Wastewater Management and Monitoring System in Special Economic Zone using Internet of Things and Smart System Approaches

Khamla NonAlinsavath

Vimontha Kheiovongphachanh

Sanouphab Phomkeona

Computer Engineering and Information Technology Department
Faculty of Engineering
National University of Laos

Background :

- All over the world that engages in industrial activities may experience similar problems for wastewater, but they are particularly common in ASEAN nations including Laos, which have an abundance of economic development zone as well as industries placement.

- Propose a system for monitoring and management of the wastewater to improve water quality at the special economic zone.

- The importance of the system is in understanding, managing, and reducing the impact of human activities on the environment

- A numerous of wastewater has been increased from industrial activities, therefore, it is needed to apply a mechanism in terms of technology to enhance efficiency and monitoring the water quality

Targets:

- To develop a smart system to handle an issue of wastewater at the special economic zone to manage and monitor water quality

- To provide accurate and real-time data on wastewater impact, reduce negative effects for social-environment

- Assist organization practice water quality responsibility and contribute to the broader sustainable development goals

Proposed Method

Hardware

excellent sensors, prototype platform and smart devices

Software

Self-application that developed by the team and experts

Platform for Data Analytics

A cloud-based system that interprets and evaluates the sensor data
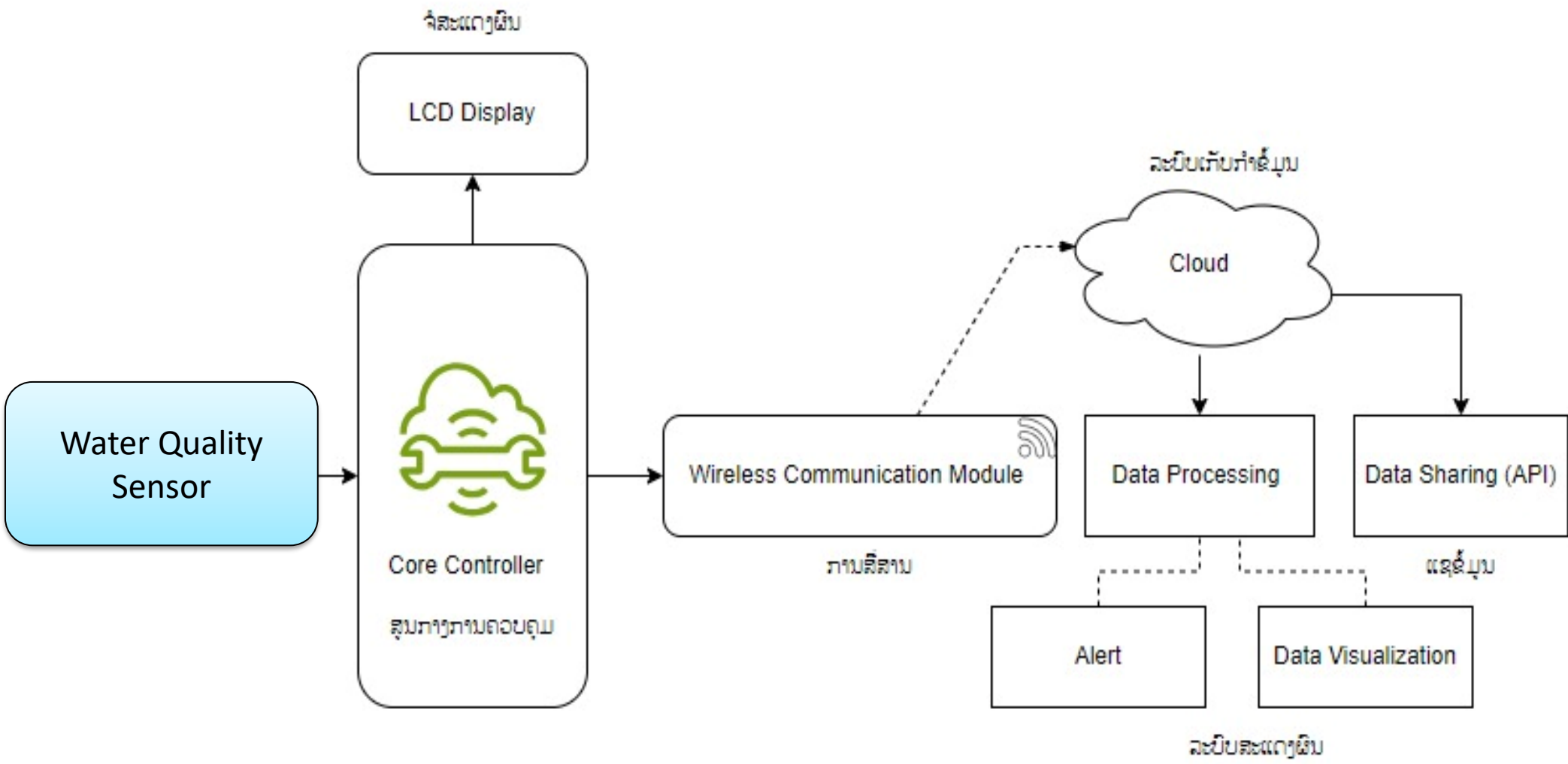
System Integration

