WATER LEVEL INDICATOR

A Project Report

Submitted in partial fulfillment of the

Requirements for the award of the Degree of

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

By

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MAHARASHTRA
2018

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CERTIFICATE

This is to certify that the project entitled **"WATER LEVEL INDICATOR"** is bonafied work of **SAMIKSHA VIJAY KINI** bearing Seat. No: _____ submitted in partial fulfilment of the requirements for the award of degree of BACHELOR OF SCIENCE in INFORMATION TECHNOLOGY from University of Mumbai.

Internal Guide **Coordinator**

External Examiner

Date: **College Seal**

DECLARATION

I here by declare that the project entitled, **"Water Level Indicator"** done at SDSM College, has not been in any case duplicated to submit to any other university for the award of any degree. To the best of my knowledge other than me, no one has submitted to any other university.

The project is done in partial fulfillment of the requirements for the award of degree of **BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)** to be submitted as final semester project as part of our curriculum.

Samiksha Vijay Kini

ABSTRACT

Water level indicator is the system which enables people to indicate and detect level of water resources more conveniently and efficiently. It can be simple as remote or automatic controlling of electrical appliances.

We focused entirely on the power saving and less appliances with minimum manpower. The concept of IoT (Internet of Things), various software are implemented in this project.

The project uses water sensor to detect the water level. Main component of this project is “Arduino” to make working effortless and efficient.

ACKNOWLEDGEMENT

The successful completion of any task would be incomplete without mentioning all those people who made it possible, the constant and encouragement, crowns the effort with success.

I wish many thanks to our Head of Department **Mr. Ashwin Bhagat** for providing guidance throughout the course and all those who have indirectly guided and helped us in preparation of this project.

I express my thanks to my project guide **Mrs. Sayalee Jadhav** for this constant motivation and valuable help through the project work.

I am indebted to my well-wishers and friends who encourage me in successful completion of the project.

SAMIKSHA VIJAY KINI

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Chapter 1

1. Introduction

1.1 Background

The drinking water crisis in India is reaching alarming proportions. It might very soon attain the nature of global crisis. Hence, it is of extreme importance to preserve water. In home based water tank, the one problem is very common to us that the control of water level of overhead tank, as a result the wastage of water is increasing day by day. But we all know water is very precious to us. Water is most essential thing on earth.

Total amount of water available on Earth has been estimated at 1.4 billion cubic kilometers, enough to cover the planet with a layer of about 3km. About 95% of the Earth's water is in the oceans, which is unfit for human consumption. About 4% is locked in the polar ice caps, and the rest 1% constitutes all fresh water found in rivers, streams and lakes which is suitable for our consumption. A study estimated that a person in India consumes on an average of 140 liters per day. This consumption would rise by 40% by the year 2025. This signifies the need to preserve our fresh water resources. This problem can be controlled by a simple electronic circuit consists with some cheap electronic components, that circuit is called 'Water Level Indicator'.

A Water Level Indicator may be defined as a system by which we can get the information of any water reservoir. Water level indicator system is quite useful to reduce the wastage of water from any reservoir, while filling such reservoir. Nowadays everybody has overhead tank at their homes but, those who have a water tank knows the kind of problems that they face .Water overflowing is of the major issues of them. prevention of water is essential. So, here we introduce the device that detect the level of water and notified by buzzer. We are using Arduino which is connected to battery, buzzer and Sensor/ultrasonic sensor.

The water level indicator circuit is a simple mechanism to detect and indicate the level of water in the overhead tank and also in the other containers.

This module is designed mainly for the DIY hobbyist and provide them a low-cost and easy-to-use water level detection scheme.

1.2 Objectives

The main objectives are to overcome overflow problems, to avoid wastage of water, attention to water crisis. These are the initial objectives and there are following objectives are likely to be focused and achieved at the end of the project.

1) To make the most commercial and reliable water level controller using as less resources as possible.

2) To study the controller model and observe its characteristics.3) To compare the controller with the conventional controllers available in market.

1.3 Purpose, Scope and Applicability

1.3.1 Purpose

Thinking about the drinking water crisis in Asia is reaching alarming proportions. It might very soon attain the nature of global crisis. Hence, it is of utmost importance to preserve water for human beings. In many houses there is unnecessary wastage of water due to overflow in overhead tanks. A Water Level Indicator and Controller can provides a solution to this problem. The operation of water level controller works upon the fact that water conducts electricity due to the presence of minerals within it. So water can be used to open or close a circuit. As the water level rises or falls, different circuits in the controller send different signals. These signals are used to switch ON or switch OFF the motor pump as per our requirements. As a result the future circuit is not very cheaper the present one, but we try our best to:

1. Make it simple
2. Easy to use
3. Easy to install
4. To make Available for all
5. Try to smaller than the present one.

So, gathering this list of problems we are going to provide the water level indicator that will help us to overcome the overflowing problem.

1.3.2 Scope

This above specified project is being made to deliver a desired device that could used by everyone. The project has wide scope in hardware as well as software. The target is to achieve the goal by making it effortless and which requires less human work.

1.3.3 Applicability

Water level indicator has wide range of applicability in many fields, they care categorized as following:
Automatic Water level Controller can be used in Hotels, Factories, Homes Apartments, Commercial Complexes, Drainage, etc.,

It can be fixed for single phase motor, three phase motors, fuel level indicator in vehicles. liquid level indicator in the huge container companies on the tank walls

It can also be implemented in open well, Bore well and Sump. We can control two motor and two sumps and two overhead tanks by single unit.

Fuel level indicator in vehicles.

Liquid level indicator in the huge containers in the companies.

1.4 Achievements

In our project water level indicator there are main conditions as follows,
There is no water available in the source tank.
When the water stared filling to the overhead water tank then the green led glows.
The level reaches upto the midlevel of the overhead water tank then yellow led glows.
There is ample amount of water available in the source tank.
After that, the red led glows that the tank is going to be full or full at last the buzzer sounds when tank is going to be over flow.
From this we come to know that, Water level will consist the notification and buzzer.

1.5 Organization Report

The project discusses the overview of the project including background, objectives, achievements, etc. of the project.

The project focuses to provide mentioned objectives and goals. The survey of technology from various research papers and projects already existing is done.

The project defines the study of existing system and identifying the problems in existing system and requirement analysis to implement new functional requirements of the project.

Providing the extra features like latest trend of making projects with Arduino which is missing in traditional water level indicators also discusses overall system development process including basic modules like ArduinoUNO (microcontroller) and building the code with Arduino IDE software.

There are various test case designs to enhance the system performance and minimize security issues.

Chapter 2

Survey of Technologies

Md. Islam Hamel 2018[1], Automatic Water Level Indicator and Controller can provide a solution to this problem. The operation of water level controller works upon the fact that water conducts electricity due to the presence of minerals within it. So water can be used to open or close a circuit.

Sanam Pudasaini, Anuj Pathak, Sukirti Dhakal, Milan Paudel, 2014[2], Automatic Water Level Controller with Short Messaging Service (SMS) Notification. Department of Mechanical Engineering, Kathmandu University, Nepal.

N. K. Kaphungkui, 2014[4], Design of Low Cost and Efficient Water Level Controller. International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 3, Issue 6, All Rights Reserved © 2014 IJARECE 671, Dept of ECE, Dibrugarh University, India.

Mudit Bajpai, Money Saxena, 2017[5] International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056Volume: 04 Issue: p-ISSN: 2395-0072 © 2017, IRJET | Impact Factor value: 5.181 | ISO 9001:2008 Certified Journal | Page 811 WATER LEVEL INDICATOR USING MICRO CONTROLLER.

Chapter 3

Requirements and Analysis

3.1 Problem Definition

In a startling reminder that our world's most precious resource is becoming scarce for too much of the population. The resource which is essential for the survival of living beings -' water'. Some 844 million people are now struggling to access life's most essential requirement – almost 200 million more than previously counted. So it's a huge cause of concern. In some areas there is excess of water and on the other side there is deficiency of water. Having resources but not using it properly is a big concern.

In such situation, Water level indicator technology play an important role to maintain water level with less human intervention. Indian monsoon being erratic in nature, there is irregularity in the distribution of rainfall throughout the year. Water need constant monitoring. This proposed paper focuses on reducing the water wastage by using smart and new technology best known as 'Water level indicator'.

Water level detection and indication system means that the device which is useful for Tracking the level of water in overhead or underground tank. In the areas like houses, offices and societies where there is excessive loss of water due to overflowing of water tank can be reduced by using this water tracking device. Key point is that this project is based on Internet of things(IOT) which is generally used when hardware and software is combined. This kind of devices are wireless or wired technologies.

