VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Jnana Sangama, Belgaum- 590 018

IOT PROJECT REPORT

ON

"Smart Plant Monitoring System"

Submitted in the partial fulfilment of the requirements for the award of the Degree of

Bachelor of Engineering in Computer Science and Engineering

submitted by

KARTIKEY RAI

1DB19CS066

Under the guidance of

Dr. K B SHIVAKUMAR

Head of Dept.,

Dept of CSE

Don Bosco Institute of Technology

Mysore Road, Kumbalgodu, Bengaluru-560074

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ABSTRACT

Farming is the cultivation of plants and livestock. Plant monitoring is one of the most important tasks in farming. The goal is to use IoT in the NodeMCU system platform for plant monitoring and smart gardening. The primary goal of this paper is to reduce direct interaction and provide comfort to the farmer by improving the system's overall performance. Humidity, sunlight, and soil moisture are important factors to consider when monitoring plant productivity. Plant growth and health information must be provided to the user on a continuous basis by monitoring and recording these parameters. The NodeMCU interfaces with all of the sensors used in this project. Farmers can use IoT to directly monitor and control plant information via their smart phones. By sensing and controlling the parameters of the plants without their physical presence, this smart gardening system will provide the user with convenience and comfort. The smart gardening application can be installed on any Android-enabled device. The software used is the Arduino IDE and the IoT platform. The Arduino IDE is used to compile and upload the programme to the NodeMCU, and the Blynk IoT platform is used to display temperature, humidity, and soil moisture from a distance. When the soil moisture is very less then we can turn motor ON and pump the water to the plant after that soil moisture increases and then turn motor OFF from the smartphone. This will assist the farmer in understanding the relationship between plant growth and mentioned plant parameters

