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Water Quality Monitoring System Using IOT

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ABSTRACT: According Commission on Human rights, 20 million people in our country are still drinking contaminated water. To avoid water-related diseases and reduce pollution, we have continuously rate water quality parameters. Data is manually collected from various sources in preliminary locating methods of water monitoring. To tackle these questions, new water monitoring devices must be employed. The main goal of this work is to build a system that uses the Iot to continuously monitor water quality parameters. Various sensors are used in proposed model. The proposed model employs various sensors to measure the required parameters. With the help of a core controller, the measured parameter values from sensors are processed. Arduino is the core controller used for the entire model. Using a Wi-Fi module, measured data from sensors are viewed.

KEYWORDS: Arduino module, wi-fi module, Turbidity sensor, MH-MQ sensor, Temperature sensor

I. INTRODUCTION

Water is the first component for the survival of human creatures and other living living beings. For Drinking, Cooking and other residential employments, great quality water is the fundamental require for human wellbeing. In the event that we don't keep up the water quality it would cause numerous health-related issues. There's a necessity for the improvement of modern strategies for genuine time water quality observing. In this work, we propose a genuine time water quality checking framework based on IOT. Our framework comprises of a core-controller, Wi-Fi module and different sensors. This setup is exceptionally little and simple to fit up indeed in little tanks, labs, etc.

II. LITERATURE REVIEW

Researchers have been continuously working on the concept of water quality monitoring to ensure a safe and healthy life for the human race. Various ideas and a number of aspects are being focused as the core research area for providing quality water for consumption. The basic idea behind all these works is to develop a simple and effective real time water quality monitoring system. A small review of the already proposed ideas in this area is listed here.

Jayati B and Jignesh P have displayed a paper entitled “Real Time Water Quality Checking System” that depicts a novel water quality checking framework based on the concepts of IOT. Different parameters that characterize the quality of water such as conductivity, turbidity and temperature are measured utilizing reasonable sensors. These values are at that point prepared employing a microcontroller. Raspberry pi and Zigbee convention are utilized in this work to handle and exchange the information to the IoT stage. Cloud computing concepts are utilized to store the information and use them for long haul alterations.

Mithila Barabde and Shruti Danve have proposed a work entitled “Real time water quality monitoring system”. This work tries to replace the conventional lab tests with a novel method that measures the water quality parameters remotely. It employs a base station and a remote station; a number of sensors and a wireless communication link is used to connect all these nodes with the sensors. Data obtained from the sensors are visualized using MATLAB and compared with the standard values to provide continuous monitoring of the system.

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III. WORKING MODEL

To degree the veritable time parameters of water, sensible sensors are chosen. These sensors are interconnected with the center controller. The Hub MCU Arduino is utilized as center controller. The Analog Flag from the sensors are changed over into advanced signals with the assistance of Hub MCU Arduino. These signals are changed over utilizing an ADC (Analog-to-Digital converter) to a voltage run that lies in a extend between to 5 V. When diverse signals from sensors are studied by the center controller, the crude information are changed over into usable information with the assistance of appropriate condition. Unmistakable component utilized here is screen. The information gets from each sensor are appeared in screen. The ESP8266 module is utilized as Wi-Fi module. The ESP8266 module comprises of Wi-Fi transmitter and beneficiary. Utilizing an advanced Wi- Fi system, the measured data are transmitted and put absent in database.

