Airplanes Risk Analysis for Business Expansion

Identifying Low-Risk Aircraft for purchasing decision making

Summary

This report evaluates the potential risks associated with different aircraft to support informed decision making for business expansion in the aviation business. Through historical aviation data analysis, key factors influencing aircraft risks, enabling the selection of low-risk models were identified. The insights derived can guide resource allocation and optimize purchasing decisions, reducing operational risks.

Outline

- Business Problem
- Data
- Methods
- Results
- Conclusions

Business Problem

Expansion to new business segment can make the company struggle to identify Low-Risk Aircraft. This lack of insight can result in ineffective purchases, wasted resources and injuries.

Objectives:

- To gain knowledge on the potential risks of different aircraft.
- To identify Low-Risk Aircraft for new Aviation Business.
- To provide actionable insights for decision making on purchasing aircraft.

Data

1. National Transportation Safety Board that includes aviation accident data from 1962 to 2023 about civil aviation accidents and selected incidents in the United States and international waters was used for analysis.
2. The data URL: https://www.kaggle.com/datasets/khsamaha/aviation-accident-database-synopses
3. The data contains attributes such as aircraft damage, make and model as well as injuries

Methods

- Data Collection: Gathering of historical aviation data.
- Data Cleaning: Preprocessed the data to handle missing values and duplicates.
- Feature Engineering: Created relevant features for analysis and modeling.
- Interpretation: Analyzed the results to derive actionable insights.
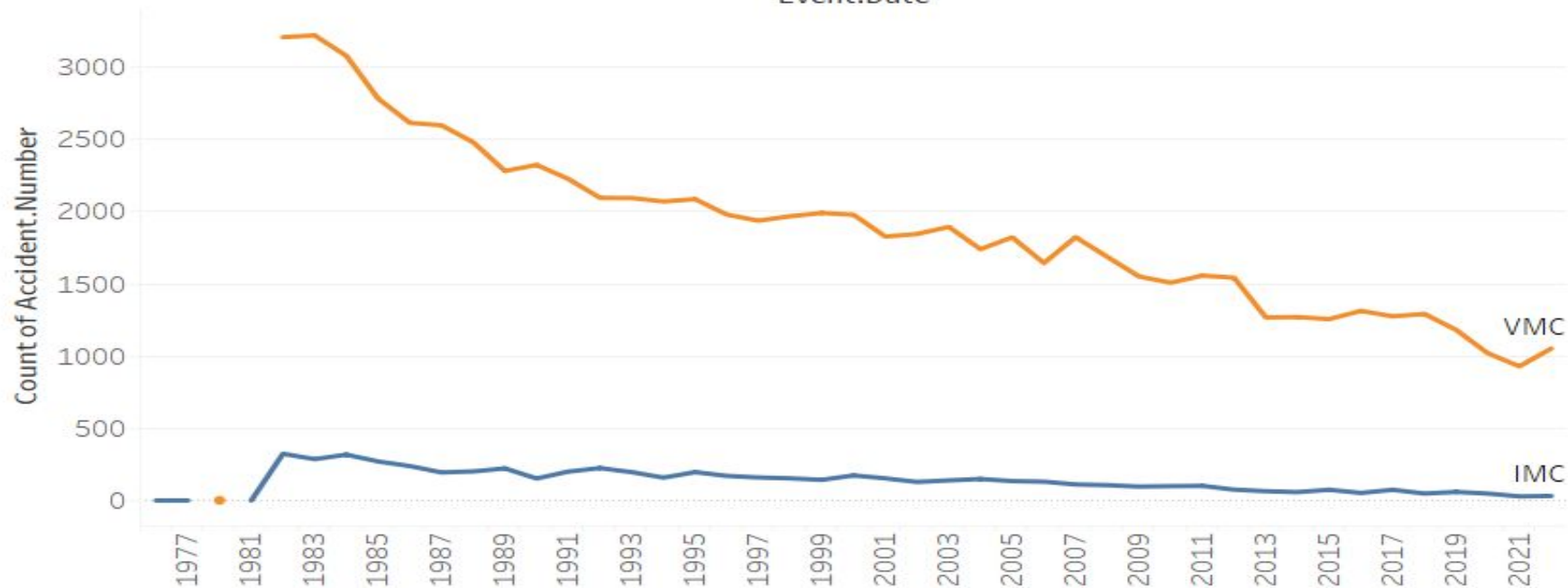
Results

1. Aircraft Damage: Destroyed aircraft pose higher risks.
2. Purpose of Flight: Commercial flights showed lower risks compared to personal flights.
3. Weather Conditions: Adverse weather significantly increases risks
4. Modern aircraft consistently demonstrate lower risks.

