

IOT BASED SMART GREENHOUSE AUTOMATION SYSTEM

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Abstract - In this project, we are using different IOT devices like Microcontroller (Atmega32), temperature, humidity, light sensors, PH sensors. Microcontroller based system to monitor and control greenhouse temperature, humidity and intensity of light is designed and many more.

In India, Agriculture is a source of livelihood for majority of people and has a great impact on the economy of the country [1]. On the statistical scale, India ranks second in worldwide in farm outputs. Water level in soil, light intensity gets calculated. Actuators are present for control heater, fans, pumps etc. It is an android application which is monitor all these measuring parameters on mobile from anywhere. Farmers do not need to present at location every time. An android application which collects the result by sensors and compare it with actual parameters and maintain atmospheric environment in warehouse system.

Key Words: Atmega32, Microcontroller, Actuators, IOT, Android, Irrigation, Cloud computing, Monitoring etc.

1. INTRODUCTION

Greenhouse is a kind of place which can change plant growth environment, create the best conditions for plant growth, and avoid influence on plant growth due to outside changing seasons and weather. In greenhouse there are a lot of parameters such as temperature humidity etc. and It is so hard to monitor all of these parameter by human and any significant changes in one climate parameter could have an adverse effect on another climate parameter as well as the development process of the plants. We plan to develop a framework that helps the farmer to automatically provide water to the plant according to its need and current water moisture present in the soil [2].

Therefore, continuous monitoring and control of these climate factors will allow for maximum crop yield improve quality, regulate the growth period and improve the economic efficiency.

The result that obtained show that the system performance is quite reliable and has successfully overcome quite a few shortcomings of the existing system by the same time providing a flexible and precise form of maintaining the environment. With advances in technology, there is more push by global stakeholders like the Food and Agriculture Organization (FAO) for farmers

to use innovative tools and digital technologies [3]. The main aim of this project to reduce the maximum hardware cost which is not affordable to small farmer.

1.1 BACKGROUND

Hand-operated Greenhouse has some drawbacks like visual inspection of the plant growth, hand-operated irrigation of plants, turning on and off the temperature controllers, hand-operated spraying of fertilizers and pesticides. It is time consuming, vulnerable to human error and hence less accurate and unreliable. So fully automatized Greenhouse is a best solution.

1.2 PROBLEM STATEMENT

Android based automated application which collects, monitor, maintain and calculate result of warehouse system by using various sensor devices. Efficiently consumes large area because of microcontrollers used in system. To solve the problem we have to design a greenhouse automation system with the use of IOT and a software application. Which will monitor, analysis and make the decision as well as control the irrigation system to maintain the environment conditions properly.

2. LITERATURE SURVEY

2.1 Vegetable Traceability with Smart Irrigation using Internet of Things, Manali Hate, Swagata Jadhav, Hitesh Patil.

This paper presents a smart wireless sensor network to monitor an agricultural environment. Here we mainly focus on monitoring soil moisture, humidity, water supply control and temperature of a particular farmland. And to monitor all the above things the sensors used here are soil moisture, humidity, and water level and temperature sensor respectively. The microcontroller will receive the information from all the sensors and display in an application.

2.2 Research on automated irrigation system –IOT based approach, Dweepayan Mishra, Arzeena Khan Rajeev Tiwari, Shuchi Upadhay.

The administration of the water system can be enhanced utilizing programmed watering framework This paper proposes a programmed water system with framework for the terrains which will reduce manual labour and optimizing water usage increasing productivity of crops.

For formulating the setup, Arduino kit is used with moisture sensor with Wi-Fi module. Our experimental setup is connected with cloud framework and data is acquisition is done. Then data is analyzed by cloud services and appropriate recommendations are given.

2.3 IOT Sensor Network Approach for Smart Farming, Yemeserach Mekonnen, Lamar Burton, Arif Sarwat, Shekhar Bhansali.

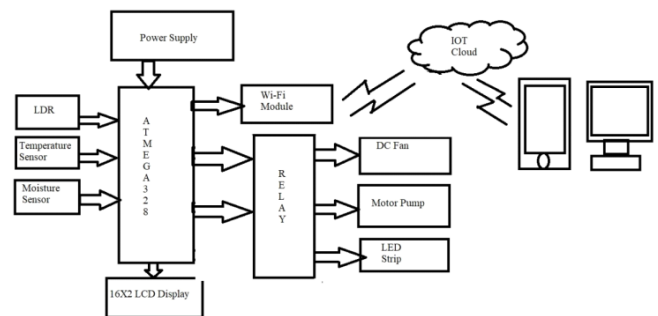
An algorithm was established based on threshold values of temperature and soil moisture automated into a programmable micro-controller to control irrigation time. The system’s energy demand is completely supplied by a solar Photo-voltaic (PV) panel supplemented with an energy storage unit. The experimental data obtained from this prototype will be modeled and optimized to investigate food production profile as a function of energy and water consumption. It will also attempt to understand the effect of extreme weather conditions on food production. This holistic approach will explore the nexus between water and energy resources, and crop yield for several essential crops in an attempt to design a more sustainable method to meet the forecasted surge in demand

2.4 IoT Based Smart Irrigation Monitoring And Controlling System, Shweta B Saraf.

Interconnection of number of devices through internet describes the Internet of things (IoT). Every object is connected with each other through unique identifier so that data can be transferred without human to human interaction. It allows establishing solutions for better management of natural resources. The smart objects embedded with sensors enables interaction with the physical and logical worlds according to the concept of IoT. In this paper proposed system is based on IoT that uses real time input data. Smart farm irrigation system uses android phone for remote monitoring and controlling of drips through wireless sensor network. Zigbee is used for communication between sensor nodes and base station. Real time sensed data handling and demonstration on the server is accomplished using web based java graphical user interface. Wireless monitoring of field irrigation system reduces human intervention and allows remote monitoring and controlling on android phone. Cloud Computing is an attractive solution to the large amount of data generated by the wireless sensor network. This paper proposes and evaluates a cloud-based wireless communication system to monitor and control a set of sensors and actuators to assess the plants water need.

3. SYSTEM DESIGN

Block Diagram



The actual implementation is starts with initialization phase in the form of all the hardware parts. The threshold value is given to all the sensor. All the sensors like temperature, light, moister, gas to check the environment in the greenhouse. Using this threshold value environment in greenhouse gets maintain. These values gets upload on cloud, where we can check the details on our mob application. To maintain the atmosphere in greenhouse fans, lights sprinklers are available and they can be monitor manual as well as on application.

WSNs integration with Cloud Computing is described. It provides performance comparison guideline for integrating WSN with Cloud Computing to improve performance and to overcome storage and energy constraints of WSN [4].

4. CONCLUSIONS

The agriculture field is being monitored and controlled by an android application at user end. This application is easily programmable, installable and lightweight.

Consumes all needs of warehouse automation need and large area easily accessible on android system. Reduces hardware cost by using microcontrollers.

5. REFERENCES

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