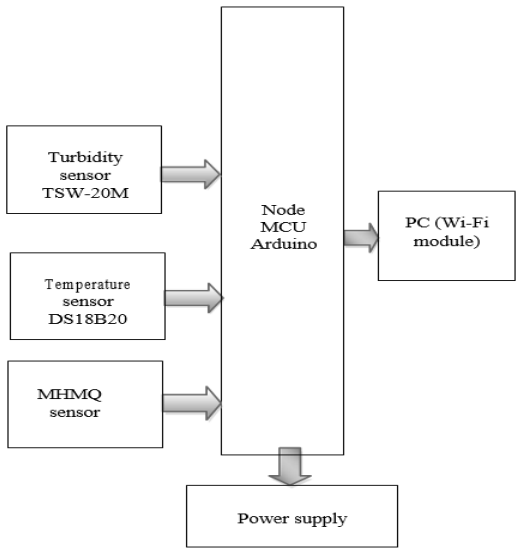

Fig.2.Block diagram

Fig.1.Block Diagram

3.1. SYSTEM DESIGN MODEL

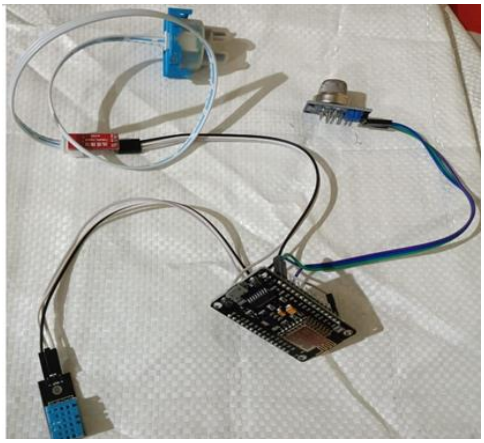

Fig 2. Framework plan show of water quality checking framework utilizing IOT.

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3.2 SPECIFICATIONS

Table 1: Components and its specifications

Component	Model	Range
Micro controller	Node MCU Arduino	16MHz
Wi-Fi Module	ESP8266	2.412GHz-2.484GHz
MH-MQ Sensor	MQ2	200-10000 ppm
Temperature Sensor	DS18B20	-55 to +125 C
Turbidity Sensor	TSW-20M	0%~3.5 % (0-4550NTU)

Table 2: Sensors and Arduino Interface details

Name of the sensor	Sensor pin	Arduino pin
MQ2	BO	D1
	GND	GND
	VCC	5V
TSW-20M	White	A0
	Black	GND
	VCC	3V
DS18B20	GND	GND
	+ Out -	3V
	+ Out -	D4

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IV. DISCUSSION AND RESULT

4.1 DISCUSSION

In the proposed work, a certain number of samples obtained from various water resources are tested. A proper model with required sensors and interconnecting devices is implemented, and it is controlled by a central processor. Major parameters taken into account in this work include turbidity and MHMQ (Methen) of water. Two different samples are initially tested to obtain the respective values. The measured values are examined in Table 3. Once this handle is over, contaminants are included to the tests and after that the water quality parameters are measured once more. The impact of contaminants on water quality parameters can in this way be chosen. These comes about have been tabulated in Fig 5. With the assistance of ESP8266 module able to transmit the gotten information to the IoT stage and they may be put away in database for advance preparing of data.

4.2 RESULT

Table 3: Water Quality Parameters measured for various samples

Variables	Quality range	Test Sample 1	Test Sample 2
MHMQ sensor	0-1	0	1
Turbidity	1-5	1.45	2.07
Temperature	0-50	33	29

