VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

School of Electronics and Communication Engineering

CLOUD IRRIGATION USING IOT

A Project Report

submitted to

Faculty: Prof. Biswajit Dwivedy

Slot: G1

In

IOT FUNDAMENTALS

(ECE 3501)

By:

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CERTIFICATE

This is to certify that the project report entitled "Smart Irrigation System" submitted by M.V.S VINAY **(19BEC0765),** Sreeraj Menon **(19BEC0775),** Devakinandan Palla **(19BEC0812)** to Vellore Institute of Technology is a record of bonafide project report undertaken by us under the supervision of **Prof. Biswajit Dwivedy (Professor) .** The contents of this report have not been submitted and will not be submitted either in part or in full, for the award of any other Project Work in any other subject.

Signature of the Professor

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Aim:

The primary focus of this project is to help the farmers and reduce their work.

This module can be implemented in perennial plant irrigation land and gardening land.

This project helps the farmers to take a note on the pattern of rainfall, temperature and humidity and it enables them to approach their job in a systematic and organized manner.

Abstract:

- The project describes the smart irrigation system using the concept of IoT.
- The project uses a microcontroller module (ESP-32) which connects the system to internet.
- This module controls a motor and two solenoid valves for supplying water to the field on the information obtained from a water level indicator and two soil moisture sensors along with a humidity and temperature sensor.
- This whole system is monitored and controlled by MQTT server (My MQTT android App) through internet.
- The project depicts the concept of Internet of Things (IoT).

Motivation:

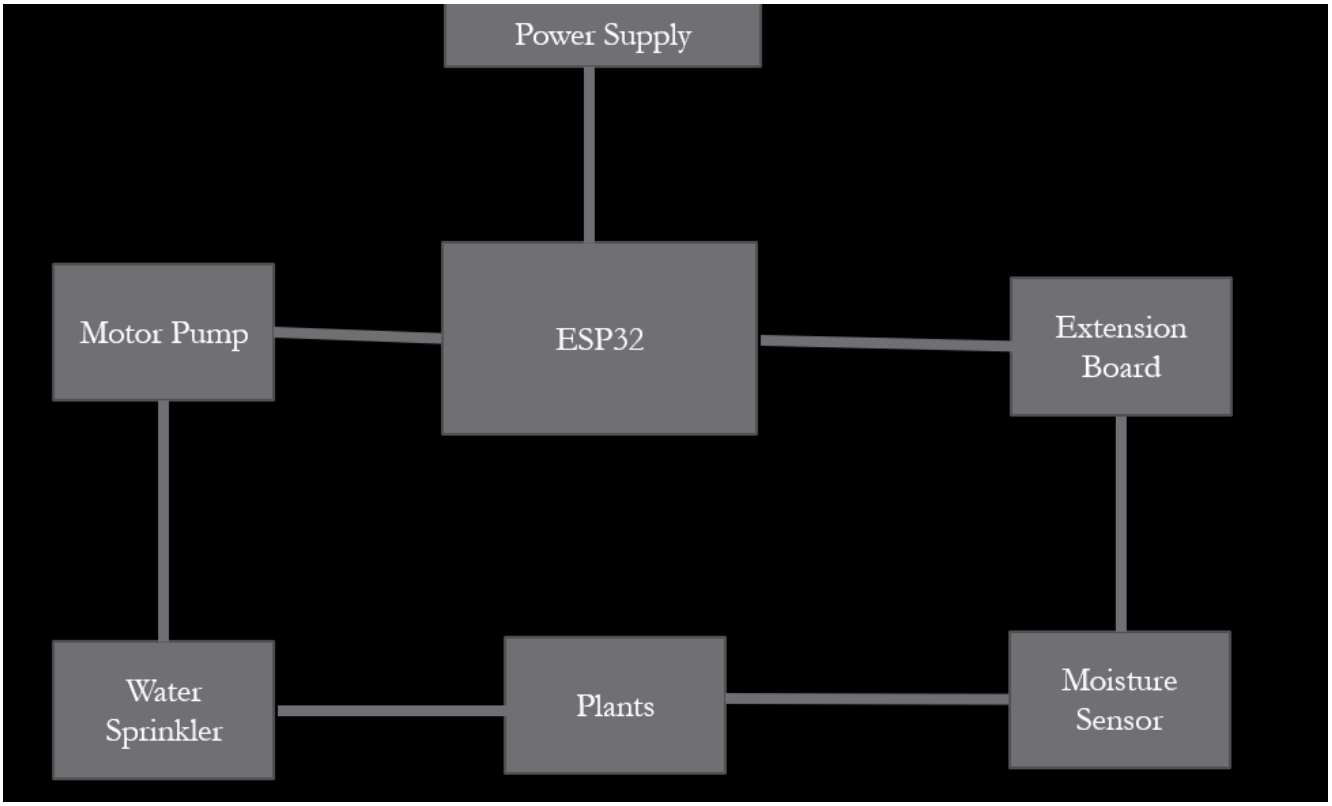
For continuously increasing demand and decrease in supply of food necessities, it's the need of the hour for improvement in production of food technology. Agriculture is only the source to provide this. This is the important factor in human societies to growing and dynamic demand in food production. Agriculture plays the important role in the economy and development, like India. Due to lack of water and scarcity of land water result the decreasing volume of water on earth, the farmer use irrigation. Irrigation may be defined as the science of artificial application of water to the land or soil that means depending on the soil type and moisture content, they are watered with the appropriate/required amount .