It not only discusses how Internet of Things (IoT) can be used to achieve optimal solution by continuously monitoring the water level but also discusses how to track the level of the water. The system will uses Arduino a d different hardware components and IDE software for programming. Arduino is open source that helps us to make code easier.

Complete Problem Statement

The water level indicator employs a simple mechanism to detect and indicate the water level in an overhead tank or any other water container the problem is that most water level indicators are equipped to indicate and detect only a single level and due to lack of notifying the level overflowing of water problem raised.

Solution Over problem

Diagnosis of the current situation of wastage of water is being solve by the proper evaluation of the problem. By using by modern technology this problem could be overcome.

Benefits of water level is given below

1. To overcome overflow problems.
2. To prevent wastage of water.
3. Attention to water crisis.
4. Thinking over its solution.

3.2 Requirements Specification

Operations to be performed can be defined as:

When the water stared filling to the overhead water tank then the green led glows, next when the level reaches up to the midlevel of the overhead water tank then yellow led glows. After that the Red led glows that the tank is going to be full or full.

At last, the buzzer sounds when tank is going to be over flow.

3.3 Planning and scheduling

1) Gantt chart representation

	Task	Start	End	Duration	2018		2019	
					Q3	Q4	Q1	Q2
	Project -Water level indicator	8/16/18	3/15/19	172				
1	Problem definition	8/16/18	8/24/18	8				
2	Requirement Specifications	8/27/18	8/31/18	4				
2.1	Requirement Gathering	8/27/18	8/31/18	4				
3	Feasibility study	9/2/18	9/8/18	5				
3.1	Project charter	9/2/18	9/6/18	3				
3.2	Technical study of hardware	9/7/18	9/8/18	2				
4	System design	10/17/18	11/17/18	28				
4.1	Architecture description	10/17/18	10/20/18	4				
4.2	Making blueprint	10/21/18	10/22/18	1				
4.3	Installation of software	10/23/18	11/17/18	23				
5	Coding and implementation	12/1/18	2/7/19	54				
5.1	Hardware selection	12/2/18	12/3/18	1				
5.2	Install hardware	12/1/18	1/15/19	36				
5.3	Connecting hardware and software	1/16/19	2/7/19	18				
6	Testing	2/3/19	2/21/19	15				
6.1	Test model	2/6/19	2/11/19	5				
6.2	Test plan	2/3/19	2/4/19	1				
6.3	Test evaluation	2/15/19	2/21/19	5				
7	Integration	2/20/19	2/23/19	4				
8	Maintenance and modification	3/9/19	3/15/19	6				

Figure no.3.1Gantt chart for entire project schedule.

3.4 Software and hardware requirements

3.4.1 Software requirements

Any operating systems i.e. Microsoft windows to run IDE program.

In this project we are going to use software named as ARDUINO 1.8.7.

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open source software. This software can be used with any Arduino board.

3.4.2 Hardware requirements

1) Arduino UNO board
2) USB cable
3) Buzzer
4) LEDs
5) 9v battery
6) Connecting wires, jumper wires.
7) Resistors
8) Breadboard
9) Water sensor

Hardware Components Details:

ArduinoUNO:

Arduino is an open source computer hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical and digital world. The Uno also provides 14 GPIO pins (of which 6 can also provide PWM output) and 6 10-bit resolution ADC pins.

USB cable:

Using a single USB cable, you cannot only power the board but also push your code onto it, and (if needed) communicate with it—for example, for debugging or to use the computer to store data retrieved by the sensors connected to the Arduino.

Devices such as Wi-Fi dongles often depend on additional software on the host system, such as networking stacks, and so are better suited to the more computer-like option of SoC.

Breadboard:

Bread Board was to be like the base. It holds up all the equipment together by completing the circuit.

LED:

LEDs are small, powerful lights that are used in many different applications.

Water sensor:

Connecting a water sensor to an Arduino is a great way to detect a leak, spill, flood, rain, etc. It can be used to detect the presence, the level, the volume and/or the absence of water. While this could be used to remind you to water your plants, there is a better Grove sensor for that. The sensor has an array of exposed traces, which read LOW when water is detected.

Connecting wires:

Connecting wires are used to connect microcontroller to the different components which are external to the microcontroller.

Jumper wires:

To connect the GPIO pins of Arduino to the components we use jumper wires.

There are 3 types of jumper wires as, Female -Female, Male-Female, Male-Male.

Buzzer:

It plays an important role in Water level detection. Buzzer provides an alert system by ringing according to given process. It can connect to any microcontroller.

Resistors:

It reduces or resist the flow of current. It is used to balance the flow of current which can reduce damages due to current and heat to the microcontroller or Arduino board.

3.5 Preliminary product description

1. LED will glow at every level.

2. When empty water level reaches at first level then Arduino turns ON the water sensor.

3. When empty water level reaches at the last level buzzer starts ringing then Arduino turns OFF the water pump by driving relay.

3.6 Conceptual model

1) Use case diagram:

Use case uses the actors, use cases.

I. In following diagram Water sensors, ED, Buzzer, Resistors, breadboard all this required components are taken as use cases.

