Smart Plant

"The Silicon Green Revolution"

Project Report

Submitted in partial fulfillment of the requirements for degree of

Bachelor of technology in Electronics and communication Engineering.

By

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Under the guidance of

Asst. professor Khusboo sharma

University Institute of Engineering and Technology, Rohtak

25-April - 2025

Certificate

This is to certify that our group has successfully completed the development of the project report for Smart Plant.

Throughout the project, we have demonstrated exceptional skills, dedication, and creativity in crafting a comprehensive and insightful report detailing the development process, objectives, technologies used, and future enhancements of the Smart Plant website project.

The report showcases a deep understanding of web development principles and technologies, as well as a commitment to delivering a user-centric and innovative solution to meet the needs of university students at the University Institute of Engineering and Technology.

Our group members contribution to the project has been invaluable, and they have played a key role in the successful completion of this endeavour.

[Signature]

Asst. prof. Khusboo sharma, Project mentor, University institute of technology.

Student Declaration

We, Yashwant, Tuhi Ram, Tushar and Sanjeev hereby declare that the project report titled "Connect and Coordinate During Calamities: Smart Plant" is the result of our combine work. All sources of information used in this report have been duly acknowledged, and any quotations or references from the work of others have been cited appropriately.

We affirm that this project report represents our original ideas, insights, and contributions to the development of the Smart Plant website project. We have not engaged in any form of plagiarism or academic misconduct in the completion of this project.

Furthermore, we take full responsibility for the accuracy and integrity of the information presented in this report. We understand that any false or misleading information provided may have serious academic consequences.

We acknowledge that this project report is submitted in partial fulfilment of the requirements for minor project, under the supervision of Khusboo mam.

Date: 07-December-2024

Yashwant

Tuhi Ram

Tushar

Sanjeev

Acknowledgement

We extend our heartfelt gratitude to all those who have contributed to the successful completion of the web development project for Smart Plant.

First and foremost, we would like to express our sincere appreciation to Khusboo mam, our project supervisor, for their guidance, support, and valuable feedback throughout the duration of this project. Their expertise and insights have been instrumental in shaping the direction and execution of our work.

We are also immensely grateful to the faculty and staff of the University Institute of Engineering and Technology (UIET) for providing us with the resources and facilities necessary to undertake this project. Their encouragement and support have been invaluable in our academic journey.

Furthermore, we would like to thank our fellow classmates and friends for their encouragement, assistance, and camaraderie throughout the project. Their collaboration and feedback have contributed significantly to the success of Smart Plant.

Last but not least, we extend our deepest appreciation to our families for their unwavering support, understanding, and encouragement during this project. Their love and encouragement have been the driving force behind our endeavours.

Thank you to everyone who has played a part in making this project a reality. Your contributions have been truly appreciated.

Yashwant

Tuhi Ram

Tushar

Sanjeev

Preface

In presenting this project report titled **"Smart Plant: A Resourceful Project for Farmers of India,"** we explore the development, implementation, and significance of the Smart Plant system in the context of modernizing agricultural practices.

The objective of this project is to create a **smart, affordable, and farmer-friendly IoT-based solution** that monitors key environmental parameters such as **soil moisture, temperature, humidity, and motion**, helping farmers make informed decisions to enhance crop productivity and water management.

Throughout this report, we delve into the various aspects of the Smart Plant system — including its **key features, real-time monitoring capabilities, technologies used (like NodeMCU, DHT11, soil sensors, PIR, and Blynk platform),** and the potential impact it aims to achieve in rural farming communities across India.

This report is a reflection of our **dedication to sustainable farming, innovation, and the use of technology to support Indian farmers** in optimizing agricultural practices with minimal manual intervention. We invite readers to explore how Smart Plant embodies our vision for a smarter, more efficient future in agriculture.

Yashwant

Tuhi Ram

Tushar

Sanjeev

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Introduction

The advent of digital technology has significantly transformed agricultural practices, presenting new opportunities for precision farming, environmental monitoring, and sustainable resource management. In this rapidly evolving digital era, farmers seek accessible, efficient, and intelligent systems to monitor their crops, manage irrigation, and optimize yields. The **Smart Plant** project emerges as a timely response to this need, offering a comprehensive and dynamic IoT-based solution to empower farmers and modernize traditional farming methods.

Smart Plant is envisioned as a **centralized IoT system** that monitors crucial environmental parameters such as **soil moisture, humidity, temperature, and motion detection**, thereby helping farmers make data-driven decisions. By integrating **low-cost sensors with microcontrollers (NodeMCU ESP8266),** and leveraging cloud platforms like **Blynk IoT**, the system provides **real-time data visualization, automated control of irrigation systems**, and timely alerts to ensure efficient water and crop management.

This project report delves into the **development process, objectives, and core functionalities** of the Smart Plant system. It explores the **technologies used**, including **ESP8266 WiFi module, DHT11 temperature and humidity sensor, soil moisture sensor, PIR sensor, 16x2 LCD with I2C, relays, and the Blynk IoT platform**. Additionally, it outlines the **system architecture**, highlights **challenges faced during implementation**, and presents the **impact Smart Plant aims to achieve in Indian agriculture**.

Through the Smart Plant initiative, we aim to **contribute to the digitization of agriculture**, promote **efficient water use**, and support **sustainable farming practices**. We invite readers to explore the transformative potential of Smart Plant and its role in shaping the **future of smart agriculture in India**.

