# SMART WATER SYSTEM

Project definition and design thinking

# PROJECT OVERVIEW

Project title: Smart water system
Domain: Internet of things
Assignment: PROJECT SUBMISSION PHASE 1

## SUBMITTED BY

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# IMPLEMENTATION

1. Deploy the IoT sensors. The IoT sensors should be deployed at strategic locations in the public places where water consumption is to be monitored. The sensors should be installed in a way that they are protected from the environment and that they have a clear line of sight to the water source.

2. Connect the IoT sensors to the data sharing platform. The IoT sensors can be connected to the data sharing platform using a variety of methods, such as Wi-Fi, Ethernet, or cellular networks. The best connection method will depend on the specific location and environment of the IoT sensors.

3. Develop the real-time water consumption information platform. The real-time water consumption information platform can be developed using a variety of programming languages and technologies. Python is a good option for this project because it is a popular language for IoT development and it is easy to learn.

4. Integrate the IoT sensor system and the data sharing platform. The IoT sensor system and the data sharing platform can be integrated using a variety of methods. One common approach is to use a cloud-based IoT platform. Cloud-based IoT platforms provide a variety of features that make it easy to integrate and manage IoT devices, such as data storage and processing, device management, and security.

5. Test and deploy the system. Once the system is integrated, it should be thoroughly tested to ensure that it is working properly. Once the system is tested and validated, it can be deployed to production.

# SOLUTION TO THE PROBLEM:

- Water conservation. By providing real-time water consumption data to users, the system can help to raise awareness of water usage and encourage users to conserve water.
- Leak detection. The system can be used to detect leaks in water pipes and other water infrastructure. This can help to reduce water waste and save money.
- Sustainable resource management. The system can help to promote sustainable resource management by providing data on water consumption trends. This data can be used to develop policies and programs to reduce water consumption and protect water resources.

# ARCHITECTURE:

- The architecture consists of the following components:
- IoT sensors: The IoT sensors are used to collect water consumption data.
- IoT gateway: The IoT gateway is used to aggregate and transmit the water consumption data from the IoT sensors to the data sharing platform.
- Data sharing platform: The data sharing platform is used to store, process, and analyze the water consumption data. It also provides real-time water consumption data to users through a mobile app or web interface.

# DESIGN THINKING APPROACH

**1. Empathize:** Understand User Needs [Project Objectives]:

- Our project aims to create a Smart Water System that empowers the community to conserve water by providing real-time data on water consumption.

**2. Define:** Clearly Define the Problem [IoT Sensor Design]:

- We will design IoT sensors that are unobtrusive and easily deployable in public areas to monitor water consumption. These sensors will collect data discreetly without disrupting public .

**3. Ideate:** Brainstorm Creative Solutions [Real-Time Transit Information Platform]:

- To engage and inform the public effectively, we will create an intuitive mobile app interface. This platform will present real-time water consumption data in an engaging and user-friendly manner, fulfilling the need for accessible information.

**4. Prototype:** Create a Solution [Integration Approach]:

- We will establish a seamless data transfer process from IoT sensors to the data-sharing platform using efficient IoT communication protocols. This prototype ensures that the data is accessible to users as intended, fulfilling our design goals.

# TECH STACK

| Component | Technology |
| --- | --- |
| IoT sensors | Ultrasonic flow sensors, water pressure sensors |
| IoT gateway | Raspberry Pi, Arduino |
| Data sharing platform | Google Cloud Platform, AWS IoT Core, Azure IoT Hub |
| Mobile app | Flutter, React Native |
| Web interface | Django, Flask, Node.js |

These are the images of some sensors and boards that are used in our project:


Arduino board

Water flow sensor

Ultrasonic flow sensor

# CONCLUSION

- The IoT water consumption monitoring system for public places is a valuable tool for promoting water conservation and sustainable resource management. The system can be implemented using a variety of technologies, and there are a number of cloud-based IoT platforms that can make the implementation process easier.