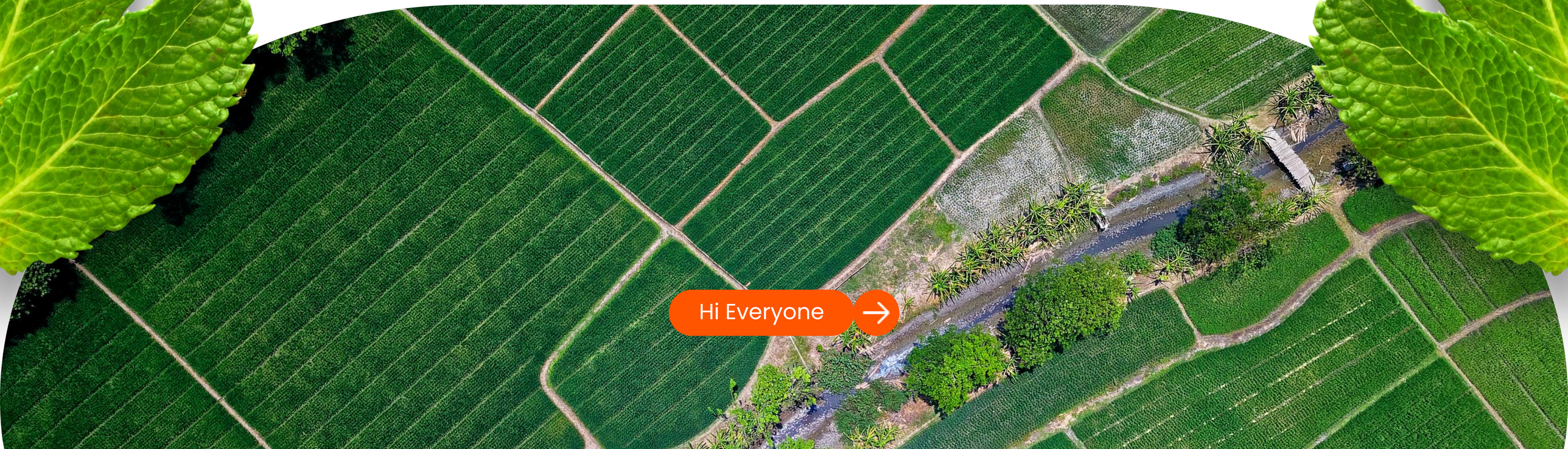
IOT SMART PLANT MONITORING



IOT SPMS

Welcome Everyone

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Mohamed Roshan Akthar

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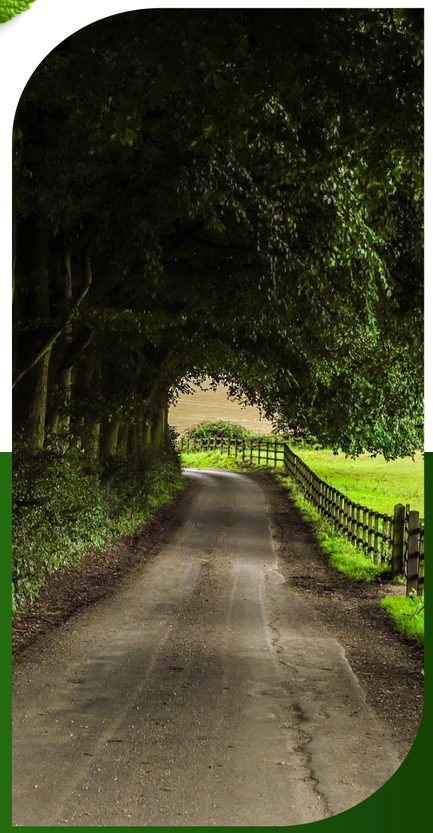
Senthtamil Selvan