II. Computer, water resources, Arduino and Software IDE are taken as actors which performs action in the system.

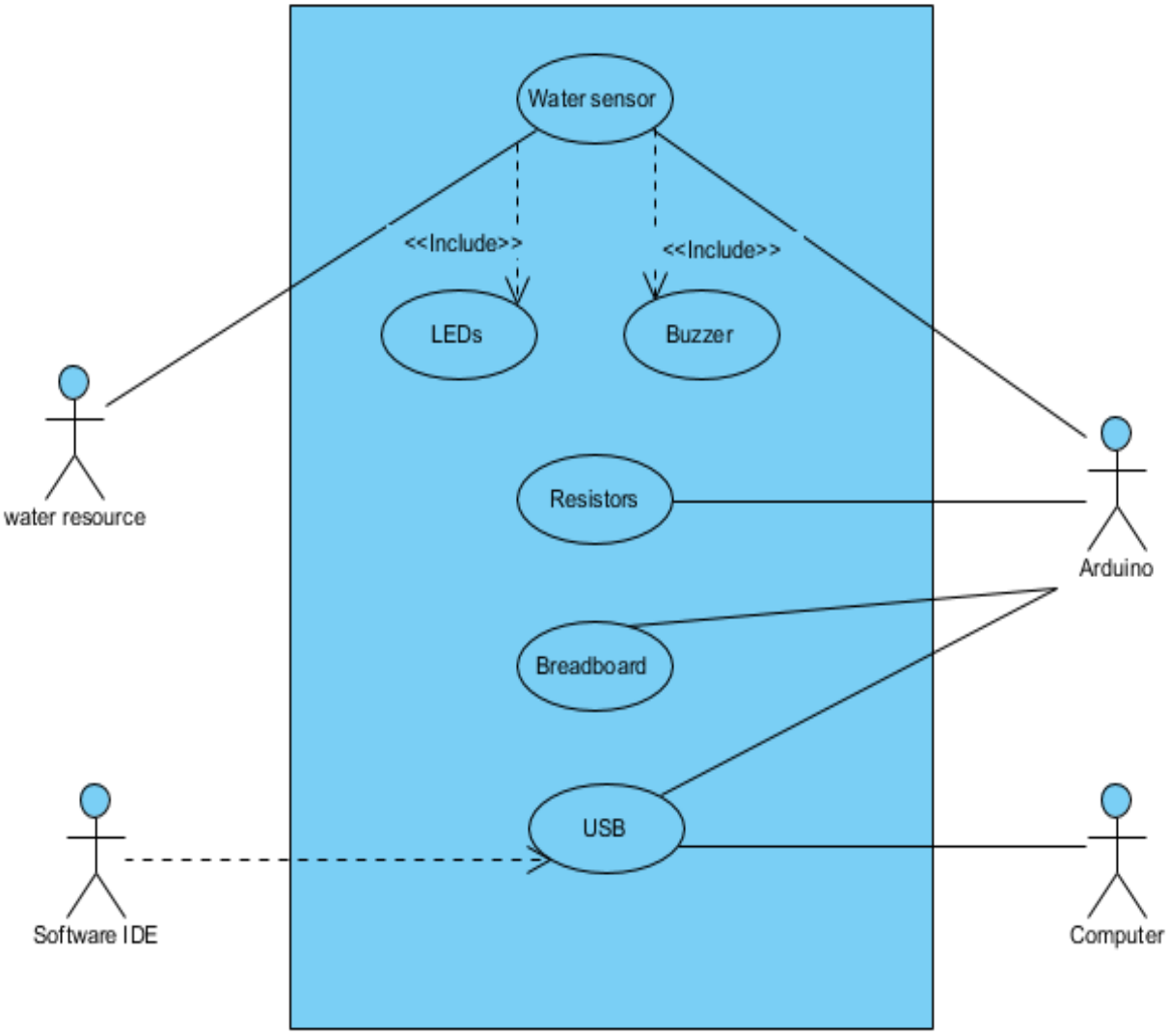

Figure No.3.2Use case for overall project

2)Class Diagram

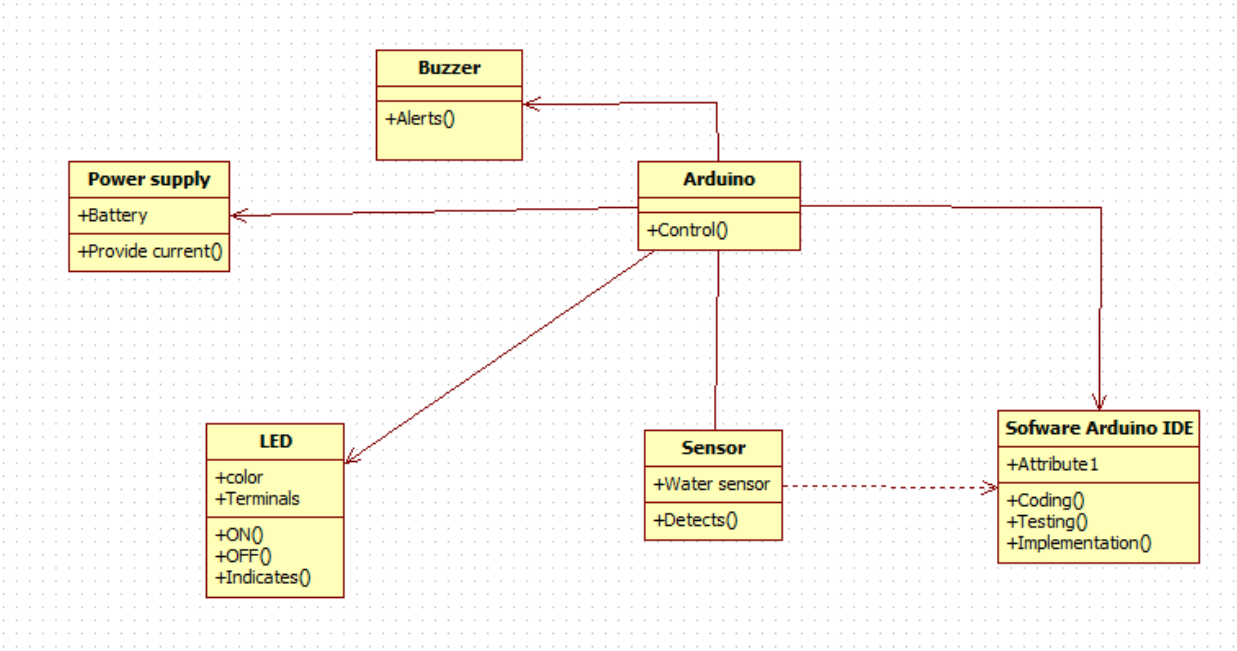

Fig No.3.3 Class diagram

3) System flowchart:

Following flowchart is a description of overall system.

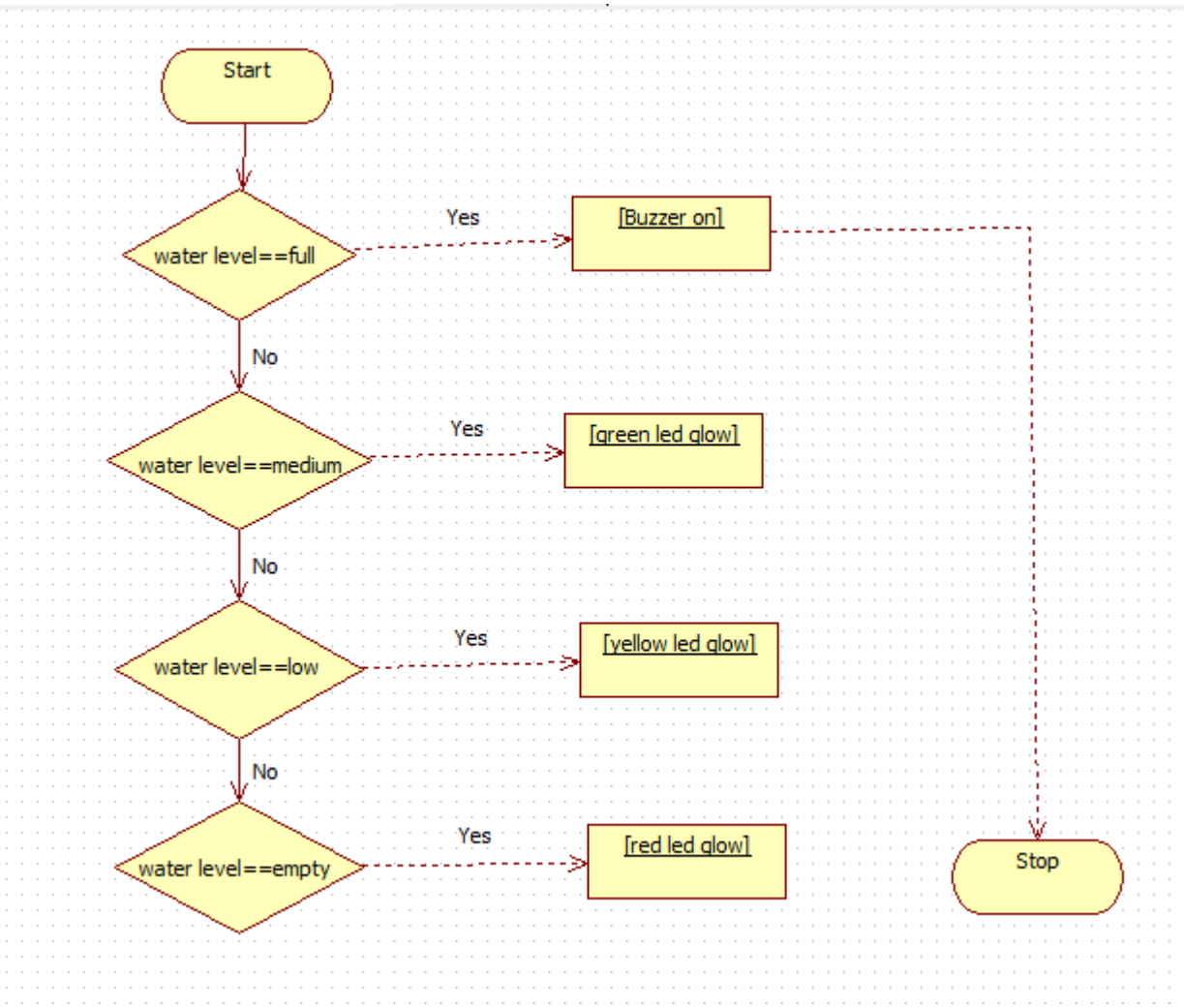

Figure No.3.4 System Flowchart for working of project

Chapter 4

System Design

4.1 Basic modules

In many houses there is unnecessary wastage of water due to overflow in overhead tanks. Water Level Indicator and Controller can provide a solution to this problem. The operation of water level controller works upon the fact that water conducts electricity due to the presence of minerals within it. So water can be used to open or close a circuit. As the water level rises or falls, different circuits in the controller send different signals.

A water level indicator may be defined as a system by which we can get the information of water within the reservoir. Water level indicator systems are quite useful to reduce the wastage of water from any reservoir, while filling such reservoir.

