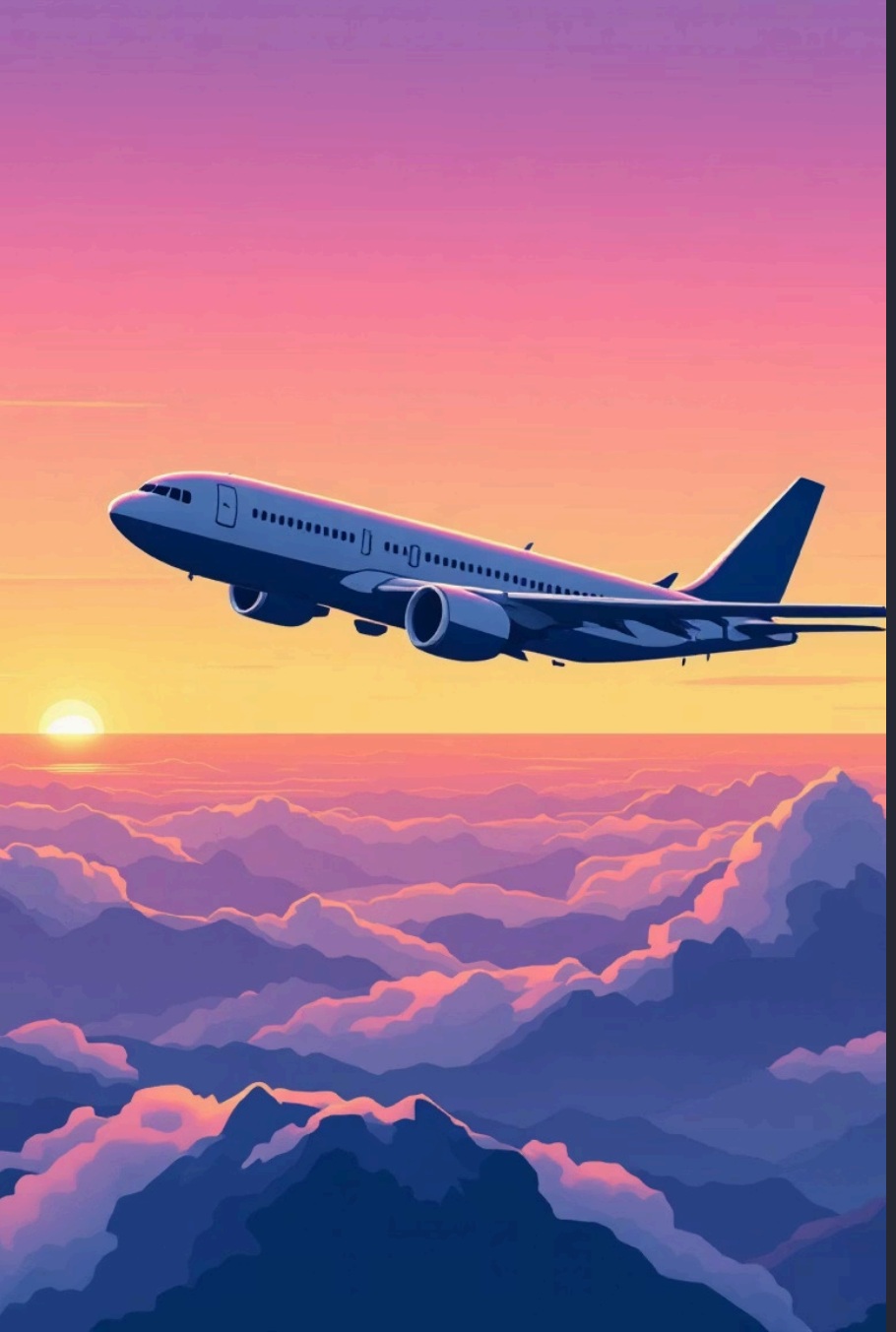


Airline Passenger Satisfaction & Recommendation Analysis

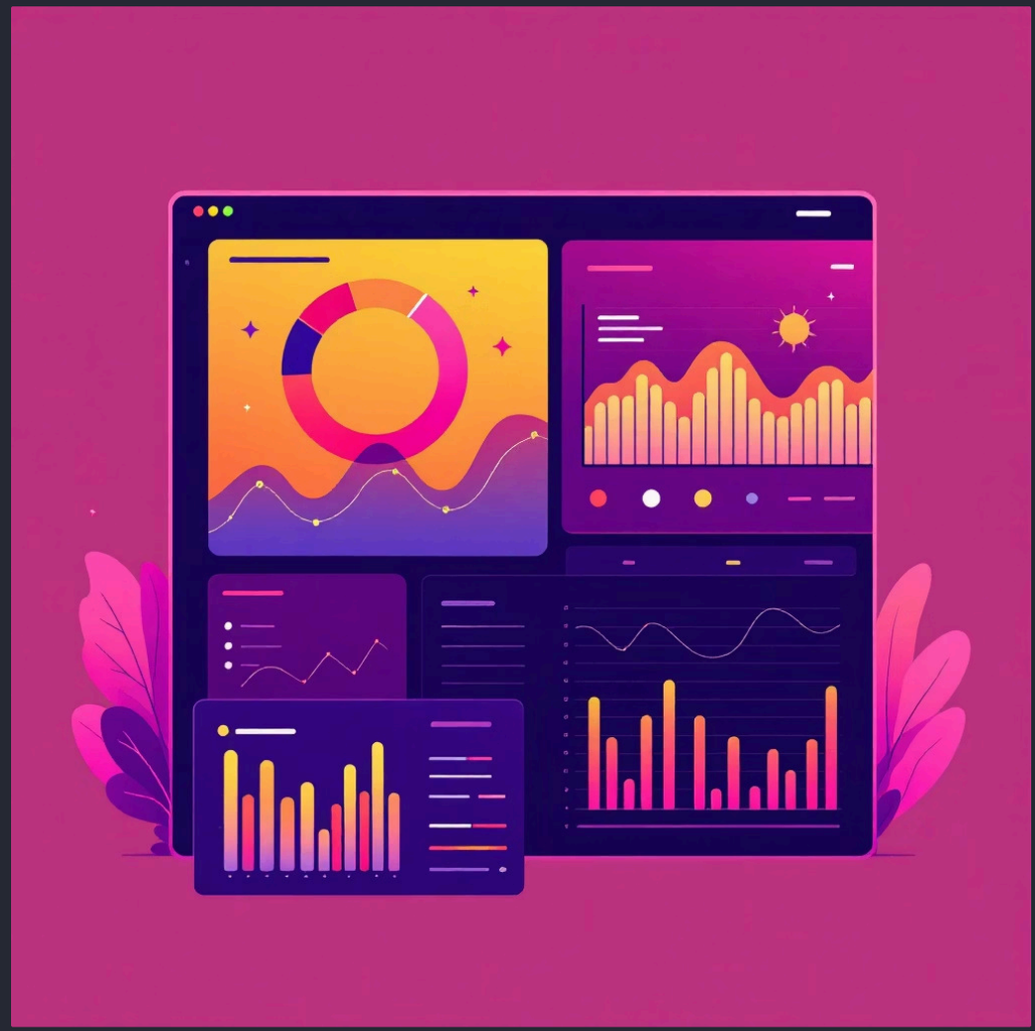
Transforming passenger feedback into strategic insights through advanced data analytics

PROJECT OVERVIEW

Project Objective

This project analyzes airline passenger review data to understand overall satisfaction, identify dissatisfaction patterns, and examine how passenger experience translates into recommendation behavior.

The focus is on extracting meaningful insights from customer feedback to support data-driven decision-making across airline operations and service delivery.



