Project Group No:32

Automated Smart Farming for Orchids using IOT

Project Domain: Internet of Things

BE Project Synopsis

Bachelor of Engineering

IN

Electronics & Telecommunication Engineering

By

KAJALE ANIRUDDHA GULAB [Roll No:2032029] [PRN No:71927828H]

KADAM MANOJ KRUSHNA [Roll No:2032027] [PRN No:72002580L]

BHONG SHASHIKANT NARAYAN [Roll No:2032005] [PRN No: 71711513F]

Supervisor Name

Prof. R. K. Shastri

Department of Electronics & Telecommunication Engineering,

Vidya Pratishthan's Kamalnayan Bajaj Institute of Engineering & Technology,

Baramati. Dist: Pune, Maharashtra

Academic Year 2021-22

Project Approval Declaration

We,

1. **KAJALE ANIRUDDHA GULAB** [Roll No:2032029] [PRN No:71927828H]
2. **KADAM MANOJ KRUSHNA** [Roll No:2032027] [PRN No:72002580L]
3. **BHONG SHASHIKANT NARAYAN** [Roll No:2032005] [PRN No: 71711513F]

hereby declare that we are submitting the curricular project synopsis on **Automated Smart Farming Using IoT** of the broad domain **Internet of Things**, with proper approval from our project guide & head of the department for the partial fulfillment of the requirement for the award of the degree Bachelor of Engineering in the academic year 2021-22.

Prof. R. K. Shastri

Guide
Department of E&TC Engineering

(Dr. B. H. Patil)

Head
Department of E&TC Engineering

Place: Baramati
Date: 25/08/2021

Abstract

Orchid: well in Orchid grow the rainy season with the Environments as mentioned in the introduction. The climate change will affect the growth of Orchids. Kong som but and et al. Tried to predict growth Dendrobium orchids using the CDF theory. They showed that the model had the possibility to forecast the growth rate of the Dendrobium orchids on regular season Monitoring the climate variable Orchids grow well in the rainy season with the inside the orchid greenhouse with the wireless sensor network was contributed by Fernandez and in order to collect information for improving the growth of orchids. The system reported environmental conditions such temperature, lighting, oxygen, other parameters without any control. In this research, we contribute the system, which controls the suitable environments for growing orchids in order to keep the growth of orchids consistently.

Greenhouses are controlled area environment to grow orchids. To achieve maximum orchid growth, the continuous monitoring and controlling of environmental parameters such as temperature, humidity, soil moisture, light intensity, soil pH etc. are necessary for a greenhouse system. The main aim of this project is to design a simple, low cost, Arduino based system to monitor the values of environmental parameters and that are continuously updated and controlled in order to achieve optimum orchid growth and yield. DHT11 sensor, Soil Moisture sensor, LDR sensor and pH sensor are the main sensors used in this project which give the exact value of temperature, humidity, water content, light intensity and soil pH respectively.

All environmental parameters are sent to cloud using Nodemcu and we can control it using Blynk app also. All farmers can control their greenhouses from any place by knowing the status of their greenhouse parameters at any time and they can control actuators (cooling fan, exhaust fan, water pump, artificial light and motor pump) to adjust environmental parameters by using Blynk app. All environmental parameters are sent to server through Ethernet and stored in the database. So, the user can monitor and control parameters through android mobile application.

