ENVIRONMENTAL MONITORING USING IOT

PHASE 3: INNOVATION

Environmental monitoring

INTRODUCTION :

Environmental monitoring refers to the process of tracking and assessing various aspects of the natural environment to understand changes, trends, and potential impacts on ecosystems, human health, and the planet as a whole. It involves the collection, analysis, and interpretation of data related to air, water, soil, and other environmental factors. Environmental monitoring is crucial for several reasons:
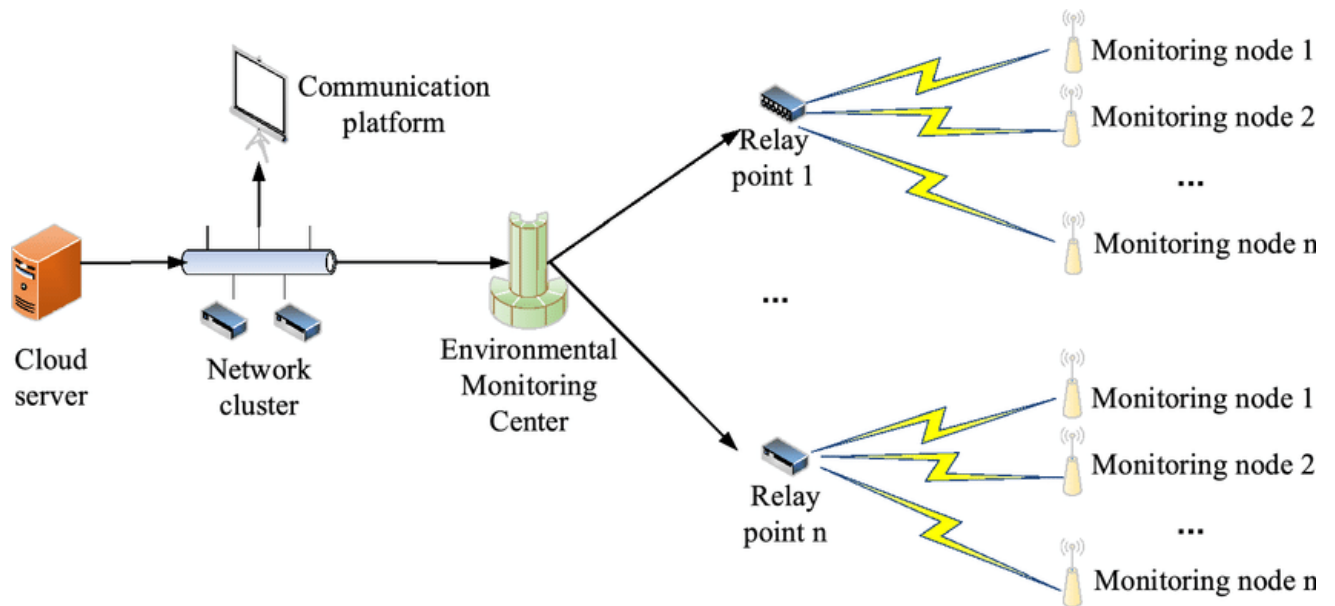

Leak Detection Systems

Techniques of Environmental Monitoring

CIRCUIT DIAGRAM

STEPS FOR FLOWCHART

STEP 1 : Start

STEP 2 : Define Monitoring Objectives

STEP 3 : Select Environmental Parameters to Monitor

STEP4 :. Choose Monitoring Locations

STEP5 :. Deploy Monitoring Equipment

STEP6 :. Data Collection and Measurement

STEP7 : Data Transmission (if remote monitoring)

STEP8 : Data Storage and Management

STEP9 : Data Analysis

STEP10 : Interpretation and Reporting
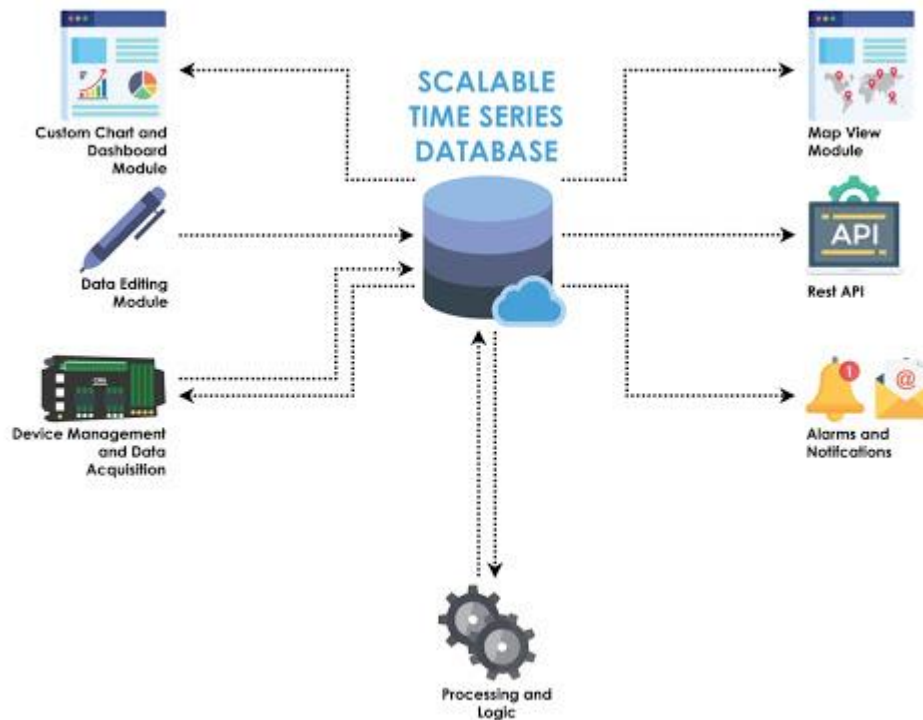
STEP11 : Decision-Making

