IOT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE

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Nor Adni MatLeh, Zuraida Muhammad, Muhammad Azri Asyri Mohd Hafez, Zakiah Mohd Yusoff, and Shabinar Abd Hamid [1] The term **"Internet of Things"** describes the process of attaching equipment, cars, and other items to a network in order to share data (IoT). The Internet of Things (IoT) is being used more often to link things and gather data. Therefore, the usage of the Internet of Things in agriculture is essential. The project's goal is to build a smart agriculture network that is integrated with the internet of things. To deal with Malaysia's changing weather, technology is coupled with an irrigation system. The **Raspberry Pi 4 Model B** serves as the system's microcontroller. The temperature and humidity in the surrounding region, as well as the moisture level of the soil, are monitored using the **DHT22** and soil moisture sensor. The data will be available on both a smartphone and a computer. As a result, Internet of Things (IoT) and Raspberry Pi-based Smart Agriculture Systems have a significant impact on how farmers work. It will have a good impact on agricultural productivity as well. In Malaysia, employing IoT-based irrigation systems saves roughly 24.44 percent per year when compared to traditional irrigation systems. This would save money on labour expenditures while also preventing water waste in daily needs.

Janani V., Divya J., and Divya M. Both the economy and the existence 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 productivity. 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 recommendations. Use of an automatic watering system is necessary when the soil temperature is high. For pesticide recommendations, the field manager receives the crop image.

H.A.C. Dharmagunawardhana, J.V. Wijayakulasooriya, and H.G.C.R. Laksiri 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 automatically adjust water flow to plants based on soil moisture levels must be developed. Then, an IoT-based communication 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 control water flow. The system also incorporates sensors for temperature, humidity, and raindrops that have been updated to enable online remote monitoring of these variables. These field meteorological variables are kept in a distant location in real time.

Pruthviraj U, Layak Ali, and Anushree Math India is a nation where agriculture is extremely important. In order to maximise yield per unit of area and hence produce optimum production, it is crucial to water the plants carefully. Irrigation is the technique of giving plants a specified amount of water at a particular time. This project's goal is to install a sophisticated drip irrigation system on the National Institute of Technology Karnataka campus to irrigate the plants. The system's primary controller is the open source platform, which is utilised to do this. Numerous sensors have been used to provide the most recent values of the variables that continuously affect the health of plants.

Shuchi Upadhaye, Rajeev Tiwari, Arzeena Khan, and Dweepayan Mishra Indians rely heavily on agriculture as a source of income, which has a significant effect on the country's economy. In order to increase output and produce products of greater quality, crop development is crucial. Therefore, crop beds with optimum conditions and the right amount of moisture can significantly affect productivity. Streams that run 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 use of a tailored watering system. This study suggests a terrain-specific programmable water system that will save human labour while boosting agricultural productivity and water efficiency. An Arduino kit, a moisture sensor, and a Wi-Fi module make up the system. Data is obtained by coupling our test system to a cloud infrastructure. The data is subsequently analysed by cloud services, who then take the required actions.

B. Sridhar and R. Nageswara Rao India and other agrarian nations are significantly dependent on agriculture for their development. The country's progress has traditionally been hampered by the agricultural sector. The only way to overcome this problem is through smart agriculture, which entails modernising current agricultural systems. In order to make agriculture smarter, the suggested plan makes use of automation and Internet of Things technology. The Internet of Things enables applications such as irrigation decision support, crop growth monitoring, and crop selection (IoT). A Raspberry Pi-based autonomous irrigation Internet of Things system has been suggested to modernise and

increase crop productivity. The primary goal of this project is to grow crops while utilising the least amount of water feasible.

Dhanashri H. Gawali and Shweta B. Saraf The connecting of a vast number of gadgets to the internet (the "Internet of Things") (IoT). Each item is connected with a distinct identity, enabling data transmission without human intervention. It enables the creation of plans for better natural resource management. According to the IoT concept, smart devices with sensors allow interaction with both the physical and logical worlds. The proposed system in this study leverages real-time input data and is based on the Internet of Things. An Android phone is used by a smart farm irrigation system to remotely monitor and control drips using a wireless sensor network. Zigbee is used for communication between base stations and sensor nodes.

M. Shrihari- Irrigation is a major issue that both scientists and farmers face while trying to automate agricultural production; this idea has been around since the early 1990s. A dynamic system, irrigation is heavily influenced by external factors. In order to create a smart system, the method described in this article uses a specially created mathematical model to manage data from wireless sensors on Google Cloud. a design that can scale up to large farms and is IoT connected. Holistic Agricultural Studies estimate that 35 have been harmed by both animals and people. This smart system can identify humans who are unauthorised visitors to the farm as well as animals depending on their threat level using Tensor flow and deep learning neural networks.

Sujatha and G. Sushanth Since Internet of Things (IoT) sensors may provide information about agricultural area and then act on it based on user input, smart agriculture is a revolutionary notion. The goal of this research is to create a smart agricultural system that uses cutting-edge technologies including wireless sensor networks, the Internet of Things, and Arduino. The goal of this study is to create a system that can use sensors to track temperature, humidity, wetness, and even the movement of animals that could harm crops in agricultural areas. If there is a discrepancy, the system will send an SMS notification to the farmer's smartphone as well as a notification on the app that was created for it via Wi-Fi/3G/4G. Using an android app, the system's duplex communication link, which is based on a cellular Internet interface, enables data inspection and irrigation schedule modification. The device has the potential to be helpful in water-scarce, remote places due to its energy independence and low cost.

Suraj S., Dhivya S., Vignesh G., Vaishali S., and Udhayakumar S. Agriculture has long been regarded as the most significant activity in human society. Traditional irrigation techniques, such flood irrigation and overhead sprinklers, are ineffective. They use a lot of water inefficiently and might even make people sick by encouraging the spread of fungus in the

soil because of excess moisture. A computerised irrigation system is necessary for water conservation and, as a result, agricultural success due to the limited availability of water. Around 85% of the water resources that are globally accessible are used for irrigation. The population is expected to grow in the upcoming years, increasing this need. We must use innovative techniques that reduce the amount of water used in order to satisfy this need.

Amina Saidi, Khaoula DJELLOUT, Mounir BOUHEDDA, and Hamza Benyeza -We all face a global problem with water management, so we must prepare carefully if we want to solve it soon. As a result of the abundance of usable sensors in today's society, systems with water-saving capabilities can be created. The goal of the work presented in this paper is to increase the farmer's ability to use water effectively. It basically uses a soil moisture sensor to determine the amount of moisture in the soil and then connects to the Thing Speaks cloud through ESP8266 Wi-Fi to monitor the soil's status. The proposed system is also equipped with an algorithm that forecasts crop irrigation decisions based on information about soil moisture patterns. If this happens, the device also alerts farmers when the water supply is exhausted. Weather forecasting via internet is another benefit of adopting this approach. The device's energy independence and inexpensive cost make it potentially useful in areas with limited water resources and remote locations. The technology's usefulness is increased by the ease with which farmers may use it. By reducing waste, it also conserves water.