

# **Exploring Insights From Synthetic Airline Data Analysis With Qlik**

## **1 . INTRODUCTION**

### **1.1 Overview**

This project explores insights derived from synthetic airline data using Qlik Sense, a leading data analytics and visualisation tool. The project aims to demonstrate how synthetic data, which mimics real-world data, can be used to perform meaningful analysis and derive insights in the context of the airline industry.

### **1.2 Purpose**

The purpose of this project is to showcase the capabilities of Qlik Sense in handling and analysing large data sets, even when they are synthetic. The project aims to:

- Identify patterns and trends in airline operations.
- Provide actionable insights for decision-making.
- Demonstrate the use of Qlik Sense for creating interactive and dynamic visualisations.

### **1.3 Technical Architecture**

The technical architecture involves:

- Data source: Synthetic airline data.
- Data processing: Data preparation using Qlik Sense.
- Data visualisation: Interactive dashboards and reports created in Qlik Sense.
- Deployment: Qlik Sense server for rendering and sharing visualisations.

## **To Define Problem / Problem Understanding**

### **2.1 Specify the Business Problem**

The business problem addressed is optimising airline operations to enhance efficiency, reduce costs, and improve customer satisfaction. This involves analysing flight schedules, delays, passenger demographics, and operational costs.

### **2.2 Business Requirements**

- Ability to handle large data sets.

- Interactive and user-friendly visualisations.
- Real-time data processing and analysis.
- Insights into key performance metrics such as on-time performance, load factors, and revenue.

## **2.3 Literature Survey**

A review of existing literature on airline data analysis reveals common challenges such as data volume, complexity, and the need for real-time insights. Studies have shown that data analytics can significantly improve operational efficiency and customer satisfaction in the airline industry.

# **3. Data Collection**

## **3.1 Collect the Dataset**

The dataset comprises synthetic data generated to reflect real-world airline operations, including flight schedules, passenger information, and operational metrics.

## **3.2 Connect Data with Qlik Sense**

The dataset is uploaded to Qlik Sense, where it is connected using Qlik's data load editor. The data is then structured and organized for analysis.

# **4. Data Preparation**

## **4.1 Prepare the Data for Visualisation**

Data preparation involves cleaning the dataset, handling missing values, and transforming data into a suitable format for visualisation. This step ensures the accuracy and reliability of the data used for analysis.

# **5. Data Visualisations**

## **5.1 Visualisations**

Various visualisations are created to explore different aspects of the data:

- Bar charts to compare flight delays across different airlines.
- Line graphs to show trends in passenger numbers over time.
- Heat maps to visualise flight density and popular routes.
- Pie charts to represent the distribution of operational costs.

## **6. Dashboard**

### **6.1 Responsive and Design of Dashboard**

The dashboard is designed to be responsive and user-friendly, allowing users to interact with the data through filters and drill-down capabilities. It includes multiple views and perspectives to provide a comprehensive overview of the airline operations.

## **7. Report**

### **7.1 Report Creation**

Reports are generated to summarize the findings from the data analysis. These reports include key insights, visualisations, and recommendations for improving airline operations.

## **8. Performance Testing**

### **8.1 Amount of Data Rendered**

Performance testing is conducted to evaluate how Qlik Sense handles large volumes of data. This involves testing the rendering speed and responsiveness of visualisations when dealing with substantial data sets.

### **8.2 Utilisation of Data Filters**

The effectiveness of data filters is assessed to ensure users can efficiently navigate and analyse specific subsets of data. This includes testing the performance impact of applying multiple filters simultaneously.

By following this structured approach, the project demonstrates the powerful capabilities of Qlik Sense in transforming synthetic airline data into actionable insights, ultimately aiding in the optimization of airline operations.