Aviation Risk Analysis Presentation

Project Overview

Choosing Low-Risk Aircraft for Your Aviation Venture

Guiding Your Expansion with Data-Driven Insights

- Your company is starting a new aviation division to operate commercial and private airplanes.
- To ensure safety and success, we examined historical aviation accident data to find the safest aircraft to purchase.
- This presentation shares our findings and recommendations in straightforward language, helping you make informed decisions.

Why This Matters

Understanding Aircraft Safety Risks

- Entering the aviation industry is exciting but tough, especially without experience in aircraft safety.
- Choosing the wrong aircraft could lead to safety risks, financial losses, or damage to your reputation.

Our project addresses key questions:

1. Which aircraft have the fewest accidents and injuries?
2. What factors, like weather or flight phase, increase risks?
3. Which aircraft should we buy to reduce safety concerns?

By identifying low-risk aircraft, we help you build a safe and successful aviation division.

Our Data Source

The Data Behind Our Insights

- We used a dataset from the National Transportation Safety Board (NTSB), a reliable source for aviation safety data.
- The dataset includes 88,889 records of accidents and incidents from 1962 to 2023, covering:
- Event details (date, type of incident)
- Locations (city, country)
- Injury counts (fatal, serious, minor)
- Aircraft details (make, model, type)
- Flight conditions (weather, purpose)

We cleaned some incomplete data to ensure our results are reliable.

How We Analyzed the Data

Turning Data into Insights

- We used Python, a popular programming tool, and pandas, a library for managing data, to process the dataset.
- Cleaning: We fixed errors, filled in missing information (like using averages for numbers and common values for categories), and removed duplicates.

<u>Analysis: We examined:</u>

1. How often accidents happen for different aircraft types
2. How serious injuries are for each aircraft make
3. How accident rates have changed over time

Visualizations: We created charts with matplotlib, a plotting tool, to illustrate patterns clearly and developed an interactive dashboard in Tableau for you to explore the data.

Key findings:

1. Most accidents involve small, single-engine aircraft.
2. Certain makes have fewer serious injuries.
3. Modern aircraft are safer than older ones.

Recommendation 1 – Choose Fixed-Wing Airplanes

Prioritize Fixed-Wing Airplanes

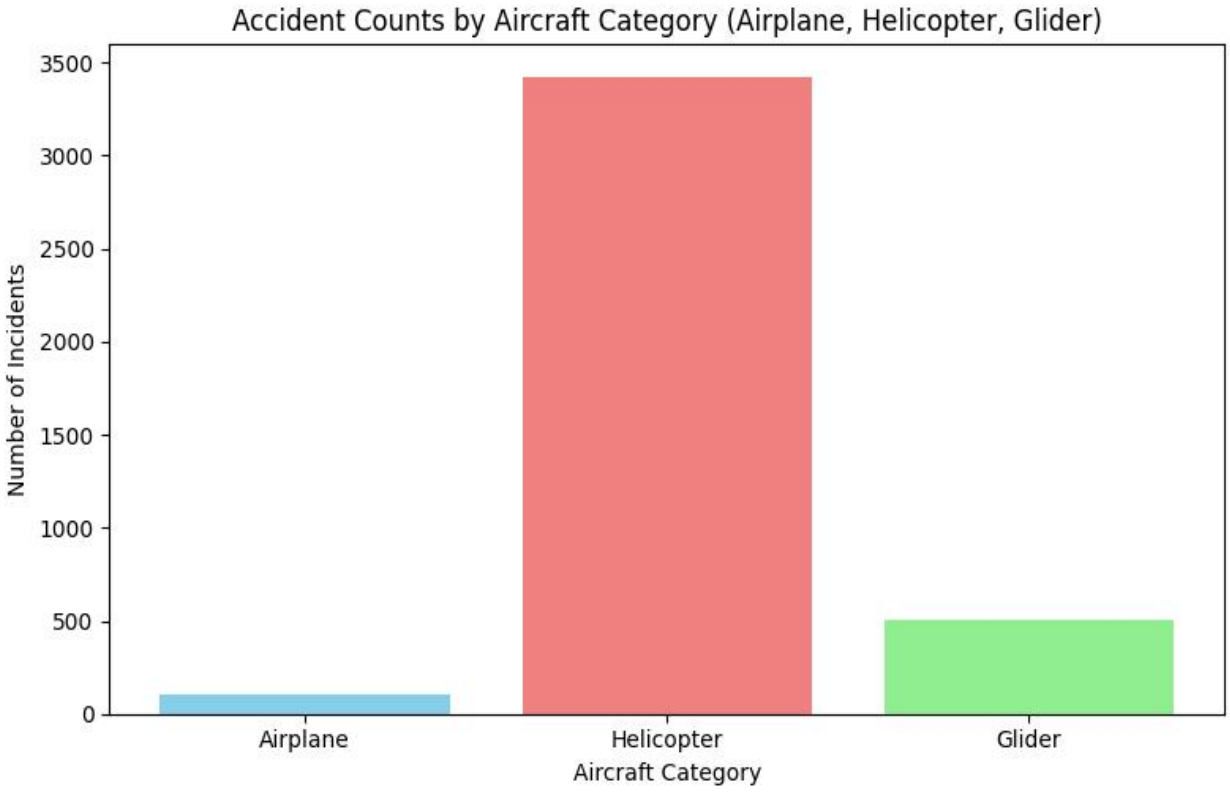
- Fixed-wing airplanes (like typical commercial jets) have the lowest accident rates compared to helicopters, gliders, or other types.
- This makes them a safer choice for your operations.

