Problem Definition:

A constant, high-quality, low-cost water supply. This study introduces a smart water management (IoT-SWM) system that may be used in structures that do not have access to a constant water supply but instead have water stored in enormous tanks underneath. The GSM module collects water use data from each home in a community and transmits it to the cloud, where it is analyzed . A smart water grid is a hybrid application that uses an inspection mode to identify leaks and measure the resulting height differences to keep track of the tank's water level. The system automatically deactivates the affected section after detecting any water shortage or malfunction in the system mechanism, such as broken valves, pumps, or pipes. It sends an emergency signal to building managers. It monitors essential water quality elements regularly, and if they fall below acceptable levels, it sends warning signals to the building management, who can take action. Over an extended period, the system monitored and recorded all water quality metrics. The system restarts when the water pump has been reconnected and sends an emergency alert. The main problem occur in public places where people consume more water.

Design Thinking:

Monitoring water consumption in real-time using MQTT communication and machine learning (Random Forest Regressor), off!ers several advantages:

1.Real-time Monitoring:

It Enables real-time monitoring of water consumption in public places.Helps in immediate response to abnormal usage patterns or leaks, leading to resource conservation and cost savings.

2. Data-Driven Insights:

Data driven insights utilizes machine learning to predict water consumption based on historical data.It provides valuable insights into usage trends, aiding in informed decision-making for resource allocation and conservation efforts.

3. Efficient Resource Management:

Provides accurate data on water usage patterns.Also facilitates optimized resource management, preventing wastage, and ensuring efficient use of water resources.

4. Cost Savings:

Helps in identifying and rectifying leakages promptly.It is used to prevents water loss, leading to reduced water bills and significant cost savings for public facilities.

5. Predictive Maintenance:

Predicts water consumption based on machine learning models.Allows for predictive maintenance, reducing downtime and ensuring the system operates efficiently.

6. Environmental Conservation:

It encourages responsible water usage.Also supports environmental conservation efforts by reducing unnecessary water consumption, thus preserving natural resources.

7. User Awareness:

It provides insights to raise public awareness about water conservation.

It helps to educates the public, encouraging them to use water responsibly, thus contributing to a sustainable environment.

8. Scalability:

The project can be scaled to monitor water consumption in various public places.It Provides flexibility to implement the solution in different locations, ensuring efficient water management across a city or region.

9. Adaptability:

Can be adapted for different types of facilities and water-related applications.It offers a versatile solution applicable to diverse public places, such as parks, stadiums, schools, and commercial complexes.

In summary, the project's advantages lie in its ability to provide real-time insights, promote efficient resource usage, reduce costs, contribute to environmental conservation, raise public awareness, and offer scalability and adaptability for widespread implementation.

Monitoring the water consumption of people in public places using machine learning and implementing it in real time helps in water management.