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Automatic Monitoring and Control of Unrefined Water Pollution from Industries Using GSM

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ABSTRACT: Smart solutions for water quality monitoring are gaining importance with advancement in communication technology. This paper presents a detailed overview of recent works carried out in the field of smart water quality monitoring. The water quality of rivers is deteriorating day by day due to discharge of untreated sewage and industrial affluent. However, the data regarding location of discharging point, amount of sewage/affluent, quality of sewage/affluent, source, etc. are scantly available. It is proposed to gather these information through internet of things. Water management local authorities are monitoring the pollution level of factories surrounded by river watersheds. The industries are need to register and login for submitting water contamination details. The model developed is used for testing water samples and the data uploaded over the Internet are analyzed. The system also provides an alert to a remote user, when there is a deviation of water quality parameters from the pre- defined set of standard values. To set up a complete set of automatic water quality monitoring and evaluating system including water quality monitor, data transmission, data processing, data query, trend analysis, geography information system and issue on net by test, in- out doors demarcation and value analysis is the aim of the article. The system takes full advantage of environmental monitor, analytical chemistry, computer communication to reflect the variation of water quality. The system gives a great deal of information for decision-making on disposal of water pollution and water environment ecological compensation. As emergency pollution management system is a complete system composed of data layer, model layer, the system interface layer and network layer. It also has early warning functions such as the real-time monitoring of water quality and water quality prediction of water pollution

I. INTRODUCTION

Water is one of the renewable resources essential for sustaining all forms of life, food production, economic development, and for general well being. It is impossible to substitute for most of its uses, difficult to de pollute, expensive to transport, and it is truly a unique gift to mankind from nature. Water is also one of the most manageable natural resources as it is capable of diversion, transport, storage, and recycling. All these properties impart to water its great utility for human beings. The surface water and groundwater resources of the country play a major role in agriculture, hydropower generation, livestock production, industrial activities, forestry, fisheries, navigation, recreational activities etc. The fresh waterof ecosystem of the world comprise only about 0.5% of the earth's surface and have a volume of 2.84x105km. Rivers constitute an insignificant amount (0.1%) of the land surface. Only 0.01% of the waters of the earth occur in river channels. Inspite of these low quantities, running waters are of enormous significance (Wetzel, 2001). India receives annual precipitation of about 4000 km including snowfall.

II. LITERATURE SURVEY

1 A novel water pollution monitoring approach based on 3s technique

The Use of 3S techniques can provide a firm foundation for the dynamic monitoring and forecasting of water pollution and cause effective control of water environment, as it has no limit to space-time and region and can provide a timely, accurate and fast access to water pollution monitoring, so it will be a great revolution in utilization of water resources. The developed forecasting system is designed to predict water pollution variables using remote sensing data.

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2 Development of IOT for Automated Water Quality Monitoring System

The need for water consumption not only for humans but also the other living things as natural supporting elements for continuity of life. Water consumption depends on the availability of water resources like rivers, lakes, and reservoirs. Certainly, water becomes limited natural resources most of them because of water pollutions. It is necessary to manage water quality to fulfil the sustainability of water functions as natural resources, we create an integrated system based on Internet of Things to measuring the water quality by developing environmental water management monitoring system using sensors. The use of raspberry pi as an embedded system will help in the manufacture of detecting sensors device and the use of remote communications technology can help the interaction of sending data between things. The result is the IoT water quality monitoring system can be operated as an automated water monitoring system for surface water and it's real-time online.

3 Design of Monitoring System for Rural Drinking Water Source Based on WSN

In order to solve the existing traditional rural drinking water monitoring in a lot of manpower, material resources, real-time, this paper introduces a WSN based on the rural drinking water source monitoring system design, the system consists of five parts: water quality monitoring, soil monitoring node node, node, routing node and gateway server. Water quality monitoring node, soil monitoring nodes send the collected data to the gateway node through the wireless module sent directly, or through the routing gateway node to the gateway node, each node of the data collection, unified by the GPRS module to upload server. The system can periodically detect the water quality and the important indicators of the soil in the rural water sources, and combine the water pollution with the soil non-point source pollution to realize on-line monitoring and provide guidance for pollution control. Network test shows that the designed system can realize data acquisition and remote transmission, stability, range of dissolved oxygen system for 1.09%~1.86% acquisition error, pH error is in the range of 0.64%~1.68%, Cu concentration in the range of error is 1.98%~2.22%, Cu concentration in the range of error is 1.58%~ 2.01%.

