



AUTOMATED FLUID SENSING AND CONTROLLING SYSTEM

Dr. D. Thamaraiselvi ¹, R.Harsha Vardhan ², S. Munigokulsai ³

¹ Assistant Professor, Department of CSE, SCSVMV University
Kanchipuram, Tamil Nadu, India

^{2, 3} UG Student, Department of CSE, SCSVMV University
Kanchipuram, Tamil Nadu, India

I. Literature Survey

Abstract- Long ago, human-based flood control resistance systems posed a wide range of issues, including dynamic responses to earlier warnings about unsafe conditions and the stage of the present water level. The development of the Internet of Things (IOT) has attracted substantial attention across many industries. The project's goal is to develop an application system that integrates the Internet of Things to protect public safety by forewarning them in advance if floods are expected as a result of rising water levels in dams and reservoirs. To accomplish the goal, a cloud database method is used, including information about the area and data from periodic water level monitoring. The cloud database, where the automatic comparative analytics about the rise in water level is documented, receives the sensor data regularly after which it uploads the data to the cloud. As a result, the public is immediately made aware of the earlier phases of the water level rise. Eventually, it was found that, in contrast to the conventional approach of monitoring and alerting system, this strategy increases the degree of accuracy.

KEY WORDS :- Node MCU ,Internet of Things , Arduino board, LED

INTRODUCTION

To prevent problems, a dam's water level needs to be efficiently managed. Typically, this is done manually, which calls for a large number of operators to be fully supervised at all times. Moreover, the amount of water released is rarely accurate, resulting in water loss, and a man is unable to properly regulate the gates without knowledge of the precise water level and input rate. A level sensor coupled to Arduino makes up this system. These sensors will be used to evaluate the water level, and an IOT module attached to the Node MCU will update the web server with the results. Officials may access this information online from any location and decide whether to regulate the dam gate to prevent more issues. Human-based resistance to flood management raises a number of issues, such as dynamic responses to earlier warnings of unsafe circumstances and the stage of the present water level.

Iot Based Water Supply Monitoring And Controlling System, The International Conference On Information Technology And Digital Applications, May 2018

Every human being has a basic need for water. Everyone must protect the water. Overflow of the water occurs frequently due to a lack of monitoring. Due to this significant water waste, tanks may overflow. Moreover, there is a chance of pipeline damage due to pipeline overflow at higher pressure. A further issue is the identification of leaks. Lack of supervision, manual labour, and a shortage of manpower are the causes of all these issues. With the purpose of understanding water supply distribution and associated systemic issues, a survey of the city of Aurangabad and a field investigation have been conducted for this article. After doing a study, they discovered that all of the labour is manual and that improved technology is required to distribute things properly.

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Automatic Gate Control And Water Level Reservoir Using GSM Technology, International Journal Of Scientific & Engineering Research, April-2016

A dam is an obstruction that stops water flow. Dams are used to store water, whilst floodgates are used to stop water from flowing into particular geographical areas. As the dam's water level rises over a specific point, the dam gate collapses. Dam level must be regularly monitored to prevent this. Due to its scarcity, water must be preserved and kept in good condition. The parameters that relate to water should be continuously monitored and assessed. The primary indicators of water contamination, such as temperature and pH, must be tracked. The pic16f877a micro controller, which aids in continually monitoring the water level in dams and aids in warning about floods, has been employed in this study.

III Existing System

An LCD-displayed liquid level indicator is used to show if the liquid level in the tank is rising or declining. The only way to communicate the water level in the current system is through several message types.

Drawbacks of Existing System: -

- ❖ Manual operations.
- ❖ We need a pc to monitor the water level
- ❖ High cost
- ❖ Low efficiency
- ❖ . Complex installations

II. Proposed System

To determine the water level in the tanks, we will utilise a water level sensor in the suggested method. Depending on the liquid level at the time the tank is filled. It will notify by SMS and other means. Here, we use both the automated controlling and the IOT concepts. Because it is heavily utilised to determine how much water is consumed every month, when the liquid level is low, it immediately sends the information to your mobile device and saves the data in the cloud. When the liquid level rises, the NodeMCU in this system is used to operate the DC motor.

