PRESIDENCY UNIVERSITY

Itgalpura, Rajanukunte, Bengaluru - 560064

School of Engineering

A Project Report on

"Waste water management system in village"

Submitted in partial fulfillment of the requirement for the course

Innovative Project - Arduino using embedded C (**CSE 1002**)

Submitted by

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Abstract

This report presents a study on wastewater management utilizing Arduino, an open-source microcontroller platform. The aim of the study is to develop a cost-effective and efficient system for monitoring and controlling wastewater management process. The report outlines the hardware, software, and tools employed in the Arduino-based wastewater management system.

A detailed block diagram and description illustrate the different components and their functionalities within the system. Results obtained from the implemented model are presented, showcasing the capabilities of the Arduino platform in wastewater management.

The report also discusses the challenges faced during the development and implementation of the system, such as sensor calibration, data accuracy, and scalability.

In conclusion, the Arduino-based wastewater management system demonstrates great potential for real-time monitoring and control, offering a promising solution for enhancing the efficiency and effectiveness of wastewater management process.

Hardware, Software, and Tools Used:

Hardware:

1. .Microcontroller (Arduino Uno)

2. PH Sensor

3. Turbidity Sensor

4. Temperature Sensor

5. Water Level Sensor

6. Nodemcu ESP8266

Software and Tools:

1. Arduino IDE for programming the Arduino microcontroller.

2. Sensor libraries for interfacing with and calibrating the sensors.

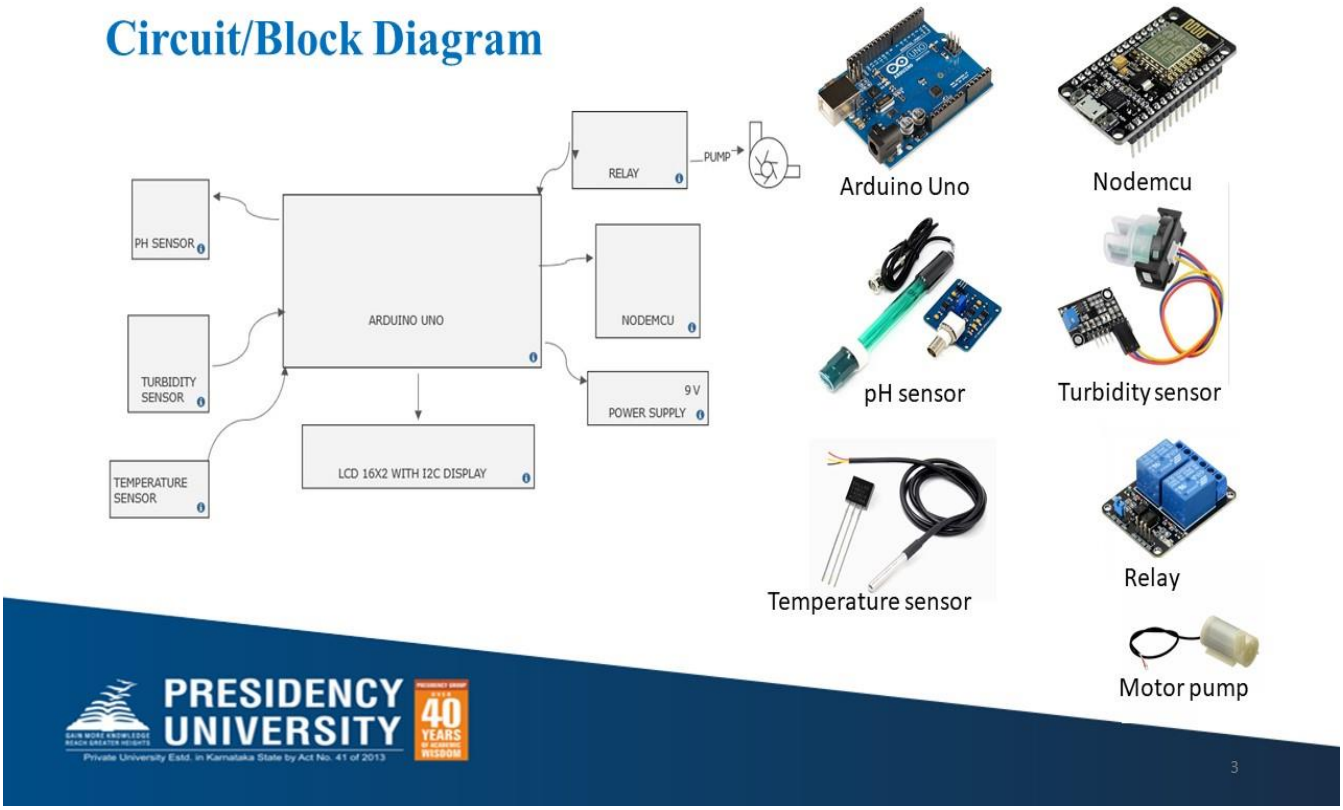
3. Data visualization software for real-time visualization and analysis of collected data.