Visualization: Bar chart showing accident counts by aircraft category (Airplane, Helicopter, Glider), with the Airplane bar significantly lower.

X-axis: Aircraft categories

Y-axis: Number of accidents

Highlight: Airplane category with the smallest bar, indicating fewer incidents.



Recommendation 2 – Select Boeing or Airbus

Opt for Trusted Manufacturers

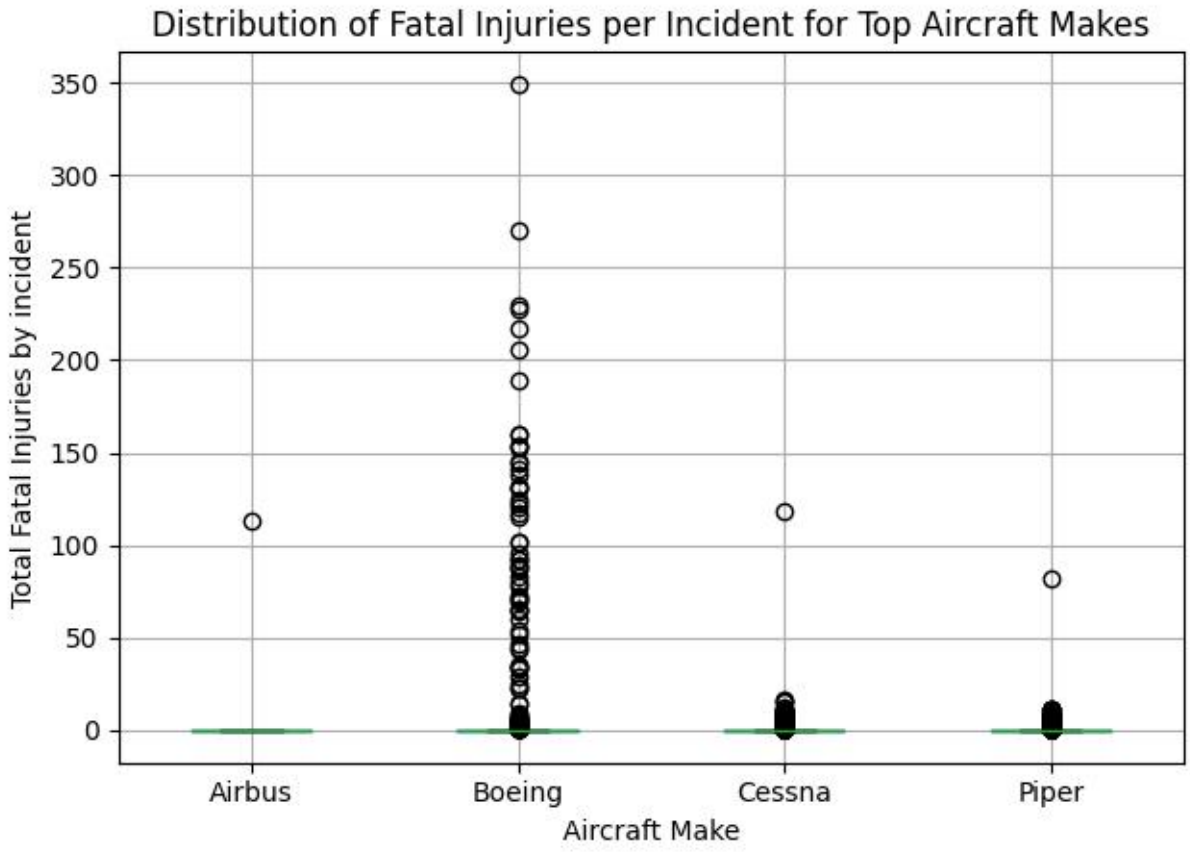
- Aircraft from Boeing and Airbus have consistently low fatal injury rates, suggesting they are safer for passengers and crew.
- These brands are ideal for building a reliable fleet.

