Real Time Water Quality Monitoring using IOT

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***Abstract*— as we as a whole realize drinking water is a vital piece of our lives, so there is a persistent water quality check is required. The conventional strategies are tedious and not all that exact. Our venture proposes a model for checking the water quality consistently and by utilizing sensors water is separated into two chambers: one for drinking and the other for livestock purposes. Furthermore, it additionally produces the bill utilizing cloud a client can see the water bill in his/her Mobile.**

Keywords—Arduino; Water quality; Sensors; Waterbill; mqtt;

I. INTRODUCTION

These days drinking water is the most valuable and significant for every single individual and potable water usage faces new difficulties in constant operation. This dispute happened due to restricted water assets, growing population and so forth. Thus there is a requirement for good techniques for checking the quality of water. Customary strategies for checking the quality of water include the manual assortment of water tests at various areas, trailed by research facility logical procedures to check the quality of water. Such strategies take so much duration and cannot be viewed as a proficient method of the cycle to keep up the nature of water. These outcomes may influence the wellbeing of the general population. Thusly, there is a requirement for ceaseless online water quality checking. By focusing on the above issues our Project assists with fostering a low expense system for real-time checking the quality of water in the IOT environment. The system design applies a particular IOT module for taking the information of sensor from the core controller to the cloud and using special IP
address we can view the values of sensor data on the cloud. As per the values of sensor, the drinking water and the livestock purpose water is isolated. The water department will create the bills depending on amount of water utilized. Furthermore, the IOT module additionally gives Wi-Fi to view the information on phone.

LITERATURE SURVEY

a) A Survey of smart water quality monitoring system: In this article, for the purpose of data acquiring, data transmission and data analysis we have gone through three major subsystems, namely data collection subsystem, data transmission subsystem and data management subsystem. In particular, for the data collection subsystem, we surveyed the choice of water quality boundaries, existing innovation of online water quality observing, recognition of the areas of examining stations, and assurance of the inspecting frequencies. We have gone through data transmission network architecture and data communication management for the purpose of data transmission subsystem. For the data management subsystem, we surveyed water quality examination and forecast, water quality assessment, and water quality information report. We additionally propose potential difficulties and future bearings for every subsystem.

b) Assessment of Water Quality Parameters: The quality of the water is usually portrayed by its physical, chemical and biological characteristics. It is essential to monitor the quality of water at a customary
period of time. We can test parameters like temperature, pH, turbidity, salinity, nitrates, and phosphates. The quality of water can also be identified by conducting an assessment of the aquatic macro invertebrates.

c) Smart water quality monitoring system: Water is a significant requirement for endurance and there should be a few strategies to test the nature of the water which is accessible for drinking. The IOT and RS
innovation model is utilized to check the nature of drinking water a few water boundaries are utilized to check the nature of the water.

d) Design of low cost system for real time monitoring of water quality parameters in IOT environment: This model briefly explains about minimal cost system that monitors the quality of water

utilizing Raspberry pi module and PH, Turbidity, Conductivity and temperature sensors. The yield will be transferred to the cloud and the information from the cloud in inspected and put into public space if not checking does not takes place in proper format.

II. METHODOLOGY

In this model, the nature of water is estimated regarding temperature, PH, turbidity and saltiness utilizing sensors. The information got from the sensors is prepared utilizing arduino microcontroller what isolates the water into 2 separate chambers. One chamber is utilized for cleaning or domesticated animals' purposes. The deliberate boundaries are likewise shipped off NODEMCU, which thusly sends the information to the cloud. The venture likewise helps in distinguishing the water stream utilizing a stream sensor and the water bill is created for the water devoured by the client. The water bill will be shipped off the customer's individual versatile utilizing cloud. There is a LED show which will demonstrate the water level, so the shopper will be alarmed on the use just as filling of the water tank. The strategy helps in keeping up the nature of the water and furthermore helps in accomplishing an good productivity, since it happens in a continuous situation

