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IOT ENABLED PRECISION CROP FIELD MONITORING SYSTEM

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Abstract - *As new technologies has been introduced and utilized in modern world, there is a need to bring advancement in the field of agriculture also. Internet of Things (IoT) is being utilized in a few ongoing applications. Various Researches have been undergone to improve crop cultivation and have been widely used. In order to improve the crop productivity efficiently, it is necessary to monitor the environmental conditions in and around the field. The presentation of IoT alongside the sensor organize in agriculture renovate the conventional method for cultivating. Various sensors are used to monitor and collect information about the field conditions. The parameters that must be appropriately checked to improve the yield are soil attributes climate conditions dampness, temperature etc., Offline crop monitoring using IoT helps the farmers to stay connected to his field from anywhere and anytime through SMS alerts or phone calls. Aggregately the yield field condition is sent to the rancher through gsm modem.*

Key Words: Internet of Thing, Arduino, Agriculture, GSM Modem, Sensor Networks

1. INTRODUCTION

The Internet-of-Things provides lots of sense information from the environment. However, the data by themselves do not provide value unless it is converted into some action. Big data and data visualization representation procedures to gain new insights by batch processing and offline analysis. Real time sensor data information and decision making is often done manually but to make it versatile it is ideally mechanized. Artificial Intelligence provides the framework and tools to go beyond trivial real-time decision and automation use cases for IoT.

Use of technology in different areas to get numerous benefits is itself a valuable research. Use of Sensor network in the area of agriculture is not new. But due to the different weather, soil, water and land conditions, diverse models, methods of analysis and solutions are needed on which different communities of researchers are working and proposing several solutions. That instigates need of some different ways specifically for agriculture that can be helpful in developing solution for different conditions. Smart Agriculture concept is the combination of context-aware computing and Wireless Sensors and Actuator Networks (WSAN) application. Smart agriculture proved its viability for the better management of Agricultural requirements.

1.1 Objective

Therefore, an agricultural monitoring system using an IoT to overcome the problems in the agricultural field is proposed in this project. In this, different sensors are used to monitor the agricultural crop field. Temperature sensors are used to monitor the weather of the agricultural crop field. Soil moisture sensor is used to monitor the volume of water present in the soil. Therefore, this sensed data's are transmitted to the user through the gsm modem for providing good yield in crops. In this, gsm modem is used to intimate the information about the agricultural crop field through phone calls or SMS for the farmer. This avoids the physical monitoring of the crop field. In this project, if the temperature value is greater than the threshold value fixed for the temperature, then gsm modem intimates the user temperature is high monitor the crop field. If the water level in the soil is low, then gsm modem intimates the farmer water level is low in the crop field. Therefore, this device is for avoiding physical monitoring of the crop filed and it involves the continuous monitoring of the crop field using weather.

1.2 Problem Statement

This project is from the motivation of the farmers working in the farm lands are solely dependent on the rains and bore wells for irrigation of their land. In recent times, the farmers have been using irrigation technique through the manual control in which the farmers irrigate the land at regular intervals when required. Moreover, for the power indication they are glowing a single bulb between any one of phase and neutral, meanwhile when there is any phase deduction occurs in other phases, the farmer cannot know their supply is low. If they may have to travel so. They may be suffering from hot Sun, rain and night time too. After reaching their farm, they found that there is no power, so they quietly disappointed to it.

2. EXISTING SYSTEM

Agricultural Technology is a specialized area or ground for the growth and farming of plants and vegetables with mechanized and smart equipment. The purpose is to provide suitable conditions and maintain desired parameter values according to the flora requirement. In the present nurseries, numerous parameter estimations are required to screen and control for the great quality and profitability of plants. In any case, to get the coveted outcomes there are some imperative variables which become an integral factor like Temperature,

Humidity, Light and Water, which are vital for a superior plant development. Remembering these parameters this mechanism is manufactured which is called Automated Agricultural Monitoring & Controlling System using HC-05 Bluetooth Module utilizing Arduino Uno with Atmega 328P microcontroller. This framework is extremely effective for developing great quality plants.

It helps the user in getting the real time values of the parameters (Soil moisture and Temperature) and also helps in controlling fans and water pump with just a click on an Android app called "Bluetooth Terminal". The other most important key feature of this working mechanism is that it can work without the requirement of any internet facility which is not the case with other automated systems.

2.1 DISADVANTAGES OF THE EXISTING SYSTEM

- There is requirement of application for accessing the data's of the Crop field.
- There is no direct interaction between user and crop field through messages or calls.

3. PROPOSED SYSTEM

As new technologies have been introduced and utilized in modern world, there is a need to bring advancement in the field of agriculture also. In order to improve the crop productivity efficiently, it is necessary to monitor the environmental conditions in and around the field. The parameters that has to be properly monitored to enhance the yield are soil characteristics, weather conditions, moisture, temperature, etc., Internet of Things (IoT) is being used in several real time applications. The introduction of IoT along with the sensor network in agriculture refurbish the traditional way of farming. Online crop monitoring using IoT helps the farmers to stay connected to his field from anywhere and anytime. Various sensors are used to monitor and collect information about the field conditions. Collectively the about the farm condition is sent to the farmer through GSM technology. System effectively, sensor is deployed in the field which senses the water requirement of the soil and provides irrigation automatically. The farmer will be able to view the information of his field through GSM technology.

The development of Intelligent Smart Farming IoT based devices is day by day turning the face of agriculture production by not only enhancing it but also making it cost-effective and reducing wastage.

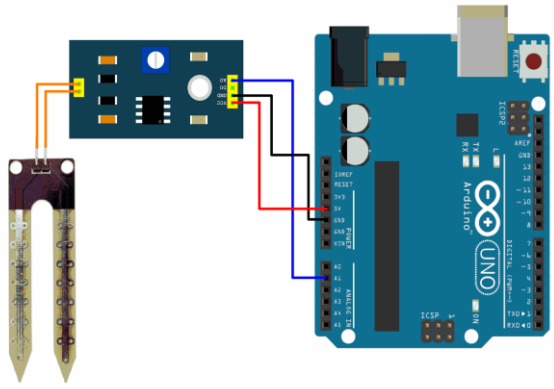

Fig: System design

The aim / objective of this project is to assisting farmers in getting Live Data (Temperature, Soil Moisture) for efficient environment monitoring which will enable them to do smart farming and increase their overall yield and quality of products. The product being proposed is tested on Live Agriculture Fields giving accuracy in data feeds.

3.2 SOIL MOISTURE SENSOR

Soil moisture is basically the content of water present in the soil. This can be measured using a soil moisture sensor which consists of two conducting probes that act as a probe. It can measure the moisture content in the soil based on the change in resistance between the two conducting plates.

The resistance between the two conducting plates varies in an inverse manner with the amount of moisture present in the soil.

3.3 ADVANTAGES OF THE PROPOSED SYSTEM

- It provides direct interaction between the farmer and crop filed through phone calls or SMS.
- This system monitors the quality of the crop for increasing the yield of crops.
- There is no requirement of application for accessing the data's of the crop field.

4. CONCLUSION

An IoT device for monitoring agricultural crop field. This device ensures the temperature of the crop field for increasing yield of crops and improves the quality of the agriculture crop field using gsm modem. It also ensures the soil moisture level for providing good irrigation in crop field. The major goal of this system is to avoid the physical monitoring of the crop field by farmer.

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