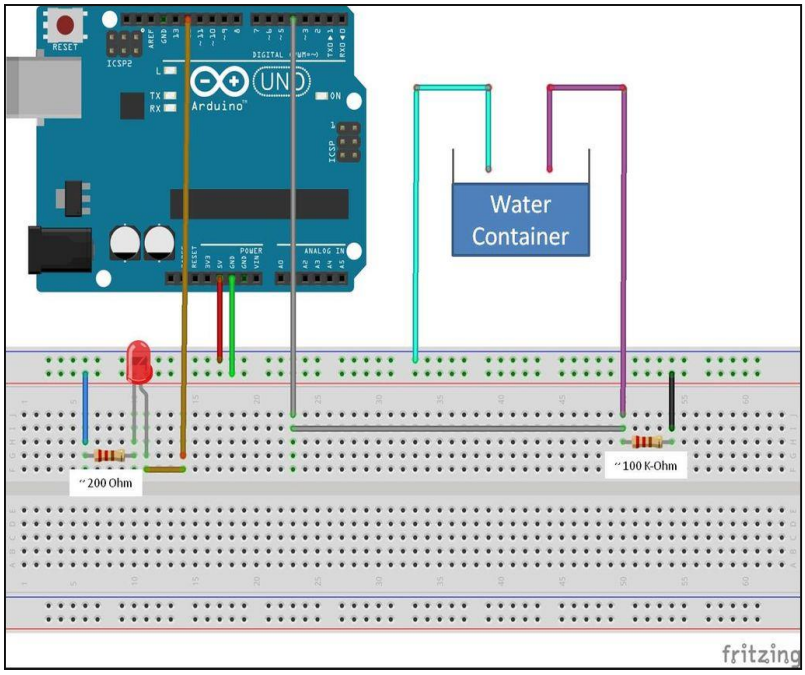

Figure No.4.1 Arduino setup.

4.2 Data design

Designing includes system design,schema design ,logical digrams and procedural diagrams and designs.Designing is very essential as it gives detailed information of the overall sytem design and key refeence to build the system.

4.2.1 Schema design

Schema design is use to make architectural design of the specified project.It is overview of the overall project ,it is simplified view.

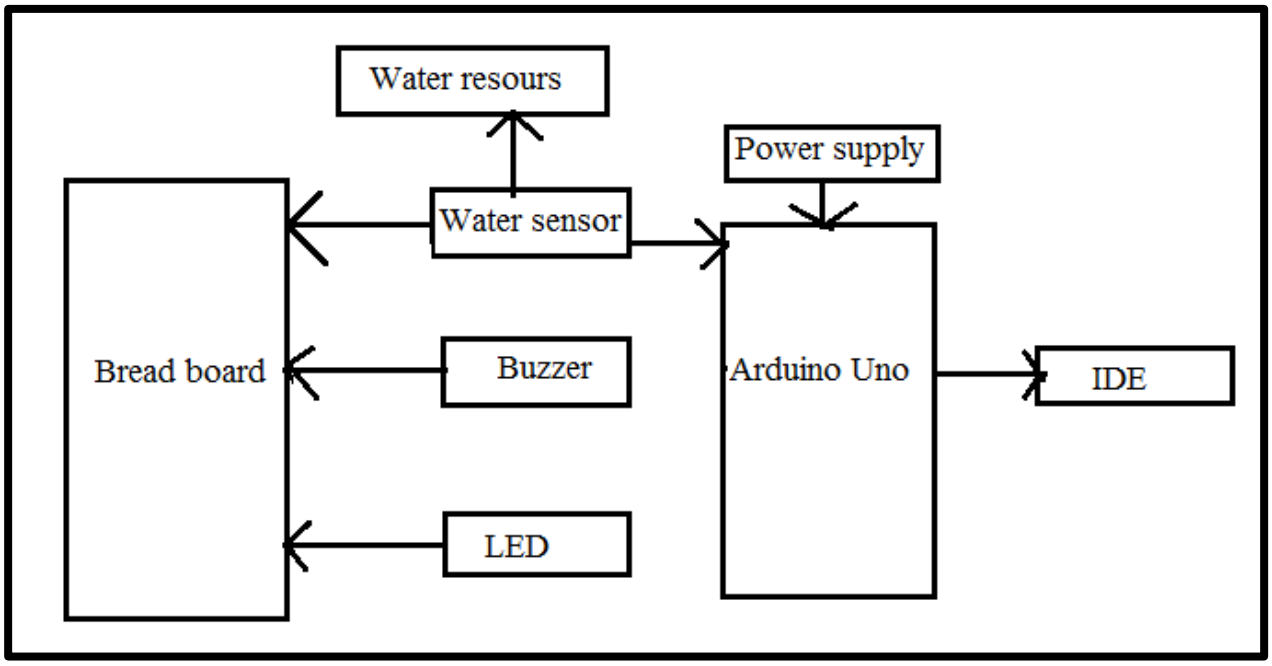

Diagram No.4.2 Schema design overview

4.3 Procedural design

4.3.1 Logical diagrams

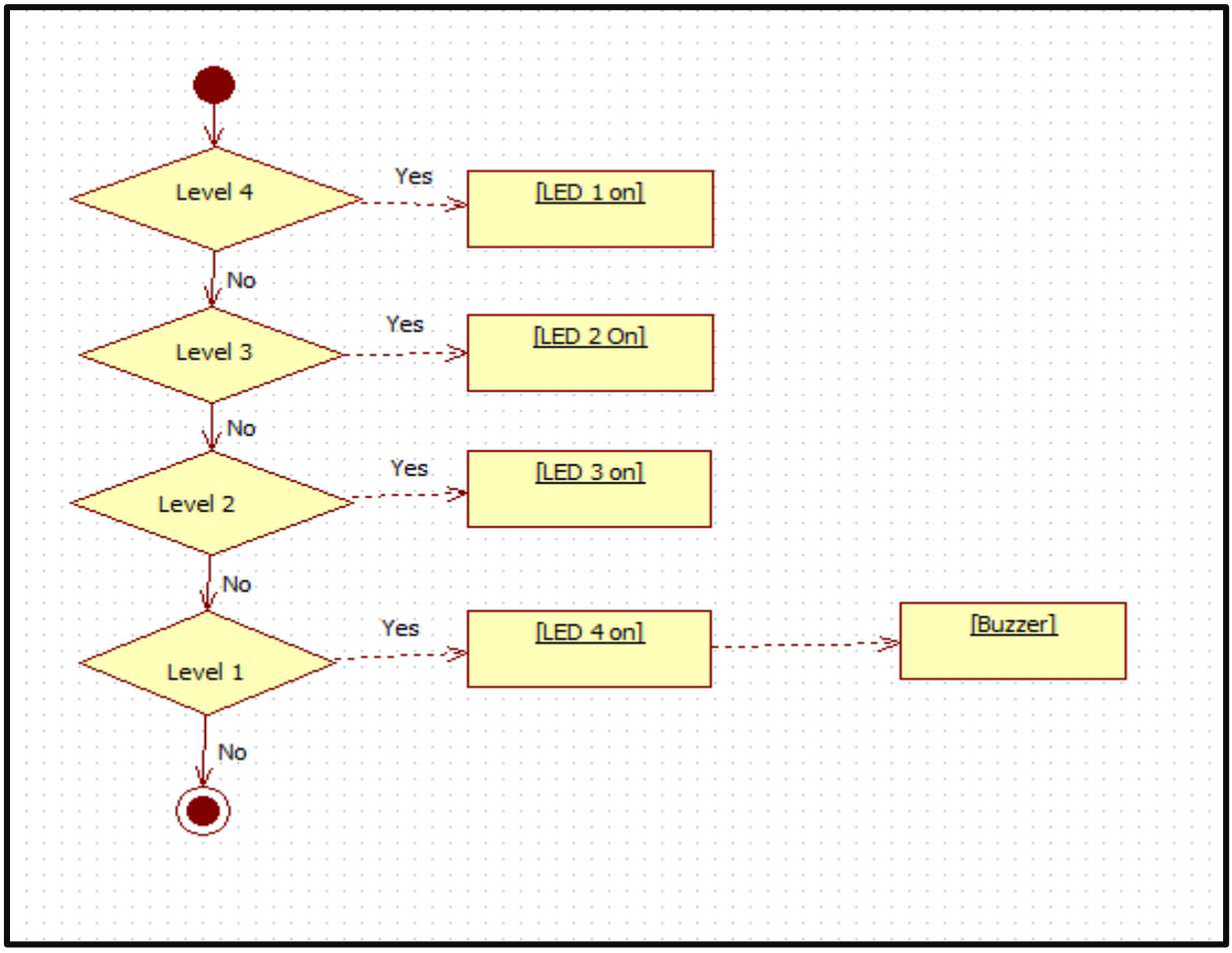

Figure No.4.3 Logical design

4.3.2 Data structure

The data structure of this module includes connection of hardware to software IDE through the USB cable.Used to run the code on the IDE platform .

