**SMART WATER FOUNTAIN**

## ***PHASE 1: PROBLEM DEFINITION AND DESIGN THINKING***

# I. Project Definition:

The "Smart Water Fountains" project is a forward-looking endeavor dedicated to the enhancement of public water fountains by leveraging Internet of Things (IoT) technology. The central mission is to introduce intelligent monitoring and control systems, thereby ensuring optimal functionality and accessibility of these essential urban amenities.

# II. Design Thinking:

**1. Project Objectives**:

a. Real-time Water Fountain Monitoring and Control:

**Objective:** The primary goal is to establish a state-of-the-art real-time monitoring and control system for public water fountains.

**Purpose:** This system will empower municipal authorities, maintenance personnel, and the general public with instant access to critical information regarding water fountain status, including water flow regulation and malfunction detection.

**Benefits:** Rapid response to issues, efficient water usage, and a seamless user experience.

b. Public Information Platform:

**Objective:** Create a user-friendly, publicly accessible platform for disseminating real-time water fountain status information.

**Purpose:** Residents and visitors will be equipped with a convenient tool to locate nearby functioning water fountains, ascertain water quality, and receive timely alerts about maintenance or quality concerns.

**Benefits:** Enhanced convenience, user satisfaction, and community engagement.

c. Efficient Water Usage:

**Objective:** To optimize water consumption by implementing intelligent water flow control mechanisms.

**Rationale:** Reduce water wastage and promote responsible water usage by incorporating sensors and controls that adjust water flow based on demand and environmental conditions.

**Benefits**: Conservation of water resources, cost savings, and environmental sustainability.

d. Malfunction Detection and Reporting:

**Objective:** To proactively detect and report malfunctions or anomalies in water fountains.

**Rationale:** Enhance the reliability of public fountains by identifying issues such as clogs, leaks, or pump failures in real-time.

**Benefits:** Minimized downtime, improved maintenance efficiency, and enhanced user safety.

e. Resident Awareness:

**Objective:** To create an accessible platform that provides residents with real-time information about nearby water fountains.

**Rationale:** Empower residents with the ability to find nearby functioning fountains, check water quality, and receive alerts or notifications about maintenance or quality concerns.

**Benefits:** Enhanced user satisfaction, convenience, and community engagement.

# 2. IoT Sensor Design:

**Strategy:** Carefully plan the deployment of IoT sensors, including flow rate sensors, pressure sensors, temperature sensors, and water quality sensors, across public water fountains.

**Placement:** Identify optimal sensor placement locations to capture relevant data accurately.

3. Real-Time Transit Information Platform:

**Interface Design:** Develop an intuitive and user-friendly mobile application interface that seamlessly integrates with the IoT sensor network.

**Features**: Include features such as real-time fountain location mapping, water quality reporting, usage statistics, and a notification system for important updates.

# 4. Integration Approach:

**a. Communication Protocols:**

Investigate and select suitable IoT communication protocols (e.g., MQTT, HTTP, WebSocket).

**b. Data-sharing platform:**

Develop a centralized data-sharing platform where the collected water consumption data can be stored and accessed by the mobile app or website.

**c. Real-time Considerations:**

Define and meet real-time requirements for data transmission and updates.

Ensure timely delivery of sensor data to the platform and end-users.to protect transmitted data from unauthorized access.

# III. Conclusion:

In conclusion, the "Smart Water Fountains" project has leveraged IoT technology to revolutionize public water fountains. It promises efficient water usage, real-time monitoring, and enhanced user awareness. This innovative initiative sets a new standard for urban infrastructure, ensuring a sustainable and