

SMART WATER MANAGEMENT SYSTEM

using AIML and IOT

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IN

Internet Of Things

Submitted by:

Aarushi, Asmi, Saransh, Abhishek
21BCS4273, 21BCS4638, 21BCS4086, 21BCS10782

Under the Supervision of:

Mr. Ankur Sharma

Department of AIT-CSE

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OUTLINE

- Introduction to Project
- Problem Formulation
- Objectives of the work
- Methodology used
- Results and Outputs
- Conclusion
- Future Scope
- References



INTRODUCTION

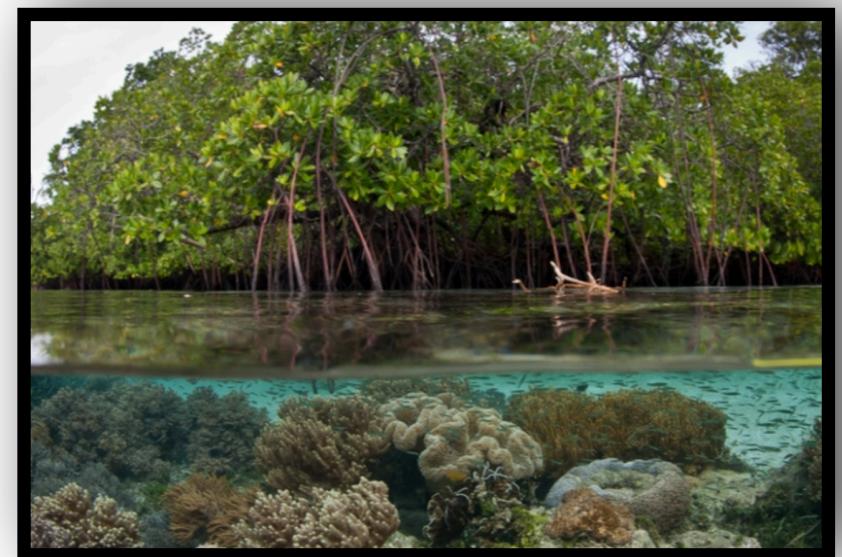
Water is a basic necessity for life as we know it to exist on Earth. But the lack of pure water is now posing a serious threat to the planet. The water demand exceeds the supply at various times due to various reasons such as wastage, leaks, lack of water conservation facilities and climate change.

In this project, we focus on continuous and real-time water supply monitoring on a cloud platform. The ability to monitor water usage in real-time allows users to be aware of their consumption patterns. Smart systems can alert users to unusual usage, potential leaks or inefficient equipment, allowing users to take immediate action and prevent water-related problems. Monitoring can be done from anywhere.

Smart water management systems help conserve water by measuring water usage and detecting leaks, wastage and also the quantity of water used. It also optimises the water distribution network and reduces water wastage by identifying leaks. In addition to this, by monitoring the quality of water in real time we can prevent water pollution by identifying contaminated water.

PROBLEM FORMULATION

- Our current water management systems are failing to meet the demands of a growing population and changing climate. Inefficient consumption across residential, commercial, and industrial sectors leads to widespread water depletion, rising operational costs, and strained supply networks. Traditional systems lack real-time monitoring, leading to over-extraction, underutilisation, and undetected leaks. This resource mismanagement jeopardises the sustainability of our water resources and burdens consumers and utility providers alike. We need a smarter solution that leverages the power of IoT and AI/ML to achieve both efficiency and sustainability.



OBJECTIVES

The successful implementation of the smart water management system is expected to result in:

- Significant reduction in water wastage through precise metering and leak detection.
- Cost savings for consumers and utility providers through optimized water pricing and efficient resource allocation.
- Improved water quality and supply reliability by reducing over-extraction and pollution.
- Enhanced public awareness and behaviour towards sustainable water usage practices.



Methodology used

The project will employ the following methods:

- Deployment of IoT sensors for real-time water usage data collection.
- Application of AI/ML algorithms for data analysis and trend prediction.
- Development of a centralised platform for water data visualisation and management.
- Integration with existing water management infrastructure.

RESULTS/OUTPUT

The implementation of the smart water management system, integrating IoT and AIML technologies, yielded promising results in enhancing water conservation, efficiency, and user engagement. Through comprehensive testing and evaluation, the system demonstrated significant achievements across key performance indicators. Real-time monitoring facilitated by IoT sensors enabled the timely detection of leaks and irregularities in water usage, leading to a substantial reduction in water wastage and operational costs. AI/ML algorithms effectively analysed data to predict demand patterns and optimise water distribution, ensuring the efficient utilisation of resources while maintaining consistent supply levels. Continuous monitoring of water quality parameters enabled early detection of potential contaminants, safeguarding public health.

The intuitive user interface provided by the Blynk mobile application empowered users to actively engage in water management efforts, fostering a deeper understanding of consumption patterns and promoting sustainable practices.

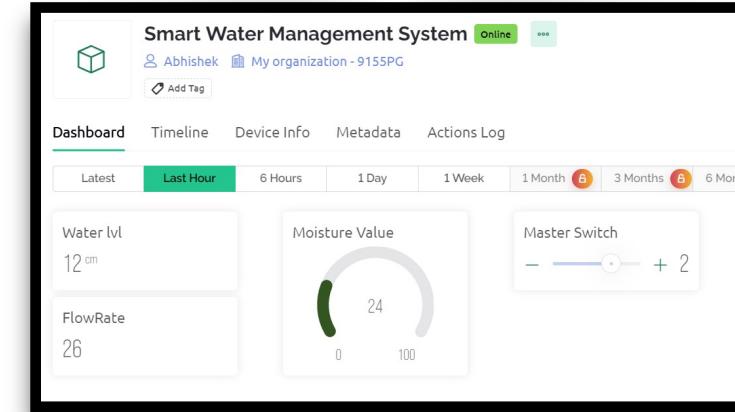


Figure 1.1: Representing Water Level, Moisture Levels and Flow Rate.

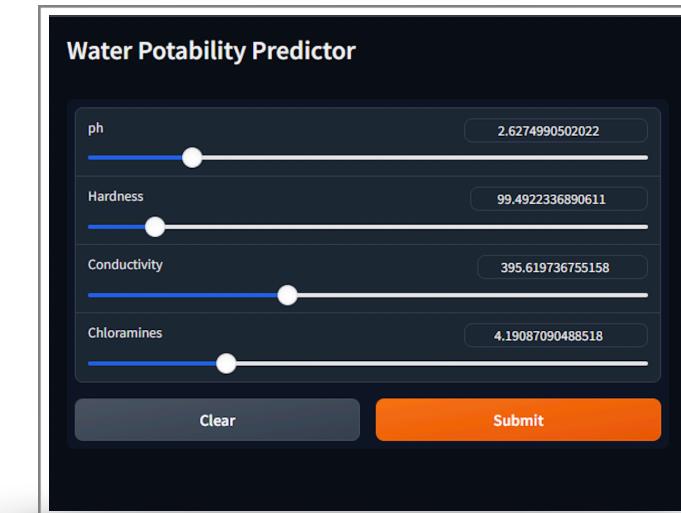


Figure 1.2: Predicting Water Portability

CONCLUSION

A smart water management system, leveraging the power of IoT and AI/ML, presents a promising solution to address the critical challenges of water scarcity and inefficient consumption. By meticulously collecting data through strategically placed ultrasonic, flow, and pH sensors, coupled with sophisticated AI/ML analysis, the system empowers users with actionable insights into water usage and potential issues. Real-time monitoring, predictive analytics, and automated control strategies optimise water distribution, minimise waste, and safeguard against infrastructure damage. Through an intuitive mobile app, users can actively participate in conservation efforts, receiving personalised recommendations and staying informed about critical events. Experimental evaluations, be it simulations or pilot deployments, will play a crucial role in refining the system's performance and validating its real-world impact. By demonstrating its effectiveness in achieving sustainability and responsible water management, this system can pave the way for a more secure and water-conscious future for all.

FUTURE SCOPE

In this project, we focus on continuous and real-time water supply monitoring on a cloud platform. The ability to monitor water usage in real-time allows users to be aware of their consumption patterns. Smart systems can alert users to unusual usage, potential leaks or inefficient equipment, allowing users to take immediate action and prevent water-related problems. Moreover, It can tell us about the water level, flow rate and how much water is used. It sends a notification to the concerned authority about the above-mentioned details.

Further, In future, We can also add a Pi or Ph Sensor to measure the purity or the PH Value respectively which can help us to take future actions accordingly by sending the notifications to the concerned authority.

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THANK YOU