GOALS

Project Goal

Measure Satisfaction

Evaluate passenger satisfaction at overall and airline-specific levels to understand performance benchmarks

Link Experience to Advocacy

Understand the relationship between satisfaction scores and recommendation behavior

Identify Patterns

Uncover key patterns and drivers behind passenger dissatisfaction across segments

Generate Insights

Translate analytical findings into clear, actionable business insights using SQL and Power BI

Tools Used

Python

Data understanding, exploratory data analysis (EDA), hypothesis testing, and clustering algorithms to identify passenger segments

SQL (PostgreSQL / pgAdmin4)

Advanced market-based analytical queries for extracting airline-level insights and comparative performance metrics

Power BI

Interactive dashboard development for visualization, storytelling, and enabling stakeholder decision-making

ANALYSIS

Results from EDA-Based Analysis

Highly Polarized Distribution

Overall ratings reveal a **highly polarized distribution**, with significant concentrations at both extremes—many very low ratings alongside a distinct group of high ratings, indicating split passenger experiences.

Recommendation Imbalance

Passenger recommendation behavior is not evenly distributed. A significant portion of reviews are marked as *Not Recommended*, signaling widespread dissatisfaction issues.

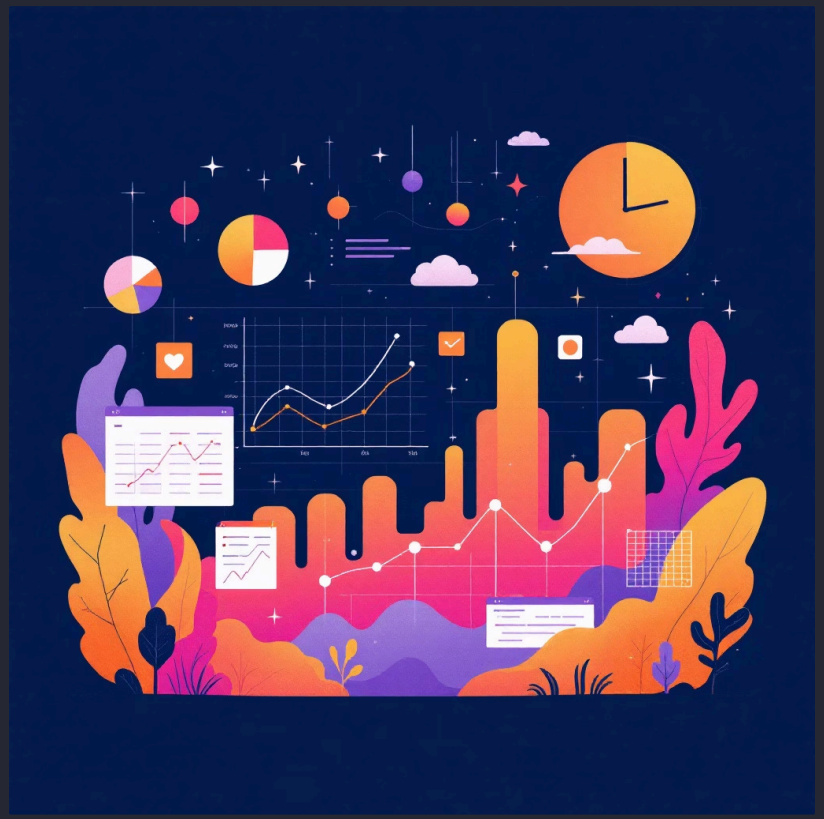
Variable Experience Quality

Overall ratings vary substantially across airlines, seat types, and traveler categories, confirming that passenger experience is far from uniform across market segments.

Verification Credibility Gap

Verified and non-verified reviews show noticeable differences in rating behavior, suggesting variation in feedback credibility and potentially different sentiment patterns.

Results from Hypothesis Testing



Hypothesis Tested

There is a statistically significant difference in overall ratings between passengers who recommend the airline and those who do not.

Outcome

- The null hypothesis was **rejected**
- Passengers who recommend an airline have significantly higher overall ratings than passengers who do not
- The difference is both **statistically significant** and **practically meaningful**
- Confirms a strong association between satisfaction and recommendation behavior

This validated further analysis to understand what drives overall satisfaction.

