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IOT BASED SMART AGRICULTURE SYSTEM

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ABSTRACT

Smart Agriculture system is an aborning topic in this materialistic world. This project describes the concept of featuring and elasting an agriculture platform to the internet world. Agriculture is the most important of human life so it can be improvised by using IoT technology. IoT technology gives a grasp to enhance the power of automation systems in agriculture. Smart agriculture System that uses the advantages of cutting-edge technologies such as Arduino and Wireless Sensor Network. This project proposes the concept and features of the sensor world in the internet of things for agriculture which is used to enhance the production of crops. Agriculture is the primary occupation in our country for ages. Various sensor nodes are deployed at different locations in the farm. Controlling these parameters are through any remote device or internet services and the operations are performed by interfacing sensors, Wi-Fi, camera with micro-controller. This concept is created as a product and given to the farmer's welfare.

Keywords: IOT, Nodemcu, Moisture sensor, DHT11 sensor.

I. INTRODUCTION

As the world is trending into new technologies and implementations it is a necessary goal to trend up in agriculture also. Many researches are done in the field of agriculture. Most projects signify the use of wireless sensor network collect data from different sensors deployed at various nodes and send it through the wireless protocol. The collected data provide the information about the various environmental factors. Monitoring the environmental factors is not the complete solution to increase the yield of crops. There are number of other factors that decrease the productivity to a greater extent

Figure 1: Shows the overview of IoT-based smart agriculture factors

II. WORKING OF IOT

An IoT ecosystem consists of web-enabled smart devices that use embedded systems, such as processors, sensors and communication hardware, to collect, send and act on data they acquire from their environments. IoT devices share the sensor data they collect by connecting to an IoT gateway or other edge device where data is either sent to the cloud to be analysed or analyzed locally. Sometimes, these devices communicate with other

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related devices and act on the information they get from one another. The devices do most of the work without human intervention, although people can interact with instance, to set the for them up, give them instructions

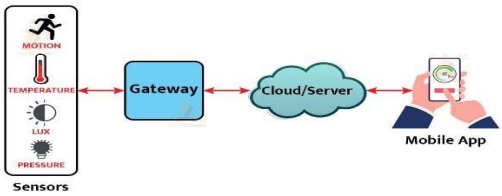

Figure 2: Working of IOT

Figure 3: Processes in IOT

I. BLOCK DIAGRAM

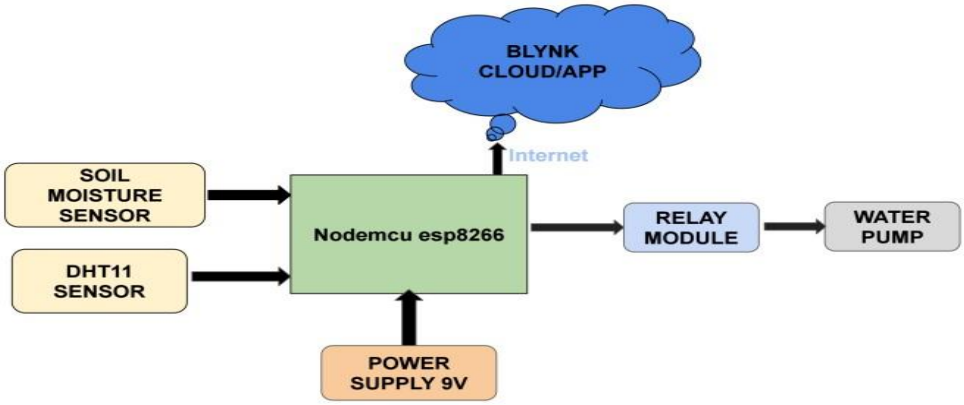

Figure 4: Block Diagram

II. CIRCUIT DIAGRAM

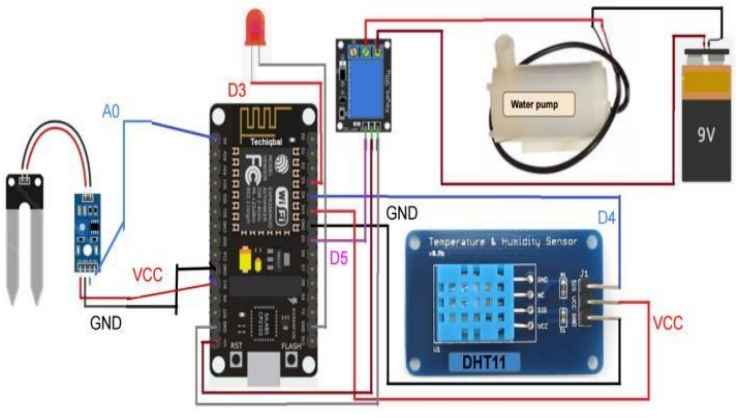

Figure 5: Circuit diagram

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III. Working Explanation

NodeMCU is an Internet of Things (IoT)-focused open-source Luabased firmware and development board. It includes software for Espress if 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[10]. 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.

