A Project Report on

"Water Quality Monitoring And Filter System To Conserve Water System Using IOT"

Submitted in partial fulfillment of the requirement for VIII semester

Bachelor of Technology

In

COMPUTER SCIENCE & ENGINEERING

by

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CERTIFICATE

*This is to certify that the technical project entitled "**Water Quality Monitoring And Filter System To Conserve Water Resource Using IOT**" is a bonafide work carried out by **Reshma N (R16CS338), Ruchitra K (R16CS349), Seema L.B, (R16CS376) Sharanamma (R16CS382)** in partial fulfilment for the award of Degree of Bachelor of Technology in Computer Science & Engineering of REVA University, Bangalore, during the year **2019- 2020.***

Name & Signature of the Guide	***Signature of the Director & Seal***
Dr. S.Sasidhar Babu	

Name of the examiner

Examiner 1		
Examiner 2		

DECLARATION

I, Ms **Ruchitra K, Reshma N, Seema L.B, Sharanamma** students of **B.Tech** belong in to School of C&IT, REVA University declare that this Project Report **"Water Quality Monitoring And Filter System To Conserve Water System Using IOT"** is the result the of project work done by me under the Guidance of **Dr.S.Sasidhar Babu, School of C&IT ,REVA University.**

I am submitting this Project Report in partial fulfillment of the requirements for the award of the degree of **B.Tech** in **Computing And Information Technology** by the REVA University, Bangalore during the academic year 2019-2020.

I declare that this project report has been tested for plagiarism, and has passed the plagiarism test with the similarity score less than 25% and it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

I further declare that this project / dissertation report or any part of it has not been submitted for award of any other Degree / Diploma of this University or any other University/ Institution.

(Signature of the candidate)

Certified that this project work submitted by **Ruchitra K, Reshma N, Seema L.B, Sharanamma** has been carried out under my guidance and the declaration made by the candidate is true to the best of my knowledge.

Signature of Guide

Date :……..

Signature of Director of School

Date :……..

Official Seal of the School

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Reshma N

Ruchitra K

Seema LB

Sharanamma

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Chapter 1

ABSTRACT

Water is basically to human life and the health of the situation. To launch a virtuous quality of water, it is required a monitoring system which established based wireless sensor network and IoT. Water productions a vast key role agricultural commercialized originality for drinking recently in order to quantity a support to farmers such as growth of crops and surveillance system physical property, humidity and water supply. Wireless sensor network used to amount water quality by sensing the change of pH. To control quality water over numerous sites as an actual time application, a base station and administer sensor nodes are endorsed a wireless application like Internet Of Things (IoT) is used to secondary the nodes and base station. To design and utilize this model power-driven by solar cell Internet of things utilization in this challenging work. Concluded WSN numerous information gathered by various sensors at node side pH, Turbidity, oxygen conjugate are sent base station. At the base station data is composed and displayed as visual in text file. The gain in this system is low power consumption, no carbon discharge, more flexible to outspread at remote site.

Keywords— Sensors, Wi-Fi module, Alarm, AWS, Micro controller, Power Supply,Total Liquefied Solids (TLS), Conduction Water Quality Factor (WQFs).

Chapter 2

INTRODUCTION

In present generation due to lots of economic development, invention, transformation, rapid growth of industries and factories, but in these days due to more pollutions, global warming, weather condition, atmospheric condition. because this there's no risk-less drinking H2O supply world's population. Where water supply released from the factory can be highly contaminated active presence of chemical mechanisms that water also sent for inegation use without any proper treatment H2O in many undeveloped areas and nations. Reason for in-sufficiency water quality measuring scheme which enlightened or without enlightened, it ruthlessly affecting human health initiating mortal harm full health issues and infections. To take defensive actions to check water purity, we got an idea that system can be implemented to display the choice of H2O that can be checked easy manner, so it can easily examine or determine critical decision and important factors in water. Various biological field study constant quantity temperature, pH, oxygen density, turbidity, so on from water supplying can be collected by these systems using different sensors. Evolution of Internet of Things application provides us approach to real time data attaining, broadcast processing. In general user get real time water evaluate data from remote, but in this system there are several nodes and a base stations where each node contains a sensors and nodes are circulated in different water bodies. By those sensors in water the collected date is sent to base station via water channel. Essentially a PC with Graphic User Interface (GUI) for user is used in a work station.

To analyze the water supply selected data when the impurities in the water gets detected, when the value is beneath preset level, then apprehension is automatically raised. Using dissimilar tools the impurity aaccumulation in water be investigated imminent compatibility and actions.

Chapter 3

LITERATURE SURVEY

1. "Multiple linear regression on water quality parameter modeling to detect hexavalent chromium in drinking water" [5] K. Sri Dhivya Krishnan, P.T.V. Bhuvaneswari (2017) signify that state in between pH, Total Dissolved Solid-state (TDS) and Conductivity H2O scheme Choice Parameters (WQPs). Author express those constant quantity will be involved find hexavalent chromium material solvent drinking H2O system. The author states the WQPs are obtained for four various hexavalent chromium unclean sample distribution through a research using pH, TDS and conduction sensing component. With use countless accrual figuring calculated principles using numerous sample distribution estimate of WQPs computed. Author early the Multiple Linear Regression (MLR) mode used to normalize the co-relational statistics among the considered WQPs. According to the outcome the errors between the actual and estimation the results can be finalized in graphical illustration. The author state that they found figuring values are closer to metric values and the calculation errors lie between 0.33% and 19.18%.

2. "Design and implementation of cost-effective water quality evaluation system"[9] Omar Faruq, Injamamul Hoque Emu, and Md. Nazmul Haque (2017) proposed an Avatar low cost vastly practiced H2O choice observation system. Authors state scheme is a micro controller based system with higher degree of accuracy. Authors mainly regulate different parametric quantity of H2O such as temperature, turbidity, potential hydrogen (pH). This system method makes possible to find the sensor values and display it on LCD.

3.“Un-Ionized ammonia detection system for water quality monitoring” [6] by Yee Ming Chung, Z. Abdul Halim and Razemy Raffay (2012) presents a new system by using a programmable system on chip and non-destructive types of measurement instruments. The author says there are four water environment parameters are measured, namely, pH, temperature, dissolved oxygen, and ammonium. The author says by using some algorithms they are going to calculate the UIA using data from measurement instruments. According to their perspective, they have designed the system to measure UIA in freshwater at 95% confidence level. The author says that the data from the system are monitored and recorded using a data acquisition system.

4.“Water quality prediction method based on LSTM Neural network” [7] by Yuanyuan Wang, Jian Zhou, Kejia Chen, Yunyun Wang, Linfeng Liu (2017) presents a new water ty prediction method based on long and short-term memory neural network (LSTM NN). The author says firstly, a prediction model based on LSTM NN is established. Then secondly, the author says they have the data set of water quality indicators in Taihu Lake which measured monthly from 200 to 2006 years is used for training model. Then they stored data in a database. Thirdly, they have improved the predictive accuracy of the model, a series of simulation and parameters selection is carried out. The author says finally the proposed method is compared with 2 different methods: one based on back propagation neural network and the other based on online sequential extreme learning machine.

5.“Water monitoring system using Arduino with LabVIEW”[8] by Yogesh K. Taru and Anil Karwankar (2017) present the system to develop, implement, monitor and control some parameter of water such as pH level, temperature, and turbidity. Authors say the main objective of this system is remotely monitors and control of water quality. The system built with Arduino UNO R3 board using Atmega328as the main controlling unit. LabVIEW is used as a Display unit in the system. According to the author, this system is more economical system and reliable, flexible for water monitoring.

Chapter 4

OBJECTIVES

1. Identifying the water transparency using turbidity Sensor.
2. Measuring water Ph value to find out whether water is acidic or alkaline or neutral in nature.
3. Conductivity sensor is used to identify more solvents or metals are dissolved in water.
4. Based on water goodness and water level, pump will work to lift the water.
5. All the sensor information and water wellness can be seen and record remotely using Internet of Things.

