Project : Air Quality Assessment TN

Phase 1 : Project Definition and Design Thinking

Project Definition:

The project aims to analyse and visualize air quality data from monitoring stations in TamilNadu.The objective is gain insights into air pollution trends,Identify Areas with high pollution levels,and develop a predictive model to estimate RSPM/PM10 levels based on SO2 and NO2 levels.This project involves defining objectives,designing the analysis approach, selective visualization techniques and creating a predictive model using python and relevant libraries.

Design Thinking:

1.Project Objectives:

a.Analyzing Air Quality Trends: This objective involves studying and analyzing historical data on air quality parameters like RSPM and PM10 levels. The aim is to identify any patterns, seasonal variations, or long-term trends in air quality.

b.Identifying Pollution Hotspots: This objective focuses on pinpointing specific areas or regions with consistently high levels of air pollution. By analyzing the spatial distribution of air quality data, we can identify pollution hotspots and prioritize targeted pollution control measures.

c.Building a Predictive Model for RSPM/PM10 Levels: This objective involves developing a model that can forecast RSPM/PM10

levels in a given area. By analyzing historical air quality data and considering relevant factors like meteorological data, industrial activities, and traffic density, the model can provide predictions and early warnings for potential pollution episodes.

2.Analysis Approach:

a. Data Loading: Load the air quality data into a suitable data analysis tool or programming environment, such as Python or R. Use appropriate libraries or modules to read the data files or connect to the datafeeds.

b. **Data Preprocessing:** Clean and preprocess the data to remove any inconsistencies, missing values, or outliers. This may involve techniques such as data imputation, normalization, or data aggregation.

c. **Data Analysis:** Perform exploratory data analysis to understand the characteristics of the air quality data. Calculate summary statistics, identify trends or patterns, and explore relationships between different variables.

d. Data Visualization: Create visualizations to effectively communicate the analysis results. Use charts, graphs, maps, or interactive visualizations to present the air quality trends, pollution hotspots, and model predictions.

3.Visualization Selection:

To effectively represent air quality trends and pollution levels, here are some visualization techniques that can be used:

a. Line Charts: Line charts are useful for showing the trend of air quality parameters over time. Plotting the RSPM/PM10 levels on the y-axis and time on the x-axis, line charts can clearly illustrate the fluctuations, seasonal patterns, and long-term trends in air quality.

b. Heatmaps: Heatmaps can be used to visualize the spatial distribution of pollution levels. By mapping the RSPM/PM10 concentrations onto a geographic map, heatmaps provide a visual representation of pollution hotspots and areas with high pollutant concentrations. The intensity of the colors can be used to represent the magnitude of the pollution levels.