SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY(Autonomous)

Batch no:7

Project Name: Gas Leakage Identification and Alert System

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GAS LEAKAGE IDENTIFICATION AND ALERT SYSTEM

PROBLEM STATEMENT :

Gas leakages are a common problem in homes and industries. If not detected and corrected at the right time, it can cause lost of lives and properties. Potentially deadly carbon monoxide is also very dangerous to life. A leakage of natural gas can be dangerous because it increases the risk of fire or explosion. Local gas companies work hard to provide adequate warning in the event of a gas leak. Because mytheme-and therefore, natural gas-does not have any odour, the gas company adds a warning “ROTTEN-EGG” smell that can be detected by most people . However people who have diminish sense of smell may not be able to rely upon this safety mechanism. Also the leak might occur at a time when no one is the vinicinity which increases the risk of explosion.

SCOPE OF SOLUTION :

A gas leakage identification and alert system typically involves sensors to detect gas leaks, a central processing unit to analyze sensor data, and an alert mechanism to notify users of potential leaks. The scope of such a solution may include:

Sensor Technology: Selecting appropriate sensors capable of detecting specific gases commonly found in households or industrial settings, such as carbon monoxide, natural gas, or propane.

Data Processing: Developing algorithms to process sensor data in real-time to identify abnormal gas levels or patterns indicative of a leak.

Alert Mechanism: Implementing various alert mechanisms such as alarms, notifications to smartphones or tablets, emails, or SMS messages to notify users or authorities about the presence of a gas leak.

User Interface: Designing an intuitive user interface for monitoring gas levels, configuring system settings, and receiving alerts.

Connectivity: Integrating the system with home automation platforms or building management systems for remote monitoring and control.

Safety Measures: Incorporating safety features such as automatic gas valve shut-off systems or ventilation control to mitigate risks in case of a leak.

Power Supply: Ensuring reliable power supply for continuous operation, including battery backup or alternative power sources in case of power outages.

Compliance: Ensuring compliance with relevant safety standards and regulations governing gas detection systems in residential, commercial, or industrial settings.

Maintenance and Support: Providing maintenance procedures and customer support to address issues such as sensor calibration, system malfunctions, or false alarms.

Scalability: Designing the system to be scalable, allowing for easy expansion to accommodate additional sensors or features as needed.

The solution's scope may vary depending on factors such as the intended application (e.g., residential, commercial, industrial), budget constraints, regulatory requirements, and user preferences.

REQUIRED COMPONENTS TO DEVELOP SOLUTIONS :

HARDWARE COMPONENTS :

