International Journal of Enhanced Research in Science, Technology & Engineering
ISSN: 2319-7463, Vol. 11 Issue 3, March-2022, Impact Factor: 7.957

Review on Cloud Based Water Quality Monitoring System

Arjun Suresh[1], Akhil Das Y[2], Afzal S[3], Anandu Arun[4], Reshmi Krishna Prasad[5]

[1,2,3,4]UG Scholar, Department of Electronics and Communication Engineering, Dr. APJ Abdul Kalam Technological University Kerala, India
[5]Assistant Professor, Department of Electronics and Communication Engineering, Dr. APJ Abdul Kalam Technological University Kerala, India

ABSTRACT

Water quality testing has traditionally been done by manually collecting samples and sending them to a laboratory for analysis. It has, however, been unable to satisfy the current demands of water quality monitoring. As a result, a set of automated water quality measurement and reporting systems has been built. The several characteristics of water quality parameters are automatically monitored using a single chip microcontroller. The data is collected by a single chip, which then processes and analyses it. The data is then delivered to the monitoring centre over the GSM network in the form of SMS. If the water quality is abnormal, the data will be supplied simultaneously to the monitoring centre and the management's mobile. It is easier for management to take appropriate actions in a timely manner and to be able to detect the current state of water quality remotely. The system has achieved water quality monitoring automation, data analysis intelligence, and information transmission networking.

Keywords-Water Quality Monitoring; Measurement and Reporting; GSM; SMS; Remote.

INTRODUCTION

With the increasing growth of the economy, more and more serious environmental issues arise. One of these issues is water contamination. Temperature, pH, turbidity, and humidity are all water quality factors that are routinely measured. The most frequent way for detecting these factors is to collect samples manually and then submit them to a lab for detection and analysis. This method is inefficient in terms of labour and material resources, and it has drawbacks such as sample collection, long-term analysis, ageing experiment equipment, and other concerns. A sensor is an excellent detecting instrument for these issues. It has the ability to convert non-power data into electrical impulses. It can readily transport, process, transform, and control signals, and it has a number of unique features, including high selectivity, sensitivity, and response speed etc. The autonomous measuring and reporting system for water quality is created and developed based on these properties and advantages of sensors. It uses the GSM (Global System for Mobile Communications) network's SMS (Short Messaging Service) to send the collected data instantly. The system uses little human, material, and financial resources while implementing automation, intelligence, and a network of water quality monitoring.

LITERATURE SURVEY

Nikhil Kedia entitled "Water Quality Monitoring for Rural Areas-A Sensor Cloud Based Economical Project." Published in 2015 1st International Conference on Next Generation Computing Technologies (NGCT-2015) Dehradun, India. The whole water quality monitoring method, sensors, embedded design, and information dissipation mechanism, as well as the responsibilities of the government, network operator, and villages in guaranteeing adequate information dissipation, are highlighted in this study. It also looks into the Sensor Cloud. While it is not possible to automatically increase water quality at this time, smart use of technology and cost-effective procedures can help improve water quality and public awareness.

Jayti Bhatt,Jignesh Patoliya entitled "Real Time Water Quality Monitoring System". This study explains a way to maintain a secure method for monitoring water by watching its quality in real time. For this goal, new IOT (Internet of Things)-based water quality testing approach has been developed. We tend to discuss the architecture of associate IoT-based water quality monitoring system that monitors water quality in real time during this study. The sensors during this system measure water parameters like pH scale, turbidity, conductivity and temperature. The

measured values from the sensors are processed by the microcontroller, and also the processed values are sent through Zigbee protocol to the core controller, that is the Raspberry Pi. Finally, by cloud computing, sensors data may be viewed on a web browser application.