1 Introduction

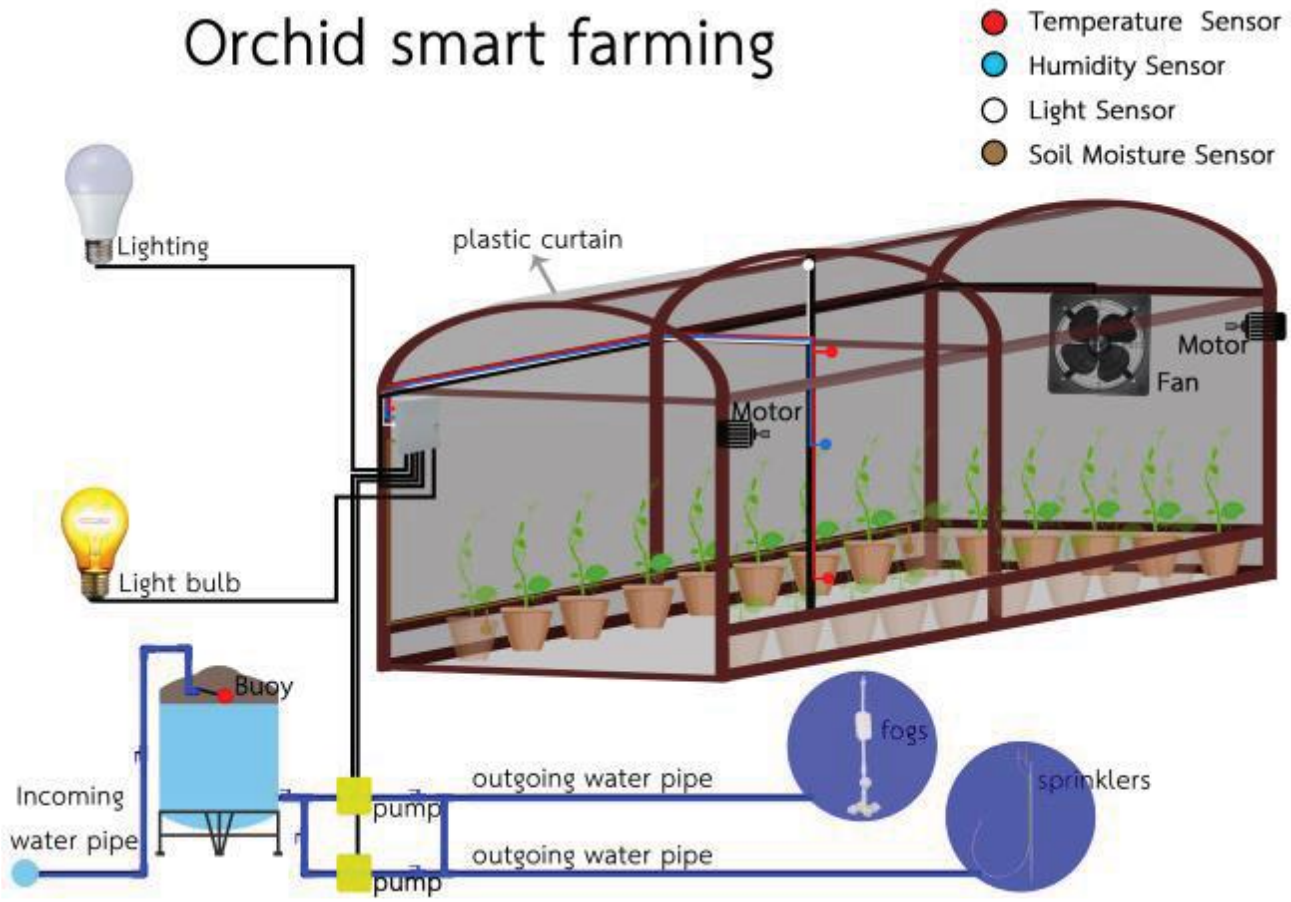
The atmospheric or environmental condition plays an important role for growth of the orchids Greenhouse farmers cannot precisely detect level of level of humidity inside the green house. They only know the condition inside the green house manually and by feel it by themselves. Ultimately, experiences play a bigger part on their daily operations. If the condition is too dry, they will give water to the orchids, but if it is too humid, they will open the rooftop of the green house, especially in the daylight.

In order to achieve the modifications of optimum growth to achieve high yield of orchids at lower cost, good quality and low environmental loads, it is necessary to have the effectiveness in greenhouse crop production. With the help of IOT we are going to control the greenhouse which is equipped with the cooling, heating, soil immersion etc. This IOT based greenhouse can be controlled from anywhere by focusing the environmental parameters like temperature and humidity. An individual person can control these environmental parameters of greenhouse by automatically. Automation plays an important role for doing the things weather condition is predicted based on a decision tree method.

