

Project: Smart Water Fountains

Project Objectives

The real-time water fountain status system aims to achieve the following objectives:

Promote water efficiency: By providing real-time information on the status of water fountains, the system can help users to identify and avoid fountains that are out of order or have low water levels. This can help to reduce water waste and encourage users to drink more water.

Increase public awareness: The system can also be used to raise public awareness of the importance of water conservation and the need to maintain water fountains in good condition.

IoT Sensor Setup

The IoT sensor setup for the real-time water fountain status system consists of the following components:

Water level sensor: This sensor is used to measure the water level in the fountain's reservoir.

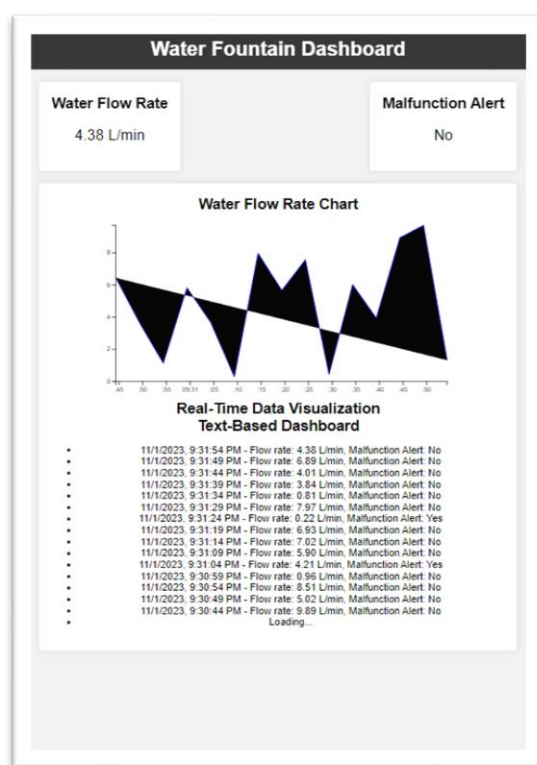
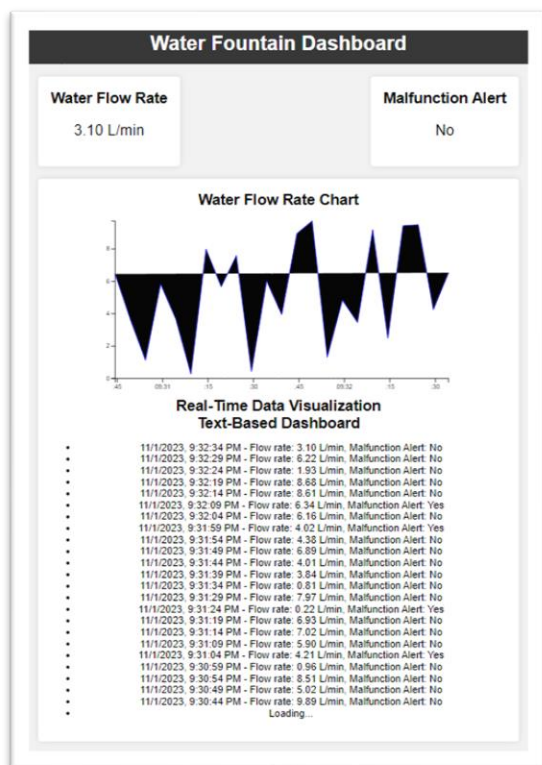
Flow sensor: This sensor is used to measure the flow rate of water through the fountain.

Temperature sensor: This sensor is used to measure the temperature of the water in the fountain.

These sensors can be connected to a microcontroller, such as a Raspberry Pi, to collect and process the sensor data. The microcontroller can then communicate the sensor data to the mobile app using a wireless protocol, such as Wi-Fi or Bluetooth.

Mobile App Development:

The mobile app is a crucial component of the system, allowing users to access real-time information about nearby water fountains. The app will display data such as water availability, water quality and malfunction alerts.



Raspberry Pi Integration:

The Raspberry Pi acts as the central hub for collecting data from IoT sensors and transmitting it to the cloud server for storage and further processing. It runs a Python script to read sensor data and sends it to the cloud server via an internet connection.

