAD button is used to load Firebase parameters.

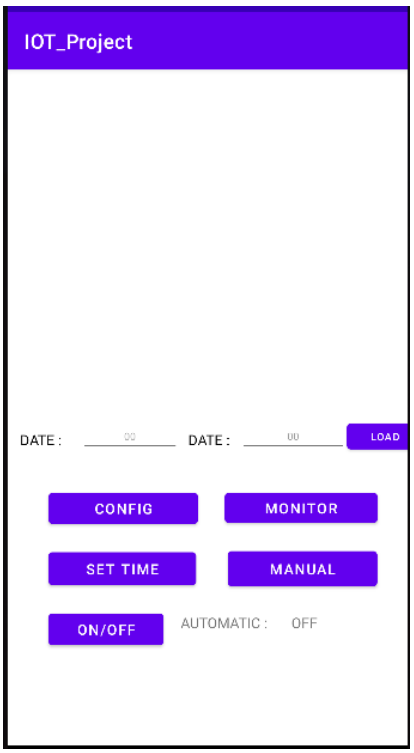


Figure 1: Menu screen

- Config Screen

The config screen is used for config the fertilizer and water spraying for the garden. For water to spray, the farmer sets the day, time, and moisture. Fertilizer-A pump (NPK46) and fertilizer-B pump (NPK47) have a time value of 0-5 minutes (NPK15). By using the OK button, the farmer may load parameters from the Firebase.

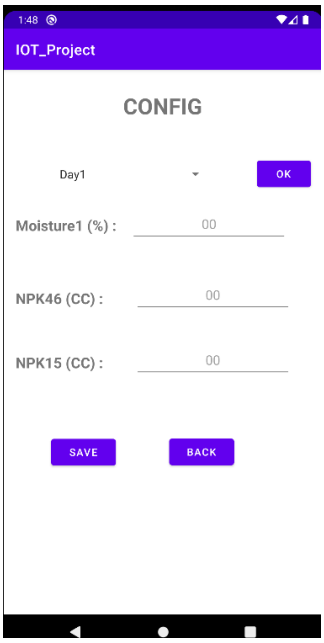


Figure 2: Config screen

- Monitor Screen

The data from the sensor is shown on the monitor screen. A farmer can look at moisture sensor to the garden in this scenario. Figure 4 shows the result.

