AGRICULTURAL SOIL MONITORING SYSTEM

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Abstract– **A large proportion of freshwater is wasted in agricultural use, which leads to poor distribution of clean water that causes imbalance in soil saturation and vegetation. Special irrigation must be carried out in the agricultural sector. An Internet of Things (IOT) device is any device that can be overseen through the web. IOT in agriculture utilizes an insightful system for monitoring the vegetation, by planning and reviewing the fields and provide information to the farmers for objective homestead control intends to save both time and money. In terms of agriculture, the environment is changing with time. Electronics are being integrated into every industry, including agriculture. Agriculturists profit from the convergence of electronics and agriculture. There are systems that use technology for the detection of factors required to enhance farming. However, these systems need to be deployed individually to obtain the desired results. In this paper, the way to monitor and manage gardening as well as agriculture is proposed. ESP32 controlling module for IOT is used and the information is updated on the cloud, now with the help of the measurements the required acceptable action is taken. In this work, some sensors such as the Light dependent Resistors(LDR), temperature sensors, Soil Moisture sensors are used, also a pump to respond to the sensors' particulars. This system will enable us to monitor the growth of the crop or plant by controlling the water flow to the crop using motor.**

Key Words: **Computerized Monitoring, crops, farming, Internet of Things, irrigation, moisture, soil, temperature sensors**

INTRODUCTION

IOT consists of two words internet and things. The full form of IOT is Internet of thing. The IOT describes the network of physical devices or thing that are inserted with sensors software and other technology. These devices gather information and share data with other connected devices. This system has the ability to share the data over a network without requiring human to human or human to computer interaction. IOT has many applications in agriculture. It play important role in development of our country's economics. Agriculture is the main occupation in our country from many decade. More than 50% population depend on agriculture. It is the main source of income and it also provide food our survival. But now a day's farmers' faced many problems like soil and water erosion, lack of modern equipment and machinery, poor irrigation, inadequate storage facilities etc. So overcome this problem we are adopted smart agriculture techniques using IOT. This technique includes various feature like GPS based remote controlled monitoring, moisture & temperature sensing, proper irrigation facilities and many more. It contains the wireless sensor network for gather the information about soil property and environmental factors continuously

LITERATURERE SURVEY

In paper[1], the main aim of this paper is to develop a 'smart irrigation system' equipped with sensors connected via IOT for continuous monitoring of soil moisture and supply water to agricultural lands as per requirements. Proper management of water resources for agricultural production is of great concern in cropping fields and automatic irrigation systems are designed to aid the farmer in needs and support during

unfavorable conditions like under and over irrigation. Here, we proposed a system that contains sensors that collect direct soil moisture levels and provide an automatic irrigation facility. The renewable source of solar energy (use of solar panels) is the power source. Also, the image processing methods are done using Raspberry Pi and Open CV to detect plant diseases through capture of plant morphology. The aim is to demonstrate that the automatic irrigation can be used to reduce water utilization and real time monitoring systems of the agricultural growth and health systems. [1]

In paper[2], Xinjiang Kurgan Water Conservancy Project Construction Administration in order to implement the water and soil conservation plan, strengthen the design and construction management of water and soil conservation, optimize the prevention and control measures of water and soil loss, and coordinate the progress of the water and soil conservation project and the construction of the main project; timely and accurately grasp the project soil erosion status and prevention effect, put forward soil and water conservation improvement measures, reduce man-made soil and water loss; to find out major soil erosion hazards in time and put forward countermeasures and suggestions on soil erosion prevention and control; to provide the technical basis of water and soil conservation supervision and management and the basic information of public supervision, to promote the effective protection and timely recovery of the ecological environment in the project area, Yellow River Institute of Hydraulic Research was specially entrusted to carry out the water and soil conservation monitoring work of the project.[2]

