Design and Development of Water Quality Monitoring System in IOT

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Abstract:
Due to the effect of dirtied water all inclusive enormous changes are occurring towards improvement of a reconfigurable brilliant sensor interface gadget for water quality observing framework in an IOT situation. Water quality checking framework quantifies the water level parameters are gathered by the sensors. The sensors are sending to the microcontroller board. We are utilizing sensors like CO_2, temperature, ph sensor, water level sensors and turbidity sensors. This sensor controls the entire activity and observed by Cloud based remote specialized gadgets. The microcontroller framework can be viewed as a framework that peruses from the information perform handling and writes to yield. For his Water checking framework yield will be in advanced structure. Right now these sensors legitimately goes to the microcontroller. At whatever point yields of different sensors are in simple structure. At that point we have to change over the simple qualities to advanced qualities before interfacing with the controller. Right now quality is unadulterated as sensors assume a significant job for water quality observing framework, the time and expenses in distinguishing water nature of a supply as a feature of the earth.

I. INTRODUCTION:

There were heaps of developments, and yet were contaminations, an Earth-wide temperature boost, etc are being shaped, in light of this there is no sheltered drinking water for the world's contamination. These days, water quality observing continuously faces difficulties in light of an unnatural weather change constrained water assets, developing populace, and so forth. Henceforth there is need of growing better strategies to screen the water quality parameters progressively [8]. Right now structure a minimal effort framework for constant water quality observing utilizing IOT (web of things).In this framework we utilized a few sensors for estimating the physical and synthetic parameters of the water. The brilliant water quality frameworks comprise of a raspberry pi controller. These water quality parameters pHs measure the hydrogen particles. It will show the water is acidic or alkaline7PH is the unadulterated water [3]. Universally the water we are utilizing for different ways for farming, businesses and travel which may influence the water quality. Right now are utilizing temperature sensor is utilized to gauge temperature esteems for how the water is hot or cool. Day by day we are utilizing remote correspondence advancements and remote sensor systems giving safe drinking water of different utilizations of remote framework. Presently a day's it is exceptionally helpful to utilize water level sensor to gauge the water level amount of the agri business and soon.

whenever water is filled than we will create some alarm intimation sound [1]. Here

we have created 3 levels (low, high, medium) for this we designed a real-time water quality monitoring system in IoT environment. All the collected data from different sensors will be sent to the cloud using WIFI through internet. Here UBIDOTS is used as cloud platform to send all the sensor data[11]. The system consists of several sensors to measure water parameters and the raspberry PI B+ model as a controller with inbuilt WIFI module. Wireless Sensor Networks (WSN) originally was used in industrial applications and military but today different applications are used for various tasks from light to heavy industrial applications [6]. The water quality monitoring is one of the first steps required in the development and management of water resources.

II LITERATURE REVIEW:

"Real Time Water Quality Monitoring System". In this paper they discuss about safety of drinking water, the quality should be monitored in real time for that purpose they used Zigbee technology. This system consists of sensors like pH, turbidity, temperature by using these sensors they measures the quality of water. In this system they used zigbee technology so that all sensors data are sent to the monitoring section, the monitoring section consist of zigbee receiver which is connected to thePC[1].

Nikhil Kedia entitled "Water Quality Monitoring for Rural Areas-A Sensor Cloud Based Economical Project" This paper highlights monitoring methods, sensors, embedded design for measure water quality and also explores the Sensor Cloud domain. While automatically improving the water quality is not feasible at this point, efficient use of technology and economic practices can help improve water quality and awareness amongpeople[11].

Ch. Pavankumar, S. Praveenkumar they propose a system which monitor air and water quality based on Bluetooth platform. The system consists of various sensors like temperature, humidity, gas and salt. Also they used ultrasonic sensor to measure underwater obstacle. In this system the all sensors data are directly send to user's mobile phone by using Bluetooth. For monitoring air and water quality they used android application which will access all sensors parameters from the system [2].

