**SMART WATER FOUNTAIN**

**PHASE 1: Problem Definition and Design Thinking**

**Project Overview:**

The project aims to enhance public water fountains by implementing IoT sensors to control water flow and detect malfunctions. The primary objective is to provide real-time information about water fountain status to residents through a public platform. This project includes defining objectives, designing the IoT sensor system, developing the water fountain status platform, and integrating them using IoT technology and Python.

**Design Thinking:**

1. Project Objectives: Define objectives such as real-time water fountain monitoring, efficient water usage, malfunction detection, and resident awareness.
2. IoT Sensor Design: Plan the deployment of IoT sensors (e.g., flow rate sensors, pressure sensors) in public water fountains.
3. Real-Time Transit Information Platform: Design a mobile app interface that displays real-time parking availability to users.
4. Integration Approach: Determine how IoT sensors will send data to the water fountain status platform.

**PROJECT OBJECTIVES:**

**1.Real-time Water Fountain Monitoring:**

Monitor the status of public water fountains in real-time, including water levels, flow rates, and operational status.

**2.Efficient Water Usage:**

Implement intelligent controls to optimize water usage, ensuring the fountains run efficiently without wastage.

**3.Malfunction Detection:**

Detect and promptly report any malfunctions or issues with the water fountains, such as pump failures or leaks.

**4.Resident Awareness:**

Provide residents with real-time information about the availability and status of nearby water fountains to encourage usage and reduce plastic bottle waste.

**IOT SENSOR DESIGN:**

**1.Flow Rate Sensors:**

Install flow rate sensors in the water supply lines of the fountains to measure the rate at which water flows into the fountain.

**2.Pressure Sensors:**

Place pressure sensors within the fountain's plumbing system to monitor water pressure, which can help detect blockages or irregularities.

**3.Water Level Sensors:**

Install water level sensors inside the fountain basins to measure water levels accurately.

**4.Temperature Sensors:**

Optionally, you can include temperature sensors to monitor water temperature, which may be relevant for user comfort.

**REAL-TIME TRANSIT INFORMATION PLATFORM:**

**1.Mobile App Interface:**

Design a user-friendly mobile app interface that displays real-time water fountain information to users.

The app should include the following features:

* Map view showing the locations of nearby public water fountains.
* Real-time status updates (e.g., operational, under maintenance, out of water) for each fountain.
* Information on the water quality and temperature, if applicable.
* Notifications/alerts for malfunctions or low water levels.
* Usage statistics and trends, such as the number of bottles saved.

**2.User Registration and Preferences:**

Allow users to register and set preferences for notifications, favourite fountain locations, and water quality preferences.

**3.Integration with Iot Sensors:**

Implement a data collection and processing system to receive data from the IoT sensors. Use a cloud platform or a dedicated server to handle data storage and analysis.

**INTEGRATION APPROACH:**

**1.IoT Sensor Data Transmission:**

IoT sensors should send data (flow rates, pressure, water level) periodically to a central data processing platform. This can be achieved using IoT protocols like MQTT or HTTP over Wi-Fi or cellular connections.

**2.Data Processing Platform:**

Set up a cloud-based or on-premises data processing platform to receive, store, and analyse data from the sensors. Platforms like AWS IoT, Google Cloud IoT, or custom solutions can be used.

**3.Mobile App Integration:**

Develop APIs or endpoints on the data processing platform to allow the mobile app to retrieve real-time information and send user preferences.

**4.User Notifications:**

Implement a notification system in the app that sends alerts to users based on data received from the IoT sensors. For instance, users can receive alerts when a nearby fountain is under maintenance or when a malfunction is detected.

**5.Security and Authentication:**

Ensure secure data transmission and user authentication to protect user data and the IoT system from unauthorized access.

**6.Continuous Monitoring:**

Implement a monitoring system that checks the status of IoT sensors and the data processing platform to ensure they are operational and responsive.

**CONCLUSION**

The IoT based Smart Water Fountain System that efficiently monitors public water fountains, optimizes water usage, detects malfunctions, and provides residents with real-time awareness through a user-friendly mobile app interface.