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Smart Greenhouse Monitoring using Internet of Things

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Abstract: **Internet of Things is one of the most important technologies of the 21st century. Smart greenhouse system is basically a system in which various sensors are used for controlling and monitoring various parameters inside a greenhouse such as temperature, humidity, soil moisture etc. A green house is basically a place or we can call it an environment where plants like vegetables and flowers are grown and they are usually covered with glass or "translucent plastic roofs". The purpose of this project is to design an easy, easy to install, user-friendly to monitor and trace the values of parameters such as temperature, humidity, natural sunlight which are continually monitored and controlled with an aim to optimize them for getting maximum possible plant increase and yield.**

Keywords: **Smart greenhouse, Internet of Things, controlling and monitoring of various parameters inside greenhouse such as temperature, humidity, soil moisture. And used in agriculture field.**

I. INTRODUCTION

The A greenhouse is a structure that is built of walls and a transparent roof and is designed to maintain regulated climatic conditions. These structures are used for the cultivation of plants, fruits, and vegetables which require a particular level of sunlight, temperature, humidity and soil moisture. IOT and Arduino based Greenhouse Environment Monitoring and Controlling Project is designed to maintain these conditions in the greenhouse. The purpose of the greenhouse monitoring using wireless sensor network prototype that is targeted at transmitting and receiving data within the greenhouse infrastructure.

II. METHODLOGY

A. Working

The proposed system uses the concept of Internet of Things. In short, Internet of things is an environment for connecting the available physical objects with internet so that they could be accessed through internet and in this each physical object is assigned with and IP address thus making them capable enough for collecting and transferring data over a network without any manual intervention.

And internet of things comprises of physical objects, controller, sensors, motor driver and internet .The proposed system consists of microcontroller Arduino, various sensors such as temperature sensors, humidity sensors, and soil moisture sensor and thingspeak application for controlling green house and parameters inside greenhouse.

Microcontroller is basically the heart of the system and kit helps in monitoring the digitized parameters of various sensors and verifies them with predefined threshold values.

In case, any unfavorable situation arises, it then takes the required control operation. And there are various sensors as mentioned above for controlling the parameters inside the greenhouse. And when sensors reach a threshold it will send the signal to the microcontroller and required action will be taken.

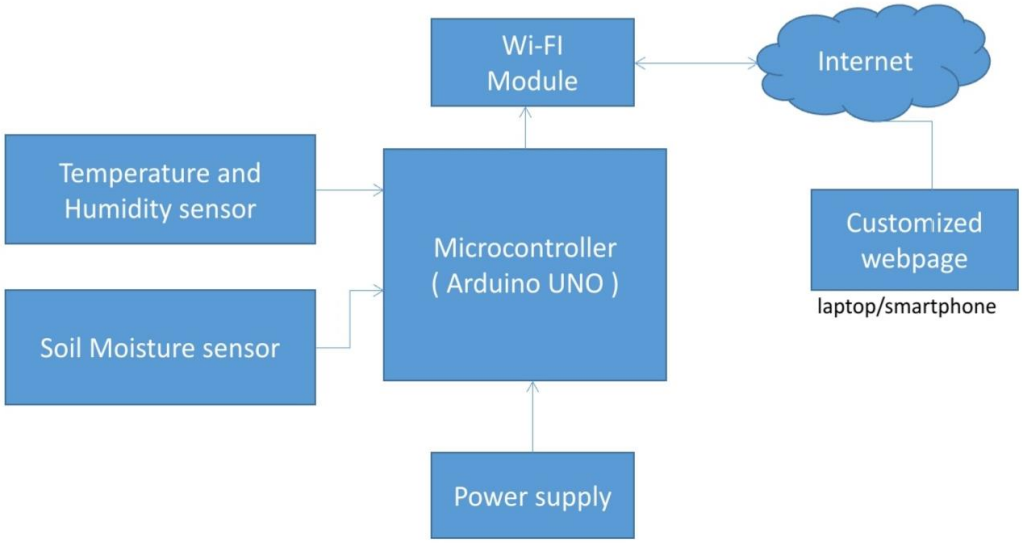

FIGURE 1: BLOCK DIAGRAM OF SYSTEM

III. ADVANTAGES

Maintaining a controlled temperature within a greenhouse environment is crucial. Temperature fluctuations can damage or kill your plants in only a few hours. Remote monitoring systems protect valuable plants from extreme temperature fluctuations. Grower can remotely monitor crop based on watering needs, temperature and humidity. It Reduces Manpower.

IV. APPLICATION

We temperature and humidity sensor to monitor room temperature and humidity , if temperature goes high cooling fan will turn on and if humidity goes high exhaust fan will turn on. We have soil moisture sensor to sense the water content in soil, if the land is dry water pump will turn on and provide water for the crop. We have thingspeak cloud were we can monitor all the sensor values.

V. FUTURE SCOPE

The Smart Greenhouse can be further upgraded in many ways and can be used in wide agricultural applications. It can be placed and operated in any of the environmental conditions to grow any kind of vegetation. Smart Greenhouse has a bright scope of future in agriculture field and it will create a revolution in the way the agriculture is carried out in India.

VI. CONCLUSION

Here, proposed design is implemented with Arduino platform for greenhouse monitoring, controlling temperature and soil moisture with the help of Web server using IOT. Temperature, Humidity and Moisture sensors are the three main sensors used in the project which give the exact value of temperature, humidity and moisture and respectively according to the plant condition. These results can be seen on the Internet WEBSITE.

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