Available online at: http://www.ijmtst.com/vol4issue10.html

International Journal for Modern Trends in Science and Technology

ISSN: 2455-3778 :: Volume: 04, Issue No: 10, October 2018

Real Time Water Monitoring System using IoT

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To Cite this Article
Pravin Pachorkar, Vidhi Dholu, Pritam Sanghavi, Pranit Mutha and Yatin Suryawanshi, "Real Time Water Monitoring System using IoT", *International Journal for Modern Trends in Science and Technology*, Vol. 04, Issue 10, October 2018, pp.-30-32.

Article Info
Received on 08-Aug-2018, Revised on 14-Sept-2018, Accepted on 04-Oct-2018.

ABSTRACT

Undoubtedly, water is one of the important resources on entire globe. No one including human beings, animals, plants or insects can live without water. Water is a scarce resource and it may deplete over coming years due to overuse. The bad quality, overflowing water from tanks, leakage in pipes, and inefficient usage of water are the main cause which leads to the wastage of water. So it is necessary have control on water wastage and usage as well by introducing or building a system which will overcome the water wastage related issues using Internet of Things (IoT).

KEYWORDS: *sensors, cloud storage, real time monitoring, efficiency, microcontroller, Internet Of Things (IoT).*

I. INTRODUCTION

Currently obtaining drinking water is costly for all the humans. Recently development of infrastructure, increase in population, leakage in pipes, uncontrolled usage and wastage of water, pollution, etc. leading to scarcity of water faced by human beings. So it is necessary to find the alternative system which can help to reduce the water wastage issues for which Internet Of Things (IoT) is the solution which helps in building a automated system for real time water monitoring. Embedding different sensors with a micro controller we can create such a system using the cloud services for data storage.

As there is uneven distribution of water across the city so automated system must be developed so that the water is distributed equally with equal pressure to the residents in the city. For checking the water quality the parameters like Ph, turbidity, temperature, TDS, etc. must be calculated. Level sensors are used to check the water level in tanks, pressure, flow sensors can be used to detect the leakage in pipes.

II. LITERATURE REVIEW

A. An Internet of Things Based Model for Smart Water Distribution with Quality Monitoring

In this paper, author Joy Shah [3] mentioned that the water distribution and quality monitoring, the valves are turned on/off area or society wise for water distribution to each end point. Even though some end points doesn't receive the water or receives water at low water pressure. To overcome these problem, the embedded Device having control valve can be turned on/off. Using the proposed device each endpoint can be controlled and monitored so it can receive the required water with Pressure. The Flow sensor sends the data to the cloud using Controller via internet. The generated data can be monitored in real time and control valves can be turned on/off for water distribution with pressure. The flow rate is measured using water flow sensor. Different

sensors such as pH sensor, conductivity Sensor, temperature sensor are used for monitoring the water quality. The reason for choosing the randomness is to avoid all the devices firing the request at the same time. These values can be monitored location wise in real time. If the supplied water is fresh and passed all the tests, even though water reaching to end points is contaminated then we can detect the source of problem.

B. *IoT based Smart Water Tank with Android application*

In this paper, the authors Priyen P. Shah, Anjali A. Patil, Subodh S. Ingleshwar [4], have utilized ESP 8266 as microcontroller. The estimations of greatest what's more, least levels are acquired by ESP from Firebase cloud. These qualities are set from the android application. The current level of water is sensed from the ultrasonic sensor. Contingent on these qualities, the motor is turned ON/ OFF. Contingent upon the water levels, as depicted over, the status of motor will be consequently controlled. In the event that water level is in the middle of both the levels, at that point the client can practice control by flipping the status of motor from the android application. Catches a E Start and Abort have been accommodated the equivalent. The application is composed so that it will demonstrate the quick estimation of ebb and flow status of water in rate. The height of tank is to be set once in ESP. This stature will be utilized to decide the rate of water. Counts of the current water level will be finished with this. Settling on choices with rate turns out to be less demanding to actualize the rationale in programming.