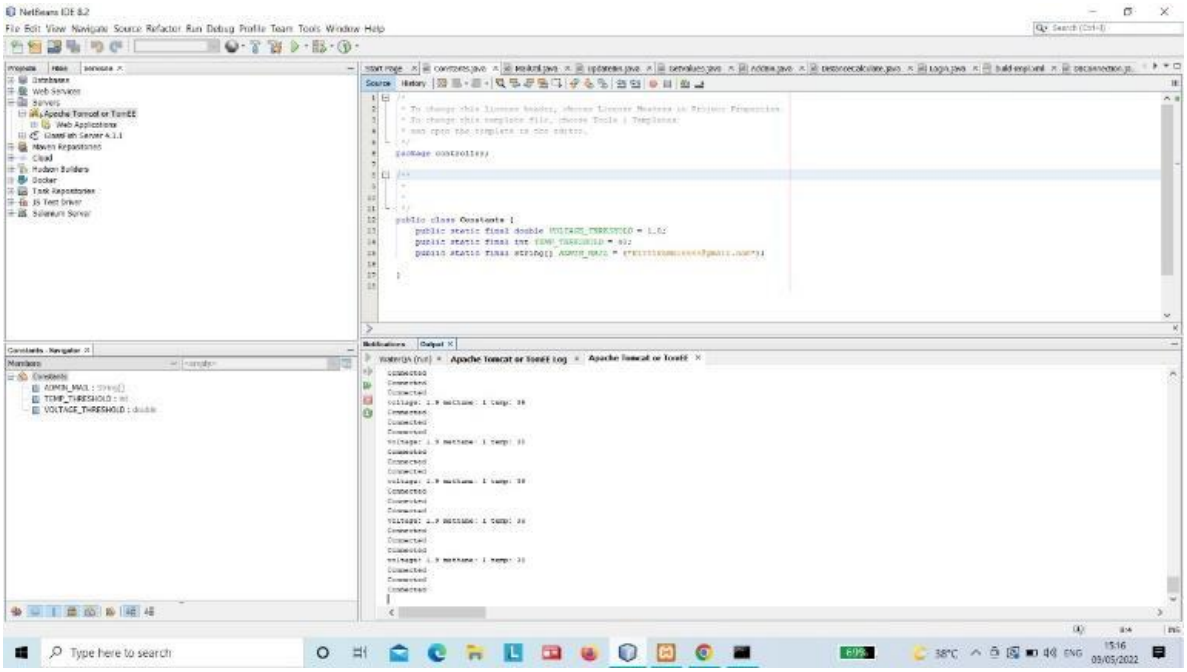

Fig. 3 Sensors values display on monitor

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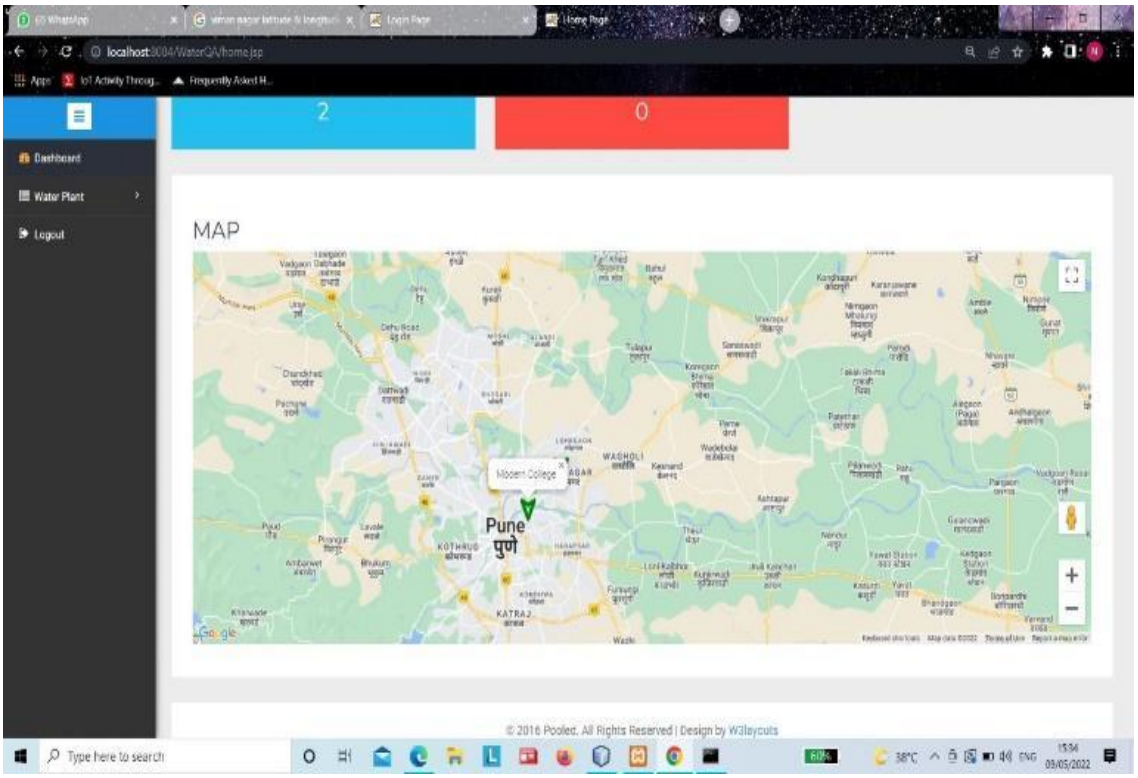