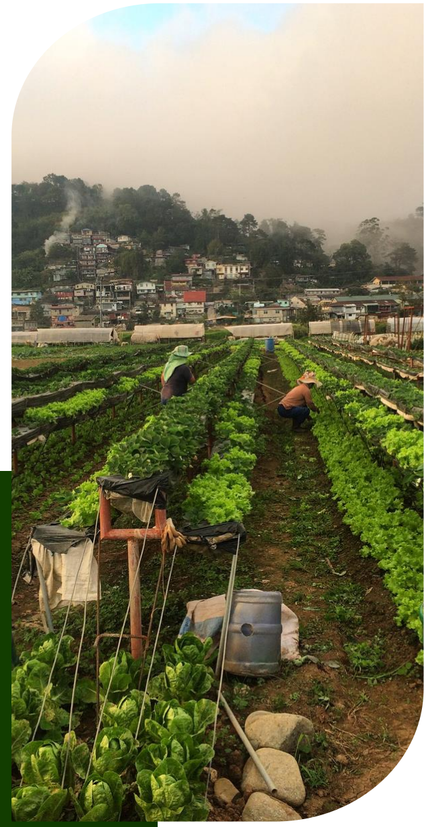
Vignesh

Akash

Abstract

In an era where sustainability is paramount, the integration of IoT technology in plant care is transforming how we interact with our green spaces. This project presents a Smart Plant Monitoring System designed to provide real-time insights into plant health and environmental conditions.



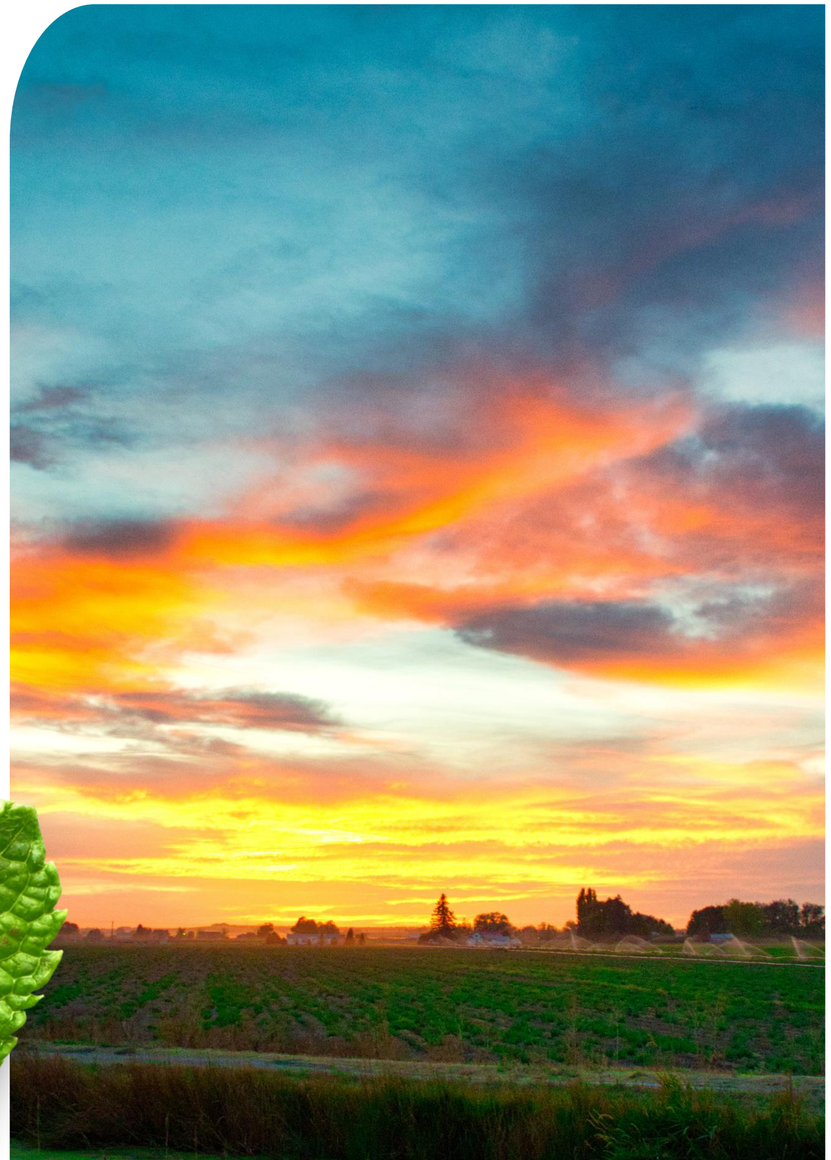


Introduction

This project utilizes an IoT-based system incorporating soil moisture sensors, temperature and humidity sensors, and motion detectors. These components work together to monitor plant health in real-time, providing valuable data for optimizing watering schedules and creating ideal growing conditions, ultimately enhancing plant care and resource efficiency.

