Ameliorated Methodology for Automatic Irrigation & Crop Prediction System

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Abstract : Farming in India is done using the mundane ways. The fact that most of our farmers lack proper knowledge makes it even more erratic. A large portion of farming and agricultural activities are based on the predictions, which at times fail. Farmers have to bear huge losses and at times they end up committing suicide. Since we know the benefits of proper soil moisture and its quality, air quality and irrigation, in the growth of crops, such parameters cannot be ignored. We, therefore, have come up with a new idea of crop monitoring and smart farming using IoT. We believe that our concept will be a benchmark in the agribusiness due to its reliability and remote monitoring. Our idea tries to digitalize farming and agricultural activities so that the farmers can check on the requirements of the crops and accurately predict their growth. This concept will surely accelerate their business to reach new heights and also be more profitable. The implementation of our project largely depends upon the awareness among farmers, which, we believe will be easily created due to its numerous advantages.

IndexTerms **– Soil moisture sensors, IOT, Arduino, Android, Microcontroller, Notification**

I. INTRODUCTION

This system is an attempt towards the smart irrigation system concept. An electronic device is responsible for sensing the temperature and Moisture conditions. Along with it a Bluetooth functionality is added to the hardware device. The sensed environmental conditions are taken and sent to the Server, which has a MySQL database for storage of records. The sensor node is deployed in irrigation field for sensing soil moisture value and the sensed data is sent to controller node. On receiving sensor value the controller node checks it with required soil moisture value.

System collects information about soil, temperature, moisture and humidity in crop field. According to the condition which is identified according to humidity, temperature and moisture values database gets updated and Farmer will get suggestions about crop field, suggestion consists of new crop plantation according to the area of farm. From this farmer will get more profit from small area.

Smart irrigation systems estimate and measure diminution of existing plant moisture in order to operate an irrigation system, restoring water as needed while minimizing excess water use. The effects of the applied amount of irrigation water, irrigation frequency and water use are particularly important. To improve water efficiency there must be a proper irrigation scheduling strategy.

In India, agriculture plays an important role for development in food production. In our country, agriculture are depends on the monsoons which is not sufficient source of water. So the irrigation is used in agriculture field. In Irrigation system, depending upon the soil type, water is provided to plant.
The aim of this project is to introduce the latest technology into the agriculture business and better crop production by collecting real-time status of crop and informing the farmers about it.

II. LITERATURE SURVEY

Various researches have been carried out on how soil irrigation can be made more efficient .The researchers have used different ideas depending on the condition of the soil and quantity of water Different technologies used and the design of the system was discussed by the researchers.

This paper aims at reducing the wastage of water and the labor that is used to carry out irrigation manually. The proposed system aims at detecting the moisture content of the soil using sensors that are placed directly into the soil. This sensors sense the water level of the soil and if the water level is not adequate then the user will be notified through a message that will be sent to the application which would be installed on the user's mobile phone.

The Arduino board, a microcontroller, controls the digital connection and interaction between objects in the proposed system, enabling the objects to sense and act [2]. Also, with its powerful on-board processing, various sensors and other application specific devices can be integrated to it. In the system, sensors detect the water and moisture level and send readings to a fixed access point, such as a personal computer, which in turn can access irrigation modules installed in the field or the physical module in the water tank, wirelessly over the internet.

A wireless application of drip irrigation automation supported by soil moisture sensors Irrigation by help of freshwater resources in agricultural areas has a crucial importance. Traditional instrumentation based on discrete and wired solutions, presents many difficulties on measuring and control systems especially over the large geographical areas. If different kinds of sensors (i.e. humidity, and etc.) are involved in such irrigation in future works, it can be said that an internet based remote control of irrigation automation will be possible [3].

An automated irrigation system was developed to optimize water use for agricultural crops. The system has distributed wireless network of soil-moisture placed in the root zone of the plants. In addition, a gateway unit handles sensor information, triggers actuators, and transmits data to an android application [4].

III. PROPOSED SYSTEM

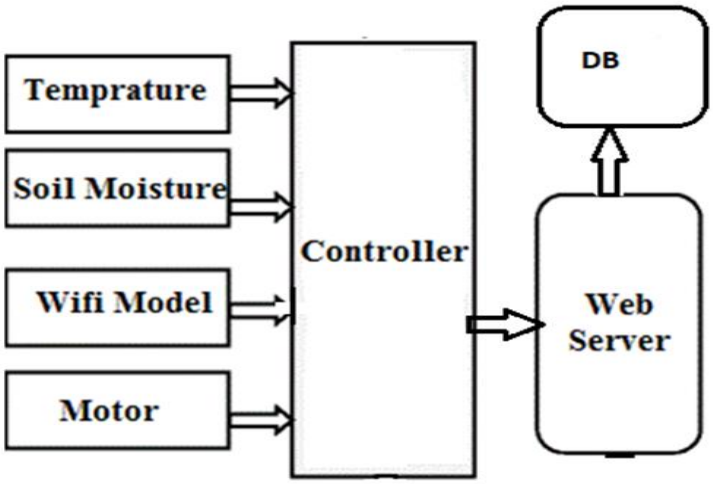

Fig 1. System architecture

A. Arduino:

Arduino is an open source computer hardware and software company, project and user community. It is the best board to get started with electronics and coding.

B. Moisture Sensor:

The Soil Moisture Sensor is used to measure the volumetric water content in the soil. This makes it ideal for performing experiments in plants by having constant information about the amount of water currently present in soil and accordingly providing water to the plants for proper nourishment. This includes constant checking of moisture content in soil and sending the readings to the android application. If the moisture content is less than the threshold value (which is pre-fed into the arduino board), a prompt message is sent to the device and automatically a sprinkler connected to the arduino will start sprinkling water on the affected area.

C. Temperature LM35:

The LM35 temperature sensor is used in the proposed irrigation system for sensing the temperature.

IV. CONCLUSION

The smart irrigation system implemented is cost effective for optimizing water resources for agricultural production. The proposed system can be used to switch on/off the water sprinkler depending on the soil moisture levels thereby making the process simpler to use.

Through this project it can be concluded that there can be considerable development in irrigation with those of IOT and automation. Thus this system is a solution to the problems faced in the existing process of irrigation.

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