4 Research on water environment automatic monitoring evaluation system for ecological compensation

The article starts with different water function and volume of hydrological datum based on entire area of big cities .To set up a complete set of automatic water quality monitoring and evaluating system including water quality monitor, data transmission, data processing, data query, trend analysis, geography information system and issue on net by test, in-out doors demarcation and value analysis is the aim of the article. The system takes full advantage of environmental monitor, analytical chemistry, computer communication to reflect the variation of water quality. The system gives a great deal of information for decision-making on disposal of water pollution and water environment ecological compensation.

5 Monitoring and Classification System of River Water Pollution Conditions with Fuzzy Logic

The development of the current era, and the rapid development of technology and the need for a significant increase in demand, as well as pollution, the water sector, especially the river has experienced a decline in water quality even to the occurrence of pollution, resulting in water can no longer be consumed either by human body also for other needs. Some of the systems that were developed began to be able to process

existing data, be it conditions from water, chemical observations or physically. This is done because water is a necessity that cannot be tolerated, so this research is done to help fulfill or even provide a calm warning of water quality. With the development of Intemet of Things (IoT) the monitoring system will develop, because with the existence of technology such as low-power wide-area network (LPWAN) as specific as possible, short data can be sent using lower power. In this research, it was proven that the author could make a monitoring system and classification of river water pollution. By using an artificial intelligence, using the fuzzy logic method. The results of system testing show that the average accuracy of the monitoring system results is 99.7% and the results of the appropriate classification values are based on the results of system testing.

6 The Application of 3s Technique in Water Pollution Monitoring and Forecasting

With the increasingly prominent of the water pollution problem and the rapid development of the 3S technique, The monitoring and forecasting of water pollution system combine with 3S becomes possible. Water pollution control has been developed for many years, but is limited to the study of trends instead of making accurate short- term . With the

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III. METHODOLGY

It is to design an efficient and robust system to control the parameters causing pollution and to minimize the effect of these parameters without affecting the plant or natural environment. The proposed methodology is to model a system to read and monitor pollution parameters and to inform pollution control.

The system investigates level of pH in industry effluents, With the design of GSM, the signals can be effectively transferred and the actions in these cases can still be made accurate and effective.

It is necessary to manage water quality to fulfil the sustainability of water functions as natural resources, we create an integrated system based on Internet of Things to measuring the water quality by developing environmental water management monitoring system using sensors. The use of raspberry pi as an embedded system will help in the manufacture of detecting sensors device and the use of remote communications technology can help the interaction of sending data between things.

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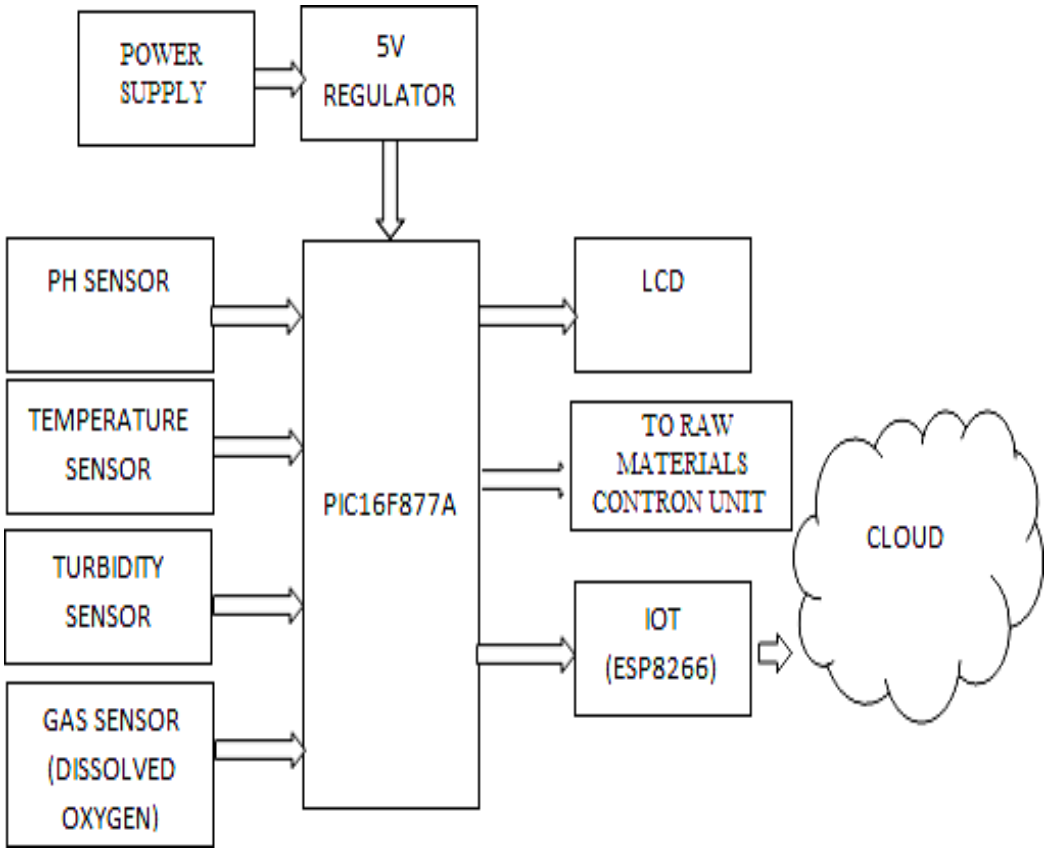
BLOCK DIAGRAM:



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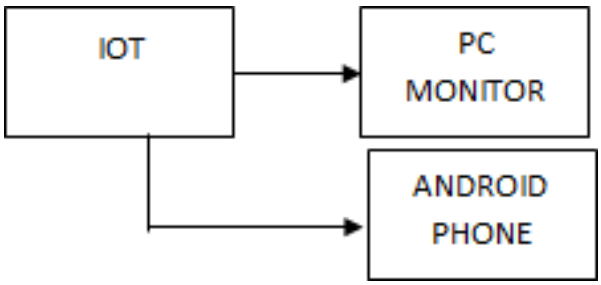
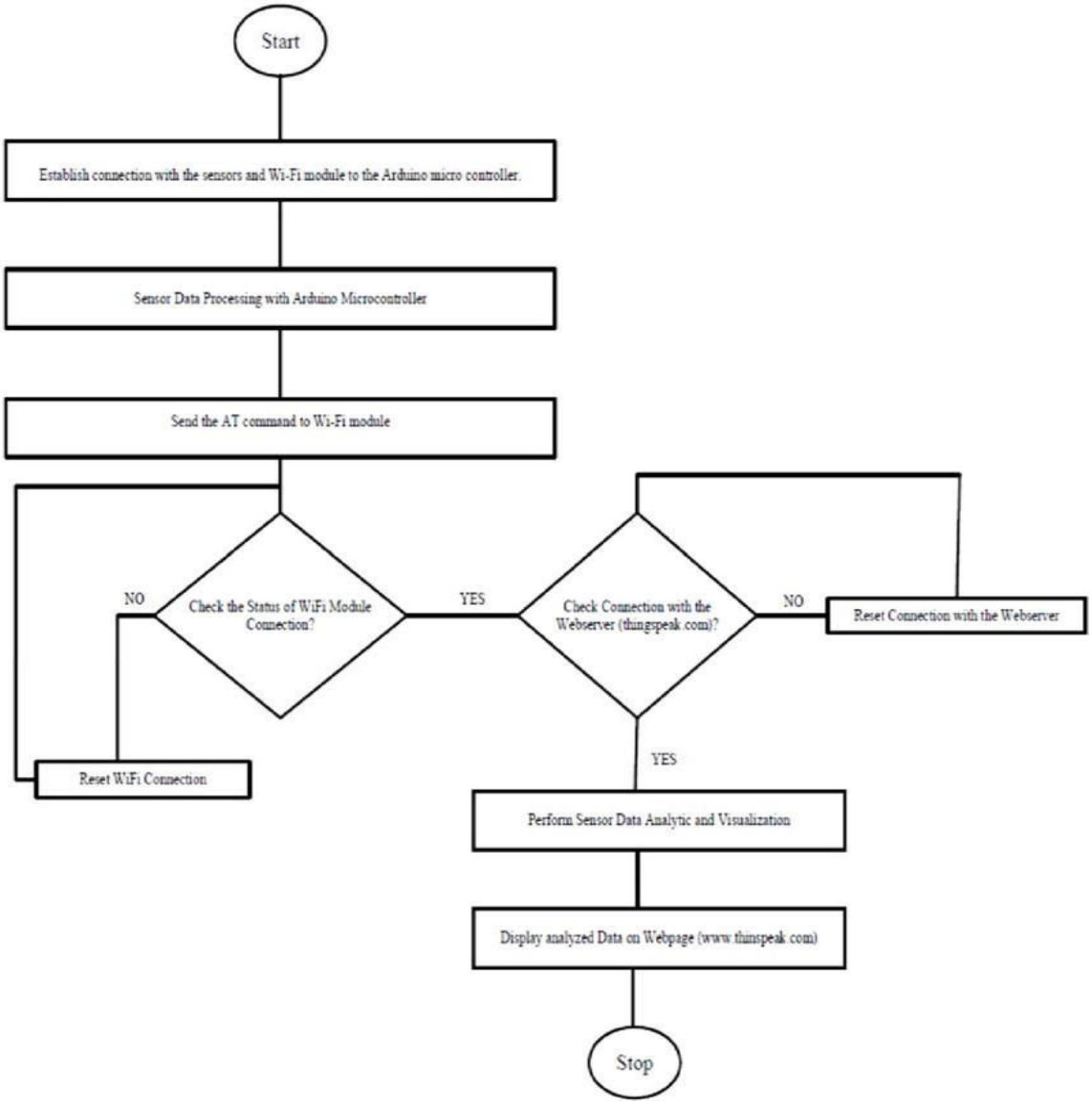