Chapter 5

MOTIVATION

The proposed system will be having remote monitoring ability and the monitoring system combined with the server and database. That will be helpful for the proposed system. Conductivity Sensor this System Controller is user interface with turbidity sensor ,PH sensor, LCD, Temperature sensor, or, Water Level sensor and Wi-Fi module. As soon as connects power supply to the system controllers and reads all sensor information continuously and display it in LCD and related to data will be sent to Wi-Fi module save display information in cloud.Turbidity detector detects water physical process in case water is not clear due to dirt or the dissolution agent present in the water then controller will rise the alarm and stops water to pump. PH sensor is after the text alter has completed, the paper ready the physical property used observe whether water is acid or alkaline or neutral and to reference number of dis-solvent or metallic particles dissolved in water conductivity sensor is used when metallic ions are more then conductivity is more .This water is not unfit for drinking. Controller will rise the alarm when conductivity is more. All detects message sent to cloud saved in Excel sheet approach departed collection of waste water data .

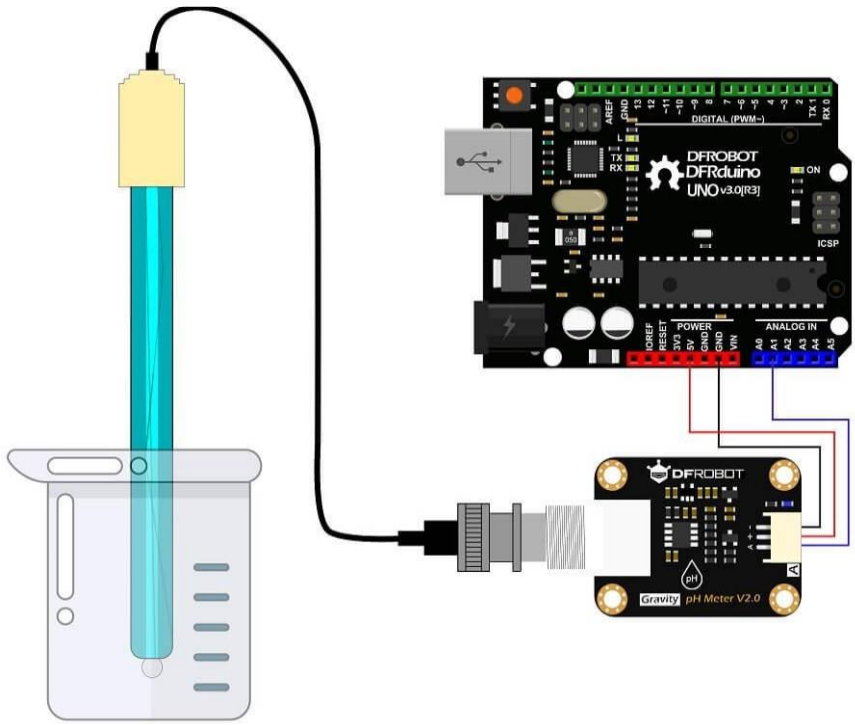

Fig-5.1:-pH sensor

- pH sensor analysis pH ion density level water.
- pH scale is technological device used check hydrogen-ion activity in water-based mixture indicating its alkalinity declared as pH.
- pH sensor is used to detect whether water is acid or alkaline or neutral level.
- And also to measure number of solvents or metallic particles dissolved in water.
- pH probes measure pH by measuring the voltage or potential difference of the solution in which it is dipped.
- Hence, a pH probe measures the potential difference generated by the solution by measuring the difference in hydrogen ion concentration using the Nernst equation and displays the pH as output.

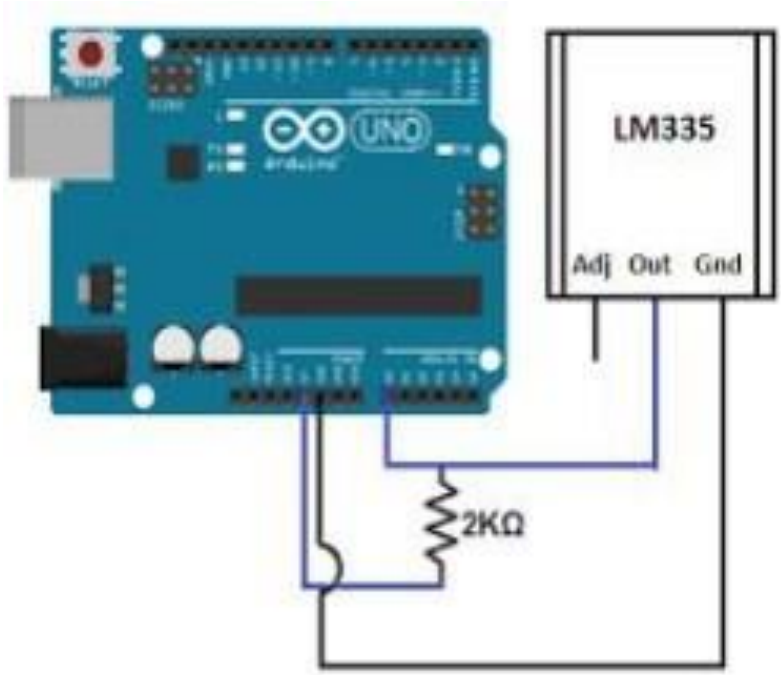

Fig-5.2 :-Temperature Sensor

- LM335 sensor is accuracy of temperature sensor which can be easily progressive.
- It has breakdown voltage directly proportional absolute physical property at 10mV/°K. LM335 has a low dynamical electric resistance.
- It can used any type of fundamental quantity sensing in range of -40°C to 100°C.
- The LM335 are linear temperature sensors that output a voltage proportional to the temperature value.
- They can be powered by the Arduino 5V pin, and to read the voltage, you use an analog pin.
- Reading the voltage from the sensor is as easy as using the analog Read() function on the sensor pin.

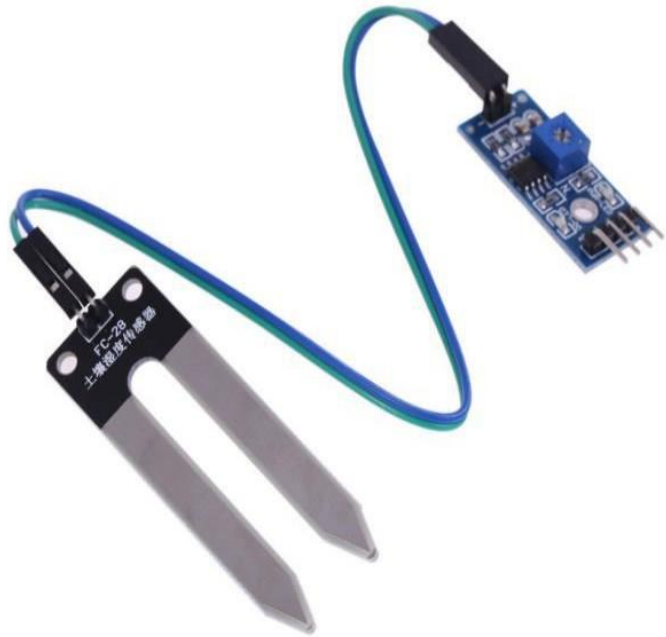

Fig-5.3:-Conductivity Sensor

- ✧ A conductivity sensor checks the ability of a dis-solvent to behaviour an electrical current.
- ✧ It is existence ions solution that let solution to be semi-conductive. greater density ions, greater conductivity.
- ✧ It is used to utilize in solving materials process of water which intakes is utility-grade & to check the condition content in water.
- ✧ An IoT system consists of sensors/devices which “talk” to the cloud through some kind of connectivity.
- ✧ Once the data gets to the cloud, software processes it and then might decide to perform an action, such as sending an alert or automatically adjusting the sensors/devices without the need for the user.
- ✧ Conductivity is useful in determining the overall health of a natural water body. It is also a way to measure changes in waste water procedures at water treatment plants.