BLOCK DIAGRAM

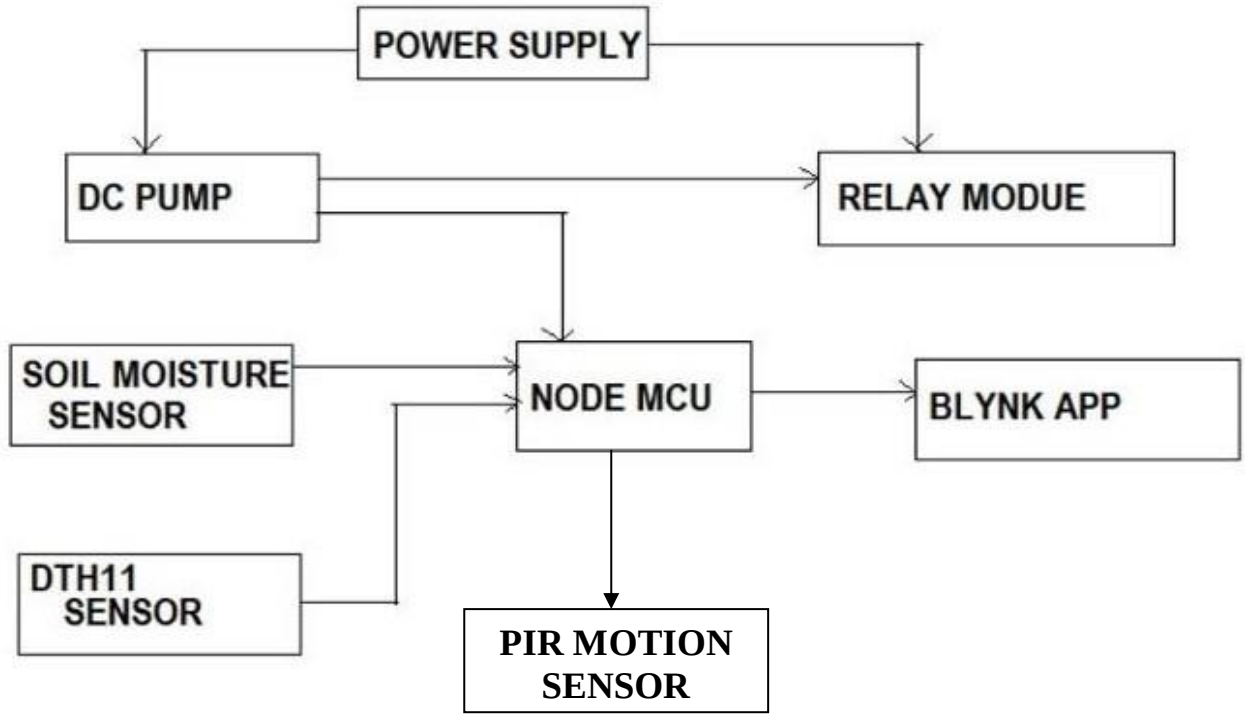

Fig. 1 Block Diagram of Plant Monitoring System

The Physical Description of project can be represented by the above Fig 1.. All Sensors are connected to the NodeMCU and DC Pump and Relay module is connected to Power Supply. Here we use the power supply as Battery. The Output can be shown in Blynk App. This app is used to Monitor and Control our Hardware project and Display the parameters in Web Dashboard of Blynk App.

- **The Steps for Flow Of Method**

1. When we give the power supply the NodeMCU activate. Then also sensors get ON.
2. When sensors are ON It reads the data from soil and also from Surroundings.
3. Based on the values which are detected by Sensors motor can be turn ON/OFF.
4. The Sensor only collects all the values and sends it to ESP8266 Wi-Fi protocol.
5. The Information Display on the Blynk App.
6. Then the user can easily control the motor by using Blynk App.