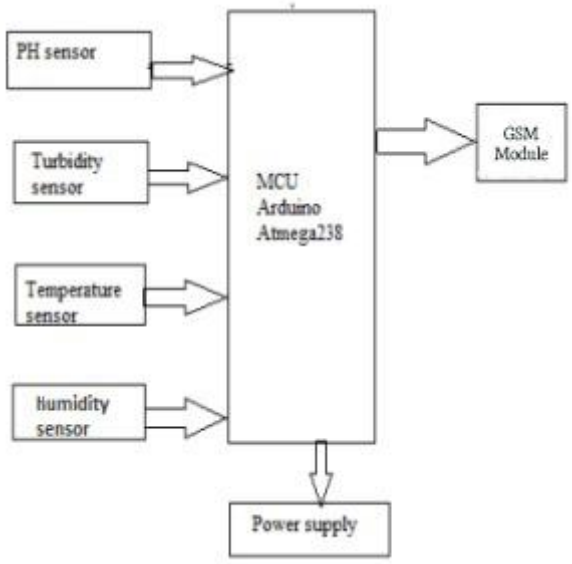
Sokratis Kartakis, Weiren Yu, Reza Akhavan, and Julie A. McCann entitled "Adaptive Edge Analytics for Distributed Networked Control of Water Systems",. This analysis describes a burst detection and localization strategy for water distribution networks that mixes lightweight compression and anomaly detection with graph topology analytics. We show that our technique not solely minimises the number of communication between devices and back-end servers, however conjointly expeditiously localises water burst occurrences by scrutiny the arrival times of vibration variations detected at different device locations.

Niel Andre Cloete, Reza Malekian and Lakshmi Nair entitled "Design of Smart Sensors for Real-Time Water Quality Monitoring", The sensors area unit coupled to a microcontroller-based activity node that processes and analyses the information. For communication between the activity and notification nodes, ZigBee receiver and transmitter modules are utilized in this system. Once the water quality parameters approach harmful levels, the notification node displays the device readings associated and generates an audio alert. To validate every part of the system, numerous qualification tests are performed. The activity node will send data to the notification node through ZigBee for audio and visual display. The results show that the system is capable of reading physiochemical parameters and processing, transmission, and displaying the data.

Mohammad Salah Uddin Chowdurya, Talha Bin Emranb, Subhasish Ghosha, Abhijit Pathaka, Nurul Absara, Karl Anderssonc, Mohammad Shahadat entitled "IoT based Real-time River Water Quality Monitoring System". A sensor-based water quality monitoring system is proposed in this research. A microprocessor for system processing, a communication device for inter and intra node communication, and multiple sensors are the essential components of a Wireless Sensor Network (WSN). Remote monitoring and Internet of Things (IoT) technology can provide real-time data access. With the help of Spark streaming analysis via Spark MLlib, Deep learning neural network models, and the Belief Rule Based (BRB) system, data may be shown in a visual way on a server PC. If the obtained amount exceeds the threshold value, the agent will receive an automated warning SMS message.

Vaishnavi V. Daigavane and Dr. M.A Gaikwad entitled "Water Quality Monitoring System Based on IOT". This study proposes the design and construction of a low-cost system for real-time water quality monitoring (internet of things). The system consists of multiple sensors that measure the water's physical and chemical characteristics. Temperature, PH, turbidity, and the flow sensor of the water can all be measured. The core controller can process the measured values from the sensors. As a core controller, the Arduino model might be used. Finally, utilising a WI-FI system, the sensor data may be seen on the internet.

PROPOSED SYSTEM



The major goal is to create a system that uses wireless sensor networks to continuously monitor river water quality in remote locations with low power consumption, low cost, and high detection accuracy. pH, humidity, turbidity level, and other parameters are examined in order to improve water quality. The goals of concept implementation are as follows: (a) Using accessible sensors at a distant location, measure water characteristics such as pH, turbidity, temperature, and humidity. (b) To collect data from various sensor nodes and transfer it through wireless channel to

the base station. (c) When the water quality observed does not meet the established standards, send an SMS to an authorised person so that required steps can be done.

