

MAINTAINING AND MONITORING WATER LEVEL & QUALITY IN AN OVERHEAD WATER STORAGE TANK

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Water Scarcity

- **Four billion people — almost two thirds of the world's population — experience severe water scarcity for at least one month each year.**
- **Over two billion people live in countries where water supply is inadequate.**
- **Half of the world's population could be living in areas facing water scarcity by as early as 2025.**
- **Some 700 million people could be displaced by intense water scarcity by 2030.**
- **By 2040, roughly 1 in 4 children worldwide will be living in areas of extremely high water stress.**



Background

Green Building

Trending Technologies

Intelligent Systems



Design an IoT-based Building Management Cloud Platform for IEST Shibpur



Applying machine learning to accurate estimation of heating and cooling load for an HVAC system



Development of a low-cost IoT Based Water Management System for a residential building at IEST Shibpur

- To construct an integrated sensor platform that can enable continuous monitoring of an overhead water tank to the user.
- To provide real-time data regarding the water level, pH, temperature and turbidity of the water stored in the tank.
- To enables automated control over the water level in the tank, enabled by the ability to turn on the water pump when the water level in the tank reaches a predefined lower limit and then turning it off when the water level in the tank reaches another predefined upper limit.
- Develop a PoC for the proposed system.

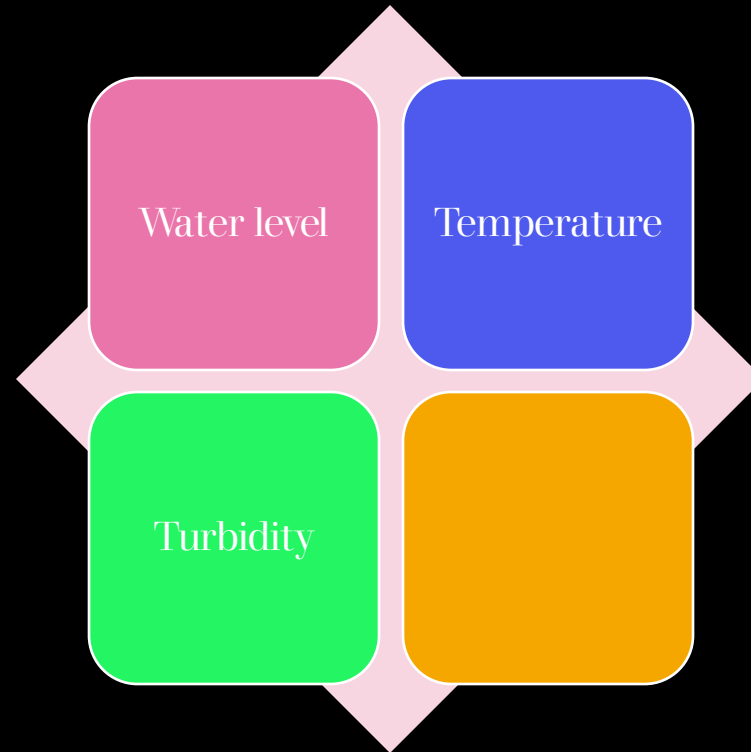
Objective

IoT

The Internet of Things (IoT) describes the network of physical objects—“things”—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet.

