e-ISSN:2582-7219

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 5, Issue 5, May 2022

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.54

International Journal Of Multidisciplinary Research In Science, Engineering and Technology (IJMRSET)

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.54|

| Volume 5, Issue 5, May 2022 |

| DOI:10.15680/IJMRSET.2022.0505040 |

Automatic Water Level Detection and Alerting System Using IOT

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ABSTRACT: Due to an abundance of water, most people in residential areas face the problem of running out of water and overflowing water tanks. It becomes difficult for users to judge the level of water in water tanks, causing users to run out of water in times of need. Even when the pump is turned on, users may not notice when the water tank is full, resulting in an overflow. A water tank monitoring system is used to troubleshoot water tank issues.
It is also possible to check the water level using a sensor, so that whenever the water level falls below a certain threshold limit, a notification is sent to the user via the Android application, and the user must turn on the pump. Also, when there is an overflow of water in the water tank, a sensor detects the water level, and if the water level exceeds a certain limit, the motor is automatically turned off. Another feature that this paper improves is that if any objects are detected in the tank, the IR sensor detects them and sends an alert notification to the user. The paper describes an automatic water level controller with notification system. The programme was written in the Arduino programming environment and then uploaded to the microcontroller. The system's water level is automatically controlled. The controller is powered by a battery. The user is notified whenever the system encounters an empty level and the status of load shedding.

KEYWORDS: Water tank, sensors, android application, automatic.

I. INTRODUCTION

As the world population has grown, so has the demand for fresh water, causing serious problems in the field of water supply. As a result, water management is now a major concern. Scientists, technicians, politicians, and many other people on the planet are becoming more educated on the subject. Pollution looms large and threatens water supplies. The scarcity of this vital liquid necessitates immediate action. The proportion of fresh water found in rivers, lakes, and underground sources accounts for only 3% of total water on the planet. Furthermore, the water discovered requires treatment for human consumption in order to remove particles and organisms that are harmful to health, and it must eventually be distributed through pipes to ensure the safety of homes. This work focuses on the distribution problem, specifically "water leaks" in residential areas.

II. LITERATURE REVIEW

KonstantinosLoizou and EftichiosKourtroulis [1] proposed a sensor made of multilayer tubes. Manufacturing and associated electronic circuits used for data collection were inexpensive. Polyethylene pipes, which are commonly used in the construction of water distribution systems in buildings and industries, were used to create the proposed sensor. This sensor's performance was tested in a 4 metre water storage tank. The experiment's results demonstrated the sensor's accuracy. However, when used for an extended period of time, the sensor revealed some limitations.
A system to monitor water tanks was implemented by L.A. Gama-Moreno, A.Corralejo, and A.Ramirez-Molina [2]. The system that was implemented included an instrumentation system, an application for managing water levels, and a mobile user interface. Interface Monitoring Water Tanks was the name given to the system (IRMA). The ultrasonic sensor was used in conjunction with the Arduino Microcontroller Board, which is linked to the application service. When the water

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level falls below the minimum threshold, notifications are sent. This system's main feature was the ability to control and monitor the watering functions online.

BezaNegashGetu and HussainA.Attia [3] have created a system that uses a level detector to first test the availability of water in the tank and then adjusts the state of the water pump based on the data collected by the level detector. This design incorporates a seven-segment display and a motor pump. A water level sensor and a digital logic processor circuit are included in the proposed system. The proposed system eliminates the need for manual control of water requirements at home and in agricultural fields.

Shrenika R M and SwathiSChikmath [4] used LabVIEW and Arduino to create a noncontact water level monitoring system. The depth of the water in the tank is measured by an ultrasonic sensor. The written programme will receive data from the sensor and supply it to Arduino, which will then switch the pump ON or OFF based on the data received. This design overcomes the disadvantages of most proposed systems, which use SS sensors, which corrode when exposed to chemicals in water.

PriyenP.Shah and Anjali A.Patil [5] presented a project that uses an Android application and IoT to monitor water in tanks. The ESP 8266 is used as the microcontroller in this project. Maximum and minimum water levels are obtained from the Firebase cloud via ESP. When the water level is between maximum and minimum, the user can control it. This project addresses the shortcomings of conventional tanks, which cannot monitor or control the level of water in the tank.