Fig-5.4 :-Turbidity Sensor

- Turbidity sensors active quantity low-density distributed, supported solid-state liquid.
- Its been utilized stream, waste liquid, waste substantial reference, control instrumentation for settling ponds, material entity transport, and research lab measurements.measuring activity low-density that is been distributed by the supported solid-state in liquid.
- This sensor is used to check the transparency of water.
- If water is more contaminated then the sensor predicts that the water is not pure.
- If water is less contaminated then the sensor predicts that the water is pure and can be used for drinking purpose.
- Turbidity sensors measure the amount of light that is scattered by the suspended solids in water.

Fig-5.5 :- Thing-speak Cloud

- ✓ Thing-speak is an Internet Of Things analytic level work that allows collective, picture and examine active data streams in the cloud.
- ✓ Thing-speak is an IoT analytic platform service that allows you to aggregate, visualize, and analyze live data streams in the cloud
- ✓ Thing-speak is often used for example and proof of content Internet Of Things systems that necessitate analytical.
- ✓ Thing-speak™ is an IoT analytic s platform service from Math Works the makers of MATLAB and Simulation.
- ✓ Thing-speak allows you to aggregate, visualize, and analyze live data streams in the cloud. Thing-speak provides instant visualizations of data posted by your devices or equipment.

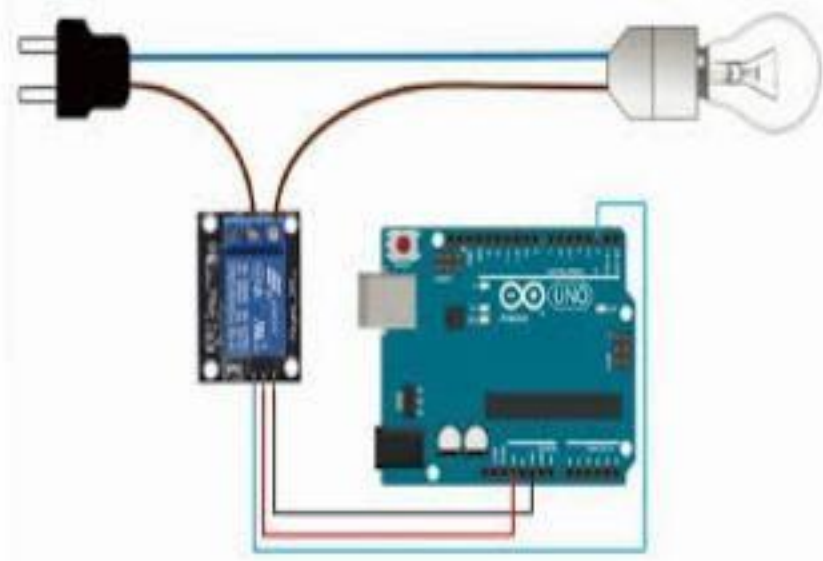

Fig-5.6:- Relay

- ✓ A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals.
- ✓ The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations.
- ✓ It is used for amplification of digital signals is used in ac to dc in electrical.
- ✓ Because we are using amplification instead of current. Its used for closing and opening the circuit.Which the process is done electromagnetically.
- ✓ When the relay contact is open (NO), the relay isn't energize with the open contact. However, if it is closed (NC), the relay isn't energize given the closed contact.
- ✓ However, when energy (electricity or charge) is supplied, the states are prone to change.
- ✓ Relays are normally used in the control panels, manufacturing and building automation to control the power along with switching the smaller current values in a control circuit.

Chapter 6

PROBLEM STATEMENT

To explore Internet of things, by using IOT we are doing the project to analyze the quality of water which is been directly released from factory to lakes, ponds and rivers etc. And also to check the contamination in water and purification is done systematically updates the results in aws cloud and pump status will be displayed in cloud. After purification processes water gets purified and is used for drinking propose.

Chapter 7

EXISITING SYSTEM

Sensors to detect the hydrocarbons, chemical and metal content in the soil can be combined into a soil examining and for monitoring the soil quality and waste material content. And sensors for detection pH, conduction, liquid oxygen, turbidity, etc. can be used for measurement the water quality in the rivers, ponds, lakes etc. Since the work is already done with the detection element like temperature sensor, pH sensor, and few has to check manual short text down the outcome that's been displayed in LCD. And it make more time consumption to note down the results of the improvement quantity that displayed. And it take more time to create the all-purpose results of the change of state processes.

7.1 Disadvantage and Limitation of Existing system

- The drawback of the papper ”Design and Implementation of Cost Effective Water Quality Evaluation System” they have used Ph, Turbidity, Temperature sensors and displayed only on LCD and not used any wireless technology.
- The drawback of the papper”Multiple Linear Regression Based Water Quality ParameterModeling to Detect HexavalentChromium in Drinking Water”they have used Ph ,TDS, conductivity and display in only LCD Not used any wireless communication device to see data remotely.

Chapter 8

PROPOSED SYSTEM

By utilization fundamental measure synthetic reasoning material property in H2O which can undertake problem solving. Conductivity sensor utilized in solving the material process of the H2O can be used to intake utility-grade and also checks the conduction content in the H2O and help to modify the attribute of water which unfit drinking. PH detector investigating pH level H2O and the content will be displayed in LCD.And once the purification is done the alarm sound automatically to check for the results thats been displayed, no need to check manually for the result which take much time intake to give the results. Wifi module is used to connect the aws cloud for storing and recall of the data. By using wifi and Amazon Web Service we can store the data and regain it whenever we need. Finally water will be gathered in water purifier.

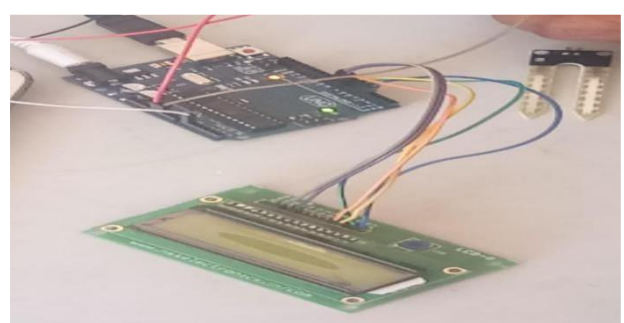

Fig-8.1

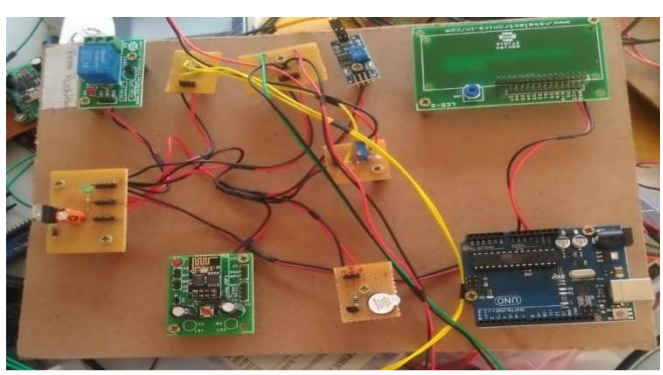

Fig-8.2

Fig-8 :-Connection of sensors with ardino UNO board and LCD Display.

8.1 Advantages of Proposed System

- ✧ Using temperature sensor and conductivity sensor we can analysis the purity of the water.
- ✧ Temperature sensorLM335 sensor is exactness of temperature sensor which can be easily graduated. It has a breakdown voltage directly proportional to absolute temperature at 10mV/°K.
- ✧ LM335 has a low dynamic electric resistance.
- ✧ It can be used for any type of temperature detection in range of -40°C to 100°C.
- ✧ And conductivity sensor used analysis the quality of water and predicts weather its fit for drinking.
- ✧ It is the existence of ions in a solution that let the solution to be conductive. the greater the density of ions, the greater the conductivity.
- ✧ PH sensor is a scientific instrument that measures the hydrogen-ion activity in water-based solutions, indicating its acidity or alkalinity expressed as pH.
- ✧ Turbidity sensors measuring the amount of light that is distributed by the suspended solids in water.