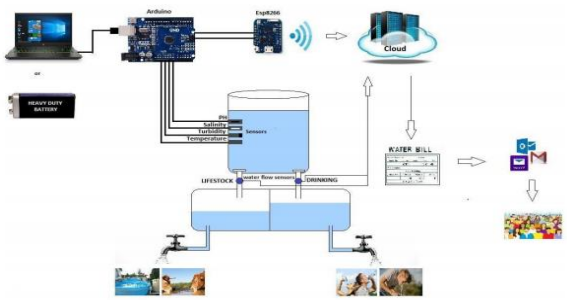


Fig 1. System Architecture

System Requirement Specifications

Software Requirements:

- Operating System : Windows XP or higher, Linux, Unix
- Language : 1. Embedded C (for Arduino and esp8266)
  : 2. Billing and alerting using .Net
- Database : My SQL
- Server : LINUX EC2 SERVER

Hardware Requirements:

- Processor : Pentium 4 +
- RAM : 2GB
- Hard Disk : 5GB
- Speed : 1.2 GHz+
- IOT specification. : Sensors (Temperature, Turbidity, Salinity, pH, IR, water flow), arduino UNO, esp8266 WEMOS, water solenoid

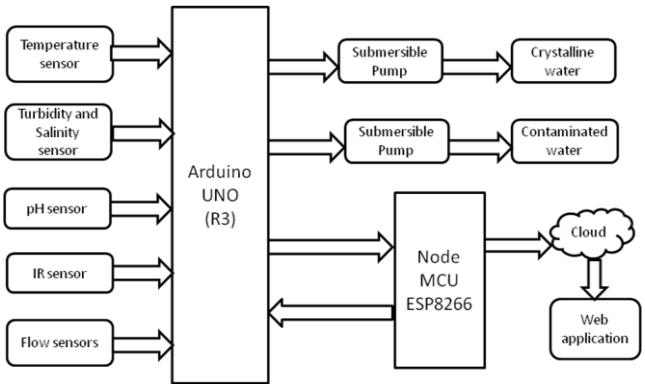


Fig 2. Block Diagram

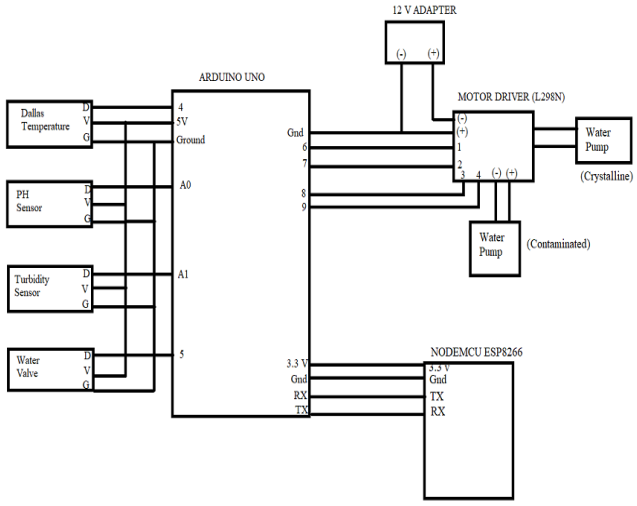
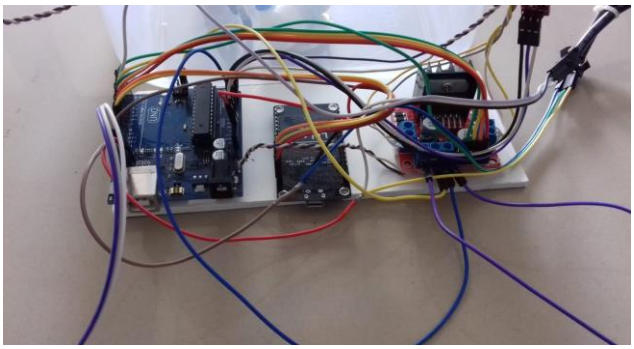


