

VOICES IN THE SKY

A Data-Driven Look at Airline Satisfaction

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Executive Summary

This case study explores customer satisfaction trends and review patterns across multiple international airlines, based on verified reviews from passengers around the world. The dataset includes critical variables such as airline name, review title and content, overall rating, travel class, frequent flyer status, origin country, etc. providing a rich foundation for analyzing passenger experiences.

Through data cleaning, visualization, and dashboard creation, we identified key trends such as satisfaction distributions per airline, service class-based satisfaction, country-wise review engagement, and the frequency of verified flyer responses. Singapore Airlines emerged as one of the most frequently reviewed carriers, but the dataset spans various global airlines, offering a broader perspective on the commercial aviation industry.

The analysis offers actionable insights into how customer satisfaction varies across regions, airlines, and flying classes, providing potential value for airline brands, customer service strategists, and aviation data analysts alike. This report aims to bridge data with empathy by translating numerical patterns into real-world experiences in the skies.

Introduction

In today's hyper-connected world, airline passengers are more vocal and influential than ever. Online reviews significantly impact customer trust, brand reputation, and airline selection. With increased competition in the aviation sector, understanding customer satisfaction has become crucial for sustaining loyalty and improving service quality.

This case study analyzes a rich dataset containing thousands of airline passenger reviews sourced from multiple carriers across the globe. The dataset includes both qualitative and quantitative aspects and review texts, ratings, travel classes, and other user demographics that together reveal how travelers perceive their flying experience.

The primary goal of this study is to extract meaningful insights from customer feedback using data analytics techniques and to visualize these patterns in a clear, interactive dashboard. These insights can help airlines benchmark performance, identify pain points, and develop data-backed strategies to enhance customer satisfaction.

Data Overview

The dataset used in this study contains customer reviews from multiple international airlines. Each row in the dataset represents a single customer review and includes a combination of structured and unstructured fields. Key columns include:

- Airline Name – The airline reviewed
- Overall Rating – A numerical score out of 10
- Review Text – The customer's written feedback
- Cabin Class – The class of travel (Economy, Business, etc.)
- Verified – Whether the reviewer was a verified traveler
- Type of Traveller – (e.g., Business, Leisure, Solo)
- Seat Type, Date Flown, Route, etc.

The dataset offers a holistic view of customer satisfaction and airline service performance across a wide range of metrics.

Cleaning Process

Before moving into visualization and analysis, the dataset required preprocessing to ensure accuracy and usability. Key steps included:

1. Handling Missing Values

- Rows with essential fields (like airline name or overall rating) missing were removed.
- Other missing fields were handled with either imputation or marked as "Unknown."

2. Data Type Conversion

- Columns like 'Date Flown' were converted into datetime format for time-based analysis.
- Ratings were ensured to be numerical.

3. Text Normalization

- Text was cleaned in preparation for potential NLP modeling, but structured data was used for analysis.

4. NLP analysis

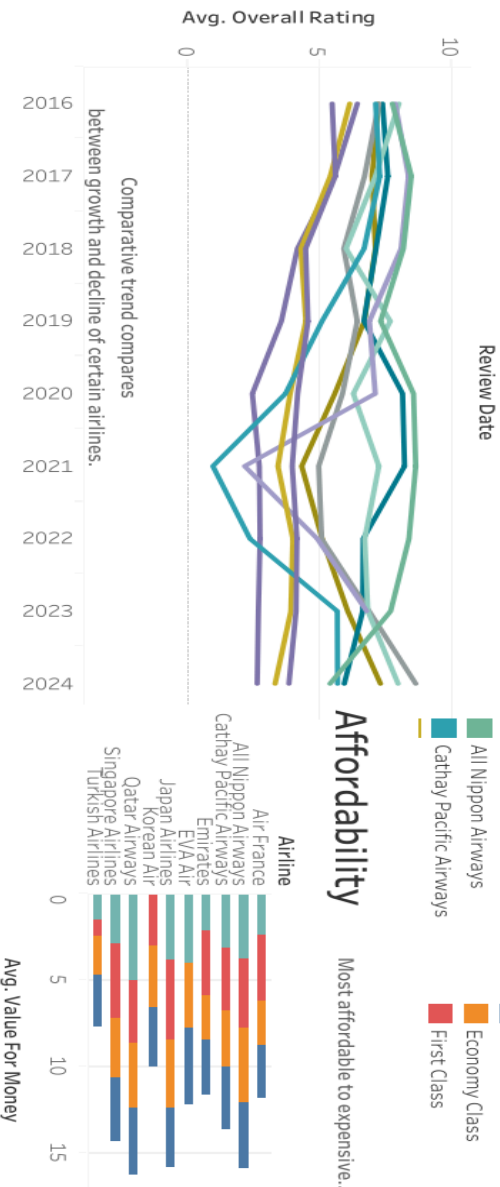
- Structured satisfaction ratings (out of 10) were used to assess airline performance. Text-based reviews were preprocessed, but **not analyzed using NLP**.