An IoT based smart GPS system robot was implemented to perform tasks like splashing, moisture sensing, etc. by Nikesh, et al [3] automatically by reducing the need of tasks of turning ON/OFF switches. Automation cannot completely eliminate or reduces the human errors but it minimizes them at certain levels. It is the need of today's world that everything should be realistic or remotely controlled. Here, assuming the owner of greenhouse can control and

monitored his greenhouse from anywhere. Owner need not to go over them continuously at every time and check the conditions. Owner has to sit at one place and continuously monitored and controlled the number of greenhouses at a time with comfortably. WIFI module NodeMCU plays an important role in send the data to platform, eliminating the needs of cables or wired connections which automatically reduces the cost. So, considering all the facts in the mind we are designing the

IOT based greenhouse system.



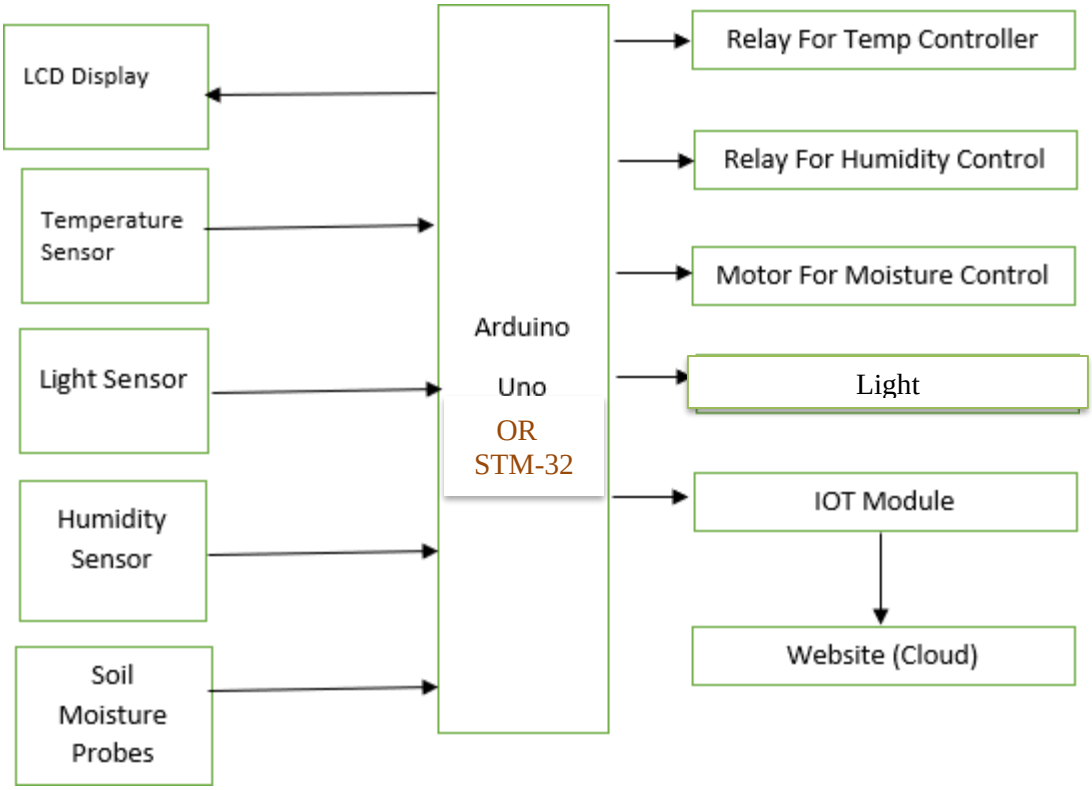


Fig: Block Diagram

2 Background of the Invention/Project (Literature Review)

The demand for the Orchid crops is more in the present scenario. Now a day the cultivation of the crops in the greenhouse under specified conditions which is suitable for the crops is increased.

