

IOT Based Smart Water Tank Monitoring System

Shweta A. Jadhav¹, Sudnya S. Patil², Divyani S. Pujari³, Prerana U. Walvekar⁴, P.K Karve⁵

Guide⁵, Students^{1,2,3,4}

Department of Computer Engineering

Sharad Institute of Technology Polytechnic (Yadav-Ichalkaranji)

Corresponding Authors' Email id: *Shwetajadhav1021@gmail.com¹, sudnya1008@gmail.com²,
divyanidsp@gmail.com³, prernawalvekar1@gmail.com⁴*

Abstract

Water is a basic human need in all economic operations. Farmland, renewable energy, the industrial industry, and mining are all critical economic areas. With the population increase, the requirement for water from competing economic sectors is increased. So, there is not enough water left to meet human needs and maintain environmental flows that maintain the integrity of our eco systems. Underground water is becoming depleted in many sectors, making now and future generations near the point of being deprived of protection from the increasing climate variability. Therefore, the critical role that information technology methods and internet communication technologies (ICT) play in water resources managing to limit the excessive waste of fresh water. In this paper, we have to review research that uses the Internet of Things (IoT) as a communication technology that controls the preservation of the available amount of water and not waste it by homeowners and farmers. In contrast, they use water, and we have also reviewed some researches that preserve water.

Keywords: *- Internet of Things (IoT), Smart Water Tank, Monitoring System, Communication Technologies*

INTRODUCTION

There are so many problems related to water which affects the overall percentage of water present. Among all problems

overflow of over head tanks is most observed problem. So, there is need for continuous monitoring, water supply scheduling, and proper distribution.

Currently drinking water is very prized for all the humans. In recent times water levels are very low and water in the lakes is going down. So it's too important to find the solution for water monitoring and control system. There is a need for continuous real time remote monitoring of water.

The IoT based Smart Water Tank Monitoring project that you are going to learn today is the smartest water level monitoring system because you get the actual distance in mm "millimeters" and the water level inside the tank in percentage. Moreover, when the water tank is empty you will get the notification on your mobile phone.

The system is focusing on one of the problems that is overflow of a water tank where a lot of water gets wasted and fulfils the need of low- cost system for real-time monitoring of water using the Internet of Things (IoT) platform for minimizing the overflow of tanks IoT is a solution.

In recent days, development in computing and electronics technologies has triggered Internet of things technology. Internet of things can be described as the network of electronics devices communicating among them by the help of a controller. The IoT is

a collection of devices that work together in order to serve human tasks in an efficient manner.

The water tank empty notification part is really important, it has to be in a smart way, you don't want to send too many notifications to annoy the user. We used a timer to control the notification messages.

The time in minutes can be adjustable as per the user ease. For the demonstration purpose, we started with two minutes. So, when the water tank is empty the ESP8266 will send the notification after every two minutes.

Another feature that makes this water level sensor the smartest IoT water level sensor is that you get notification even when the water monitoring App is not active that is "Running in the background".

This report presents a low cost water monitoring system, which is a solution for the water wastage. Microcontroller and different sensors are used for the system. Ultrasonic sensor is used to measuring water level.

COMPONENTS

- Node MCU ESP8266
- Ultrasonic sensor

- PCB
- LED
- Switch
- 5v power supply

Node MCU ESP8266:

Node MCU stands for Node Micro Controller Unit. The Node MCU ESP8266 wi-fi module is capable of either hosting an application or offloading all wi-fi networking functions from another application processor. Wi-Fi significantly expand on the geographic range of your mobile phone and will be able to have in controlling the Arduino.

Ultrasonic sensor:

In this project we are using Ultrasonic Sensor HC-SSR04. HC-SR04 ultrasonic module has four pins Ground, VCC, Trig, and Echo. The distance calculated from the ultrasonic sensor will be in meters (m), that can be modulated to any form units.

PCB:

The PCB stands for Printed Circuit Board. We are using PCB to electrically connect electronic components using the conductive pathway.

Switch:

We are using the switch in this

Project to start and stop the system work. If the switch is off, the circuit breaks and the power flow is interrupted. And if the switch is on, the power flow within circuit continues.