Fig 4. Navigation on map

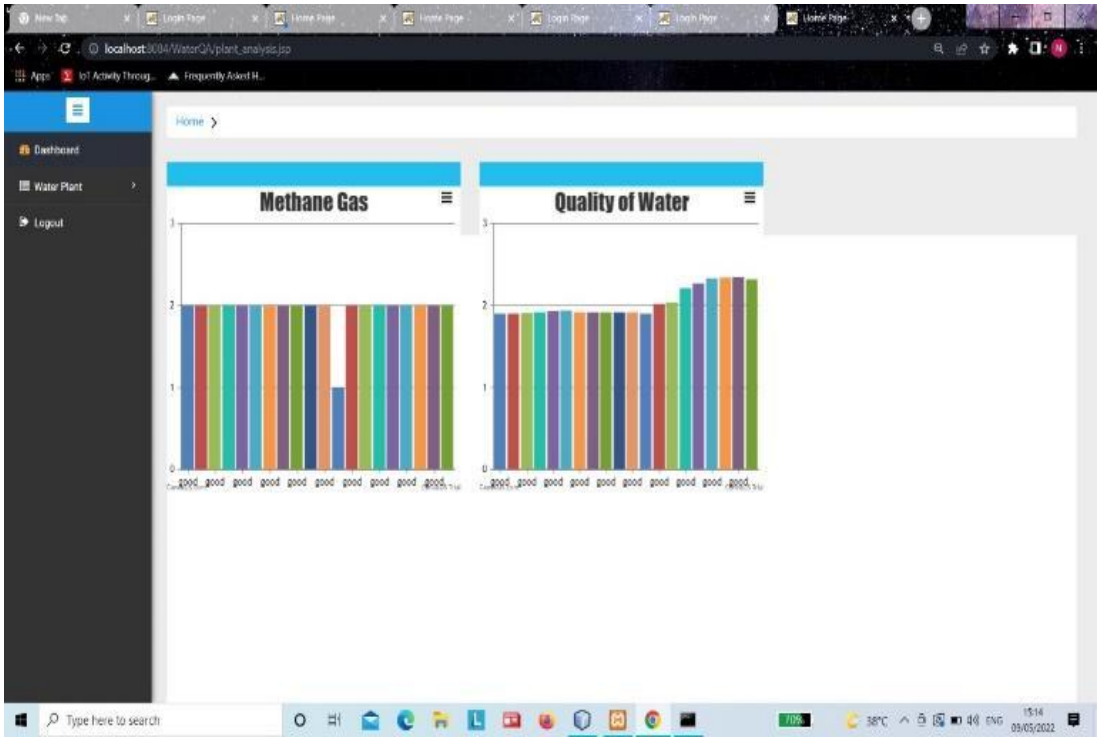

Fig 5. Shows the graph based on sensors rightness

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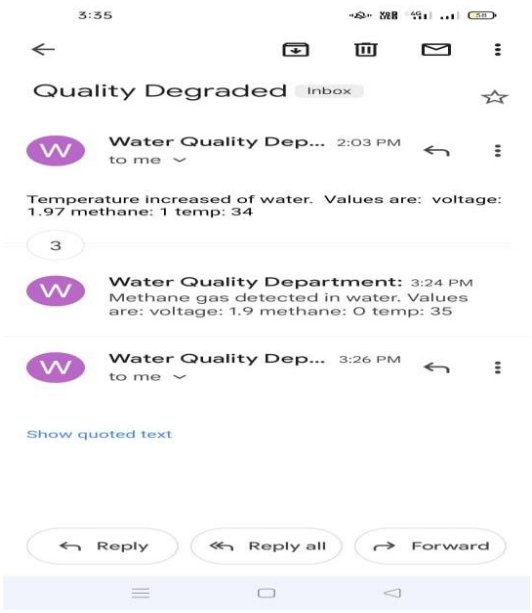

Fig 6. Mail has been sent to the end user

V. CONCLUSION

Various parameters including turbidity and MH-MQ of water are continuously monitored with the help of various sensors. As the framework does not require any manual intercession, working fetched of the framework is profoundly decreased. The same system can be used to check other parameters related to water quality by including more sensors and the required software programs for their operation. The Internet of things actualized in this framework empowers the sensor to supply online information to the client. This data could be stored and operated on to obtain the changes in water quality parameters. The proposed system is expandable and it can be used in various other fields like pollution control.

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