1. INTRODUCTION

1.1 Overview

This project explores insights derived from synthetic airline data using Qlik Sense, a leading data analytics and visualization 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 analyzing large datasets, 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 visualizations.

1.3 Technical Architecture

The technical architecture involves:

- Data source: Synthetic airline data.

- Data processing: Data preparation using Qlik Sense.

- Data visualization: Interactive dashboards and reports created in Qlik Sense.

- Deployment: Qlik Sense server for rendering and sharing visualizations.

2. Define Problem / Problem Understanding

2.1 Specify the Business Problem

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

2.2 Business Requirements

- Ability to handle large datasets.

- Interactive and user-friendly visualizations.

- 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 Visualization

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

5. Data Visualizations

5.1 Visualizations

Various visualizations 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 visualize 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, visualizations, 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 visualizations when dealing with substantial datasets.

8.2 Utilization of Data Filters

The effectiveness of data filters is assessed to ensure users can efficiently navigate and analyze 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.