Detecting the Defects In Agriculture Sector Using Big Data Tool

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Abstract- *Big data is a term of data set that are so larger complex that becomes difficult to process by using on hand database management system. The farmer are using the traditional method in agriculture sector due to this the productivity becomes less and large amount of crops are get affected by bacterial attack. This is get happened because the farmers are unable to know the weather conditions and the types of pesticides they are to be use. So avoiding this problem the sensors are used and by using these sensors the farmers get the information about the weather condition and easily predict the climatic situation. So based on these climatic situation they can change the crops and it acts as a real time monitor system.*

Keywords- Big Data, Agriculture,Sensors

I. INTRODUCTION

Sensors that measure a variety of essential soil properties on the go are being developed. These sensors can be used either to control variable rate application equipment in real-time or in conjunction with a Global Positioning System (GPS) to generate field maps of particular soil properties. Depending on the spacing between passes, travel speed, and sampling and/or measurement frequency, the number of measurement points per acre varies; however, in most cases, it is much greater than the density of manual grid sampling. The cost of mapping usually is reduced as well.. When thinking about an ideal precision agriculture system, producers visualize a sensor located in direct contact with, or close to, the ground and connected to a "black box" which analyzes sensor response, processes the data, and changes the application rate instantaneously. They also hope that the real-time information detected by the sensor and used to prescribe the application rate would optimize the overall economic or agronomic effect of the production input. This approach, however, does not take into account several difficulties met in the "real world":Agricultural Sensors, positioning systems for detecting location of sensors, actuators like sprinklers, foggers, valve-controlled irrigation system, etc. are already available in market. However, very limited work has been done so far on the technologies to be used to transfer sensor data wirelessly from crop field to the remote server.

II. EXISTING SYSTEM

In the existing system the farmers use the traditional methods to overcome the defects in the production field. In the existing system farmers can find out the climatic conditions and get the information about the crops and the soil type for each crop and more details by the mobile application system. So the experts take class for the farmers about the modern agricultural systems. Every one are not able toattend the programs and does not get good ideas about this. So the existing system send the news feeds through the mobile phones and make the farmers aware about this.

- News feeds
- Online learning
- Weather alerts
- Buy products
- Sell products
- Market status

News feeds are used to update all the news and can be known through notifications. Online learning helps the farmers to know the best practices with the help of different tutorials weather alerts are get through notifications and provides all the information about the climatic conditions here we are getting the information from different sources like metrological departments about atmosphere conditions new variety of seeds in the market etc,. in this existing system all the farmers should aware to use the new technology in mobile phones. But its very difficult to make a good understand about this to others . so peoples donot take time to now the details by using the mobile phones. So this application cannot be much useful for the people who are not much aware about the latest technologies.

III. PROPOSED SYSTEM

One of the most challenging issues in agricultural sector is the lack of productivity. The people are not aware about the new technologies and not much interested to use the mobile application . So a proposed system is used to find the climatic conditions and all by using the sensors. Different sensors are used such as location sensors, optical sensors, electrochemical sensors, mechanical sensors, dielectric moisture sensors, airflow sensors and agriculture weather stations.

- Location sensors use signals from GPS satellite to determine the latitude, longitude and altitude within a specific feet . Minimum three satellites are used to triangulate the positions.
- Optical sensors use the light to measure the soil properties. The sensors measure different frequencies of light reflectance in polarised light spectrum. Sensors can placed in vehicles, aerial platforms such as drones or even satellites. Optical sensors are developed to determine clay, organic matters and the moisture content of the soil.
- Electrochemical sensors provide key information required in precision agriculture. This is used by the roots in water absorbtion and are very useful for irrigation interventions. It is a honeywall force sensor.
- Dielectric soil moisture sensors access moisture level by measuring the dielectric constant ie the electric property that changes depending on the amount of moisture content present in the soil.
- Airflow sensors are used to measure the soil air permeability. Measurements can be made at each single locationsor dynamically within motion. It contain various types of soil properties such as structure, compactibility, soil type, moisture level, unique identifying signatures

IV. LIMITATIONS OF EXISTING IRRIGATION SYSTEM

The existing projects have not considered moisture level of soil they are time based. Also user data communication user has no idea about the status of motor and condition of water level from area.