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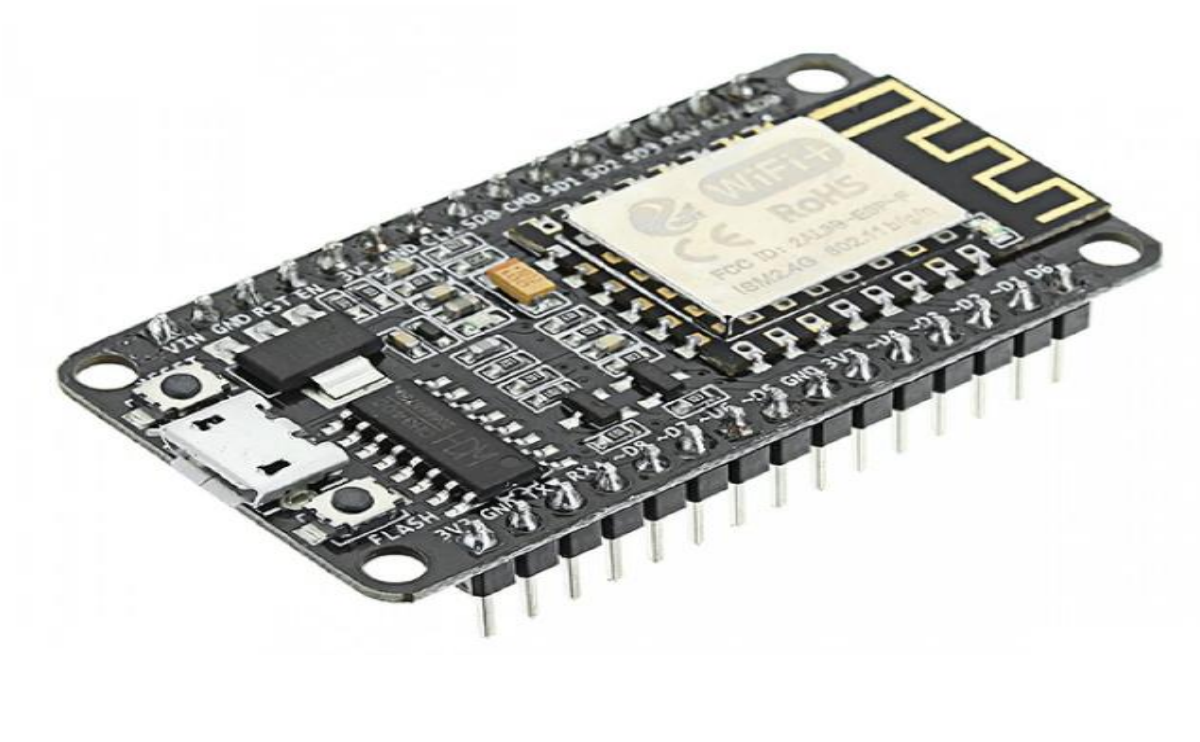
NodeMCU ESP8266

NodeMCU is an open-source development board and firmware based on the ESP8266 Wi-Fi SoC (System on Chip) from Espressif Systems. It is widely used in IoT-based projects due to its low cost, built-in Wi-Fi capabilities, and ease of programming.

Key Features:

- **Wi-Fi Connectivity**: One of the primary features of NodeMCU is its ability to connect to the internet via Wi-Fi, making it suitable for wireless communication in IoT applications.
- **Microcontroller**: It is powered by the ESP8266 chip, which has a 32-bit RISC CPU running at 80 MHz (can be overclocked to 160 MHz), providing enough computational power for sensor data processing and control tasks.
- **Memory**: It typically includes 4 MB of flash memory, allowing storage of firmware and user programs.
- **Programming Interface**: NodeMCU can be programmed using the Arduino IDE, Lua, or MicroPython, making it accessible for both beginners and experienced developers.
- **GPIO Pins**: It provides multiple General Purpose Input/Output (GPIO) pins to connect with sensors, actuators, and other peripherals.
- **USB Interface**: The board comes with a micro-USB port for power supply and programming, making it easy to set up.

Applications in the Smart Plant Project: In the Smart Plant project, NodeMCU acts as the central controller. It collects data from various sensors such as soil moisture sensors, temperature sensors, and light sensors, and transmits this data wirelessly to a cloud server or a mobile application. It can also be programmed to make real-time decisions, such as activating a water pump when the soil moisture drops below a certain threshold.



Soil Moisture Sensor

A soil moisture sensor is an electronic device used to measure the water content in the soil. It plays a vital role in agriculture and plant care automation by helping determine when plants need watering, thereby conserving water and ensuring optimal plant growth.

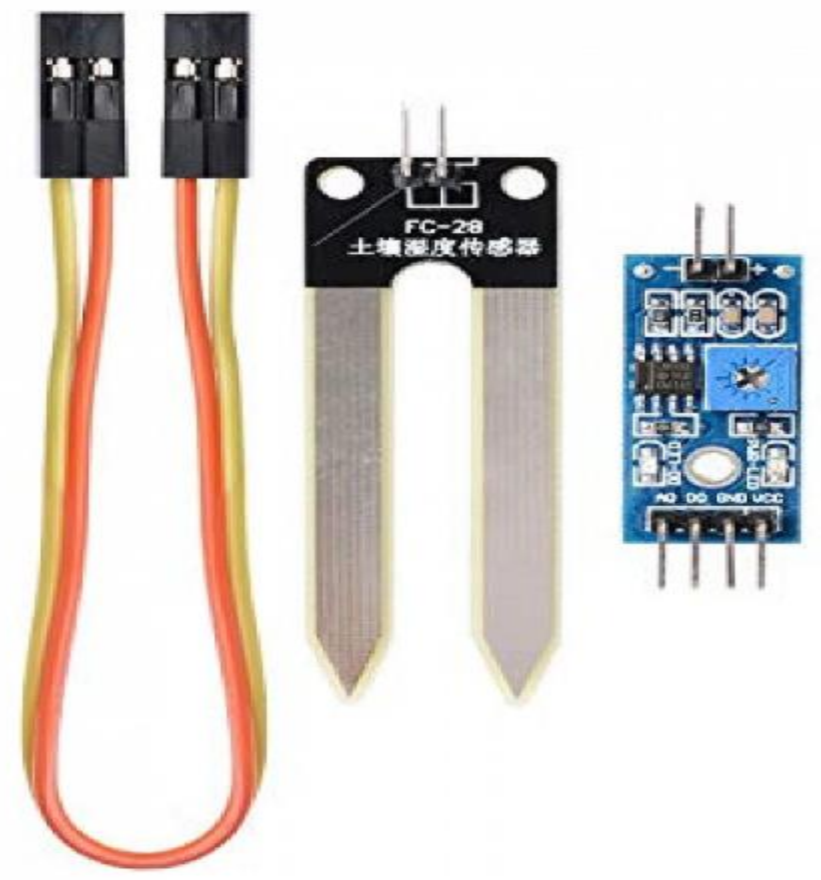
Working Principle: The soil moisture sensor typically consists of two probes that act as electrodes. These probes are inserted into the soil, and the sensor measures the resistance between them. Moist soil conducts electricity better than dry soil, so the sensor detects the change in resistance and converts it into an analog signal, which represents the moisture level.

