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Water Quality Monitoring And Distribution IOT Based Economical Project

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ABSTRACT

Now a day water is a vital resource for life, and economy. One of the most serious issue to solve and manage the water scarcity and distribution of water contains employee work and consumed time for distribute the water to each area. Purity of water for human health is most serious issue. Water monitoring and impurity removal is important task. Exiting systems uses clorinization for purification of water but only clorinization for purification is not helpful. Other impurity remain in water. To check that impurity by using turbidity sensor check purity of water. PH sensor use and flow sensor use for equal distribution of water. This system is Real time monitoring system. This paper is reconfigurable smart sensor interface device for water quality monitoring using IOT based environment.

Keywords : Water Resources, Ph Sensor, Flow Sensor,Turbidity Sensor, Scarcity

I. INTRODUCTION

In the past decade, all human life changed because of the internet. The internet of things has been heralded as one of the major development to be realized throughout the internet technologies. The Internet of Things (IOT) is concerned with interconnecting communicating objects that are installed at different locations that are possibly distant from each other. IOT communication is quite different from the traditional human to human communication, bringing a large challenge to existing telecommunication and infrastructure.

The water quality monitoring is the essential need for the human life. There are huge numbers of diseases which cause through the polluted drinking water. The water will be polluted by the human being, animals, natural disasters and seasonal changes. So, people have to aware of their own locality water bodies conditions. To enable this, a prototype is proposed to monitor water quality in IOT environment.

The conventional techniques for water quality screen include the manual gathering of water test from various areas. These water tests tried in the research facility utilizing the expository innovations. Such methodologies are tedious and didn't really to be viewed as proficient. The Wireless Sensor Network (WSN) [1] and wireless Communication technologies have been increasingly developed for assisting human's personal and professional daily tasks. Today's state-of-the-art WSNs have more advantages such as low costs for both installation and maintenance, and longer operating time. The remote sensor network can be used for stationary or mobile sensor networks.. The WHO (world health organization) estimated, in India among 77 million people is suffering due to not having safe water. WHO also estimates that 21% of diseases are related to unsafe water in India Therefore, various water quality parameters such as dissolved

oxygen (DO), conductivity, pH, turbidity and temperature should be monitored in real time. The water quality parameter pH show water is acidic or basic. Pure water has 7 pH value, less than 7 values indicate acidity and more than 7 indicate alkalinity. The normal range of pH is 6 to 8.5. In drinking water if the normal range of pH doesn't maintain it causes the irritation to the eyes, skin and mucous membranes. Turbidity has indicated the degree at which the water loses its transparency. It is considered as a good measure of the quality of water. Water temperature, indicates how water is hot or cold. The deterioration of water resources becomes a common human problem. The traditional methods of water quality monitor involve the manual collection of water sample from different locations. These water samples tested in the laboratory using the analytical technologies. Such approaches are time consuming and no longer to be considered efficient. Traditional methods of the water quality detection have the disadvantages like complicated methodology, long waiting time for results, low measurement precision and high costs Therefore, there is a need for continuous monitoring of water quality parameters in real time.

By focusing the above issues, we have to develop and design a low cost water quality monitoring system that can monitor water quality in real time using IOT environment. In our proposed system water quality parameters are measured by the different water quality monitoring sensors such as pH, turbidity, conductivity, dissolved oxygen and temperature. These sensor-values are processed by the microcontroller and theses processed values are sent to the core controller remotely using Zigbee IEEE 802.15.4 protocol. In the proposed system, IOT module is used to access processed data from the core controller to the cloud. The processed data can be monitored through a browser application using a special IP address.

