SMART IRRIGATION SYSTEM USING IOT(BLYNK APP)

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ABSTRACT

Today's world is experiencing a water shortage, making it urgent to implement clever irrigation techniques. The project explains how IOT can be used to manage irrigation in an intelligent manner. The goal of this project is to save time and steer clear of issues like ongoing vigilance. By automatically watering the plants or field based on their needs, it also aids in water conservation. Additionally useful in agriculture, parks, and lawns, this system. This system's goalis to measure the soil's moisture content and, if necessary, sprinkle water. A mobile phone belonging to the user will receive all of this data. The idea behind this project is to give land owners the ability to oversee and monitor the development of the plants in their farms.Thisis accomplished by using an intelligent IoT platform and Arduino to control the water flow based on the soil moisture and provide real-time surveillance to the owners who live far from the farms. In order to prevent losses, this project also enables surveillance of the workers and their crops. Anyone with a Smartphone can use it with ease, and once it is set up, it doesn't need to be maintained.

INTRODUCTION

Since agriculture is our primary source of food and other raw materials, it is regarded as the foundation of our way of life. It is essential to the expansion of the nation's economy. Growth in the agricultural sector is essential for the improvement of the nation's economic situation. Unfortunately, a lot of farmers continue to employ old-fashioned farming practises. The main goals of this project are to conserve water and use as little labour as possible to irrigate the fields. The system that was created is set up to irrigate at regular intervals for predetermined lengths of time. In this method, soil moisture sensors are positioned close to the module and in the root zone of the plant. The gateway unit manages sensor information and transmits data to the controller, which in turn controls the water flow through the valves.

To fix the problems with the current system, we now irrigate the land based on the soil humidity and wirelessly update the Android App with the irrigation status. Farmers will be able to use the proposed system to remotely manage the supply while continuously monitoring the amount of moisture in the field.In order to achieve optimal irrigation using the Internet of Things, sprinklers or drip irrigation systems would be turned on automatically when moisture drops below a certain level.

LITERATURE SURVEY

Both the economy and the survival of the Indian people depend on agriculture. The goal of this project is to develop an embedded-based irrigation and soil monitoring system that will lessen the need for manual field monitoring and deliver data via a mobile app.The technique is designed to assist farmers in boosting agricultural output. The equipment used to inspect the soil includes a pH sensor, a temperature sensor, and a humidity sensor. Farmers may choose to plant the best crop for the land based on the findings. Wi-Fi is used to transmit sensor data to the field manager, and a mobile app is used to generate crop advice. Use of an automatic watering

system is necessary when the soil temperature is high.

[1] Dweepayan Mishra,Arzeena Khan,Rajeev Tiwari,Shuchi Upadhaye

Indians rely heavily on agriculture as a source of income, which has a significant effect on the country's economy. In order to increase yield and deliver products of higher quality,crop development is crucial. Therefore, crop beds with ideal conditions and the right amount of moisture can significantly affect output. Streams that flow from one end to the other of an area are common examples of traditional irrigation systems. The delivery of this material has the potential to change the fields' moisture content. The management of the water system can be improved with the aid of a designed watering system.

[2] Shweta B.Saraf, Dhanashri H.Gawali

The Internet of Things (IoT) is the internet-based connectivity of a huge number of devices(IoT). A unique identity links each item, allowing data to be sent without human involvement It makes it possible to develop strategies for improved natural resource management. Smart gadgets with sensors, according to the IoT concept, enable interaction with the physical and logical worlds. The proposed system in this study is built on the Internet of Things and uses real-time input data. Over a wireless sensor network, a smart farm irrigation system uses an Android phone to remotely monitor and regulate drips. Between sensor nodes and base stations, Zigbee isutilized to communicate. The server's real-time observed data is processed and presented using aweb-based java graphical user interface. Field irrigation system wireless monitoring eliminates human interaction and enables for remote monitoring and control using an Android phone.

