

IoT-Enabled Air Quality and Safety Monitor

Kale Shreya Kishan¹, Gogade Namrata Sanjay²,
Rukme Samiksha Sopan³, Shelke Ramola Umakant⁴, Mrs. Sayyad F. S.⁵

^{1,2,3,4} Student of Diploma in Computer Engineering

⁵Lecturer in Diploma in Computer Engineering

Vishweshwarayya Institute of Engineering and Technology, Almala, Maharashtra, India

Abstract: Air pollution has become a major environmental and health concern in modern cities. Continuous monitoring of air quality is important to detect harmful gases and maintain a safe environment. This project presents an IoT-based Air Quality Monitoring System that measures environmental parameters such as temperature, humidity, and air quality using sensors and transmits the data to a cloud platform for remote monitoring.

The system is built using an ESP32 microcontroller, which acts as the central processing unit. A DHT22 sensor is used to measure temperature and humidity, while an MQ-135 gas sensor detects harmful gases present in the air. The collected data is processed by the ESP32 and displayed locally on an OLED display. If poor air quality is detected, an alert system consisting of a buzzer and LED is activated to warn users about potential air pollution.

The ESP32 connects to the internet through its built-in Wi-Fi module and sends sensor data to the Blynk IoT cloud platform. Users can monitor temperature, humidity, and air quality levels in real time using the Blynk mobile application or web dashboard. This enables remote monitoring and instant alerts whenever air quality conditions become unsafe.

The proposed system is cost-effective, portable, and easy to implement. It demonstrates how Internet of Things (IoT) technology can be used for environmental monitoring and smart alert systems. Such systems can be deployed in homes, laboratories, classrooms, and industrial environments to improve safety and awareness of air pollution levels.

Keywords: Internet of Things (IoT), Air Quality Monitoring, ESP32 Microcontroller, MQ-135 Gas Sensor, DHT22 Sensor, Blynk IoT Platform, Environmental Monitoring, Smart Alert System

