Aircraft Risk Analysis for New Aviation Division

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OVERVIEW

- Our company is entering the aviation industry with plans to purchase aircraft for commercial and private operations.
- The leadership team needs clear, data-driven insights on which aircraft models and manufacturers present the lowest operational risks.
- This presentation provides an evidence-based guide to support safe and strategic investment decisions.

Business problem

- The company’s expansion into the aviation sector is jeopardized by fundamental lack of expertise in the market and relative safety profiles of various models. Without an objective, data driven analysis of fatal accident rates, dispatch reliability and maintenance costs, the company faces the high risk of acquiring unreliable or unsafe aircraft leading to excessive operational costs, damaging legal liability and catastrophic financial loss.

Project objectives

- To analyze aircraft data and understand it
- To Identify risk patterns
- To benchmark aircraft performance and contextualize it
- To recommend the safest models for acquisition

Data sources

- Data Source: The data came from historical aviation records which covered incidents, manufactures ,aircraft models and flight purposes
- Key Features Examined*:*
  - Aircraft model and manufacturer
  - Purpose of flight (commercial vs. private)
  - Aircraft age
  - Incident outcomes (severity
- Data Strength : Provides a broad view of safety patterns across time, aircraft categories, and usage types.

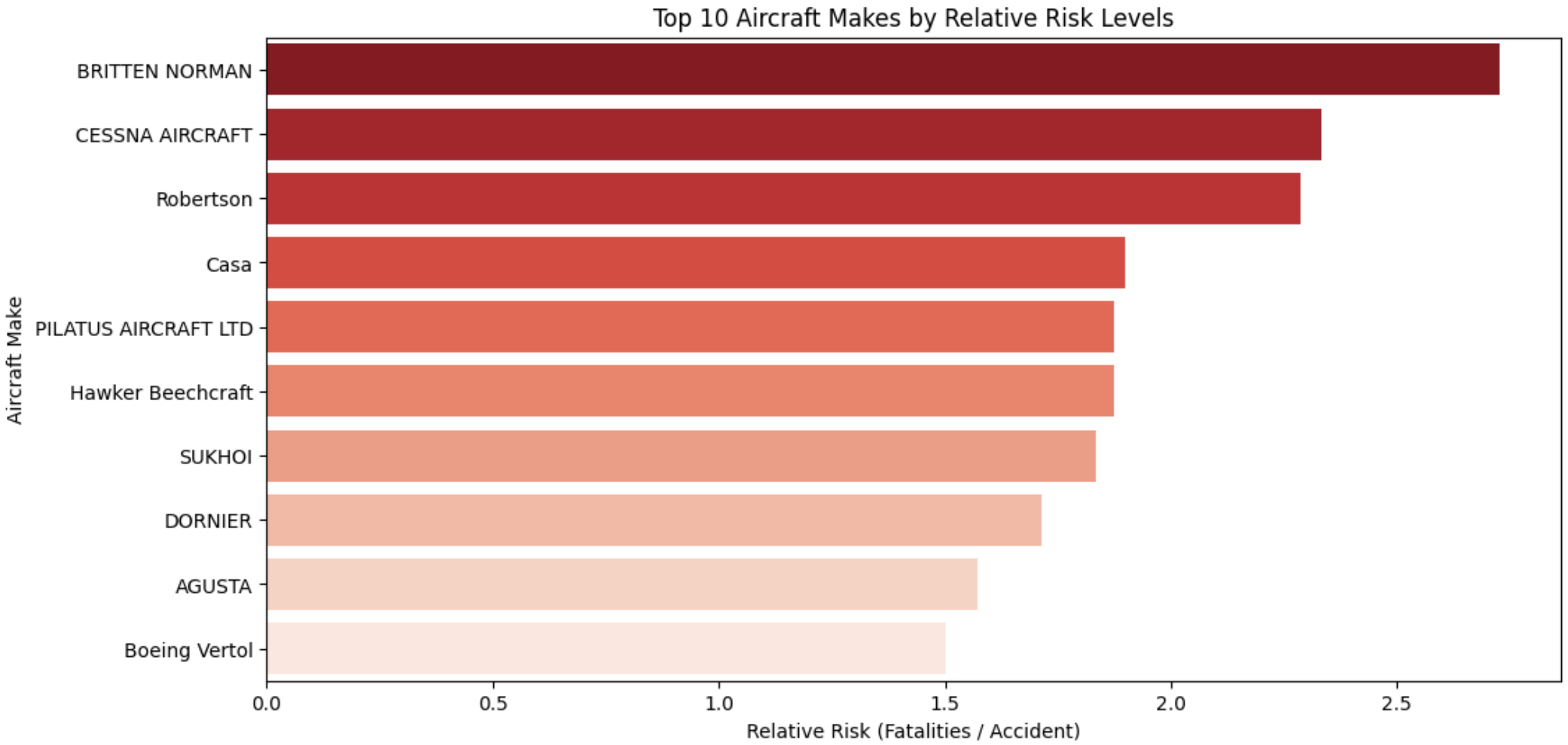
Data preparation

- The acquired data was handled by doing the following : Data cleaning-removing duplicates and handling missing values
- Additionally, it was important to define risk scores; combining frequency and severity of incidents
- This step is important because it translates raw aviation data into actionable business insights for safer decision-making

