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A RESEARCH PAPER ON SMART AGRICULTURE USING IOT

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Abstract - *Smart agriculture is an emerging concept, because IOT sensors are capable of providing information about agriculture fields and then act upon based on the user input. The feature of this paper includes development of a system which can monitor temperature, level of water, moisture and even the movement if any happens in the field which may destroy the crops in agricultural field through sensors using Arduino UNO board. Smart agriculture is an emerging concept, because IOT sensors are capable of providing information about agriculture fields and then act upon based on the user input. The project aims at making use of evolving technology i.e. IOT and smart agriculture using automation. Once hardware has been developed depending on the change in requirements and technology the software needs the updating. The updated hardware is called new version of the software. This new version is required to be tested in order to ensure changes that are made in the old version work correctly and it will not bring bugs in other part of the software. This is necessary because updating in one part of the hardware may bring some undesirable effects in other part of the hardware.*

***Key Words*: Internet of Things (IOT), Smart Agriculture using IOT, Arduino, Soil Moisture Sensor, Water level Sensor**

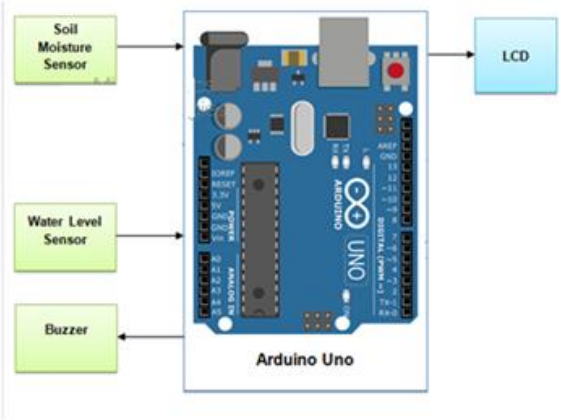
1. INTRODUCTION

Smart Farming is a farming management concept using modern technology to increase the quantity and quality of agricultural products. Farmers in the 21st century have access to GPS, soil scanning, data management, and Internet of Things technologies.

The goal of smart agriculture research is to ground a decision making support system for farm management. Smart farming deems it necessary to address the issues of population growth, climate change and labour that has gained a lot of technological attention, from planting and watering of crops to health and harvesting.

In IOT-based smart agriculture, a system is built for monitoring the crop field with the help of sensors (light, humidity, temperature, soil moisture, etc.) and automating the irrigation system.IOT (Internet of things) in an agricultural context refers to the use of sensors, cameras, and other devices to turn every element and action involved in farming into data.

We need smart agriculture to expand and develop from what it currently is because this practice will substantially decrease the negative environmental externalities of modern agriculture. Smart cities use Internet of Things (IOT) devices such as connected sensors, lights, and meters to collect and analyze data. The cities then use this data to improve infrastructure, public utilities and services, and more. For Farmers, it is difficult for them to understand technical terms and usage of technology, and also it is a cost effective affair.



1.1 Problem Statement

To provide efficient decision support system using wireless sensor network which handle different activities of farm and gives useful information related to farm. Information related to Soil moisture, Temperature and Humidity content.

Due to the weather condition, water level increasing Farmers get lot of distractions which is not good for Agriculture. Water level is managed by farmers in both Automatic/Manual using that mobile application. It will make more comfortable to farmers. Performing agriculture is very much time consuming.

1.2 Problem Definition

It should utilize minimum resources in terms of hardware and cost. This overcomes the manual operations required to monitor and maintain the agricultural farms in both

automatic and manual modes. It should be able to measure the increase or decrease in level of water as well as moisture in the soil.

2. LITERATURE SURVEY

Smart Agriculture: IOT based smart sensors agriculture by Anand Nayyar and Er. Vikram Puri, November 2016

This paper describes Internet of Things (IOT) technology has brought revolution to each and every field of common man's life by making everything smart and intelligent. IOT refers to a network of things which make a self-configuring network. 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. The aim / objective of this paper is to propose a Novel Smart IOT based Agriculture 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.

Brief Introduction of Paper: This paper brings insights to construct a framework for robust working on fields and easy for farmers. One of main areas where IOT based research is going on and new products are launching on everyday basis to make the activities smarter and efficient towards better production is "Agriculture".

Agriculture sector is regarded as the more crucial sector globally for ensuring food security. Talking of India farmers, which are right now in huge trouble and are at disadvantageous position in terms of farm size, technology, trade, government policies, climate conditions etc.

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3. IMPLEMENTATION

3.1 Implementation of IOT in the field of smart agriculture: The global population is predicted to touch 9.6 billion by 2050 – this poses a big problem for the agriculture industry. Despite combating challenges like extreme weather conditions, rising climate change, and farming's environmental impact, the demand for more food has to be met. To meet these increasing needs, agriculture has to turn to new technology. New smart farming applications based on IOT technologies will enable the agriculture industry to reduce waste and enhance productivity. It is the application of modern ICT (Information and Communication Technologies) into agriculture. In IOT-based smart farming, a system is built for monitoring the crop field with the help of sensors (light, humidity, temperature, soil moisture, etc.). The farmers can monitor the field conditions from anywhere.

3.2 Implementation of Soil moisture sensor in smart agriculture: Soil moisture sensors measure the volumetric water content in soil. Reflected microwave radiation is affected by the soil moisture and is used for remote sensing in hydrology and agriculture. Portable probe instruments can be used by farmers or gardeners.

Soil moisture sensors aid good irrigation management. Good irrigation management gives better crops, uses fewer inputs, and increases profitability. Soil moisture sensors help irrigators to understand what is happening in the root zone of a crop.

3.3 Implementation of Water Level Sensor in smart agriculture: Water source is necessary and an important factor in agricultural and farm production and is a key of our quality of life as well. Monitoring water level of a water source, such as water tank or bore well etc., plays a key role in agricultural. Monitoring water level of a water source, such as water tank or bore well etc., plays a key role in water management. Keeping track of water level in a water source can be used to preserve water and to study the water us age. Thus monitoring water level is an important task in agricultural. In this prototype experiment of the proposed system Arduino UNO board along with Ethernet shield for Internet connectivity in used. A Water level sensor in this prototype is only used for demonstration purpose.

4. CONCLUSION

We have designed automated Smart Agriculture system which reduces the time and resources that is required while performing it manually. This system uses the technology of Internet of Things. The system also measure moisture of soil and level of water in fields. This system works well in the ideal conditions and further improvement can be made when the conditions are not ideal like proper illumination or lightning.

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