SMART GREEN HOUSE USING IOT AND CLOUD COMPUTING

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Abstract—In identifying and maintaining the micro climatic conditions inside of Greenhouse the Smart Green House android app has get succeed. The Sensor reading of soil moisture, humidity and temperature of greenhouse would be displayed in android application, as per sensor reading, we set predefined threshold values for each sensor, based on these readings the water sprayers, cooling fan, rooftop and focus light could be controlled. The app would have power control button of the motors, so that motors can be turned on or off and it also has the data of all horticulture plantation and seasonal precautions to monitor and control. The main aim of this project is to design an application which is easy to install and user friendly to the operations, such as, monitoring and recording the values of temperature, humidity, soil-moisture and sunlight of the natural environment. To achieve maximum plant growth and yield these have to be optimized continuously. The results show that the proper situation specified in the sensors database and system. The proper functioning of the system can be decided by the achieved result.

I. INTRODUCTION

The agriculture sector plays a major role in the economy of our country. In that, The Greenhouses form give an immense advantage to grow plants in a manageable climatic condition to achieve maximum production. An automized greenhouse envisages observing and managing of the climatic parameters that are govern the plant growth and their production.The 60 of Indian population lives depends on farming. Though, the max-imum people are not aware of using latest techniques and tech-nology innovations in forming. The greenhouse form would stand in primary position to enhance the performance.There are drawbacks in hand-operated greenhouse such as, visual inspection of plant growth, hand-operated irrigation of plants, operating in temperature controllers, hand operated spraying of fertilizers and pesticides. These manual operations are time consuming and vulnerable to human errors. These reasons would affect the accuracy and it is unreliable. In order to overcome these failures automized green house would be the best solution. The automized greenhouse would remove the difficulties involved in the manual operated systems by decreasing human involvement to the best possible area. The sensors sense the change and raspberry-pi reads this from the data at its input ports (GPIO). The greenhouse form emphasizes to the maximum growth in output, it helps to grow the business crops. This would be the best way to strengthen the agriculture system and improves in profits. As we know that, the farmer is the one who is continuously struggling for the betterment of their lives and hoping for the best output from their forming. The smart technology application enables the growth of agriculture sector which leads to the drastic growth in country's economy. This also reduces the hard work and investment to the small-scale farmers and it is so simple to use and to adopt this technology

II. RELATED WORK

a) Sheetal Vatari, Arti Bakshi, Tanvi Thakur says that Greenhouse is the best path to control and manage the errors and to save the time. This is important to find a method which gives the proper analyzation and controlling information to develop suitable environment. The sensor network would cover large areas and could establish greenhouse with precision environment required for different crops. Two technologies are required to build this environment those area IT and Cloud computing. Devices would be controlled by using IOT (internet of things) and cloud would provide storage facility.

b) Ravi Kishore Kodali, Vishal jain and Sumit karagwal stated that, this project provides a model of smart greenhouse, which helps the farmers to carry out the work in a farm with atomization technology in absence of hand operated inspection. The automatic drip irrigation could be used, which operates according to the moisture content of soil so that, optimum amount of water is applied to the plants.

c) Uday A. Waykole, Prof.Dhiraj. G. Agrawal says that temperature is indirectly proportional to humidity where tem-perature raises humidity decreases hence, it is difficult to control the temperature and humidity together at once. Due to this, the temperature and humidity of greenhouse should be monitored constantly to ensure optimal conditions. A wireless sensor network would be used to gather the data from point to point. The extracted data from the green house will be measured by the sensor and the data would send to receiver. The date would display on LCD screen.

d) Bharat Institute of Technology issued a report on "The Project Green bee" based on Monitor and Control of green-house environment. According to the report, the system is modeled for the automation of greenhouse using embedded system. e) Jia Song, He proposed a system on Greenhouse Monitoring and Control System using 8051 controllers.

III. PROPOSED WORK

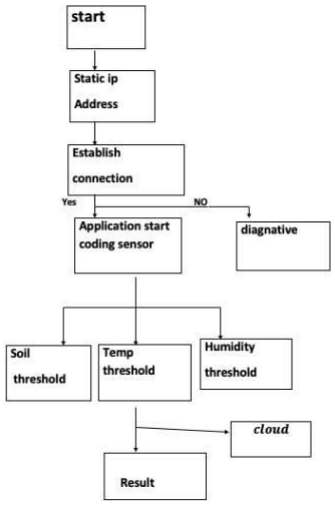

Fig. 1. Algoritham

The process woukd start by giving internet connection to the application by using an uniq ip address. the process would start once the connection establishes with the application. if the connection could not establish, the system has to be daiognised. if the connection establishes without any errors, the systen will start functioning. the sensors would start reading the sensors as per specified threshold instructions to the programme. these results will display on screen. hence, the final user would know the climatic conditions bof the greenhouse. if any errors occurs, final user would come to know and could take immediate action against to the error

IV. METHODOLOGIES

A. SOIL MOISTURE:

To measure the volumetric water content in soil the soil moisture sensors would be used. The direct gravimetric mea-surement of free soil moisture requires removing, drying, and weighting of a sample, so the soil moisture sensors measure the volumetric water content indirectly by using other content of the soil such as, electrical resistance, dielectric constant or interaction with neutrons, as a proxy for the moisture variable. Soil moisture sensors typically refer to sensors that are estimate volumetric water content.