Fig 3. Circuit Diagram

III. RESULTS AND DISCUSSION

In this module, we spoke with sensors utilizing different specialized boundaries like baud rate, start bit, stop bit, Serial object communication. Once the device is initialized, we spoke with the device utilizing serial coding and caught live information from the associated sensors. When we get the information from the sensors, we coordinated with the reference data index utilizing Machine learning directed framework to discover a match towards water quality ID. To send readings, we executed a MQTT host which is fit for beginning assistances and allow sender and collector to impart. We created a Desktop application to keep up with client profile, producing the bill and furthermore alarming the client, Dashboard where the client can see total utilization and furthermore data about the live. Bill receipt and alarming framework module is made to create PDF and sending the same to the client email to recognize utilization. We developed a sequential program to gather information from ARDUINO and set up WIFI hotspot application to connect to support the internet to present IOT information on cloud through MQTT administration.



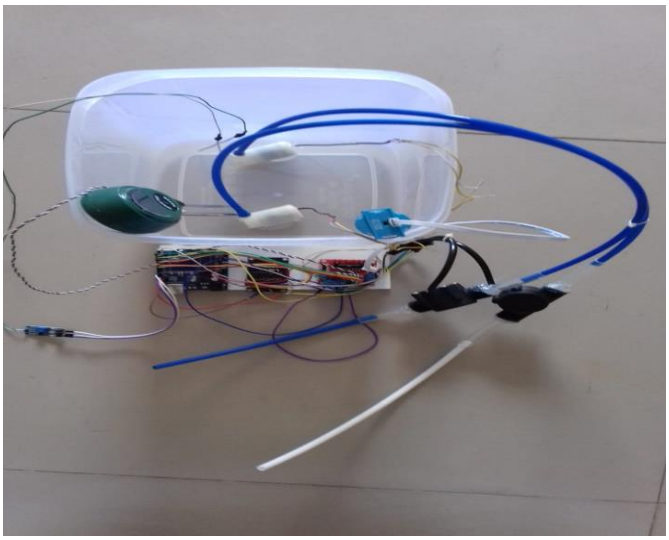


Fig 4. Hardware Implementation

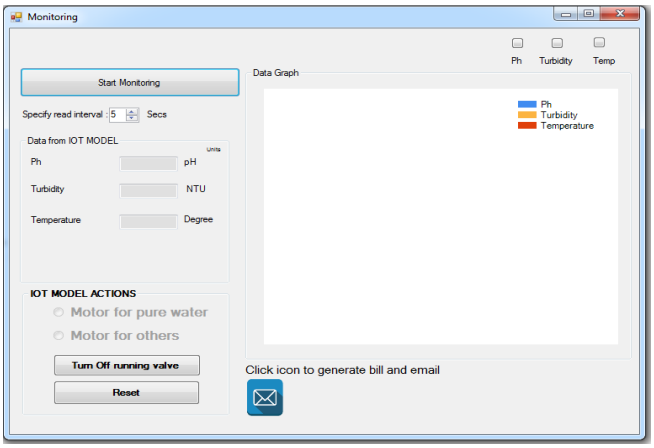


Fig 5. IOT monitoring desktop application

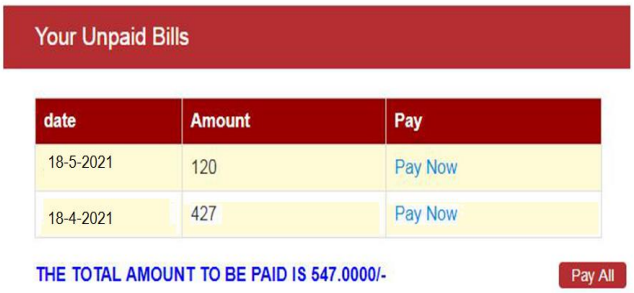


Fig 6. Consumer bill payment

Fig 7. Customer details

IV. CONCLUSION

The above presented project was fruitful in what it expected to achieve. Our key objective was to decrease the time required for testing of water in research facilities, and we have had the option to accomplish it yet with lesser exactness. It minimizes the laboratory apparatus that would be needed for the conventional method of testing water quality. The significant point is that we recorded all the information obtained in our testing in cloud. The results can be seen and gotten at whatever point required. We can easily track the water quality online using this system. In this manner, we have tried to achieve all of our objectives.

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