**Phase 2 project**

**Project Title : SMART WATER MANAGEMENT**

**Project ID :** proj\_223734\_Team\_8

**College :** Gnanamani College of Technology

**College cod e :** 6208

**Branch :** B.Tech/Information Technology

**Year :** IIIrd year

**Team Members:**

Sivadharshini P (620821205051)

Sivagami K (620821205052)

Mangaikarasai R(620821205032)

Jayabarathi L (620821205021)

Kiruthiga R(620821205030)

**SMART WATER MANAGEMENT**

**Additional implemention:**

An IoT Smart water management system is using by Solar-Powered Sensors,Water Quality Sensors Automated Billing.Consider using solar-powered sensors to reduce the need for battery replacements and ensure continuous data collection.If you have a water recycling component, use additional water quality sensors to monitor the treated water's quality before reuse.Implement an automated billing system that calculates water usage and sends bills to consumers electronically, reducing paperwork and improving accuracy. This comprehensive sensor network can significantly improve the efficiency, sustainability, and reliability of your IoT-based smart water management system.

**Components Needed:**

Water sensors (e.g., flow sensors, moisture sensors)

IoT hardware (e.g., Raspberry Pi, Arduino)

Internet connectivity (Wi-Fi or cellular)

Cloud platform (e.g., AWS, Azure)

Mobile app or web interface

**MODULES:**

**Sensor Data Collection:**

Install water sensors at key points in the water system (e.g., pipes, soil).

Set up the IoT hardware to read data from these sensors regularly.

**Data Storage and Processing:**

Store the incoming data securely in the cloud.

Implement algorithms for data analysis, such as leak detection, consumption patterns, and soil moisture levels.

**User Interface:**

Develop a mobile app or web interface for users to monitor and control their water usage.

Provide real-time information on water consumption, leaks, and soil moisture levels.

**Alerts and Notifications:**

Set up alert mechanisms in the system.

Send alerts to users when leaks or abnormal water usage is detected.

**Data Visualization:**

Create graphs and charts to help users visualize their water usage over time.

**Maintenance and Updates:**

Regularly maintain the hardware and software to ensure the system's reliability.

Update the system to incorporate new features and improve efficiency.

**Security:**

Ensure robust security measures to protect user data and prevent unauthorized access

**ALGORITHM:**

1. **Machine Learning Algorithms:**
   * Anomaly Detection: Machine learning models can detect anomalies in water flow data, such as leaks or unusual usage patterns, by training on historical data.
   * Predictive Maintenance: Algorithms can predict when equipment, such as pumps or valves, will require maintenance based on usage patterns and sensor data.
2. **Data Analytics Algorithms:**
   * Data Mining: Algorithms can be used to extract valuable insights from historical water data, helping water utilities make informed decisions.
   * Time Series Analysis: Analyzing time-series data can reveal patterns and trends in water consumption, which is valuable for forecasting and resource planning.
3. **Remote Sensing Algorithms:**
   * Satellite and Aerial Imagery Analysis: Remote sensing algorithms can be used to monitor water resources, including reservoir levels and land cover changes.
4. **Control Algorithms:**
   * SCADA (Supervisory Control and Data Acquisition) Systems: Control algorithms are used to manage water treatment processes and distribution systems, allowing for real-time control and adjustments.