MOBILE APPLICATION FOR DRIP IRRIGATION IN AGRICULTURE LAND

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ABSTRACT-The **I**nternet **O**f **T**hings (**IOT**) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with uniqueidentifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The Internet of Things(IOT) in remodeling the agriculture enabling the farmers with the wide range of techniques such as precision and sustainable agriculture to face challenges in the field such as Crop Water Management, precision agriculture, **I**ntegrated **P**est **M**anagement or **C**ontrol (**IPM/C**). Wireless sensor network is used for monitoring the farm conditions and micro controllers are used to control and automate the farm processes. To view remotely the conditions in the form of images and videos, wireless cameras have been used, such as IFFCO Kisan Agriculture, Agriapp, CCMobile App.

1. INTRODUCTION

The **Internet of things** (**IoT**) is the network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these objects to connect and exchange data. Each thing is uniquely identifiable through its embedded computing system but is able to inter-operate within the existing Internet infrastructure.

The term Internet of Things is 16 years old. But the actual term “Internet of Things” was coined by Kevin Ashton in 1999 during his work at Procter&Gamble. Ashton who was working in supply chain optimization, wanted to attract senior management’s attention to a new exciting technology called RFID.

IoT devices are a part of the larger concept of homeautomation, also known as demotics. Large smart home systems utilize a main hub or controller to provide users with a central control for all of their devices.Media use of the Internet of things is primarily concerned with marketing and studying consumer habits. Through behavioral targeting these devices collect many actionable points of information about millions of individualsFarming challenges caused by population growth and climate change have made it one of the first industries to utilize the IoT.

Environmental monitoring applications of the IoT typically use sensors to assist in environmental protection by monitoring air or waterquality, atmospheric or soil conditions and can even include areas like monitoring the movements of wildlife and their habitats.

IoT devices can be used to enable remotehealthmonitoring and emergency notification systems. These health monitoring devices can range from blood pressure and heart rate monitors to advanced devices capable of monitoring specialized implants, such as pacemakers, Fit bit electronic wristbands, or advanced hearing aids.

The IoT components of a transport system enables inter and intra vehicular communication, smart traffic control, smart parking, electronic toll collection systems, logistic and fleet management, vehicle control, and safety and road assistance.

2. REVIEW OF LITERATURE

The concept of precision agriculture is learnt through this paper "**The realization of precision agriculture monitoring system based on wireless sensor network".** This paper introduces the theory of the monitoring system, and discusses the aspect of hardware and software design of the composed modules, network topology, network communication protocol and the present challenges. Because of this the agriculture production efficiency is improved drastically. Hence it is incorporated in our paper.

Wireless Sensor Network(WSN) is a significant and exciting technology with good potential for application in various fields including agriculture. It is observed in the paper**" Deployment of wireless sensor networks (WSN) in automated irrigation management and scheduling systems".** Irrigation management via automatic access to in-field soil moisture conditions and control of irrigation systems is implemented in our paper.

Zigbee protocol to control the water quantity programming using an algorithm with threshold values of the sensor to a microcontroller for irrigation system. The system is prevented by cellular-internet interface for data inspection through IoT. IoT devices is fixed in crop field to monitor the disease area. This is the theme of the paper**"Wireless sensor Network based automated irrigation and crop field monitoring system".** The interface of IoT with agriculture system is extracted from this paper which minimize cost and energy autonomy.

As mentioned in the paper**"Research on the agriculture intelligent system based on IOT".** There are three platforms available on this framework using RFID. They are expert system which makes decision. The second one is the intelligent production management platform which could control the supply of water and fertilizer. This is adopted as the base for our work.

The **"Remote Sensing and Control of an Irrigation System Using a Distributed Wireless Sensor Network",** provides idea for sensor based irrigation systems that offer a potential solution to support site specific irrigation management which saves water. Wireless Sensor Network with IoT technology made this concept possible.

3. SYSTEM ARCHITECTURE

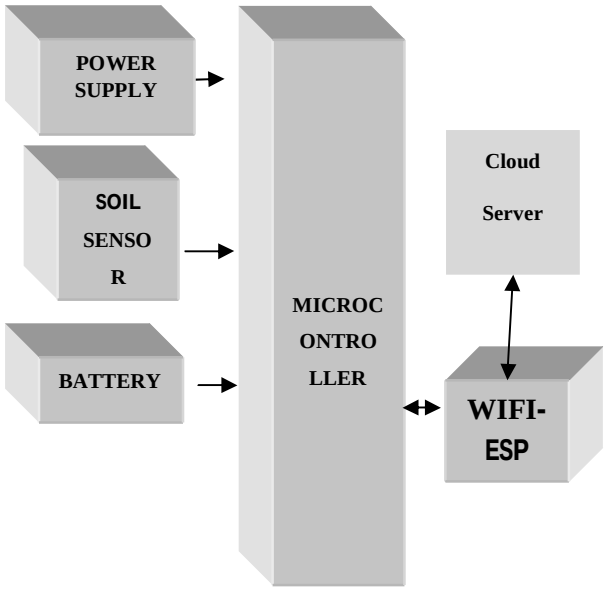

Fig. 3.1 system architecture

From the above block diagram denotes the system of drip irrigation in the agricultural land the system architecture has the following hardware components, such as microcontroller, Wi-Fi device attached with microcontroller, power supplier, soil sensor for deduct the soil moisture level in the land, battery, and finally Cloud server for interconnect the hardware components and the application for the mobile devices.

