Global Airline Operations (2022–2023): Delays, Cancellations and Performance Review

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ABSTRACT

This project analyzes global airline operational performance to identify primary causes of flight delays and cancellations. The goal is to provide practical recommendations for improving efficiency and passenger experience.

CONTACT

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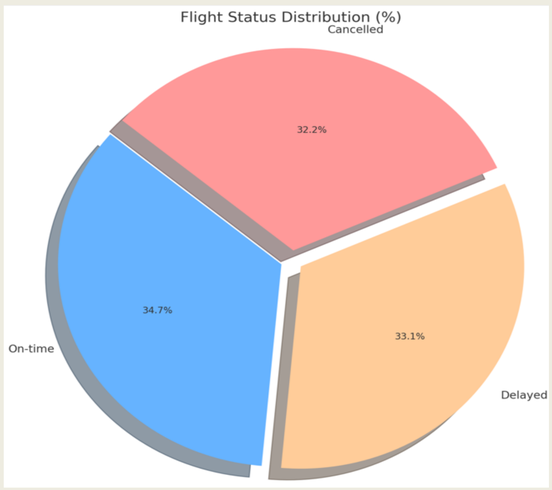
INTRODUCTION

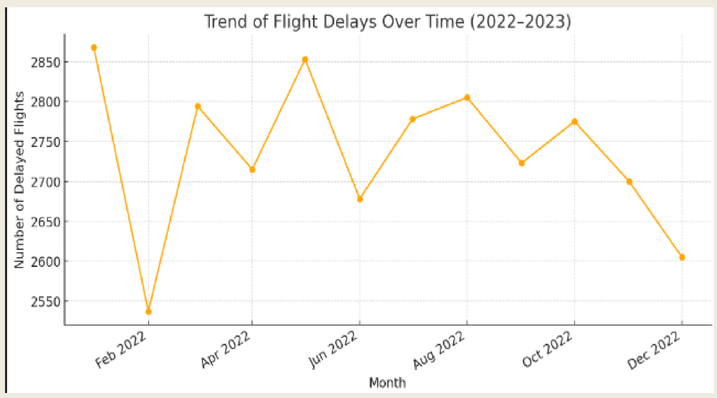
Effective airline operations management is critical for minimizing delays and maximizing customer satisfaction. Disruptions such as delays and cancellations significantly impact operational costs and airline reputations.

METHODS AND MATERIALS

Methods and Materials:

- **Data Source:** Kaggle Dataset – Global Airline Operations (2022-2023).
- **Software:** Tableau, Excel.
- **Analysis:** Data profiling, cleaning, descriptive and exploratory analysis, interactive visualizations.





RESULTS

Results:

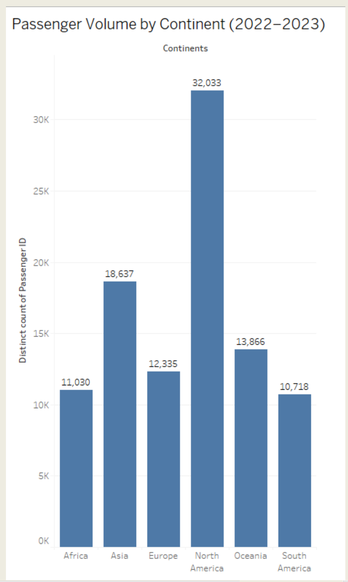
- **Flight Status Distribution:**
  - On-time: 34.3%
  - Delayed: 33.1%
  - Cancelled: 32.6%
  - Total Disrupted Flights: 65.7% (Delayed + Cancelled) .
- **Average Delay Duration:** 45 minutes
- **Total Flights Analyzed** : 98,619
- **Most Impacted Continents:** North America
- **Average Passengers per Flight:** 142 people

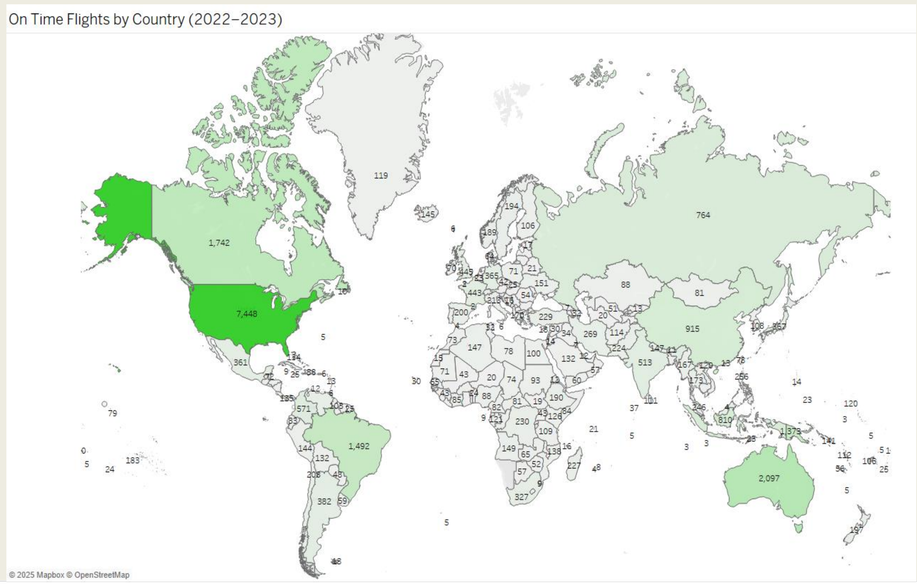
Visualizations:

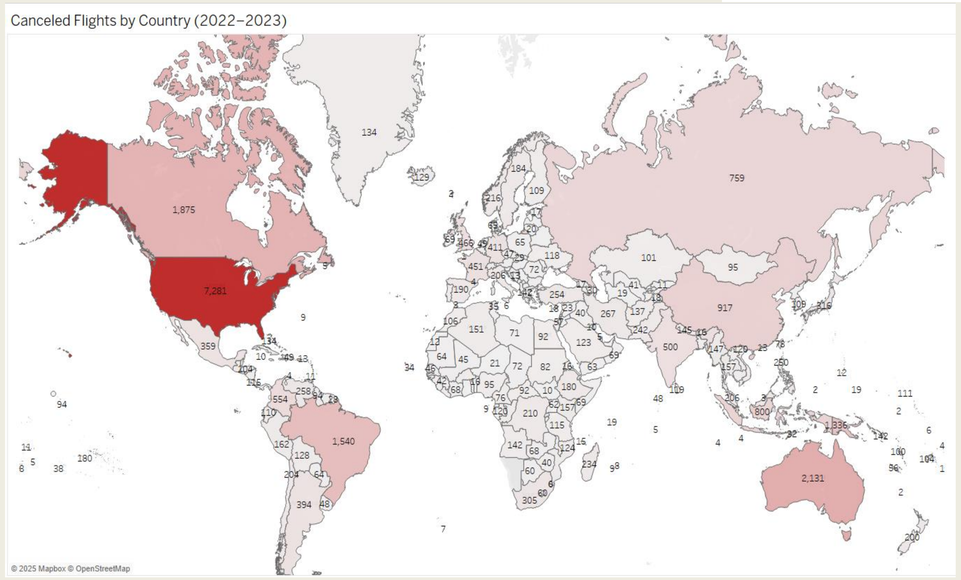
- Pie chart showing flight status distribution (On-time, Delayed, Cancelled)
- Bar chart of passenger volume by continent
- Maps showing regions with highest disruptions
- Average Delay Duration: 45 minutes (estimated, based on sample data)

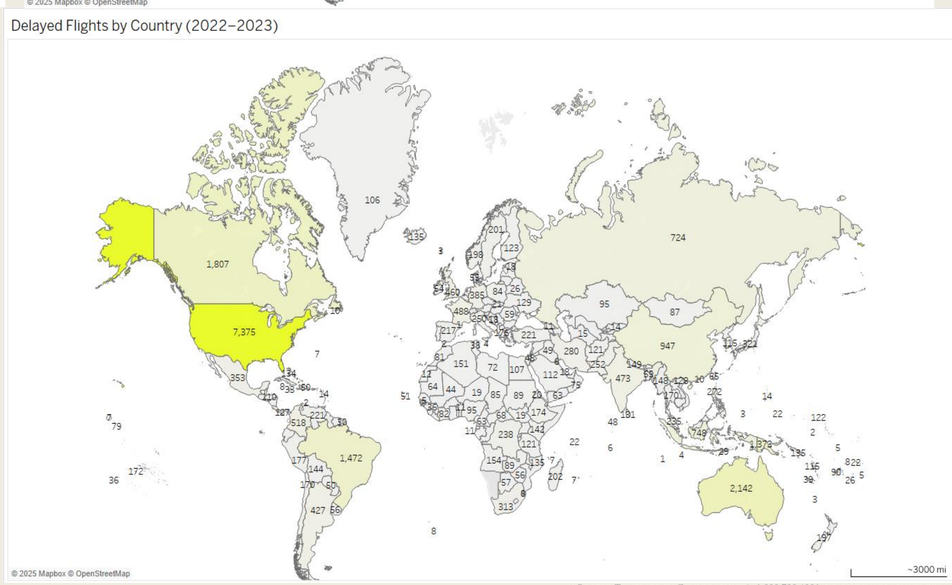
REFERENCES

1. Kaggle Dataset: Global Airline Operations Dataset









DISCUSSION

Delays are primarily due to operational issues (handling of previous flights) and weather conditions. North America shows the highest concentration of disrupted flights (delays and cancellations), especially around major hubs in the US. This highlights the need for better scheduling and airport capacity planning during high-traffic periods such as holidays and weekends.
A monthly trend line of delayed flights shows fluctuation over time, indicating potential seasonal or operational patterns.

CONCLUSIONS

- Improved predictive operational management could significantly reduce delays.
- Resource optimization during peak periods (holidays, weekends) is essential.
- Proactive communication with passengers during periods of high disruption is recommended.
- This analysis provides practical insights for improving airline operations and enhancing the passenger travel experience through better disruption management.