An IOT Based Farming By Using Arduino Technology

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Abstract - Agriculture plays vital role in the development of agricultural country. In India about 70% of population depends upon farming and one third of the nations capital comes from farming. Issues concerning agriculture have been always hindering the development of the country. The only solution to this problem is smart agriculture by modernizing the current traditional methods of agriculture. Proper cultivation is very important to increase the crop. This is to propose a state of art wireless sensor technology in agriculture, which can show the path to the rural farming community to replace some of the traditional techniques. In our system the sensor motes have several external sensors namely leaf wetness, soil moisture, soil pH, atmospheric pressure sensors attached to it. Also the value of soil pH sensor is detected and intimates the farmer about the soil pH. Obtaining the soil pH value the farmer selects the necessary fertilizer and crop for farming. Our system will maintain two different cloud database one for agriculture department and other for farmer department. Using this system the agriculture factors monitored and controlled correctly because of this system there will be improvement in the productivity.

Keywords — pH Sensor, Arduino, Soil, Smart Farming, Cultiva-tion, Wifi, Moisture.

I. INTRODUCTION

Agriculture is the backbone of India, and plays an important role in economic development. It is the science or practice of farming, including cultivation of the soil for the growing of crops. Cultivation is most often used to talk about the ways that farmers take care of crops and their farms. However, it consists of various phases that are depends on the environmental factors such as Temperature, Soil moisture and water level. Farmers need to keep the records of these environmental factors manually to cultivate crops properly. To avoid such burden from farmer, and to achieve such functionality farmers require a System which will be able to gather the information, from farm such as Temperature level, water level and soil moisture via various sensors. Furthermore, system should process this information to provide functionality to the farmers. To enable system accessible from anywhere it needs to be centralized and connected to Internet. Here, the concept of Cloud Computing comes .Thus, to manage all these functions Cultivation Management System comes into picture. This system allows farmers to view farm (or farm field) information such as sensors values, devices connected, etc. with the help of micro-controller arduino. All this information can be accessed via Android enable mobile phone, tabs, etc. by farmers.

II. LITERATURE SURVEY

Sr. No	Method	Work Done	Cons
1	A Control System in an Intelligent Farming by using Arduino Technology[1].	System had focus on the control part which are watering and roofing systems of an outdoor farm based on the statistical data sensed from the sensor systems (including temperature, humidity, moisture and light intensity sensors).	Sensed data would not be always accurate due to noises.
2	Arduino Interface with Smart Farming System[2].	To plan and grow an agricultural system based on arduino method	System will suggest crop based on only sensor values

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Sr. No	Method	Work Done	Cons
3	A Software Model for Precision Agriculture for Small and Marginal Farmer[3].	This approach is characterized by a farmer soil crop database acquired from the field, crop calendars provided by agricultural experts, real-time acquisition of parameters such as temperature and rainfall through sensors, and an analytical model.	The model was designed taking into consideration the specifics of agriculture of the Kerala region of India, the same principles can be applied to small and marginal farmers everywhere in the country.
4	A flexible and extensible framework for agricultural Crop Yield Prediction[4].	This system is flexible and extensible. It has provision for selection of crop, dependent and independent variables, datasets for crop yield prediction towards precision agriculture.	This system is suitable for only particular types crop.
5	XCYPF: A Flexible and Extensible Framework for Agricultural Crop Yield Prediction [5].	This paper they are studied the need for crop yield prediction and the data mining method is used in this paper.	This system can give only the prediction of yield of crops.
6	Comparison of Self Organizing Maps and Sammons Mapping on agricultural data sets for precision agriculture [6].	In this paper we have compared Self Organizing Maps and Multi-Dimensional Scaling.	From this paper we conclude that we can use data mining instead of Sammons Mapping

III. PROPOSED SYSTEM

This system is a system which is used to make improve-ments in the agricultural field. It is done on the basis of the cloud-based network. In this system, all the work will be operated with the help of an android app through which the farmers have to register themselves and they can get all the details about how much crop to be cultivated in that land and what kind of plants can they plant in the field. Other than that they will also get the information about the pH level of the soil and that how much moisture their soil contains so accordingly they can also get knowledge that what crop would be beneficial for them. We have also added sensors which will work as a sensing machine to sense the pH level as well as the moisture level. This system will be totally automated so no manual interference is required in this system the farmers will get the notification about their land and the crop as well.

A. Soil Moisture Sensor

This sensor is interfaced with micro-controller and programmed. Once it is programmed it is placed inside a box and kept in field f The soil moisture sensor has two probes which is inserted into the soil. The probes are used to pass current through the soil. The moisture soil has less resistance and hence passes more current through the soil whereas the dry soil has high resistance and pass less current through the soil. Soil moisture sensor includes comparator (LM393) which converts analog data to discrete. Two soil probes consist of two thin copper wires each of 5 cm length which can be immersed into the soil under test. The circuit gives a voltage output corresponding to the conductivity of soil. The soil between the probes acts as a variable resistance whose value depends upon moisture content in soil. The resistance across soil probes can vary from infinity (for completely dry soil) to a very little resistance (for 100moisture in soil) his variation in resistance across the probes (RS) leads to variation in forward-bias voltage which leads to corresponding variation in input base current (Ib).

B. Modules

1) Farmer Registration

Farmer has to register first and provide a personal information and its create a user id and next sign up first using a user name

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and password and their are different option are available of view all crop list, feedback.

2) Hardware Embedding

The system having sensors connected to Arduino depending on the external factor they contribute to the plant growth. The sensors include soil moisture and water level sensors.