CIRCUIT DIAGRAM

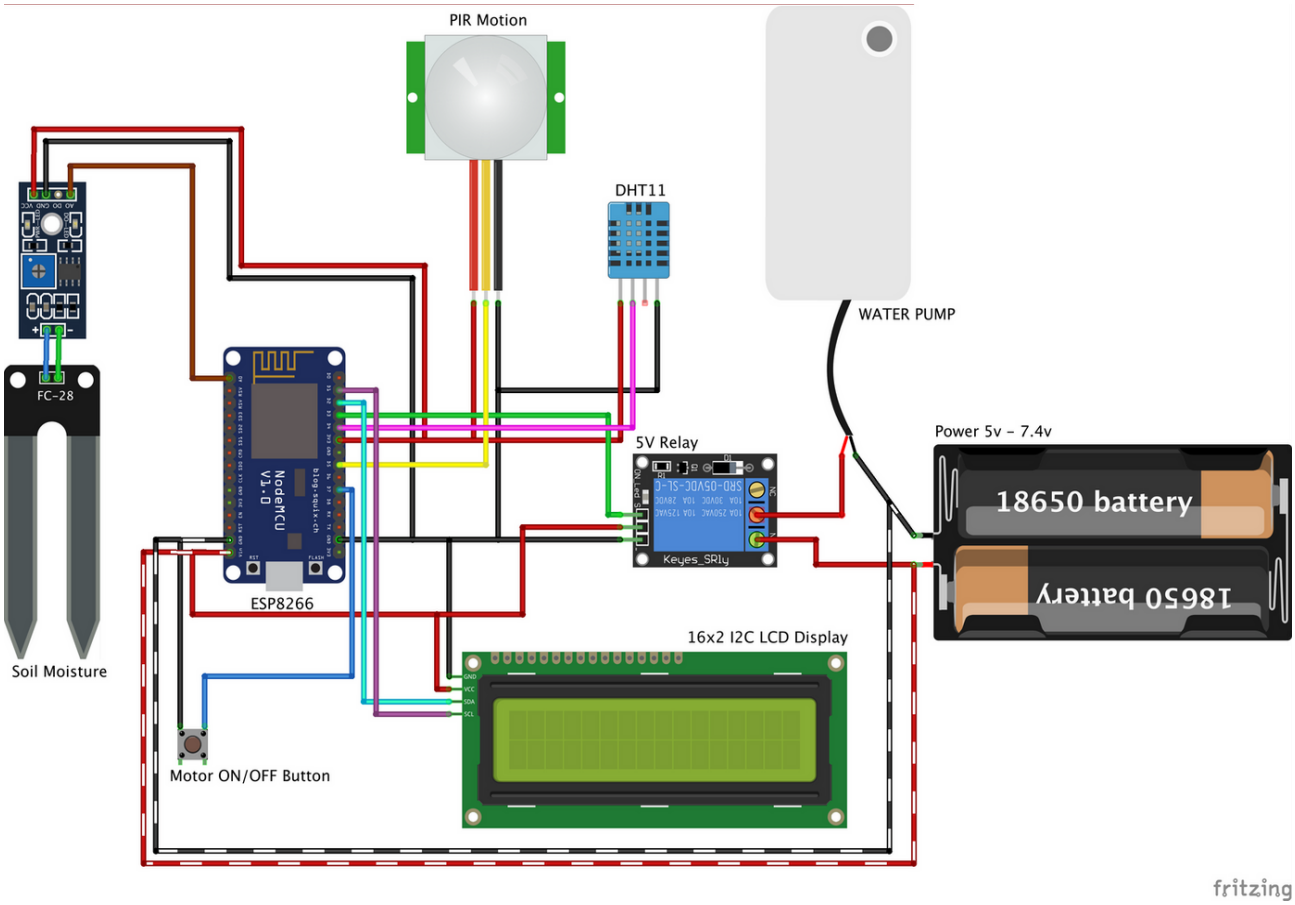

Fig. 2 Circuit diagram Plant Monitoring System

COMPONENTS

NodeMCU

Fig. 2.1

NodeMCU is an Internet of Things (IoT)-focused open-source Lua-based firmware and development board. It includes software for Espressif Systems' ESP8266 Wi-Fi SoC as well as

hardware for the ESP-12 module.The major argument for choosing this is that it is cheap and includes a built-in Wi-Fi module. Because it is similar to Arduino, it can be programmed using the Arduino IDE software. It has ten General Purpose Input/Output pins for connecting to external devices. A standard NodeMCU, complete with pin numbers.

Soil Moisture Sensor

Fig. 2.2

The Soil Moisture Sensor is a straightforward breakout for determining the moisture content of soil and other similar materials. The soil moisture sensor is simple to set up and operate. The sensor's two big exposed pads serve as probes, and combined they operate as a variable resistor. The greater the amount of water in the soil, the better the conductivity between the pads will be, resulting in a lower resistance and a larger SIGout. It's commonly used in greenhouses to regulate water supply and other bottle enhancements. Experiments in biology to track the amount of water in the soil.

DHT 11

Fig. 2.3

The dht11 sensor, which combines a temperature and humidity sensor, typically outputs either digital or analog data. It contains information about the temperature around the plant if it needs extra sunshine and the degree of humidity in the surrounding environment. Water vapor is detected by measuring the electrical resistance between the two electrodes. The humidity sensing component consists of the electrode and the substrate, which is responsible for retaining moisture while in contact with the surface. Ions are released by the substrate. The conductivity between the electrodes

rises as soon as water vapour is absorbed by it. The calibration result of the dht11 sensor is quite accurate. Because of its small size and low power consumption, the DHT11 sensor has a wide range of uses. It can also transmit signals over a distance of up to 20 meters. The product we used was a four-pin single row pin box.

PIR Motion Sensor

Fig. 2.4

This project is using passive infrared (PIR) sensor to detect if intrusion occurs at crop field. The PIR sensor can detect living obstacles such as human and animal. The sensor operates by detecting the temperature and wavelength of objects. If an object or obstacle detected by the sensor meet the requirement as the sensor detect human and animal presence, the sensor will send the data to the NodeMCU microcontroller. Once detected, it will send notification on the smartphone.

Relay

Fig. 2.5

It is an Electrical switch it opens and closes Under control of another electric circuit. Relay Uses the power supply for opening and closing Switch contacts. The supply voltage range from 3.75 to 6V.Operating time is 10ms.