Existing System

- **Manual Methods:** Gardeners rely on intuition and basic tools for monitoring.
- **Fixed Irrigation:** Often leads to over- or under-watering without real-time adjustments.
- **Lack of Data:** No real-time data collection results in inconsistent decision-making.
- **Labor-Intensive:** Remote monitoring is unavailable, increasing the workload for gardeners.



Proposed System

- **Real-Time Monitoring:**Continuously tracks soil moisture, temperature, and humidity for optimal plant care.
- **Automated Irrigation:**Adjusts watering schedules based on real-time data, preventing over- or under-watering.
- **Data-Driven Insights:** Provides actionable insights to enhance plant health and resource efficiency.
- **Remote Access:** Allows users to monitor conditions from anywhere via a mobile or web application.
- **Customizable Alerts:** Sends notifications for specific conditions, ensuring proactive plant management.

Requirments

System Requirements

- Processor: 32-bit or 64-bit (e.g., Intel Core i3 or higher)
- Hard Disk: Minimum 500 MB of available space
- RAM: Minimum 4 GB (8 GB or higher recommended for smooth performance)

ESP32 Board

- Microcontroller: Used for sensor integration and IoT functionalities

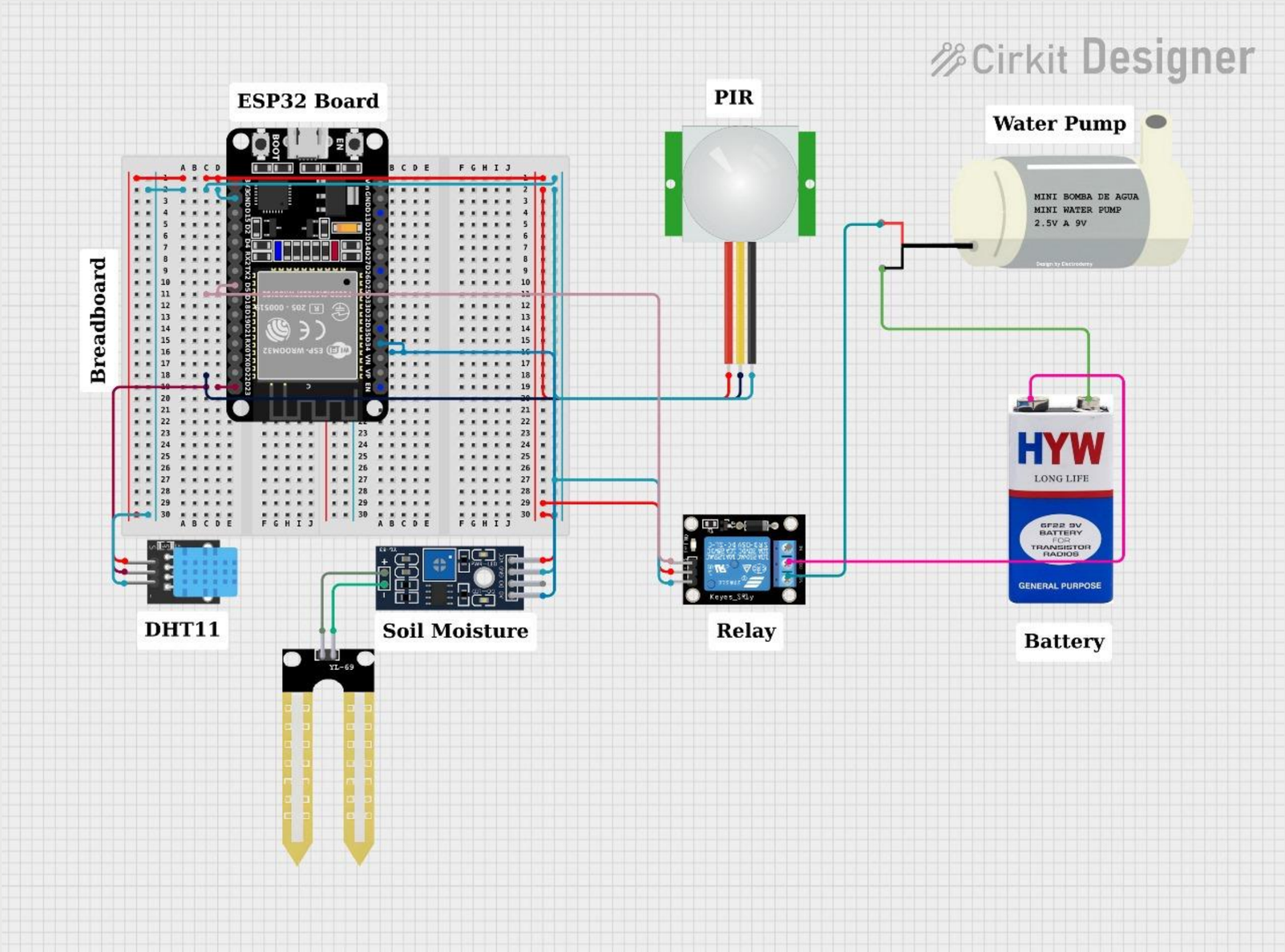
Sensors

- Soil Moisture Sensor
- DHT11 Sensor (Temperature & Humidity)