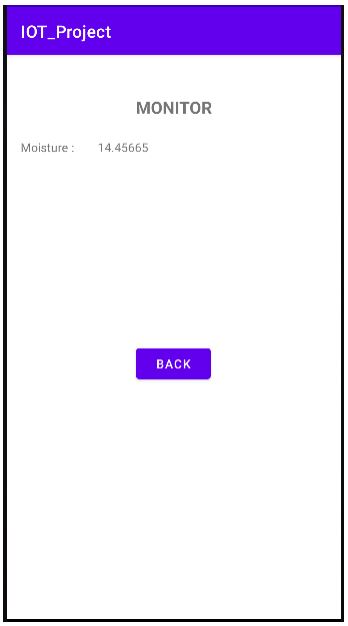


Figure 3: Monitor screen

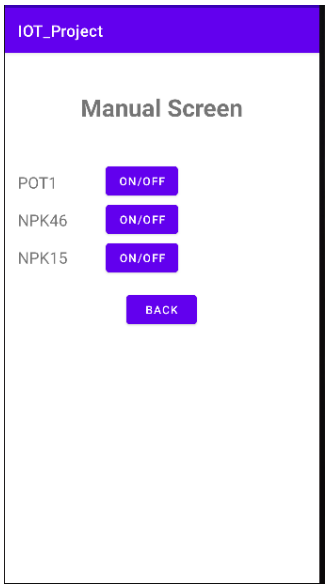


Figure 4: Manual screen

- Manual Screen

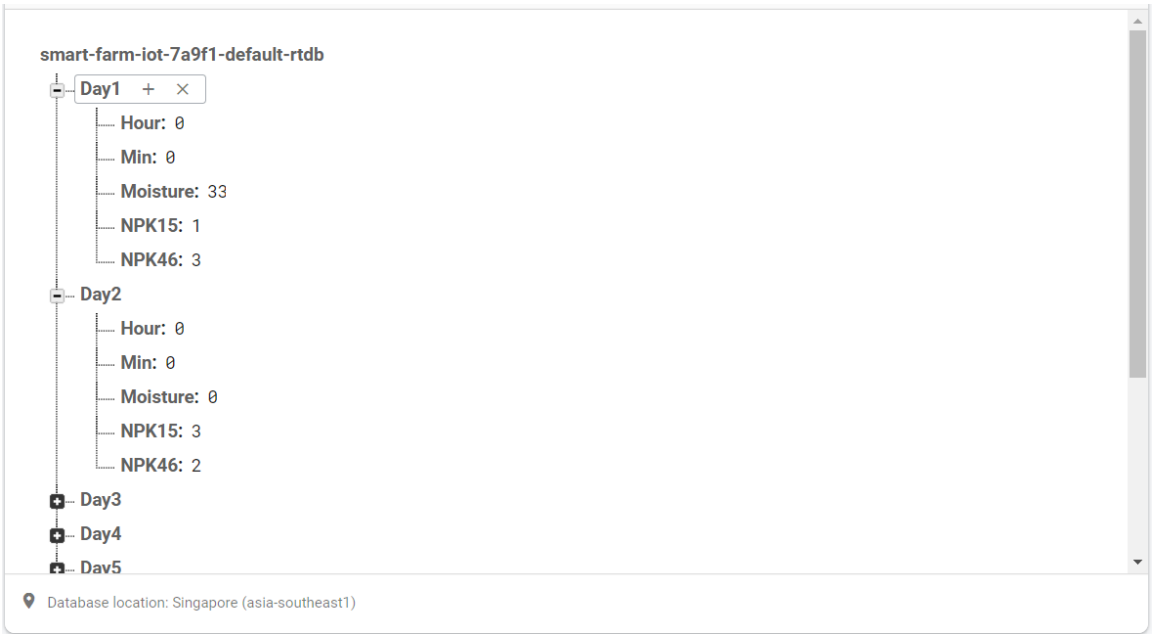
The manual screen allows the user to manually active the three pumps.

POT1 acts as a master switch, if it isn’t on neither the NPK46 or NPK15 will be on.

SET TIME

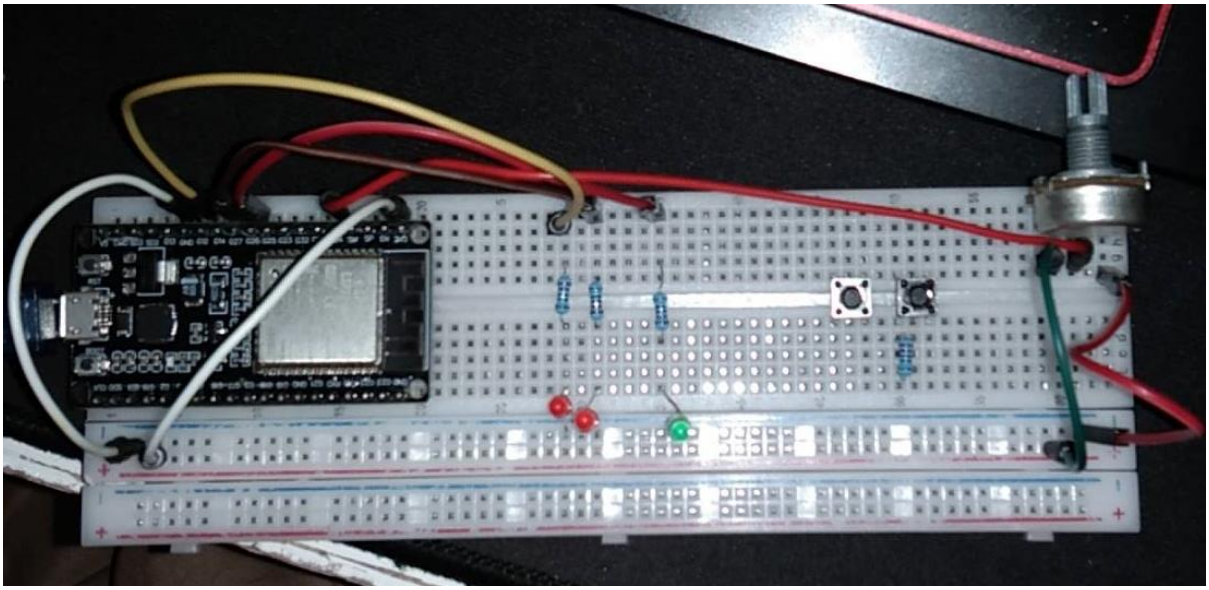
User can set the time on the selected day as well as load it.

- Firebase



Control parameters are stored in the firebase Real-Time database, which can currently up to 6 days. Other data are also store in the firebase. The data will be read from the firebase by the ESP32. And control the smart farm accordingly.

