

IOT Based Agriculture Monitoring System

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ABSTRACT

IOT stands for Internet of Things which creates a network among the things, so that they can communicate with each other and can exchange the data. IOT creates a unique identity of each device due to the embedded computing system over a network. Things can be anything; it can be vehicles, home appliances, software, sensors etc. The IOT can control and sense the things through the network so they can be operated from anywhere at any time. Here, the system we are working on contains different sensors connecting to Arduino platform accessing the data from the environment uploading it to internet which further will be accessible to the user from anywhere. This proposal is towards the increasing need of availability and facilities of a farmer.

KEYWORDS: Software, Arduino, Sensors, IOT, Network.

I.INTRODUCTION

Being in the 21st century, the technology is the most crucial part of our daily life. Technology has reached to every domain where agriculture is also an area adhered to technology. But in India it is quite far from the farmer whose earnings are based on agriculture. They are not much sophisticated towards the modern methods and due to lack of technology and knowledge they lag behind. Therefore, they have to suffer from lots of obstacles throughout their life time like less productivity. To overcome from such situations, technology is must.

India is the second world ranking country in agriculture sector where 75% of people's occupation is probably farming. The Indian agriculture is composed of many crops and soil from which rice and wheat is one of the important crops. Since, the Indian farmers are still using the traditional methods of agriculture in their field which is not enough to reach the high expectations of today's growing population and their demands. Hence, there should be an evolution in agriculture sector too.

Well, there are so many ways through which the farmer can increase the productivity, improve the quality of crops and fields too, via technology. They can get rid out of tedious work on field and make it easier for themselves to utilize their time in other skills. The system to be



proposed can help them to monitor and control the parameters conveniently. The system is all about Internet of Things where the arduino is connected to the sensors. Here, the sensors updates minute to minute information and save them over the internet so the farmer can easily monitor the field requirement and process the field.

In such a ways this proposal will help in overall improvement of agricultural field.

II.LITERATURE SURVEY

In past years the system for monitoring the parameters related to the agricultural field was manually. If farmer intended to check the moisture of soil he had to attend the process physically and test the texture of the soil in a traditional way. Due to which it became hectic to repeat this procedure concurrently. Then in further years, the systems based on IOT were introduced making these procedures easy and handy for the farmer. But the range of the parameters was limited which in turn made the system expensive as the parameters were particulate to that area and needed the other one for different range, this increased the number of parameters to be used.

The proposed system will reduce these possibilities and demerits as the total work will be done by sensors with the increased range.

III. ARCHITECTURE

The System architecture will consist of a web cloud server where all the data regarding the parameters will be stored at one place. Two applications one in android app and another in computer will be made through which the user can monitor and see the data and the parameter of the environment and the soil. Arduino Uno/ Raspberry pi which will be connected through the internet. Where it will take the input from the various sensors and it will collect the values and upload it on the web server. Arduino is nothing but the platform for software and hardware development.



Figure. IOT based agriculture monitoring system



The "Effective Agriculture System using IOT" is such a concept where we are trying to create a small evolution to farming technique.

As specified above, we are trying to change the methods used in the Agricultural methods and implementing the modern methods to obtain and increase the productivity of the field. The farmer will be able to conveniently monitor and control the parameters in the field. The features included in our system are as follows:

Humidity and Temperature Monitoring Sensor

The Temperature is an important parameter for the farmers. Some crops are grown only in a certain temperature also they are to be given water when the crop meets certain temperature. It is really hectic to manually monitor these things. This will monitor the temperature and humidity in the arena and upload it on the cloud and the user can directly check the parameter using android mobile or computer.

Soil Moisture Sensor

The moisture of the soil must be convenient for crops to grow. Certain crops require perfect moisture of the soil for growing. Not more or not less we cannot manually calculate the moisture. This moisture sensor will calculate the moisture from beneath the soil and update it on the cloud and store. Once uploaded, the user can check the moisture and parallely control the peripheral like water pump.

Co2 Sensor

The Co2 is a vital factor for plants to grow. The Co2 must for the photosynthesis process for the plants to grow fast in the environment. This CO2 sensor would help to understand the factors responsible for productivity mainly Carbon dioxide. The peripherals like sprinkler will be handled simultaneously by the user.

Light Intensity

The Light intensity is also important for plants to develop. The sensor will monitor the intensity of the sunlight and upload it on the cloud. This can be checked from any source connected to the internet.

This system will be handled by the user via an application and software. Focusing on the requirement of crops and fields, we are also emphasizing on time to time data and update to the user so it will help to discard the flaws from the field processing.

IV. WORKING

Agriculture monitoring system is a result of smooth interfacing between hardware and software. The hardware part consists of Air Quality Sensor, DHT11 sensor, moisture sensor and light sensor respectively. We are using ESP12E or Node MCU module which is based upon esp8266. The program which runs on ESP12E is collecting data from analog pins and



sending it on the cloud. Since ESP12E has only one analog pin, we are doing multiplexing. So at a time only one sensor remains on. The sensors are turned on one by one such that if sensor 1 is on the other sensors will be off. Then we are turning on the next sensor and turning other sensors off. In this way we are able to connect multiple sensors to a single analog pin. Only DHT11 sensor is always on since it is being read from digital pin. The turning on and off of sensor is achieved by programming pins to supply powers to one sensor at a time. After we have collected data of sensors in temporary variable, we are sending the data on the cloud. The cloud here is thingspeak. The thingspeak cloud provides read and write API key which prevents unwanted updation of data or additional security to the IoT cloud. We have created fields in thingspeak. While updating fields which ard. nothing but the collected values of sensors, we have to use write api key obtained from thingspeak. Thingspeak already provides custom graphs to show the data. We can see the previous and incoming data in graphical format on the server.

After this, we have used "Web App" for showing the data. We have created "APK" file for our "HTML Page". The web app made is being enclosed and packaged as apk file. In the web app, Iframe is being used to show the link of the thingspeak graph which we obtained from thingspeak. Then we created Iframe of specific size and displayed in the tabular format on a web app. Appgeyser is used to package this webapp into apk. When we install the application, the application opens the webpage in the package. This web app is static except the graph. The graph is dynamic and is directly loaded into application. Whenever the Node MCU updates data on thingspeak, it will show in the application

V.RESULTS

This project uses thinkspeak cloud to upload the data from the sensors. The cloud will update data at regular interval of time. For these we first need to create user id and password on the thinspeak cloud so that the farmer can login and monitor the parameters of the field.

A.Login Page

This is the login page where the farmer needs to create his user id and password to login. He can use his gmail account to create user id. After the creation of user id he needs to login.

□ , ThingSpeak~	Channels	Apps	Community	Support +	How to Buy	Sign In	Sign Up
Sign In to Thing	Speak						
Email Address							
qureshi0317@gmail.com							
Next							
New user?							
Sign up for the first time							



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Figure: login page

B.Creating channels

After creating user id we needs to create our channels on the cloud and fields required on the cloud.



Fig: Creating channels

C. Graphs







Fig: temperature



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Fig: soil moisture



Fig.light intensity

VI.CONCLUSION

This all draft is based on IOT for inventing a better technology for farming zone and gaining the knowledge about the main resources of field by using the field parameters. We want to enhance and explore the technology in cultivation, so that every single person get closer to the future world and able to receive the superior life .By using this technology the farmer can automate the system and hence can yield more.

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