Chapter 9

BLOCK DIAGRAM

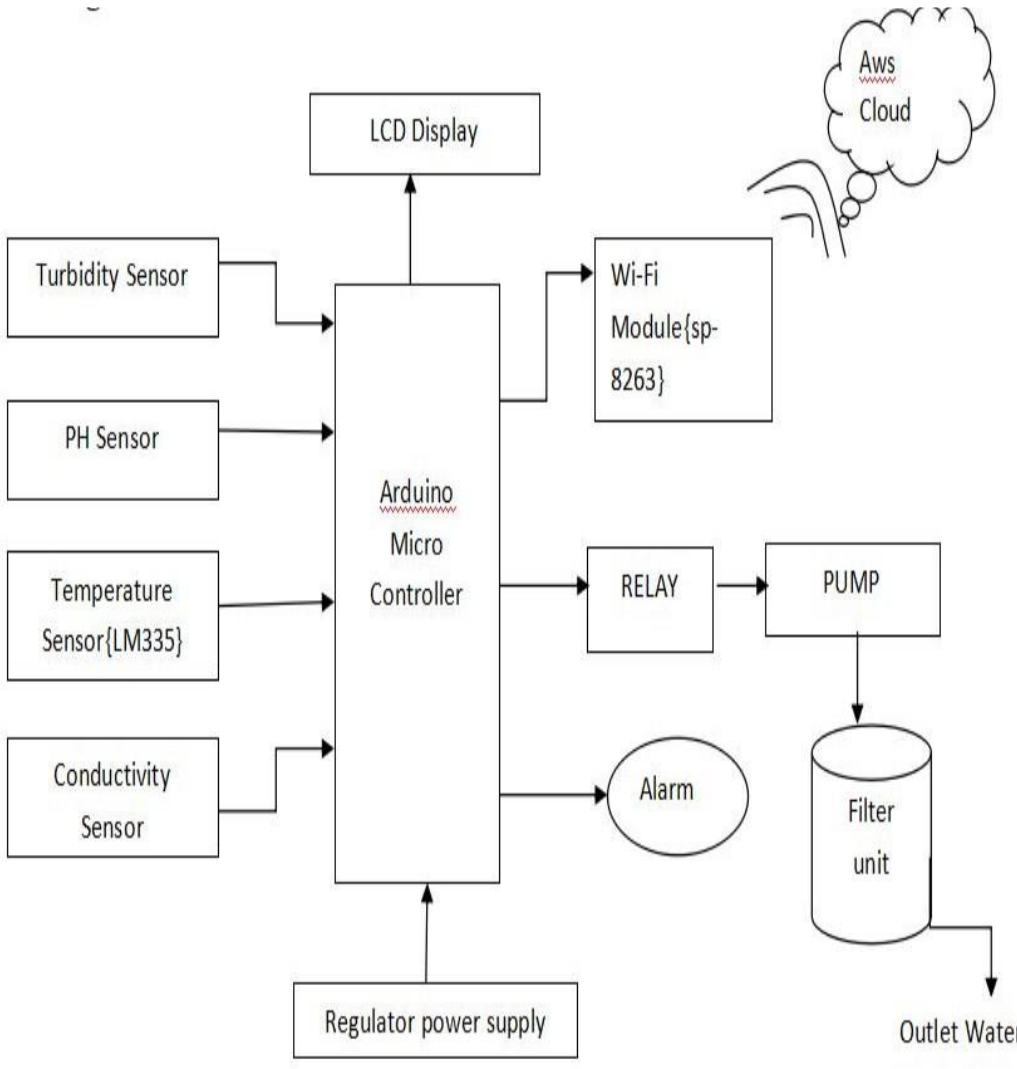

Fig:-9.1

Water Quality Monitoring And Purification System.

Chapter 10

System Requirement

10.1 Software Components

- OS:-Windows 10
- HDD:- 500 GB
- RAM:- 4 GB
- Aurdino 1.8.11 Software
- IC circuit:- ICatmga328
- ARDUINO UNO
- Embedded C and JAVA Programming.
- Thing-speak Cloud
- Wi-Fi Module {sp-8263}
- Eclipse oxygen-3 software
- TOMCAT - V8.5

10.2 Tools used

10.2.1 Hardware Components

- ✓ Arduino Micro Controller
- ✓ Turbidity Sensor
- ✓ Ph Sensor
- ✓ Conductivity Sensor
- ✓ LCD Display
- ✓ BUZZER
- ✓ Filter Unit
- ✓ PUMP
- ✓ Arduino Uno Board
- ✓ Temperature Sensor-LM335

Chapter 11

System analysis and design

11.1 Implementation

11.1.1 Code for sensor to work

```
#include <LiquidCrystal.h>
LiquidCrystal lcd( 9,8, 7, 6, 5, 4); // (rs,en,d4,d5,d6,d7)


int TEMP    = A0;
int CONDU_SNS_PIN= A1;
void TEMP_READ(void);
void CONDU_READ(void);


int COND_ADC=0;


void setup() {
 lcd.begin(16, 2);
 //lcd.clear();
 pinMode(TEMP,    INPUT);
 pinMode(CONDU_SNS_PIN,    INPUT);
 lcd.setCursor(0, 0);
 lcd.print("    WATER QUALITY    ");
   lcd.setCursor(0, 1);
 lcd.print(" MONITOR SYSTEM    ");
 delay(100);
```

```
 }
void loop() {

 delay(400);
   lcd.clear();
      TEMP_READ();
      CONDU_READ();
 }



 void TEMP_READ(void)
{
     int ADC;
     int Temp;
   ADC = analogRead(TEMP);

      if(ADC>610){
                Temp = 25+(( ADC-610)/2);
      }else{
                 Temp = 25-((610- ADC)/2);
      }
        lcd.setCursor(0, 0);
      lcd.print("Temp:    ");
```

```
      lcd.setCursor(5, 0);
      lcd.print(Temp);
      lcd.print("c");

   }

void CONDU_READ(void){
    int smoke;
      COND_ADC=analogRead(CONDU_SNS_PIN);

      if(COND_ADC>1000){
          lcd.setCursor(0, 1);
         lcd.print("INSCERT SNS IN WATER    ");
    }else if((COND_ADC<850)&&(COND_ADC>550)){
         lcd.setCursor(0, 1);
         lcd.print("DRINKABLE WATER      ");
           }else if(COND_ADC<540){
          lcd.setCursor(0, 1);
          lcd.print("BAD QUALITY WATER    ");
      }
          lcd.setCursor(9, 0);
      lcd.print("C:");
      lcd.setCursor(11,0);
      lcd.print(COND_ADC);

}
```

