



Aviation Expansion Project – Mawingu Airlines

DATA-DRIVEN AIRCRAFT ACQUISITION STRATEGY

Overview

- ▶ Mawingu Airlines is considering expanding into aircraft acquisition as one of its business ventures.
- ▶ Our goal: Use historical aviation safety data to make low-risk, high-reward investment decisions.
- ▶ This project uses data science to identify the safest aircraft models and most critical risk factors.

Business Understanding

- ▶ **Challenge:** Aircraft are expensive, and accidents are costly to both life and reputation.
- ▶ **Objective:** Identify low-risk aircraft for purchase.
- ▶ **Key Business Questions:**
 - Which aircraft models are most accident-prone?
 - What are the safest options?
 - When during the flight are incidents most likely to occur?

Data Understanding

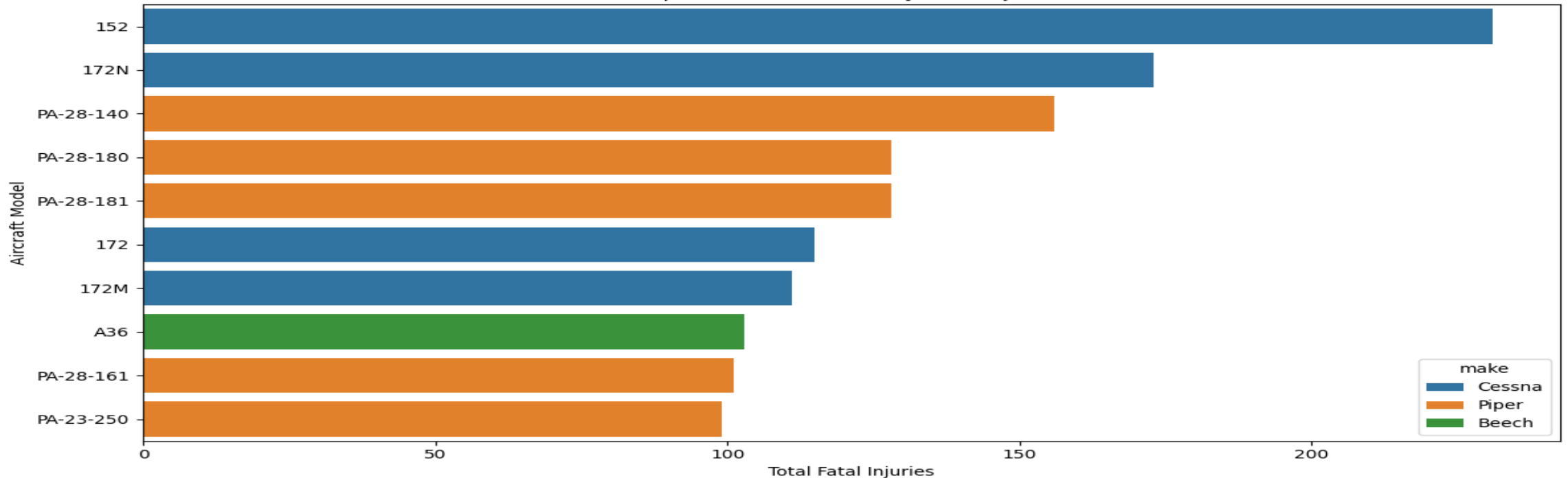
- ▶ **Source:** National Transportation Safety Board (NTSB)
- ▶ **Timeframe:** 1962–2023
- ▶ **Key Features:**
 - Aircraft make and model
 - Fatalities and total accidents
 - Flight phase during incident
 - Weather, flight purpose, and more

Data Analysis – Top 10 Aircraft by Fatal Injuries

Insight:

Aircraft like the **Cessna 152** and **Piper series** show consistently high fatality counts. These are high-risk investments for the company.