ESP32



The ESP is connected with the potentiometer and 3 LEDS

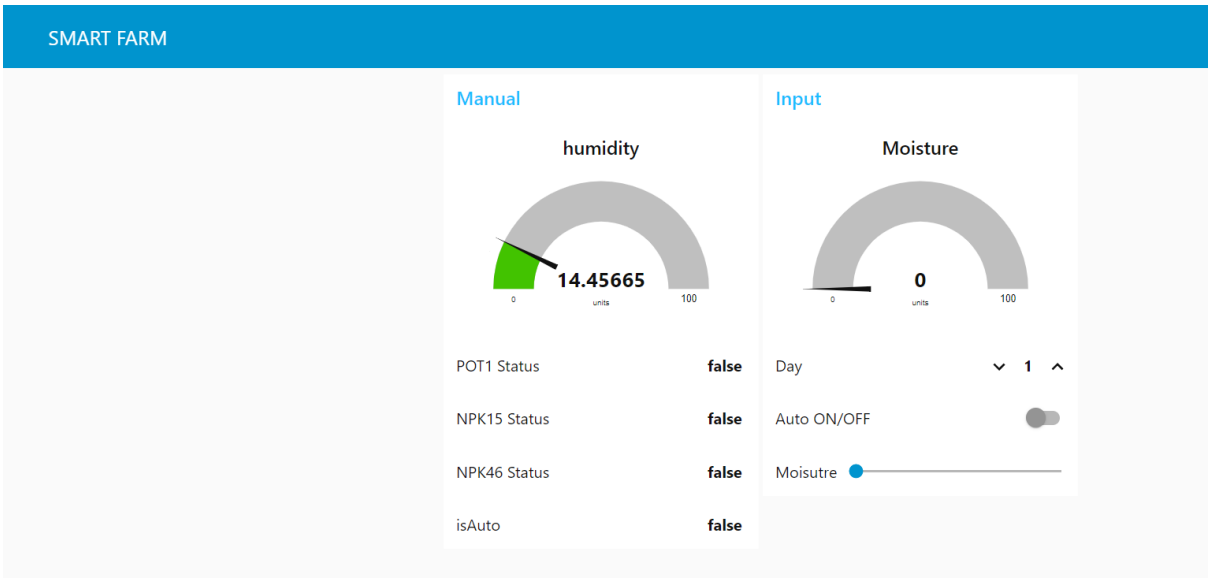
The 1st red led (Left) is the npk15.

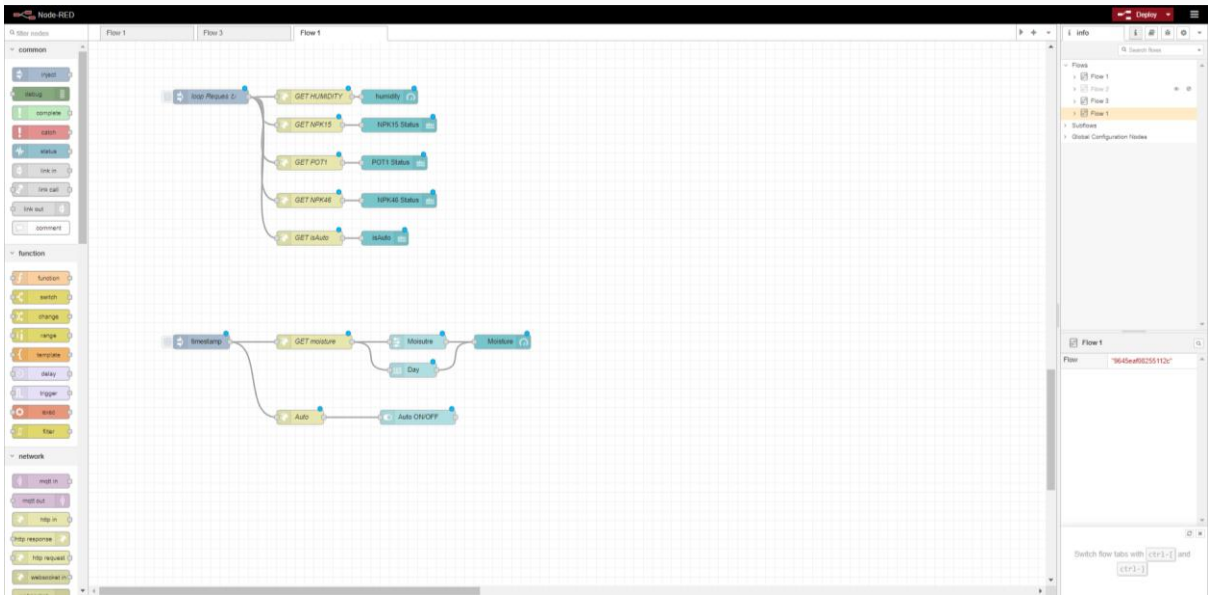
The 2nd red led (right) is the npk46.

And the green Led is the pot1

-Node-red

The dashboard is designed on Node-Red. The window shows the current status of the Smart-Farm. And the Right window (Input) is for inputting the data (Incomplete)





Conclusion:

The IOT farm enables the farmer to reduce manpower costs and increase productivity, resulting in profit maximization. It based farming incorporation with big data has potential to present a global solution to indoor and is a broad development prospect of one of the highest technologies.