Aircraft Risk Ranking

- This analysis ranked aircraft models by incident frequency and severity
- Modern, widely used models consistently rank safer while older or niche models appear more prone to incidents
- This showed that the safest aircraft models represent the best entry point point for building trusted and reliable fleet.

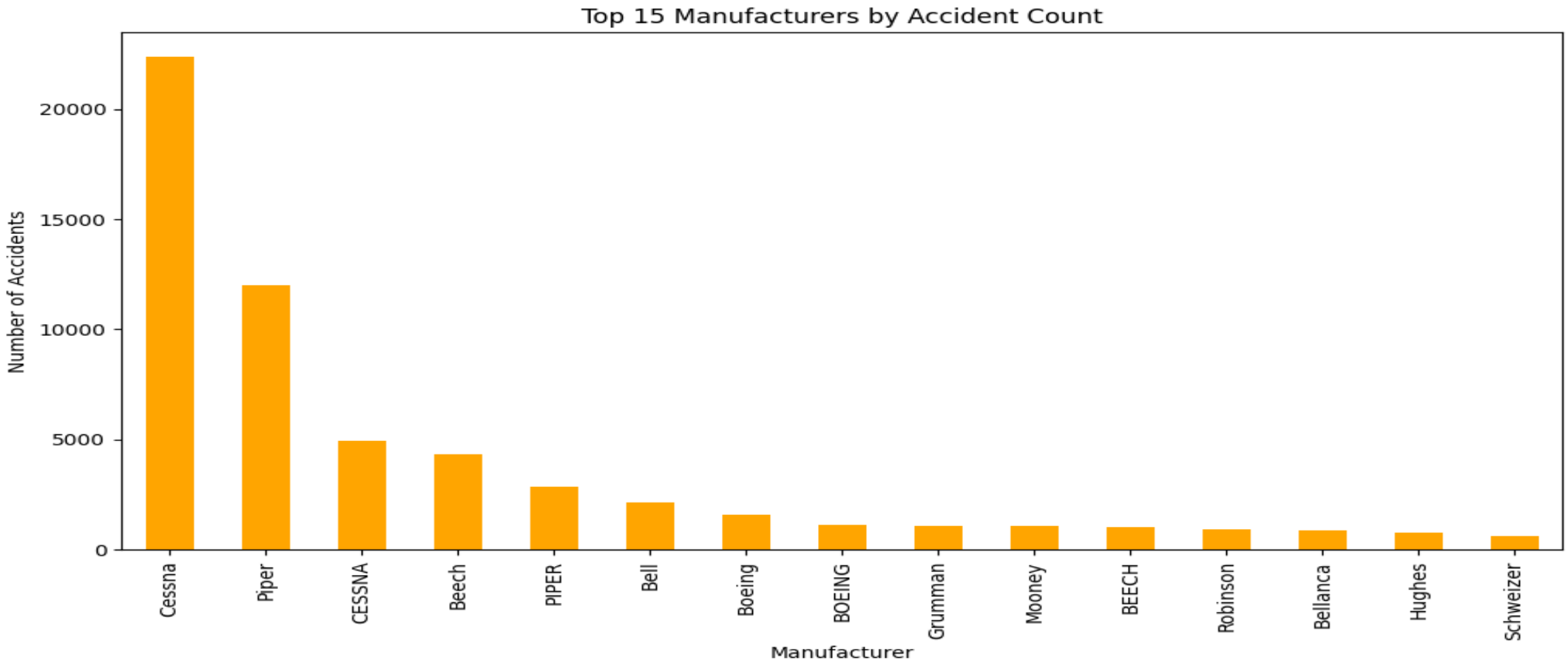
Aircraft models by Relative risk levels



Manufacturer vs Number of Accidents

- In this industry, not all manufacturers have the same safety record. The analysis shows clear differences in accident frequency across manufacturers.
- Some manufacturers consistently appear in the lowest risk category, while others account for a higher share of incidents
- Choosing manufacturers with a proven track record of fewer accidents significantly lowers safety risks and protects risk and protects the company’s reputation.