- PIR Motion Sensor

Requirments

- Components:
  - Breadboard
  - Jumper Wires
  - Relay
  - Battery
  - Water Pump
- Power Supply:
  - USB Cable or External Power Source for the ESP32

System Design



Implementations

1. Blynk Website Connection

a) Sign Up for a Blynk Account
Create an account on the Blynk website to access the platform's features.
b) Create a New Template
Set up a project template specifying your device and connection type.
c) Configure Data Streams
Define virtual pins for your sensors and actuators within the template.
d) Get Your Device Credentials
Obtain the necessary credentials (Template ID, Device Name, Auth Token) for device authentication.

Implementations

e) Install Blynk Library in Arduino IDE

Add the Blynk library to your Arduino IDE to enable communication with Blynk Cloud.

f) Write the Code

Develop the code to connect your device to Blynk using the provided credentials.

g) Upload the Code

Flash the code onto your hardware using the Arduino IDE.

h) Verify Device Connection

Check the device status in the Blynk Console to ensure it is connected and online.

Implementations

Hardware Connections

a) ESP32 Pinouts

DHT11 Sensor:

- **Data Pin: GPIO 4**
- **VCC: 3.3V**
- **GND: GND**

b) Soil Moisture Sensor:

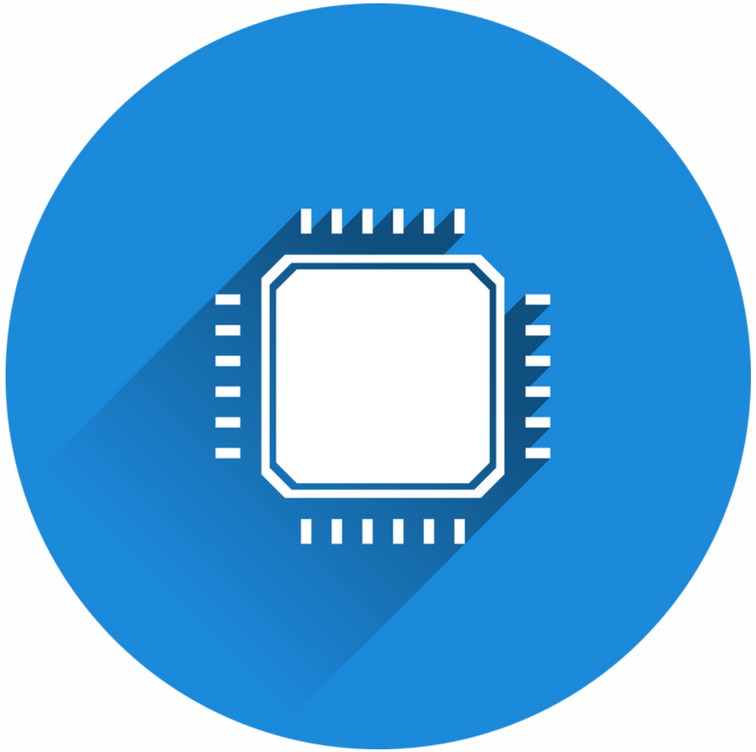
- **Analog Pin: GPIO 34**
- **VCC: 3.3V**
- **GND: GND**