AainaVenkateswaran, HarshaMenda P, Prof PritiBadar presents Smart Sensors for Real-Time Water Quality Monitoring using ZigBee.The system is able to measure physiochemical parameters of water quality, such as flow, temperature, pH, conduction and also the redox potential. These physiochemical parameters are used to detect water contaminants. The sensors which are designed from first principles and implemented with signal conditioning circuits are connected to a microcontroller-based measuring node, which processes and analyses the data. In this design, ZigBee receiver and transmitter modules are used for communication between the measuring and notification node. The notification node presents the reading of the sensors and outputs an audio alert when water quality parameters reach unsafe levels[6].

III Existing System:

The water quality observing framework was recently created; in that framework they utilized different sensors to gauge water quality. For checking reason they utilized Bluetooth and zigbee innovation [1], [2].But both correspondence advancements have a few hindrances like they have short separation for correspondence so the client ought to be inside the range for observing parameters. The information

from the sensors are transmitted from the server, couldn't be transferred to the cloud server which is because of detachment at the hub during transmitting information from sensors [11]. Right now is issue slacked information is transferred to the cloud server in the middle of due to zigbee innovation. For setting up this innovation it requires more measure of equipment and it is expensive. Likewise in that framework there is no ready sign when parameters are irregular.

IV Proposed System:

Block Diagram:
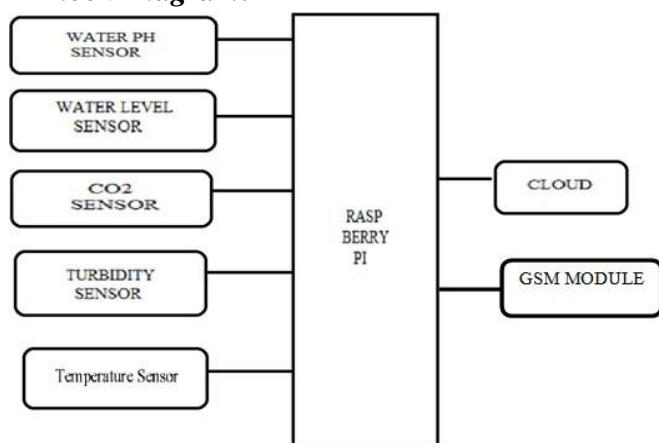
Figure 3.1: System Block diagram

V Flowchart:
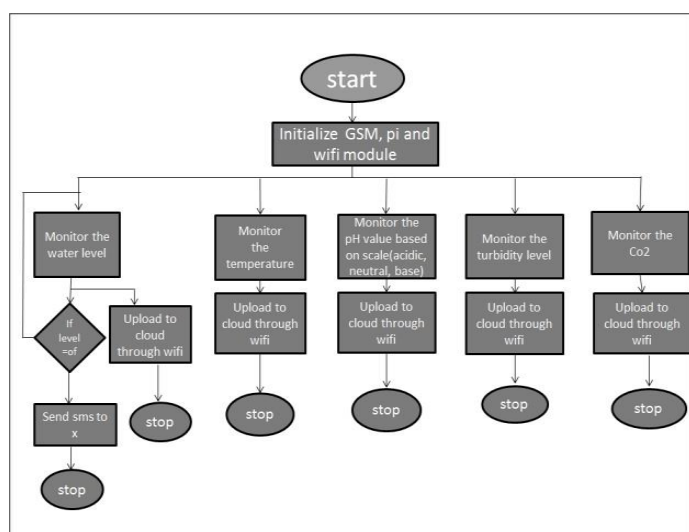
Figure 3.3: System Flowchart