5. Filtering Duplicates

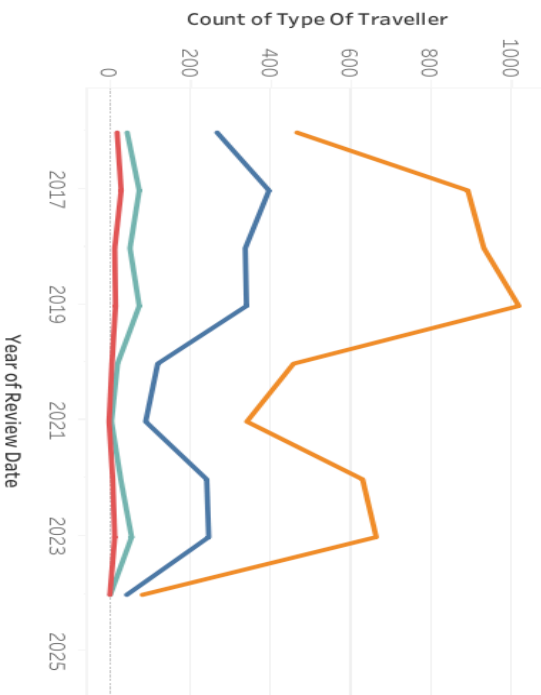
- Duplicate entries were dropped to avoid data redundancy.

These preprocessing steps laid the foundation for clean, meaningful visual insights.

Airline ratings (Comparison)

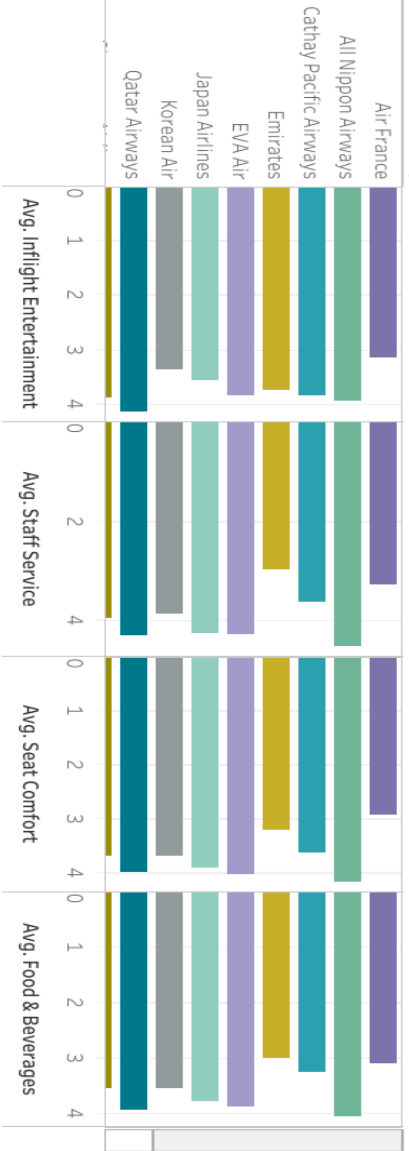


Customer Trends for Flights



Basic Ratings (Airlines)

In-Flight Service ratings to compare better service providers.



Class comparison (Airlines)



Decreasing trends over the years show a shift in ways of transportation.

According to class trends, Qatar Airways Economy Class is the best rated and most preferred mode of flights.

Exploratory Data Analysis (EDA) & Key Insights

With the cleaned dataset, a visual dashboard was created to explore the performance of various airlines based on customer feedback. Here are the major insights derived from the analysis:

1. Top-Reviewed Airlines

The dashboard highlighted that airlines such as **Singapore Airlines**, **Qatar Airways**, and **Emirates** consistently received a large volume of reviews. This indicates strong customer engagement and a larger user base willing to share feedback.

2. Highest Rated Airlines

Despite many reviews, only a few airlines stood out in terms of **consistently high average ratings**:

- **Singapore Airlines**: Frequently achieved 9+ ratings.
- **Qatar Airways**: Known for top-notch business class service.
- **ANA & EVA Air**: High-performing Asian airlines receiving positive global recognition.

This suggests that brand perception, service consistency, and cabin experience significantly influence customer ratings.

3. Low Performing Airlines

Some airlines consistently received lower average scores:

- Airlines such as **Turkish Airlines** and **Air France** were observed to have ratings mostly below average.
- Negative sentiment often centered around delays, poor customer service, and lack of comfort.