11.1.2 Diseases control.java

```
package com.xvitcoder.springmvcangularjs.controller;


import java.time.LocalDateTime;

import java.time.ZoneId;

import java.time.ZonedDateTime;

import java.time.format.DateTimeFormatter;

import java.util.List;


import org.springframework.beans.factory.annotation.Autowired;

import org.springframework.stereotype.Controller;

import org.springframework.web.bind.annotation.RequestMapping;

import org.springframework.web.bind.annotation.RequestMethod;

import org.springframework.web.bind.annotation.RequestParam;

import org.springframework.web.bind.annotation.ResponseBody;


import com.xvitcoder.springmvcangularjs.beans.model;

import com.xvitcoder.springmvcangularjs.service.serviceinterface;

import com.xvitcoder.springmvcangularjs.service.sms;


@Controller

@RequestMapping("/disease")
```

```
public class diseaseController {

    private static final String DATE_FORMAT = "dd-M-yyyy hh:mm:ss a z";

    private static final DateTimeFormatter formatter =
DateTimeFormatter.ofPattern(DATE_FORMAT);

    public static int smscount=0;

    public static int smscount2=0;




    @Autowired

    private serviceinterface trService;


    @RequestMapping("/lists")

    public @ResponseBody List<model> gettrList() {

        return trService.getlist();

    }




    @RequestMapping(value = "/send", method = RequestMethod.GET)
```

```
public @ResponseBody void sndss(@RequestParam String
field1,@RequestParam String field2,@RequestParam String field3,@RequestParam
String field4) {



String s1="PUMP IS OFF";

if (field4.equals("1")) {

    s1="PUMP IS ON";



}



model rw =    new model();

ZoneId fromTimeZone = ZoneId.of("Asia/Kolkata");



LocalDateTime todays = LocalDateTime.now();                //Current time0

ZonedDateTime currentISTime = todays.atZone(fromTimeZone);

String todayy=    currentISTime.toString();

String repstr=    todayy.replaceAll("[Asia/Kolkata]", "");

String sustr= repstr.substring(0, 19);

rw.setF1(field1);

rw.setF2(field2);

rw.setF3(field3);

rw.setF4(s1);
```

```
            rw.setDate(sustr);
            if (field4.equals("1")) {
                sms s =    new sms();
                s.sendSMS("8073183401","\n PUMP IS ON\n");

            } else if (field4.equals("0")) {
                sms s =    new sms();
                s.sendSMS("8073183401","\n PUMP IS OFF\n");
            }
            trService.add(rw);
}
    @RequestMapping("/layout")
    public String getCarPartialPage() {
        return "disease/layout";

    }
}
```

11.1.3 Model. Java

```
package com.xvitcoder.springmvcangularjs.beans;

public class model {

    private String f1;
```

```
    private String f2;
    private String f3;
    private String f4;
    public String getF3() {
        return f3;
    }
    public void setF3(String f3) {
        this.f3 = f3;
    }
    public String getF4() {
        return f4;
    }
    public void setF4(String f4) {
        this.f4 = f4;
    }




    private String date;
    public String getF1() {
        return f1;
    }
    public void setF1(String f1) {
        this.f1 = f1;
    }
    public String getF2() {
        return f2;
    }
    public void setF2(String f2) {
```

```
        this.f2 = f2;
    }



    public String getDate() {
        return date;
    }
    public void setDate(String date) {
        this.date = date;
    }

}
```

11.1.4 SMS.java

```
package com.xvitcoder.springmvcangularjs.service;


import java.io.BufferedReader;
import java.io.InputStreamReader;
import java.net.HttpURLConnection;
import java.net.URL;
import java.net.URLEncoder;
import java.util.Date;


public class sms {


    public    static void sendSMS(String mobileNumber,String text) {
```

```
try{
        Date mydate = new Date(System.currentTimeMillis());
        String data = "";
        data += "sendMethod=simpleMsg";
        data += "&userId=mitron";
        data += "&password=" + URLEncoder.encode("Mitron@123456",
"UTF-8");
        data += "&msg=" + URLEncoder.encode(text + mydate.toString(),
"UTF-8");
        data += "&mobile=" + URLEncoder.encode(mobileNumber,
"UTF-8");
        data += "&msgType=text";
        data += "&format=json";
        data += "&senderId=CAKEML";
        URL url = new
URL("https://www.smsgateway.center/SMSApi/rest/send?" + data);
        HttpURLConnection conn = (HttpURLConnection)
url.openConnection();
        conn.setRequestMethod("GET");
        conn.setDoOutput(true);
        conn.setDoInput(true);
        conn.setUseCaches(false); conn.connect();
        BufferedReader rd = new BufferedReader(new
InputStreamReader(conn.getInputStream()));
```

```
                String line;
                StringBuffer buffer = new StringBuffer();
                while((line = rd.readLine()) != null){
                    buffer.append(line).append("\n");
                }
                System.out.println(buffer.toString());
                rd.close();
                conn.disconnect();
            }
            catch (Exception e){
                e.printStackTrace();
            }
    }
}
```

11.1.5 Service interface.java

```
package com.xvitcoder.springmvcangularjs.service;

import java.util.List;

import com.xvitcoder.springmvcangularjs.beans.model;

public interface serviceinterface {
```

```
    void add(model tr);

    List<model> getlist();

}
```

11.1.6 Service impl.java

```
package com.xvitcoder.springmvcangularjs.service;

import java.util.ArrayList;
import java.util.List;

import org.springframework.stereotype.Service;

import com.xvitcoder.springmvcangularjs.beans.model;
@Service("rainWaterservice")

public class serviceimpl implements    serviceinterface {
    public static ArrayList<model>      arr=    new ArrayList<model>();

    @Override
    public void add(model tr) {
```

```
            arr.add(tr)   ;
      }


      @Override
      public List<model> getlist() {
            // TODO Auto-generated method stub
            return arr;
      }


}
```

11.1.7 Layout.java

```
<div style="width: 1000px;">


      <marquee style="color: black">Water Monitoring with PH using
            IoT </marquee>




      <div class="input-append">
            <!--    <input style="width:358px; margin-left: 100px;" class="span2"
type="text" ng-model="carName" required="required" min="1" />
       <button class="btn btn-primary" ng-disabled="!carName"
ng-click="addNewCar(carName)">Add Car</button> -->
```

```
</div>



<h3 style="margin-left: 100px; color: black">

              
              
              
           Water Monitoring with
PH
    using IoT</h3>



<div class="alert alert-info"
    style="width: 1000px; margin-left: 100px;" ng-show="trf.length == 0">
    No Data found</div>


<div class="table-responsive-lg" id="angular-with-newlines">



    <table class="table "
        style="width: 1000px; background-color: #3394b7; margin-left: 30px;"
```

```
ng-show="trf.length > 0">
<thead>
    <tr>

        <th style="text-align: center; width: 25px;"><span id="time"
            style="font-size: 20px; color: #f70909">
Time</span></th>

        <th style="text-align: center;"><span id="time"
            style="font-size: 20px; color:
#f70909">Temperature</span></th>

        <th style="text-align: center;"><span id="time"
            style="font-size: 20px; color: #f70909">Ph</span></th>
        <th style="text-align: center;"><span id="time"
            style="font-size: 20px; color: #f70909">Conductivity
</span></th>
        <th style="text-align: center;"><span id="time"
            style="font-size: 20px; color: #f70909">PUMP Status
</span></th>
```

```
            </tr>
        </thead>
        <tbody>

            <tr ng-repeat="tr in trf|limitTo:-1|orderBy:'-date' ">
                <td><span style="font-size:
17px"><center>{{tr.date}}</center></span></td>
                <td><span style="font-size: 17px; text-align:
left"><center>{{tr.f1}}&#8451;</center></span>
                </td>
                <td><span style="font-size:
17px"><center>{{tr.f2}}</center></span>
                </td>
                    <td><span style="font-size:
17px"><center>{{tr.f3}}</center></span>
                </td>
                    <td><span style="font-size:
17px"><center>{{tr.f4}}</center></span>
                </td>
```

```
                        <!--  <td  style="width:70px;text-align:center;"><button
class="btn btn-mini btn-danger"
ng-click="removeCar(car)">Remove</button></td>-->


                    </tr>

                </tbody>

            </table>

        </div>

        <div></div>


        <!--  <button style="margin-left:100px;"  class="btn btn-danger"
ng-show="cars.length > 1" ng-click="playAudio()">Clear</button>-->


</div>


<style>

marquee {

    color: black;

    font-size: 16px;

}


th {
```

```
    color: #c44f15;
}

td {
    color: white;
}

#angular-with-newlines {
    white-space: pre-wrap;
}

#id {
    size: 19px;
}

#values {
    size: 13px;
}
</style>
```

Chapter 12

RESULTS

The results which ay. By talking four types of water samp
As its represented i

Fig:-12.1

Once the code is executed then the output is displayed is TOMCAT - V8.5 software.
If the code gets executed the eclipse-workspace software, then it displays as no data found.
As its represented in below fig:-12.2.