SOFTWARE TOOLS

Blynk IoT is main Software Tool of Our Project. Blynk is a comprehensive software suite that enables the prototyping, deployment, and remote management of connected electronic devices at any scale. Whether it's personal IoT projects or commercial connected products in the millions, Blynk empowers users to connect their hardware to the cloud and create iOS, Android, and web applications, analyze real-time and historical data from devices, remotely control them from anywhere, receive important notifications, and much more.

It can be Installed by using Following Steps:

First we have to install the Blynk IoT App from play store. After Create Account on Blynk App by using Mail Id.Then go to Developer mode and Create New Template According to our project. After creation of Template we have to go to DataStream's and create Separate Data stream for each parameter. In our project we take Four Data Streams like Temparature,Humidity and Soil Moisture along LED. After Create Web Dash Board for Displaying parameters purpose. In Web Dash Board we take three Gauges for measuring Temperature Humidity and Soil Moisture and take Switch as LED for ON/OFF.

RESULTS

The below Fig. shows the real time results on Blynk App web dashboard Screen.it displays the Exact Temperature ,Humidity and Soil Moisture Readings. It also has PIR motion sensor switch through which we can turn on and off. Red led blink when sensor detects any intruder. It has a motor on and off switch. The Blynk application is connected to Wi-Fi.Through this Wi-Fi the App can shows the Readings in any Android Device.