II. PROBLEM STATEMENT

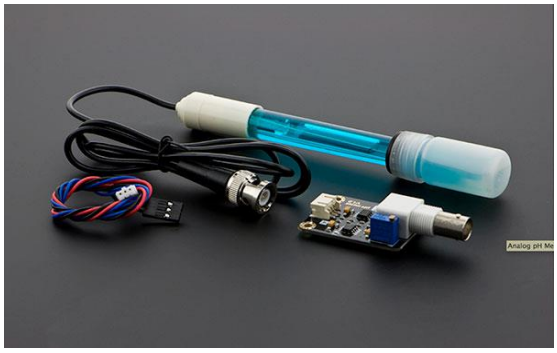
- Existing water treatment systems cannot detect the dissolved contaminants such as chemicals. Using traditional approaches of monitoring water quality in the water distribution system are not safe.
- Chlorinating in distribution system is usually used to protect microorganisms. However, drinking too much chlorinated water leads to Cancer and other diseases.
- Thus, developing a real-time online monitoring system in water distribution is highly important to prevent the future water-related diseases. Thus with this single instrument can detect all the possible water parameters such as pH, turbidity and conductivity.

hardware components

In this system, smart sensor interface devicethat integrate the data collection.following sensors used .

1. pH sensors.
2. Turbidity sensor.
3. Conductivity Sensor
4. Flow sensor.
5. Wi-Fi module.
6. Arduino Uno

pH sensor



In this water monitoring and distribution system, the pH sensor is used to detect the pH level of water. It is one of the main component of the proposed system. The safe pH level of the water for drinking is 7. It check the range whether it is alkaline or acidic. The pH sensor connected to arduino Uno board. And fetch

the data through Wi-Fi module to display on webpage.

Turbidity Sensor

The turbidity sensor used to detection of Suspended particles in water by measuring the light Transmittance.

Figure 1. Turbidity Sensors.

Turbidity is used to a measure of the cloudiness of water. Turbidity has indicated the degree at which the water loses its transparency. Turbidity blocks out the light needed by submerged aquatic vegetation. It also can raise surface water temperatures above normal because suspended particles near the surface facilitate the absorption of heat from sunlight.

Conductivity sensor

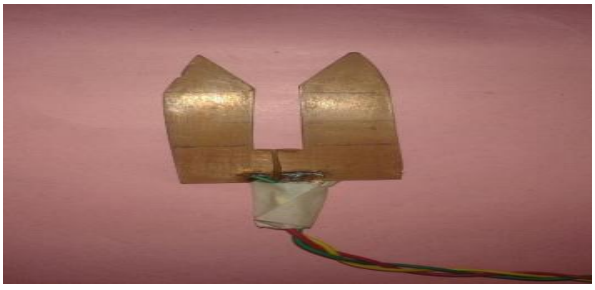


Figure 2

Electrical conductivity is also use as indicator of water quality. It measures free chlorine without sample pretreatment. It does not have messy and expensive reagents needed. Conductivity data can detect contaminants, determine the concentration of solutions and determine the purity of water. It is small in size.

Flow sensor

Figure 3

Water flow sensor is used to measure the flow rate.

It has operating temperature range of -25°C - 80°C which is wide enough for application to operate successfully.

Wi-Fi module

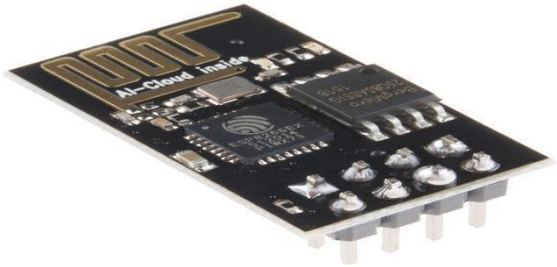


Figure 4. Wi-Fi module.

After all the parameters are connected and checked the information has to be sent through Wi-Fi module online so that it can be monitored remotely. For this purpose, Wi-Fi module is used. It helps us make this system real time.

Wi-Fi module is connected to making the system real time.