VII System Architecture:
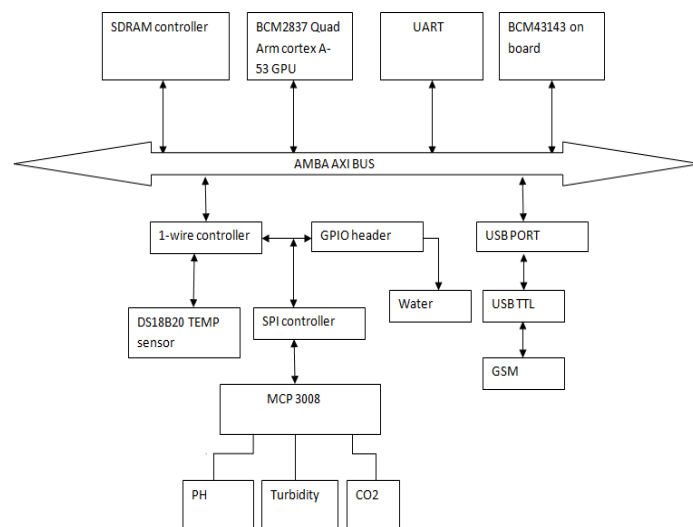
Figure 3.4: System Architecture

VIII. RESULTS & DISCUSSION:

The water level sensor is used to detect and indicate the level of the water in the tank. Sensing is done by using the probes at 3 different levels based on the level of water as shown in the fig (4.2),fig (4.3),fig (4.4).Turbidity sensor quantitative measure of suspended particles in the fluid or liquid. Water with high turbidity is murky, while water with low turbidity is clear. As shown in figure (4.8), fig (4.9). pH sensor, commonly used for water measurements, is a measure of acidity and alkalinity, or the caustic and base present in a given solution based on its nature as shown in the fig(4.5),fig(4.6),fig(4.7). One-wire temperature sensors like the DS18B20 are devices that can measure temperature with a minimal amount of hardware and wiring. These sensors use a digital protocol to send accurate temperature readings directly to your development board without the need of an analog to digital converter or other extra hardware as shown in the graph fig (4.10)&fig(4.11) Sensitive material of MQ-2 gas sensor is SnO2, which with lower conductivity in clean air. When the target

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combustible gas exist, the sensor's conductivity is higher along with the gas concentration rising. As shown in fig (4.12), fig (4.13) GSM module is used for the alert indication when the water overflows.

Figure 4.1: Hardware module ofsystem
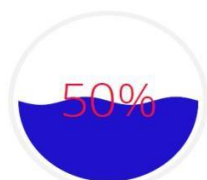

Figure 4.2: Water level at level1(LOW)

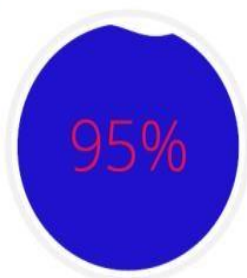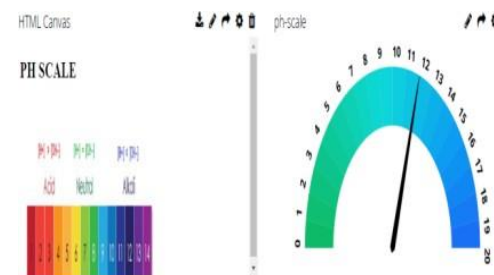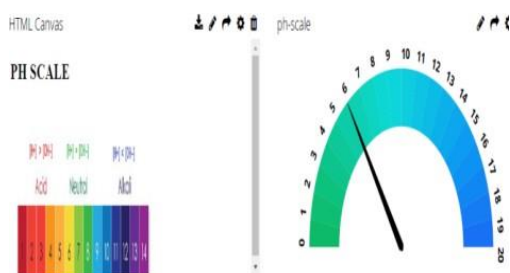**Figure 4.3: Water level at level2 (MEDIUM)**

Figure 4.4: Water level at level3 (HIGH)