Types: The most common type used in basic plant monitoring systems is the resistive soil moisture sensor. Some advanced versions are capacitive, which offer better durability and accuracy.

Output:

- **Analog Output**: Provides a variable voltage that represents the moisture level. This can be read by microcontrollers like NodeMCU to determine how wet or dry the soil is.
- **Digital Output (optional)**: Some sensors have an onboard comparator and provide a high/low signal based on a preset moisture threshold.

Applications in the Smart Plant Project: In the Smart Plant project, the soil moisture sensor continuously monitors the soil's water content. The NodeMCU reads the sensor's output and can be programmed to trigger actions such as sending an alert to the user or turning on a water pump when the soil becomes too dry. This helps maintain optimal soil conditions automatically and prevents over- or under-watering.



PIR Motion Detector Sensor

A Passive Infrared (PIR) motion detector sensor is an electronic device that detects infrared radiation emitted by objects in its field of view, particularly human or animal body heat. It is commonly used for motion detection in security systems, automation projects, and energy-efficient devices.

Working Principle: PIR sensors detect changes in infrared radiation levels. Every object with a temperature above absolute zero emits some form of infrared radiation. The sensor contains two slots made of a special material sensitive to IR. When a warm body (like a human or animal) passes in front of the sensor, it causes a differential change between the two slots. This change is interpreted as motion.

Key Features:

- **Low Power Consumption**: Ideal for battery-operated systems.
- **Digital Output**: The sensor provides a HIGH signal (typically 3.3V or 5V) when motion is detected and LOW when there is no motion.
- **Detection Range**: Generally ranges from 5 to 7 meters, depending on the model and environment.
- **Adjustable Sensitivity and Delay Time**: Many PIR modules have potentiometers to set detection sensitivity and how long the signal remains HIGH after detecting motion.

Applications in the Smart Plant Project: In the Smart Plant project, the PIR motion detector sensor can be used to detect human presence near the plant. This could serve multiple purposes such as:

- Triggering alerts or notifications when someone approaches the plant.
- Activating lights or displays to show plant health data when someone is nearby.
- Logging activity for monitoring purposes.

This feature adds an interactive or security dimension to the Smart Plant system, enhancing its functionality beyond basic environmental monitoring.

Relay Module

A relay module is an electrically operated switch that allows a low-voltage circuit to control a higher-voltage circuit. It is commonly used in automation systems to interface microcontrollers or development boards, like the NodeMCU, with high-power devices such as motors, pumps, and lights. Relays serve as a bridge between the low-power control signals from microcontrollers and the high-power devices that they control.

Working Principle: Relays operate using an electromagnet. When an electric current passes through the relay's coil, it generates a magnetic field that moves a switch, either opening or closing the circuit. This allows the microcontroller to control the flow of current to high-voltage devices, using low-voltage logic signals (e.g., from a NodeMCU).

A typical relay has:

- **Coil**: The electromagnet that gets energized to switch the contacts.
- **Contacts**: Normally open (NO), normally closed (NC), and common (COM) contacts that connect and disconnect based on the relay's state.

When the coil is energized, the normally open (NO) contact closes, allowing current to flow through the high-power circuit. When the coil is de-energized, the normally closed (NC) contact opens, stopping the current..

Applications in the Smart Plant Project: In the Smart Plant project, the relay module is used to control high-power devices such as:

- **Water Pumps**: The relay can turn a water pump on or off based on soil moisture readings from the moisture sensor, automating the irrigation process.
- **Lights/Fans**: The relay can control fans or lights, turning them on or off in response to environmental conditions or user input.
- **Other Actuators**: Relays can be used to control other devices, such as alarms or additional sensors, based on specific triggers from the system.

The use of a relay module enhances the automation capabilities of the Smart Plant, allowing for seamless interaction with high-power components while maintaining safe control via low-power circuits.

Breadboard

A breadboard is a solderless device used for prototyping and testing electronic circuits. It allows developers and engineers to build and experiment with circuit designs without permanently fixing components. Breadboards are essential tools for rapid prototyping, especially during the development phase of electronics projects.