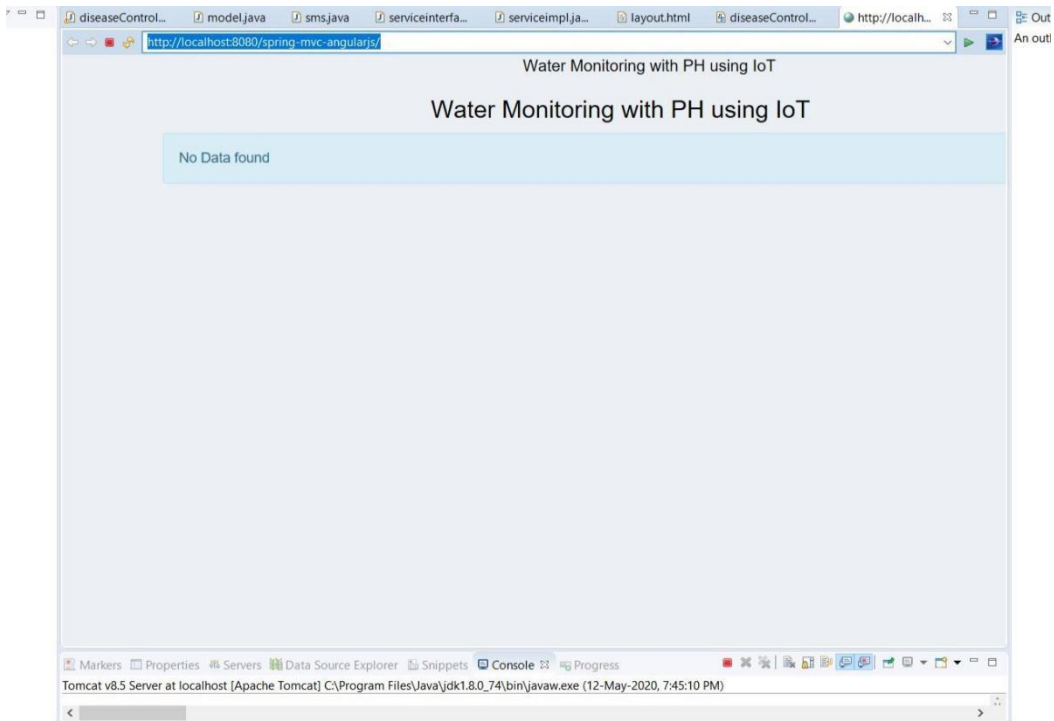

Fig:-12.2

Displaying the results on eclipse-workspace software

After running the same in browser it displays the following output. As represented in fig:- 12.2 and 12.3

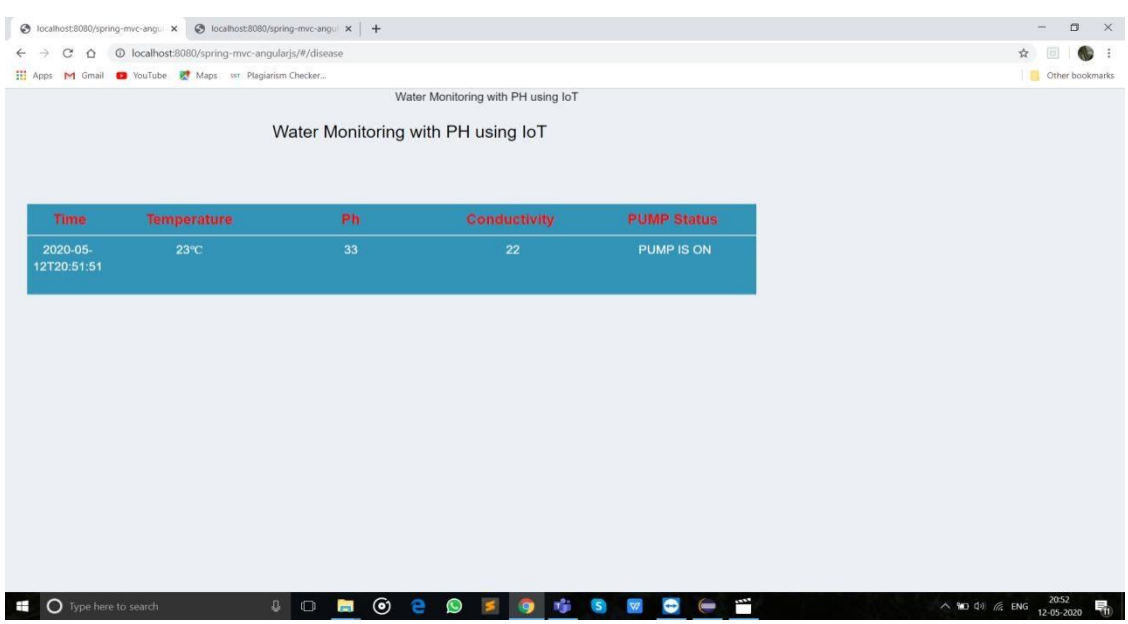

Fig:-12.3

Displaying the pump status as ON

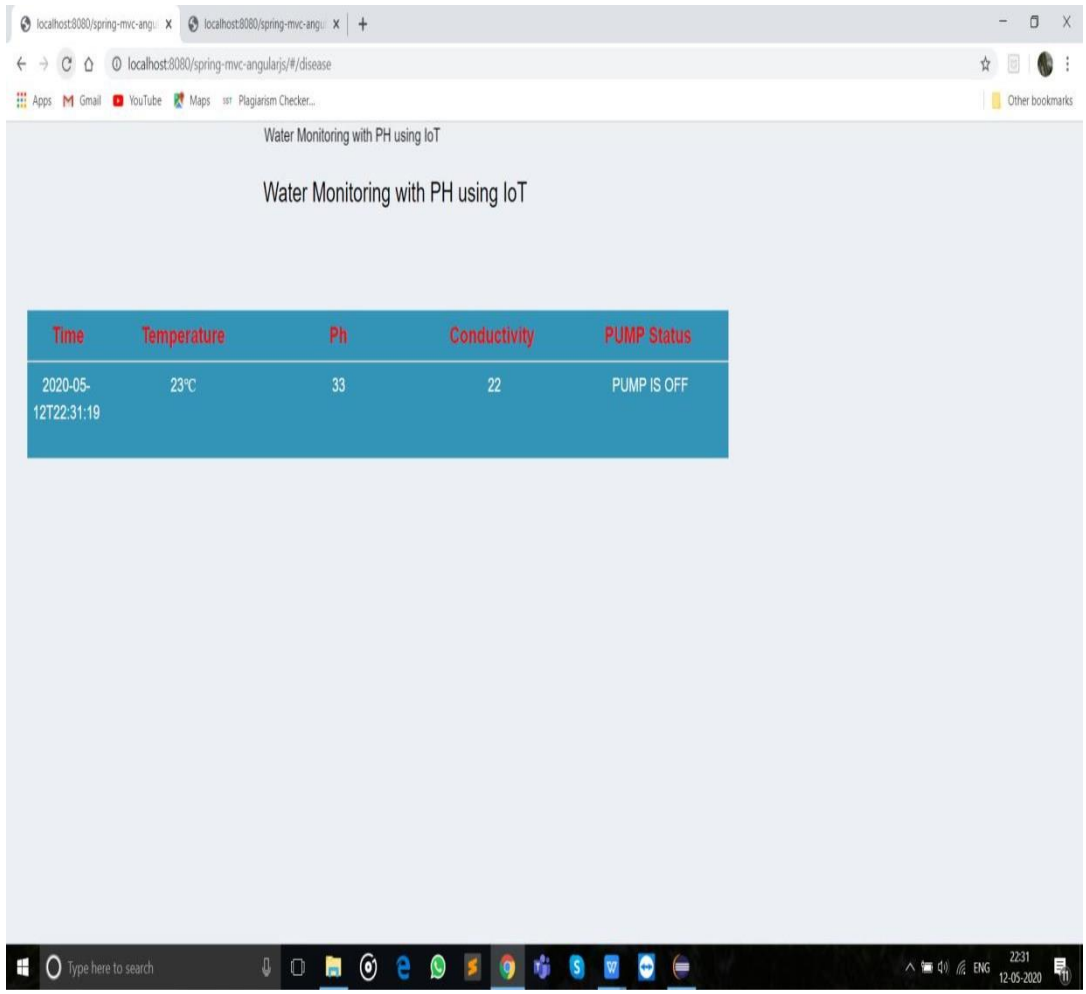

Fig:-12.4

Displaying the pump status as OFF

After the results gets displayed in the browser, at the same time the displayed result will be sent as a message in mobile as shown in (Fig:-12.4).

