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"AN IOT BASED AUTOMATIC LUMINOSITY AND SOIL MOISTURE CONTROL SYSTEM FOR POTTING SHED"

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Abstract*:* The main goal of the Arduino-based IoT-based potting shed monitoring system is to increase production by enhancing current agriculture methods. Here is given an internet of things (IoT)-based automatic lighting and soil moisture control system for potting sheds. With the use of an LDR sensor, the automatic luminosity control system was created to gauge ambient brightness. The LED bulbs are then automatically controlled to illuminate a region between 3000 and 5000 lux that is suitable for plant development. The automatic soil moisture controller, on the other hand, uses a fork-type sensor to monitor soil moisture and automatically activates or deactivates the water sprayer when the value of the soil moisture is lower or higher than the set value. Also, air humidity and temperature are managed.

Index Terms – **IoT (Internet of Things), Automatic Control, Luminosity, Soil Moisture, Potting Shed, Sensors, Microcontroller, Wireless connectivity, Temperature, Humidity, ThingSpeak, ThingView, LDR, DHT11, ESP8266 Wi-Fi Module**

I. INTRODUCTION

Temperature, relative humidity, lighting, and soil moisture in the potting shed are key environmental elements for the quality and improved productivity of plant growth. Ongoing observation of these variables provides pertinent data regarding the specific contributions of the many variables to achieving optimal crop output.

There are 4 Sectors in the suggested automatic control system. A LDR sensor that controls luminosity serves as a potting shed's ambient lighting monitor. A soil moisture sensor, a transistor, and a water pump linked to a water sprayer make up the soil moisture control sector. We can keep an eye on the potting shed's humidity and temperature. The most important elements for good plant development and productivity are light, soil, humidity, and temperature.

A smartly regulated potting shed produces more crops per square meter than open field gardening does. Electronic equipment like as sensors, actuators, and controllers were created to be able to communicate data by connecting wirelessly to one another or to a server. We are regarded in our project as a gerbera plant in the potting shed. A plant genus in the daisy family called Gerbera produces flowers with beautiful, two-lipped ray florets in hues of yellow, red, orange, white, and pink. Its main goal is to enhance agricultural operations through the integration of contemporary technologies for greater agriculture output and quality. The system's environmental data automatically feeds back to the processing unit. The suggested automatic control method provides the path for the expansion of large intelligent framing or intelligent potting sheds for various plants.

II. EXISTING SYSTEM DESIGN AND IMPLEMENTATION

Existing System Methodology:

The device employs two different types of sensors to gauge soil moisture and light levels. The amount of light in the potting shed is measured by a light sensor, and the moisture level of the soil is determined by a soil moisture sensor. The data from the sensors is received by a microcontroller, which then processes it. It serves as the system's brain and regulates the output devices in accordance with the input data. The device uses two different types of actuators to regulate the soil moisture and light levels. When the level of illumination is low, a light bulb or LED is used to add more light to the potting shed, and a water pump is used to irrigate the plants when the soil moisture level is low. On a mobile app, a Blynk application provides the user interface. The system may be monitored and managed remotely by the end user, who can also change the soil moisture and light levels as necessary. The system receives electricity from a power supply. Depending on the particular needs of the system, it can be a battery or an AC/DC adaptor.

Block Diagram:

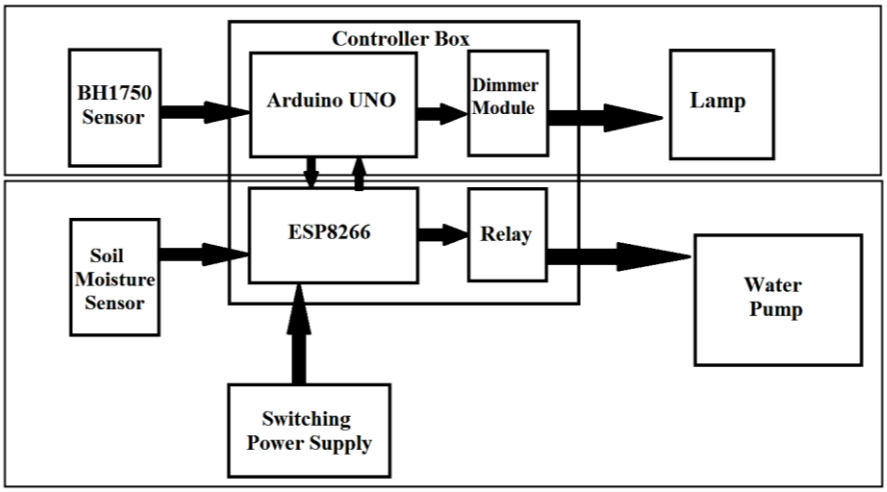


Fig-1 Existing system block diagram

Conclusion:

