

Smart Irrigation System using IOT

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Abstract

The majority of nations rely heavily on agriculture to power their economies. A nation's growth is mostly dependent on agriculture, notably for people's livelihood and the production of food and other raw resources. The rise of agriculture is the main driver of a nation's economy. One type of irrigation system that is frequently utilized in the agricultural industry is the smart irrigation system. In areas of farming where water is scarce, irrigation is used. This intelligent irrigation system is designed with farmers in mind. In this paper, the proposed smart irrigation system uses NodeMCU ESP8266. This system reads the values using sensors and waters the plants based on those values. Also, the system will send notification as well as email to the owner for a certain interval of time depending on the owner specification. The owner can also remotely monitor values by using the mobile application or web application. It is very easy to implement, and will save manpower, leading to a cost-effective solution for efficient water management in agriculture. This system harnesses the power of a microcontroller to monitor and control irrigation process, ensuring optimal water usage.

Keywords: Agriculture, Internet of Things (IoT), Real-time monitoring, Sensor Technology, Smart Irrigation.

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1. Introduction

This research paper regards the potential of the smart irrigation system. Irrigation is the application of providing controlled amounts of water to plants, assisting the growth of agricultural crops with efficient water management. Our research's aim is to create an automated irrigation system that is both cost-effective and time-saving, using a Node microcontroller. The NodeMCU (Node Microcontroller Unit) is an open-source hardware and software development environment that is built around a very cheap System-on-a-Chip (SoC) called the ESP8266. If there is an insufficient amount of moisture in the soil detected by the soil moisture sensor, the proposed system will water the plants automatically. Our goal is to connect the system to the internet, enabling a smart phone app to monitor it from anywhere at any time. The concept of this research is to allow the owners of fields to monitor the moisture level and in their farms

remotely. Real-time information is provided and water flow can be controlled based on soil moisture using a smart platform of IoT. It is straightforward to use for anyone with a smart phone and does not require any maintenance once set up. This research was created to monitor irrigation systems in farms without the necessity of manual checking. For example, if you are staying in any place in the world, and have your farm at your home and it is not possible for you to go to the farm every time to maintain a close watch on the plants. Instead, this research offers the opportunity to check up on your plants with a simple IoT system. The water pump can be controlled by the node used to connect the system to your smart device, which is a positive aspect of this research

2. Related Works

M. Priyanka *et.al* [1] developed the smart irrigation system using both Arduino and NodeMCU. They used various sensors like soil moisture sensor, ultra sonic sensor. The readings can be seen by the farmer remotely

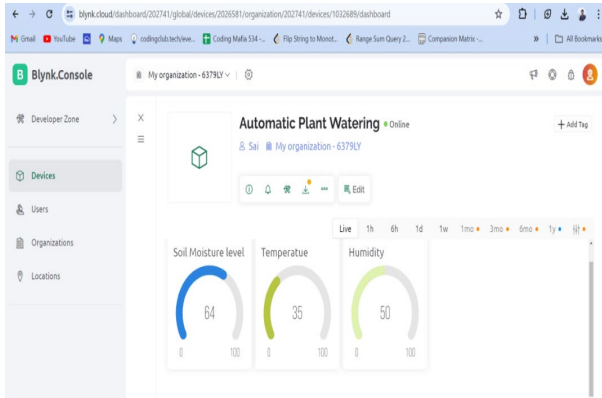


Figure 9. Web dashboard

Fig 9 shows the web dashboard of our research. It can be accessed by any web browser. We can see the same thing in the mobile dashboard Figure 10.

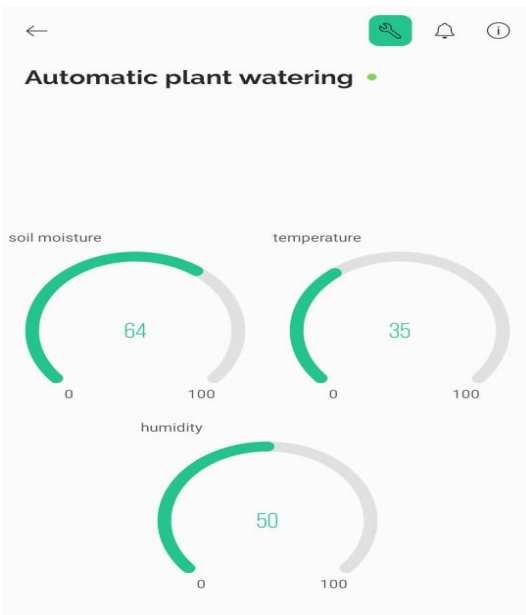


Figure 10. Mobile dashboard

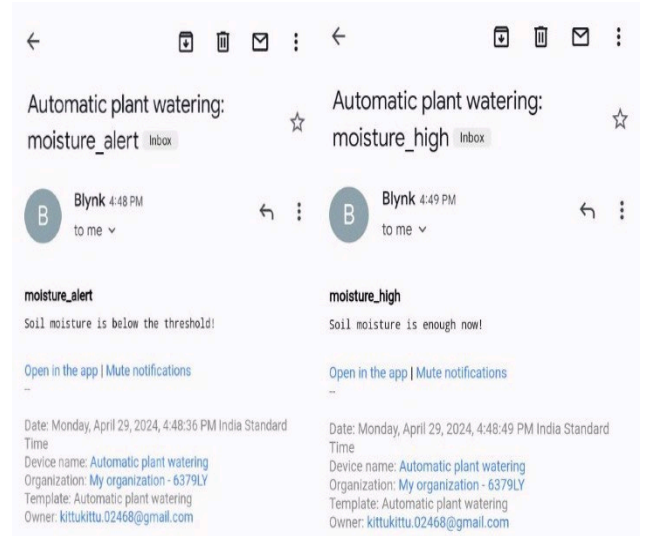


Figure 11. Email of moisture alert and moisture high

Figure 11 are the emails received to the owner regarding the information of soil moisture level for a specific interval of time. The emails are regarding the soil moisture level whether it is low or high.

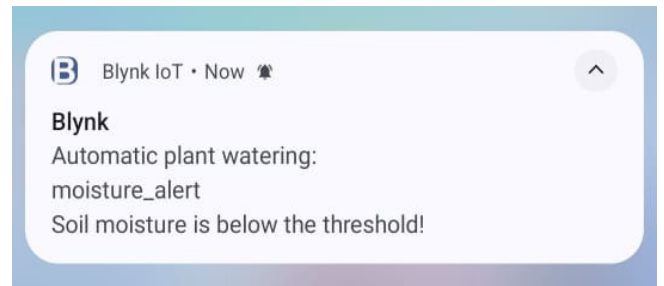


Figure 12. Blynk app notification of moisture alert

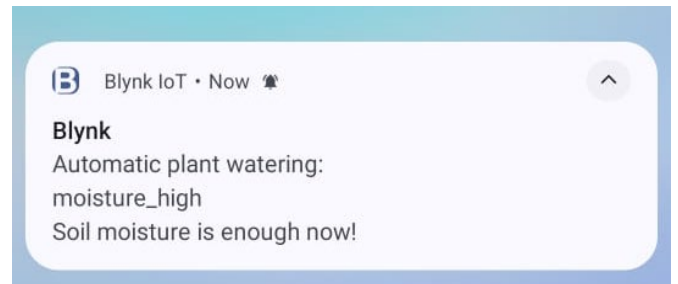


Figure 13. Blynk app notification of moisture high

Figure 12 and Figure 13 are the notifications received to the owner regarding the information of soil moisture level for a specific interval of time. It is from the blynk app.

