ALAGAPPA CHETTIAR GOVERNMENT COLLEGE OF ENGINEERING AND TECHNOLOGY
KARAIKUDI – 630 003

SMART WATER FOUNTAIN

Development Part – 02 :

Introduction:

The advancement of the Internet of Things (IoT) technology has ushered in a new era of innovation, with sensor technology, big data, and mobile internet contributing significantly to this transformative landscape. This paper delves into the development of an intelligent monitoring system designed specifically for water fountains, employing the power of IoT. In a world where efficient resource management and real-time data access are of paramount importance, the system offers a comprehensive solution. It extracts critical parameters from water fountains through an array of sensors, and through secure GPRS or Wi-Fi networks, it securely transmits this encrypted data to a centralized server. An Access database is skillfully established to house the real-time operational data from a multitude of water fountains situated in diverse locations. Furthermore, this system provides a user-friendly PC interface application, which empowers both users and administrators with different levels of authority to maintain and manage the unified database effectively. As a result, this intelligent monitoring system not only offers real-time oversight but also the means to control water fountains remotely via the internet. It excels in alerting users and administrators promptly via SMS in the event of any abnormal fountain states. The practical applications of this system promise to enhance the management and efficiency of water fountain resources while underscoring the potential of IoT technology to address real-world challenges and deliver solutions with far-reaching implications.

Overview:

Water fountains have been a major tourist attraction these days which freeze the attention of tourists with their variety of lights, designs, and heights. And as we all know music holds a major partin our day-to-day lives. And hence our idea is to combine the beautiful water fountain with music which makes an extraordinary tourist attraction when constructively set with a range of frequenciesthat enables us to operate through various electronic devices. Musical water fountain consists of Arduino UNO, sound sensor with external MIC, submersible motors, LCD, relay modules, soundgeneration using mobile, ARGB LED light strip &adapters.

VARIOUS TOOLS USED FOR THIS PROJECT:

Sensors:

IOT smart water fountain system rely on a variety of sensors designed to measure parameterslike temperature, humidity, water quality, water level and more. These sensors are strategically deployed to collect real time data.

IOT device:

These are the hardware component that sensors, process data, and facilitate communication. Devices like Raspberry Pi, Arduino, or specialized IoT modules are commonly used to collect data from sensorsand transmit it to central systems.

Communication Networks:

Data from sensors is transmitted using various communication protocols, such as Wi-Fi, Bluetooth, Zigbee, or cellular networks. The choice of network depends on the specific application's range and data transfer requirements.

IoT Platform:

Data collected by sensors is sent to an IoT platform or cloud service, such as AWS IoT, Google Cloud IoT,or Microsoft Azure IoT. These platforms provide storage, data processing, real-time monitoring, and visualization tools.

components:

* ARDUINO UNO OR ARDUINO NAN

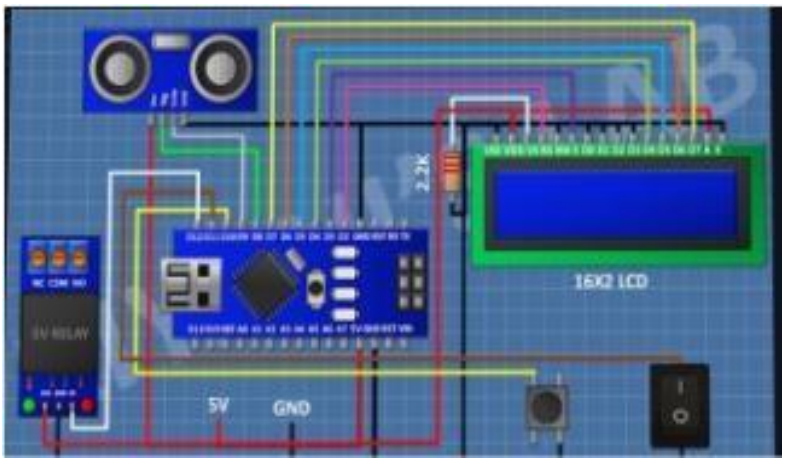
* 1K 0.25WATT RESISTORS – 8 NO (R1 – R8)

* 10K 0.25WATT RESISTORS – 4 NO (R9 – R12)

* BC547 NPN TRANSISTOR (Q1)

* LED 5MM – 7NO

* 2-PIN TERMINAL CONNECTORS (5 NO)



Design features:

- fountains wirelessly communicate with base stations.
- base stations collect and transmit usage, filter, and system health information to the cloudvia ethernet.
- wireless communications use a low-power unlicensed band for improved security and power savings.

Working:

- In manual;
  - if tank is empty, we need to turn on manually
- In auto;
  - if tank is empty, motor turn on automatically

Program:

```
#include <EEPROM.h> #include
<LiquidCrystal.h>
LiquidCrystal lcd(2,3,4,5,6,7);long
duration, inches;
```

```
int set_val,percentage;bool
state,pump;
void setup() {
lcd.begin(16, 2);
lcd.print("WATER LEVEL:");
lcd.setCursor(0, 1);
lcd.print("PUMP:OFF MANUAL");
pinMode(8, OUTPUT);
pinMode(9, INPUT);
pinMode(10, INPUT_PULLUP);
pinMode(11, INPUT_PULLUP);
pinMode(12, OUTPUT);
set_val=EEPROM.read(0);
if(set_val>150)set_val=150;}void loop()
{
digitalWrite(3, LOW);
delayMicroseconds(2);
digitalWrite(8, HIGH);
delayMicroseconds(10);
digitalWrite(8, LOW);
duration = pulseIn(9, HIGH);
inches = microsecondsToInches(duration);
percentage=(set_val-inches)*100/set_val;
lcd.setCursor(12, 0);
if(percentage<0)percentage=0;
lcd.print(percentage);
lcd.print("% ");
if(percentage<30&digitalRead(11))pump=1;
if(percentage>99)pump=0;
digitalWrite(12,!pump);
lcd.setCursor(5, 1);
if(pump==1)lcd.print("ON ");
else if(pump==0) lcd.print("OFF");
lcd.setCursor(9, 1);
if(!digitalRead(11))lcd.print("MANUAL");else
lcd.print("AUTO ");
if(!digitalRead(10)&!state&digitalRead(11)){state=1;
set_val=inches; EEPROM.write(0,
set_val);
}
if(!digitalRead(10)&!state&!digitalRead(11)){state=1;
pump=!pump;
}
if(digitalRead(10))state=0;
delay(500);
}
```

```
long microsecondsToInches(long microseconds) {return
microseconds / 74 / 2;
}
```

Output link:

HTTPS://WOKWI.COM/PROJECTS/379631344770984961