

Project Steps:

Phase 1: Project Definition and Design Thinking

Project Definition: The project involves setting up IoT devices to measure air quality parameters and make the data publicly available for raising awareness about air quality and its impact on public health. The objective is to create a platform that provides real-time air quality information to the public. This project includes defining objectives, designing the IoT monitoring system, developing the data-sharing platform, and integrating them using IoT technology and Python.

Design Thinking:

1(a). Real-time air quality monitoring:

It refers to information about the current levels of pollutants in the air, such as particulate matter, ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide. Public can access the constantly updated data.

1(b). Data sharing:

Data sharing is the process of making the same data resources available to multiple applications, users, or organizations. It includes technologies, practices, legal frameworks, and cultural elements that facilitate secure data access for multiple entities without compromising data integrity.

1(c). Public awareness:

Communication about air quality has the potential to reduce the adverse effects of air pollution through generating awareness and catalyzing public opinion in support of policies for air pollution reduction and through education for individual risk mitigation behaviors; all are components of environmental health.

1(d). Health impact:

Exposure to air pollution can affect everyone's health. When we breathe in air pollutants, they can enter our bloodstream and contribute to coughing or itchy eyes and cause or worsen many breathing and lung diseases, leading to hospitalizations, cancer, or even premature death.

2. Design and deployment of IoT devices to measure air quality parameter:

IOT Based Air Pollution Monitoring System monitors the Air quality over a web server using Internet and will trigger an alarm when the air quality goes down beyond a certain threshold level, means when there are sufficient amount of harmful gases present in the air like CO₂, smoke, alcohol, benzene, NH₃, LPG and NO_x.

Disadvantages:

As this devices are interconnected via internet there are possibilities that they can get hacked or monitored by malicious users or can be tracked by other systems as well. So the security of the recorded data can be an issue using this type of devices.

3. Design a web-based platform to display real-time air quality data:

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.

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4. Determine how IOT devices will send data to the data-sharing platform:

Once the network server has done its work, data is typically exchanged with a cloud application that will finish turning the IoT data into useful information, offer it to human users and store it for subsequent analysis. Cloud applications often run alongside other network services on platforms like AWS or Azure.

IoT devices use embedded sensors to collect, exchange, and share data with other devices, applications, and systems, in real-time. Internet of Things is a collaboration of custom-designed technologies to interconnect internet-enabled physical devices and enable communication with each other through a wireless network.