FIG:- 12.5

Displayed results sent through normal message.

Final results of the proj

Fig:-12.6

Final results on LCD.

Chapter 13

APPLICATIONS

1. The advantage in this system is low power consumption, no carbon emission, more flexible to deploy at remote site.

2.Using various simulation tools the recoded data can be analyzed for future correspondence and actions.

3.The development of IoT technology provides us approach to real time data acquisition, transmission and processing.

4.Water pollution status in remote region can be archived by monitoring the quality of water & collecting comprehensive data.

Chapter 14

CONCLUSION

14.1 Conclusion

Sequential follow H2O impurity state outback region collect by observation choice water & collecting across-the-board data. This system not only provides across-the-board assessment of water environment but also can quickly discover imperative water pollution accidents or natural disasters, legal document the improper water quality information to monitoring center by faster communication network and provides graphical acceptance for the decision making department to range the status of the water. Our proposed system predicts the solution to this issue to analysis the water contaminated with waste particles and to purify it using IOT technology.

14.2 Future Work

In upcoming work, used to observe quality waste product materials H2O physical structure that released from factory examined automatically by this formulation.

Chapter 15

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Water Quality Monitoring and Filter System to Preserve Water Resource Using IOT

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Abstract

Water is basically to human life and the health of the situation. To launch a virtuous quality of water, it is required a monitoring system which established based wireless sensor network and IoT. Water productions a vast key role agricultural commercialized originality for drinking recently in order to quantity a support to farmers such as growth of crops and surveillance system physical property, humidity and water supply. Wireless sensor network used to amount water quality by sensing the change of pH. To control quality water over numerous sites as an actual time application, a base station and administer sensor nodes are endorsed a wireless application like Internet Of Things (IoT) is used to secondary the nodes and base station. To design and utilize this model power-driven by solar cell Internet of things utilization in this challenging work. Concluded WSN numerous information gathered by various sensors at node side pH, Turbidity, oxygen conjugate are sent base station. At the base station data is composed and displayed as visual in text file. The gain in this system is low power consumption, no carbon discharge, more flexible to outspread at remote site.

Keywords: *Sensors, Wi-Fi module, Alarm, AWS, Micro controller, Power Supply, Total Liquefied Solids (TLS), Conduction Water Quality Factor (WQFs).*

1. Introduction

In present generation due to lots of economic development, invention, transformation, rapid growth of industries and factories, but in these days due to more pollutions, global warming, weather condition, atmospheric condition. Because this there's no risk-lessdrinking H2O supply world's population. Where water supply released from the factory can be highly contaminated active presence of chemical mechanisms that water also sent for inegationuse without any proper treatment H2O in many undeveloped areas and nations. Reason for in-sufficiency water quality measuring scheme which enlightened or without enlightened, it ruthlessly affecting human health initiating mortal harm full health issues and infections.To take defensive actions to check water purity, we got an idea that system can be implemented to display the choice offH2O that can be checked easy manner, so it can easily examineor determine criticaldecision and important factors in water. Various biological field study constant quantity temperature, pH, oxygen density, turbidity, so on from water supplying can be collected by these systems using different sensors. Evolution of Internet of Things application provides us approach to real time data attaining, broadcast processing. In general user get real time water evaluate data from remote, but in this system there are several nodes and a base stations where each node contains a sensors and nodes are circulated in different water bodies. By those sensors in water the collected date is sent to base station via water channel. Essentially a PC with Graphic User Interface (GUI) for user is used in a work station.

To analyze the water supply selected data when the impurities in the water gets detected, when the value is beneath preset level, then apprehension is automatically raised. Using dissimilar tools the impurity aaccumulation in water be investigated imminent compatibility and actions.

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2. Literature survey

"Multiple linear regression on water quality parameter modeling detect hexavalent chromium in drink water" [1] K. Sri Dhivya Krishnan, P.T.V. Bhuvaneswari (2017) signify that state in between pH, Total Dissolved Solid-state (TDS) and Conductivity H2O scheme Choice Parameters (WQPs).Author express those constant quantity will be involved find hexavalent chromium material solventdrinking H2Osystem. The author states the WQPs are obtained for four various hexavalent chromium unclean sample distribution through are search using pH, TDS and conduction sensing component. With use countless accrual figuring calculated principles using numerous sample distribution estimate of WQPs computed. Authorearly the Multiple Linear Regression (MLR) mode used to normalize the co-relational statistics among the considered WQPs. According to the outcome the errors between the actual and estimation the results can be finalized in graphical illustration. The author state that they found figuring values are closer to metric values and the calculation errors lie between 0.33% and 19.18%.

"Design and implementation of cost-effective water quality evaluation system"[2] by Md. Omar Faruq, Injamamul Hoque Emu, and Md. Nazmul Haque (2017) proposed an Avatarlow cost vastly practiced H2O choice observation system. Authors state scheme is a microcontroller based system with higher degree of accuracy. Authors mainly regulate different parametric quantity of H2O such as temperature, turbidity, potential hydrogen (pH). This system method makes possible to find the sensor values and display it on LCD.

3. Existing system

Sensors to detect the hydrocarbons, chemical and metal content in the soil can be combined into a soil tentative and for monitoring the soil quality and waste material content. And sensors for detection pH, conduction, liquid oxygen, turbidity, etc. can be used for measurement the water quality in the rivers, ponds, lakes etc. Since the work is already done with the detection component like temperature sensor, pH sensor, and few has to check manual short text down the outcome that's been displayed in LCD. And it make more time consumption to note down the results of the improvement quantity that displayed. And it take more time to create the all-purpose results of the change of state processes.

4. Proposed System

By utilization fundamental measure synthetic reasoning material property in H2O which can undertake problem solving. Conductivity sensor utilized in solving the material process of the H2O can be used to intake utility-grade and also checks the conduction content in the H2O and help to modify the attribute of water which unfit drinking. PH detector investigating pH level H2O and the content will be displayed in LCD. Once the betterment is done the device sound mechanically to check for the results that's been exhibited, no need to check semi-automatic for the result which take much time drinking to give the outcomes. Wi-Fi component is used to associate the AWS cloud for storing and recollection of the data. By using Wi-Fi and Amazon Web Service we can be used to store the data and retrieve it whenever we need. Finally water will be collected in water purifier.

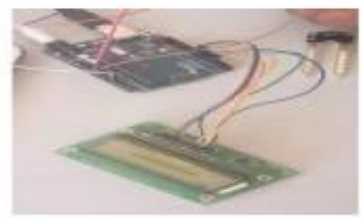

Figure 1: Connection of sensors with ardino UNO board and LCD Display.

5. Methodology

In thispaper will be having remote observing ability and the observance system linked with the server and database. Conductivity Sensor this System Controller is user interface with turbidity sensor PH sensor, LCD, Temperature sensor, or, Water Level sensor and Wi-Fi module. As soon as connects power supply to the system controllers and reads all sensor information continuously and display it in LCD and related to data will be sent to Wi-Fi module preserve display evidence in cloud. Turbidity sensor senses water physical process in case water is not clear due to dirt or the dissolution agent present in the water then controller will rise the alarm and stops water to pump. PH sensor is after the text alter has completed, the paper ready the physical property used observe whether water is acid or alkaline or neutral and to reference number of dis-solvent or metallic particles dissolved in water conductivity sensor is used when metallic ions are more then conductivity is more .This water is not unfit for drinking. Controller will rise the alarm when conductivity is more. All detects message sent to cloud saved in Excel sheet approach definetcollection of waste water data.