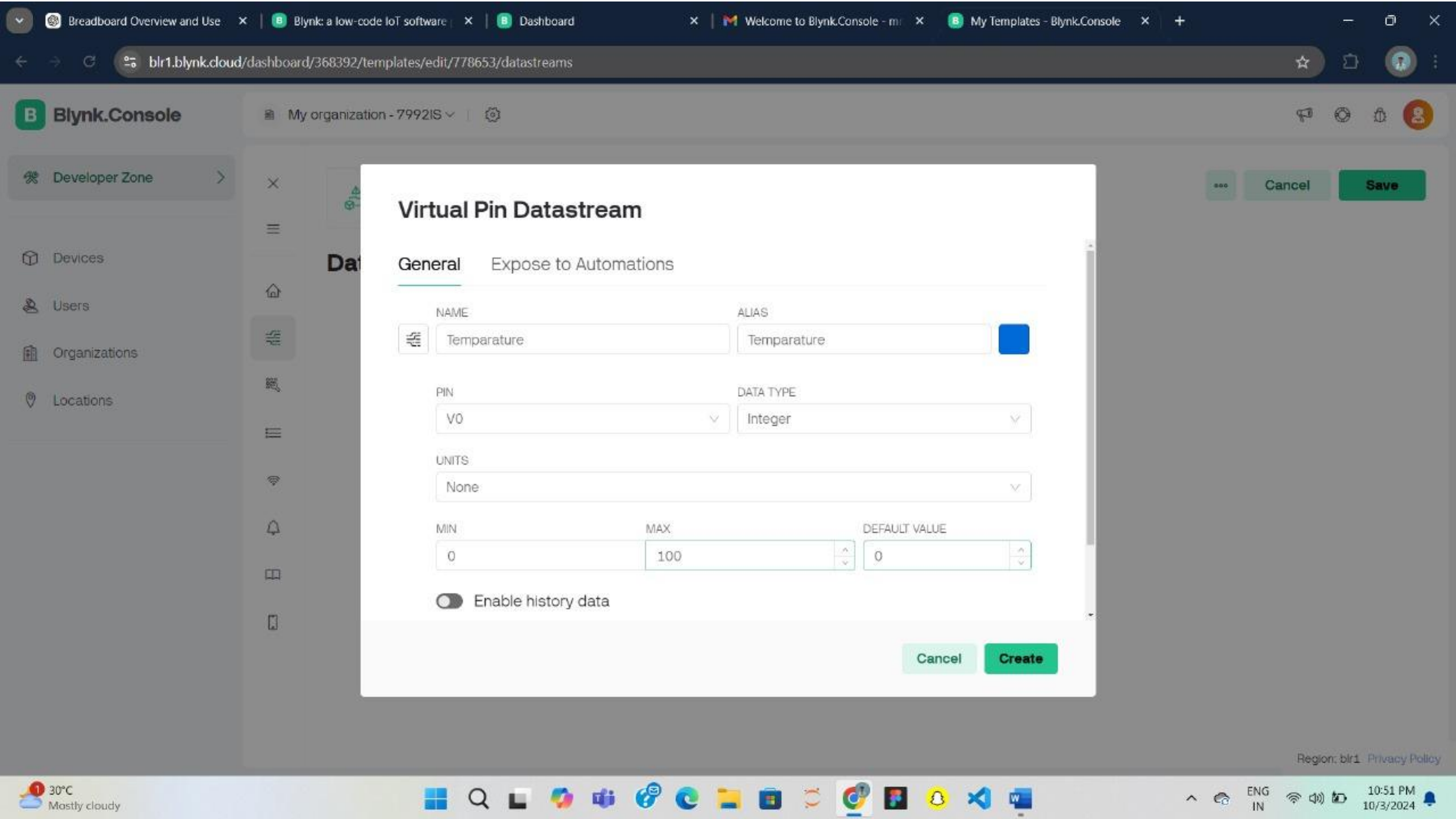
c) Relay:

- **VCC: 5V**
- **GND: GND**
- **IN Pin: GPIO 5**

d) PIR Sensor:

- **Output Pin: GPIO 18**
- **VCC: 5V**
- **GND: GND**




Breadboard Overview and Use
Blynk: a low-code IoT software
Dashboard
Welcome to Blynk.Console - m
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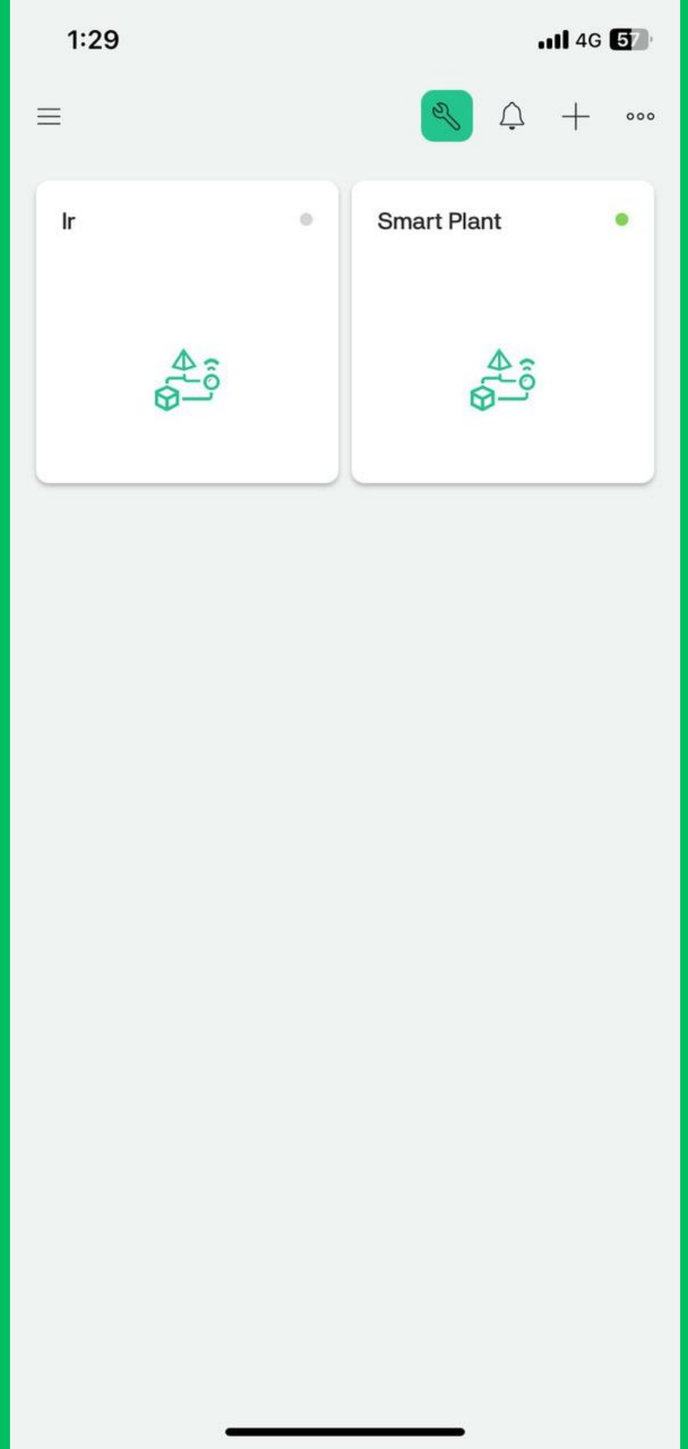
Blynk.Console
My organization - 7992IS
Developer Zone
Devices
Users
Organizations
Locations
Cancel
Save
Virtual Pin Datastream
General
Expose to Automations
NAME
Temparature
ALIAS
Temparature
PIN
V0
DATA TYPE
Integer
UNITS
None
MIN
0
MAX
100
DEFAULT VALUE
0
Enable history data
Cancel
Create
Region: blr1
Privacy Policy
30°C
Mostly cloudy
ENG
IN
10:51 PM
10/3/2024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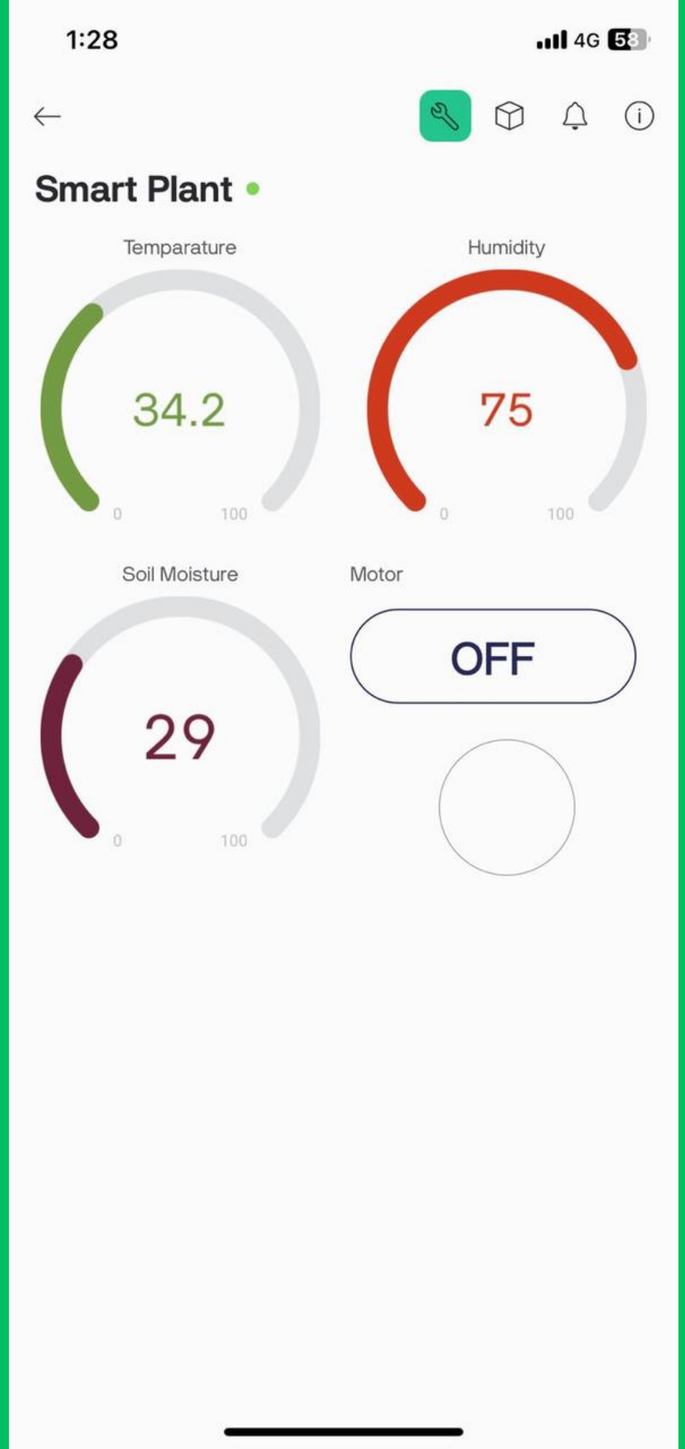
Smart Plant


