Smart Water Tank Level Detection

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Abstract: *As the world around, us transforms and becomes more linked and digitalized, public water management is expected to provide in way. How far are we from achieving a true Smart Water Tank Level Detection, from cutting-edge technology to comfort, safety, reliability, and maintain. We notice that cleanliness of the surrounding area in Water Tank is also important because many people using by water stoaring tank, so how much west water is collected in the any other tank. As a result, we are implementing this approach and developing a green and complete water management city. Because of the day by day by many variant viruses in water and clean water is minimum available of sources, the smart water tank finder is primarily focused on human health, The human body will be affected, and the human life span will be reduced. So, by employing this system, the amount of human power necessary will be minimized, and you will be notified automatically on your mobile screen when a water tank needs to be disconnected supply or when an order is detected. Another sensor, ultrasonic sensor.*

Keywords: Ultrasonic Sensor, Oder sensor; Node MCU, Web Application

I. INTRODUCTION

Water is a universal solvent which plays an important role in Everyday life. The total amount of water available on earth has Been estimated at 1.4 billion cubic kilometres, enough to cover the planet with a layer of about 3km. About 95% of the Earth's Water is unfit for human consumption. About 4% is locked in the polar ice caps, and the rest 1% constitutes all fresh water Found in rivers, streams and lakes which is suitable for our Consumption. A study estimated that a person in India Consumes an average of 135 litters per day. This consumption Would rise by 40% by the year 2025. This signifies the need to Preserve our fresh water resources. Many houses make use of Supplementary water tank to store water that is collected from Rain water or water pumped from well or underground. At Present, water meters are used to calculate the amount of water Used at homes. This doesn't provide an efficient method of Monitoring the water usage. The water is wasted at each and Every outlet knowingly or unknowingly which adds up to huge Amount in the end. Efficient management of the water used at Homes is very much necessary as, about 50% of water supplied to the cities gets wasted through its improper usage. Water Management is only possible, if the user is aware of the Quantity of water he uses and the quantity available to him. Hence there is a need for modifying the traditional water Meters for the users to continuously monitor their water usage Which is always not possible.

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II. LITERATURE SURVEY

In [1], the paper emphasizes about the essentiality of water for human beings, plants and animals. The key aim of the paper is to reduce human intervention to reduce percentage water wastage in agricultural farms using a water level controller with wireless technology. The paper has said about the development of 4 stages of water pumping system. The paper has also compared between the wired and wireless Bluetooth based water level controller. They have used an Ultrasonic sensor, Arduino uno microcontroller, pump, relay and Bluetooth module HC-12. The controller decides unique code for water level based on 4 stages of water pumping. Distance is calculated using formula $d=S*(T/2)=0.03435*(T/2)$, where S is speed of sound, T is duration of transmission and reception of sound wave from an ultrasonic sensor. $S=0.003435$ cm/microsecond. The paper also displays drawbacks of wired controller, which includes limited wire length, which paved way for introducing wireless automatic water level controller.

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In [2], the paper says about the issue due to excessive water usage in the domestic or commercial purposes, which in turn may lead to further problems like problem with weather patterns. The paper has said about the development of a system comprising of a water level sensor, digital logic processing unit or integrated circuit (IC), for input signal processing, 7 segment display, JK flip flop sequential circuit, motor driver controlled by relay. The data from the water level sensor is encoded using a digital encoding circuit, where water level is encoded to decimal, indicating the water level from 0 to 9. The decimal is then decoded from BCD to 7 segment using BCD to 7 segment decoders (IC7447). Digital logic controller, responsible for the turning on or off of the pump, turns the pump whenever the water level reaches ONE, and turns off when it reaches level NINE. A JK flip flop is used as a driver circuit to turn on or off the motor. Relay is used as a switch, which turns on the

In [3], the paper explains the importance of internet for communication, and also objects communicating with each other, otherwise called Internet of Things (IoT). The paper also says that a process of water filling, causes overflowing and wastes water. The paper says about development of Blynk IoT and PHP web-based programming to provide water level sensing. They have also said that system has an error of 2cm controlling the water level. They have used an ESP8266 as a microcontroller, which has capability of connecting to the internet. They use an ultrasonic sensor for water level sensing. The Blynk app is used to provide connectivity both to the ESP8266 and also smartphone or any smart device. The microcontroller communicates with the PHP web-based water container monitoring information system via Blynk Server. The pump can be controlled automatically and also semi automatically. They have given the result that the pump runs at a range between 15 to 35 cm of water level in the container or tank.