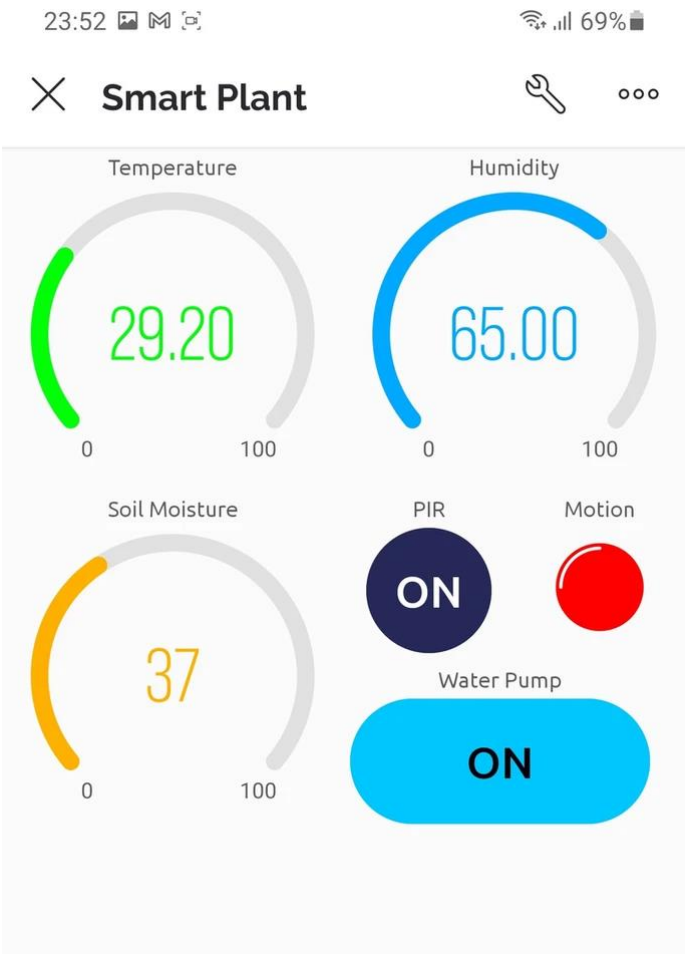

Fig. 3.1 Dashboard on Blynk App

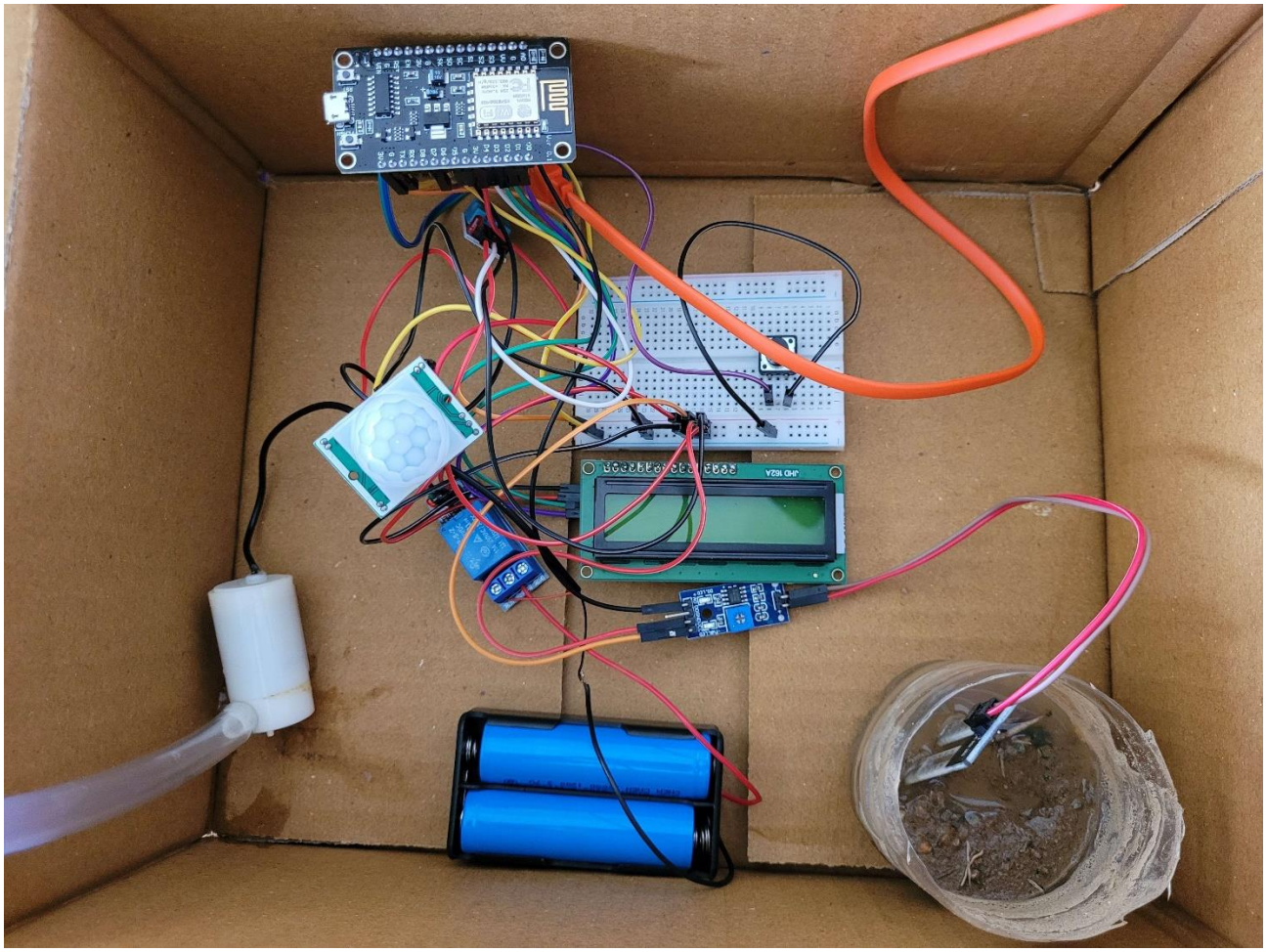

Fig. 3.2 Plant Monitoring System

CONCLUSION

By this project we Conclude that we reduce the Effect of daily Watering of plants and we can Improve the growth of the plant and health also Improved.

FUTURESCOPE

The Future Scope of this Project never be ended Because in today fast World every person will Require a helping hand to take care of plant and Plant health status. This is Further used for large Scale of Agriculture Purpose to increase the CropRate and help farmers to reduce man power.