1:28
4G
Smart Plant
Temparature
34.2
0
100
Humidity
75
0
100
Soil Moisture
29
0
100
Motor
OFF

ChatGPT | Blynk: a low-code IoT software | Devices - Blynk.Console

blynk.cloud/dashboard/339609/global/devices/1/organization/339609/devices/1230125/dashboard

Blynk.Console

My organization - 5535IV

Developer Zone

Devices

Users

Organizations

Locations

Smart Plant

Online

Mohamed Roshan Akthar M | My organization - 5535IV

Add Tag

Edit

Live | 1h | 6h | 1d | 1w | 1mo | 3mo | 6mo | 1y

Temperature

34.2

0 100

Humidity

75

0 100

Soil Moisture

47

0 100

Water Pump

Motion

Region: blr1 Privacy Policy

Hot weather
Now

ENG
IN

1:24 PM
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Merits of SPMS

- **Remote Monitoring:** Access and control plant data anytime, anywhere via the Blynk app.
- **Automated Watering:** Optimizes water usage with customizable soil moisture thresholds.
- **Energy Efficiency:** ESP32 uses low power and can be solar-powered for sustainability.
- **Custom Notifications:** Set alerts for conditions and receive instant updates.
- **Scalability:** Easily add sensors and modules for future expansions and adaptability.