III. PROPOSED SYSTEM

Block Diagram

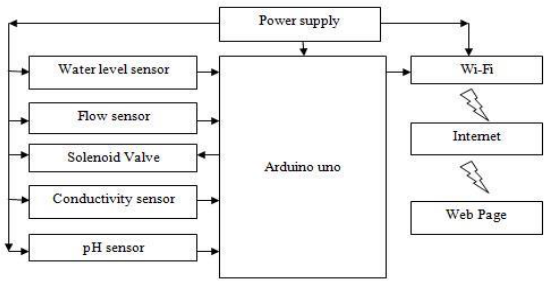


Figure 5. Block diagram

The quality-of-sensing is always the primary concern of sensor placement in WSN, and there is no exception in WDS.
Placement in WSN, and there is no exception in WDS
The quality-of-sensing requirement in WDS is even more important.

The main aim here is to develop a system for continuous monitoring of water quality at remote places using Sensor networks with low power consumption, low cost and high detection accuracy. pH, conductivity,

Turbidity level, etc. are the parameters that are analyzed to improve the water quality. Following are the objectives.

- To measure water parameters such as pH, dissolved oxygen, turbidity, conductivity, etc using available
- Sensors.
- To collect data from various sensor nodes and send it to base station.
- To simulate and analyze quality parameters for quality control.
- To send SMS to an authorized person automatically when water quality detected does not match the preset standards, so that, necessary actions can be taken.

Flow diagram.

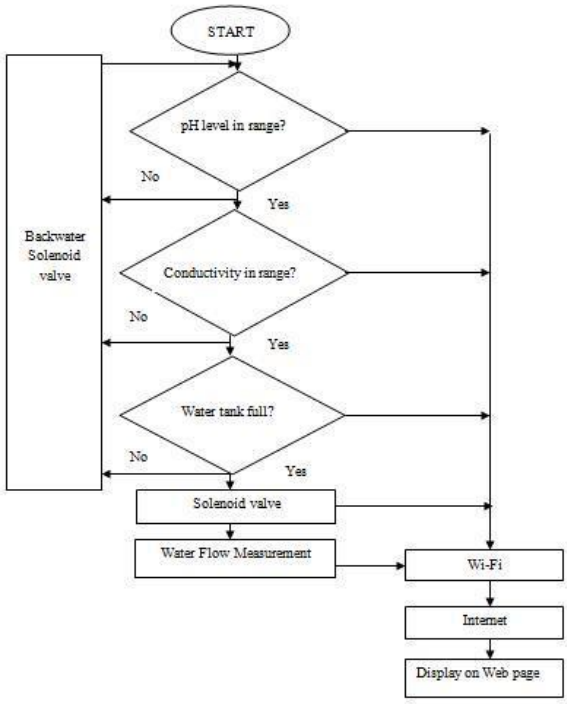


Figure 6. Flow diagram for water monitoring and distribution system.

This system can be implement on water tank for safe and waste less consumption of water. Water is supplied to tank first check the quality of water using pH sensor, turbidity sensor, and Conductivity sensor. If the quality of water in range then it supply further for distribution if it is not in safe ranged then it will not be supply to household tank. The same process will follow till the water does not come in safe range quality. After satisfactory quality checked of water if the tank is full the n valve of the water tank will be open and the water will supply for distribution for various area. During distribution of water rate flow measured by the rate flow sensor for equal distribution of water to the area. The whole data sends though the Wi-Fi to web page which can access only authorized person which contain security for access the whole data. The data sends though a Wi-Fi module is work for sending the data to web page and the whole information display on the webpage. And all the work will done in real time. Also automatic water distribution will done by using a single button for distribution of water.

IV. CONCLUSION

Based on a study of existing water quality monitoring system and scenario of water we can say that propose system is more suitable to monitor water quality parameter in real time. The system can monitor water quality automatically, and it is low in cost and does not require people on duty. The operation is simple .This paper will demonstrate the successful implementation of an internet based approach to measuring water quality and usage on a real time basis.

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