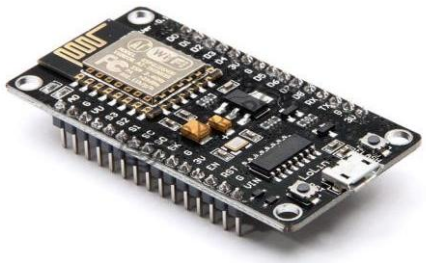

Figure 6: nodemcu

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.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 vapor 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 nce of up to 20 meters. The product we used was a four-pin single row pin box. Blink is a platform that allows you to control Arduino, Raspberry Pi, and other devices via the Internet using IOS and Android applications. It's a digital dashboard where you may drag and drop widgets to create a graphic interface for your project. Blink is a programme that allows you to create your own apps. It can be applied to a single project or a number of them. Virtual LEDs, buttons, value displays, and even a text terminal, as well as the ability to interact with one or more devices, may be incorporated in any project.

IV. SOFTWARE TOOLS REQUIREMENTS

Arduino IDE:Arduino IDE The Arduino Integrated Development Environment (IDE) is a cross-platform application in which the functions are written in C and C++ languages. It is used to write and dump the written programs to Arduino compatible boards with the help of third party cores and other vendor development boards.

Figure 7: Arduino IDE application

Blynk cloud / Application: After adding the device, Blink will generate an Authentication Token that can be used for controlling any microcontroller from Blink IoT App through the internet. First, you have to create a template in Blink Cloud. You can refer to the following article to set up the new Blink cloud account.

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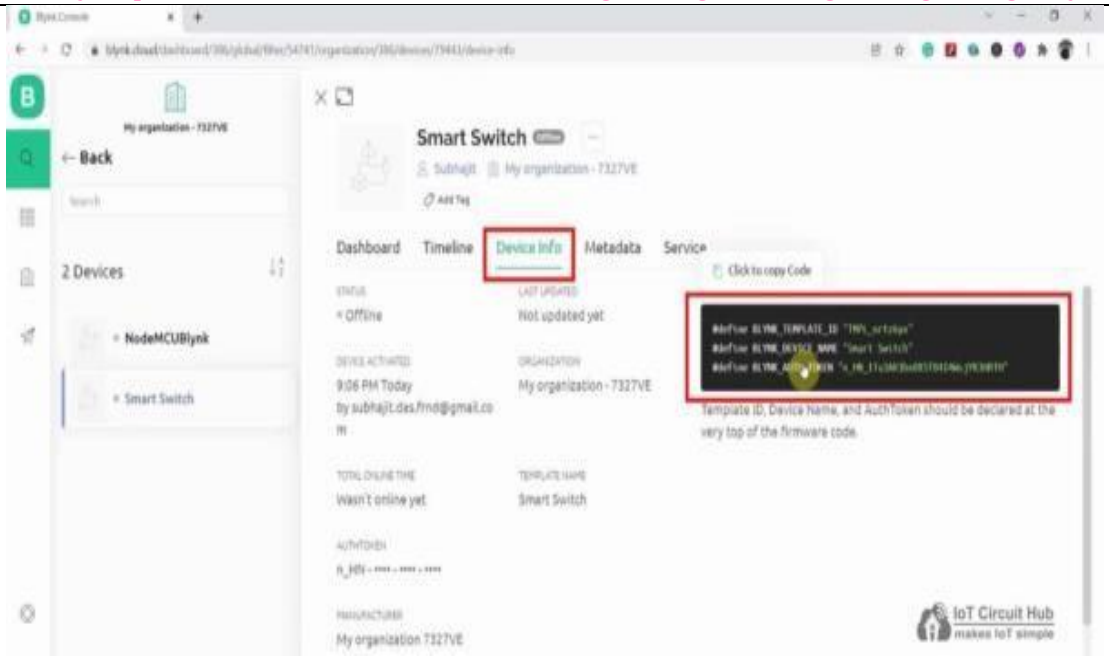

Figure 8: Blynk cloud

V. RESULTS AND DISCUSSION

The values obtained through sensors enable the system to switch the sprinkler on and off. A farmer can remotely monitor the irrigation process on the farm. Hence, the system contributed in making a smart farm. depicts the readings of the two YL-69 soil moisture sensors taken over a period of one hour. depicts readings from two YL-69 soil moisture sensors one of which was inserted in over irrigated soil and the other in soil with initial moisture content 79% . The readings were taken over a period of one hour to observe the rate at which moisture content in soil is reducing when the sprinklers are off. These readings are transmitted to the website and blynk channel.

Figure 9: Monitoring report.

VI. CONCLUSION

IoT will help to enhance smart farming. Using IoT the system can predict the soil moisture level and humidity so that the irrigation system can be monitored and controlled. IoT works in different domains of farming to improve time efficiency, water management, crop monitoring, soil management and control of insecticides and pesticides. This system also minimizes human efforts, simplifies techniques of farming and helps to gain smart farming. Besides the advantages provided by this system, smart farming can also help to grow the market for farmer with single touch and minimum effort.

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