Here, Arduino can be used to regulate and keep track of the lighting and soil moisture. This has the drawback of being unable to gauge and monitor the potting shed's surrounding temperature and humidity, as well as store data in the cloud.

III. PROPOSED SYSTEM DESIGN AND IMPLEMENTATION

There are 4 Sectors in the suggested automatic control system. A LDR Sensor controls the brightness and monitors the potting shed's ambient lighting. A soil moisture sensor, a transistor, and a water pump linked to a water sprayer make up the soil moisture control sector. The internet of things (IoT)-based automatic lighting and soil moisture control system for potting sheds is demonstrated. A LDR sensor was used in the automatic luminosity control system's design to measure ambient light levels. The LED lights are then automatically set to glow between 3000 and 5000 lux, which is the ideal range for plant growth.The automatic soil moisture controller, meanwhile, uses a fork-type sensor to monitor soil moisture and automatically activates or deactivates the water sprayer when the soil moisture value falls within or exceeds the predetermined range.

Humidity and temperature are two other variables that are frequently used to gauge environmental conditions. We will measure the ambient temperature, humidity, and other characteristics for this Arduino-based project, and the information will be displayed on a 16x2 LCD screen. ArduinoUno makes use of the DHT11 temperature/humidity sensor. Also, the provided system runs flawlessly thanks to an ESP8266 microcontroller that is IoT-integrated. The ThingSpeak Cloud stores all of the potting shed's sensor data, which may be updated once per minute. We can easily examine the data using the ThingView application. From time to time, it graphically presents the data. As a result, this project raises plant yield and quality.

BLOCK DIAGRAM:

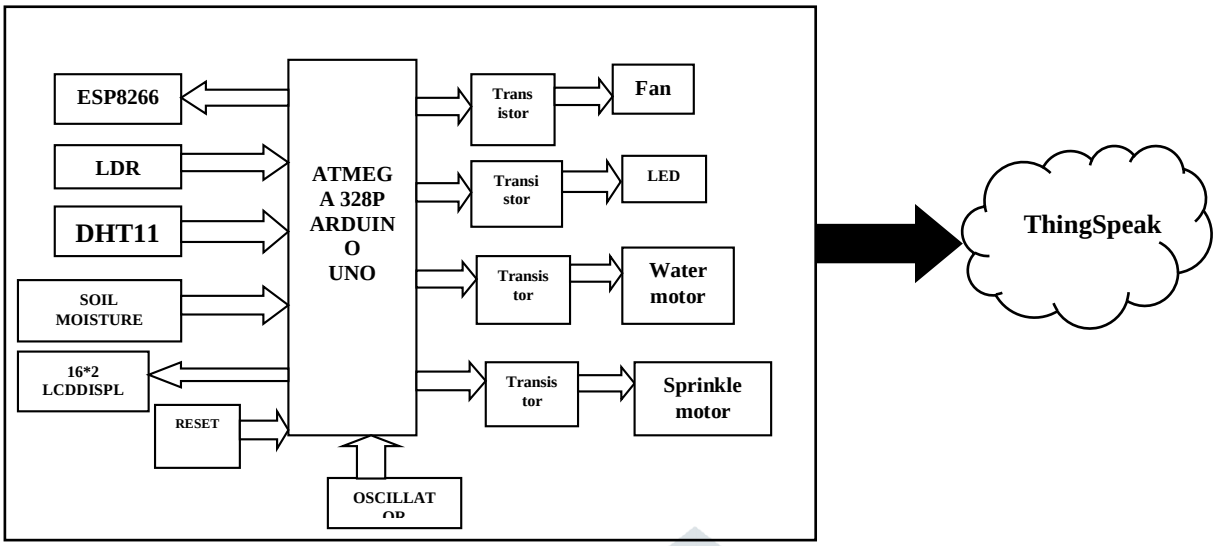
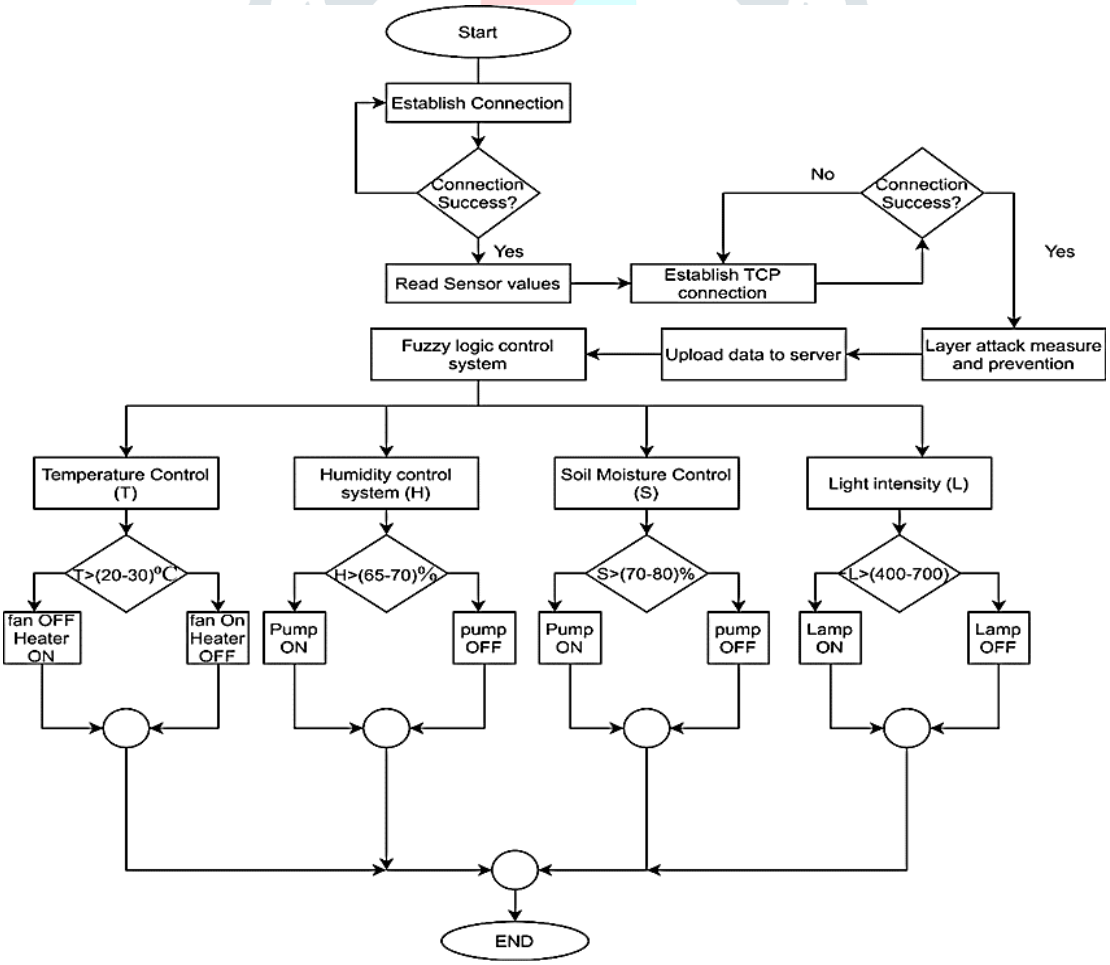


Fig-2 Proposed system block diagram

The functional diagram for "An IoT-based Automated Luminosity and Soil Moisture Management System for Potting Shed" is depicted in the block diagram above.