In [4], the paper explains about the application of IoT in Any Control- which is a home appliance controlling and monitoring system. The paper also says about the enhancement of old appliances and also controlling experience through IoT. The paper also says about the existing systems which are sensor based, self-learning based, universal controller applications. The paper has an objective to enhance old appliances by using add on modules and sensors to the existing appliances, also providing them network connection. The paper also aims for task based and sensor triggered automation, where process is organized based on the tasks, which also supports self-learning and prediction service. The paper says that they have developed a universal controller, on Raspberry Pi which is a Linux based single board computer having serial communication, internet connectivity, infrared module capability. They also use an environment sensor which senses Radiation Temperature, Illuminance, Flow Velocity, Humidity, Air Pressure. The operation performed is Monitoring, Controlling, Trigger Tasks through an Android Application. But the drawback is that using an IR based module, we cannot know whether the operation is done correctly or not, however is detected using the environment sensor. The paper also says that they are trying to implement in a bigger scale like whole building or bigger rooms.

In [5], The paper has described about the controlling and monitoring of home appliances, using an android application using internet, thus controlling the device both in home and remotely, making it easier for physically challenged people, this particular paper uses Wi-Fi (Wireless Fidelity) as connectivity protocol. The paper also describes about usage of Arduino Mega Microcontroller, WIFI module for communicating with the phone, which acts as a bridge between the Smartphone and Arduino Mega. They use an Android SDK based application. The sensors used here are Temperature Sensor, Light Dependent Resistor (LDR) and also includes other components like Servo Motor, Relays, IC MAX232, LCD display and finally a bulb. The Wi-Fi module use here is HLK-RM04. The paper also describes the working of the system developed, in which Arduino is interfaced with temperature sensor, rain sensor to control the fan speed, and also status of the fan and lighting equipment is monitored using Android app and also displayed on the LCD display. The android app allows to send the light intensity and fan speed change commands. The paper also aims in providing security to the application using password, username and also aims for using it for large number of devices like Television, Refrigerator

III. PROBLEM STATEMENT

Water tank management, like humans, are the front lines of fight against water storage in tank detect. They are regularly in contact with diseased people and also with health in the surrounding water tank level management. Need of this project is to avoid wastage of water. Because sometimes people forget to off the motor when tank is full, because of

