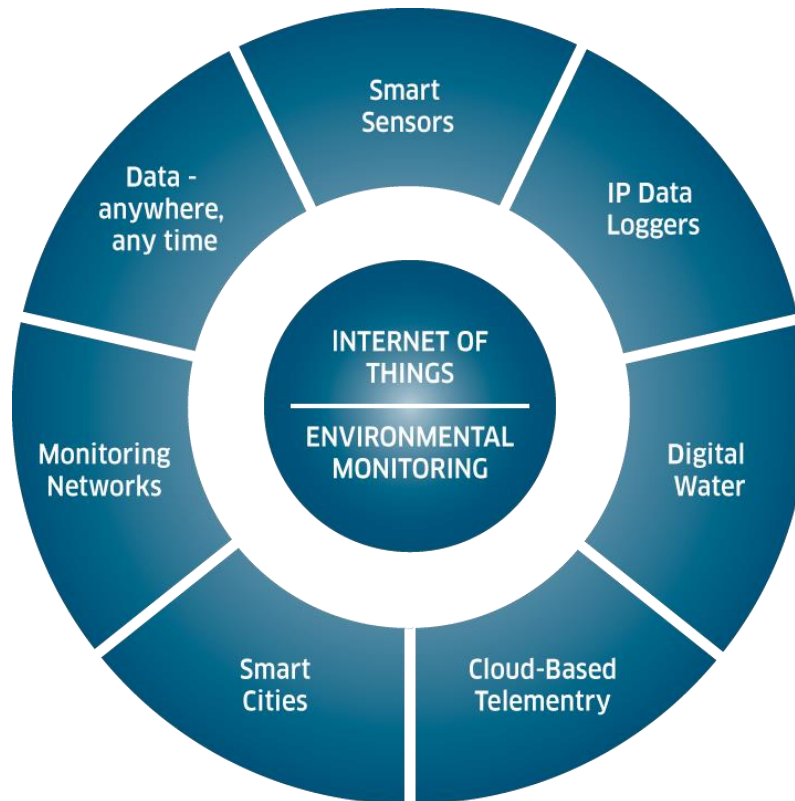


ENVIRONMENT MONITERING

Phase 5: Project Documentation & Submission

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The goal of this project is to monitor environmental parameters such as temperature, humidity, air quality, and light intensity in a specific area using IoT devices.

IoT Devices (Sensors)

- ✓ Temperature Sensor (e.g., DHT11)
- ✓ Humidity Sensor (e.g., DHT11)
- ✓ Air Quality Sensor (e.g., CCS81)
- ✓ Light Sensor (e.g., LDR)

IoT Gateway

- ✓ Raspberry Pi (or similar) with connectivity capabilities (e.g., Wi-Fi, Bluetooth)

Platform Development

- ✓ Web Application (Frontend and Backend)
- ✓ Database for data storage
- ✓ API for communication between IoT devices and platform

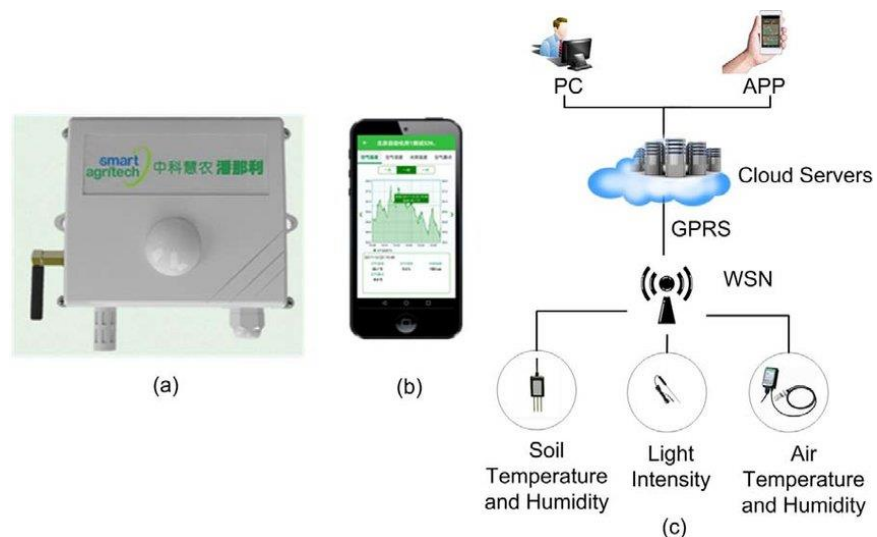
Cloud Server for Hosting

- ✓ AWS, Azure, Google Cloud, etc.