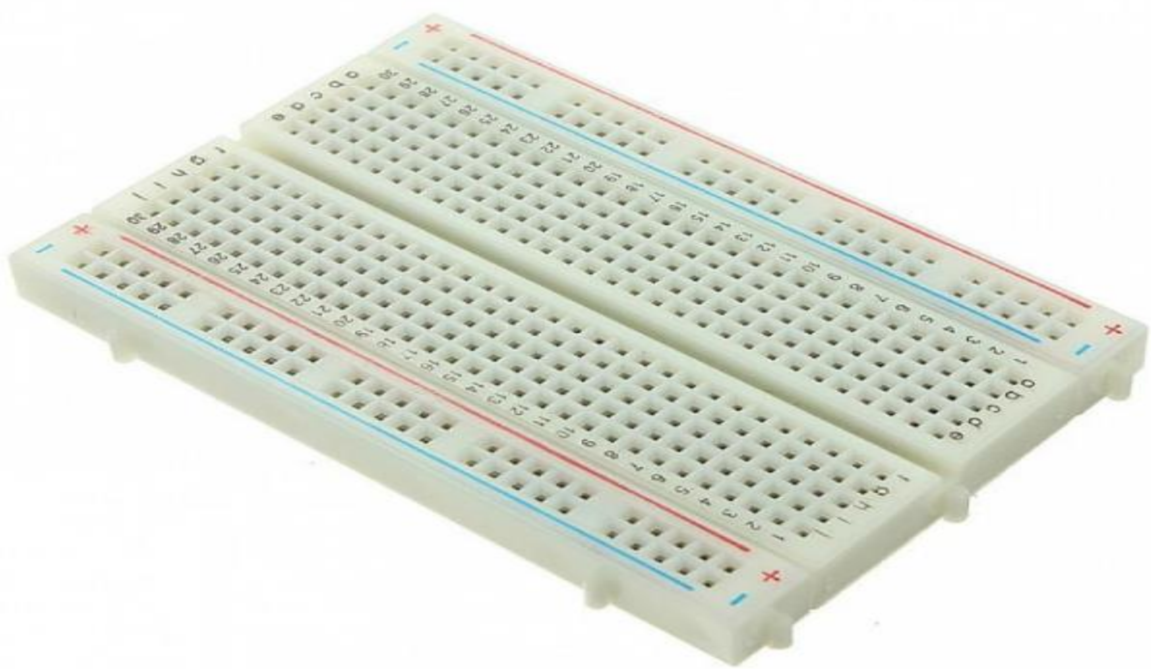
Structure and Layout:

- **Terminal Strips**: These are the main areas where electronic components like resistors, transistors, and sensors are inserted. They consist of rows and columns of interconnected metal clips hidden beneath the plastic surface. Each row is typically connected horizontally.
- **Power Rails**: Located on the sides of the breadboard, these long rows are used to distribute power (VCC and GND) across the board. They are typically marked with red (positive) and blue or black (negative) lines.
- **Interconnectivity**: The breadboard does not require any soldering; components are connected by simply inserting their leads into the holes. Jumper wires are used to make connections between different parts of the circuit.

Types of Breadboards:

- **Half-size breadboards**: Commonly used in compact projects.
- **Full-size breadboards**: Used for more complex circuits.
- **Mini breadboards**: Small and portable, used for very basic setups or compact designs..

Applications in the Smart Plant Project: In the Smart Plant project, the breadboard is used to connect various components such as the NodeMCU, soil moisture sensor, PIR motion sensor, relay module, and other electronic parts. It helps in organizing and testing the circuit layout before moving to a more permanent setup, such as a PCB (Printed Circuit Board). Using a breadboard ensures quick and easy changes during the development and testing phase of the project.



Jumper Wires

Jumper wires are simple electrical wires with connector pins at each end, used to make connections between components on a breadboard or between breadboards and other devices like microcontrollers, sensors, and modules. They are essential tools for building and testing electronic circuits quickly and efficiently without the need for soldering.

Types of Jumper Wires:

1. **Male to Male (M-M)**: Used to connect two female headers or two points on a breadboard.
2. **Male to Female (M-F)**: Used to connect a male pin (e.g., on a sensor or board) to a female header.
3. **Female to Female (F-F)**: Used to connect two male header pins.

Key Features:

- **Reusable**: Can be used multiple times in different projects.
- **Flexible and Insulated**: Wires are usually flexible and come with insulation to prevent short circuits.
- **Color-Coded**: Often available in different colors to help visually organize and distinguish connections (e.g., red for power, black for ground).

Applications in the Smart Plant Project: In the Smart Plant project, jumper wires are used to connect:

- The **NodeMCU** to the **soil moisture sensor**, **PIR motion sensor**, and **relay module**.
- **Power and ground rails** on the breadboard to various components.
- Other modules and sensors involved in the project setup.

They allow for a clean and flexible wiring solution, making it easier to troubleshoot and modify the circuit as needed during development and testing.

Tactile Push Button

A tactile push button, also known simply as a tactile switch, is a small electromechanical component used to provide user input to electronic circuits. It is widely used in embedded systems, DIY electronics, and prototyping projects due to its compact size and ease of integration.

Working Principle: A tactile push button operates by completing an electrical circuit when pressed. Inside the button, a conductive material makes contact between two terminals, allowing current to flow. When the button is released, the contact breaks and the circuit is disconnected.

Physical Characteristics:

- **Momentary Action**: The switch is only active (closed) while it is being pressed. Once released, it returns to its original open (off) state.
- **Four Pins**: Typically, tactile buttons come with four pins arranged in a square. Internally, opposite pins are connected, allowing flexibility in circuit design.
- **Compact and Durable**: Designed for repeated use, tactile switches are small and mechanically stable.

Applications in the Smart Plant Project: In the Smart Plant project, the tactile push button can serve several purposes, including:

- **Manual Control**: Allowing the user to manually trigger actions such as turning on a water pump, resetting the system, or changing operating modes.
- **User Input**: Can be used to enter commands or acknowledge notifications from the system.
- **Testing and Debugging**: Useful for simulating user interaction during the development phase.

Its simplicity, reliability, and ease of use make the tactile push button a valuable component in both the control and interaction aspects of the Smart Plant system.

Water Pump

A water pump is an electromechanical device used to move water from one place to another. In the context of smart irrigation and plant automation systems, it is used to supply water to plants based on environmental conditions or sensor inputs. This component plays a key role in automating the watering process, ensuring that plants receive the right amount of water without manual intervention.

Types Commonly Used: In small-scale projects like Smart Plant systems, a **mini submersible DC water pump** is typically used. These pumps are compact, efficient, and easy to integrate with microcontroller systems.