that water get wasted. To avoid this problem this project came into picture. By using this water level indicator system, we can monitor water level and consumption of water.
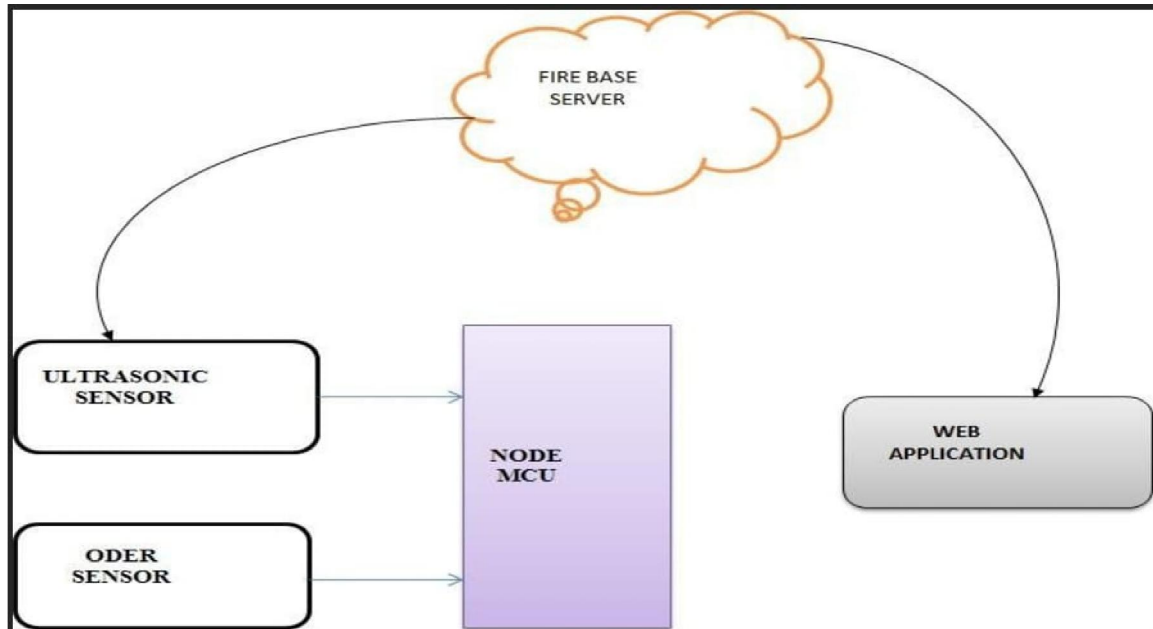
IV. PROPOSED SYSTEM

Fig. 4.1: Proposed system architecture

4.1 Working of Proposed System

A. Ultrasonic sensor

Ultrasonic sensors work by sending out a sound wave at a frequency above the range of human hearing. The transducer of the sensor acts as a microphone to receive and send the ultrasonic sound. Our ultrasonic sensors, like many others, use a single transducer to send a pulse and to receive the echo. The sensor determines the distance to a target by measuring time lapses between the sending and receiving of the ultrasonic pulse

Fig. 4.2: Ultrasonic sensors

1. Ultrasonic sensors transmit sound waves toward a target and will determine its distance by measuring the time it took for the reflected waves to return to the receiver.

2. This sensor is an electronic device that will measure the distance of a target by transmitting ultrasonic sound waves, and then will convert the reflected sound into an electrical signal.

B. NODE MCU

The Node MCU ESP8266 development board comes with the ESP-12E module containing the ESP8266 chip having Ten silica Extensa 32-bit LX106 RISC microprocessor. This microprocessor supports RTOS and operates at 80MHz to 160 MHz adjustable clock frequency. Node MCU has 128 KB RAM and 4MB of Flash memory to store data and programs. Its high processing power with in-built Wi-Fi / Bluetooth and Deep Sleep Operating features make it ideal for IoT projects. Node MCU can be powered using a Micro USB jack and VIN pin (External Supply Pin). It supports UART, SPI, and I2C interface. In our system design NODE MCU is the heart of system. Which is control the all the operation with connecting two sensor one Ultrasonic sensor, and Oder sensor.
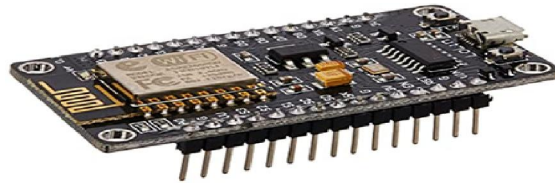
Fig. 4.3: Node MCU

C. Oder sensor:

Fig 4.4: Oder Sensor

When molecules of any chemical element are placed on the surface of a sensor, the e-nose operates. When a sensor is exposed to scents, the change in resistance is detected. The outcome is a pattern that is unique to that element. Our technology is built around an Oder sensor that detects where Oder is present in the trash can. To keep the railway bogie's environment clean. Aside from that, there is a stench there, and there isn't a lot of scrap. As a result, we'll need another sensor to detect Oder.