MODELING AND ANALYSIS

Circuit Explanation

The circuit diagram of this project is very simple and easily worked. To power up the Node MCU ESP8266, we will need a power supply. J1 is the DC female power jack and this is where we connect our 9V to 25V power supply. The LM7805 voltage regulator step-down this voltage and outputs regulated 5Volts. To filter out the noise and voltage spikes two 470uF electrolyte decoupling capacitors are connected at the input and output sides of the regulator.

An LED is also connected to the output of the regulator, which is used as an indicator. The output of the regulator is also connected with the pin of the Node MCU and don't forget to connect the ground of the Node MCUESP8266 with the Ground of the regulator.

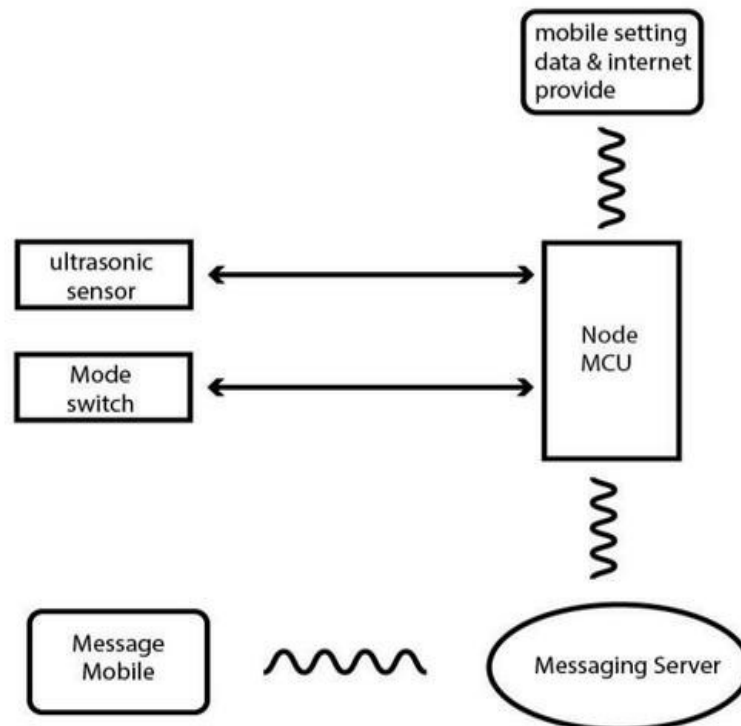


Figure 1

What our Arduino code needs to do is, first of all, connect to the network whose SSID and passwords are mentioned in the code. After successfully getting, it needs to spit out the local IP Address to the serial monitor, so that we may access the webpage created by it. After doing so, it should start dealing with the ultrasonic sensor and after calculating the distance, it must be send the data to the webpage that we have created. Let's us understand it part by part, so first of all, we are including the necessary libraries and the global variables that will be used further in the code. Along with that, we are also providing the SSID and password of the

wi-fi router and initiating the web server at port 80.

CONCLUSION

This system is designed and implemented using Node MCU and Ultrasonic sensor. Various testes are performed to verify if the ultrasonic sensor can identify current water level of water tank and according to the water level tests are conducted of water tank. Meanwhile ultrasonic sensor detects water level. Proposed system is more suitable to monitor the water level in the tank in real time. This system will be low cost, faster, more efficient and user friendly.

APPLICATIONS

This system can be used in:

- Homes
- Commercial complexes
- Hotels
- Factories
- Farms etc.

level detection technique.
International Journal of Advanced
Research in Computer and
Communication Engineering,
4(12). ISSN 22781021.

Future Scope

Our system will control the overflow of the water tanks where a lots of water gets wasted. You can implement this system on the farm ponds or farm wells to detect who is trying to commit suicide.

REFERENCES

1. Patil, Y., and Singh, R. (2014, June). Smart water tank management system for residential colonies. International Journal of Scientific and Engineering Research, 5(6).ISSN 2229-5518.
2. Kwon, D., Tak, H., and Cho, H.G.(2013,february). Water tank monitoring and visualization system using smart phones. International Journal of Machine Learning and Computing, 3(1).
3. Paul, S., Das, M., Sau, A., & Patra, S.(2015). Android based smart water pump controller with water