MONITORING SECTION

PROPOSED SYSTEM



The main aim of this propose system to overcome the problem of manual filtration of water. In this proposed system the filtration of water is automated at remote places using wireless sensor networks, micro controller and high accuracy. pH, conductivity, turbidity level, etc are the parameters that are analyzed to improve the water quality.
In this, we present the theory on real time monitoring of water quality in IoT environment. The overall block diagram of the proposed method is explained. Each and every block of the system is explained in detail.

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This proposed block diagram consist of several sensors (temperature, pH, turbidity, flow) is connected to core controller. The core controller are accessing the sensor values and processing them to transfer the data through internet Following are the objectives of idea implementation :

- To measure water parameters such as pH, temperature , turbidity, salinity and industrial chemicals or the oils which are wasted in river etc by using available sensors at remote place.
- To collect data from the given sensors and send it to base station and the server(data base) or Health department or waterpollution control/monitoring department by GSM module. To analyze quality parameters for quality control
- To send notification to an authorized person automatically when water quality is degraded and it does not match the given standards.
- So that, the purification or the filtration of polluted water automatically turn on by micro-controller.

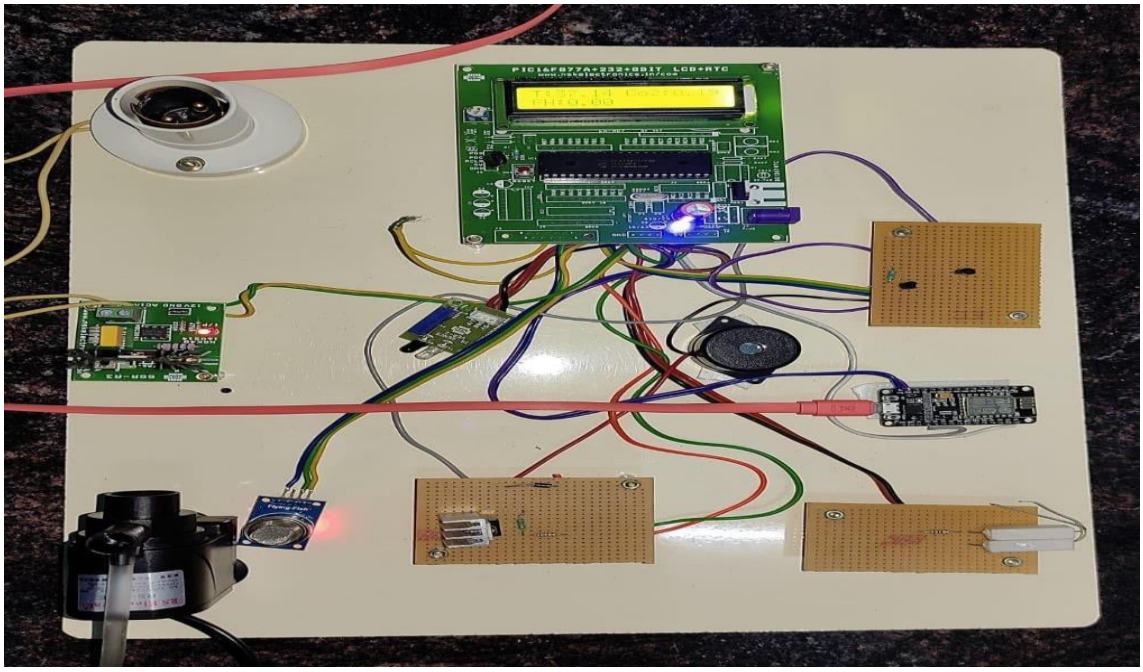
IV. WORKING PRINCIPLE

The water which is pollutant from industries is passed in a unfiltered way then the sensor senses the water using temperature, turbidity, gas and pH all the analong singal passes into the PIC microcontroller(PIC16F877A). Here the analog signal is converted to digital signal and the values are compared with the reference normal value of water so any differeces in the value it passes the signal to LCD, raw material control unit and IOT (ESP8266) .From the wi-fi module Esp8266 the data is stored in the cloud and given acess to the bing and mobile application.so the pollution can be controlled from industries