SOLUTION:

The above limitations are properly avoided in the soil irrigation system. The status of all parameters such as motor ON/OFF, water level etc. by using zigbee module we can transmit and receive the data over long distance. We can control motor by using microcontroller. There are many different technologies available for wireless communication useful in application related to irrigation in farm field that is limited largely by the governmental allocation of communication bands. The major types of wireless communication are radio frequency (RF) communication, personal area networks (PAN)--both narrow band and local area networks (LAN), cellular networks, and satellite networks are used. Irrigation control with the zigbee in agricultural areas has a crucial importance. Because of highly increasing demand for freshwater, optimal usage of water resources has been provided with greater extent by automation technology. ZIGBEE system is efficient for water management in the irrigated agricultural cropping systems. The system is based on soil condition identification and consists of zigbee module for communication purpose. . In order to produce specific wireless ZigBee-based irrigation control system is a potential solution to optimize yields and maximize water use efficiency.

WORKING:

Soil moisture sensing network is used to monitor the moisture contained in soil. Three different sensors are used to monitor three layers of soil. And according to that further action is taken by microcontroller as the output of network is given to the microcontroller. Indicator indicates whether the soil is dry or wet. Microcontroller is the heart of the system; it controls the overall irrigation system. It takes the input from moisture sensor 1, 2, 3 etc. & according to the written program it turns ON or OFF the motor pump. It also indicates the condition of soil. Also it provides the data to the PC through zigbee module. When soil is dry motor is on and when soil is wet motor is off. Thus microcontroller controls the operation of motor. Zigbee module is a communication technology just like a Bluetooth but different that it is a full duplex communication. It is used here to have wireless link between PC & the main irrigation system. So that data can be logged into PC. In our project we have one master and one slave device. AC or DC motor can be used for whole system. On the basis of soil moisture detection, motor ON/OFF working will be done. Provision of water and considering the need of water to the crop is done by controlling motor. Along with this the valves are made on depending on the state of the soil. LCD is also used at field .It indicates message from the microcontroller soil state, motor state.

V. NEED OF ZIGBEE IN AGRICULTURE FIELD:

ZigBee is an established set of specifications for wireless personal area networking (WPAN), i.e. digital radio connections between computers and related devices. ZigBee provides specifications for devices that have low data rates, consume very low power and are thus characterized by long battery life. ZigBee makes possible completely networked homes where all devices are able to communicate and be controlled by a single unit.

VI. WATERMARK SENSORS

The Watermark is a resistance type granular matrix sensor. The resistance across a pair of electrodes imbedded within the granular matrix varies with moisture content. This varied resistance is calibrated against known values and reported as soil water tension, the same value we obtain from an Irrometer tensiometer reading. Internally installed gypsum is used as a buffering agent to compensate for the effects of varying salinity levels typically found in the irrigated agricultural environment. Watermarks sensors can be read by several different devices. The Watermark Meter is a solid state alternating current resistance bridge meter for reading Watermark sensors. It is adjustable for soil temperature variations. One meter is required to read an unlimited number of sensors, one at a time. The Meter includes: touch pad operating panel, durable case and field changeable cable assembly. Read from 0 cb (wet) to 199 cb (very dry). The Watermark Monitor automatically reads up to eight sensors. The readings can be downloaded to a computer for graphical representation, which makes the changes in soil moisture status easier to identify. Current readings are also displayed in the field for making on the spot scheduling decisions. Several sensor selections are available for each input port. Either Watermark soil moisture sensors, soil temperature sensors, dry contact switch closure sensors, Irrometer Model RSU tensiometers and other 4-20mA or voltage input sensors can be utilized. Data can be downloaded directly to a computer, via a PDA, via radio or via cellular telemetry. The Watermark Electronic Module (WEM) uses two Watermark sensors placed at varying depths within the root zone. The total tension is measured and averaged to report the overall condition within the root zone. This device typically works in conjunction with a standard 24 VAC irrigation controller. The WEM is in effect a switch which interrupts the common ground connection between the control valves and the controller. The irrigation scheduler selects the appropriate moisture level on the dial of the WEM, and the controller is allowed to only run the irrigation cycles necessary. Truly “automatic” scheduling is Watermark Electronic provided.

VII. CONCLUSION

The sensors can be use in the agricultural fields which can improve the productivity in agricultural fields by identifying the weather conditions and the soil moisterisation.The ZigBee based drip irrigation system proves to be a real time feedback control system which monitors and controls all the activities of drip irrigation system efficiently. This will modernize the agriculture field and irrigation control by using ZigBee is one of the good technologies for controlling irrigation over large agricultural sector areas for growing of crops.

VIII. ACKNOWLEDGEMENT

We would like to thank, first and foremost, Almighty God, without his support this work would not have been possible. We would also like to thank all the faculty members of Mount Zion college of engineering, for their immense support.

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