STEP12 : Implement Mitigation Measures (if necessary)

STEP13 : Regulatory Compliance

STEP14 : Public Communication and Awareness

STEP15 : End

FLOWCHART

Python Script For Environmental Monitoring

```
#include <WiFi.h>

#include "DHTesp.h"

#include "ThingSpeak.h"

const int DHT_PIN = 15;

const int LED_PIN = 13;

const char* WIFI_NAME = "Wokwi-GUEST";

const char* WIFI_PASSWORD = "";

const int myChannelNumber =2307358 ;

const char* myApiKey = "1U2N21SZEGP74GFZ";

const char* server = "api.thingspeak.com";

DHTesp dhtSensor;

WiFiClient client;

void setup() {

 Serial.begin(115200);
```

```cpp
  dhtSensor.setup(DHT_PIN, DHTesp::DHT22);

  pinMode(LED_PIN, OUTPUT);

  WiFi.begin(WIFI_NAME, WIFI_PASSWORD);

  while (WiFi.status() != WL_CONNECTED){

    delay(1000);

    Serial.println("Wifi not connected");

  }

  Serial.println("Wifi connected !");

  Serial.println("Local IP: " + String(WiFi.localIP()));

  WiFi.mode(WIFI_STA);

  ThingSpeak.begin(client);

}

void loop() {

  TempAndHumidity  data = dhtSensor.getTempAndHumidity();

  ThingSpeak.setField(1,data.temperature);

  ThingSpeak.setField(2,data.humidity);

  if (data.temperature > 35 || data.temperature < 12 || data.humidity > 70 || data.humidity <
40) {

    digitalWrite(LED_PIN, HIGH);

  }else{

    digitalWrite(LED_PIN, LOW);

  }

  int x = ThingSpeak.writeFields(myChannelNumber,myApiKey);

  Serial.println("Temp: " + String(data.temperature, 2) + "°C");

  Serial.println("Humidity: " + String(data.humidity, 1) + "%");

  if(x == 200){

    Serial.println("Data pushed successfull");

  }else{

    Serial.println("Push error" + String(x));

  }

  Serial.println("---");

  delay(10000);

}
```
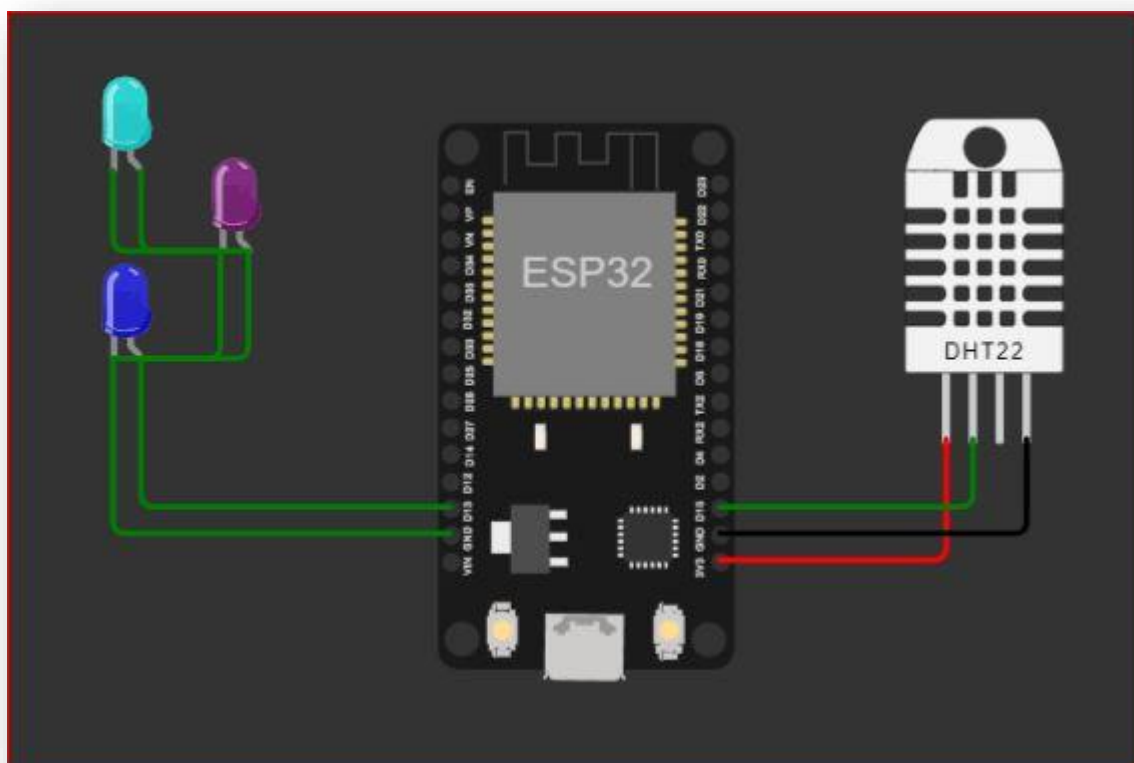
OUTPUT

Temp: 38.70°C

Humidity: 65.5%

Push error-401

Temp: 38.70°C

Humidity: 65.5%

Data pushed successfull

CONCLUSION :

Environmental monitoring is a multidisciplinary field that involves collaboration between scientists, government agencies, environmental organizations, and the private sector. It plays a crucial role in addressing pressing environmental challenges and promoting the sustainable management of natural resources.