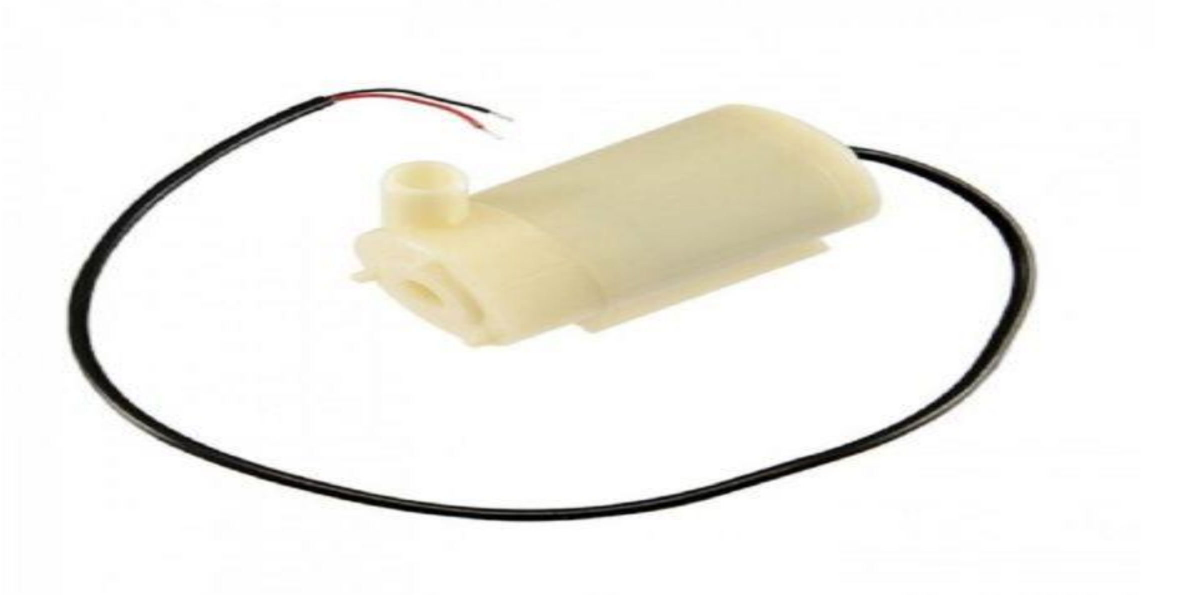
Working Principle: The water pump operates by using an electric motor to drive a rotor that pushes water through an outlet tube. It usually runs on low DC voltage (e.g., 5V, 6V, or 12V), making it safe and compatible with microcontroller-driven circuits. When the pump is powered, it draws water from a reservoir and delivers it to the plant through a pipe or tube.

Control Mechanism: In automated systems, the water pump is often connected to a **relay module** or a **MOSFET switch**, which acts as an interface between the low-power control circuit (e.g., NodeMCU) and the high-power motor. The microcontroller decides when to activate the pump based on input from sensors like the soil moisture sensor.

Applications in the Smart Plant Project: In the Smart Plant project, the water pump is activated automatically when the soil moisture level falls below a predefined threshold. This ensures:

- Efficient water usage
- Timely watering of plants
- Minimal human intervention

By integrating the water pump with sensor data and control logic, the system maintains optimal soil conditions, promoting healthy plant growth and conserving water.



16x2 I2C LCD Display

The 16x2 I2C LCD display is a widely used output device in electronics and embedded systems, especially in projects that require a simple and effective way to show information to the user. The “16x2” indicates that the display can show 16 characters per line, over 2 lines. The "I2C" (Inter-Integrated Circuit) interface significantly reduces the number of pins required for connection, making it ideal for microcontrollers with limited I/O pins like the NodeMCU.

Features:

- **Display Format**: 16 columns and 2 rows for alphanumeric characters.
- **I2C Interface Module**: Attached to the back of the standard LCD, this module allows the LCD to communicate with the microcontroller using just two wires — SDA (data line) and SCL (clock line).
- **Reduced Pin Usage**: Unlike a standard 16x2 LCD that uses 6 to 10 GPIO pins, the I2C version only uses 2 GPIO pins for communication, which helps save valuable pins on the controller.
- **Adjustable Brightness and Contrast**: Most modules include a potentiometer to adjust the screen’s contrast and a jumper to control the backlight.
- **Easy Integration**: Compatible with libraries in Arduino IDE (like LiquidCrystal_I2C.h), making it easy to program and use.

Working Principle: The I2C interface uses a serial communication protocol. Data is sent bit by bit through a shared bus, and each I2C device is identified by a unique address. The microcontroller sends commands to this address to display characters on the LCD.

Applications in the Smart Plant Project: In the Smart Plant project, the 16x2 I2C LCD is used to:

- Display real-time sensor data such as soil moisture levels, temperature, and humidity.
- Show system status messages (e.g., “Watering Now”, “Moisture OK”, “Pump ON/OFF”).
- Provide user feedback when buttons are pressed or actions are triggered.

This display makes the Smart Plant system more interactive and informative, allowing users to monitor the system directly without needing a smartphone or computer interface.

18650 3.7V Lithium-ion Battery

The 18650 lithium-ion battery is a high-capacity rechargeable battery widely used in portable electronic devices, DIY electronics, and embedded systems. In projects requiring reliable and portable power sources, such as the Smart Plant system, it is a preferred choice due to its compact size, high energy density, and long cycle life.

Specifications:

- **Voltage**: 3.7V (nominal), can be charged up to 4.2V and discharged down to around 2.5V.
- **Capacity**: Common capacities range from 2000mAh to 3500mAh or more, depending on the manufacturer and model.
- **Form Factor**: Cylindrical shape, 18mm in diameter and 65mm in length (hence the name 18650)..

Protection and Safety: For safe usage, it is important to use **protected 18650 batteries** or combine them with:

- **Battery Protection Circuits**: To prevent overcharging, over-discharging, and short circuits.
- **Battery Holders**: For easy installation and replacement.
- **Charging Modules**: Such as TP4056 modules for controlled charging via USB or solar panels.

Applications in the Smart Plant Project: In the Smart Plant system, the 18650 battery serves as the **primary power source** or backup power solution. It powers the NodeMCU, sensors (e.g., soil moisture sensor, PIR sensor), display modules, and the water pump (via relay), especially in outdoor or off-grid setups.

