ISSN No:-2456-2165

Study of Irrigation System by using Internet of Things

Mahantesh S. Tattimani[1], Prasanna[2], Prashant[3], Badiger[4], Gadigeesh[5]
[1] Associate Professor Department of Mechanical Engineering, SKSVM Agadi College of Engineering & Technology, Lakshmeshwar, India ([1]Corresponding Author)
[2,3,4,5] Student Department of Mechanical Engineering, SKSVM Agadi College of Engineering & Technology, Lakshmeshwar, India

Abstract:- As water supplies become scarce in today's society, there is a critical need to implement smart irrigation methods. The project illustrates how smart irrigation can be managed via IOT. This initiative attempts to save time and minimize issues such as constant monitoring. It also helps to conserve water by automatically supplying water to plants or fields according on their needs. This method is also beneficial in agriculture, parks, and lawns. The goal of this technology is to detect soil moisture content and, based on it, sprinkle water. This information will be delivered to the user's cell phone.

Keywords:- *Smart Irrigation, Agriculture, Soil Moisture Sensor, Wi-Fi Module.*

I. INTRODUCTION

Agriculture is a country's oldest and most important economic industry. A water system is a fundamental method that has an impact on crop output. Farmers visit their agricultural fields on a regular basis to assess soil moisture levels, and water is pumped by motors to irrigate specific fields based on need. The farmer must wait for a set amount of time before turning off the motor in order for water to flow in a sufficient amount in specific fields. This water system technique requires a significant amount of time and effort, especially when a farmer needs to irrigate several farming areas spread over various topographical regions. Farmers will typically demonstrate water system processes in their fields. Farmers must now balance their agriculture activities with other responsibilities.

The GSM module controls the irrigation system by delivering text messages and alert messages from the flood control module. The system then overcomes it by utilizing a water flow level sensor to measure and monitor the flow level of water in drip irrigation pipe lines in order to limit superfluous water by promoting plant development. However, wheat and paddy fields always demand an abundance of water in the field.

Therefore, implementing the Internet of Things in the agriculture sector is necessary to increase yield. Most of the papers imparts the use of wireless sensor network which gathers the In this paper, there is a monitoring system where data gathered by the sensors to computer by Wi-Fi module and upgrade information about the water assets, soil quality.

Discovering these devices with uniqueness is the most interesting aspect. A unique IP address is necessary for device discovery in a network. IPv6 addressing scheme is essentially present in IoT devices. The IP addresses of type v6 on these devices are either fixed or subnet-masked. Devices are able to be discovered on the internet as independent nodes due to their unique IP addresses. The basic IOT architecture is shown in figure 1.

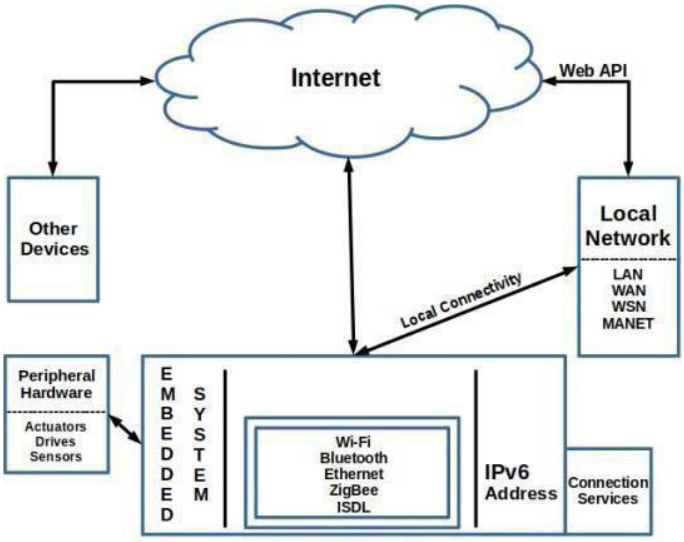

Fig. 1: Basic Architecture of IOT

Syeda Iqra et. al [1] proposed the use of real-time input data from IoT devices. Remote monitoring and control of the drips from the smart farm irrigation system was achieved by using an android phone. Zigbee is able to communicate with different nodes (sensor, base station, and hub). Remote monitoring and control of an irrigation system using remote applications can be achieved through wireless monitoring of field irrigation systems.

Smart sensor networks' high volume of data generated by cloud computing is a viable solution. The device is modeled manually and automatically. The cloud server processes real-time sensed data for decision-making and monitoring behavior. The Android app allows users to monitor the farm's regulating activities and regulate irrigation on their mobile phones.

Muhammad Ayaz et. al [2] in this journal anticipate that the current irrigation methods situation will be altered by utilizing emerging IoT technologies. Using techniques such as crop water stress index (CWSI)-based irrigation management is expected to result in a significant increase in crop efficiency.