D. Server / web application:

In this system what are data can be predict by ultrasonic sensor and order sensor which is nothing but ultrasonic sensor is detect what is level of scrap in dustbin and where smell s present or not this data is send to server and where on web application we register/ login with login id and Password and there will be open is one sheet there is content present ID, level, Oder, and comment is nothing but dustbin is required need to replace or where smell is present. And above system is given prefect information about dustbin level and human manpower will be reduced and other infection will be infected to human being largely reduced.

V. RESULT AND DISCUSSION

The below result page shows the construction of a login and registration page, which has we give a signup and login page with a username and password to present the real-time database of design project results.

Result page 1. Login and Registration
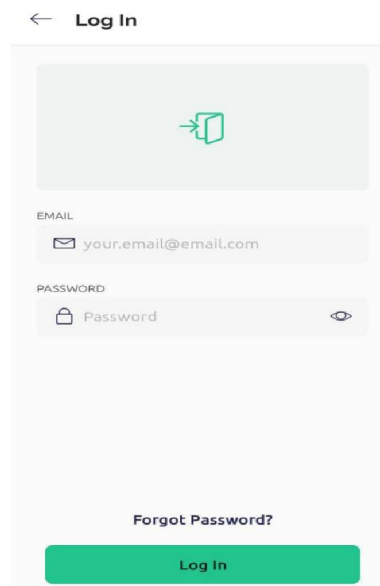
Result Page 2. Fetching Hardware components to take real time database.

Above result page which will show Real time database from server to this page project is designed based on hardware module which is mechanically connected with water tank and Node MCU ESP8266 is Wi-Fi compatible is heart of system which takes real time analog value to send server and design and developed web application to show all the notifications of the water tank related where is level, Oder is ON or OFF, and what will be action to take.
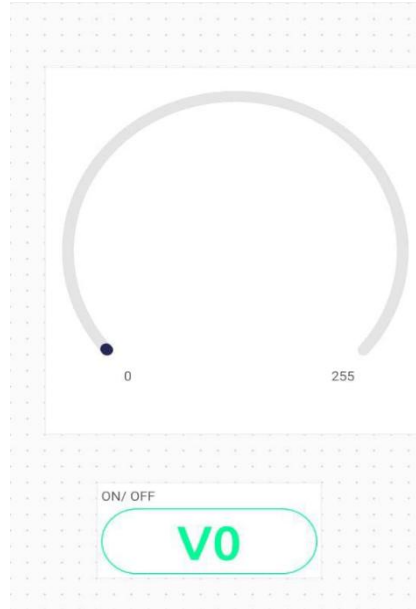
VI. CONCLUSION AND FUTURE WORK

Smart water tank contributes to a cleaner, save water, and more sanitary environment, as well as improved operating efficiency, while lowering management costs, resources, and unuse area side emissions. The Smart water tank is suitable for high- level areas. The smart water tank transmits information about fill levels and guarantees that the tank is only collected water when it is completely full. As a result, the streets will be water saver and time saver. Because of the pattern of the presence of keen innovation, the advancement of clever frameworks, notably in the improvement of clever water tank, would in general increase. The experimental results show that the smaller-than-normal and super-brilliant water tank level framework works and performs as expected. Nowadays water is being waste and, in many ways, and wastage due to overflowing of tanks is a major contributor for this. Thus, Water Tank Monitoring System helps to reduce the wastage of water due to overflowing by automatically turning off the pump when the water level in the tank reaches threshold limit. Proposed system can also be enhanced by monitoring the entire activity through an app. An application is developed to help the users turn on the pump through the app and off the pump automatically.

VII. FUTURE WORK

Using photoelectric, water cleaner liquid and detect the photo capturing through in under tank situation clean or not and smell sensor. Best working on situation is a project save the water and save time The Automatic water level controller ensures no overflows or dry running of pump there by saves electricity and water. Avoid seepage of roofs and walls due to overflowing tanks. Fully automatic, saves man power.

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