(MIJ) 2018, Vol. No. 4, Jan-Dec **e-ISSN: 2454-924X; p-ISSN: 2454-8103**

LEVERAGING THE TOOLS AND TECHNIQUES OF INTERNET OF THINGS (IOT) IN CONTROLLING DAM VALVE OPERATIONS

Namrata Deswal

GD Goenka World Institute Lancaster University, Gurugram, Haryana

ABSTRACT

This task gives a blueprint for improving a data framework, provided the current frameworks use specific sensors and IoT. The support of this task depends on the philosophy of IoT. should keep up the water level in a dam with really to stay away from entanglements. The amount of water delivered is barely right, bringing about wastage of water. It is unimaginable for a man to unequivocally control the entryways without information on the specific water level and water inflow rate. We have fostered a mechatronics-based framework. We have planned a framework in which ongoing things are interconnected to the web. Water level contactless Ultrasonic sensor is set in tub associated through Arduino UNO to fill a similar need naturally and forward the status to it. This framework distinguishes the degree of water and gauges the water inflow rate in a tub and, along these lines, controls the Solenoid valve utilizing IoT on an ongoing premise. The water level is broken down using this sensor and refreshed in the webserver utilizing the IOT module associated with the Arduino UNO. Arduino unit takes a look at that information and transfers the situation with water level on the web.

I. INTRODUCTION

In India, almost 4000 significant/medium dams are built, and many more are ready to go. Typically, the dam storage limit is 185 billion cubic meters of water with a surface area of 5,580 km (93.4 TMC ft). During precipitation, for each 9.6 mm, the ascent of the water level increments by 0.3 ft.

In the new investigation by the BC dam security yearly report, from the year 2011-to 2016, the number of dam episodes, dam alarms, and dam disappointments diminished separately. With the developing interest in the Internet of Things, it has turned into the best decision for the pre-alert framework for checking the ascent in the water level in dams and controlling their doors. During the windy season, floods are highly normal to happen. In any case, if they happen intensely, issues will emerge. Through this venture, we have assembled a programmed insurance framework for dams through IOT based water checking and controlling strategies. We required an Arduino UNO microcontroller to connect with the water level sensor, valve, Wi-Fi model, etc. We set the sensor over the tub.

We customized the Microcontroller so that at whatever point the sensor detects the water, the worth of the water level will be refreshed on the distant server likewise. When the water level hits the sign of 85%, the valve quickly gets opened consequently, and the ringer cautions for quite a while. The valve stays open till the water level is diminished to 85%. We propose a programmed dam water level checking and entryway controlling framework over IoT. Our proposed project utilizes a sensor to detect the water level and afterward opens the valve as

(MIJ) 2018, Vol. No. 4, Jan-Dec **e-ISSN: 2454-924X; p-ISSN: 2454-8103**

indicated by the water level in the tub. In this manner, our proposed framework considers programmed valve opening and shutting in light of water level detection.

It likewise proposes an original thought of gathering and sharing consistent data about water levels to an approved headquarters focus through far-field correspondence. Specialists can see this data utilizing the web from any spot.