- Enables portability and use in locations without constant power supply.
- Supports low-power operation and intermittent charging using solar panels or USB sources.

By integrating a 3.7V 18650 battery, the Smart Plant system becomes more energy-efficient, portable, and adaptable to real-world conditions.

Arduino IDE and Coding

The **Arduino IDE (Integrated Development Environment)** is an open-source software platform used to write, compile, and upload code to microcontrollers such as the **NodeMCU (ESP8266)**, Arduino Uno, Nano, and others. It plays a central role in programming and controlling hardware components in embedded systems and IoT projects.

Key Features of Arduino IDE:

- **Simple Text Editor**: For writing code in C/C++.
- **Built-in Compiler**: Converts high-level code into machine-readable instructions for microcontrollers.
- **Serial Monitor**: Allows communication with the microcontroller during runtime to view output, debug data, and send commands.
- **Board Manager**: Supports a variety of boards, including NodeMCU (ESP8266), with easy board installation.
- **Library Support**: Offers thousands of libraries to interface sensors, modules, displays, and communication protocols.
-

Role of Arduino IDE in the Smart Plant Project

In the Smart Plant project, the Arduino IDE was used for:

1. **Programming the NodeMCU (ESP8266)**:
    - Writing logic to control sensors (soil moisture, PIR sensor).
    - Interfacing the relay module to control the water pump.
    - Displaying messages on the 16x2 I2C LCD display.
    - Sending and receiving data over Wi-Fi if connected (optional).
2. **Library Integration**:
    - Wire.h for I2C communication.
    - LiquidCrystal_I2C.h for controlling the LCD.
    - ESP8266WiFi.h for Wi-Fi functionality (if used).

- Custom code for sensor readings, decision-making logic, and controlling outputs.

3. **Sensor Input and Actuator Output**:
   - Reading analog values from the soil moisture sensor.
   - Monitoring motion detection via the PIR sensor.
   - Triggering the relay to operate the water pump when moisture is low.
   - Displaying real-time status and sensor readings on the LCD.
4. **Debugging and Testing**:
   - Using the Serial Monitor to check sensor outputs and verify correct execution of the program logic.

BlynkIOT_SmartPlant_Monitoring_Manual.ino

```
  digitalWrite(RELAY_PIN_1, relay1State);
}

void checkPhysicalButton() {
  if (digitalRead(PUSH_BUTTON_1) == LOW) {
    if (pushButton1State != LOW) {
      relay1State = !relay1State;
      digitalWrite(RELAY_PIN_1, relay1State);
      Blynk.virtualWrite(VPIN_BUTTON_1, relay1State);
    }
    pushButton1State = LOW;
  } else {
    pushButton1State = HIGH;
  }
}

void loop() {
  if (PIR_ToggleValue == 1) {
    PIRsensor();
  } else {
    WidgetLED LED(V5);
    LED.off();
  }

  Blynk.run();
  timer.run();
}
```

Blynk App

Blynk is a popular Internet of Things (IoT) platform that allows users to build and control electronic projects through a smartphone. It provides an easy-to-use interface to interact with hardware like **NodeMCU (ESP8266)** via the internet, making it ideal for remote monitoring and control.

Key Features:

- **Mobile Dashboard**: Customizable interface with widgets like buttons, sliders, displays, and graphs.
- **Real-time Monitoring**: View live sensor data on your phone.
- **Remote Control**: Turn devices (like a water pump) ON or OFF from anywhere.
- **Notifications**: Get alerts when certain conditions are met (e.g., low moisture).
- **Cloud-based & Offline Modes**: Can work with Blynk Cloud or private/local servers.
- **Easy Integration**: Comes with a Blynk library for Arduino/ESP that simplifies communication between the app and hardware.

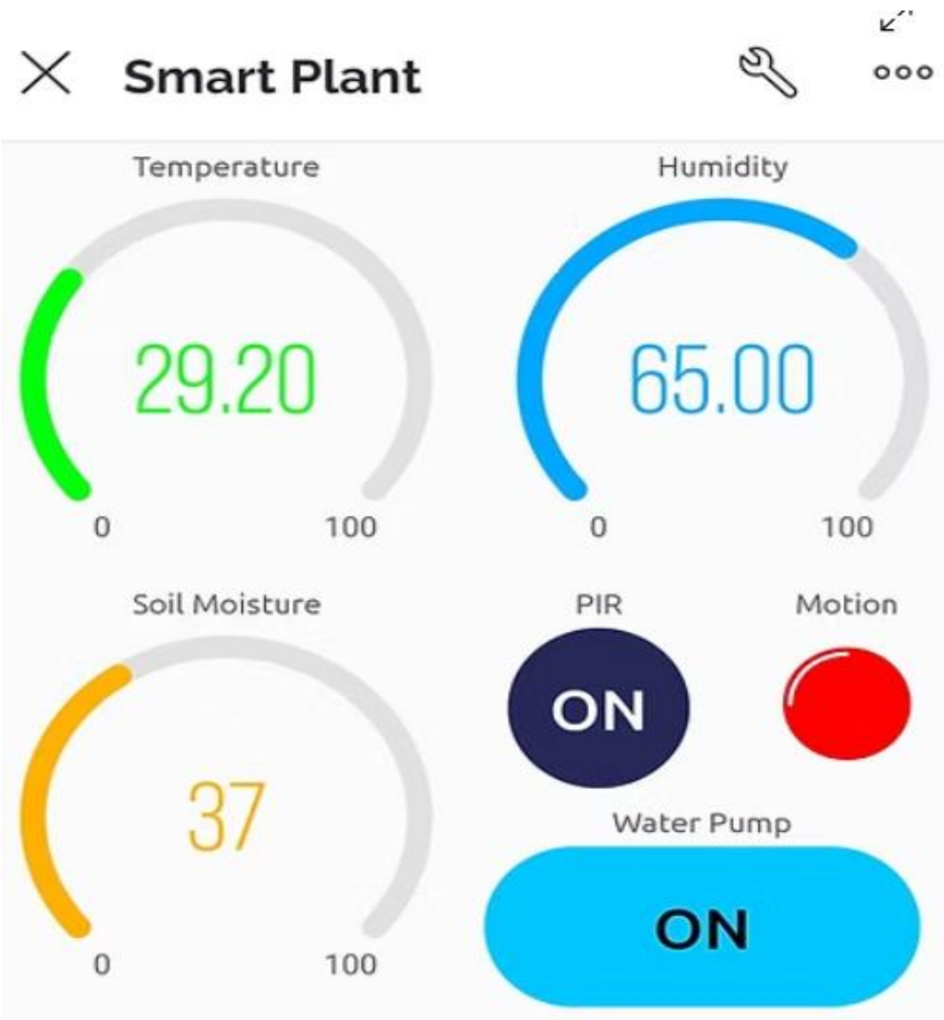
Role of Blynk App in the Smart Plant Project

