Indoor Air Quality Monitoring (IAQ)

Overview

Air quality monitoring (IAQ) is carried out to assess the extent of pollution, ensure compliance with national legislation, evaluate control options, and provide data for air quality modelling. It is particularly important in chemical plants or other facilities with potentially harmful concentrations of pollutants.

With air quality regulation shifting the burden from publicly funded monitoring to monitoring funded by industry, it has been increasingly important for businesses to acquire their own quality monitoring equipment. Beyond that, it is ultimately of utmost importance to ensure that the location is safe for all individuals and for the environment as a whole.

Proper utilization of IAQ technology makes that a possibility.

Applicable Industries

- Healthcare Services
- Mining

Applicable Functions

- Environmental Health & Safety
- Facility Maintenance

Market Size

Estimate A

The global market for indoor air quality monitoring and management is forecasted at USD 5.6 billion in 2020.

Source: Navigant Research

Estimate B

The global market for indoor air quality monitoring equipment is forecasted at USD 6.1 billion in 2019.

Source: Markets and Markets

User Viewpoint

Business Value

How does this use case impact an organization's performance?

This solution improves the air quality in cities and helps to save the environment. It also detects air quality at different locations and the reasons for its deterioration. It creates safer spaces for people, and helps businesses to manage regulatory risks.

System Capabilities & Requirements

What are the typical capabilities in this use case?

A system can detect air quality at different locations. It continuously sends data to centralized monitoring system, which can log, analyze and predict the air quality of a particular location.

Deployment Environment

Where is the 'edge' of the solution deployed?

Sensors are mounted on stationary as well as on moving objects like cars and trucks to detect harmful gases and substances in the air all across the city.

Stakeholder Viewpoint

System End Users

Who are the regular users of the system?

City residents

External Data Users

Which external stakeholders are provided with limited access to the data?

Meteorological labs

Technology Viewpoint

Sensors

What sensors are typically used to provide data into the IoT system, and which factors define their deployment?

Various sensor technologies are used for IAQ monitoring and management, including CO2 sensors, demand-controlled ventilation (DCV), energy recovery ventilation (ERV), dedicated outdoor air systems (DOASs), ultraviolet germicidal irradiation (UVGI), displacement ventilation (DV), and underfloor air distribution (UFAD).

These technologies improve building operations while reducing energy use. These sensors are complemented by software which process and analyze data, and prove to be a critical piece to the puzzle of air quality monitoring. This can be leveraged in a variety of ways, including pushing the information to a user's cell phone. Industrial operators use air quality monitoring equipment to cost effectively monitor and manage emissions on their perimeter, which helps them improve relationships with regulators and communities.

Analytics

What types of analysis are typically used to transform data into actionable information?

Analytical tools monitor the real-time data and can find the air quality deteriorating premises in the city as per the density variation and trends in the data log.

Cloud & Edge Platforms

What factors define the cloud and edge platforms used to integrate the solution?

Sensors send real-time information to the central location, from there it is accumulated in the cloud.

Connectivity

What factors define the connectivity solutions used to provide both device-to-device and device-to-cloud communication?

Wide Area Network (WAN)

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