B. TEMPERATURE:

The sensor panel would consist of both analog and digital outputs. The analog output gives a parameters voltage rating that allows finding the satisfied moisture of the soil. The digital output gives a simple indication such as on/off ll when the soil moisture content is above a certain value. To measure the warmness or cold of an object the outline temperature sensor would be useful. DHT 11 is a precision IC temperature sensor with its output proportional to the temperature (in oc). The temperature can be measured with better accuracy with the DHT 11 than with a thermistor.

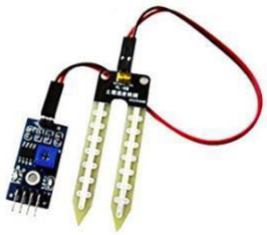

Fig. 2. soil moisture

C. SUN LIGHT:

The most important slice of apparatus in circuit is that the Light Dependent Resistor or LDR sensor. It is very difficult to detect weather it is dark or light without using the LDR. If it light the sensor would have few hundred ohms and if it is dark it could have several mega ohms.

Fig. 3. sun light

V. SYSTEM ARCHITECTURE

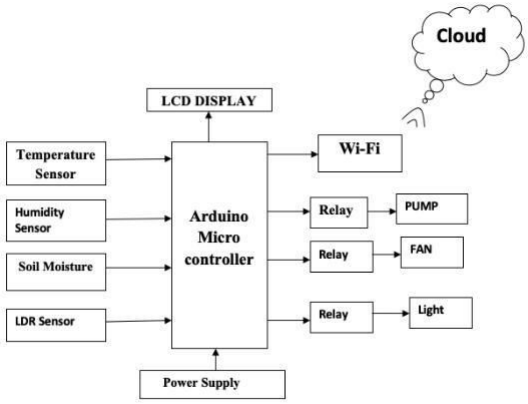

Fig. 4. system architecture

VI. CLOUD COMPUTING

Cloud computing services provide an information technol-ogy services through using internet or any dedicated network based on demand it delivers and payment based on usage. Cloud computing provide wide range of services from full applications and development platforms to servers, storage

and virtual desktops. To deliver the hosted services over the internet, the cloud computing is useful. Cloud computing allows companies to consume a computer resources such as, a virtual machine (VM), storage or an application, as a utility rather than having building and maintain computing infrastructure in home. Cloud computing can be described as it is a computing that relies on sharing computing resources instead of having local servers or personal devices to handle applications. The word cloud used as a metaphor for “the internet”, hence the cloud computing tells that it is a type of internet-based computing, where it provides different services such as, servers storage and applications are delivered to an organization’s computers and devices through internet. The cloud computing is a method which is used for delivering IT services in which resources are retrieved from the internet through web based tools and applications, as opposed to a direct connection to a server. The cloud based storage provides a facility to save files in a remote data base instead of saving them on a proprietary hard drive or local storage. When an electronic device has an access to the web, it has access to the data and the software programmes to run it. If the information being accessed from the cloud and does not require a user to be in a specific place to gain access to it, this process called as cloud computing.

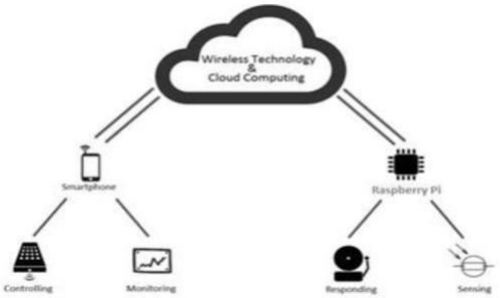

Fig. 5. cloud computing

VII. RESULT

Fig. 6.

the graph in fig 6 shows that the temperature variations in side the green house throughout the day. we can see that, the temperature slightly decreases from 30 to around 28.

Fig. 7.

The chart in fig 7 shows the field result of humidity variation with respective to the date observed. the graph shows that the humidity reduces graduall with in a test day.

Fig. 8.

in fig 8 the chart shows the soil condition woth respective to the date. we can see the drastic gradual rose in soil condition from around 25 to 60 during a day.

