AIR QUALITY MONITOING

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PHASE-1

# Introduction

An IoT-based air pollution monitoring system is an ideal solution that can provide real-time data and insights about the air quality in a particular area. An IoT based air pollution monitoring

system consists of several hardware and software components that work together to collect

and process data.In this project we are going to make an IoT Based Air Pollution Monitoring System in which we will monitor the Air Quality over a using internet and will trigger a alarm when the air quality goes down beyond a certain level, means when there are sufficient amount of harmful gases are present in the air like CO2, smoke, alcohol, benzene and NH3. It will show the air quality in PPM on the LCD and as well as on so that we can monitor it very easily.

Previously we have built the LPG detector using MQ6 sensor, Smoke detector using MQ2 sensor, and Air Quality Analyser but this time we have used MQ135 sensor as the air quality sensor which is the best choice for monitoring Air Quality as it can detects most harmful gases and can measure their amount accurately. In this IOT project, you can monitor the pollution level from anywhere using your computer or mobile. We can install this system anywhere and can also trigger some device when pollution goes beyond some level, like we can switch on the Exhaust fan or can send alert SMS

is necessary to assess and improve the quality of the data obtained through the IoT systems, in order to establish their reliability and provide useful information to decision makers.The study of Data Quality (DQ) emerged from the field of information systems, where large amount of data are needed to be stored in databases and managed by such information systems. Authors in Wang proposed a set of dimensions that were more important for data consumers in this field. Because of the importance of data, this concept has been adopted by other applications and fields. Specifically, in the context ofIoT systems, the analysis of DQ has become relevan in order to guarantee the reliability of the data to the decision makers. Authors Liu et al. (2019) and Karkouch et al. (2016) have both conducted a systematic literature review and a state-of-the-art review of DQ in IoT, and have discussed how DQ has been addressed in IoT applications. They have also identified the challenges and most prominent research sub-fields of D in IoT, which include the most commonly used dimensions, endangering factors, and enhancing methods.DQ analysis in the field of air quality monitoring systems is a fairly new topic, since massive low-cost systems have become popular in the past few years.Even though there are specific definitions for the DQ expected out of these systems, provided by the EPA and the EU the studied on this topic are limited to the dimensions addressed by the deployed solutions, and do not consider the relationship between the DQ dimension and the indicator suggested by the standardization entities. In this context, this study aims at providing an overview of how DQ has been addressed in the implementation of IoT-based air quality monitoring systems. We review and analyA pictorial representation of your project that puts your solution in context. Not necessarily restricted to your design. Include other external systems relevant to your project (e.g. if your solution connects to a phone via Bluetooth, draw a dotted line between your device and the phone). Note that this is not a block diagram and should explain how the solution is used, not a break components.

1. **ABSTRACT:**

Air quality parameters refer to various measurements and indicators used to assess the cleanliness and safety of the air we breathe. These parameters include concentrations of pollutants like particulate matter (PM2.5 and PM10), ground-level ozone (O3), nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), and volatile organic compounds (VOCs)

. Additionally, meteorological factors such as temperature, humidity, wind speed, and atmospheric pressure play a role in determining air quality. Monitoring and analyzing these parameters are crucial for assessing environmental health, public safety, and regulatory compliance,

as poor air quality can have detrimental effects on human health and the environment.

## Project definition:

## A project focused on air quality parameters involves comprehensive monitoring and

## analysis of key atmospheric factors and pollutants to assess and improve air quality.

## This initiative typically includes deploying sensor networks, collecting data on pollutants

## like PM2.5, ozone, NO2, and CO, as well as considering meteorological variables.

## The project's primary objectives are to provide insights into air quality trends, identify pollution sources, and develop strategies to mitigate their impact. It plays a crucial role

## in enhancing public health, environmental sustainability, and policy decisions aimed at achieving cleaner and safer air for communities and ecosystems.

### 2.1 .OBJTIVES:

### The objective of studying air quality parameters is to systematically assess and understand the composition of the air we breathe. This involves quantifying the presence of pollutants like particulate matter, ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide, and volatile organic compounds, while also considering meteorological factors. By doing so, the goal is to accurately measure air quality, identify pollution sources, assess health and environmental risks, and inform policies and interventions aimed at safeguarding public health and reducing the detrimental effects of air pollution on our environment.at the temperature of 25 degrees.

### **Designing and deploying IoT devices to measure air quality parameters:**

### 1.Objectives\*: Define project goals and data requirement

### 2. \*Sensors\*: Choose suitable, calibrated sensors.

### 3. \*Connectivity\*: Decide on data communication (Wi-Fi, cellular, etc.).

### 4. \*Power\*: Determine power sources and energy-efficient designs.

### 5. \*Deployment\*: Strategically place sensors, shield from environmental factors.

### 6. \*Data Handling\*: Collect, store, and secure data.

### 7. \*Analysis\*: Develop algorithms for data analysis and visualization.

### 8. \*Maintenance\*: Enable remote monitoring, plan for maintenance.

### 9. \*Compliance\*: Ensure adherence to local regulations.

### 10. \*Community\*: Engage the community and share data.

### 11. \*Collaboration\*: Explore partnerships for data sharing.

### 12. \*Scalability\*: Plan for network expansion.

### 13. \*Cost\*: Estimate project expensence

### 14. \*Testing\*: Validate data accuracy and reliability.

### 15. \*Documentation\*: Maintain thorough project records.Conductivity sensor:

### Data sharing platform:

### The web-based platform for real-time air quality data is designed to offer the public an easy-to-use interface that integrates with IoT sensors to provide up-to-the-minute air quality information. This platform ensures accessibility, security, and scalability while offering interactive data visualization tools, location-based insights, and user alerts. It encourages engagement through social sharing and education, includes feedback mechanisms, and maintains transparency regarding data sources and costs. Ultimately, the platform aims to empower users to make informed decisions about air quality and its impact on their lives.

# 3.Integration approach

# The integration approach for IoT devices to send data to the data-sharing platform involves setting up a secure and efficient communication channel. IoT devices will transmit real-time data through protocols like MQTT or HTTP over Wi-Fi, cellular networks, or Low-Power Wide-Area Networks (LPWANs) depending on the deployment location. Data will be securely transmitted and received by the platform's designated endpoints or APIs. Security measures such as encryption and authentication will be implemented to protect the data during transmission, ensuring that the data-sharing platform receives accurate and reliable information from the IoT devices.

**Conclusion:**

air quality monitoring plays a crucial role in safeguarding public health and the environment. By continuously monitoring and analyzing air pollutants, we can better understand the quality of the air we breathe and take proactive measures to mitigate the harmful effects of pollution. This data-driven approach empowers policymakers, industries, and individuals to make informed decisions, reduce emissions, and work towards it