Advantages:

- Reliable
- Smart

III. Methodology

- An ultrasonic sensor detects the liquid in the fluid tanks.
- The liquid fills the ultrasonic sensor.
- It sends a message to any mobile number entered in the GSM Module and emits an alarm beep sound.
- With the help of the controller, the owner can turn off the motor after receiving a notification

.Architecture: -

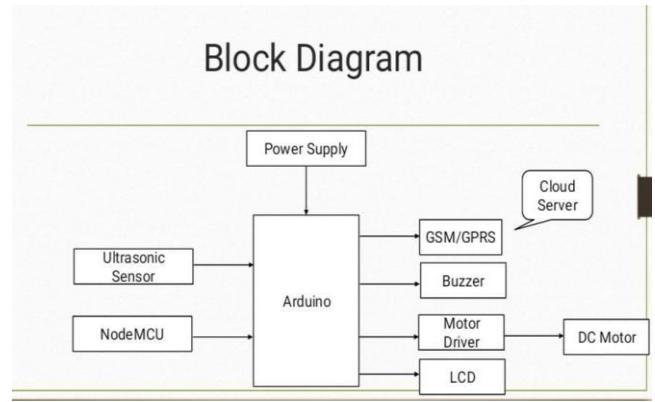


Fig 1. Hardware block diagram

B. Hardware Description

Arduino - Arduino is an open-source electrical platform that is simple to use and put into practice. It is based on how hardware and software interact. They are designed to be able to detect when the water reaches a certain threshold and, when it does, turn that information into an alert.



Fig 2. Arduino board

Ultra sonic sensors-Depending on their transmitting field, sensors come in many different varieties. To gather and detect the information, they are found at certain locations. Three different types of sensors are used in this range. They are replicable.

Ultrasonic Sensor: We have used ultrasonic sensors to detect water levels. This sensor will function on sound extending and routes. Short and high frequency waves will be transmitted, and when the echo is received back, the level will be determined by these. Calculations for the distance between the sensor and the water level include –

$$\text{Distance } L = \frac{1}{2} \times T \times C$$

Where L=Distance

C=Sonic speed

T=Time between transmission and reception



Fig 3. Ultrasonic Sensor

The Node MCU open-source firmware and development kit is essential for creating your own Internet of Things (IoT) device with a few lines of Lua code. The board has a number of GPIO pins that may be used to generate PWM,

I2C, SPI, and UART serial communications when connected to additional peripherals.

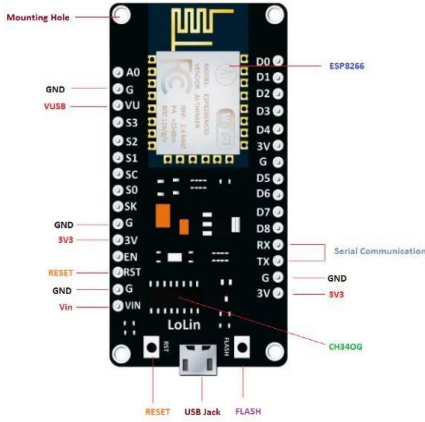


Fig 4. Node Mcu

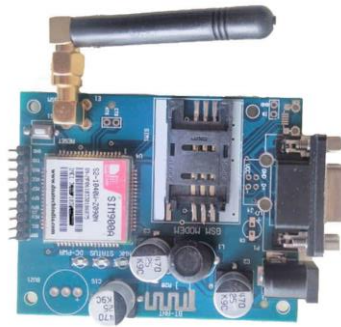


Fig 6. GSM- Module

IV. Motor Driver

A typical motor driver or motor driver integrated circuit (IC), the L293D enables DC motors to drive in either direction. A



16x2 I2C LCD Display- It can show 16x2 characters on 2 lines with a blue backdrop and white text. In most cases, especially with Arduino Uno, projects involving LCD displays on Arduino will quickly run out of pin resources. The soldering and connecting of the wires add to the complexity.

Fig 7. 16x2 I2C LCD Display

Buzzer- A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric.



Fig 8. Buzzer

pair of two DC motors may be controlled concurrently in either direction using the 16-pin IC L293D. That means that a single L293D IC may operate two DC motors. Incorporated Dual H-bridge Motor Driver (IC).

Light Emitting Diodes (LEDs)- The Light emitting diode is a two-lead semiconductor light source.