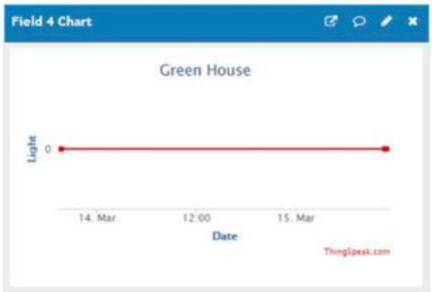

Fig. 9.

in fig 9 the graph shows that the light condition in side greenhouse during a day. it is observed that the light condition

is constant throught out the observed day.

VIII. CONCLUSION

As we know that, the agriculture sector stood as a backbone in our country's economy. In order to improvise the quality and productivity of greenhouse and open field crops, it is required to measure and control several interacting physical variables. By using control system with built in software these tasks can be accomplished.

The process of erecting greenhouse is very expensive. As we don't have the manufacturing unit of automation machinery we have to import it from foreign countries, hence it is expensive. Due to this reason, many of our Indian formers cannot adopt this technology as they could not afford the cost. Our system highlights about the approach to control the environment in green house. The green house controller senses the changes in the temperatures (dry temperature, wet temperature), humidity, soil moisture through input sensors and processes take control action.

To get reliable and timely information of crop and soil status and to take important decisions on upgradation of crop production the real time monitoring is required. Evaluation of agricultural production system involves performing visits to selected crop fields to be able to measure and register certain physical, chemical and biological characteristics of the cultivated areas and analysis of all input parameters.

IX. REFERENCE

[1] Sheetal vitari, Aarti Bakshi, Tanvi Thakur Green house by using IoT and cloud computing 2016 IEEE International Conference on Recent Trends in Electronics Information and Communication Technology

[2] Ravi Kishore kodali, Vishal Jain and Sumit Karagwal-IoT beased Smart Green house II 2016 IEE region 10 Human-itarian Technology Conference

[3] P. Raja Lakshmi, S. Devi Mahalakshmi-IOT based crop -field monitoring and irrigation automation II 2016 IEE International conference on intelligent system and control

[4] Kenneth J ayala, the 8051 Microcontroller Architecture, programming and applications, Penram International, 2nd edi-tion, 1996

[5] Muhammad ali mazidi, Janice Gillispie Mazidi, Rolin D. Mc Kinlay, the 8085 microcontroller embedded system, Pearson Educaiton Inc. 2nd Edition, 2008

[6] He, Guomi Wang, Xiaochan; Sun, Guoxiang. They had discussed about humidity and moisture monitoring in green house using Zigbee monitoring system.

[7] Jia Song, He proposed a system on Greenhouse moni-toring and Control System using 8051 controller.

[8] In this project we have discussed about Greenhouse monitoring and control system base on microcontroller wire-less senor network using ARM controller. The parameters in the greenhouse are monitored on the PC. In this project we have proposed a low cost method microcontroller to accurately monitor and control the various parameters like humidity, soil moisture, light intensity carbon dioxide(gas sensor) and temperature.

[9]IOT Based Smart Greenhouse Automation Using Ar-duino; Prof. D.O.Shirsath, Punam Kamble, Rohini Mane, Ash-wini Kolap, Prof.R.S.More,International Journal of Innovative Research in Computer Science Technology (IJIRCST), 2017

[10]JRahul Belsare, Komal Deshmukh, Mayuri Patil, M.HattargeA.International Journal of Computer Science En-gineering Technology (IJCSET)2019

[11].Green House by using IOT and Cloud computing; Sheetal Vatari, Aarti Bakshi, Tanvi Thakur, IEEE International Conference On Recent Trends In Electronics Information Communication Tech- nology, May 20-21, 2019, India

[12].Smart green house using iot and cloud computing; SD Bhagwat, Al Hulloli,SB Patil, AA Khan, Research Journal of 2018-academia.edu

[13] Internet of things and cloud computing enabled disaster management. RGaire, C sriharsha ,D Puthal,H Wijaya, J Kim,2019 india

[14] Yan, C., Han, F., Yang, Y.-H., Ma, H., Han, Y., Jiang, C., et al. (2014). Time-reversal wireless paradigm for green internet. IEEE Internet of Things Journal, 2019

[15]. Schaller, A., Mueller, K. (2019). Motorola's experi-ences in designing the internet of things. International Journal of Ambient Computing and Intelligence 2018

[16]. Vermesan, O., Peter, F. (2017). Internet of things: Converging technologies for smart environments and inte-grated ecosystems

[17]. Saha, B. (2019)Green computing and cloud comput-ing. International Journal of Computer Trends and Technology,