3) Naive Bayes

It is a machine learning algorithm for classification problems.

4) GPS location Extractor

Easily track Farmer and Farm location.

5) Cloud Embedding

To enable system accessible from anywhere it need to be centralized and connected to Internet. Here the concept of cloud computing is used.

6) Mobile Application

The Mobile application has three main parts i) a user can see historical sensed data from the plot, ii) a user can monitor plants status data and manually operate watering and roofing systems, and iii) a user can check the current and forecasts weather for the next three days.

7) Admin Module

Admin have facility of add crop, edit, delete, search particular crop and view available crop.

IV. Goals & Objectives

A. Goals

- To provide farmer with real time PH value of his farm. To gen notification of watering the plant whenever needed.
- To reduce the manual monitoring with the GPS module.
- To generate crop rotation and identification of appro-priate fertilizer.
- To provide list of farmers growing which type of crop in that area.
- To minimize loss of farmers.

B. Objectives

The objective of this project is to provide android based embedded system for detect soil moisture and temperature.

V. DOM Parser Algorithm

Algorithm MultipleTreeMerge(T,P)

// T is a set of DOM trees of the same type;
// P is the tag for the roots of T.
Initial M;i=0;
for each tree t in T;
I=0;
for each child c in t;
M[j++][i]=c;
Endfor
I++;
Endfor
recognizePeerNode(M); childList = matrixAlignment(M); childList = repeatMining(childList,1); mergeOptional(childList); for each node c in childList
if(c is a tree) then
C = multipleTreeMerg(peerNode(c,M),log(c));
Else // c is a leaf node
C=c;
Endif
Insert C as a child of P;

VI. Mathematical Model

S = (I,O,F) Where,

1) S: System.

I = f FI, FI1, M, PV, WL g are set of Inputs Where,

1) FI : Farrmer Information.
2) FI1 : Farm Information
3) M : Moisture
4) PV : pH Value
5) WL : Water Level

F = f F1, F2, F3, F4, F5, F6 g are set of Function Where,

1) F1 : Register
2) F2 : Login
3) F3 : Moisture calculation
4) F4 : pH calculation

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5) F5 : Water Level calculation

6) F6 : crop suggestion

O = f CI, CS, SD, FD g are set of Output Where,

1) FD : Farmer Details.

2) CI : Crop Information.

3) CS : Crop Suggestion.

4) SD : Sensor Details.

Success Condition : To do proper feature extraction, Sensor embedding, Location details, proper database.

Failure Condition : No database, No internet connection.

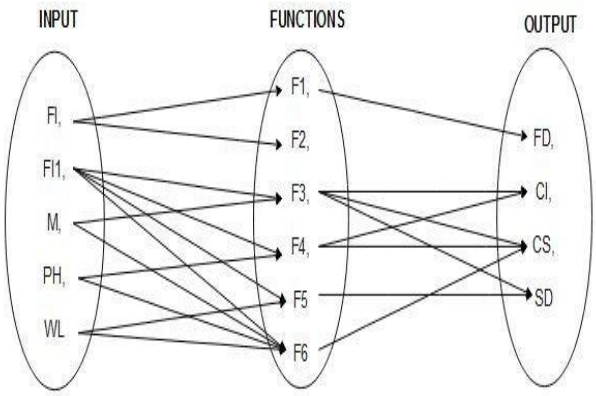

Fig 1. Venn Diagram

VII. CONCLUSION

We conclude that Cloud based Cultivation Management System is system for the user who cultivates plants in farm field. Farmer can monitor farm details from anywhere. Farmer can also monitor the temperature, soil moisture details, water level, etc. If such environmental factors are monitored and there can be increase in the productivity.

VIII. FUTURE WORK

1) In future adding of feature that remotely manage and control their smart connected other irrigation equipment in proposed system.

2) In future we can make system for full country database.

3) In future we will be provided solar energy.

REFERENCES

[1] Narayut Putjaikal, Sasimanee Phusael, Anupong Chen-Iml,Dr.Phond Phunchongharnl, and Dr.Khajonpong Akkarajitsakup, *A Control Sys-tem in an Intelligent Farming by using Arduino Technology*, Fifth ICT nternational Student Project Conference (ICT-ISPC), 2016

[2] Ms. G. Rekha M.E1, S. Muthu Selvi,*Arduino Interface with Smart Farming System*,International Journal Of Engineering And Computer Science ISSN:2319-7242,2017,Page No. 20521-20526

[3] Satish Babu , *A Software Model for Precision Agriculture for Small and Marginal Farmers*, at the International Centre for Free and Open Source Software (ICFOSS) Trivandrum, India, 2013.

[4] Anshal Savla; Nivedita Israni; Parul Dhawan; Alisha Mandholia; Him-tanaya Bhadada; Sanya Bhardwaj,*Survey of classification algorithms for formulating yield prediction accuracy in precision agriculture*, In-ternational Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS), 2015, Pages 1 - 7

[5] Aakunuri Manjula; G. Narsimha, *XCYPF: A flexible and extensi- ble framework for agricultural Crop Yield Prediction*, IEEE 9th Inter-national Conference on Intelligent Systems and Control (ISCO), 2015, Pages: 1 - 5

[6] Yash Sanghvi; Harsh Gupta; Harmish Doshi; Divya Koli; Amogh Ansh; Umang Gupta, *Comparison of Self organizing maps and Sam- mons mapping on agricultural datasets for precision agriculture*, In- ternational Conference on Innovations in Information, Embedded and Communica-tion Systems (ICIIECS), 2015, Pages: 1 – 5.

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