C. *Internet of things enabled real time water quality monitoring system*

In this paper, authors S.Geetha and S.Gouthami [5] mentioned that how water quality can be monitored in real time using IOT. Conductivity, turbidity, water level and pH are the parameter which can be monitored The Data is received by the cloud by using sensors. Edge is set in the cloud in view of the gauges given by WHO. Message is sent from cloud to the clients portable if the esteem surpasses the edge. A portable application has been produced in which esteems got by each sensor in the cloud can be seen. This can be utilized by both the water quality checking experts and in addition clients. Conductivity is the proportion of arrangements capacity to convey current. This parameter is utilized to decide the salt substance in the water. In the proposed plan, YL-69 is utilized to quantify the conductivity of the water. It comprises of two anodes, when put in water a potential is produced which is corresponding to conductivity. It is assessed in seimens per cm. Attractive extent of conductivity is from 300 to 800 µ seimens per cm. pH sensor involves two anodes which is reference cathode and pH terminal generally called assessing terminal. It is estimated in seimens per cm. Satisfactory scope of conductivity is from 300 to 800 µ seimens per cm. pH sensor comprises of two cathodes which is reference anode and pH terminal otherwise called estimating terminal. At the point when set in the arrangement pH cathode builds up a potential that is corresponding to pH. The esteem ranges from 0 to 14. The adequate scope of pH for drinking water is 6.5 to 8.5. Turbidity is a proportion of darkness in the water. Opto electronic gadgets, for example, LDR and LED are utilized to gauge the turbidity. Light is transmitted and reflected by suspended solids and reflected light is gotten by the sensors. A LDR is high opposition semiconductor. On the off chance that light falling on the gadget is of high recurrence, photons consumed by the semiconductor gives the bound electrons enough lead power in this way bringing down obstruction. Information sent from the controller are putaway in "Ubidots" cloud. "Ubidots" offers a stage for designers to catch information and transform it into helpful data. The highlights incorporate an ongoing dashboard to examine information or control gadgets and offer the information through open connections. Information put away in the cloud can be utilized for point by point examination. The cloud is modified to send ready SMS messages at whatever point the observed parameter surpasses as far as possible. The Table 8 displays a synopsis of valuable highlights of Ubidots cloud stage (Ubidots, 2017).

D. *Automated Water Tank Filtration System Using LDR Sensor*

In this paper the autors S. Noorjannah Ibrahim, M.S. Lokman Hakim, A. L. Asnawi and N.A. Malik [7] mentioned that how LDR sensor can be utilized for mechanized water tank filtration framework and Experiments on water turbidity was led under two conditions, undisturbed stream and persistent stream, which will influence the estimations of the LDR. Results demonstrate that the LDR readings in persistent stream require additional time in the middle of perusing so the

turbidity esteem can be steady. The detecting unit comprises of a light dependent resistor (LDR) and a light-transmitting diode (LED), situated inverse each other inside a dark PVC pipe. By utilizing a calculation, the microcontroller (Arduino Uno) gets signals from the LDR and in this manner controls the activities of the fluid miniaturized scale pump to manage water stream to the water channel.

E. *Smart Water Monitoring System Using Wireless Sensor Network at Home/Office*

In this paper the authors [9] Ms T. Deepiga, Ms A. Sivasankari utilized remote sensor arrangement for water observing at home/office. Tank Water Level Monitoring, is utilized to abstain from flooding and cozy level of water in the tank. Water controlling framework execution makes potential noteworthiness in home applications. The current computerized strategy for level recognition is portrayed and that can be utilized to make a gadget on/off. Additionally, the basic strategy for level control for home machine is essentially to begin the feed pump at a low level.

III. Existing System

In the existing system, it starts with the distribution of water in the city with the help of stepper motor receiving signals from microcontroller for ON/OFF, leakage detection is carried out by pressure sensors and quality parameters like pH, temperature, turbidity are measured through using different sensors like pH sensors, temperature sensors, conductivity sensors, etc. And at the tank level of water is measured by using ultrasonic sensor and indicating the level by using the led lights.

The drawbacks of the system:

The notification is not sent to the government officials & users about the distribution of water, leakage is not effectively detected in pipes. The system is partially implemented & not that effective.

IV. CONCUSSION

This paper presents the design and development of real time water monitoring system with all the advanced methodologies. Additionally, a combination of all these advancements is not an impossible task and can be effectively completed. Looking towards further modifications in case of more enhancements, the data stored from Smart System analysis can be used as a platform for future plans and new strategies at any instance of time via smart terminals connected. Further changes will be made to make this system more cost effective and more firm for deploying in different areas.

ACKNOWLEDGMENT

This work is partially supported by Department of Information Technology, Sandip Institute of Technology and Research Centre, Sandip Foundation, Nashik. We offer our sincere gratitude to Prof.P.R.Pachorkar (Project Coordinator), Prof.Dr. P.R.Bhaladhare (Head of Department Information Technology) SITRC, Nashik who guided us and supported us. We take this opportunity to express gratitude to all department faculty members for their help support. We also thank my parents for the unceasing encouragement and support.

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