CONCLUSION

A water detection sensor with a unique advantage and an existing GSM network are used in the GSM-based autonomous water quality testing and reporting system. Water characteristics such as trubidity, pH, temperature, and humidity can be monitored automatically by the system. The system does not require staff to remain on duty, further personnel costs can be avoided. Thus, water quality testing will most certainly become more cost-effective, convenient, and quick as a result. The approach is simple and the system is very customizable. The system's applicability can be broadened further by tracking hydrologic, air pollution, industrial, and agricultural production.

REFERENCES

[1]. Nikhil Kedia entitled "Water Quality Monitoring for Rural Areas-A Sensor CloudBased Economical Project." Published in 2015 1st International Conference on Next Generation Computing Technologies (NGCT-2015) Dehradun, India.
[2]. Jayti Bhatt, Jignesh Patoliya, Iot Based Water Quality Monitoring System, IRFIC, 21 Feb, 2016.
[3]. Sokratis Kartakis, Weiren Yu, Reza Akhavan, and Julie A. McCann, 2016 IEEE First International Conference on Internet-of-Things Design and Implementation,
[4]. Niel Andre cloete, Reza Malekian and Lakshmi Nair, Design of Smart Sensors for Real-Time Water Quality monitoring
[5]. Mohammad Salah Uddin Chowdurya, Talha Bin Emranb, Subhasish Ghosha, Abhijit Pathaka, Nurul Absara, Karl Anderssonc, Mohammad Shahadat entitled "IoT based Real-time River Water Quality Monitoring System".
[6]. Vaishnavi V. Daigavane and Dr. M.A Gaikwad, "Water Quality Monitoring System Based on IOT", Advances in Wireless and Mobile Communications.
[7]. Lokhande DG, Mohsin SA (2017) Internet of things for a ubiquitous smart home system. In: 2017 1st International Conference on Intelligent Systems and Information Management (ICISIM), 5–6 Oct 2017.
[8]. Gupta N, Shukla D (2016) Design of embedded based automated meter reading system for real-time processing. In: IEEE Students Conference on Electrical, Electronics and Computer Science (SCEECS), 5–6 Mar 2016.
[9]. A. Alkandari, M. alnasheet, Y. Alabduljader and S. M. Moein, "Watermonitoring system using Wireless Sensor Network (WSN)" 2012 Second International Conference on Digital Information Processing and Communications (ICDIPC), Klaipeda City, 2012, pp. 10-15.
[10]. Hsia1 S-C, Hsu S-W, Chang Y-J (2012) Remote monitoring and smart sensing for water quality and leakage detection. IET Wirel Sens Syst 2(4):402–408.
[11]. Sun Xiaodong, Jing Yunpeng, "Sensors' application to environmental monitoring," Measurement and Testing Technology, 2006
[12]. Wu Xiaoqing, Huhe Muren,ĀGSM module communication controlled by single-chip,āNei Mongol Science and Technology and Economic,2010
[13]. Britton TC, Stewart RA, O'Halloran KR (2013) Smart metering: an enabler for rapid and effective post meter leakage identification and water loss management.
[14]. Pal M, Ayele Y, Hadush M, Panigrahi S, Jadhav VJ (2018) Public Health Hazards Due to Unsafe Drinking Water
[15]. K. S. Adu-Manu, C. Tapparello, W. Heinzelman, F. A. Katsriku, and J.-D. Abdulai, "Water quality monitoring using wireless sensor networks: Current trends and future research directions," ACM Transactions on Sensor Networks (TOSN), vol. 13,
[16]. Akanksha Purohit, Ulhaskumar Gokhale, Real Time Water Quality Measurement System based on GSM, IOSR (IOSR-JECE) Volume 9, Issue 3, Ver. V (May - Jun. 2014)
[17]. Mithaila Barabde, shruti Danve, Real Time Water Quality Monitoring System, IJIRCCE, vol 3, June 2015.