

INDUSTRIAL WASTE WATER MONITORING SYSTEM USING IOT

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ABSTRACT

Industrial wastewater is one of the important pollution sources in the pollution of the water environment. During the last century a huge amount of industrial wastewater was discharged into rivers, lakes and coastal areas. This resulted in serious pollution problems in the water environment and caused negative effects to the eco-system and human's life. In order to ensure the safe flow of the industrial waste water, the quality needs to be monitored in real time. Here, we are going to design low cost Real time Waste water Purity monitoring and indication system (RWPIS) which monitors the water quality. The system consists of several sensors which is used to measure physical and chemical parameters of the water such as temperature, pH, turbidity and salinity. Here the GSM and IoT technology is used to transform the information regarding the Quality of waste water.

Key Words: Water Quality, RWPIS, GSM, IoT, Sensors

1.INTRODUCTION

Industrial pollution takes on many faces. It contaminates many sources of drinking water, releases unwanted toxins into the air and reduces the quality of soil all over the world. Water pollution and soil pollution are often caused directly due to inefficiency in disposal of waste. Long term exposure to polluted air and water causes chronic health problems, making the issue of industrial pollution into a severe one. It also lowers the air quality in surrounding areas which causes many respiratory disorders.

The effects of industrial pollution are far reaching and liable to affect the eco-system for many years to come. Most industries require large amounts of water for their work. When involved in a series of processes, the water comes into contact with heavy metals, harmful chemicals, radioactive waste and even organic sludge.

These are either dumped into open oceans or rivers. As a result, many of our water sources have high amount of industrial waste in them which seriously impacts the health of our eco-system. The same water is then used by farmers for irrigation purpose which affects the quality of food that is produced.

Industrial waste water contains pollutants which when freely discharged into river bodies leads to both physical and chemical changes to the environment such as coloration, biological condition, reduction in quality and quantity of the biotic floral of the human aesthetical assets. As a result of this the cost of pollution control is climbing rapidly.

If untreated waste water is allowed to accumulate, the decomposition of the organic materials it contains can lead to the production of large quantities of the malodorous gases. The untreated waste water usually contains numerous pathogenic or disease causing micro-organisms that dwell in the human intestinal track or that may be present in certain industrial waste. Waste water also contains toxic components which are let out from the industries.

The motivation behind the proposed system was to design a real time monitoring of water quality in a simplest and cost effective manner by measuring Temperature, Turbidity, pH , Salinity in water using Aurdino Board and different sensors in IoT Environment and notifying respective authorities about their water quality. In our design Aurdino Board is used as a core controller. The design system applies a specialized IoT module for storing sensor data (simulated) from core controller to the cloud. The sensor data can be viewed on the cloud using a special IP address. Test results are recorded in cloud so that any previous data of testing can be fetched easily. Results are sent to owners so that required action can be taken by the operator. The factory detail will be uploaded in a social media if necessary action is not taken.

II.EXISTING METHOD

Traditional methods of water quality involve the manual collection of water sample at different locations, followed by laboratory analytical techniques in order the character the water quality. Such approaches take longer time and no longer to be considered efficient. Although the current methodologies analysis the physical, chemical and biological agents, it has several drawbacks:

- (a) Poor spatiotemporal coverage.
- (b) It is labor intensive and high cost (labor, operation; and equipment)
- (c) The lack of real time water quality information to enable critical decisions for public health protection.

Therefore, there is a need for continuous online water quality monitoring.

III.PROPOSED METHOD

By focusing on the above issues we have developed a low cost system for real time monitoring of the water quality in IOT environment. In our design aurdino is used as a core controller. The design system applies a specialized IoT module for accessing sensor data (simulated) from core controller to the cloud. The sensor data can be viewed on the cloud using a special IP address.