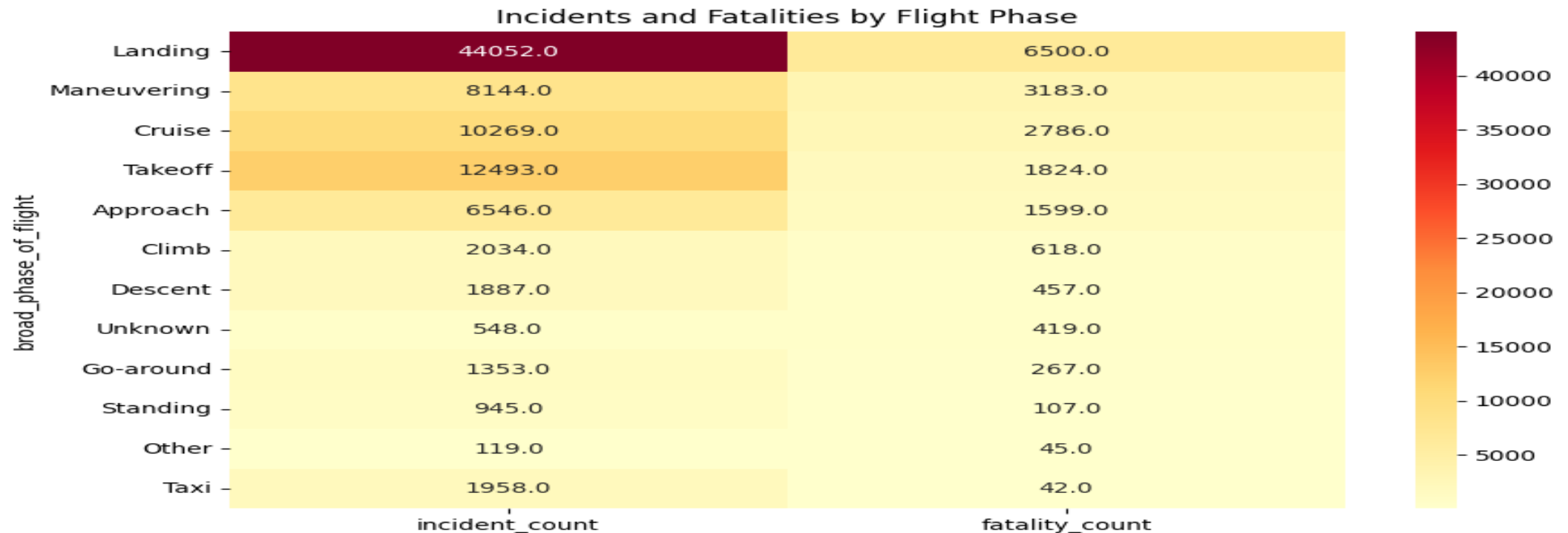
Top 10 Aircraft Models by Fatal Injuries



Data Analysis – Flight Phase Risk Heatmap

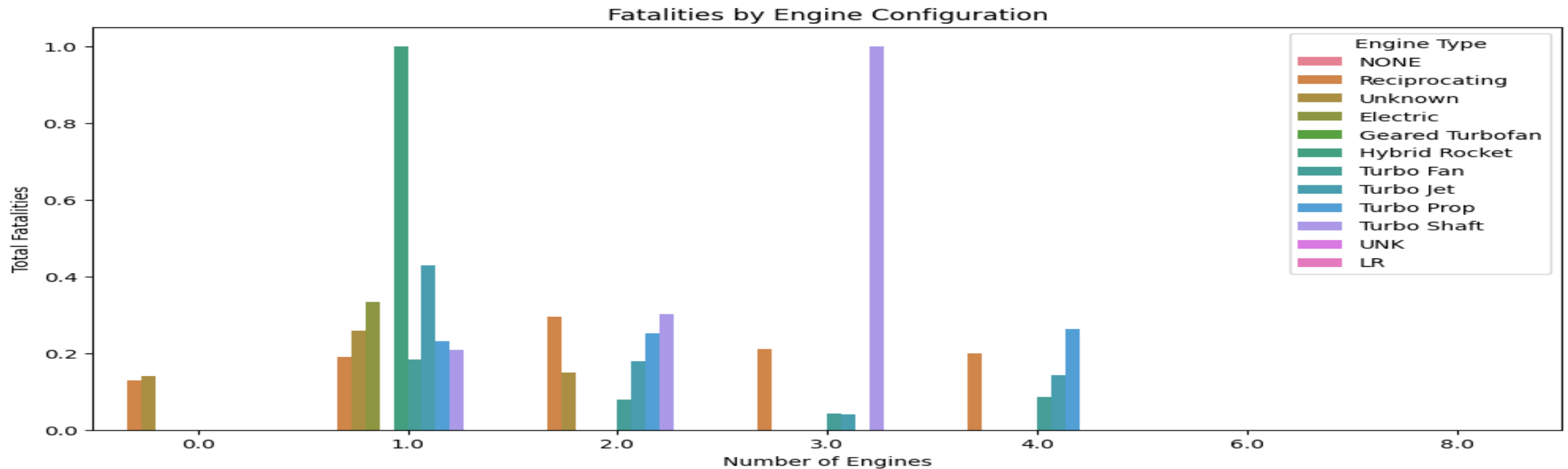
Insight:

Most incidents occur during **landing**, followed by maneuvering and cruise. Investments in pilot training and safety during these phases are critical.



Data Analysis – Aircraft Technical factors

Insight: Planes with 1 jet engine of a Hybrid Rocket type and planes with 3 jet engines of a Turbo Shaft type have been involved in the most incidents.



Recommendations

- ▶ Invest in aircraft with low fatality and incident rates.
- ▶ Avoid models from manufacturers with poor safety history (e.g., Cessna, Piper).
- ▶ Focus on operational risk mitigation — especially during takeoff and landing
- ▶ Avoid Hybrid Rocket type and Turbo Shaft type engines

Next Steps

- ▶ Present insights to leadership for investment decision-making.
- ▶ Conduct cost-benefit analysis of recommended aircraft.
- ▶ Partner with flight safety and maintenance teams for pre-acquisition audits.



Thank You / Q&A

Thank you for your attention.
Please feel free to ask any questions.

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