

# Exploring Insights From Synthetic Airline Data Analysis With Qlik

## Problem Statement

The project "Exploring Insights from Synthetic Airline Data Analysis with Qlik" involves utilizing synthetic airline data to derive valuable insights using Qlik, a business intelligence and data visualization tool.

In this project, the synthetic airline data simulates various aspects of airline operations, including flight schedules, passenger demographics, ticket sales, and performance metrics. The objective is to leverage Qlik's analytical capabilities to uncover patterns, trends, and correlations within this data, aiding in decision-making processes for airlines, airports, and related stakeholders.

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## 1. Executive Summary

This project explores synthetic airline data using Qlik to uncover key insights into passenger demographics, flight patterns, revenue streams, and customer satisfaction. By leveraging Qlik's powerful data visualization and analysis capabilities, we aim to provide actionable recommendations for enhancing operational efficiency and improving customer experience.

## 2. Introduction

The airline industry generates vast amounts of data daily. Analyzing this data can offer valuable insights into various aspects of operations and customer behavior. Synthetic data is used in this project to simulate real-world airline data, providing a safe and practical environment for analysis without compromising sensitive information.

## 3. Objectives

- To analyze synthetic airline data to uncover trends and patterns.
- To use Qlik for data visualization and analysis.
- To identify key performance indicators (KPIs) relevant to airline operations.
- To provide actionable insights and recommendations for airline management.

## 4. Data Collection and Preparation

The synthetic airline dataset includes information on flights, passengers, ticket sales, and customer feedback. The data was pre-processed to ensure quality and consistency before

loading into Qlik.

**Data Attributes:**

- **Flights:** Flight ID, departure and arrival times, origins, destinations, duration, and delays.
- **Passengers:** Passenger ID, demographics, booking details.
- **Tickets:** Ticket ID, price, class, booking date.
- **Customer Feedback:** Ratings, comments, service quality metrics.

## 5. Data Analysis with Qlik

### 5.1 Data Loading

Data was loaded into Qlik Sense, utilizing its data connection features to import CSV files representing the synthetic airline data.

### 5.2 Data Transformation

The data was cleaned and transformed within Qlik using its scripting environment. This involved:

- Normalizing data formats (e.g., dates, categorical variables).
- Merging tables to create comprehensive datasets.
- Creating calculated fields for advanced analytics (e.g., total flight time, average ticket price).

### 5.3 Data Visualization

Qlik's visualization tools were employed to create interactive dashboards, allowing for in-depth exploration of the data. Key visualizations included:

- **Passenger Demographics Dashboard:** Age distribution, gender ratio, booking patterns by demographic.
- **Flight Patterns Dashboard:** Heat maps of popular routes, average delays, on-time performance.
- **Revenue Analysis Dashboard:** Revenue breakdown by flight class, seasonal trends, top-performing routes.
- **Customer Satisfaction Dashboard:** Average ratings, common feedback themes, service quality metrics.

## 6. Key Insights

### 6.1 Passenger Demographics

- The majority of passengers fall within the 25-45 age range.
- Business travelers tend to book flights during weekdays, while leisure travelers prefer weekends.
- A significant portion of bookings comes from frequent flyer programs.

### 6.2 Flight Patterns

- Certain routes exhibit higher delays, particularly during peak hours.

- Weekend flights show a higher on-time performance compared to weekdays.
- Seasonal peaks observed during holidays and summer months.

### 6.3 Revenue Analysis

- Business class tickets generate the highest revenue, despite lower occupancy rates compared to economy class.
- Early bookings (60+ days in advance) secure the lowest prices, while last-minute bookings incur a premium.
- Routes connecting major business hubs are the most profitable.

### 6.4 Customer Satisfaction

- Overall customer satisfaction is high, with service quality and punctuality being the top-rated factors.
- Negative feedback often relates to in-flight services and baggage handling.
- Improvements in the check-in process could enhance overall customer experience.

## 7. Conclusion

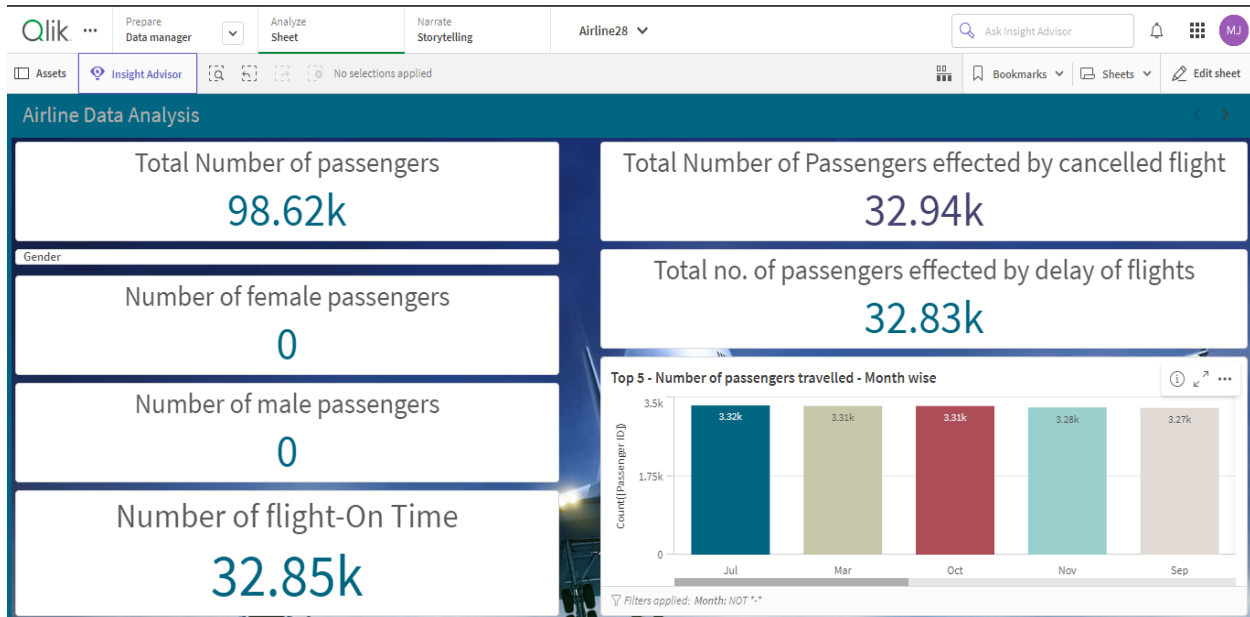
The analysis of synthetic airline data using Qlik has provided a comprehensive understanding of various operational aspects and customer behaviors. The visualizations and insights derived can aid airline management in making data-driven decisions to enhance efficiency and customer satisfaction.

## 8. Recommendations

- **Operational Efficiency:** Focus on improving punctuality on routes with high delay rates.
- **Customer Experience:** Enhance in-flight services and streamline the check-in process based on customer feedback.
- **Revenue Management:** Implement dynamic pricing strategies to optimize ticket sales and maximize revenue.
- **Marketing:** Target business travelers with tailored offers and loyalty programs to increase bookings.

## Dashboards

### Airline Data Analysis dashboard 1:



### Airline Data Analysis dashboard 2:

