

GNANAMANI COLLEGE OF TECHNOLOGY
DEPARTMENT: BIO MEDICAL ENGINEERING

YEAR: Third Year

TOPIC: ENVIRONMENTAL MONITORING

TEAM MEMBERS

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By,

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PROBLEM:

Let's consider a common environmental monitoring problem:

Monitoring soil moistures in a garden to optimize irrigation and conserve water resources.

SOLUTION USING IOT AND ARDUINO:

COMPONENTS NEEDED:

1.ARDUINO BOARD:

You can use an Arduino Uno or Arduino Nano for this project.

2.SOIL MOISTURE SENSOR:

A soil moisture sensor to measure the moisture level in the soil.

3.WIFI MODULE:

An IOT Wi-Fi module like a ESP8266 or ESP32 for internet connectivity.

4.POWER SOURCE:

A power source for your Arduino and Wi-Fi module (e.g. Batteries or a power adapter).

5.BREAD BOARD AND JUMPER WIRES:

To connect and prototype the circuit.

6.CLOUD PLATFORM:

Choose an IOT cloud platform AWD IOT,google cloud IOT or adafruit.

SOLUTION STEPS:

1.CONNECT THE HARDWARE:

- * Connect the soil moisture sensor to the Arduino board.
- * Connect the wifi module to the Arduino for internet connectivity.

2.CODE THE ARDUINO:

- * Write Arduino code to read data from the soil moisture sensor.

- * Use the Wi-Fi module to send this data to your choose IOT cloud platform.

3.SET UP CLOUD PLATFORM:

- * Create an account on your choose IOT cloud platform.
- * Set up a device and topic for your Arduino to publish data to.

4.PUBLISH DATA:

- * Modify your Arduino code to publish soil moisture data to the cloud platform at regular intervals(e.g. Every 15 minutes).

5.DATA STORAGE AND VISUALIZATION:

- * Use the cloud platform services to store and visualize the data.
- * Create graphs or dashboards to monitor soil moisture levels remotely.

6.THRESHOLD AND ALERTS:

- * Define moisture level threshold for your specific plants.
- * Set up alerts or notifications throw the cloud platform when moisture levels fall below or exceed these thresholds.

- * With this IOT and Arduino solution, you can monitor soil moisture levels *remotely, enabling you to optimize irrigation and prevent under watering.*

- * It conserves water resources by ensuring that plants receive the right amount of water.

- * Alerts and notifications help you take timely action when moisture levels or not with in the desired range.

- * The data collector over time can also provide insides into plant health and watering patterns, helping you make informed decisions.

USES:

Environmental monitoring often involves the use of strategically placed data collection points to gather information about various environmental factors such as air quality, water quality, temperature and more.

These points can be sensors or monitoring stations that help assess the state of the environment and track changes over time.

ADVANTAGES:

Resource Management:

Helps in the sustainable management of natural resources like water, air, soil, ensuring their preservation for future generations.

Public Health Protection:

Monitoring can identify threats to public health, such as air quality issues or contaminated water sources, allowing for interventions.

DISADVANTAGE:

Environment Impact:

The monitoring process itself can have environmental consequences.

Data Management:

Storing, managing, and analyzing large volumes of data can be challenging.