In Paper [3], A large proportion of freshwater is wasted in agricultural use, which leads to poor distribution of clean water that causes imbalance in soil saturation and vegetation. Special irrigation must be carried out in the agricultural sector. An Internet of Things (IOT) device is any device that can be overseen through the web. IOT in agriculture utilizes an insightful system for monitoring the vegetation, by planning and reviewing the fields and provide information to the farmers for objective homestead control intends to save both time and money. In terms of agriculture, the environment is changing with time. Electronics are being integrated into every industry, including agriculture. Agriculturists profit from the convergence of electronics and agriculture. There are systems that use technology for the detection of factors required to enhance farming. However, these systems need to be deployed individually to obtain the desired results. In this paper, the way to monitor and manage gardening as well as agriculture is proposed. ESP32 controlling module for IOT is used and the information is updated on the cloud, now with the help of the measurements the required acceptable action is taken. In this work, some sensors such as the Light dependent Resistors(LDR), temperature sensors, Soil Moisture sensors are used, also a pump to respond to the sensors' particulars. This system will enable us to monitor the growth of the crop or plant by controlling the water flow to the crop using motor.. [3]

In paper [4] Agriculture contributes to a major portion of India's GDP. Two major issues in modern agriculture are water scarcity and high labor costs. These issues can be resolved using agriculture task automation, which encourages precision agriculture. Considering abundance of sunlight in India, this paper discusses the design and development of an IoT based solar powered Agribot that automates irrigation task and enables remote farm monitoring. The Agribot is developed using an Arduino microcontroller. It harvests solar power when not performing irrigation. While executing the task of irrigation, it moves along a pre-determined path of a given farm, and senses soil moisture content and temperature at regular points. At each sensing point, data acquired from multiple sensors is processed locally to decide the necessity of irrigation and accordingly farm is watered. Further, Agribot acts as an IoT device and transmits the data collected from multiple sensors to a remote server using Wi-Fi link. At the remote server, raw data is processed using signal processing operations such as filtering, compression and prediction. Accordingly, the analyzed data statistics are displayed using an interactive interface, as per user request.[4]

In paper [5] , a large proportion of freshwater is wasted in agricultural use, which leads to poor distribution of clean water that causes imbalance in soil saturation and vegetation. Special irrigation must be carried out in the agricultural sector. An Internet of Things (IOT) device is any device that can be overseen through the web. IOT in agriculture utilizes an insightful system for monitoring the vegetation, by planning and reviewing the fields and provide information to the farmers for objective homestead control intends to save both time and money. In terms of agriculture, the environment is changing with time. Electronics are being integrated into every industry, including agriculture. Agriculturists profit from the convergence of electronics and agriculture. There are systems that use technology for the detection of factors required to enhance farming. However, these systems need to be deployed individually to obtain the desired results. In

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HARDWARE REQUIREMENTS
The following components are hardware requirements for the development of project.
1. ESP 32 micro-controller
2. RFID Tags
3. Display (16X2)
4. Relay
5. Buzzer.
6. Water Motor
7. Soil Moisture Sensor
8. LED
9. DHT11

THEME
India is known as land of farmers. It gives more importance to farming as agriculture contributes a lot in the economic growth of the country. The farmers have to adopt the modern technology to have better yield and quality crops. In order to help the farmers we decided to make this automatic water supply using microcontroller. There are timer based devices available in India which waters the soil on set interval. They do not sense the soil moisture and the ambient temperature to know if the soil actually needs watering.

SYSTEM ARCHITECTURE
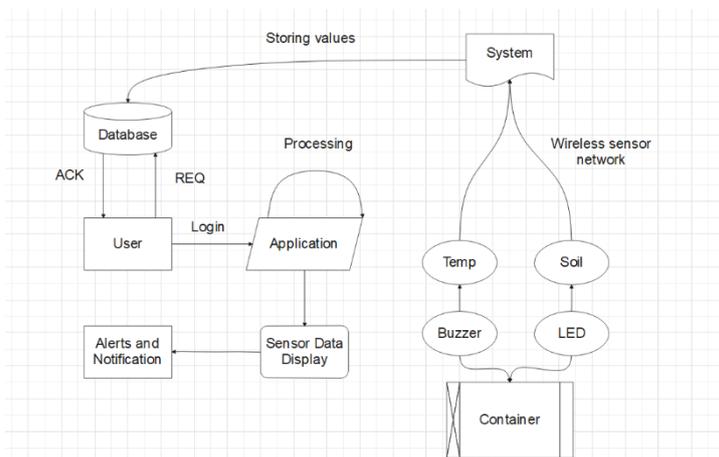
Fig -1: System Architecture