Due to the increasing depletion of water resources around the world, the efficient use of water is a significant concern for all countries, according to Zeynep Unal, [3]. Smart irrigation has become a specific research area due to the many studies conducted to efficiently manage irrigation processes in agriculture. In order to manage the irrigation process efficiently, it is crucial to detect the water status of plants [5].

We have learned that using a robot in irrigation can work for multiple purposes, making it suitable for various tasks in terms of time and work, through reading and understanding the papers.

II. WORKING OF SMART IRRIGATION SYSTEM

The user is able to monitor and control the water supply from a remote location. This system makes use of a concept called IOT (Internet of Things). So we're connecting our system to the Internet with a Wi-Fi module as part of our project. To send control signals and connect to our desired Web site, we use an Arduino Uno board. There are two things you can see on the website: 1. Motor status 2. The level of moisture

The circuit continuously checks the soil's moisture content using a moisture sensor. It then updates the moisture level on a website. From a remote location, the user can check the current moisture level and control the water supply. To do this, the user only needs to switch the "Motor status" from 'ON-OFF' or 'OFF-ON', and the water pump will be turned on or off accordingly. This way, the soil moisture is monitored and the water supply can be controlled by toggling the "Motor status". Therefore, the user doesn't need to worry about their crops or plants being damaged by water logging or drought.

This system can also be beneficial for individuals with small gardens. Even when they cannot be present in their garden all the time, they can use this project to monitor soil moisture and ensure proper water supply from a distance.

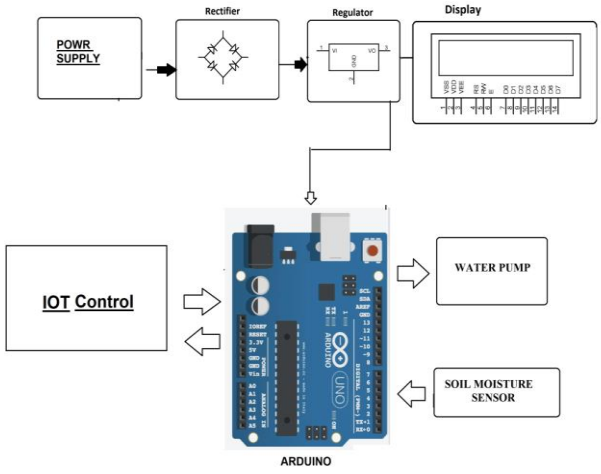

Fig. 2: Smart irrigation system module

➢ *Hardware Specifications*

- Micro-controller.
- LCD panel.
- Bluetooth HC-05.
- Pump Motors.
- Moisture sensor.
- Vehicle body and its spare.
- DC Gear Motors

➢ *Software Specifications*

- Arduino Compiler
- MC Programming Language: C
- IOT Gecko

III. CONCLUSIONS

This Agribot, which automatically sows seeds and irrigates, has increased productivity for Indian farmers. The chassis is responsible for bearing the weight of the battery and the hardware mounted on the agribot, allowing it to skillfully and successfully perform all operations. The irrigation process has improved, resulting in higher production levels and reduced water usage. During each rotation of the rotating wheel, seeds are released from the seed drum, enabling a smooth and efficient seed planting process without any wastage. The sowing disc rotates within the seed chamber, causing the seeds to fall from the seed storage tank into the chamber. The seed buckets collect the seeds from the chamber and sow them in the ground at the appropriate depth with the assistance of a plough. Additionally, if any obstacles appear in front of the seed sowing machine, the IR sensor detects them and activates a buzzer as an indication.

ACKNOWLEDGMENT

I would like to take this opportunity to express our gratitude and deep regard to our (Prof. M.S.Tattimani), for his commendable guidance, valuable feedback and constant encouragement throughout the duration of the project. His insightful appreciation kept me working to make this project in a much better way. Working under him was an extremely knowledgeable experience for us.

REFERENCES

[1]. Syeda Iqra Hassan, Muhammad Mansoor Alam, Mohammed A. Aghamdi, A Systematic Review on Monitoring and Advanced Control Strategies in Smart Agriculture, Received January 7.

[2]. Zhang, I. K. Dabipi, and W. L. Brown, ‘‘Internet of Things applications for agriculture,’’ in Internet of Things: Technologies and Applications, Volume 7. 2019.

[3]. Zeynep Ünal, Received April 30, 2020, accepted May 25, 2020, date of publication June 4, 2020, date of current version June 17, 2020. Digital Object Identifier 10.1109/ACCESS.2020.3000175.

[4]. B S Balaji, Smart Phone Operated Multipurpose Agriculture. International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181, Vol. 07.
[5]. K. Ahmed and M. Gregory, "Integrating Wireless Sensor Networks with Cloud Computing", 2011 Seventh International Conference on Mobile Ad-hoc and Sensor Networks, pp. 364-366, 2011.