FLOW CHART:



IV. RESULT

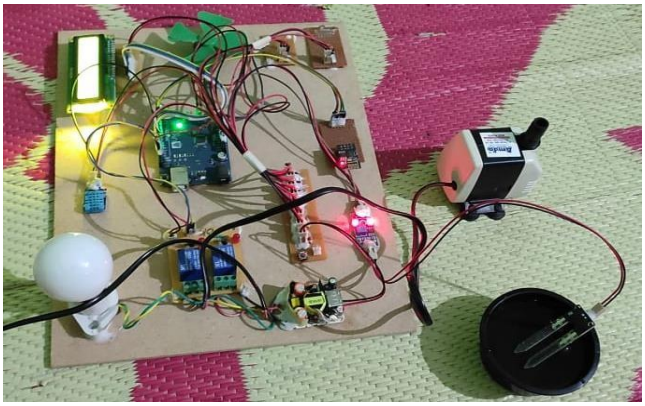


Fig-3 Prototype

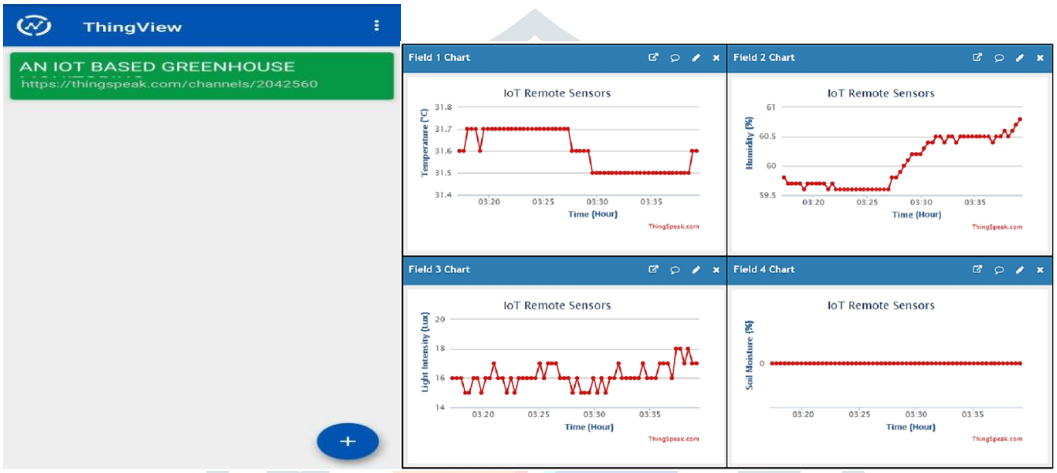


Fig-4 ThingView Page for an IoT Based Potting Shed System

The four parameters in this system that we measured and tracked were luminance, soil moisture, temperature, and humidity. These values can all be recorded in ThingSpeak. With the aid of the ThingView smart phone app, we may periodically check the data.

V. APPLICATIONS

- It can be applied to farms, botanical gardens, and potting sheds in this project.

Potting Shed:

A potting shed is a tiny structure that is used for gardening, notably for potted plants and flowers to be prepared.

Botanical Gardens:

Botanical gardens are carefully curated collections of plants that are grown for aesthetic, educational, and scientific reasons.

Farms:

Agricultural farms are farms that produce crops or livestock for food, fiber, or fuel. These farms are essential for feeding the growing global population and providing raw materials for many industries.

Overall, an IoT-based automatic luminosity and soil moisture control system for a potting shed can provide a range of benefits, including better plant growth, energy efficiency, water conservation, remote monitoring, and real-time data analysis.

VI. CONCLUSION AND FUTURESCOPE

It was suggested to use the internet of things to automatically adjust the lighting, temperature, humidity, and soil moisture of gerbera plants. The technology automatically changes the brightness and soil moisture to a suitable range for gerbera growing in addition to continuously monitoring them. Moreover, the soil moisture controller offers the option of automated or manual operation. When the

soil moisture is outside of the acceptable range, the soil moisture controller can operate in automatic mode, turning on or off the water pump to spray water. The cooling fan and water sprayer can be turned on automatically when the temperature and humidity in the potting shed rise. According to the aforementioned, the suggested approach may effectively give the gerbera the ideal brightness and soil moisture control.

The potting shed can be improved in numerous ways and utilized for a variety of agricultural purposes. It can be used in any environment and under any set of conditions to grow any kind of vegetation. The autonomous greenhouse equipment is powered by non-traditional energy sources like solar panels and wind turbines, and the paltrier effect is used for cooling. It is possible to farm without using soil to further increase the nutritional content. IoT integration in farming can significantly increase its productivity and profitability. Potting sheds have a promising future in the agricultural sector and will revolutionize the way agriculture is practiced in India.

VII. REFERENCES

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VIII. BIBILOGRAPHY

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