VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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MAJOR PROJECT (21ECP76) SYNOPSIS

ON

"IOT ENABLED GREEN HOUSE SYSTEM"

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF MAJOR PROJECT VII SEMESTER

BACHELOR OF ENGINEERING
IN
ELECTRONICS AND COMMUNICATION

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ABSTRACT

The IoT-based greenhouse system project aims to revolutionize agricultural practices by integrating advanced Internet of Things (IoT) technologies for real-time monitoring and management of greenhouse environments. By employing various sensors, such as temperature, humidity, soil moisture, and light sensors, the system collects critical data that influences plant growth. This data is processed by a microcontroller, such as the ESP8266, which facilitates wireless communication and enables remote access to greenhouse conditions via a user-friendly interface. Automated actuators, including water pumps and ventilation systems, respond to sensor inputs, ensuring optimal growing conditions while minimizing resource wastage. The cloud platform securely stores data, allowing for historical analysis and trend identification to inform decision-making. This project not only enhances crop yield and quality but also promotes sustainability by optimizing water and energy usage. Additionally, it reduces labor costs through automation, making agriculture more efficient. The system's scalability allows for implementation in various agricultural settings, from small-scale gardens to large commercial farms. Challenges such as initial investment and technical complexity are addressed through comprehensive training and support. Ultimately, the IoT-based greenhouse system represents a significant step toward smart farming, providing farmers with the tools needed for modern agriculture in a rapidly changing climate

METHODOLOGY

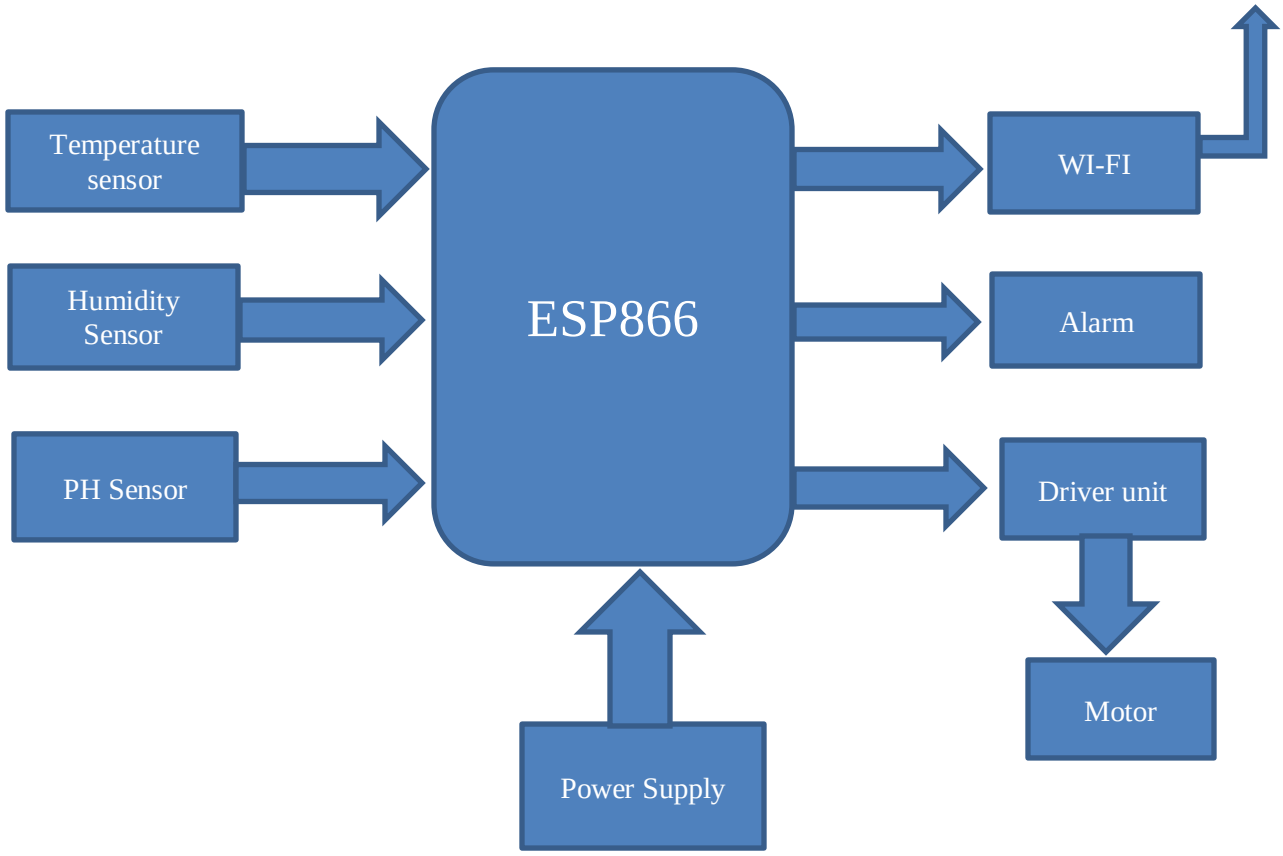

Figure 1: Block diagram of Proposed Methodology

EXPLANATION:

An IoT-based greenhouse system utilizes Internet of Things technology to enhance agricultural management by monitoring and controlling environmental factors such as temperature, humidity, soil moisture, and light. Key components include sensors that gather data, actuators for automated irrigation and climate control, and a microcontroller that processes this information. Connected to a cloud platform, the system enables real-time monitoring and remote management through a user-friendly interface. This approach increases crop yields, optimizes resource usage, and reduces labor costs, while promoting sustainability.

Hardware requirements:

- **MCU ESP866**: The ESP8266 is a low-cost Wi-Fi microcontroller unit (MCU) that enables easy connectivity for IoT applications. It features a built-in TCP/IP stack, allowing devices to connect to the internet and communicate wirelessly.

- **DHT11 Sensor**: The DHT11 is a low-cost digital temperature and humidity sensor that provides accurate readings for indoor environmental monitoring. It features a simple interface and is commonly used in DIY electronics and IoT projects.

- **Soil monitoring sensor**: A soil moisture sensor measures the water content in soil, helping to optimize irrigation and prevent over- or under-watering. These sensors provide valuable data for precision agriculture and garden management, enhancing plant health and resource efficiency.

- **LDR Sensor**: An LDR (Light Dependent Resistor) sensor detects light levels, changing its resistance based on ambient light conditions. It's commonly used in applications such as automatic lighting systems and solar-powered devices to adjust brightness or turn lights on and off.

- **Relay module**: A relay module allows low-power microcontrollers to control high-power devices by using electromagnetic switches. It serves as an interface to turn on or off electrical appliances like lights, motors, or pumps safely and efficiently.

- **Water supply motor**: A water supply motor, often used in irrigation and plumbing systems, pumps water from a source to distribution points. These motors can be electric or diesel-powered and are designed for reliable and efficient water movement to meet demand.

Software requirements:

- **Arduino IDE :** The Arduino UNO is a microcontroller board based on the ATmega328P, commonly used for prototyping due to its simplicity and versatility. It features 14 digital I/O pins and 6 analog inputs, making it ideal for controlling sensors and small systems. It is programmed via the Arduino IDE, which is beginner- friendly and widely supported

- **BLYNK APP :** The Blynk app allows remote control of Arduino and other microcontrollers using customizable widgets like buttons and sliders on a smartphone. It supports connections via Wi-Fi, Bluetooth, or GSM, making it easy to build IoT projects without complex coding.