Figure 4.5: pH values in acidic

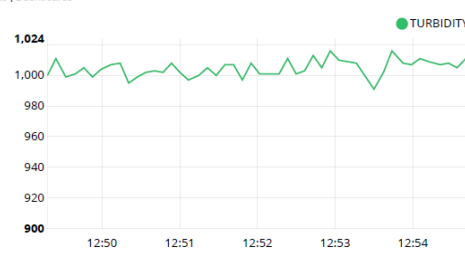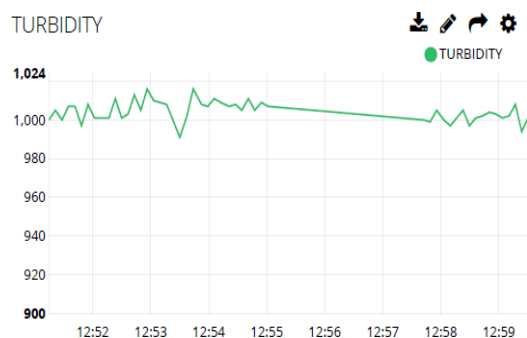**Figure 4.6: pH values in alkaline**
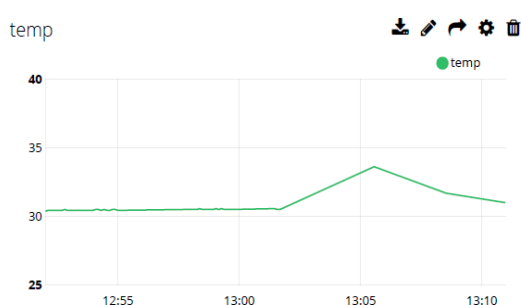
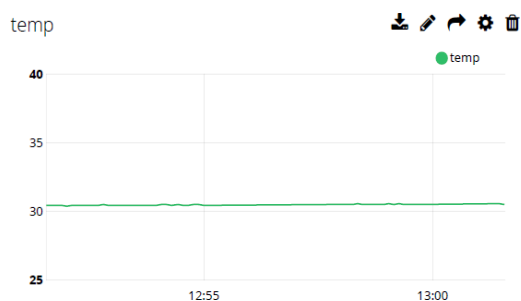**Figure 4.7: pH values in neutral**

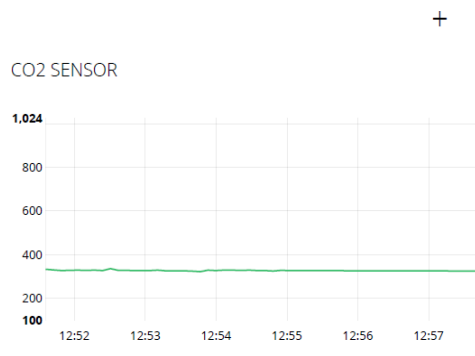**Figure 4.8: normal is water flowing**

Figure 4.9: muddy water is flowing

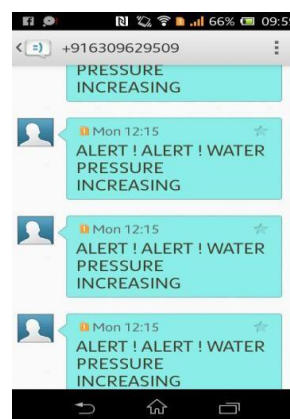**Figure 4.10: temperature values increases**

Figure 4.11: temperature values is normal

Figure 4.12: Co2 level is normal

Figure 4.13: Co2 level is more

Figure 4.14: Alert msg when water level is high

XI Conclusion & Future scope:

The conclusion of the parameters of water quality monitoring system is verified that the system achieved the reliability and feasibility of using it for the actual monitoring purposes. Monitoring of Turbidity, PH & Temperature of Water makes use of water detection sensor with unique advantage. The sensors are control the project the system can monitor water quality automatically, and it is low in cost and does not required people. The future Scope of this paper is, we can also remove GSM hardware and we can receive the emergency alerts to mobile phone from cloud server through internet due to his cost is reducing and hardware also reduced.

X References:

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