4. Cloud platforms for storing and accessing data remotely.

5. An algorithm to process the sensors data efficiently.

Block Diagram and Description:

The Arduino-based wastewater management system comprises several components and processes, as shown in the block diagram:



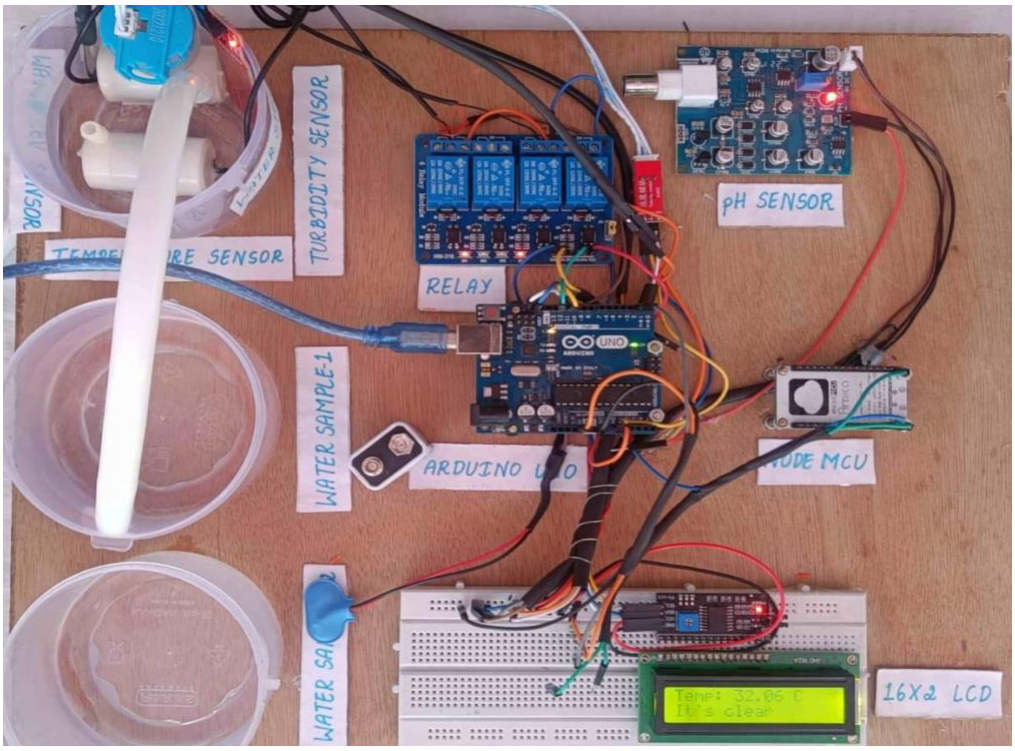
The block diagram of the waste water management system consists of four main components: pH sensor, water level sensor, turbidity sensor, and temperature sensor. These sensors are connected to the Arduino Uno, which acts as the main controller. The sensors provide data to the Arduino Uno, which processes the data and controls the discharge of the wastewater into the environment. The system also includes a display unit that shows the readings from each sensor.

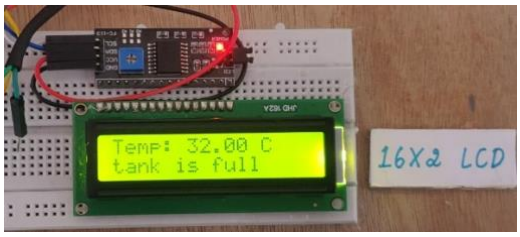
In this system a 24*7 monitoring system is designed for monitoring abd management of waste water according to its quality . Here a smart and organized system is designed for selective water segregation and supply.

In this model we can find out the quality of the water by using PH Sensor,Turbidity Sensor,Temperature Sensor and Water Level Sensor .Then segregate the water sample in two divisions which is water sample 1 and water sample 2 . If the water sample is waste water then the sample will be detected using sensors and will be passed to the one storage , and it will be sent to treatment process to reuse the water and if it is potable water then it is transferred to another storage and it can be used for domestic and agriculture supply according to needs . By using nodemcu the data of the water samples will be collected and stored in the cloud and if the water is non potable an alert message will be sent to the corresponding authority.