Working Principle & Block diagram:

In irrigation field, soil moisture sensor, temperature sensors and humidity sensors are placed in root of plant and microcontroller handles the sensor information and transmits data. One algorithm was developed to measure threshold values of temperature sensor ,humidity and soil moisture sensor that was programmed into a microcontroller to control water quantity.

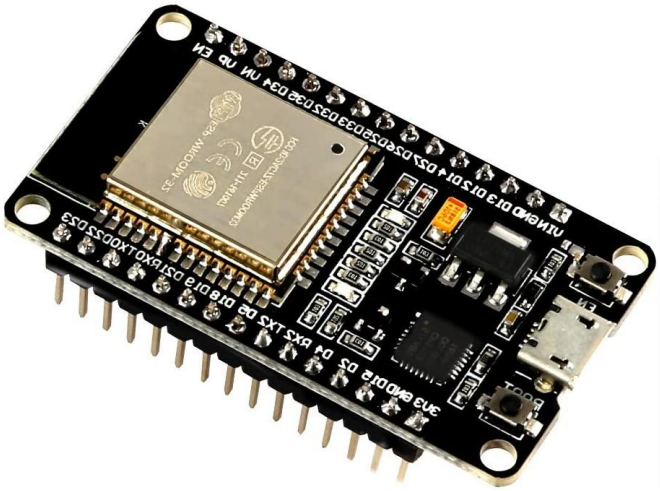
A model of automatic irrigation system which is based on microcontroller and solar power was used only for source of power supply. Various sensor are placed in paddy field. Sensors sense water level continuously and give the information to farmer through cellular phone. Farmer controls the motor using cellular phone without going in paddy field. If the water level reaches at danger level, automatically motor will be off without conformation of farmer.