SEGMENTATION

Results from Cluster Analysis

Cluster analysis was performed to group passengers based on their service rating patterns, revealing distinct experience segments.

Natural Experience Groups

Passengers naturally fall into **distinct experience groups** rather than behaving uniformly, indicating varied service perceptions across the customer base.

Satisfaction Spectrum

Some clusters represent consistently dissatisfied passengers, while others reflect mixed or highly satisfied experiences with clear differentiation.

Hidden Patterns Revealed

Clustering helped reveal hidden patterns in service perception that are not visible through averages alone, providing deeper insights.

This analysis demonstrated that passenger dissatisfaction is not random but follows identifiable patterns that can be targeted strategically.

Results from SQL-Based Analysis

Advanced SQL queries extracted market-level insights to identify specific problem areas and performance gaps across the airline industry.

01

Negative Recommendation Hotspots

Identified airlines with a **higher-than-average share of negative recommendations** compared to industry benchmarks

02

Route-Level Dissatisfaction

Detected specific routes contributing disproportionately to overall dissatisfaction scores

03

Performance Gap Ranking

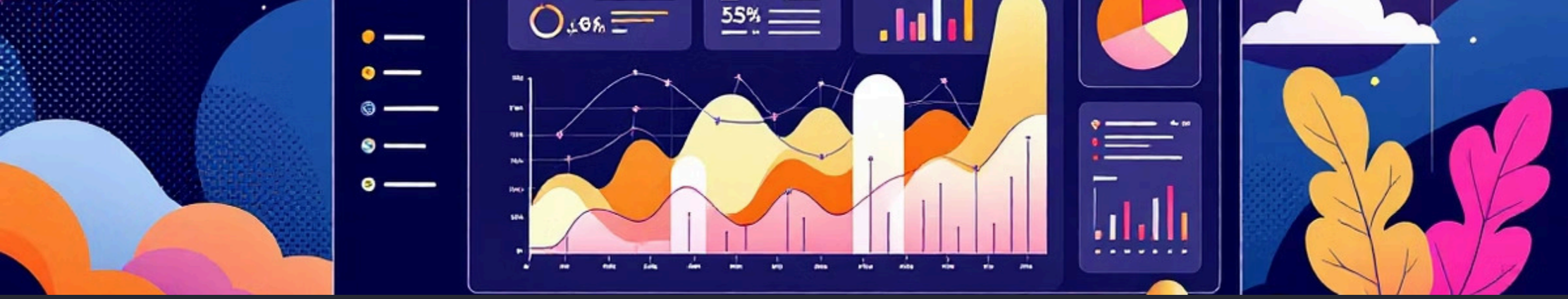
Ranked airlines based on the gap between satisfied and dissatisfied passenger ratings to prioritize intervention opportunities

04

Segment Comparison

Compared traveler types and verification status to uncover systematic differences in passenger experience

These insights provided a **structured and scalable view** of passenger dissatisfaction across airlines, routes, and segments—enabling targeted operational improvements.



VISUALIZATION

Results from Power BI Dashboard

The Power BI dashboard was designed to clearly communicate complex insights to non-technical stakeholders in an intuitive, decision-ready format.

High-Level Overview

Displays total reviews, average ratings, and recommendation share at a glance for quick executive understanding