[4]H.G.C.R.Laksiri,H.A.C.Dharmagunawardhana,J.V.Wijayakulasooriya

The creation of an efficient loT-based smart irrigation system is another essential requirement for farmers in the agricultural sector. A low-cost, weather-based smart watering system is created by this research. In order to get started, an efficient drip irrigation system that can automaticallyadjust water flow to plants based on soil moisture levels must be developed. Then, an IoT-basedcommunication feature is added to this water-saving irrigation system to increase its efficiency.This feature enables a remote user to monitor soil moisture levels and manually adjust water flow. The system also includes sensors for temperature, humidity, and raindrops that have been updated to enable online remote monitoring of these variables. These field weather variables are kept in a distant database in real time. Finally, a weather prediction algorithm is used to manage water distribution based on the current weather conditions. The suggested smart irrigation system would enable farmers to irrigate their crops more effectively.

PROPOSED SYSTEM

There are both hardware and software components in this system. The hardware portion consists of various sensors, including an Arduino board and a soil moisture sensor. The software, however, is made up of an Android app that is connected to an Arduino board and other hardware through the Internet of Things (IoT). Water conservation and irrigation process improvement canboth be attained through the use of an improved irrigation system and wireless network. This research tries to automate the process of irrigation on the farmland by monitoring the soil waterlevel of the soil relative to the plant being cultivated and the adaptively sprinkling water to simulatethe effect of rainfall..

This project was created to monitor irrigation systems in farms without the need for manual irrigation system inspection. For instance, if you live in Bangalore and your farm is in Andhra Pradesh or somewhere else, it would be impossible for you to regularly visit the farms to monitor the plants. Instead, this project enables you to monitor your plants with a straightforward IoT system. The good thing about this project is that the node that

connects the system to your smart device also regulates the irrigation cycle timing and water flow from the pump. This essay will cover every aspect of the project, including its construction and operation.

Base Paper Explanation

[1] Essentially, the designed system has two inputs and two outputs. Moisture sensor and level sensor are the inputs, and the pumping motor is the output.The innovative aspect of this project is the integration of a level sensor and moisture sensor for effective irrigation. In order to pump water from the ground to a reservoir, the level sensor determines whether or not to operate our pumping motor. By measuring the water content of the soil the plant is growing in, the moisture sensor determines whether or not the plant needs to be watered. We can turn on and off the valve using soil moisture sensor alone but what is going to be done suppose the water in our reservoir gets finished during irrigation time.With out a doubt, a man is required to take the task of pouring water. With little power consumption, this project simplifies, expedites, and makes things easier.No one can question the concept because a human being has existed in cultivation.

[2] This paper presents a novel approach towards effective irrigation system. An Arduino,moisture sensors, a submersible water pump, and a relay mechanism made up the prepared system. The Arduino system will take the inputs from both sensors and determine how much water should be supplied based on the two moisture sensors' ability to detect the dryness of the soil at two different locations on the field. The pump will be automatically turned off when the soil has enough moisture, at which point the system will continue to take inputs from the sensors.With relatively little expense, this irrigation system will ease farmer hardship, save time, and improve accuracy and effectiveness.

[3] The need to constantly monitor over-irrigation is one of the many issues that farmers encounter in the course of their regular farming operations.The distance a farmer must frequently travel to get to their fields and irrigation pumps is several kilometres. Therefore, a farmer spends a significant amount of time and effort each day irrigating the field when they could be spending that time on other farms, like raising animals, which requires much more constant monitoring and care. In this paper, a project is put forth that involves developing a system to fully automate irrigation so that little to no human involvement is needed. The objective is to install a wireless sensor network in the field that will gather information about soil moisture and send instructions to turn on the water pump if the level drops below a predetermined threshold.

[4] In order to place the water directly into the root zone and reduce evaporation, drip irrigation was used in this project, where the water was allowed to drip slowly to the plant roots from above the soil surface or buried into the surface. It uses temperature sensors, soil humidity sensors, and float switches to collect and monitor field data as well as to check the level of ground water via a website. The field will receive an SMS alert when the ground water level drops and the field becomes dry. This offers a solution to the issues that arise when creating a system for smart farming. The water pump, relay, and node MCU are used.