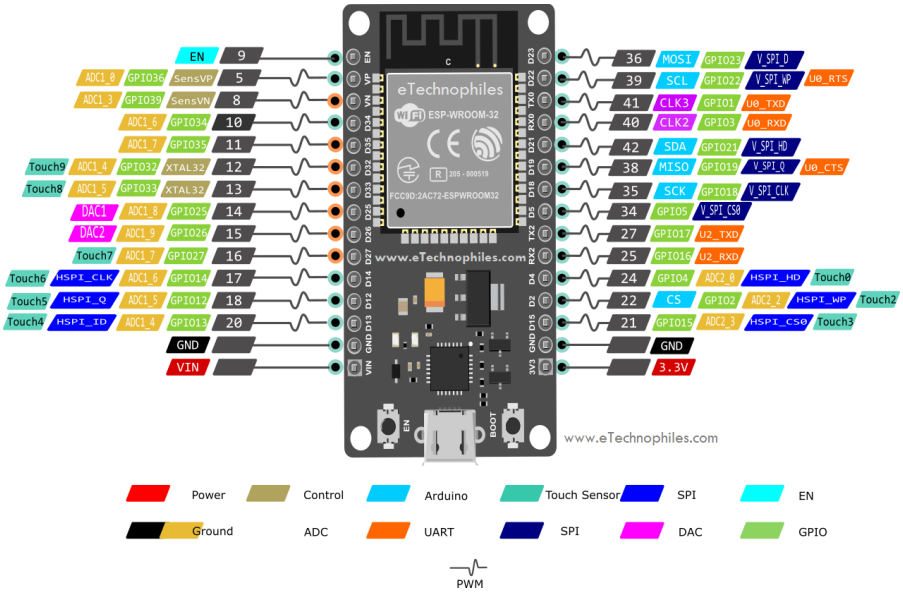
Block Diagram



For designing this project idea we have employed the following hardware components along with required IOT connections using the Arduino Code

- Esp32
- temperature sensor
- moisture sensor
- rain sensor
- relay module
- motors





Arduino Code:

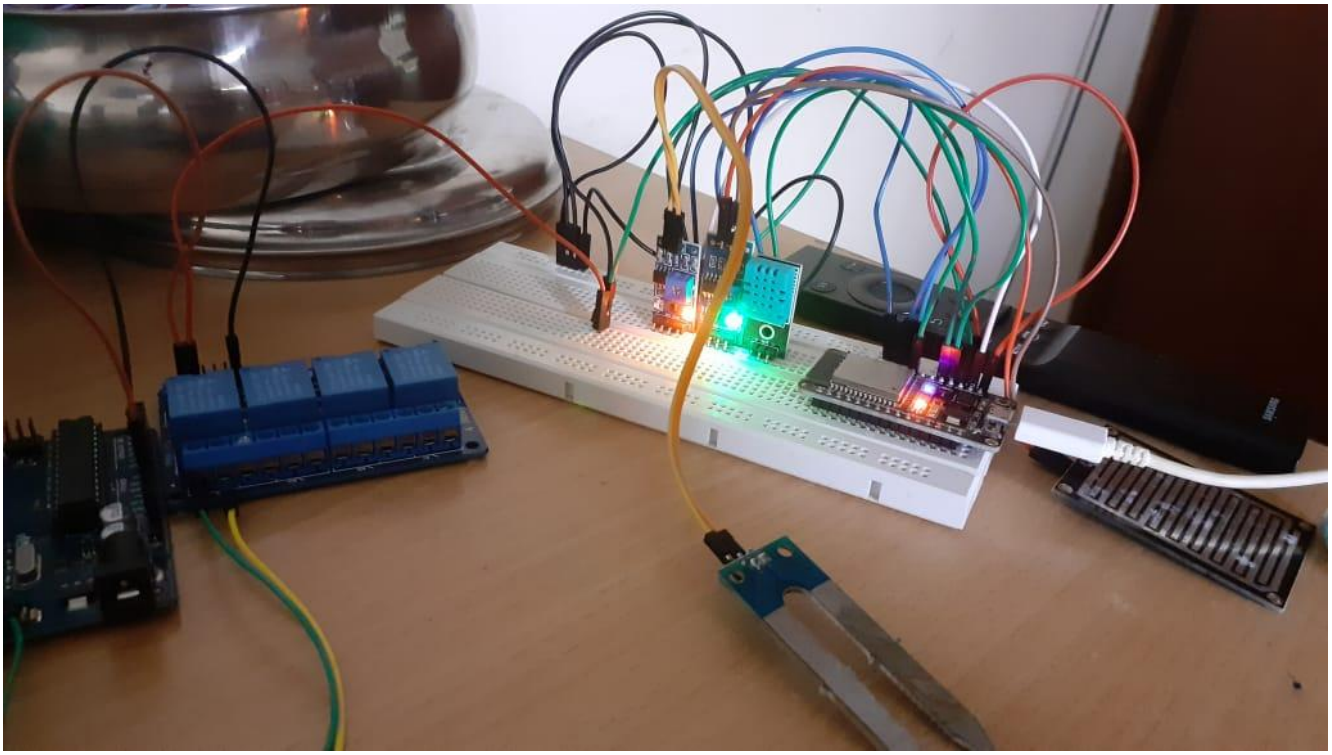
```
/* Comment this out to disable prints and save space */
#define BLYNK_PRINT Serial
#define BLYNK_TEMPLATE_ID "TMPLlSZwrvVb"
#define BLYNK_DEVICE_NAME "IOT PROJECT DEVICE"
#define BLYNK_AUTH_TOKEN
"w7o3RhivOyVw4ohwj2EwwjRgDWY7zNlR"
//------------------------------------------------------------------
#include <WiFi.h>
#include <WiFiClient.h>
#include <BlynkSimpleEsp32.h>
#include <DHT.h>
BlynkTimer timer;
//------------------------------------------------------------------

char auth[] = "w7o3RhivOyVw4ohwj2EwwjRgDWY7zNlR";
char ssid[] = "Pranay's Xstream";
char pass[] = "sapv42812";
//------------------------------------------------------------------

int moisture_pin = 5;
int rain_pin = 4;
const int DHTPin = 2;
#define WATER_PUMP 15
#define DHTTYPE DHT11
DHT dht(DHTPin, DHTTYPE);

//------------------------------------------------------------------

float temp_val ;
float humid_val;
int motor_val;
int moist_val;
int rain_val;

//------------------------------------------------------------------
```

```
void sendSensor()
{
  Blynk.virtualWrite(V0,temp_val);
  Blynk.virtualWrite(V1,humid_val);
  Blynk.virtualWrite(V2,moist_val);
  Blynk.virtualWrite(V3,rain_val);
}

//-------------------------------------------------------------------

   BLYNK_WRITE(V4)
        {
          int Upd_motor_status = param.asInt(); // Get value as integer
          digitalWrite(WATER_PUMP,Upd_motor_status);
        }
//-------------------------------------------------------------------

void setup()
{
  dht.begin();
  Serial.begin(9600);
  Blynk.begin(auth, ssid, pass);
  pinMode(WATER_PUMP, OUTPUT);
  timer.setInterval(2000L, sendSensor);
}

//-------------------------------------------------------------------

void loop()
 {
   Blynk.run();
   timer.run();
   //---------------------------------------
   float upd_humid = dht.readHumidity();
   float upd_temp  = dht.readTemperature();
   if (isnan(upd_humid) || isnan(upd_temp))
    {
    Serial.println("Failed to read from DHT sensor!");
    return;
```