Figure 2: pH sensor

pH sensor analysis H ion density level water. pH scale is industrial device used check hydrogen-ion activity in water-based mixture, indicating its alkalinity declared as pH.

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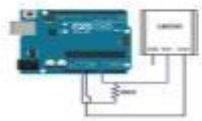

Figure 3: Temperature Sensor

LM335 sensor is accuracy oftemperature sensor which can be easily progressive. It has breakdown voltage directly proportional absolute physical property at 10mV/°K. LM335 has a low dynamical electric resistance. It can used any type of fundamental quantity sensing in range of -40°C to 100°C.

Figure 4: Conductivity Sensor

A conductivity sensorchecks the ability of a dis-solvent to behaviour an electrical current. It is existence ions solution that let solution to be semi-conductive. greater density ions, greater conductivity.

Figure 5: Turbidity Sensor

Turbidity sensors active quantity low-density distributed, supported solid-state liquid. Its been utilized stream, waste liquid, waste substantial reference, control instrumentation for settling ponds, material entity transport, and research lab measurements. measuring activity low-density that is been distributed by the supported solid-state in liquid.

Figure 6: Thing-speak Cloud

Thing-speak is an Internet Of Things analytic level work that allows collective, picture and examine active data streams in the cloud. Thing-speak is often used for example and proof of content Internet Of Things systems that necessitate analytical.

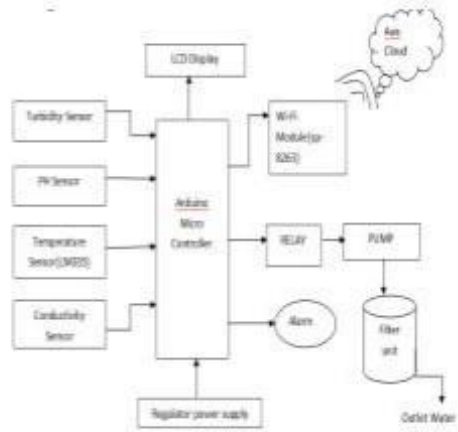

Figure 7: Quality Monitoring and Purification System.

6. Conclusion

Sequential followH2O impurity state remote region collect by observation choice water & collecting data. This system not only provides comprehensive assessment of water environment but also can quickly discover instant water pollution accidents or natural disasters, legal document the improper water quality information to monitoring center by faster communication network and provides graphical representation for the decision making section to range the status of the water. Our proposed system predicts the solution to this issue to analysis the water contaminated with waste particles and to purify it using IOT technology.

7. Future work

In upcoming work, work used observe quantity waste product material H2O physical structure that released factory examined automatically by this formulation.

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1	ijsetr.org Internet Source	13%
2	Shashika Lokuliyana, Anuradha Jayakody, N.B.R.P. Bandara, J.W.P. Deshapriya, P.C Kavinda, T.L Wijewickrema. "A Survey: IoT Enable Framework for Water Quality Measurement and Distribution", 2018 13th International Conference on Computer Science & Education (ICCSE), 2018 Publication	9%
3	A. Meenakshi Sundaram, C. Nandini. "Chapter 10 ASRD: Algorithm for Spliced Region Detection in Digital Image Forensics", Springer Science and Business Media LLC, 2017 Publication	3%
4	Nayana Hegde, Sunilkumar S. Manvi. "MFZKAP: Multi Factor Zero Knowledge Proof Authentication for Secure Service in Vehicular Cloud Computing", 2019 Second International Conference on Advanced Computational and	1%

Communication Paradigms (ICACCP), 2019
Publication

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GRADEMARK REPORT

FINAL GRADE

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GENERAL COMMENTS

Instructor

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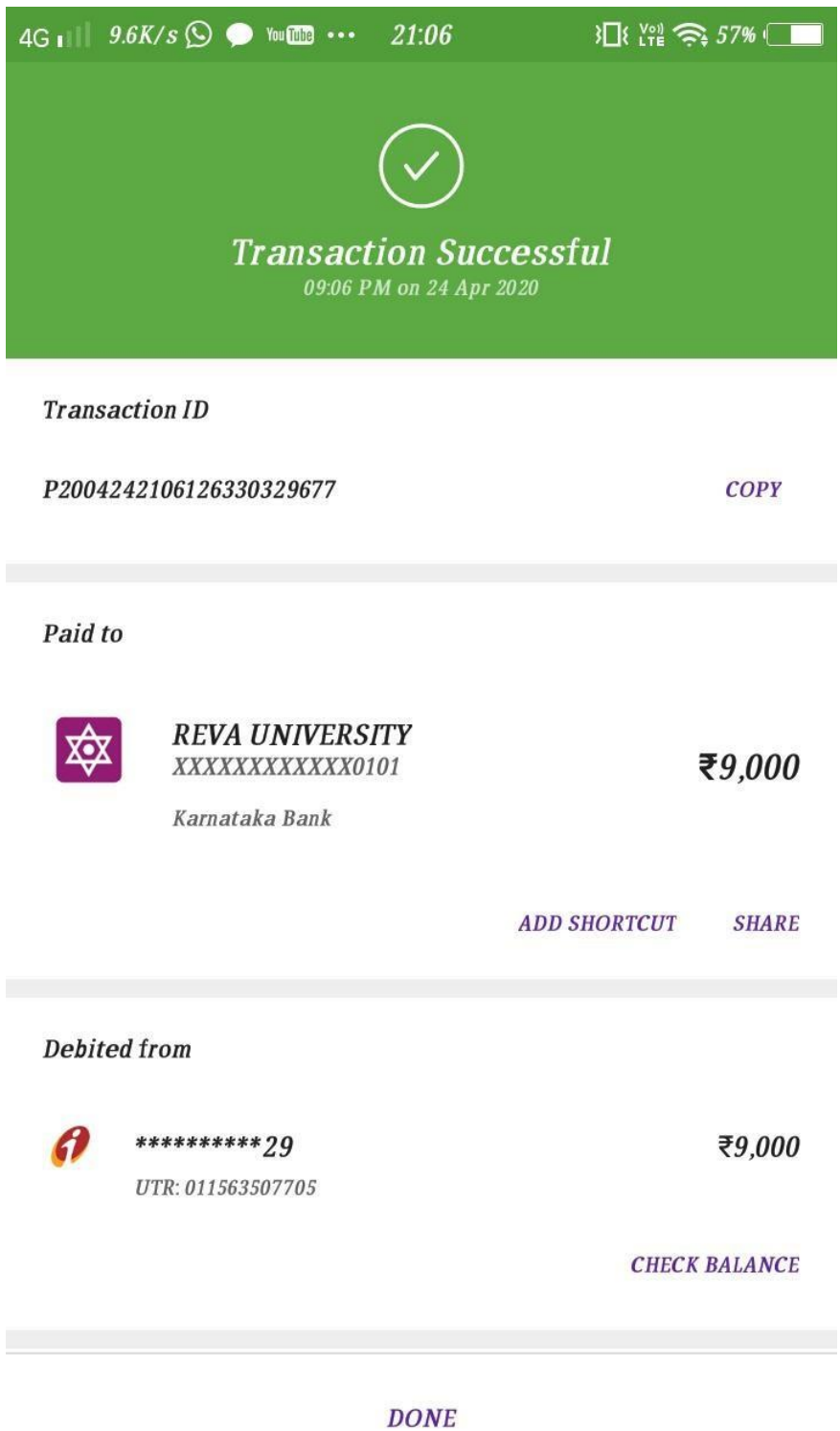

Cost of hardware components in our project.

Sl. no	components	Cost
1.	Temperature Sensor	130/-
2.	pH Sensor	2650/-
3.	Conductivity Sensor	4000/-
4.	Pump	390/-
5.	Relay	100/-
6.	Aurdino UNO	250/-
7.	LCD Display	220/-
8.	Turbidity Sensor	1450/-
9.	Buzzer	10/-
10.	Filter Unit	3000/-
11.	Aurdino Micro Controller	250/-