[5] The farm can be technologically advanced with electronic innovation that continuously monitors the conditions of the soil,crops,and condition so that the crops can be watered and shed as needed. With the help of IoT, the entirety of this can be managed and monitored online, and by using our suggested algorithm to train our model, human-like intelligence can be added.To shield the garden from sunlight and rain, we will create a device that will be connected to awater pump and a shed and operated by a single-channel relay. The water syphon and shed are subsequently controlled based on estimates of various natural elements such as temperature, moistness, soil dampness, and light intensity, which we can quantify through sensors such as the Temperature and Humidity Sensor (DHT-11), Moisture Sensor, and LDR Light Sensor. Bystoring the historic values from previous scans in the database and performing pre-perception onthose values during the working

model's learning phase, we will attempt to make the model intelligent through our research.To train our model,we'll use a linear regression algorithm.

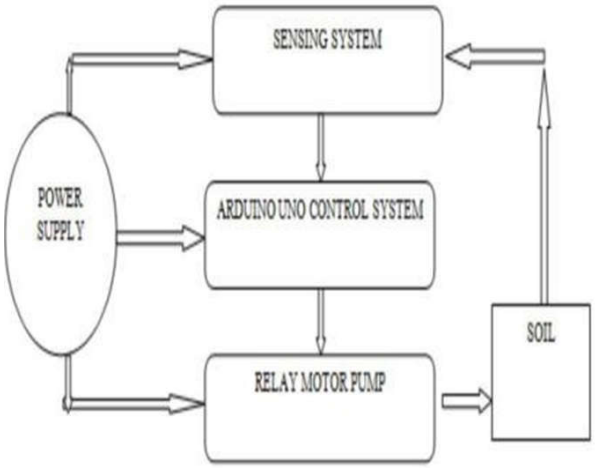
Proposed System Architecture

A system's structure,behavior,and other aspects are defined by its system architecture,which is a conceptual model. A formal description and representation of a system that is setup to facilitate analysis of its structures and behaviours is called an architecture description.

A block diagram is a system's representation of its main components or functions through the useof blocks connected by lines that reveal the connections between the blocks. They are widely used in engineering for process flow diagrams, software design, electronic design, and hardware design.

Block diagrams are frequently used for higher level, less detailed descriptions that aim to make overall concepts clearer without worrying about implementation specifics. In contrast, electrical engineering uses layout and schematic diagrams, which show the physical construction and implementation details of electrical components.

Block Diagram



Introduction to Blynky:

For use with the Internet of Things, Blynk was created. It has many cool features, including remote hardware control, sensor data display, data storage, data visualization, and many more.

The platform consists of three main parts:

- BLYNK APP : With the help of the many widgets we offer, you can design stunning user interfaces for your projects.

• BLYNK SERVER : In charge of overseeing all communications between the hardware and the smart phone. You can run your own personal Blynk server locally or use our Blynk App. It can easily handle tens of thousands of devices and is open-source.

• BLYNK LIBRARIES: Enable communication with the server and process all incoming and outgoing commands for all common hardware platforms.

• NOW IMAGINE: Imagine that whenever you press a button on the Blynk app, a message issent to the app, where it somehow manages to reach your hardware. The process is the same going the other way,and it all happens in a blink of an eye.

BLYNK CONFIGURING

Blynk can be configured for our application using justa few simple steps : The necessary supplies are
Hardware equipped with WiFi