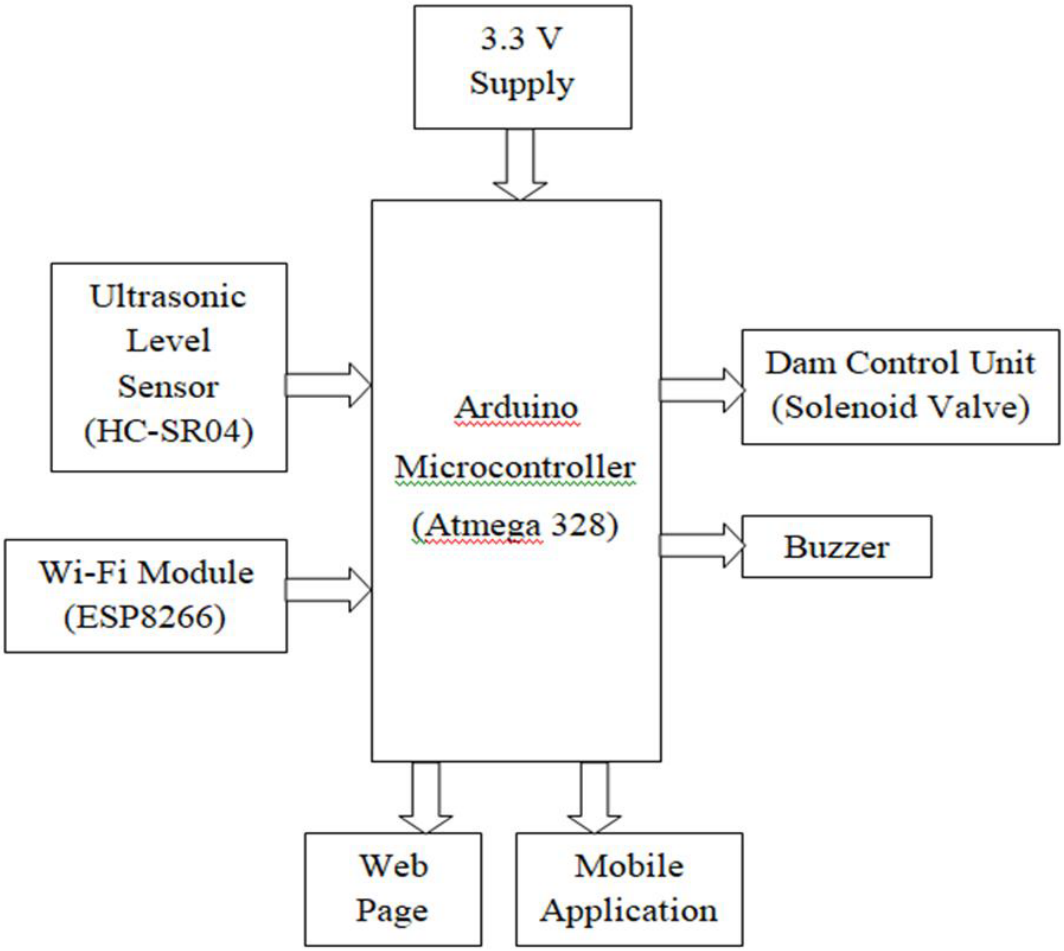
Likewise, our task is to screen the water level in the dam utilizing the high-level idea of IoT using Arduino UNO. It is tied in with fostering a computerized framework for observing and controlling the barriers from a distance.

A. Proposed System

In the proposed framework, water level checking in the tub is finished with the assistance of an Ultrasonic non-contact sensor, and the ebb and flow status is shipped off the Arduino UNO over IoT. We have planned a framework in which, rather than a door, the solenoid valve is utilized, which gets opened consequently when the water level ascends high. Bell gives a full alert when the water level is in danger. The water level and valve flow status should be visible on Mobile or PC. The proposed framework offers more adaptability than existing frameworks.

II. PHILOSOPHY

A. Block Diagram



B. Working

1) Arduino: In this task, we make the framework by utilizing Arduino Microcontroller named Atmega 328 over IoT. The power supply required is 3.3 V. Arduino is used to control the general framework naturally, diminishing the framework's plan and control intricacy. It will take input from the sensor unit, which will detect the water level through the level sensor. When the water level rises or diminishes, then, at that point, the sensor circuit will set off the Arduino. If the level ascends high, the regulator will get the order and play out the activity of controlling gadgets. The regulator will control the valve and Buzzer.

2) Ultrasonic Level Sensor: The contactless Ultrasonic water level sensor HC-SR04 is utilized for detecting water levels precisely. It will give the result to Arduino.

3) Wi-Fi Module: ESP8266 Wi-Fi module is primarily used to layout remote correspondence between the gadgets. Gathered detected would send information to the webserver through a Wi-Fi module. Arduino will convey the message to the valve whether to get opened or shut through this Wi-Fi module.

4) Solenoid Valve: It will be fixed in dams rather than doors. It will be opened or shut consequently as indicated by the degree of water.

When the water level spans 95%, it will consequently open. Will open the valve till the water level is diminished to 85%. The Microcontroller will constrain it.