Flight Purpose Accident Timelines
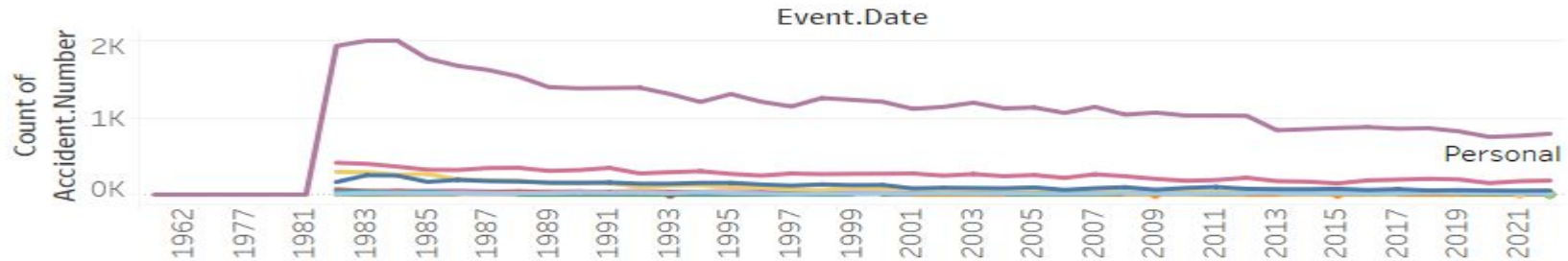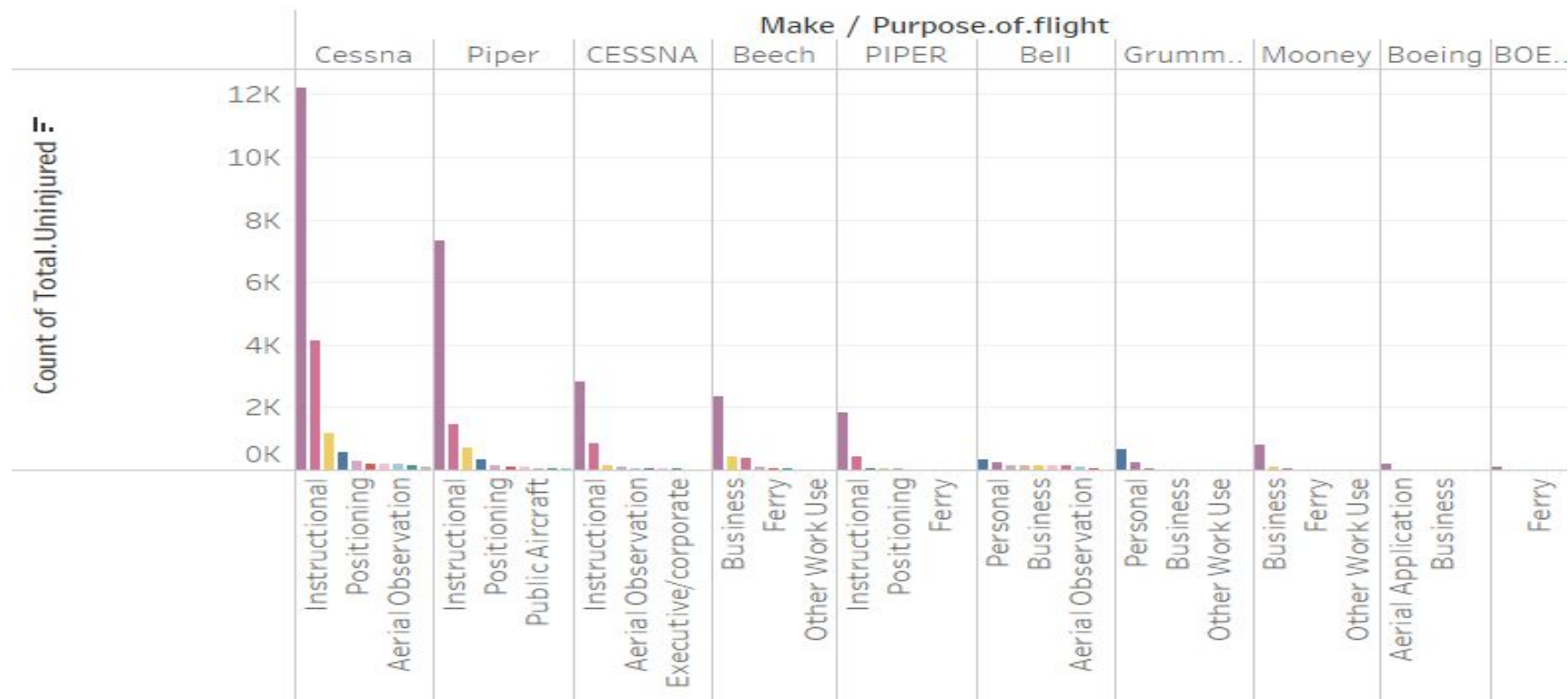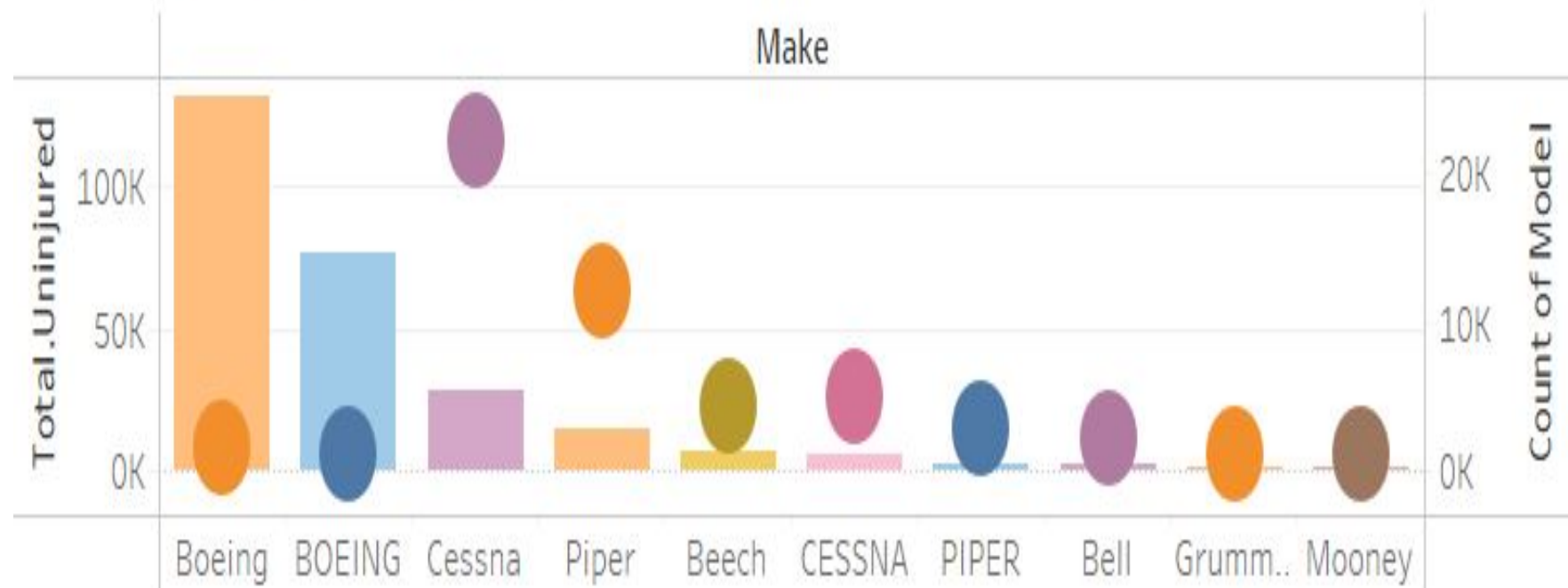
Weather Flight Accident Timeline

Make and Purpose of flight

Make Vs Total Uninjured

Event Occurrence Map

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Conclusion

- Data-driven insights support effective purchasing decisions.
- There was assumption that data may contain biases that need acknowledgement during analysis
- Important factors influencing decisions include aircraft damage, weather conditions and injuries.
- Focus on safety, compliance, and operational reliability.
- Future modeling can refine purchasing behavior.

Thank You!

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