IDE detects a the situation and woks accordingly .Water sensor detects water level in the water resource and gives the command to the buzzer to ring.

At last,when water level reaches at th high level and when it is going to overflow buzzer will ring.

4.3.3 Algorithm Design

Step 1: Water tank is on ,water tank starts filing.

Step 2: When water level reaches at low level green LED will glow.

Step 3: When water level reaches at intermediate level yellow LED will glow.

Step 4: When water level reaches at high level red LED will glow.

Step 5: If water sensor detects that water is overfilling ,then Program will run and buzzer starts ringing.

4.4 User Interface

User:

The user of this module or a program is anyone can use it.

Environment:

In offices, Restaurants, in parks, Houses and societies, everywhere where water tanks are implemented.

-It is easier for user because it gives indication after glowing of LED's.

-Water sensor detects water level and buzzer starts ringing .User don't require to pay attention.

4.5 Security Issues

Water security is widely recognized as an important and increasingly urgent policy challenge. To address this challenge, appropriate indicators are needed to stimulate policy action and measure the effectiveness of interventions. Indicators are more likely to have an impact on policy formulation when they are valid, credible and salient. This project applies a co-production approach to develop a set of Urban Water Security Indicators which aim to meet these criteria. The approach was piloted in two cities, Singapore and Hong Kong. Data for a 15-year period were collected and stakeholder consultation and validation conducted. The paper reports on the indicator development process and findings, and reflects on the value of the Urban Water Security Indicators as a tool in policy formulation. The approach is being replicated in a larger group of cities as part of an ongoing research program.

4.6 Test Cases Design

(1)Component testing:

-Arduino circuit testing.

-Water sensor maintenance.

-Software installation debugging.

(2)Integration Techniques:

The software IDE is combined with Arduino for testing and coding. The software and hardware interface will be integrated.

REFERENCSES

[1]https://www.researchgate.net/publication/322938907_Water_Level_Indicator

[2]http://www.ijsrp.org/research-paper-0914/ijsrp-p3391.pdf

[3]http://ijarece.org/wp-content/uploads/2014/06/IJARECE-VOL-3-ISSUE-6-671-674

[4]*www.irjet.net*

Chapter 5

Implementation and Testing

5.1 Implementation Approaches

A water level indicator can be made using resistors, LEDs, buzzer and some wires etc. Project we have designed consists of the sensor that measure water up to three levels. Adjust the length of the wire segments according to the water levels. The jumper wire is connected to buzzer. The wires with colors Red, Yellow &Green are adjusted to check Level1, Level2 and Level3 respectively from bottom to top.

Here circuit is connected to 9 volt dc voltage source. The positive end of the dc source is connected to the overhead water tank and the negative end of the dc source is connected the diode LEDs and the buzzer accordingly. The other end of the LED are connected to the 220 k resistors and the resistor ends are connected to the separately to the overhead water tank. The buzzer's other end is connected to the overhead water tank here the resistor is not connected. One switch is connected between the positive voltage source of the circuit and the battery.

Condition 1:

When tank have no water there are no signal in the indicator. After starting flow water first LED is indicate the level of water

Condition 2:

When tank is medium full of water, then the 2nd LED is indicator is ON.

Condition 3:

When tank is High full of water third LED is indicator is ON.

Final Condition: After overflow the tank Buzzer is starting the sound.

5.2 Coding details and code Efficiency

Set up:

Step 1: Water tank is on ,water tank starts filing.

Step 2: When water level reaches at low level green LED will glow.

Step 3: When water level reaches at intermediate level yellow LED will glow.

Step 4: When water level reaches at high level red LED will glow.

Step 5: If water sensor detects that water is overfilling ,then Program will run and buzzer starts ringing.

Coding details for the different components :

LED blinking :

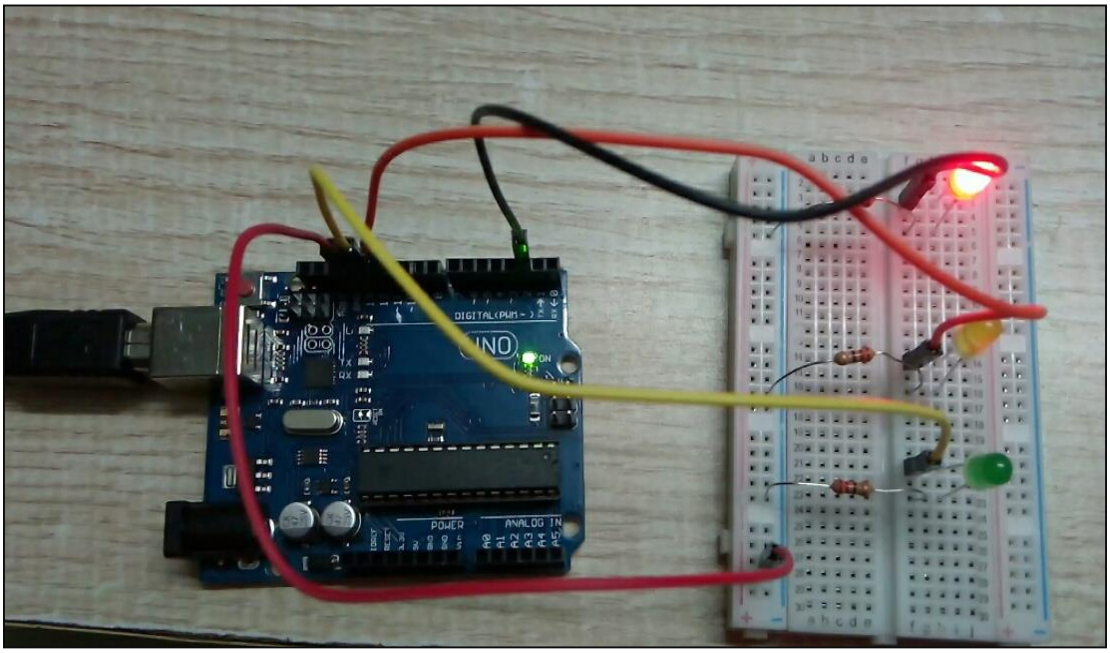

Figure No.5.1 LED blinking

Code for LED :

```
void setup() {//Setting up the Arduino
Serial.begin(9600);
{
  pinMode(2,OUTPUT);//Setting up LED as an output pin
  pinMode(12,OUTPUT);//Setting up LED as an output pin
```

pinMode(13,OUTPUT);//**Setting up LED as an output pin**

}}

void loop() //**Code written between "{}" repeats itself for ever**

{{

digitalWrite(2,LOW); //**This statement sets the LED Low**

Serial.println("Led off"); //**This statement prints values stored in input val on the serial monitor**

delay(1000);//**This statement makes the Adriano sleep for 1000ms**

digitalWrite(12,LOW);

Serial.println("Led off");//**This statement prints values stored in input_val on the serial monitor**

delay(1000);

digitalWrite(13,LOW);

Serial.println("Led off");

delay(1000);

}}

Buzzer code:

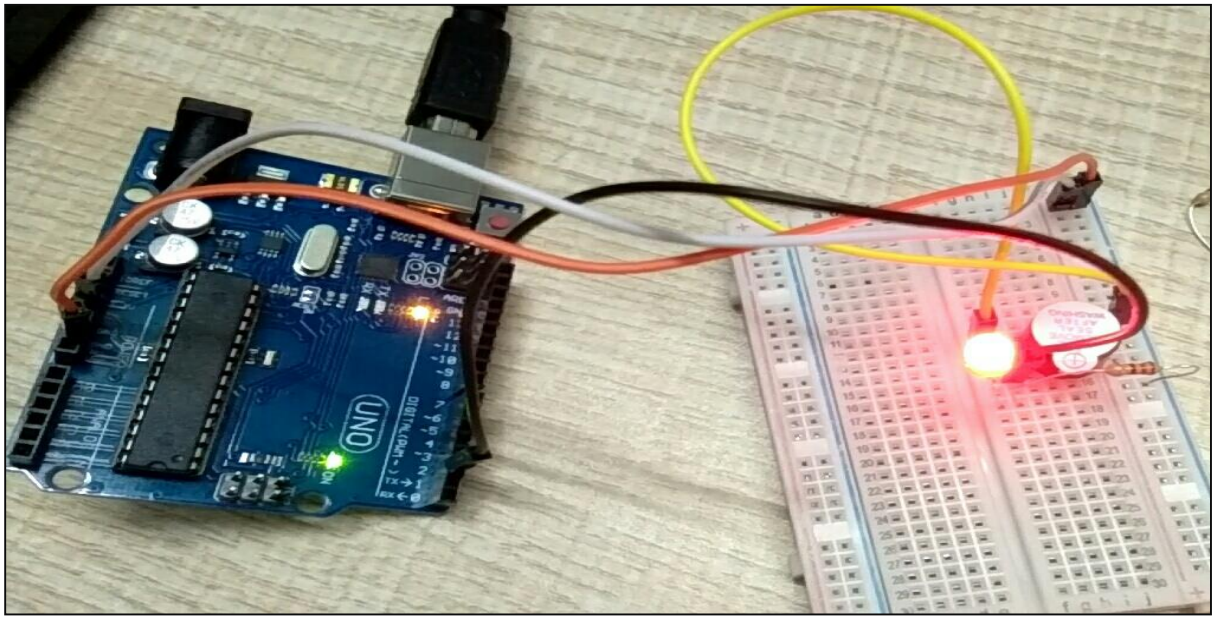

Figure No.5.2 Buzzer

Code for piezo buzzer :

```
Constint buzzer=2;//This statement gives name buzzer to pin3
void setup(){
Serial.begin(9600);
  {
pinMode(buzzer,OUTPUT);  //This statement sets buzzer pin as an output pin
}}
void loop() {
digitalWrite(buzzer,LOW);// This statement makes buzzer on.
delay(200);    }                    //some delay
```

5.2.1 Code Efficiency

1. Define the variables

```
int sensorPin=A1;
int greenpin=8;
int yellowpin=7;
int redpin=6;
int sensorValue=0;                    //to store the value coming from the sensor
int buzzpin=A0;                       //for buzzer
```

2. Defining the pin number to specific variable

```
void setup() {
  Serial.begin(9600);
  pinMode(greenpin,OUTPUT);
  pinMode(yellowpin,OUTPUT);
  pinMode(redpin,OUTPUT);
  pinMode(buzzpin,OUTPUT);
}
```

3.Actual running code using loops

```
void loop() {
  sensorValue = analogRead(sensorPin);            // read the value from the sensor
 // send the message about water level to serial monitor

 if (sensorValue <= 0) {
  Serial.println("Water level: 0mm - Empty!");
 }
 else if (sensorValue > 1 && sensorValue <= 330) {
  Serial.println("Water lvl: 20mm");
  digitalWrite(greenpin, HIGH);                    // turn the green LED on
 }
 else if (sensorValue > 331 && sensorValue <= 360) {
  Serial.println("Water lvl: 50mm");
 }
 else if (sensorValue > 361 && sensorValue <= 385 ) {
  Serial.println("Water lvl: 65mm");
  digitalWrite(yellowpin, HIGH);                   // turn the yellow LED on
  }
  else if (sensorValue > 386 && sensorValue <= 399 ) {
  Serial.println("Water lvl: 80mm ");
 }

 else if (sensorValue > 400 && sensorValue <= 449 ) {
  Serial.println("Water lvl: 91-129mm tank is going to full..");
 }
 else if (sensorValue > 450) {
  digitalWrite(buzzpin, HIGH);                     // turn the piezo buzzer on
  digitalWrite(redpin, HIGH);                      // turn the red LED on
  Serial.println("Water lvl: 100mm  Alarm! Alarm!turn off....");
```

```
  }
  delay(1000);                          // delay 1 second
  digitalWrite(greenpin, LOW);          // turn the green LED off
  digitalWrite(yellowpin, LOW);         // turn the blue LED off
  digitalWrite(redpin, LOW);            // turn the red LED off
  digitalWrite(buzzpin, LOW);           // turn the speakerPin off - reset

}
```

5.3 Testing Approach

Schema design of the project is simple outline of how the components are joined together.

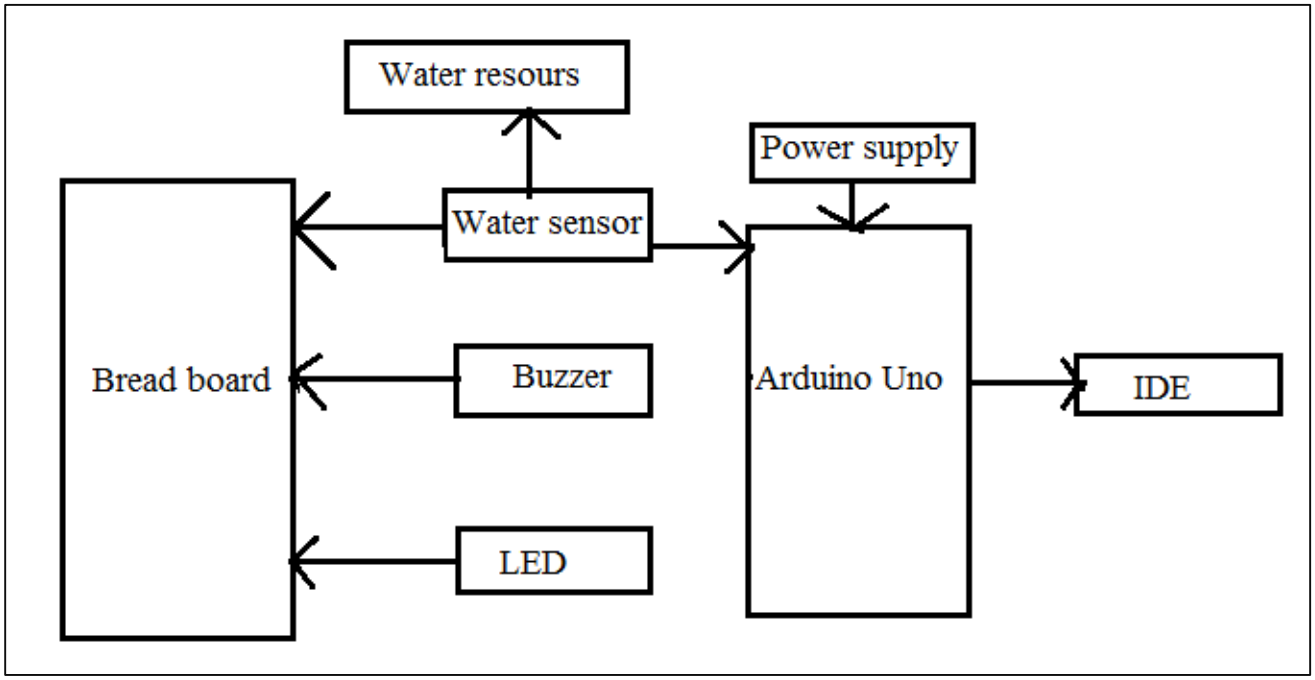

Figure No.5.3 Schema design

As per diagram above "water level sensor" –the main component is connected to both water resource and onto the arduino board. Water sensor is connected to the arduino pins. Arduino is joined to the different components such as Breadboard for the connection with LEDs-Light

Emitting Diode. Also, buzzer is connected to the breadboard which is indirectly connects to the arduino board. Arduino is having power supply externally attached to the power supply socket.

5.3.1 Unit Testing

Each components are tested separately for next phase. After the unit testing completed all components are combined together for integration testing.

1) LED:

We tested LED working. Three led Of Red, Green, Yellow blinked properly. Red light indicates the high level (full) water tank. Green light indicates water started filling in the tank. Yellow light means water level is at intermediate level.

2) Buzzer:

Buzzer is attached to the red LED .When Led Glows the buzzer starts ringing. We will change the delay time according to our requirements. A peizo buzzer is a device that is used to generate beep sound (generally a warning or alert in embedded system).It is a two leg device the longer leg is positive. If voltage is supplied it generates beep sound.

3) water sensor:

It directly attached to arduino board. Water sensor senses the water in the tank. It works properly without any bugs in the code.

5.3.2 Integrated Testing

All modules such as buzzer and main component water sensor are bring together to built a overall model.

There are two parts of our project for integration testing

Part 1:

First part consists of testing of LED and buzzer.