Code Implementation

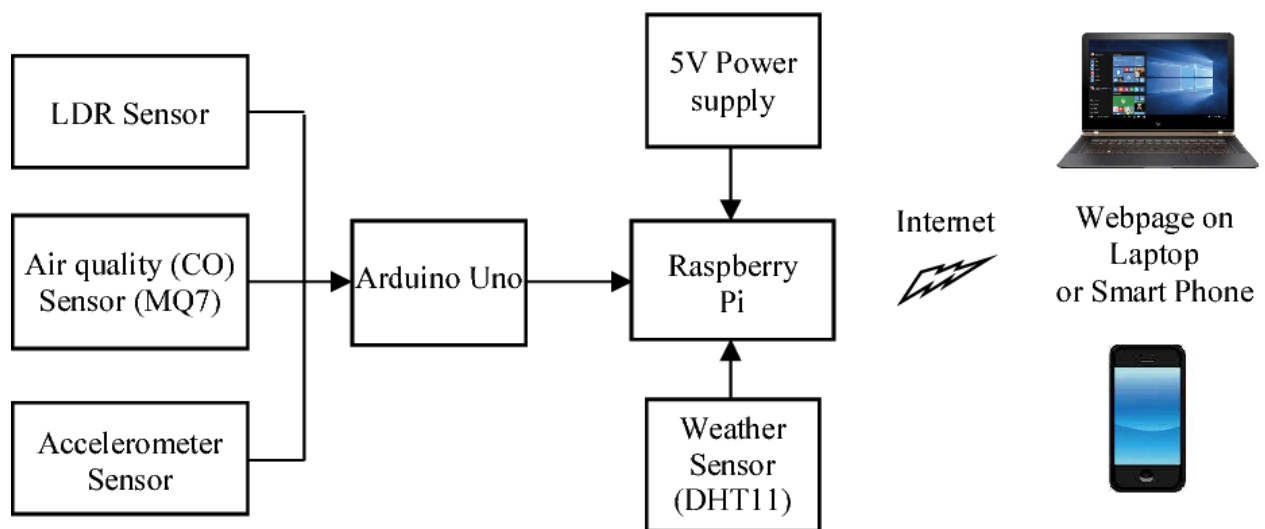
- ✓ Sensor Data Collection Code
- ✓ IoT Gateway Code (Communication and Data Transmission)
- ✓ Backend Code (Data Processing, Storage, and Retrieval)
- ✓ Frontend Code (User Interface for data visualization)

Diagram

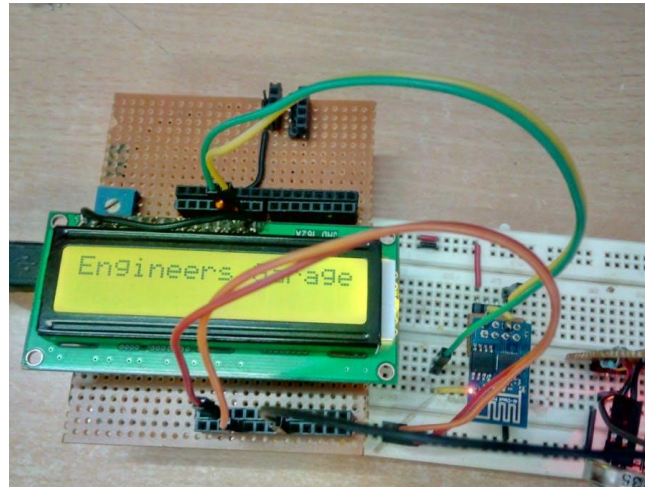


IoT Device Schematics

Create a schematic diagram of the IoT device setup including sensors, microcontroller (e.g., Raspberry Pi or Arduino), and connectivity modules. You can use software like Fritzing or draw it manually. Label the components and connections.



For the data display, you'll need screenshots of the web application's user interface. Once the platform is developed, take screenshots of the different pages or sections showing real-time and humidity data.



