Arduino Based Autonomous Water Quality Monitoring Gadgetry

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ABSTRACT: Water being a universal solvent faces extreme variations in its quality at diverse places depending on the condition of its source and the   treatment it receives. The quality of this holy source is bound to meet Environmental Protection Agency (E.P.A) standards. Periodical analysis of the quality of water should be routinely executed to maintain and monitor its purity. Turbidity, Temperature and pH are the most prominent parameters that define water's quality and the existing mode of challenging these parameters has always been manual collection of samples and sending them over to laboratory for water quality check, which procrastinates the process by a few days. The proposed system ensures to provide a real-time, on-spot and speedy and effective water quality analysis by automatically monitoring the turbidity, Temperature and pH of water through sensors and intimates the remote user of even the slightest change in the quality. All the existing systems had aimed to cover a small area but the proposed work not only automates the entire process but also focuses on covering wider boundaries and larger perimeters and is hugely economical too.

KEYWORDS: pH, temperature and Turbidity.

I. INDRODUCTION

Any resource over utilized will lead to hazardous aftermath and water defilement is one such impacts that the planet is facing currently. Some of the manually and regularly monitored parameters are pH, turbidity, dissolved oxygen, chemical oxygen demand, biochemical oxygen demand, ammonia nitrogen, nitrate, nitrite, phosphate, various metal ions. This conventional methodcomes with the limitations of the manual sample collection, long-time analysis, demonstration equipment aging and many more. Usage of sensors prove to be an ideal solution to these aforementioned limitations as it readily converts a no-power information into an electrical pulse and this work involves implementation of this coming-of-age minute device to solve issues concerning water quality.

Todaymanydifferentforms of water quality monitoring devicesarebeingusedbut the complexity and compactness of the system is interrogate able. According to the survey, various authors proposed different methodology to obtain the data efficiently. Several monitoring devices involved expensive elements and degradable.

II.LITERATURESURVEY

A remote water quality monitoring system which based on wireless sensor network, choose low-power and the sleeping function devices to design coordination of wireless sensor networks and sensor node, and realized a low- power design of sensor nodes. Appling the advanced WSN technology and wide coverage of GPRS technology for data collection and transmission, it can solve numerous difficulties such as intermediate-range transmission of water quality monitoring system.

The system architecture for a Wireless sensor Network which aids in River Water Quality Monitoring. This paper also proposes a novel technique for the design of a water quality sensor node which can be used for monitoring the pH of water. The proposed design of the sensor node consists of the pH amplifier circuit, the level shifting circuit, filter design using Sallen key topology, the processing unit which is implemented using PIC microcontroller and the wireless communication module consisting of Zigbee radio. The circuit for the sensor node is designed, simulated and the hardware prototype is developed which was tested for different pH conditions with the wireless transmission of that data achieved through the use of MicaZ motes. This system provides an energy efficient and low-cost sensor node platform for monitoring water quality through the use of inexpensive,

low power devices for the hardware design.

When this pH sensor unit is integrated with other basic water quality sensors such as temperature, conductivity, dissolved oxygen and turbidity, etc., it can be used for monitoring the water pollution in an area as well.

The next phase of this project includes integration of water conductivity, dissolved oxygen and temperature sensors with the pH sensing module. Methods to improve and optimize the system performance and reliability of the currentsystem