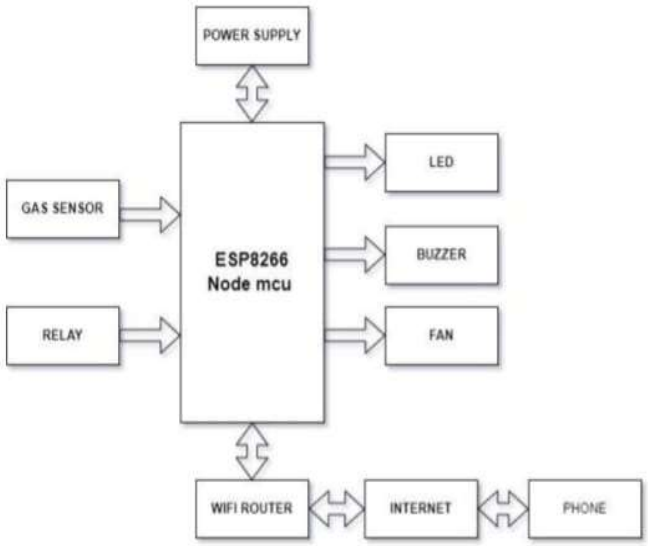
1.ESP8266

2.MQ-6 Gas sensor

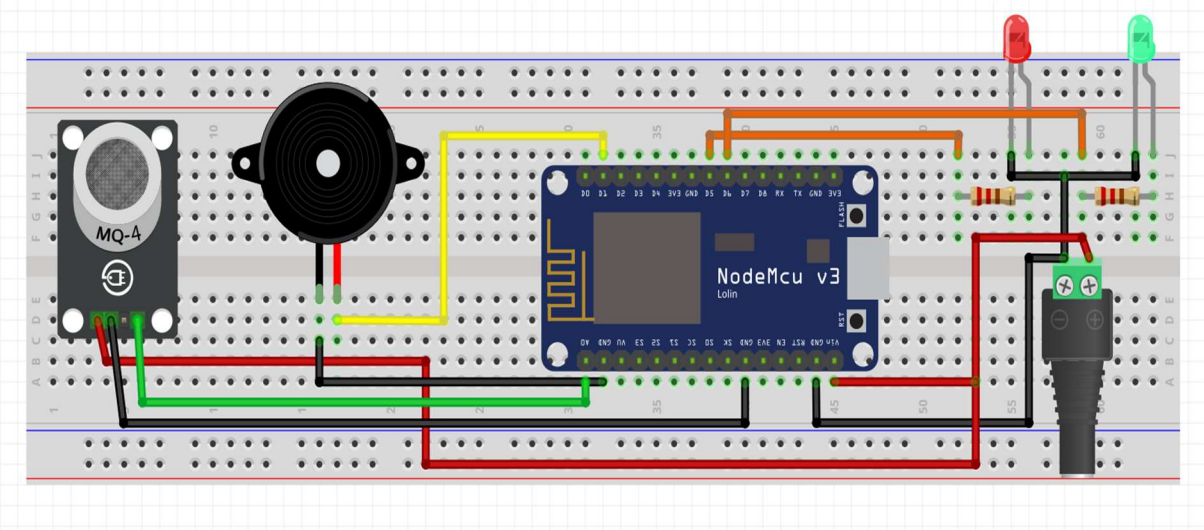
3.Buzzer

4.Relay sensor

BLOCK DIAGRAM :



SIMULATED CIRCUIT :



CODE FOR SOLUTION :

```
#include <ESP8266WiFi.h>
#include <WiFiClient.h>
#include <ESP8266WebServer.h>
#include <ESP8266HTTPClient.h>
const char* ssid = "your-ssid";
const char* password = "your-password";
// Define GPIO pins for gas sensor and buzzer
const int gasSensorPin = D1;
const int buzzerPin = D2;
void setup() {
  Serial.begin(115200);
  pinMode(gasSensorPin, INPUT);
  pinMode(buzzerPin, OUTPUT);
```

```
// Connect to WiFi
  WiFi.begin(ssid, password);
  Serial.println("Connecting to WiFi");
  while (WiFi.status() != WL_CONNECTED) {
    delay(1000);
    Serial.println("Connecting...");
  }
  Serial.println("Connected to WiFi");
 // Start web server
  server.on("/", handleRoot);
  server.begin();
  Serial.println("HTTP server started");
}
void loop() {
  int gasValue = digitalRead(gasSensorPin);
   if (gasValue == HIGH) {
    // Gas detected, activate buzzer and send alert
    digitalWrite(buzzerPin, HIGH);
    sendAlert();
  } else {
    digitalWrite(buzzerPin, LOW);
  }
 delay(1000);
}
void sendAlert() {
  // Use HTTPClient to send a POST request to a server or trigger an alert
}
void handleRoot() {
  // Handle web server requests if necessary}
```

CONCLUSION:

In this research, an IoT approach for gas detection system at a low concentration is described using MQ-6 gas sensor the sensor sense signal to ESP8266 NodeMCU microcontroller. In the next step , microcontroller sends an active signal to other externally connected device which performs a cellphone. The efficiency of a NodeMCU is proven through sending multiple messages that could be message per second . This easy control over the devices like exhaust fan makes environment less accident-prone.

Using NodeMCU microcontroller also makes the system cheaper. Quick access and control makes the system very useful. In addition this paper presents gas leakage detection system using IoT platforms.