MadhurimaSantra and SanjoyBiswas [6] developed a system that uses ultrasonic sensors to measure water level. Water level indicator, water level sensor, water pump controlling system, and microcontroller are all used in the system. The Arduino Uno R3 at the heart of this system is powered by a DC SMPS. The system initially receives power from the SMPS. When the ultrasonic sensor detects a change in the water level, it sends a signal to the microcontroller and begins to echo the pulses. One of the project's drawbacks is the high cost of the devices used.

AjinkyaKaner and MilindRane [7] proposed an Automatic Water Level Indicator and Controller circuit-based project. IN4007 diodes and Light Emitting Diodes are used in this system (LED). This project's results show three LEDs indicating different levels of water in the tank. The main benefit of this project is that it is very simple in design and can be used to find various liquids and oil levels in industries and chemical labs as well. Some changes to the project will result in a well-designed and efficient system.

Amrit Kumar Panigrahi and Chandan Kumar Singh [8] created a system that displays information about the tank's water level and also controls a pump motor. This system employs a priority encoder, which communicates with the decoder and displays water level information on a 7-segment display. BCD-to-7-segment decoder is employed. The main advantage of this project is that it reduces water waste by turning off the pump automatically when the tank overflows.

Anyasi [9], EruaJ.Band, created an Automatic Water Level Controller. A Float Switch was used in this design to detect the level of liquid within a tank. This switch is suitable for use in a pump, an indicator, an alarm, or other devices. The benefits of this system include its low cost, durability, and efficiency, as well as its ease of operation and high level of reliability. It is also effective in reducing stress associated with manual power water pump controller.

Asaad Ahmed Mohammed Ahmed Eltaieb and Zhang JianMin[10] implemented an automatic water level control system based on an Arduino to automate the process of water pumping in a tank and has the ability to detect the level of water in a tank, turn on or off the pump accordingly, and display the status on an LCD screen. The system also monitors the water level in the sump tank (source tank). If the level in the sump tank is low, the pump will not turn on, protecting the motor from dry running. When the level in the sump tank is low or there is a sensor fault, a beep sound is generated.

Aanchal M. Pande [11] proposed a Water quality Monitoring system for housing society water tanks. A water tank monitoring system based on IOT (Internet of Things) has been proposed, including tank water level sensing monitoring and water pollution monitoring. The system monitors physical and chemical water quality parameters such as pH, level, turbidity, temperature, and humidity. This parameter detects contaminants in water. The measured values from the sensors are processed by the ESP8266 Wemos d1 mini, and these processed values are remotely transmitted to the raspberry pi via Wi-Fi, causing the raspberry Pi to display the data on a simple graphical interface over various time periods.

SanamPudasaini, AnujPathak, SukirtiDhakal, and Milan Paudel [12] proposed an automatic water level controller with SMS notification. SMS Notification was added to the automatic controller system, allowing the user to manage water during load shedding. The automatic level controller system and the SMS system work in tandem. The programme was written in the Arduino programming environment and then uploaded to the microcontroller. The system's water level is automatically controlled. The controller is powered by a battery. When the system encounters an empty level and the load shedding status, an SMS notification is sent to the user.

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III. METHODOLOGY

The purpose of this paper is to design a system that monitors the level of water and alerts the user if it becomes too low. The ultrasonic sensor measures the distance between the tank's top and the water in order to alert the user when the water level falls below a certain threshold. The project begins with the assembly of components. That is the ultrasonic sensor in conjunction with the NODE MCU. Following the connection, the components are linked to the software. The next requirement in the software is for the specified board. The code can only be executed and uploaded if the comport and board are properly configured.

To notify the user, the arduino software simply combines the components with the code and the android application, which is a mobile-based application. The software's code also requires Android OS to connect. The most important requirement is an ultrasonic sensor that detects the level of water (in distance) from the top of the tank to the bottom of the tank. The sensor is linked to the system via the NODE MCU's WiFi (ESP8266). The application has been installed and is linked to the Arduino.

The application is used to receive values and notifications on the user's mobile device. The user can be notified when the tank is empty and proceed to fill the tank with water. When the application receives the sensor values, it will notify the user to take the next steps.

When the water level in the tank reaches the lower level sensor (empty tank condition), a notification is sent to the user's Android application.