Real-time and humidity data

WOKWI SAVE SHARE Temp. & hum. detection system.ino by barbu Docs SIGN IN

DHT22.ino diagram.json libraries.txt Library Manager

```
1 /*  
2  * How to use the DHT-22 sensor with Arduino uno.  
3  * Is a temperature and humidity sensor!  
4  * See it in original form:  
5  * https://create.arduino.cc/projecthub/mafzal/temperature-monitoring-with-dht22-arduino-1560  
6  */  
7 //LCD I2C library:  
8 #include <LiquidCrystal_I2C.h>  
9 //DHT22 sensor library:  
10 #include <DHT.h>  
11 //LCD I2C address 0x27, 16 column and 2 rows!  
12 LiquidCrystal_I2C lcd(0x27, 16, 2);  
13  
14 //Constants:  
15 #define DHTPIN 2 //what pin we're connected to  
16 #define DHTTYPE DHT22 //DHT 22 (AM2302)  
17 DHT dht(DHTPIN, DHTTYPE); //Initialize DHT sensor for normal 16mhz Arduino  
18  
19 //Variables:  
20 float H; //Humidity value  
21 float T; //Temperature value  
22 int buzzer = 12;  
23  
24 //Initialize LCD, DHT22 sensor and buzzer:  
25 void setup(){  
26   lcd.init(); lcd.backlight(); dht.begin(); pinMode(buzzer, OUTPUT);  
27   //Print some text in Serial Monitor  
28   Serial.begin(9600); Serial.println("DHT22 sensor with Arduino Uno R3!");  
29   pinMode(9, OUTPUT); pinMode(10, OUTPUT); pinMode(11, OUTPUT);  
30 }  
31  
32 void loop(){  
33   delay(2000);  
34   //Read data and store it to variables hum and temp  
35   H = dht.readHumidity(); T = dht.readTemperature();  
36  
37   //Print temp and humidity values to serial monitor  
38   Serial.print("Humidity: ");
```

Simulation

00:34.490 99%

Humidity: 9.50 %;
Temperature: -25.10 Celsius.

Humidity: 9.50 %;
Temperature: -25.10 Celsius.

A real-time environmental monitoring system offers several benefits to park visitors and promotes outdoor activities in various ways

Safety and Comfort

Visitors can access up-to-date information on weather conditions, temperature, humidity, and air quality. This helps them make informed decisions about their outdoor activities, ensuring they are dressed appropriately and prepared for any changes in weather.

Health and Well-being

Monitoring air quality and pollution levels can help visitors with respiratory conditions, allergies, or sensitivities make informed decisions about outdoor activities. It provides them with the information they need to choose the best times and locations for their visit.

Recreation Planning

Real-time data on weather conditions, including temperature and wind speed, helps visitors plan activities such as hiking, picnicking, or water sports. They can choose optimal times for these activities to maximize enjoyment and safety.

Wildlife Observation

Knowledge of environmental conditions can enhance wildlife observation experiences. Visitors can plan visits during times when specific wildlife species are more active or visible, based on factors like temperature, humidity, and lighting conditions.

Educational Opportunities

The availability of real-time environmental data can be integrated into educational programs and interpretive displays within the park. It provides an opportunity to learn about the natural environment, weather patterns, and ecological processes.

Emergency Preparedness

In the event of sudden changes in weather conditions, such as storms or extreme temperatures, visitors can receive alerts and information on how to stay safe. This can be critical in situations where rapid response is needed.

Resource Conservation and Preservation

Monitoring systems can provide data that aids in the conservation and preservation of natural resources. For instance, data on soil moisture levels can inform park management about the need for watering plants during dry spells.

Citizen Science Engagement

Real-time data can be made available to the public, encouraging citizen science initiatives. Visitors can actively participate in data collection, contributing to ongoing research and conservation efforts.

Enhanced User Experience

Access to real-time environmental information enhances the overall visitor experience. It demonstrates a commitment to visitor safety and enjoyment, which can lead to positive reviews, return visits, and increased recommendations to others.

Promotion of Outdoor Activities

By providing accurate and timely environmental information, the park encourages more visitors to engage in outdoor activities. It builds confidence among visitors, knowing they can rely on accurate data for their plans.

Marketing and Promotion

A real-time monitoring system can be a unique feature that sets a park apart from others. It can be promoted as an added benefit, attracting more visitors who value access to accurate environmental information.

Overall, a real-time environmental monitoring system enhances the visitor experience, supports safety, and fosters a deeper appreciation for the natural environment. It encourages outdoor activities by providing the necessary information and tools for a positive and enjoyable visit to the park.

Conclusion

This comprehensive project involves a combination of hardware (sensors, IoT devices), software (code implementation, platform development), and cloud deployment. It aims to create a robust Environmental Monitoring system with real-time data visualization and analysis capabilities. Remember to document your progress, and conduct thorough testing at each phase to ensure the system's reliability and accuracy.

THANK YOU