Project Documentation: Smart Water Fountains using IoT

Jasper Daniel C

Artificial Intelligence & Data Science

Kings Engineering College

(Affiliated to Anna University)

Chennai, India

Mohamed Sheik M

Artificial Intelligence & Data Science

Kings Engineering College

(Affiliated to Anna University)

Chennai, India

Dhanush Raja R

Artificial Intelligence & Data Science

Kings Engineering College

(Affiliated to Anna University)

Chennai, India

Lingam S

Artificial Intelligence & Data Science

Kings Engineering College

(Affiliated to Anna University)

Chennai, India

**Objectives**

The core objectives of this project are as follows:

1. **Real-time Water Fountain Monitoring**: Implement an IoT-based system to continuously monitor the status of public water fountains, including water flow, temperature, and pressure.

2. **Efficient Water Usage**: Promote efficient water usage by controlling the water flow rate based on demand and usage patterns.

3. **Malfunction Detection**: Detect malfunctions and anomalies in water fountains in real-time, ensuring prompt maintenance.

4. **Resident Awareness**: Provide residents with real-time access to information about water fountain availability, cleanliness, and quality through a user-friendly public platform.

**IoT Sensor Design**

**Sensor Types:**

The deployment of IoT sensors is critical for achieving the project objectives. The following types of sensors will be utilized:

1. **Flow Rate Sensors**: These sensors will measure the flow rate of water from each water fountain, providing data on consumption patterns.

2. **Pressure Sensors**: Pressure sensors will monitor water pressure within the fountains, detecting issues related to water supply.

3.**Temperature Sensors**: Temperature sensors will ensure that water remains within acceptable ranges for drinking.

4. **Water Quality Sensors**: Sensors will monitor water quality, ensuring that the water is safe and clean for consumption.

**Sensor Deployment:**

The sensors will be strategically placed at public water fountains, collecting real-time data. Each sensor will be connected to a central IoT gateway for data transmission.

Real-Time Transit Information Platform

**Platform Development**:

A dedicated platform will be developed to serve as a centralized hub for real-time information on water fountains. Key features of the platform include:

**1. Real-time Fountain Status**: Users can access real-time information on the status of nearby water fountains, including availability, water flow, temperature, and water quality.

2**. Flow Control**: The platform will allow administrators to control water flow rates remotely based on usage patterns and demand, promoting water conservation.

3. **Malfunction Alerts**: Automatic alerts will be generated and sent to maintenance teams when malfunctions or anomalies are detected.

4**. User Notifications**: Users will receive notifications about fountain availability and condition through the platform or a mobile app.

5. **Data Visualization**: Visual representations of data will be provided to help users understand water fountain usage and trends.

**Integration Approach**

**IoT Technology and Python Integration:**

Integration of IoT sensors and the water fountain status platform will be achieved through the following steps:

1. **Data Collection:** IoT sensors will continuously collect data and transmit it to the central platform using IoT protocols and connectivity options.

2**. Data Processing**: Python scripts will be used for data processing, analysis, and anomaly detection, ensuring the data's accuracy and reliability.

3**.User Interface:** Python-based web and mobile app interfaces will be developed to access and display real-time information from the platform.

4. **Remote Control**: Python scripts will enable remote control of water flow rates based on the platform's data and user settings.

5. **Alerting System**: Python will be used to implement automatic alerting mechanisms for maintenance teams and users in case of issues or malfunctions.

6. **Security Measures**: Robust security measures will be implemented to protect data integrity and user privacy.

This project documentation outlines the objectives, IoT sensor design, real-time platform development, and integration approach for enhancing public water fountains using IoT technology and Python. It serves as a comprehensive guide for the successful execution of the project.