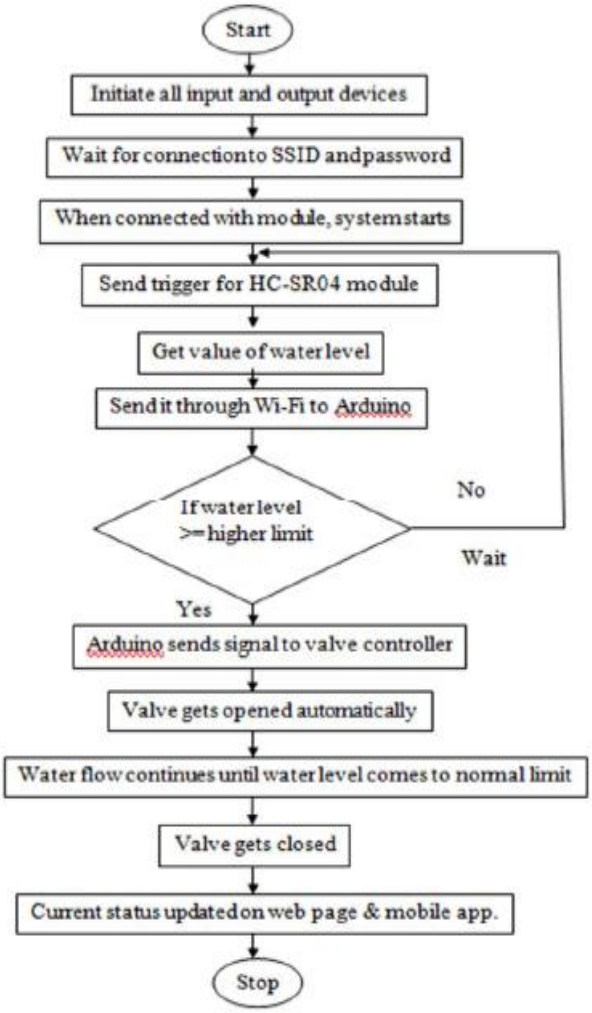
5) Buzzer: It will turn ON for a specific period when the water level arrives at a risky cutoff. Arduino will convey a message to it likewise.

6) Power Supply: The power supply required is 3.3 V for the Arduino. It will give power to different parts.

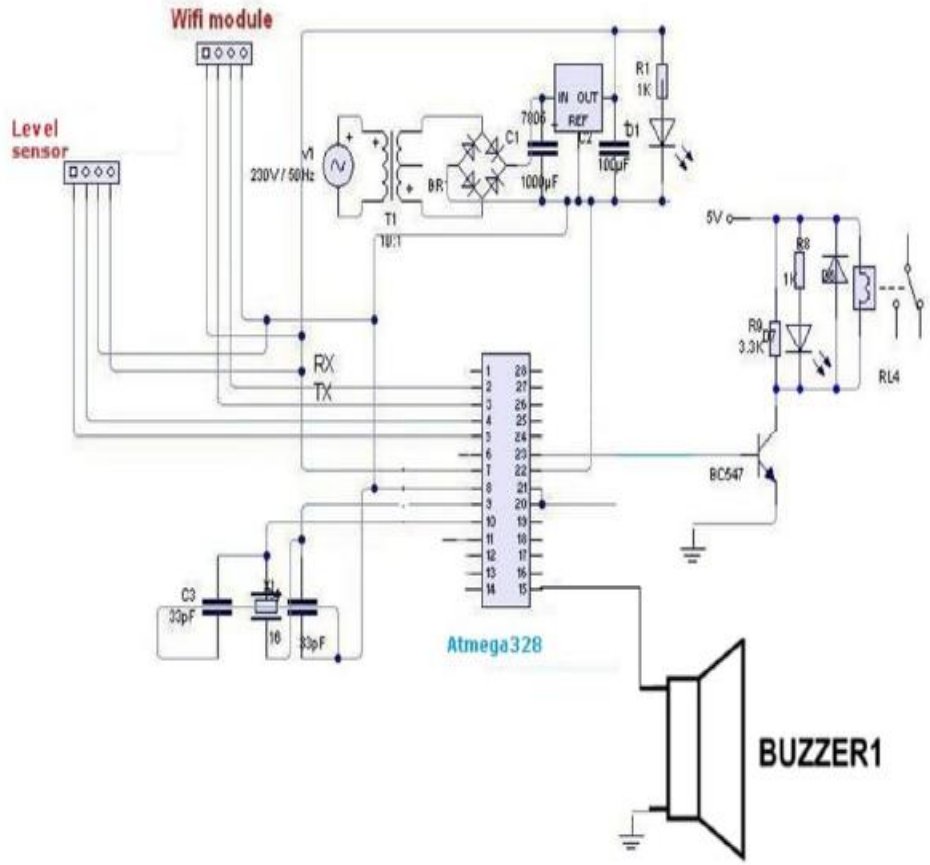
7) Web Page: The water level sign and valve flow status, i.e., whether it is ON or OFF, will be transferred on the Web page.

8) Mobile Application: All the information concerning the current valve status and the water level will be refreshed in the Mobile application.