4. WORKING PRINCIPLE

4.1 Description

Module 1 is monitoring the soil moisture level through the soil sensor the soil sensor deducts the level of the moisture in the agricultural land and through the result reading to microcontroller. The microcontroller getting the reading from the soil sensor and the deducted moisture is transfer through the WIFI device to cloud. The application BLYNK have LED user interface to display the deducted moisture level form the cloud.

From the bellow diagram (FIG 3.Work flow diagram for deducting the soil moisture level in the land) we can understand the flow of drip irrigation system, and its working process is given in bellow steps

STEP 1: Start the process.

STEP 2: Initialize all sensor to the system by using the IOT.

STEP 3:- Check the sensor value is less or more, soil moisture sensor gives the moisture level reading from humidity sensor we get the reading of humidity level present in the atmosphere also, temperature sensor gives the temperature present in soil and most important sensor is water level sensor which gives the water in the soil is less or more.

STEP 4: If the water level and soil moisture level the fixed criteria. There is no need to give to irrigation.

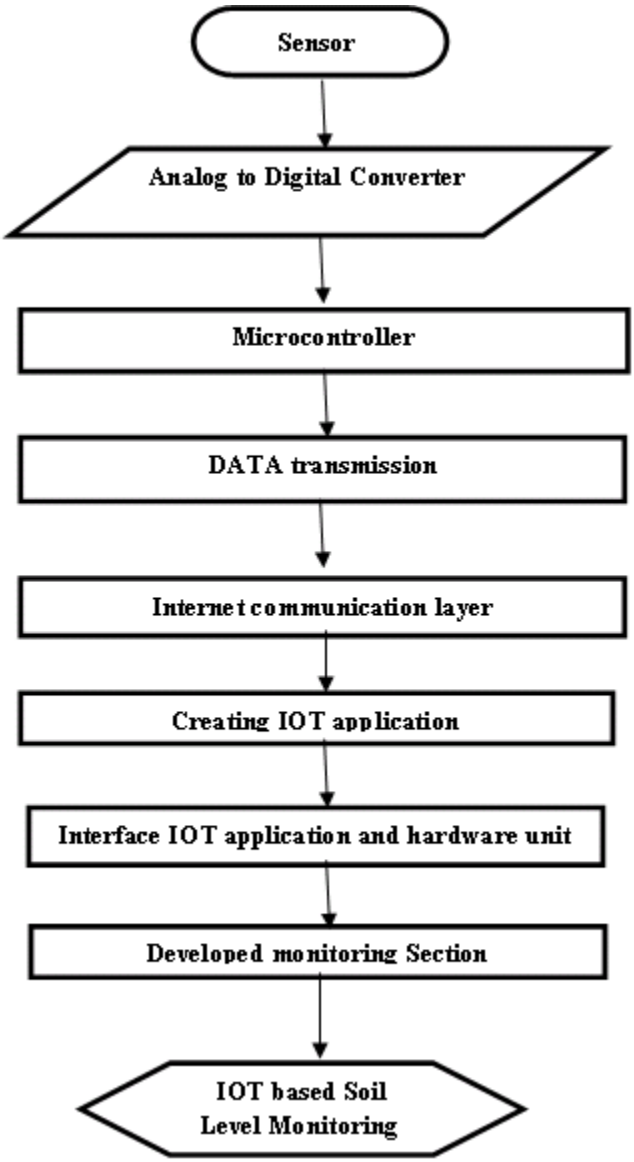

Fig 4.1 Work flow diagram for deducting the soil moisture level in the land

STEP 5: If the soil moisture level or water level is less than the fixed criteria. Need to give to irrigation

STEP 6: After the step 5 we need to initialize the all the sensor value. The process will be completed. After the process completed, it moves to the original state in field sensing sensor monitor the field condition of soil moisture, soil temperature and humidity in air.We get monitors the information on the field i.e. humidity, temperature of soil, etc. All in field sensor data are

wirelessly transmitted to our system. In the day to day life atmospheric condition is change fastly and climate is change due to this type of the change that‘s effects on the agriculture or the production of the crops. Some time, water in the agriculture field is over does of water given by the former also the production of crop is less due to the less rainfall or less does of the water. There are many types of the reason for the less production of crop for overcome fall this type of query this projects is designed and it is handled from any place**.**

STEP 7: Creating IoT application. Here we used **BLYNK** for interconnecting the hardware component and the mobile application. It is open-source, could easily handle thousands of devices and can even be launched on a Raspberry Pi.

How BLYNK works - BLYNK was designed for the Internet of Things. It can control hardware remotely, it can display sensor data, it can store data, visualize it and do many other cool things. There are three major components in the platform,

BLYNK App - Allows to you create amazing interfaces for the projects using various widgets we provide.

BLYNK Server - Responsible for all the communications between the smartphone and hardware. We can use our BLYNK Cloud or run our private BLYNK server locally. It is open-source, could easily handle thousands of devices and can even be launched on a Raspberry Pi.

Now imagine: every time you press a Button in the BLYNK app, the message travels to space the BLYNK Cloud, where it magically finds its way to your hardware. It works the same in the opposite direction and everything happens in a BLYNK of an eye.

5. CONCLUSION

Internet of Things has enables the agriculture crop monitoring easy and efficient to enhance the productivity of the crop and hence profits for the farmer. Wireless sensor network and sensors of different types are used to collect the information of crop conditions and environmental changes and theses information is transmitted through network to the farmer/devices that initiates corrective actions. Farmers are connected and aware of the conditions of the agricultural field at anytime and anywhere in the world. Some disadvantages in communication must be overcome by advancing the technology to consume less energy and also by making user interface ease of use.

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