Satisfaction-Recommendation Link

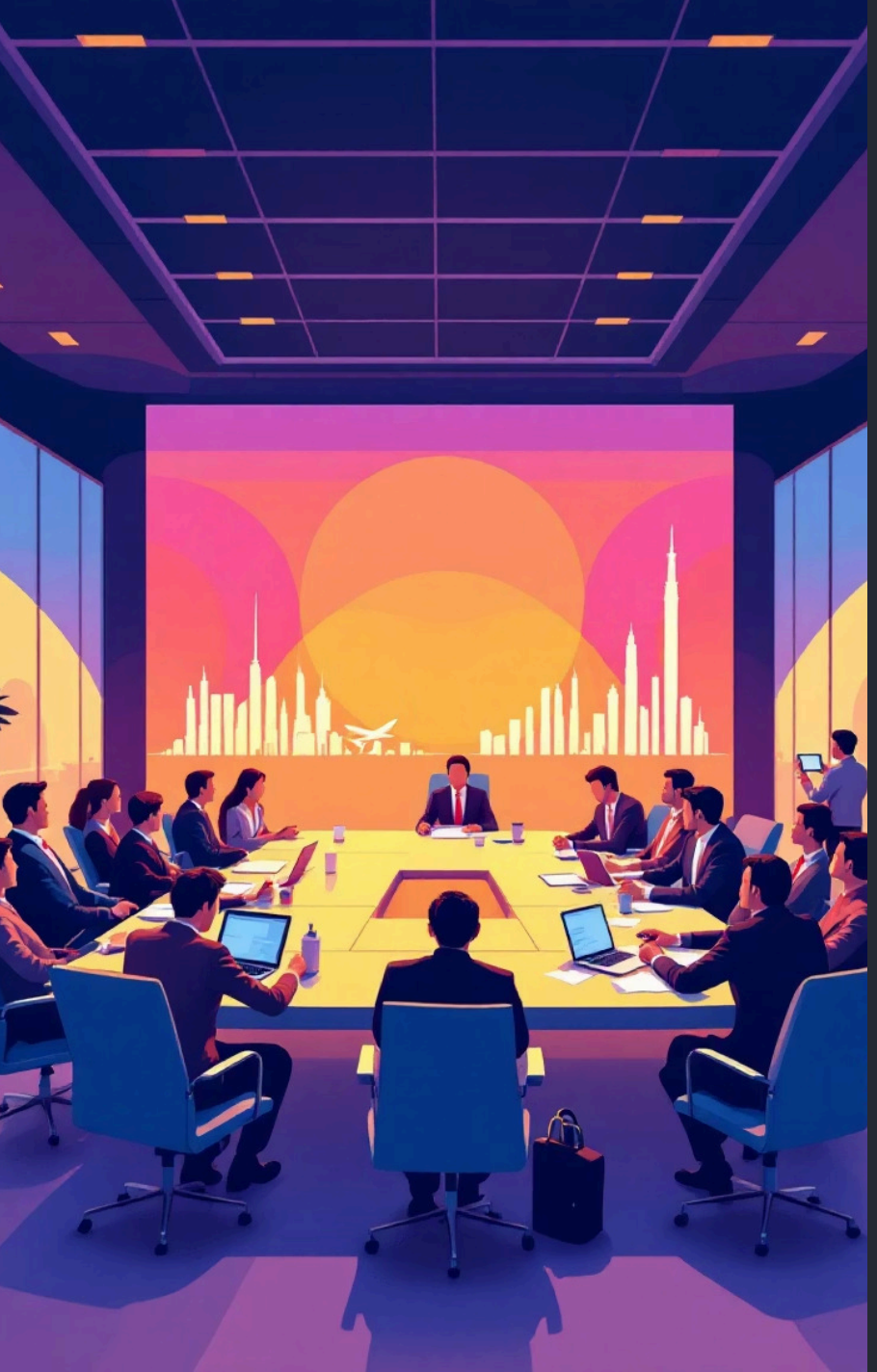
Visual confirmation that recommendation behavior is strongly linked to overall satisfaction scores

Airline Performance Snapshots

Airline-level views highlight underperforming carriers and identify improvement opportunities

Clear Pattern Representation

Dissatisfaction patterns presented without technical jargon for broader stakeholder accessibility



Business Recommendations

Prioritize Experience Drivers

Airlines should focus on **improving passenger experience drivers** that contribute most significantly to dissatisfaction

Target Problem Areas

Direct resources toward airlines and routes with consistently high negative recommendation rates

Monitor Trends

Track dissatisfaction trends over time to detect early warning signals before reputation impact escalates

Adopt Segment Strategies

Implement segment-based approaches, as different passenger groups experience airlines differently