Fig 9. LED

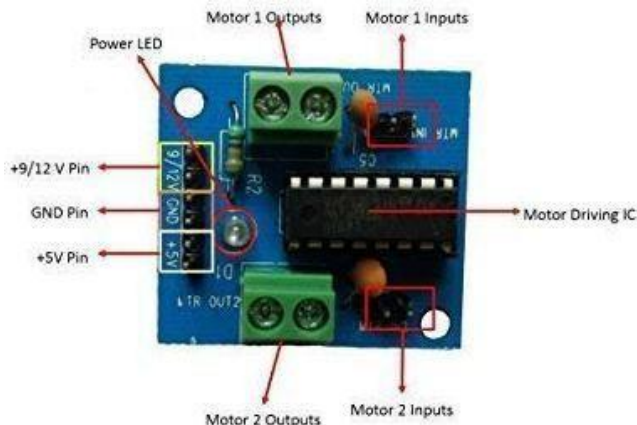


Fig -5 Motor Driver

DC Motor

A machine that converts D.C power into mechanical power is known as a d.c. motor. Its operation is based on the principle that when a current carrying conductor is placed in a magnetic field, the conductor experiences a mechanical force. The direction of this force is given by Fleming's left hand rule and magnitude is given by;

$$F = BIl \text{ newton's}$$

Basically, there is no constructional difference between a D.C. motor and a D.C. generator. The same D.C. machine can be run as a generator or motor.

GSM -Module It utilises the wireless network. A sim card is required for communication, and this modem functions similarly to a dialup modem. Dial-up modem delivers and receives data using a fixed telephone line, in contrast to GSM modem, which employs radio waves for data transmission and reception.

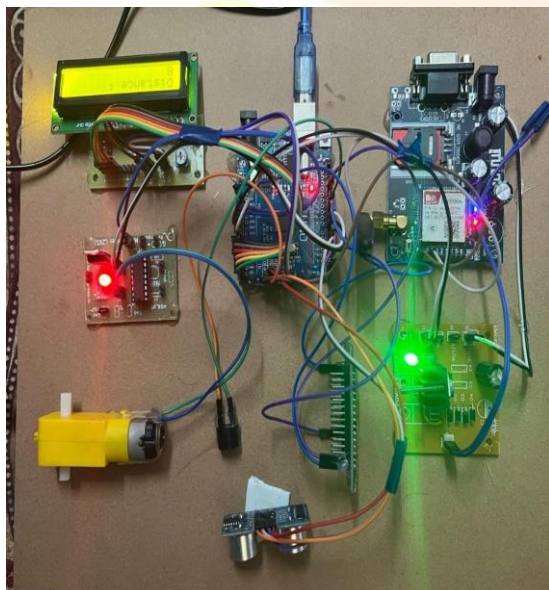
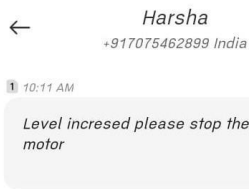


Fig 10 :-DC Motor

C. Software requirements

Arduino IDE where IDE stands for Coordinates Improvement Environment – An official computer program presented by Arduino.cc, that's basically utilized for composing, compiling and uploading the code within the Arduino Gadget. Nearly all Arduino modules are consistent with this computer program that's an open source and is promptly accessible to introduce and begin compiling the code on the go.

V. Working



As appears in figure 11 this framework is utilizing Arduino board. This circuit is comprising of several equipment
 Fig 11. Full Board

components which incorporate of Arduino board, ultrasonic sensor, rain drop sensor, DHT11 sensor, GSM, buzzer, LCD, Power supply board, and some jumper wires as association for entire circuit.

VI. EXPERIMENTAL RESULTS



Fig 12. SMS Alert

Conclusion

The spread of IOT platforms across a variety of industries promotes a decrease in the number of fatalities and property losses brought on by natural and man-made disasters. The main benefit of IOT cleared the way for dynamic safety with extremely precise performance and doable data analytics. The right situation regarding the accident is communicated by the adoption of new technologies. For a change in input, the system reacts quickly. Consequently, the study gives an IOT based monitoring and alerting of dam water level by using different prior research contributions and issues repair methods which enables the smart warning approach for public safety.

ACKNOWLEDGMENT

This project proposed and Smart Microgrid system to automatically turn on/off the house motors using the IoT devices according to the tank levels and using the cloud for analyzing the data for efficient and no wastage of water will be done and an app that controls the house motor and finds the leakage dimension in the water tank of each .

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