



COLLEGE NAME: PRIYADARSHINI ENGINEERING COLLEGE

COLLEGE CODE : 5119

COURSE NAME: Internet Of Things (IOT)

GROUP NUMBER: 1

PROJECT TITLE: SMART WATER MANGEMENT

PROJECT SUBMITTED TO: SKILL UP ONLINE

YEAR: 3rd

DEPARTMENT: ELECTRONICS AND COMMUNICATION ENGINEERING.

SEMESTER: 5th

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PROJECT DESCRIPTION

Introduction

The Smart Water Management System is designed to address the growing challenges of water scarcity, quality monitoring, and distribution efficiency. This project aims to leverage cutting-edge technologies to create a sustainable and intelligent water management system.

Objectives

- a. Real-time Monitoring: Implement sensors and IoT devices to continuously monitor water sources, quality, and consumption.
- b. Data Analytics: Collect and analyze data to gain insights into water usage patterns, leak detection, and demand forecasting. Remote Control: Enable remote control and automation of water distribution systems for efficient allocation and maintenance. User Engagement: Develop user-friendly interfaces and mobile apps for consumers to monitor and manage their water usage

Components;

- a. **Sensors and IoT Devices:** Deploy various sensors to measure water quality, flow rates, pressure, and level sensors in reservoirs.**Data Management:** Set up a centralized database to store, process, and analyze the collected data.
- b. **Communication Infrastructure:** Establish a robust communication network for real-time data transmission.**Data Analytics and AI:**Implement machine learning algorithms to detect anomalies, predict demand, and optimize water distribution.
- c. **User Interface:**Develop a user-friendly web or mobile application for consumers to access water usage information and control water-related devices.

Implementation:

- a. Phase 1: Sensor deployment and data collection
- b. Phase 2: Data analysis and anomaly detection
- c. Phase 3: Automation and remote control
- d. Phase 4: User interface development and consumer engagement

Conclusion:

The Smart Water Management System project is an essential step towards sustainable water resource management. By leveraging advanced technologies and data-driven insights, we can address the growing water challenges and work towards a more water-efficient and sustainable future.

Working model for device

Water Sensors Use water quality, flow, and level sensors to monitor water sources, reservoirs, and distribution points **Microcontrollers** Employ microcontrollers (e.g., Arduino, Raspberry Pi) to interface with sensors, collect data, and control devices. **Set up a communication system** to transmit data from sensors to a central server. This can be through Wi-Fi, LoRa, or cellular networks.

Sensor Deployment Place sensors at key points in the water distribution system, like near water sources, in reservoirs, and along pipelines. **Data Collection:** Program the microcontrollers to read data from the sensors and send it to the central server periodically.

Python program

Import random

Class WaterManagementSystem:

Def __init__(self):

Self.water_meter = 1000 # Initial water meter reading in liters

Self.consumption_threshold = 50 # Threshold for leak detection

Def simulate_water_consumption(self):

Simulate water consumption

Return random.randint(1, 100)

Def detect_leak(self, consumption):

Detect potential leaks based on consumption exceeding the threshold

Return consumption > self.consumption_threshold

```
Def update_water_meter(self, consumption):
```

```
    # Update the water meter reading
```

```
    Self.water_meter -= consumption
```

```
Def main_loop(self):
```

```
    While True:
```

```
        Consumption = self.simulate_water_consumption()
```

```
        Print(f"Current water consumption: {consumption} liters per minute")
```

```
        If self.detect_leak(consumption):
```

```
            Print("Potential water leak detected!")
```

```
            # Add logic here to send notifications or take necessary actions
```

```
        Self.update_water_meter(consumption)
```

```
        Print(f"Remaining water in the meter: {self.water_meter} liters")
```

```
If __name__ == "__main__":
```

```
    Water_system = WaterManagementSystem()
```

```
    Water_system.main_loop()
```