Results:

The successful implementation of this Arduino project has showcased its potential as a cost-effective and scalable solution for waste water management in villages, highlighting the importance of technological interventions in addressing pressing environmental challenges .By employing Arduino microcontrollers, sensors, and actuators, the system effectively monitored and controlled various aspects of waste water management, including collection, treatment, and reuse.





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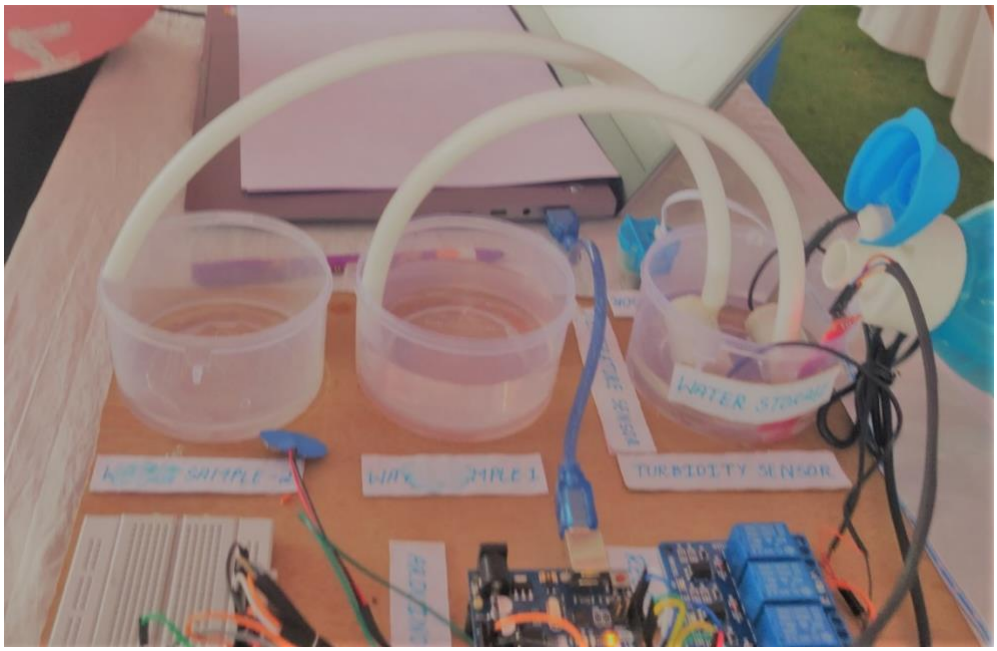

The waste water management was tested and validated to ensure its effiency.The system was able to monitor the quality of the waste water accurately and control its discharge into the environment.The display unit showed the real time readings from each sensor.The system was also cost-effective and efficient compared to the traditional waste water management methods.

Challenges faced:

- During the development and implementation of the Arduino-based wastewater management system, several challenges were encountered.
- One of the most significant challenges was caliberating the sensors to ensure accurate readings.sensor calibration , ensuring data accuracy and reliability, scalability of the system, and integration with existing infrastructure.
- The arduino circuit pins and wiring connections was a completely new and unfamiliar concept to us.
- Due to classes our team had minimal time to arrange offline meeting.
- Writing the program code according to the respective connections made on the arduino board with other components, which is different from normally followed coding procedure(or style).
- Ensuring data accuracy and reliability, scalability of the system, and integration with existing infrastructure was also a tough part.
- Another challenge was designing a compact and efficient circuit layout
- The circuit design required carefull planning and consideration of the space available to ensure that all components fit within the available space.

Conclusion:

The Arduino-based wastewater management system demonstrates the potential for cost-effective and efficient monitoring and control of wastewater treatment processes. The system's utilization of Arduino microcontrollers, sensors, and actuators enables real-time data acquisition and automation, contributing to enhanced operational efficiency and resource optimization. Despite the challenges faced, the system shows promise in improving wastewater treatment processes, ensuring better water quality and environmental sustainability. Further research and development are needed to address the challenges and refine the system for broader implementation.

Future work can focus on adding more sensors to the system to monitor other parameters of waste water and improving the accuracy of the readings obtained from each sensor . Overall , this project is an excellent example of how technology can be used to solve environmental problems and improve our quality of life.