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Parameters Considered



Sensors



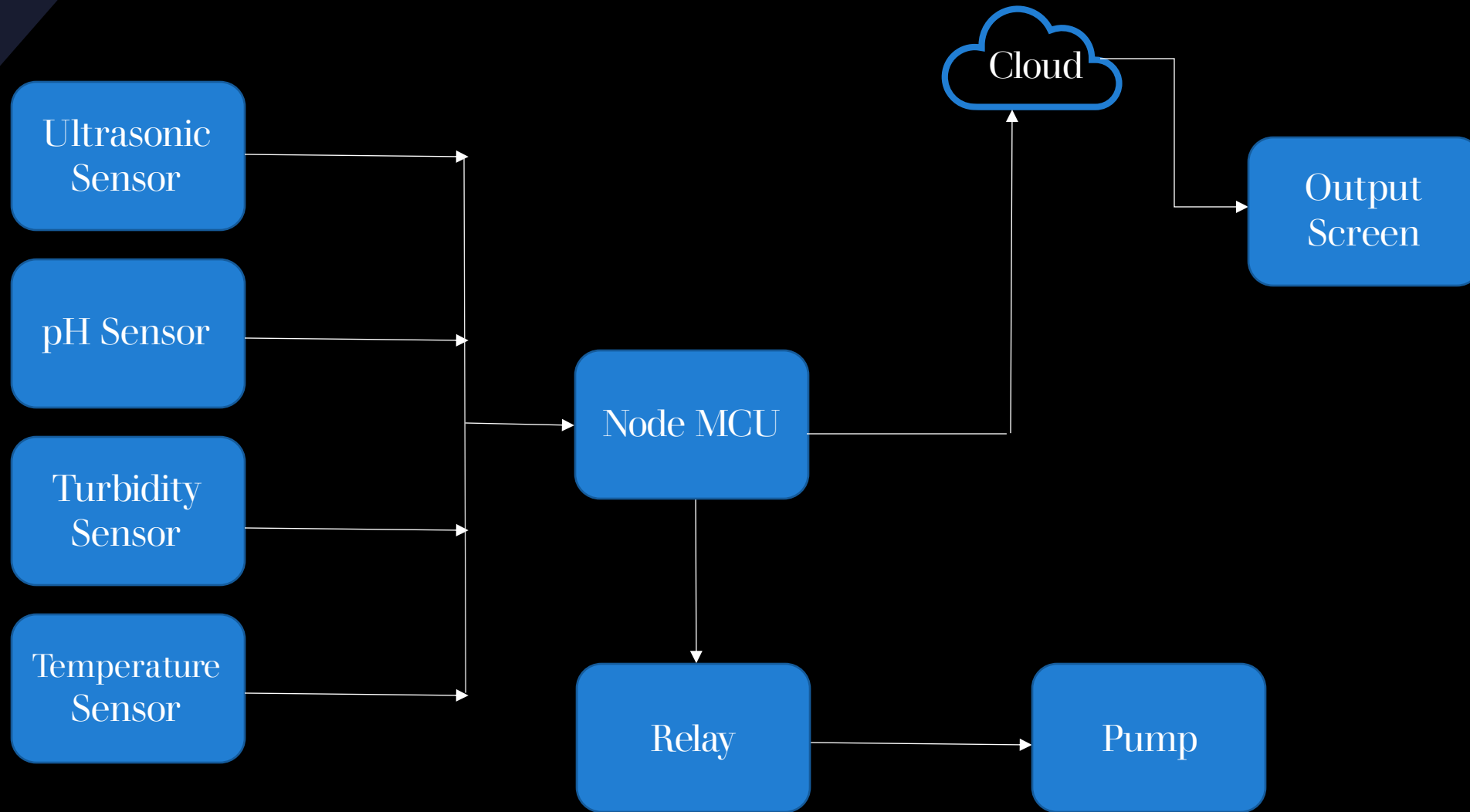
Ultrasonic
Sensor

pH Sensor

Turbidity
Sensor

Temperature
Sensor

Block Diagram of Proposed System



Other Important Components

NodeMCU

Arduino

IC 7432

Water
Pump

BlynkIoT

Hardware Setup

Software Setup

System Cost

Results

Water level	
pH	
Turbidity	
Temperature	

Sample 1

Water level	
pH	
Turbidity	
Temperature	

Sample 2

Water level	
pH	
Turbidity	
Temperature	

Sample 3

Advantages

Cost-effective.

Automatically controls the water level saving time.

Real-time monitoring.

Saves energy.

Easy to install.

Modular system.

Open-source code.

Limitations



Requirement of internet connection.



Dependency on 3rd party server.



Requirement of timely calibrations for pH and turbidity sensors.

- The Blynk IoT app shows the data related to water level, pH, turbidity and temperature in real-time (can be accessed using the QR code available).
- The OLED screen shows the temperature data in real-time.
- The system is transportable in nature and can be implemented on existing overhead water tanks.
- The developed PoC works in accordance with the project objective.
- As a future directive, the suggestion is to use latest sensors for detecting various other parameters of quality, use wireless communication standards for better communication and IoT to make a better system for water quality monitoring and the water resources can be made safe by immediate response.

Conclusion



Future Scope

Monitoring other water quality parameters.

Development of a notification system.

Adding UI for better understanding of the user.

Informing about the amount of water used to the user on daily basis.

Shifting the system to a paid server.

THANK YOU!