A mobile device with the Blynk app installed

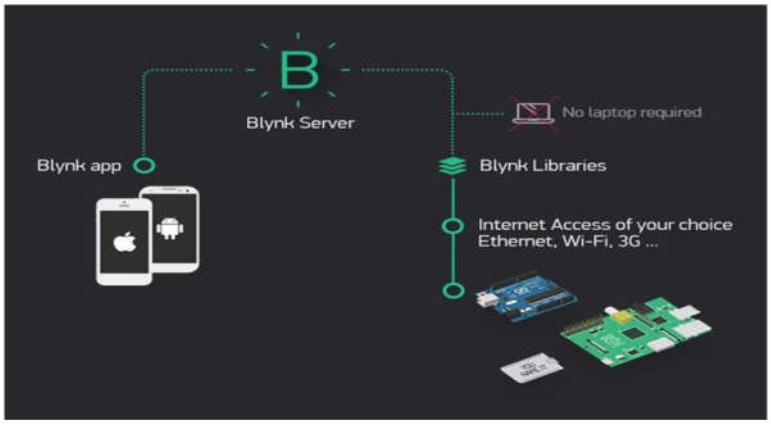
1. Equipment:

The following hardware can be used with a Blynk development kit made for Arduino, Raspberry Pi, Node MCU, or similar platform.

Using the Internet, Blynk operates. This means that the hardware you select should have an internet connection. Some of the boards, such as the ArduinoUno, require an Ethernet or Wi-Fi Shield to communicate, while others, such as the ESP8266, Raspberry Pi with Wi-Fi dongle, Particle Photon, or Spark Fun Blynk Board, are already Internet-capable. However, even if you don't have a shield, you can still connect it to your laptop or desktop via USB (it's a little more difficult for beginners, but we can walk you through it).

2. Mobile device

A well-designed interface builder is the Blynk App. It is compatible with both iOS and Android operating systems.

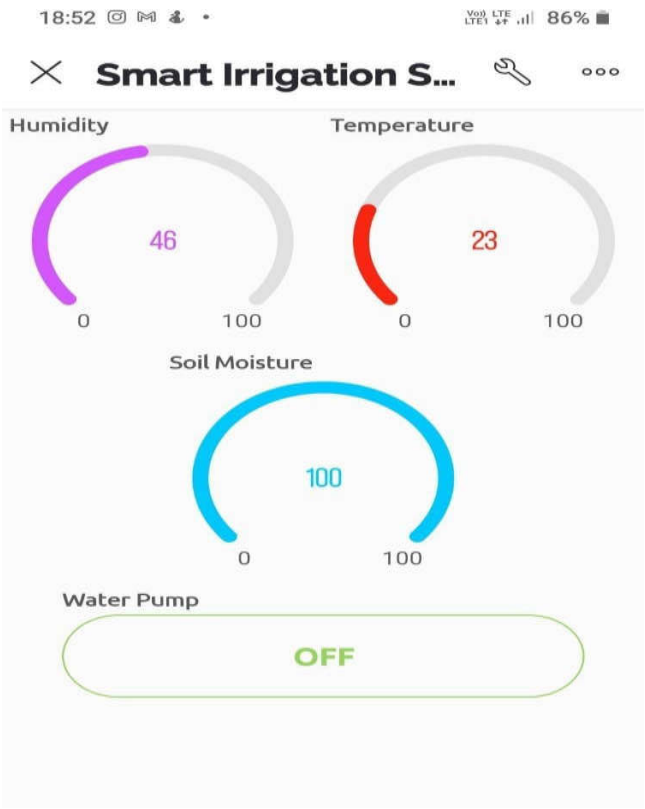


Blynk app Architecture

OUTPUT DISPLAY

All of the IOT devices are shown in the following figure econnected and activated.

Pumping water into the soil.



Output Display in Blynk App

CONCLUSION

In order to minimise the use of water while also reducing the amount of labour required from humans, agricultural monitoring is crucial. Many systems have been developed that use wireless sensors to monitor and forecast the soil condition so that the field can be watered. By reducing waste and minimising farmer intervention, the automatic irrigation system maximises the use of water. As the system is automatically controlled, energy is also saved.

As a result, the system is turned off when the field is wet and turned on when the field is dry.It is used in all varieties of irrigation systems. (channel, sprinkler, drip). Additionally, we offer fewer sensor nodes that can be used over a larger area of field, which lowers the system's cost.
Additionally, wireless network devices useless power and the system runs smoothly for a long time.

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