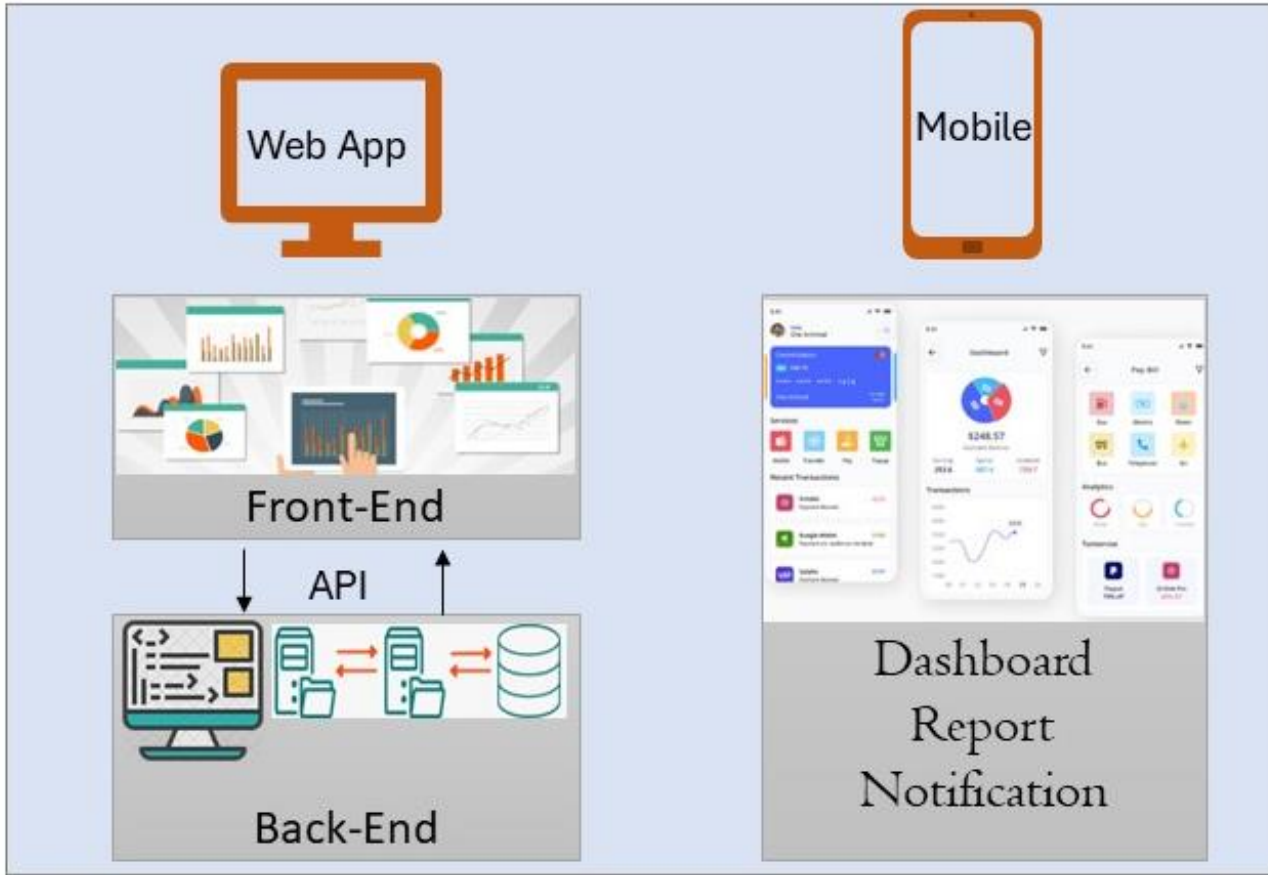Skilled sensor installation and smooth system integration with current infrastructure.

Support and Maintenance

guarantee the system's optimum performance and dependability, regular maintenance, upgrades, and technical support

Proposed Method

Proposed Method

Impact

- Development projects are carried out in a manner that promotes sustainability for business operators who need to pay attention on wastewater and environment issues.

- The system is important for promoting sustainable development, protecting biodiversity, managing resources responsibly, coping with climate change especially soil and water quality, complying with regulations, community participation, protecting human health, considering economic impacts, and realizing the value of ecosystem services.

- A systems can identify and notify authorities of possible environmental hazards or calamities, including ecological imbalances, water quality and pollution occurrences.

- Early warnings facilitate prompt action and intervention, reducing the amount of damage and enhancing efforts to control disasters.

Output/Outcome

- Real-time monitoring system to track the status and treatment process by providing virtualization and dashboard to monitor

- To be able provide customized reports such as daily, weekly, monthly, yearly

- Early warnings facilitate prompt action and intervention, reducing the amount of damage and enhancing efforts to control disasters

- To provide a new technology for companies at the special economic zone in terms of environment monitoring and management

- Proposed system stands out for its all-encompassing strategy, experienced analytics, and intuitive user interface

- well-known wastewater treatment monitoring firms with conventional solutions and up-and-coming startups

Conclusion:

- The management of wastewater derived from industrial activities is increasingly recognized as an urgent challenge for sustainable urban development because it is a source of physical, chemical, and biological environmental contamination.

- The integration of IoT technologies into wastewater management systems in Special Economic Zones not only improves operational efficiency but also supports sustainable practices by assuring compliance with environmental requirements.

- These technologies will be essential in resolving the problems related to wastewater treatment in metropolitan areas as they develop further.

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