Working: Farming is the cultivation of plants and livestock. Plant monitoring is one of the most important tasks in farming. The goal of this paper is to use IoT in the Node MCU system platform for plant monitoring and smart gardening. The primary goal of this paper is to reduce direct interaction and provide comfort to the farmer by improving the system's overall performance. Humidity, sunlight, and soil moisture are important factors to consider when monitoring plant productivity. Plant growth and health information must be provided to the user on a continuous basis by monitoring and recording these parameters. The NodeMCU interfaces with all of the sensors used in this project. Farmers can use IoT to directly monitor and control plant information via their smart phones. By sensing and controlling the parameters of the plants without their physical presence, this smart gardening system will provide the user with convenience and comfort. The smart gardening application can be installed on any Android-enabled device. The software used is the

Arduino IDE and the IoT platform. The Arduino IDE is used to compile and upload the programme to the NodeMCU, and the IoT platform is used to display temperature, humidity, atmospheric pressure, and soil moisture from a distance. This will assist the farmer in understanding the relationship between plant growth and mentioned plant parameters.

RESULT
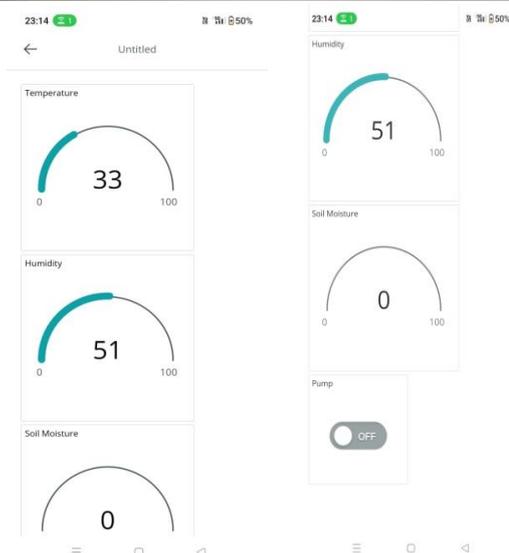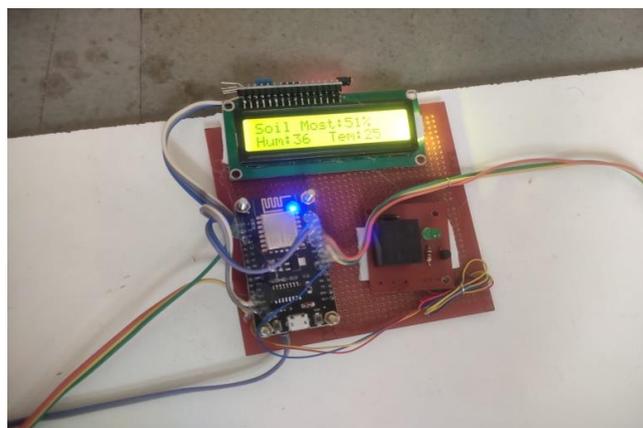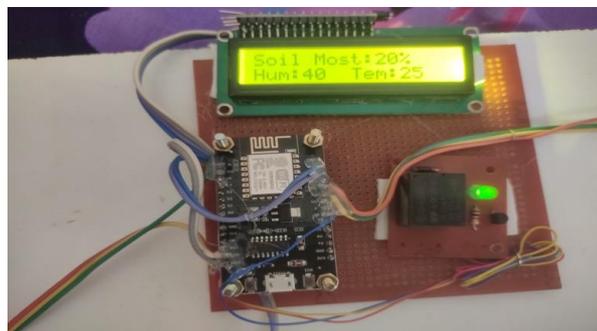
CONCLUSION

The prototype remotely sensed soil moisture data can provide timely, objective and quantitative crop soil moisture information with broad geospatial coverage and sufficiently high resolution observations collected throughout the growing season. This paper evaluates the feasibility of using the assimilated ESA Soil Moisture Ocean Salinity Mission L-band passive microwave data for operational US cropland soil surface moisture monitor

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