In sensor based automated irrigation system with IoT Karan Kansara, et al [1] explains about the automated technology of irrigation. The sensors used send the interrupt signal to the microcontroller by gathering temperature and humidity conditions. Using MAX232, the GSM and microcontroller were connected. The moisture sensor detects the moisture value and the signal to mobile through microcontroller thus it reduces the power resulting in lower power consumption.
An Arduino based control system in an intelligent farming Narayut Putjaika, et al [2] explains about the improvement of the production process in plating which composes of two parts which are a sensor system and a control system. Kalman filtering is used to smooth the sensed data where the light power isn't regularly fixed motivation driving confinement regard then electric light

which is connected with the hand-off will be turned on or else light will in the off condition. PH sensor is used to measure ph of the soil. Then the entire sensor data are sending to cloud through NODEMCU (esp8266) module is interfaced with Arduino. User can monitor and control the environment parameters using computer or mobile.

3 Problem Statement & Proposed Project

Complexity involved in monitoring climatic parameters like humidity, soil moisture, illumination, soil pH, temperature, etc. . which directly or indirectly govern the orchid growth. Investment in the automation process is high, as today's greenhouse control systems are designed for only one parameter monitoring to control more than one parameter simultaneously there will be a need to buy more than one system. High maintenance and need for skilled technical labor. The modern proposed systems use the mobile technology as the communication schemes and wireless data acquisition systems, providing global access to the information about one's farms.

4 Significance & Objectives

The main significance of this project is that, in order to achieve the optimum growth of Orchid, the continuous monitoring and controlling of environmental parameter such as temperature, humidity, soil moisture, light intensity etc.

Objectives:

1. Main objectives of this project to automate greenhouse with automatic monitoring and controlling system.
2. Constantly monitor and control environmental conditions in greenhouse. It focus on saving water, increasing efficiency and reducing the environmental impacts on orchid orchid growth.
3. The user can be seeing the atmospheric conditions of the greenhouse orchid on cloud and control the greenhouse from faraway places.
4. It is to increase the production of Orchid To save water, power etc.

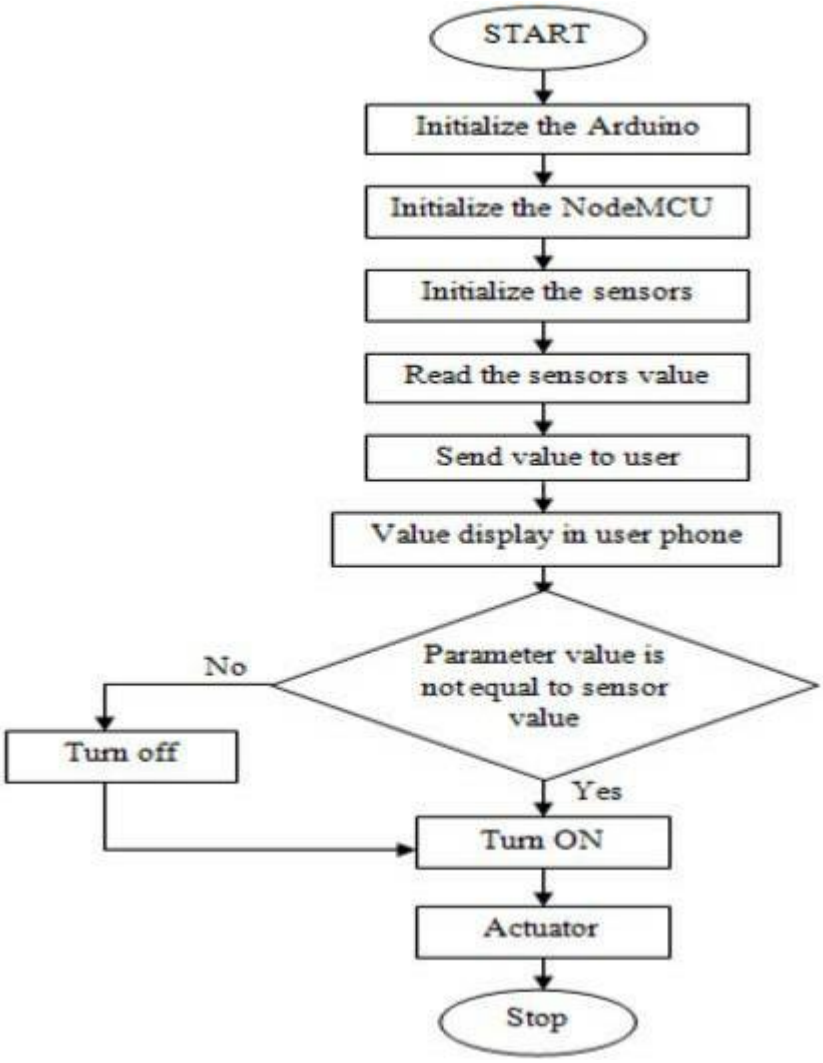
5 Methodology (with flowchart)