III.PROPOSEDSYSTEM

Our proposed system possesses of a mobile application which can show the user both the parse values along with the present water quality parameters. Previously fetched parameters can also be retrieved by accessing from the sheet storage through application. Spreadsheet doesn't have the limitation with limit as we use Bluetooth mobile at a greater region can also access the data.
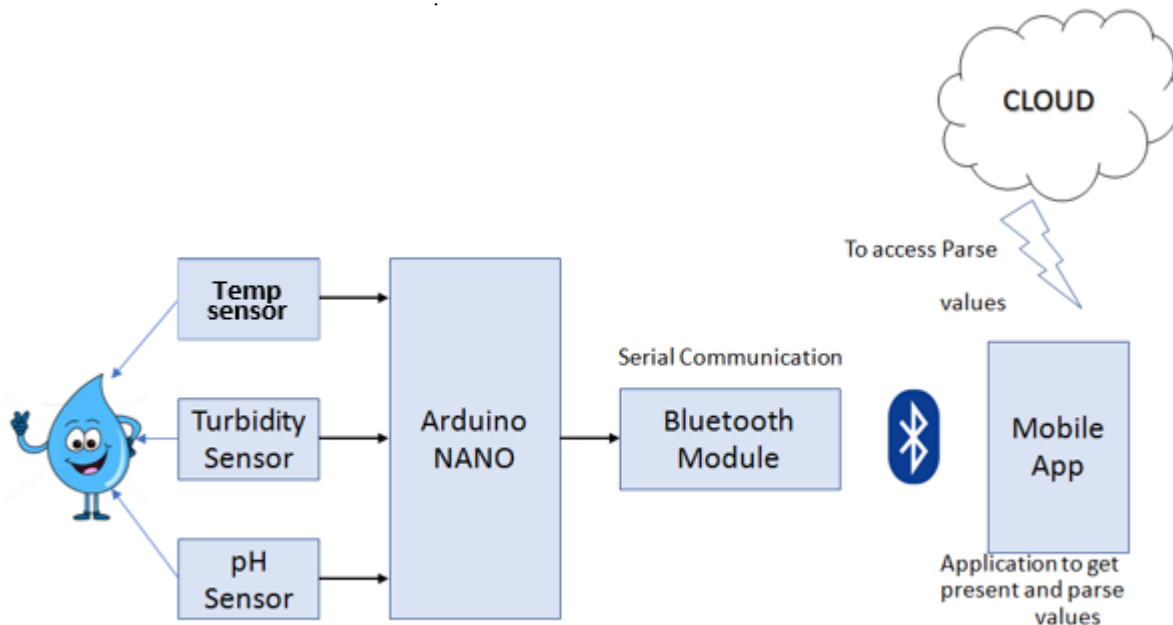
CIRCUIT DIAGRAM:

Fig. 1 Block Diagram

IV.SYSTEM OVERVIEW

The basic system of water quality monitoring is shown in the block diagram below. An android mobile application to access the cloud and to monitor the parameters is the creative idea in this system. Arduino and Bluetooth Module is used to allow real time monitoring

With the help of the mobile application the data fetched through the sensors such as temperature, turbidity, and pH which is displayed to the mobile application display. Similarly, the mobile application has another option which isused to get the values that is previously fetched with the help of cloud storage. The parse values that are fetched are saved in the cloud sheet and accessing of the sheet doesn't require the Bluetooth to be connected with the module or other mobile system.

V. FUTURESCOPE

By logging on the website, the official users can access the data. On a web page, the required parameters are shown in real-time. To determine the quality of water, the pH sensor, turbidity sensor and temperature sensor is put into a container which is filled with tap water and 34 drops of acidic is mixed to it. When the pH of water is still around 3 - 4.5 range then the water is acidic in nature. And the surrounding temperature still between 32 to 34 degrees. The water turbidity varies according to the soluble particles in the water. Man power is reduced. The number of parameters to be sensed can be increased by theaddition of multiple sensors to measure dissolved oxygen (DO), chemical oxygen demand (COD), biochemical oxygen demand (BOD), ammonia nitrogen, nitrate, nitrite, phosphate. The system can be further upgraded using wireless sensor networks. The system can be expanded to monitor hydrologic, air pollution, industrial and agricultural production and soon.

- In future we use IOT concept in thisproject

- Detecting the more parameters for most securepurpose

- Increase the parameters by addition of multiplesensors

- By interfacing relay, we control the supply ofwater

VI.CONCLUSION

The low cost, efficient, real-time water quality monitoring system has been implemented and tested. Through this system, the officials can keep track of the levels of parameters in the water bodies and send immediate warnings to the public. This can help in preventing diseases caused due to unhealthy water and presence of alkalinity. The system can be easily installed in the target area, and the task of monitoring can be done by less-trained individuals. Performance modelling in different environment is important to study in future because different kind of monitoring application requires different arrangement during systeminstallation.Benefit of mobile application is to entail Ease of usage! Accessibility is one of the key benefits of having a mobile application as an extension of your process. Our Consumers directly come to you as per their convenience. This improves customer's engagement when they need. Mobile application advantages include freehand availability that helps increase your customer experience. Distinct advantages of mobile apps over websites are they are smaller in size, easily accessible and can be loaded in a mobile platform.

Internet of Things (IoT) and its services are becoming part of our everyday life, ways of working, and business. There is a great deal of research on developing crucial building blocks and models for the next generation Internet services supported by a plethora of connected things. With the help of efficient and intelligent use of mobile network, IoT has revolutionized the world. It is changing the future of technology and how objects behave around us? It won't be long when we can access any information and command objects at the touch of fingertips.

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