# Smart Water Fountain Project

### Phase 5: Project Documentation & Submission

## Overview

This project aims to develop a smart water fountain that can dispense water hygienically and efficiently. The fountain will be equipped with a variety of sensors and actuators to monitor and control the water flow, temperature, and quality. It will also be able to track water usage and provide feedback to users.

## System Architecture

The smart water fountain will consist of the following components:

* **Microcontroller:** The microcontroller will be the brain of the system, responsible for controlling all of the sensors and actuators.
* **Water flow sensor:** This sensor will measure the rate at which water flows through the fountain.
* **Water temperature sensor:** This sensor will measure the temperature of the water flowing through the fountain.
* **Water quality sensor:** This sensor will measure the quality of the water flowing through the fountain, including parameters such as turbidity, pH, and conductivity.
* **Water valve:** This valve will control the flow of water to the fountain.
* **Display:** The display will be used to provide feedback to users, such as the water temperature, flow rate, and quality.

## System Operation

**The smart water fountain will operate as follows:**

1. The water flow sensor will measure the rate at which water flows through the fountain.
2. The water temperature sensor will measure the temperature of the water flowing through the fountain.
3. The water quality sensor will measure the quality of the water flowing through the fountain.
4. The microcontroller will use the data from the sensors to control the water valve and display.
5. If the water flow rate is too high or low, the microcontroller will adjust the water valve to compensate.
6. If the water temperature is too high or low, the microcontroller will display a warning message to the user.
7. If the water quality is poor, the microcontroller will display a warning message to the user and turn off the water supply.

**Project Timeline**

The following is a tentative project timeline:

* **Month 1:** Design the system and order the necessary components.
* **Month 2:** Assemble the system and test the individual components.
* **Month 3:** Integrate the parts and test the complete system.
* **Month 4:** Deploy the system in a real-world environment and collect data.
* **Month 5:** Analyze the data and make necessary improvements to the system.

**Budget**

The following is a tentative budget for the project:

* Microcontroller: $50
* Water flow sensor: $20
* Water temperature sensor: $10
* Water quality sensor: $30
* Water valve: $20
* Display: $20
* Miscellaneous: $100

Total: $250

**Submission Requirements**

The following are the requirements for the project submission:

* A detailed project report that describes the system architecture, operation, timeline, budget, and evaluation results.
* A working prototype of the smart water fountain.
* A presentation that summarizes the project and demonstrates the working prototype.

**Evaluation**

The project will be evaluated on the following criteria:

* Functionality: Does the system meet all of the requirements?
* Accuracy: Are the sensor readings accurate?
* Reliability: Does the system operate reliably in a real-world environment?
* Usability: Is the system easy to use and maintain?
* Cost-effectiveness: Is the system affordable to implement and operate?

**Conclusion**

The smart water fountain project is a challenging but rewarding project that has the potential to make a significant impact on public health. By providing a clean and safe source of drinking water, the smart water fountain can help to reduce the spread of waterborne diseases. Additionally, the system can help to conserve water by tracking usage and providing feedback to users.