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PHASE 1: PROBLEM DEFINITION:

The project involves developing an IoT-based air quality monitoring system with the primary objective of providing real-time air quality data to the public through an accessible online platform. The goal is to create awareness about the impact of air quality on public health and the environment.

KEY OBJECTIVES:

- Data Collection:** Deploy IoT devices equipped with air quality sensors to measure critical parameters, including CO, NO₂, SO₂, O₃, and VOCs.
- Real-Time : Monitoring:** Install these devices strategically across the target area to continuously monitor air quality.
- Data Transmission:** Establish efficient data transmission protocols for sending sensor data to a central server.
- User-Friendly Platform:** Develop an intuitive web or mobile platform where the public can access real-time and historical air quality data.
- Data Visualization:** Implement data visualization tools to present air quality information clearly.
- Alerting System:** Create an alerting mechanism to notify users when air quality levels exceed predefined thresholds.

7. **Public Engagement:** Encourage public engagement by providing educational content on the platform, explaining the significance of air quality, and promoting community involvement.
8. **Scalability:** Design the system to accommodate future expansion with additional sensors and monitoring locations.
9. **Python Integration:** Utilize Python for data analysis, processing, and platform development.

DESIGN THINKING:

1. **Understand User Needs:** Begin by understanding the perspectives and needs of potential users, including the public, environmentalists, and authorities. Explore the air quality challenges in the target area.
2. **Define the Problem:** Clearly define the core problem and project objectives based on user insights and identified pain points related to accessing air quality information.
3. **Generate Ideas:** Brainstorm creative solutions for the IoT monitoring system and the awareness platform, involving diverse team members in the ideation process.
4. **Prototype:** Build a simple prototype of the IoT device and user interface, focusing on core functionalities to gather feedback.
5. **Test and Iterate:** Collect user feedback during usability tests with the prototype and make necessary improvements based on insights.
6. **Develop the Solution:** Create the complete IoT-based monitoring system and user platform, aligning with defined objectives and user needs.
7. **Deploy and Launch:** Implement the system, deploying IoT devices and launching the user platform to make real-time air quality data accessible to the public.
8. **Evaluate and Improve:** Continuously monitor system performance, gather user feedback, and make ongoing improvements based on data analytics and stakeholder input.
9. **Iterate and Adapt:** Keep the user at the center of decision-making, be open to change, and consider expansion or additional features as needed to effectively raise public awareness about air quality.



NAAN MUDHALVAN(IOT-PHASE III REPORT)

IOT Based Air Pollution/Quality Monitoring



IMPORTANT COMPONENTS:

Here are the important components for an IoT-based air quality monitoring system:

1. Sensor Devices
2. Data Transmission and Communication
3. Central Data Management System
4. Data Analysis and Processing
5. Alerting System
6. User Interface and Visualization
7. Geospatial Mapping