V. RESULT

We have identified a suitable implementation model that consists of different sensor devices and other modules, their functionalities are shown in figure. In this implementation model we used PIC16F877A with Wi-Fi module. Inbuilt ADC and Wi- Fi module connects the embedded device to internet. Sensors are connected to PC monitoring board for monitoring, ADC will convert the corresponding sensor reading to its digital value and from that value the corresponding environmental parameter will be evaluated .After sensing the data from different sensor devices, which are placed in particular area of interest. The sensed data will be automatically sent to the web server, when a proper connection is established with sever device.

Connection:



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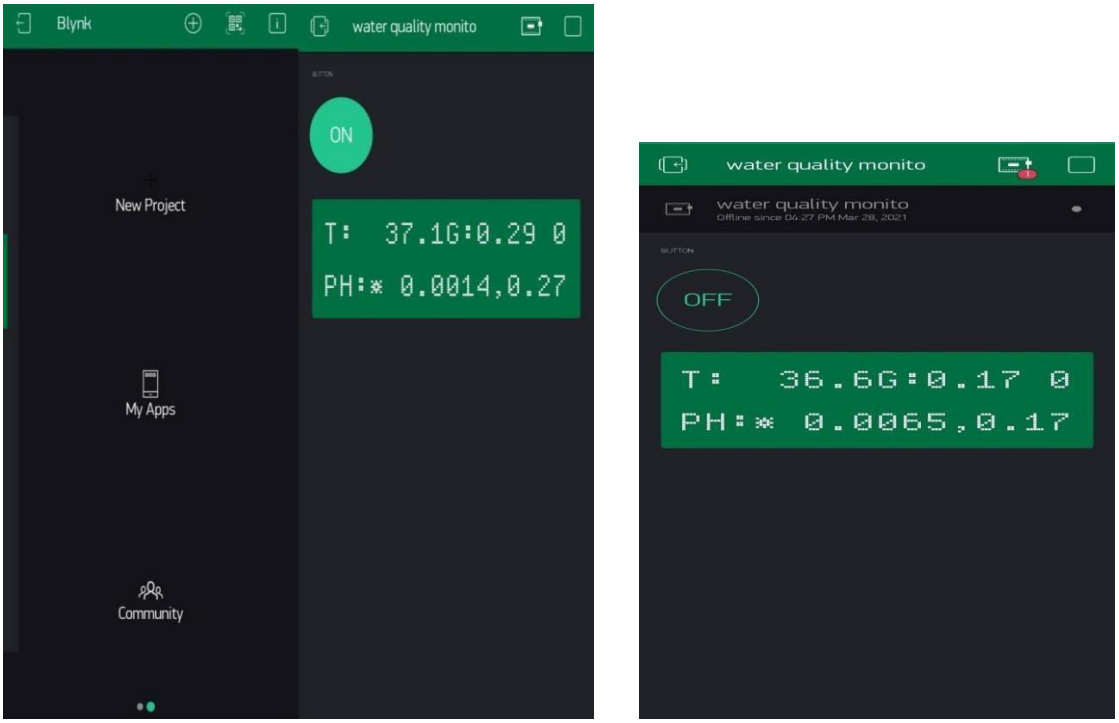
Experimental setup Output for an LCD Display



Mobile application

VI. CONCLUSION

Monitoring of Turbidity, PH & Temperature of Water makes use of water detection sensor with unique advantage and existing GSM network. The system can monitor water quality automatically, and it is low in cost and does not require people on duty. So the water quality testing is likely to be more economical, convenient and fast. The

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system has good flexibility. Only by replacing the corresponding sensors and changing the relevant software programs, this system can be used to monitor other water quality parameters. The operation is simple. The system can be expanded to monitor hydrologic, air pollution, industrial and agricultural production and so on. It has widespread application and extension value. By keeping the embedded devices in the environment for monitoring enables self protection (i.e., smart environment) to the environment. To implement this need to deploy the sensor devices in the environment for collecting the data and analysis. By into real life i.e. it can interact with other objects through the network. Then the collected data and analysis results will be available to the end user through the Wi- Fi.

VII. FUTURE WORK

- In future we use IOT concept in this project
- Detecting the more parameters for most secure purpose
- Increase the parameters by addition of multiple sensors
- By interfacing relay we controls the supply of water

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