Visualization: Box plot showing the distribution of fatal injuries per incident for top aircraft makes (Cessna, Piper, Boeing, Airbus).

X-axis: Aircraft makes

Y-axis: Fatal injuries per incident

Highlight: Boeing and Airbus with low median lines and narrow ranges, indicating fewer and less severe injuries.



Recommendation 3 – Focus on Modern Aircraft

Embrace Modern Technology

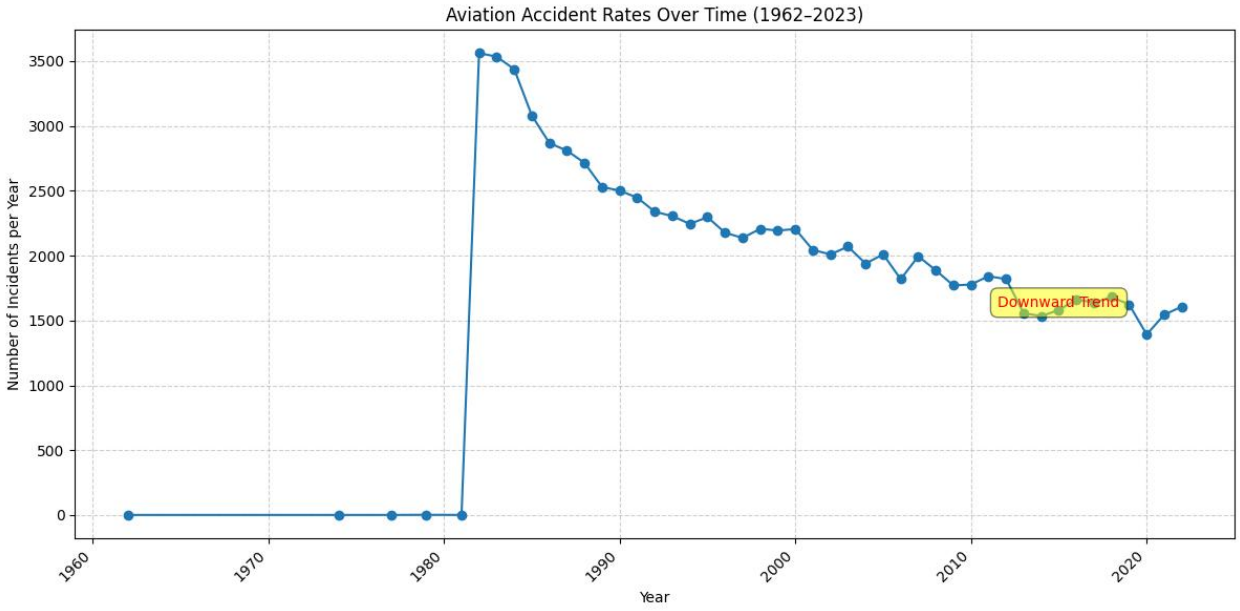
- Newer aircraft, built in recent decades, have lower accident rates due to improvements in safety technology and regulations.
- Investing in modern models will improve safety and efficiency.

Visualization: Line graph showing accident rates over time (1962–2023).

X-axis: Years

Y-axis: Accident rate (incidents per year)

Highlight: Downward trend in recent years, showing better safety.



Next Steps

Moving Forward

- Review our recommendations and choose aircraft for further evaluation.
- Conduct due diligence on selected aircraft, assessing costs, maintenance, and operational needs.
- Plan the acquisition process, using our safety insights to guide decisions.
- Explore our Tableau dashboard to dive deeper into the data and refine your strategy.

Thank You

Questions?

Thank you for your time and attention.

We're excited to support your aviation venture and welcome any questions.

Contact me via email:

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