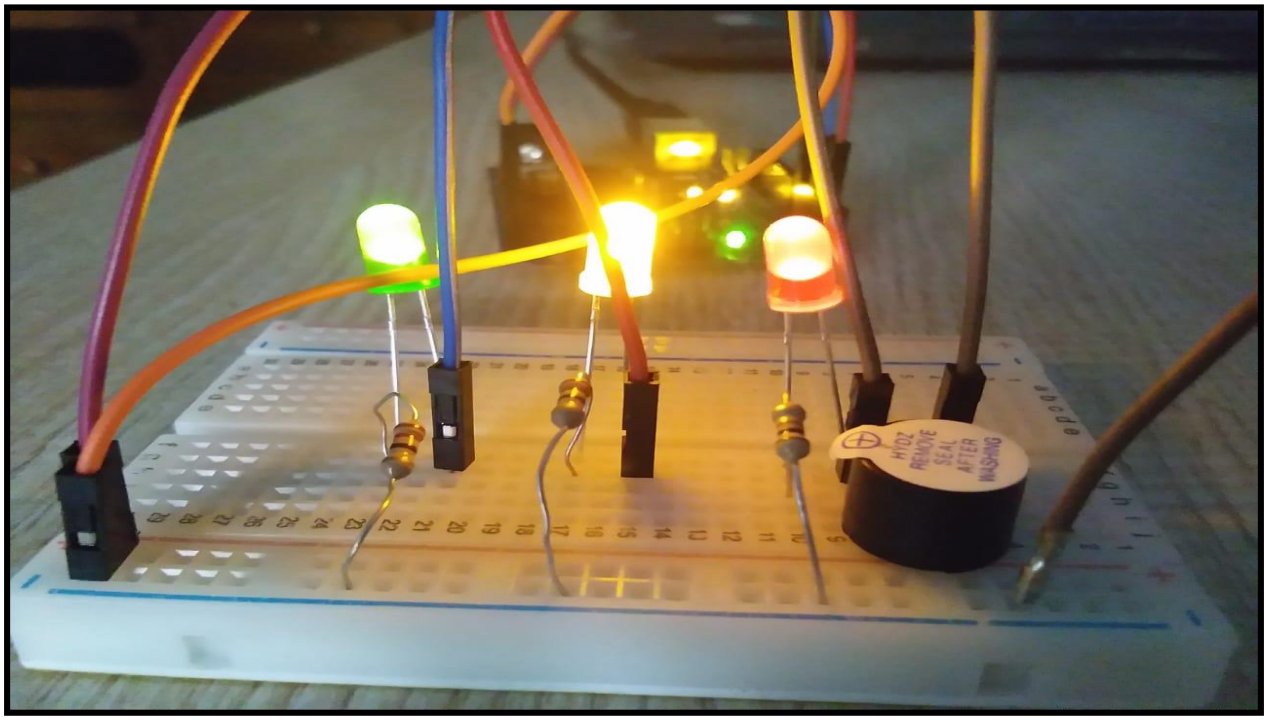

Figure No.5.4 Integrated testing of LED's with Buzzer

The connection is done as follows:

1. The positive end of LED is connected to positive end of buzzer.
2. Positive side of Red, Yellow and green color LEDs are joined to the pin no 7, 2 and 4 of Arduino board respectively.
3. Register is connected to the negative side of LED.
4. 5V and ground pin of arduino is connected to the positive and negative of the breadboard respectively.
5. Negative part of buzzer is connected to the ground pin of the Arduino.

Part 2:

Second part consists of testing of LED and buzzer with water sensor.

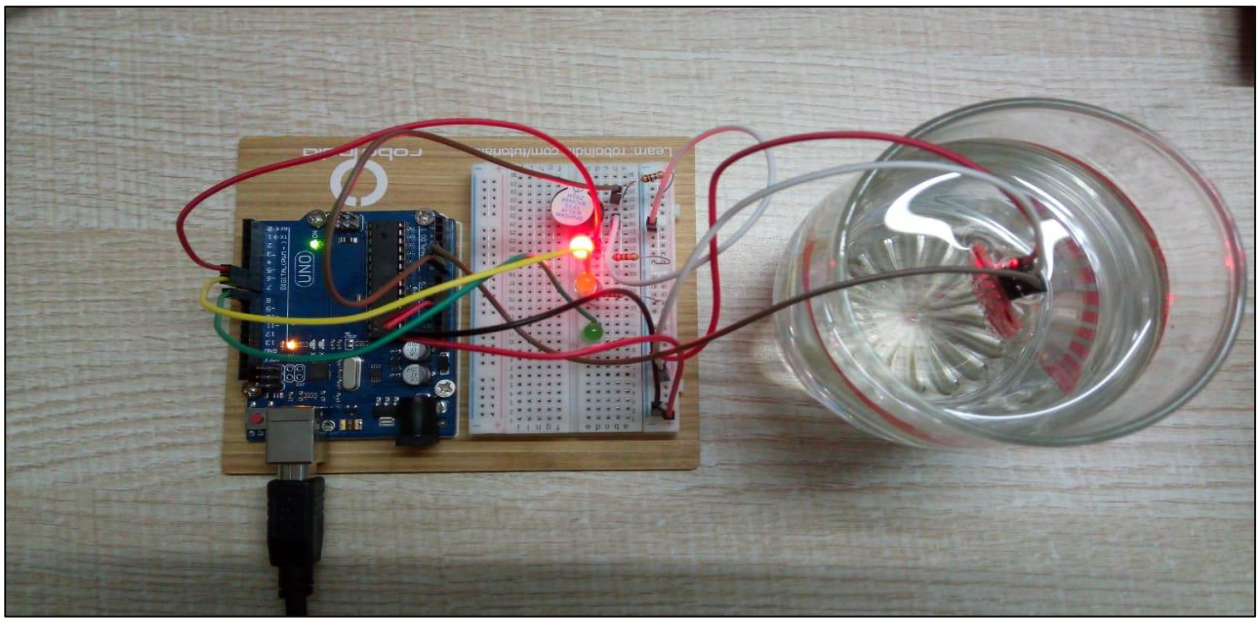

Figure No.5.5 Integrated testing of LED and buzzer with sensor.

The connection is done as follows:

1. The positive end of LED is connected to positive end of buzzer.
2. Positive side of Red, Yellow and green color LEDs are joined to the pin no 7, 2 and 4 of Arduino board respectively.
3. Register is connected to the negative side of LED.
4. 5V and ground pin of arduino is connected to the positive and negative of the breadboard respectively.
5. Negative part of buzzer is connected to the ground pin of the Arduino.
6. Ground pin of sensor is connected to the negative of the breadboard.
7. 5V pin of sensor is connected to the positive of the breadboard.
8. S pin of sensor is connected to the A0 of the Arduino.

5.4 Modification and Improvements

- Improvements in Peizo Buzzer code :

  An uppermost LED is attached to the buzzer, when the LED glows the buzzer sounds beep. Initially,the buzzer not beeped;hence we check polarity and code runs successfully.

- Improvement in LED code:

  When we implemented code for the first time we got three errors such as:

1. **LED is not glowing-**

   Checked and changed polarity of the LED.We pulled it out and insert it again.

2. **Code uploading error-**

   We have some minor errors in the code .so, we solved the error.The code uploaded successfully.

3. **General error –**

   It will occur if circuit and connection is wrong.Check the circuit for once and again compile it for any errors.

Chapter 6

Results and Discussion

6.1 Test Reports

Operation:

At the end of implementation of our project we could see that all the components are working properly. But if in case any damage will occur we could change that particular part or component. We used water sensor in our project but it has limited usability. Water sensor has some limitation that it can get corrode after using it. So this part may have to get replaced within a year or few months.

The readings of the water level can be shown on different platforms. They can be listed as:

1) By LCD(Liquid Crystal Display)
2) By connecting it to the wifi module and get readings on the application software.
3) By using Serial monitor displayed on the arduino IDE platform.

Because of time constraint we are displayed it through the 3rd option means using serial monitor.

Reports and testing:

Here**,** we tested many algorithms and programs for the product at last the appropriate code was generated. As various codes are used for testing bugs are also detected during this process. We solved the errors and uploaded project to the arduino board.

Inputs are taken from the water sensor as it detects the water. The inputs are the values detected from the water sensor and outputs are the levels detection using the final product.