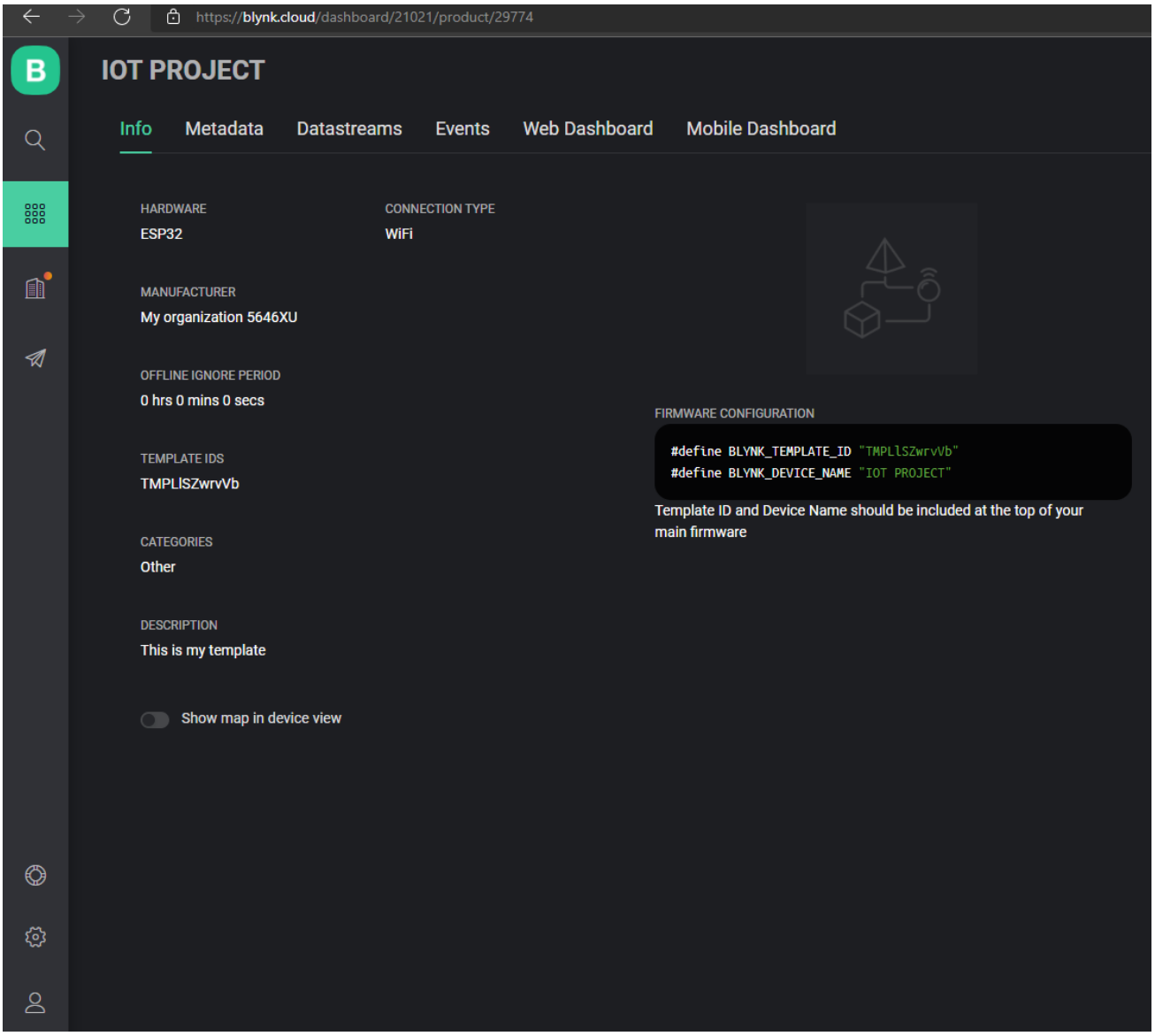
```
    }
    humid_val=upd_humid;
    temp_val=upd_temp;
    Serial.print("Humidity is: ");
    Serial.println(humid_val, 1);
    Serial.print("Temperature is: ");
    Serial.println(temp_val, 1);
   //---------------------------------------
    float upd_moist = 0;
    upd_moist = analogRead(moisture_pin);  // read the values of moisture
sensor
    upd_moist = map(upd_moist,0, 858, 0,100);
    moist_val = upd_moist;

    Serial.print("Soil Moisture is  = ");
    Serial.print(moist_val);
    Serial.println("%");
    if(moist_value == 0)
    {
      digitalWrite(WATER_PUMP,HIGH);
    }
    else
    {
      digitalWrite(WATER_PUMP,LOW);
    }

   //---------------------------------------
    int upd_rain = digitalRead(rain_pin);         // calling the function values
and storing "val" variable
    if(upd_rain==0)
    {
    Serial.println("yes, its  raining");

    }

    else
    {
    Serial.println("no its not raining");
    }
```

```
  rain_val=upd_rain;
  Serial.print("Digital Output: ");              // print statements
  Serial.println(rain_val);                      // print statements
 //----------------------------------------
  sendSensor();
  Blynk.syncVirtual(V0, V1, V2, V3);
  delay(2000);
}
```

ATTACHED PROOF FOR HARDWARE IMPLEMENTATION:



We have employed the Blynk app to show us the results after the code is uploaded to the hardware system.



Results and Inference:

Sample output screenshot of the system in thin air:(Blynk app)

The detailed explanation behind working of the system and the results obtained has been attached in the 2 links below in video format

->
https://drive.google.com/file/d/1Ovuqphs3dAkzcNELY95XQ08FTbRYHN9G/view?usp=sharing

->
https://drive.google.com/file/d/1agAFZJdLqymPsdk1u5EEni9EIka-Ezt1/view?usp=sharing

Conclusion:

- The agriculture field is being monitored and controlled by My MQTT android app at user end.
- The ESP32 is the device at field end which receives the messages from broker network and manipulates it and will perform the function mentioned in data(soil moisture content, humidity, temperature and whether it is raining or not)
- Afterwards it will send the required data to broker network and in turn it will be published to the Client (user end).

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Research on the Denoising Algorithm of Speech Signal

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