In the **Smart Plant** system, the Blynk App enhances user experience by providing a **remote interface** for:

- Monitoring **soil moisture levels**.
- Receiving **alerts** when moisture is too low or motion is detected.
- Turning the **water pump ON/OFF** manually using a virtual button.
- Viewing **system status** from anywhere via Wi-Fi or mobile data.

Working Mechanism:

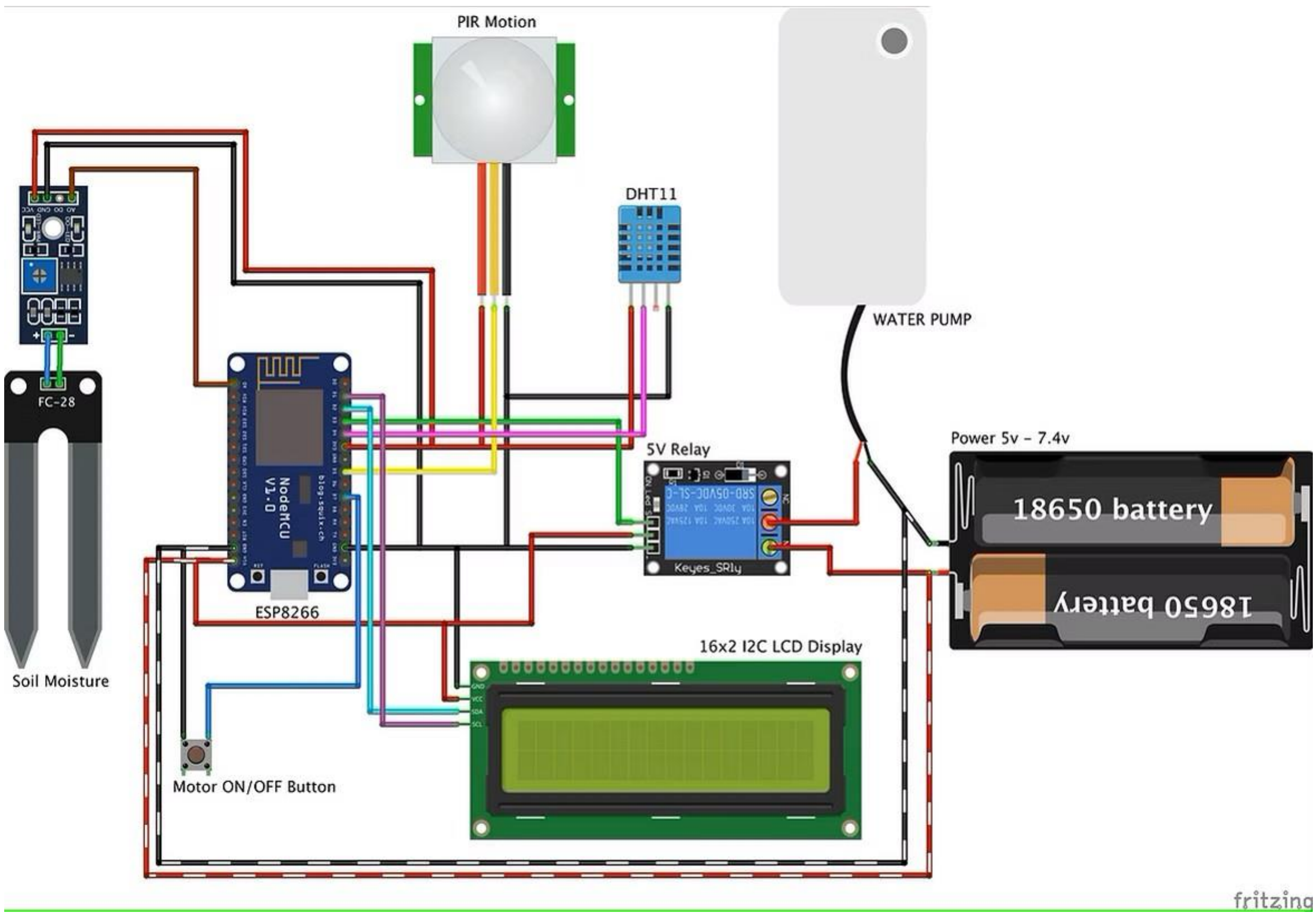
1. **Blynk Setup**:
    - Install Blynk from the Play Store or App Store.
    - Create a new project and choose **NodeMCU** as the hardware model.
    - Add widgets like **Gauge**, **Button**, and **Notification** to monitor and control the system.
    - Get the **authentication token** sent to your email.
2. **Code Integration in Arduino IDE**: The token, Wi-Fi credentials, and control logic are integrated into the code using the Blynk library.