Code Implementation:

```
import requests
import time
from sensor_library import WaterLevelSensor, WaterQualitySensor

# Initialize sensors
water_level_sensor = WaterLevelSensor()
water_quality_sensor = WaterQualitySensor()

# Define the API endpoint for data transmission
api_url = "https://yourapiendpoint.com/data"

while True:
    # Read sensor data
    water_level = water_level_sensor.get_level()
    water_quality = water_quality_sensor.get_quality()

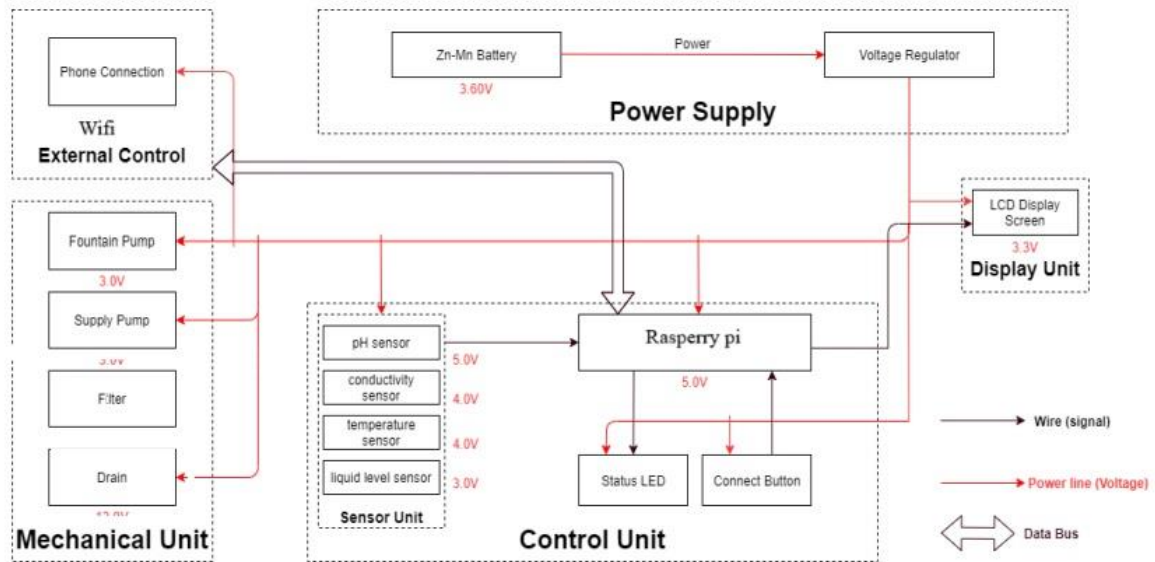
    # Create a JSON payload
    data = {
        "water_level": water_level,
        "water_quality": water_quality
    }

    # Send data to the cloud server
    response = requests.post(api_url, json=data)

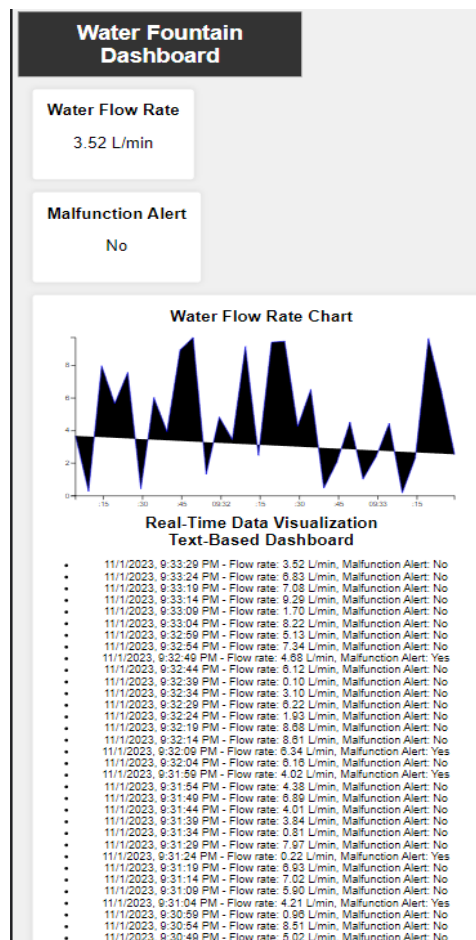
    if response.status_code == 200:
        print("Data sent successfully.")
    else:
        print("Failed to send data. Retrying in 5 minutes.")
```

Wait for 5 minutes before the next reading
time.sleep(300)

flow Diagram:



Mobile App UI



The real-time water fountain status system promotes water efficiency and public awareness through several mechanisms:

1. Water Efficiency:

- a. Real-Time Information: The system provides real-time data about water fountains, including their water availability and quality. Users can quickly determine if a nearby fountain has an adequate water supply and whether the water is safe to drink.
- b. Reduced Wastage: Armed with this information, individuals can make informed decisions about using a particular fountain or seeking an alternative source. This reduces unnecessary water wastage, as people avoid using fountains with low water levels or poor water quality.
- c. Encouraging Responsible Usage: By raising awareness about water scarcity and the importance of efficient water use, the system encourages responsible water consumption habits. Users become more conscious of their role in conserving this precious resource.

2. Public Awareness:

- a. Visibility: The mobile app and any public displays of the water fountain status make the information highly visible and accessible to the public. This increased visibility raises awareness about the status of water fountains in public spaces.
- b. Education: The system can include educational features within the app to inform users about water conservation, water quality standards, and the environmental impact of water wastage. This educational content helps users understand the broader context of water conservation.
- c. Community Engagement: Users may be encouraged to share information about the system and their efforts to conserve water on social media. This can lead to a broader community engagement and the promotion of water-efficient behaviors.
- d. Data Transparency: By providing real-time data on water fountain status, the system promotes transparency in water management. It may also encourage local authorities and municipalities to take action to maintain and improve the water fountain infrastructure.
- e. Sustainability Goals: The system aligns with global sustainability goals related to responsible water usage. It contributes to a more conscious and responsible society that values water conservation as part of its broader sustainability efforts.

Overall, the real-time water fountain status system leverages technology to empower individuals with the information they need to make sustainable choices regarding water usage. It not only minimizes water wastage but also fosters a sense of responsibility and awareness about the importance of preserving our water resources, benefiting both the environment and the community.

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