C. Flowchart



D. Circuit Diagram



E. Clarification

Whenever the association is laid out between the Arduino UNO and Wi-Fi module, the green LED on the circuit board shines. This is a sign of the availability of the gadget in an area of interest. The transformer takes 230 V essential power supply and gives the result of 12 V AC. It is a stage-down transformer that gives 1 A current. This information is given to the circuit board, which is decreased to 5 V DC as expected by the microcontroller utilizing a rectifier circuit comprised of 4 diodes in4007. For the sober type of DC, sifting capacitors are being used. 7805 voltage controller, a three-terminal IC is utilized to direct the voltage level from 12 V to 5 V. First pin of the IC is input, the second is ground, and the third is yield. Then, at that point, the 5 V inventory is given to the Arduino UNO microcontroller IC, Buzzer, LED, and to set off the transfer. Wi-Fi module works at 3.3 V DC so to change its voltage level; a similar voltage is likewise provided to LMT17 customizable voltage controller. It will change the 3.3 voltage level though it can change from 1.5 V to 32 V. To change the voltage level, a variable resistor is utilized. Whenever this variable resistor is changed, the voltage level gets altered. It has been set to 3.3 V. This voltage level is given to the Wi-Fi module. There are eight wires associated with the Wi-Fi module, of which I utilized 5-6 wires which are VCC, ground, RX, TX, security empower. VCC and ground are associated with voltage controllers. RX and TX are associated with the second, what's more, third pins of microcontroller IC separately. To give pull high to them, two additional pins are added under two pins. So there are all four pins extra. Security pin is pulled up utilizing resistor. Driven is used to demonstrate the fruitful working of the relative

multitude of parts on the circuit board. Bell blares for quite a while to show the level is high. The transfer is utilized to ON/OFF the valve, which requires 12 V DC is provided by SMPS (Switched Mode Power Supply), which takes 230 V information. The transfer is utilized for the activity of the Solenoid valve. One terminal association from the microcontroller goes to IC (Optical Isolator) of transfer to protect the hand-off to the microcontroller.

Gem is the regulator's core, which is utilized to make the regulator ON. We have used it at 16 MHz. Whenever the precious stone is ON, then the regulator is ON. It begins with correspondence. As per the program, we first interface with SSID and secret key. The microcontroller will speak with the Wi-Fi module over the RX and TX to identify the association with SSID and secret key.

Then Wi-Fi (Wireless correspondence) is associated with the focal point of the gadget (Android Mobile), LED becomes ON. Then, at that point, the program arrangement of the circle gets executed. Will ship off the trigger an Ultrasonic sensor of 10 microseconds. Then the distance will be distinguished, which will be shipped off the microcontroller, and afterward, the microcontroller chooses whether to open the valve or not.

III. CONCLUSION

We have effectively finished this task. Hence, we reason that every variety of water levels is informed to the webserver by this task. We are supplanting the contact sensor with a contactless sensor. Additionally, the solenoid valve is utilized rather than a door, which gets opened naturally when the water level ascents as far as possible. We have carried out this completely robotized framework using a little tub to address the working of such a framework in the dam. Thus, this model or model is prepared, which is another framework, and soon, this framework will be utilized in natural barriers with actual or reasonable working on a vast premise, at first, perhaps in little dams.

REFERENCES

[1] IOT based water supply monitoring and controlling system: "International Journal of Innovative Research in Science, Engineering and Technology" (An ISO 3297: 2007 Certified Organization) Pranita vijaykumar Kulkarni, Mrs. M. S. Joshi P.G. Student, Department of Electronics and Communication Engineering, Marathwada Institute of Technology Aurangabad, India

[2] Automatic Gate Control And Water Level Reservoir using Zigbee technology: "International Journal of Research in Electronics" Saranya.B, Snaju.S, Santhiya.L.P, Sandhiya.G, Palanivel.D.

[3] Wireless Disaster Monitoring and Management System for Dams: "International Conference on Intelligent Computing, Communication & Convergence(ICCC-2014)" Conference Organized by Inter science Institute of Management and Technology.Anita, Rajesh Singh, sushabhan Choudhury, Bhupendra Singh.

[4] Dam Gate Level Monitoring And Control Over IOT: "SSRG International Journal of Electrical and Electronics Engineering - (ICRTECITA-2017) -Special issue- March 2017"Sakthi Krishnan V, Sindhu R, Swetha A, Vivek MuthuKumaran G, and Sri Ragavis

[5] Raspberry Pi Based Automatic Dam Monitoring and Alert System: Sneha D. Kayte1 UG Student, Department of ETC, G.H. R.I.E.T, Nagpur (India) Shweta Jamodkar2UG Student, Department of ETC, G. H. R.I.E.TMimansa Raut3UG Student, Department OF ETC, G. H. R.I.E.T, Nagpur (India).

[6] IOT Based Water Level Monitoring System For Lake: Mr. patil. K.N., Mr. kadam Tushar, Ms. Sawant Swaranjali, Ms. Amange Shreya, Assistant Professor, Department of Electronics And Telecommunication , Annasaheb Dange College of Engineering and Technology, Aastha, Maharashtra, India.