Aviation Accident Risk Analysis

Purpose of this project:

This presentation analyzes historical aviation accident data to understand:

- How risky aviation accidents are
- Whether aviation safety has improved over time
- Which manufacturers are associated with higher accident severity

Audience:

Business stakeholders involved in aviation operations, safety planning, and risk management.

Business Understanding

Business Problem:

Organizations involved in aviation need to:

- Reduce safety risks
- Understand accident severity patterns
- Make informed decisions when selecting or operating aircraft

Key Business Questions:

- How often are aviation accidents fatal?
- Are accidents becoming more or less frequent over time?
- Are some manufacturers linked to more severe accidents?

Data Understanding

Data Source:

•Historical aviation accident records

What the data includes:

•Accident date

•Aircraft manufacturer

•Accident severity

•Fatal vs non-fatal outcomes

•Environmental and operational conditions

Important note (non-technical):

Each row in the dataset represents **one aviation accident**.

Data Analysis Approach (Simple Explanation)

How the analysis was done:

•Accident data was cleaned to remove missing or inconsistent values

•Summary metrics were calculated to understand overall risk

•Visual charts were created to identify patterns and trends

Why visualization matters:

Charts allow decision-makers to:

•Quickly identify risks

•Compare manufacturers

•Understand trends over time

Key Insight 1 – Overall Risk (KPI Summary)

📌 **Visualization: KPI Summary**

Key Findings:

- About **18.7% of recorded accidents were fatal**
- Average accident severity is **moderate**
- Most accidents are non-fatal, but a significant risk remains

Business Meaning:

Aviation accidents are not always fatal, but when they occur, safety risk is still substantial and requires attention.

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📌 **Visualization: KPI Summary**

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Key Insight 2 – Accident Severity by Manufacturer

- Some manufacturers are linked to higher average accident severity
- This does NOT mean blame, but highlights risk patterns
- Useful for monitoring and safety planning

Business Recommendations

✅ **Recommendation 1**

Continue investing in aviation safety programs

The declining accident trend shows safety investments are working.

✅ **Recommendation 2**

Apply targeted risk assessment by manufacturer

Manufacturers associated with high-severity accidents should be monitored more closely.

✅ **Recommendation 3**

Use historical data to guide operational decisions

Past accident patterns provide valuable insight for aircraft selection and safety planning.

Next Steps

To build on this analysis, future work could include:

- Analyzing accident severity by aircraft model
- Studying environmental factors such as weather conditions
- Comparing commercial vs private aviation risk
- Predictive analysis for future accident risk

Thank you for your time.

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