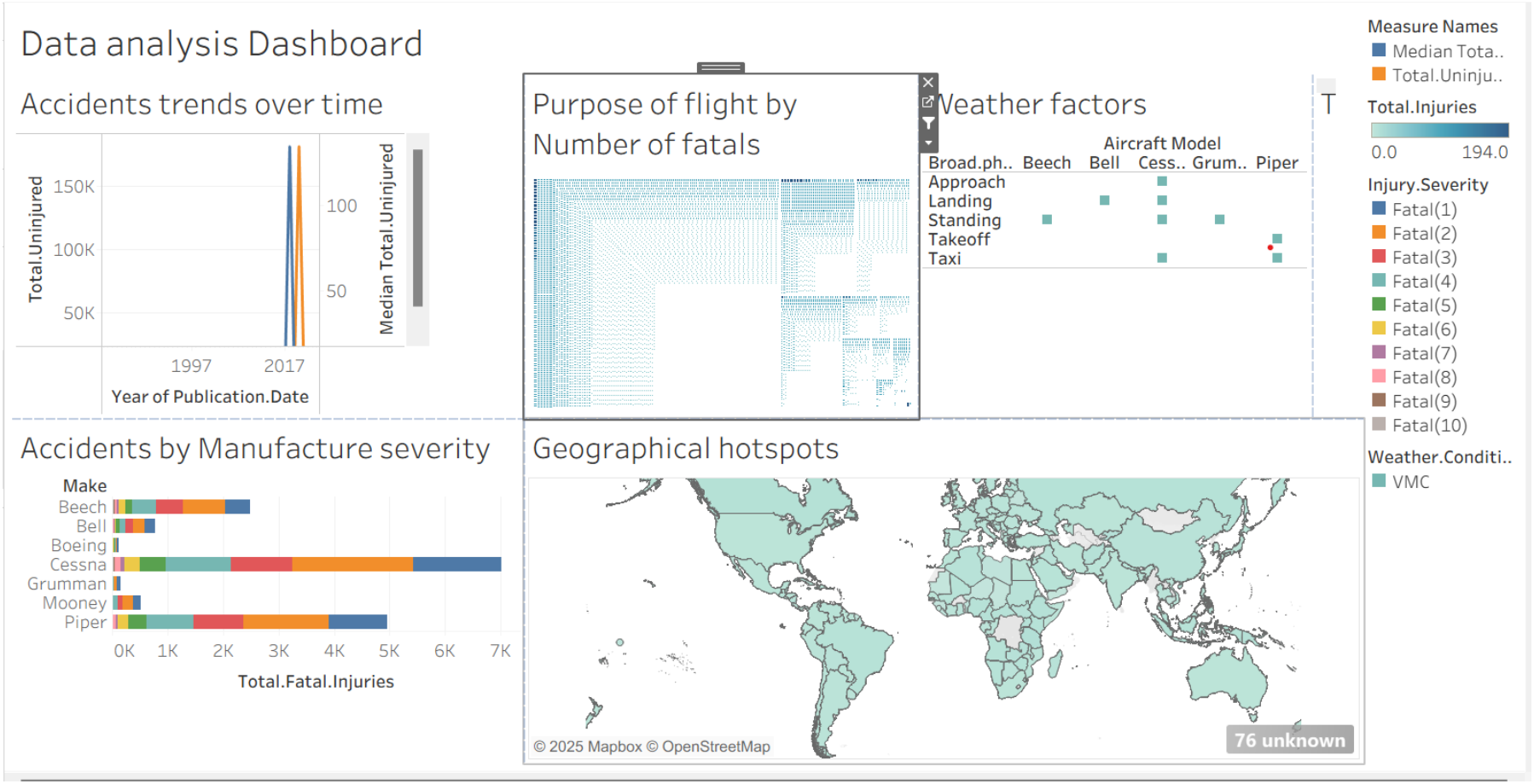
Manufacturer vs Number of Accidents



The Dashboard

- After keenly analyzing the data, the dashboard below was formulated to better help the understanding of the data and help make necessary recommendations

Overall Dashboard



Recommendations

- After analyzing the data that was used the following recommendations were made

- Prioritize modern aircraft models with the lowest risk scores for acquisition.
- Set an age limit on purchases (avoid aircraft older than 15 years).
- Partner with manufacturers who demonstrate strong safety in the company's intended area of operation (commercial/private).
- Adopt a continuous monitoring strategy for fleet safety to maintain industry standards.

Limitations and assumptions

- Based on historical data future conditions of weather, cost and manufacturer may change
- Regional operating differences not fully captured
- It also heavily assumed that this dataset reflects industry wide risk trends and that is a big assumption

Next Steps

- Moving forward conducting cost benefit analysis to recommend models
- It is also important to run a pilot program with small low risk fleet
- Additionally we need to monitor safety KPIs and adjust strategy ad needed

Questions

- FEEL FREE TO ASK ANY QUESTIONS AT THIS POINT
- THANK YOU FOR GIVING ME YOUR ATTENTION.

THANK YOU