1. After receiving the notification, the user will activate the motor via the app. (Manual).
2. When the water level in the tank reaches the higher level sensor, the motor turns off automatically.
3. The main feature added here is an IR sensor, which is also used to receive notifications about objects detected in the tank.

IV. CONCLUSION

Nowadays, water is wasted in a variety of ways, with tank overflow being a major contributor. Thus, the Water Tank Monitoring System reduces water waste due to overflowing by automatically turning off the pump when the water level in the tank reaches a preset limit. The proposed system can also be improved by monitoring all activity via an app. An app is created to assist users in turning on and off the pump via the app.

The automatic water level controller system is suitable for use in the home, office, swimming pool, and even industrial settings. As previously stated, there is no connection between the reservoir tank and the tank of interest; communication between the two can now take placethis project to the next level Furthermore, extra caution is required.Water is used as a conducting medium. Moreover, GSM.The module can be used in place of a cell phone. The system can also betransformed into a two-tank system with wireless communicationbetween the interest tank and the reservoir tank Despite the fact that .As a smart system, there are numerous opportunities for improvement, which, when taken into account, can make this system smarterUltimately, the user becomes smarter.

REFERENCES

[1] KonstantinosLoizou, EftichiosKoutroulis, DimitriosZalikas and GeorgiosLiontas, ”A Low-cost Capacitive Sensor for Water Level Monitoring in Large-Scale Storage Tanks”, ©2015 IEEE.

[2] L.A. Gama-Moreno, A. Corralejo, A. Ramirez-Molina, J. A. TorresRangel, C. Martinez-Hernandez and M.A. Juarez, “A Design of a Water Tanks Monitoring System Based on Mobile Devices”, 2016 International Conference on Mechatronics, Electronics and Automotive Engineering, Proc. of IEEE,© 2016 IEEE.

[3] BezaNegashGetu and Hussain A. Attia,”Automatic Water Level Sensor and Controller System”, ©2016 IEEE.

[4] Shrenika R M , Swati S Chikmath , Dr. Ravi Kumar A V , Mrs. Divyashree Y V and Mrs. Roopa K Swamy, ”Non-Contact Water Level Monitoring System Implemented using LabVIEW and Arduino”, 2017 International Conference on Recent Advances in Electronics and Communication Technology, © 2017 IEEE.

[5] Priyen P. Shah, Anjali A. Patil and Subodh S. Ingleshwar, “IoT based Smart Water Tank with Android application”, International conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC 2017), ©2017 IEEE.

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| DOI:10.15680/IJMRSET.2022.0505040 |

[6] MadhurimaSantra, SanjoyBiswas, SibasisBandhapadhyay and KaushikPalit, “Smart Wireless water level Monitoring & Pump controlling System”, International Journal of Advances in Scientific Research and Engineering (ijasre), Vol. 03, Issue 4, May -2017.
[7] AjinkyaKaner and MilindRane,”Automatic Water Level Indicator & Controller (To control water level of overhead tank)”, International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE), Volume6,Issue 11,November2017.
[8] Amrit Kumar Panigrahi, Chandan Kumar Singh, Diwesh Kumar and NemishaHota, “Tank Water Level Indicator & Controller Using Arduino”, Vol. 6, Issue 3, March 2017.
[9] Erua J. Band, Anyasi and F. I., “Design of an Automatic Water Level Controller Using Mercury Float Switch”, IOSR Journal of Electronics and Communication Engineering (IOSR-JECE), .Volume 9, Issue 2, Ver. II (Mar - Apr. 2014), PP 16-21.
[10] Asaad Ahmed Mohammed ahmedEltaieb and Zhang Jian Min, “Automatic Water Level Control System”, International Journal of Science and Research (IJSR), Volume 4 Issue 12, December 2015.
[11] AanchalM.Pande, Krishna K. Warhade and Rajkumar D. Komati, “Water Quality Monitoring System for Water Tanks of Housing Society”, International Journal of Electronics Engineering Research.ISSN 0975-6450 Volume 9, Number 7 (2017) pp. 1071-1078.
[12] SanamPudasaini, AnujPathak, SukirtiDhakal and Milan Paudel,” Automatic Water Level Controller with Short Messaging Service (SMS) Notification”, International Journal of Scientific and Research Publications, Volume 4, Issue 9, September 2014.

Impact Factor
7.54

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