4. Cabin Class Impact on Ratings

Customers flying **Business Class or Premium Economy** tended to leave **higher ratings** compared to those in Economy. This aligns with the increased satisfaction due to better seating, meals, and in-flight service.

5. Traveller Type Trends

- **Business Travellers** rated their experiences more critically.
- **Leisure Travellers** and **Families** were generally more generous in their reviews unless significant issues occurred.
- **Solo Travellers** provided balanced feedback, often focusing on comfort and punctuality.

6. Review Verification and Bias

Verified travelers generally gave **more realistic and sometimes lower scores** compared to unverified ones, highlighting the authenticity and honesty of verified feedback.

7. Temporal Trends

- Certain periods (post-COVID recovery years, festival seasons, etc.) showed noticeable dips or spikes in ratings, possibly due to service strain or increased traffic.

These insights helped in understanding not just which airlines perform better, but why, based on the voices of real travelers across the globe.

Business Problem and Objective

In today's hyper-competitive airline industry, understanding customer sentiment and satisfaction is crucial to staying ahead. Airlines operate under tight margins and face intense scrutiny over service quality, pricing, punctuality, and overall passenger experience.

However, raw customer reviews alone do not offer easily actionable insights. There is a need to:

- Consolidate unstructured feedback,
- Identify patterns in satisfaction or dissatisfaction,
- Benchmark performance against competitors,
- Understand the reasons behind customer ratings across different customer profiles.

The Objective

This analysis aimed to transform raw customer review data into a structured dashboard that allows:

- Comparison of airline performance based on customer type, travel class, and verification status.
- Identification of top-rated and underperforming airlines using measurable review metrics.
- Extraction of insightful patterns such as which traveler segments are more critical and what service aspects drive ratings.

- Empowering business teams with a single visual interface that informs decision-making, from service improvements to targeted marketing.

Ultimately, this report supports data-backed strategic planning for airline service optimization, competitor benchmarking, and improving customer loyalty

Target Audience and Stakeholders

Who Will Benefit from This Dashboard?

This report and its visual dashboard are designed for the following stakeholders:

1. **Airline Management Teams**

To identify service gaps, improve customer experience, and benchmark performance against competitors.

2. **Customer Experience (CX) Analysts**

To gain structured insights from qualitative feedback and improve satisfaction across traveler segments.

3. **Marketing & Brand Teams**

To target campaigns based on traveler types, loyalty status, and preferences, for example, frequent flyers or premium-class passengers.

4. **Product and Service Designers**

To understand specific pain points mentioned in reviews (e.g., baggage delays, meal quality, inflight entertainment) and innovate accordingly.

5. Investors and Strategic Planners

To assess the competitive position of different airlines through the lens of real customer sentiment and satisfaction.

Recommendations

Prioritize Economy Class Upgrades

Airlines can improve overall perception by enhancing the economy class experience—better seating, food variety, and in-flight entertainment.

Focus on On-Time Performance

Delay-related complaints are significant. Strengthening operations and communication during delays can reduce dissatisfaction.

Invest in Cabin Crew Training & Recognition

Positive staff interactions heavily influence review sentiment. Regular training and employee engagement programs can elevate service quality.

Targeted Customer Segmentation Strategies

Tailor services and marketing based on traveler type, e.g., offer exclusive deals to solo business travelers and families.

Act on Review Insights Proactively

Airlines should monitor sentiment trends in real-time to act promptly on negative feedback and identify service gaps.

Limitations

While insightful, this analysis has some limitations:

- **Data Scope:** The dataset may not include every airline or be evenly distributed, so findings might not generalize across the entire aviation industry.

- **Limited Variables:** Factors such as pricing, routes, and loyalty programs were not included but could have influenced customer satisfaction.

Conclusion

The dashboard provides a comprehensive visual summary of airline review data from a global dataset, allowing stakeholders to assess overall customer satisfaction and identify performance disparities among various airlines.

Key takeaways include:

- **Singapore Airlines** and a few other major carriers maintain high satisfaction scores, particularly in premium cabins.
- **Economy class travelers** report a lower satisfaction level, with complaints mostly centered around seat comfort, food quality, and delays.
- **Staff behavior** and **timeliness** are consistent drivers of positive and negative reviews, respectively.
- Travelers from different regions and travel types (e.g., solo vs. family) exhibit varying levels of criticality, underlining the need for **targeted experience strategies**.

Appendix/References

Data Source: [Airline Reviews Dataset](#)

Tools Used: Google Sheets, Jupyter NB, Kaggle, Tableau.

GitHub Repo: [spod-codes/Data_Analytics – Voices in the Sky](#)