

Air Quality Monitoring and Reporting System for Urban Areas

Visit and Problem Identification

Conduct a Group Visit

Location: Santragachi Station

Activities:

- Keep track on air quality conditions and sources of pollutants i.e. vehicle emissions, dust, industrial activities etc.
- Listen to the customers and the suppliers explaining their satisfaction/nonsatisfaction about air pollution.
- Document and assess environmental concerns such as the presence of visible pollutants and ot potential sources of emission.

Identify and Document Problems

- Accessibility: A number of the respondents would require real time access to air quality data but this is not possible.

- **Affordability:** In most cases, air quality monitoring contraptions are also quite pricey and therefore very high in average homes, not to mention small businesses.
- **Convenience:** Air quality relevant methods or devices which are readily available are normally cumbersome to operate or restrictive the users in terms of functionality and they seldom give alert/recommendations.
- **Overall Well-Being:** There is health problems associated with poor air quality such as respiratory illness and cardiovascular illnesses which degrade a man's overall state of wellbeing.

Analysis and Selection

Analyze Identified Problems

- **Frequency:** Air quality concerns daily arise in metropolitan cities with high traffic and industrial activities.
- **Severity:** Chronic pollution exposure circumstances can result in debilitating diseases such as chronic obstructive pulmonary disease and cardiovascular other diseases.
- **Impact on Community:** Well, addressing these dynamics would prevent major health issues and high treatment costs to the society.

Selection of Problems

Selected Problems

- Unavailability of real time air quality data
- Inaccessibility of the cost-effective air sampling devices

Rationale

- **Access to Real-Time Data:** Real-time monitoring of air quality and informing the population about it helps people to take measures such as staying indoors, using protective gadgets as well as going outside on healthy windy days to protect their health.
- **Affordable Devices:** Cutting down the prices of devices which can monitor air quality helps more people to keep watch of the air around them leading to a more efficient and effective control of air pollution.

Solution Design

Detailed Design

Product

Full scope system of monitoring and reporting of air quality.

Technical Specifications

- Sensors: The most sensitive details for particulate matter s including PM2.5, PM10, CO2, NO2, and SO2 are provided.
- Data Transmission: The data is transferred to a central server either through a Wi-Fi or a GSM network.
- Platform: Mobile and web application for integrated use to provide real-time, historical air quality information and health suggestions for users.
- Alerts: Automatic alerts via push notifications and emails wherever the air quality level is critical, along with recommended actions to be taken.

Features

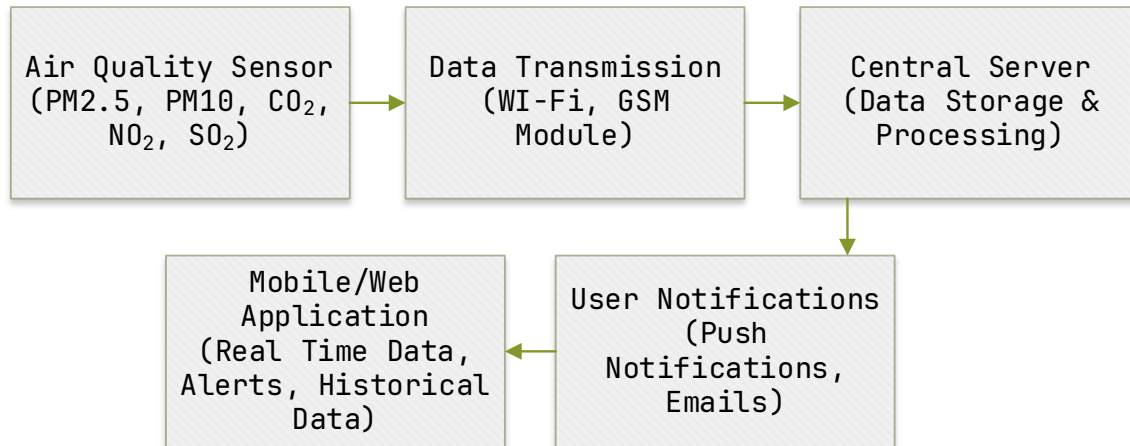
- The ability to get the current level of pollution in the air with visual and numeric display.
- Analysis of data, which will help to understand how pollution has changed with time.
- Suggestions from the application depending on the level of pollution, for example, staying inside or wearing masks outside.

Potential Impact:

- Improved public participation and concern over the state of air quality in the republic.
- Decrease in health-related problems through notifications and advice given at the right time.
- Greater demand for air quality management systems within homes and organizations.

Concept Sketch

Here's a basic flowchart for the concept sketch:



Report Presentation

Overall Report Presentation

- **Introduction:** In this section, the need of air quality monitoring in urbanized cities has been demonstrated and how it can directly influence the life of the people.
- **Methodology:** Indicate the matters that were addressed during the field visit with including the processes of gathering and analysing the data.
- **Findings:** List the summary of the key problems found and explain briefly why the chose the particular problems to address.
- **Conclusion:** Highlight the advantages of the proposed solution and its ability to promote the better management of air quality

Writing Quality

- Prior to submittal of the report especially for the final version, make sure that the report is logically consistent, grammatically correct and lacking in unclarities.
- For any numerical data, sources, or references mentioned in the report, citation must be provided in the correct format.
- The report has to be presented systematically by substantiate it properly with headings and subheadings.