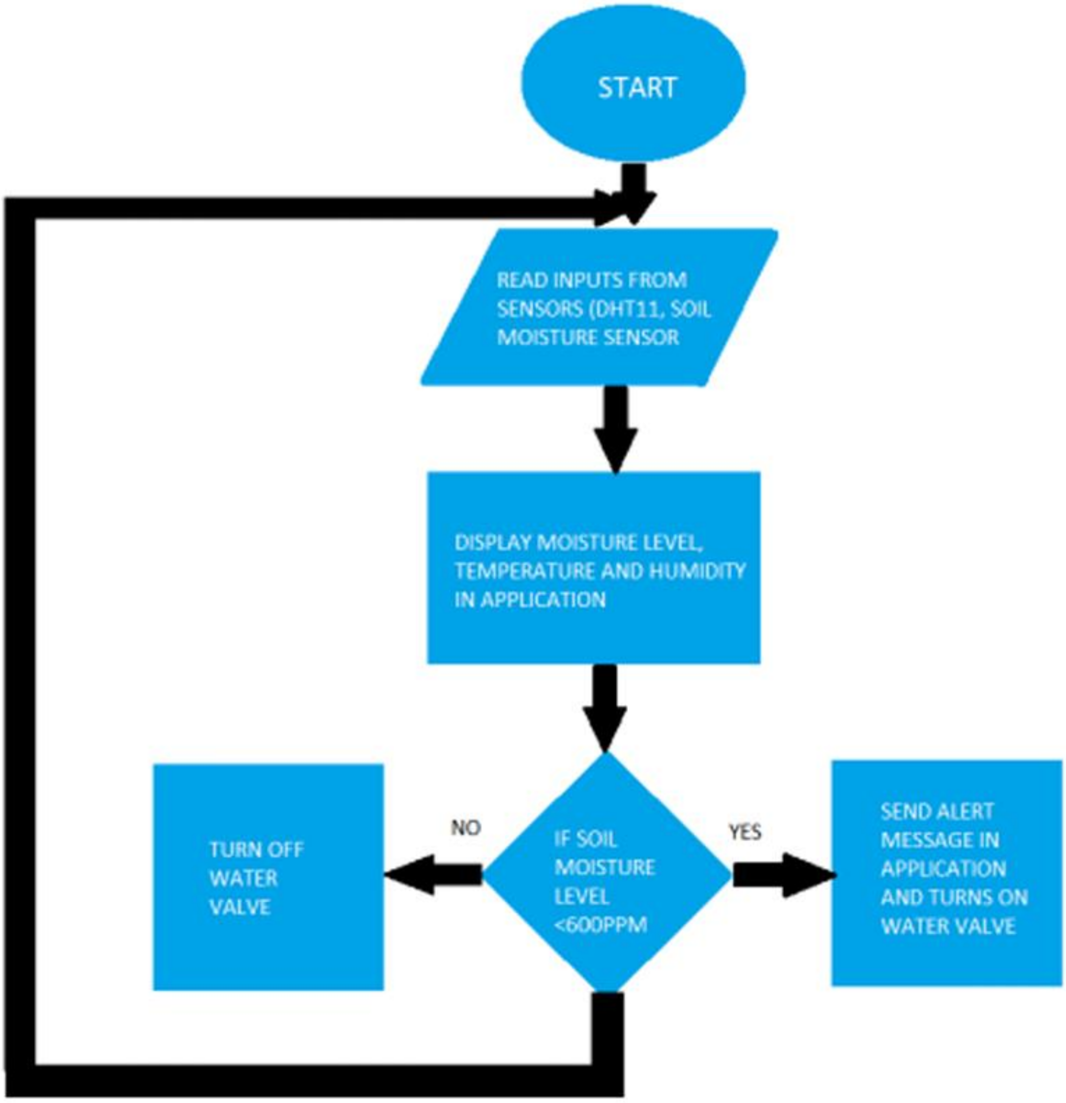

```
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>

char auth[] = "YourAuthToken";
char ssid[] = "YourWiFiName";
char pass[] = "YourWiFiPassword";

BlynkTimer timer;
int moisturePin = A0;
int pumpPin = D1;

void sendSensor() {
  int moisture = analogRead(moisturePin);
  Blynk.virtualWrite(V1, moisture); // Send to Gauge on V1
  if (moisture < 400) {
    digitalWrite(pumpPin, LOW); // Turn pump ON
    Blynk.notify("Soil is too dry! Watering now...");
```

Algorithm

1. START
2. Initialize all the devices, DHT11, Soil moisture sensor, Buzzer, Node mcu and mobile application
3. Collect the sensors output .
4. Display the value on Mobile app
5. Check the value of Soil moisture
    a. If value>threshold, turn on the water pump
    b. If value<threshold, go to step 4.
6. Check the value of DHT11
7. Sending alert messages to the user using Wifi module
8. Go to step 3


PIR Motion
DHT11
WATER PUMP
FC-28
Soil Moisture
ESP8266
NodeMCU V1.0
5V Relay
Keyes_SRly
Power 5v - 7.4v
18650 battery
18650 battery
16x2 I2C LCD Display
Motor ON/OFF Button
fritzing

FLOWCHART


START
READ INPUTS FROM SENSORS (DHT11, SOIL MOISTURE SENSOR
DISPLAY MOISTURE LEVEL, TEMPERATURE AND HUMIDITY IN APPLICATION
IF SOIL MOISTURE LEVEL <600PPM
NO
TURN OFF WATER VALVE
YES
SEND ALERT MESSAGE IN APPLICATION AND TURNS ON WATER VALVE

CONCLUSION

This whole project mainly focuses on two results. The first result is to help farmers to upgrade their agriculture – technical knowledge, act in accordingly with minimum requirements on environmental issues and mostly the basic function being prevented by major disasters and protect plants and nature from being ruptured. And the second result of our project is to use technology to measure the humidity, temperature and moisture of the plant root and make the plant grow in a well suitable environment with out the use of soil as per the concept of hydroponics. The farmer or user receives the message regarding the status and thus helps in avoiding delay of plant watering and protect the plant to live in a suitable environment.