IV. TABULATION

BOD Level

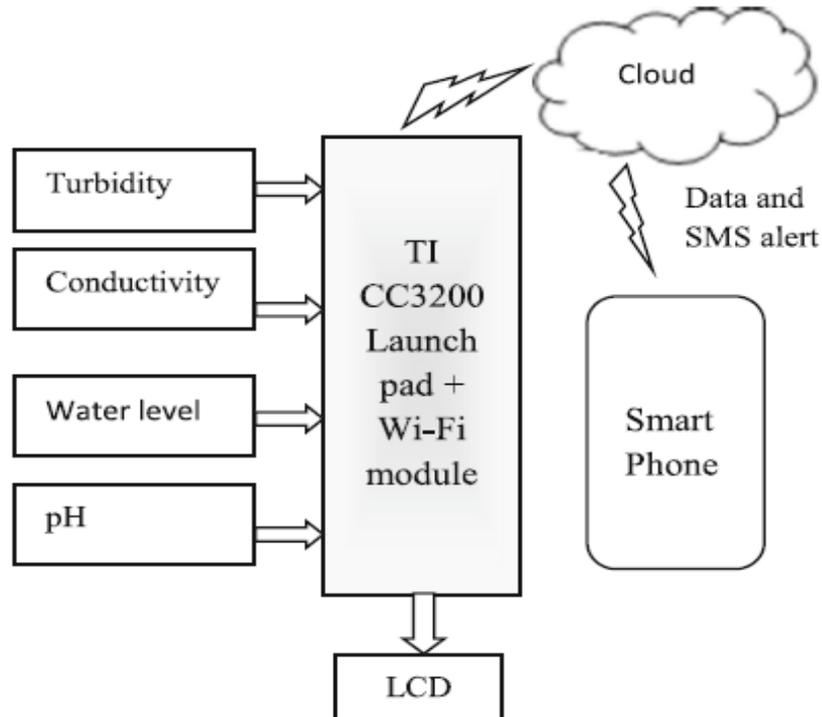
| <u>BOD Level</u> (in ppm) | <u>Water Quality</u> |
|------------------------------|--|
| 1 - 2 | Very Good There will not be much organic waste present in the water supply. |
| 3 - 5 | Fair: Moderately Clean |
| 6 - 9 | Poor: Somewhat Polluted Usually indicates organic matter is present and bacteria are decomposing this waste. |
| 100 or greater | Very Poor: Very Polluted Contains organic waste. |

IV. LITERATURE SURVEY

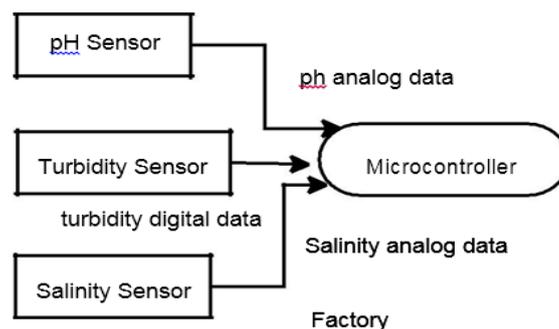
1. "A low-cost system for real time monitoring and assessment of potable water quality at consumer sites" paper presented by T.P.Lambrou, C.G. Panayiotou and C.C. Anastasiou This paper says how water can be monitored in real time. From this we got a idea of how the water quality can be monitored in real time, also how using internet the results of the tested water could be viewed and further actions could be taken up.
2. Solid-state sensors monitoring parameters of water quality for the next generation of wireless sensor networks." paper presented by S. Zhuiykov. This paper gives information about using sensors to test the quality of water. From this paper we got to know that we could use sensors or simulated module to test the quality of water from the various simulated sensor values.
3. A Portable Sensor With Disposable Electrodes for Water Bac-terial Quality Assessment." paper presented by Marco Grossi, Roberto Lazzarini, Massimo Lanzoni, Anna Pompei, Diego Matteuzzi, and Bruno Ricco. Based on impedance measurements, this paper presents a portable sensor implemented as an electronic embedded system featur-ing disposable measurement cells, which is suitable of measuring bacterial concentration in water samples. From this paper we got to know that different sensors available in the market could be used to test different parameters of the water quality. Our testing of water quailty involves parameters like temperature, pH, conductivity and turbidity from the simulated values generated through software at the IoT core.

V.DESIGN IMPLEMENTATION

Industrial waste water contains pollutants which discharged into river bodies leads to both physical and chemical changes to the environment such as coloration, biological condition, reduction in quality and quantity.



Here, we are going to design a low cost Real time Waste water monitoring system which monitors the water quality. The system consists of several sensors which is used to measure physical and chemical parameters of the water such as temperature, pH, turbidity and salinity. Here the GSM and IoT technology is used to transform the information regarding the Quality of waste water.



Here all sensors are connected to the microcontroller to extract the data of the sensors which are dipped in the industrial sewage water. The data fetched from the sensors are converted into digital signals.

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VI.CONCULSION

Water pollution is a major environmental issue in India. The largest source of water pollution in India is untreated sewage. Other sources of pollution include agricultural runoff and unregulated small scale industry. Most rivers, lakes and surface water in India are polluted.

By our product we can monitor the untreated waste water draining from the industries. If this product is mandatory for monitoring industrial effluents then the water pollution can be easily controlled. And maintain the river water quality as per the environmental standard .for that purpose the committee should consider our project for the next phase of the competition.

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