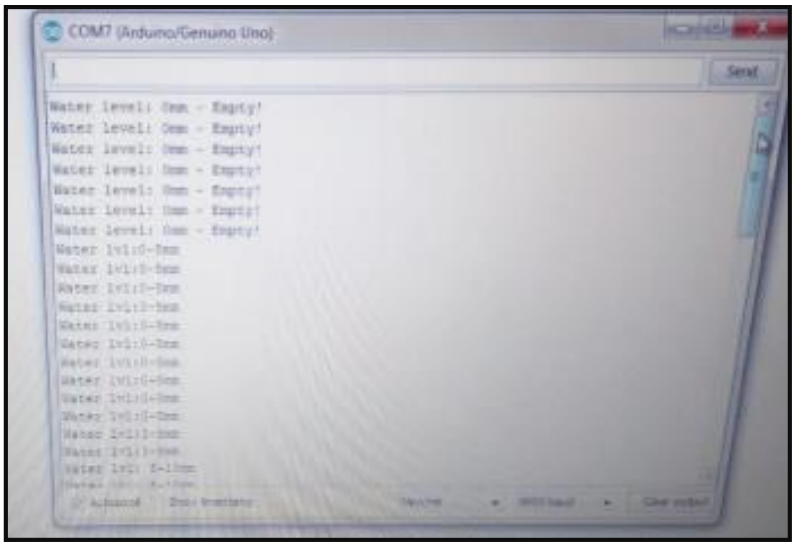

Figure No.6.1 Report of testing

Testing:

Testing process is done through the software IDE. Debugging test is done for solving the bugs. Bugs are fixed properly. Hence it is error free testing. Now it can make move to the further process. Such as documenting and getting outputs.

Reports:

Above figure shows the actual outcomes gathered from the serial monitor from the screen. This outcome shows us the readings of the water sensor which are the proof that project works successfully. Now it is able to take readings from the setup**.**

6.2 User Documentation

KNOW YOUR DEVICE:

Arduino Water Level indicator is technologically advanced version of water detection. It is provided by the Arduino UNO and Arduino IDE. It has built-in power jack for power supply.

DEVICE OVERVIEW:

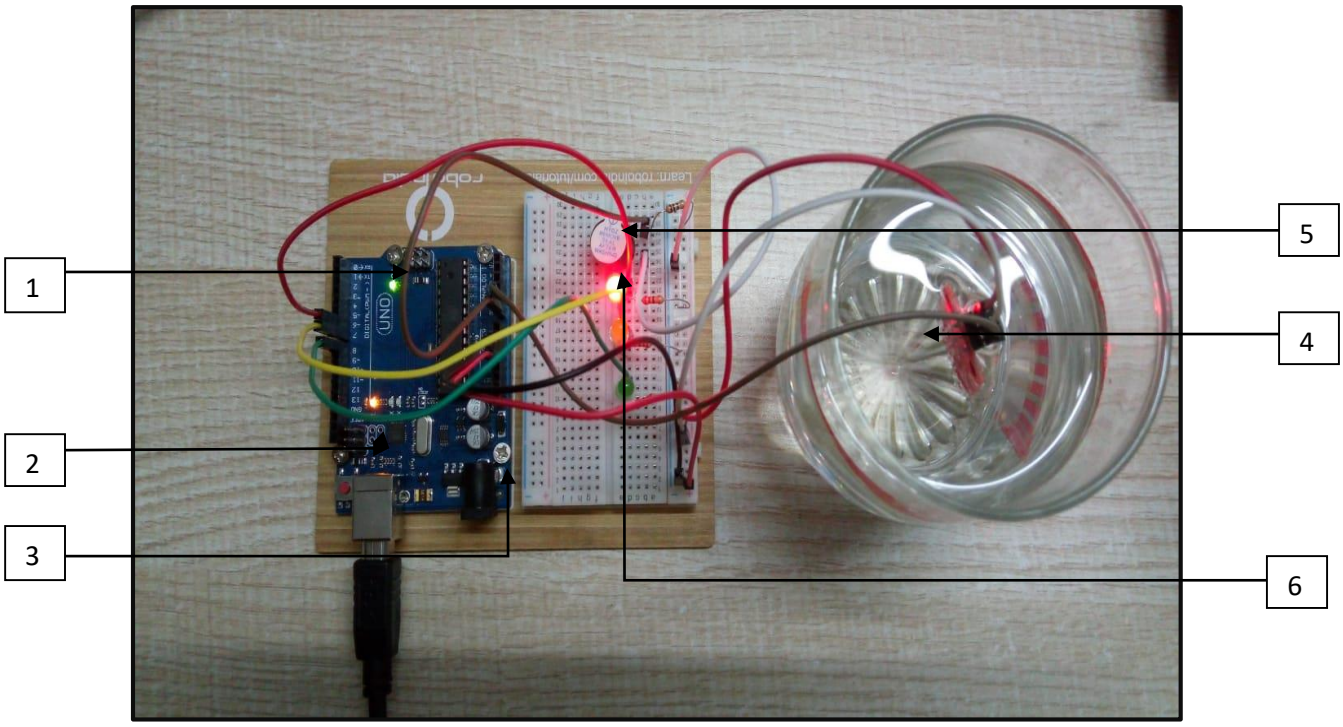

Figure No.6.2 Device Overview

DESCRIPTION OF COMPONENTS:

1	Arduino Uno board
2	USB(Universal Serial Bus)
3	Power supply
4	Water sensor
5	Buzzer
6	LED glow

GETTING STARTED:

Take the water sensor detector and keep it in the water tank. Give the power supply and start up the device. Keep the circuit away from water except water sensor.

You are now ready to turn on your device.

When you turn on the device and water starts raising in the water tank you will see the color change in the LED green to yellow. Finally, when it reaches to the high level mark red LED will glow and buzzer starts ringing. It is the clear indication that you will need to turn off your water tank.

PROPER DISPOSAL:

This is an electronic device that's why should not be disposed of as a household garbage.

For the recycling purpose contact to the near - by authorized recycler or recycling center.

REGULATIONS AND SAFETY USAGE:

To avoid any injury or harm follow some guidelines before using this device.

1) Do not handle device with wet hands.
2) Do not apply force to connect the device as it may damage internal parts of the device.
3) Do not keep water sensor in the sun directly or near to the heat.
4) When not in use keep water sensor dry. Precipitation, humidity, liquid or moisture can contain minerals that can corrode the sensor.
5) Do not spill the chemicals or do not shake or drop the device as it can harm the internal connections.
6) Do not store the device in too hot or too cold temperature. High temperature can shorten the life span of the product.

Chapter 7

Conclusions

7.1 Conclusion

Hence we can conclude that this system is very beneficial in rural as well as urban areas.

It is easiest way to detect the water level in the tank to prevent the wastage of water.

The water level Indicator employs a simple mechanism to detect and indicate the water level in an overhead tank or any other water container. It helps in the efficient utilization of available water sources. If used on a large scale, it can provide a major contribution in the conservation of water for us and the future generations. In these days, when the Earth's reserve of consumable water is decreasing every moment, every drop has its value. Water level controller is a simple yet powerful way to prevent wastage of water. Its simplicity in design and low cost components make it an ideal piece of technology for the common man.

Only aim of this efficient and elegant project is to make it easy to use machine which will be used to save water. By adding technology to simple water level indicator and making it more advanced was our target. More and more people should use this technology with concern to save water. At the end we want assure that our project will help the mankind to save the basic need for their life.

On concluding I want to say that this project is build on the small scale use for now but it can be made on large scale to solve the water overflowing problem for sure.

7.2 Limitation of the Systems

1) It works only when the power is in on state.
2) Buzzer do not reproduce lower frequencies, and cannot move a lot of air so they cannot get very load.
3) LED's don't withstand long term exposure to high temperatures as well as some other form of lighting do.
4) Not only will high temperatures sap the lifespan out of LED's, but heat can also affect the quality of their color.
5) Sensors are not designed for underwater use, gets easily corroded by the outside environment
6) Sensing accuracy of sensor affected by soft materials.

7.3 Future Scope of the Project

In future, we want upgrade this circuit with some sensor which can automatically stop the power supply of the driving pump or motor.
As the technology is changing this project can be kept to the next step. We can use this model with advanced technology. Sensors, Wi-Fi modules and different components can be used to make it more efficient. Also, AI technology could be implemented in such projects as it is done by people,to the people. Robots and other tools would handle detection which will be more concerned about the wasting of water.

Our project is made to detect water level by using the mechanism water level indicator. Short term futuristic goal will be controlled on the mobile and long term futuristic goal will be making an application software that can control and detect the water level.

Short term goal also include:

1) To make it more efficient and working on the limitation.
2) To make the device corrode free and long lasting.
3) To make it automatically controllable.
4) To overcome existing limitation and make it more durable.

REFERENCSES

[1]https://www.researchgate.net/publication/322938907_Water_Level_Indicator

[2]http://www.ijsrp.org/research-paper-0914/ijsrp-p3391.pdf

[3]http://ijarece.org/wp-content/uploads/2014/06/IJARECE-VOL-3-ISSUE-6-671-674

[4]*www.irjet.net*