Limitations of SPMS

- **Limited Sensor Accuracy**
- **Initial Setup Complexity**
- **Single Functionality Per Sensor**
- **No Automatic Nutrient Monitoring**

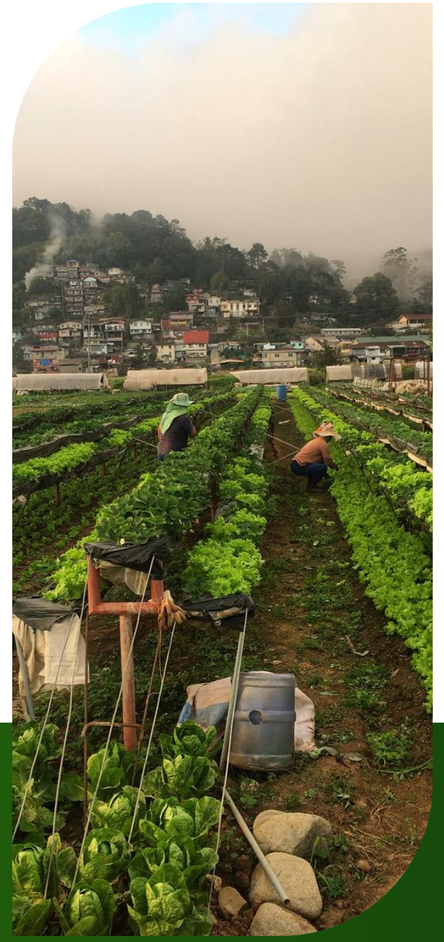
Future Enhancements

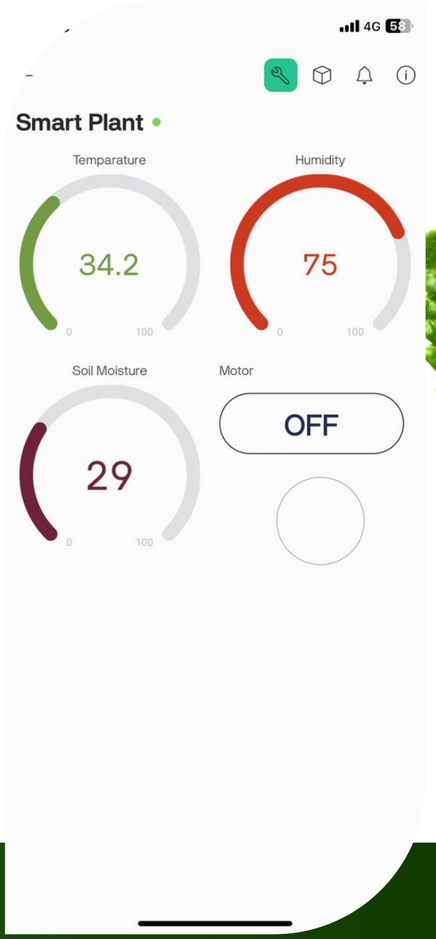
- **Automated Nutrient Delivery System:** Ensures plants receive the right nutrients at optimal times, enhancing growth and health.
- **Voice Control Features:** Allows users to control the system using voice commands, improving accessibility and ease of use.
- **Remote Camera Monitoring:** Enables users to visually check on their plants remotely, providing peace of mind and real-time observations.
- **Integration with Smart Home Systems:** Connects with existing smart home devices for seamless automation and enhanced control within a unified system.

IOT SPMS

THANK YOU

BY : TEAM VRAPS





By integrating smart technology into plant care, we empower ourselves to nurture our greens effortlessly, ensuring sustainability and growth in harmony with our busy lives.a, at.