The implemented greenhouse system consists of two sections, monitoring section and controlling section. The monitoring section consists of DHT11 sensor, LDR sensor, Soil moisture sensor, pH sensor, fire sensor, DS18B20 temperature sensor and flow meter sensor to monitor the environmental parameters. A NodeMCU esp8266 is used to send environmental parameters to IOT cloud platform. The controlling section consists of cooling fan, exhausts fan, water pump, artificial light and buzzer. Arduino microcontroller forms the heart of the system.

In this endeavor Arduino is the standard controller used to interface all the sensors. When the soil doused state sensor regard isn't ordinarily the motivation driving containment regard, controller recollects that it and turns on the water siphon. precisely when water siphon is on water will course through the water stream meter sensor and water meter sensor will look at the dimension of water travel through the pipe in liters and when the immersion of soil regard taking off to the ordinary run, again controller sense it and turns off the water siphon. In the event that fire is going on in any condition, controller recalls that it and turns on the LED and ringer. DHT 11 sensor is used to check both humidity and temperature, when temperature and humidity looking dht11 sensor crosses the edge regard then the two fans will be turned on. Else the two fans will be in the off condition. LDR sensor is used to measure the intensity of the light, when light power isn't regularly fixed motivation driving confinement regard then electric light which is connected with the hand-off will be turned on or else light will in the off condition. PH sensor is used to measure PH of the soil.

Then the entire sensor data are sending to cloud through NODEMCU (esp8266) module is interfaced with Arduino. User can monitor and control the environment parameters using computer or mobile.

Flowchart



6 Development Tools

A. Hardware

1. Node MCU
2. Light Sensor
3. Moisture Sensor
4. Arduino
5. LCD
6. DC Fan
7. AC Pump
8. Resistor
9. Capacitor
10. Transistor

11. Diode
12. PCB and Breadboard
13. LED

B. Software
    1. Arduino IDE/ CUBE STM32
    2. Proteus
    3. Tinker Cad

7 Proposed Project Plan

Activity	July	Aug	Sept	Oct	Nov	Dec
Literature Review and Study	✓	✓				
Design of System		✓	✓	✓		
Simulation of Design			✓	✓		
Purchasing of components				✓	✓	
Publication of review paper					✓	
Final Write-up & Thesis Submission						✓

Table 1: Project Plan

References

1) Rouibah, N.; Barazane, L.; Benghanem, M.; Mellit, A. IoT-based low-cost prototype for online monitoring of maximum output power of domestic photovoltaic systems. ETRI J. 2021, 43, 459–470. [CrossRef]

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5) Huang, K.; Shu, L.; Li, K.; Yang, F.; Han, G.; Wang, X.; Pearson, S. Photovoltaic Agricultural Internet of Things Towards Realizing the Next Generation of Smart Farming. IEEE Access 2020, 8, 76300–76312. [CrossRef]