Identifying Low-Risk Aircrafts for Commercial and Private Enterprise Operations

Overview

We are expanding our reach to the aviation industry, specializing on buying & operating air-crafts for commercial and private companies. The main aim is to identify the lowest risk aircraft to reduce the prospective operational hazards and procedural risks.

This presentation will cover the company's goals, data content, methods utilized including visualizations, results derived and the recommended steps that will be beneficial for the company.

Business Understanding

Importance to Stakeholders:

Safety Assurance - To sustain the reputation and operational success of our company, it is essential to put passengers and crew safety first, thus prioritizing the acquisition of low-risk aircraft.

Cost Efficient: Fewer incidents lead to fewer accidents, decreasing costs associated with vehicle repairs, legal liabilities and insurance premiums.

Operational Reliability: By choosing aircraft models of a high reliability, the machine downtime is reduced whilst the airplane service image is improved, what results in superior customer satisfaction and loyalty.

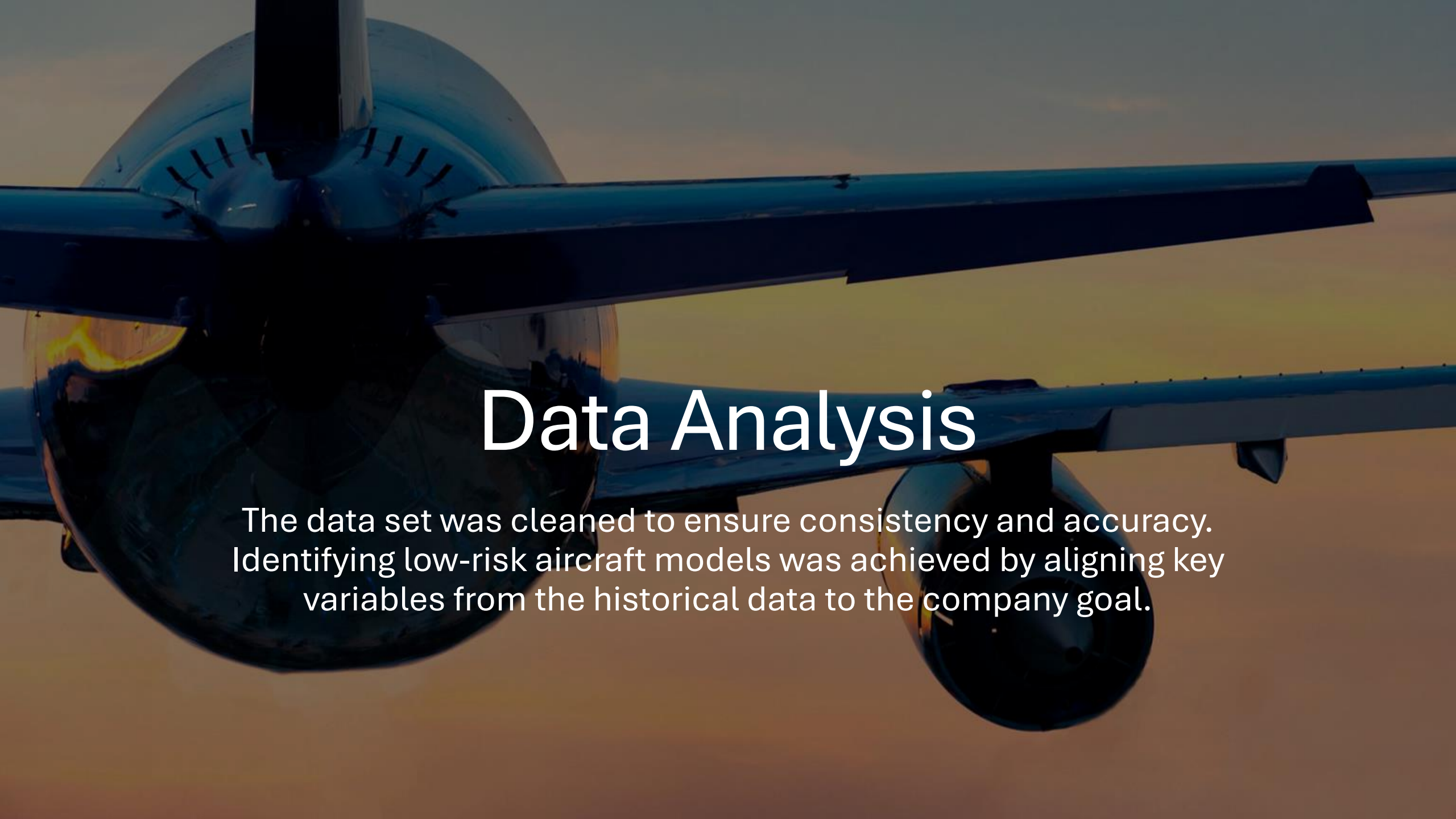
Informed Strategic Investments: By using proper risk analysis to make well-informed decisions, resources could be strategically directed to the acquisition of aircraft whose safety and performance metrics are second to none.

Data Understanding

This Data set was obtained from the **National Transportation Safety Board (NTSB)** which is a body that provides records of aviation incidents, including aircraft information, incident details, and the outcomes

Key Variables:

- *Incident Year:* The year in which the incident happened.
- *Specific Model:* The make and model of the aircraft involved.
- *Broad Phase of Flight* - the phase of flight within which the incident occurred (i.e., takeoff; cruise; landing).
- *Injury Severity:* Injuries sustained by a person (eg, uninjured, minor, serious, fatal).
- *Counts of Injuries:* This is the total count of injuries listed for each incident.



Data Analysis

The data set was cleaned to ensure consistency and accuracy. Identifying low-risk aircraft models was achieved by aligning key variables from the historical data to the company goal.

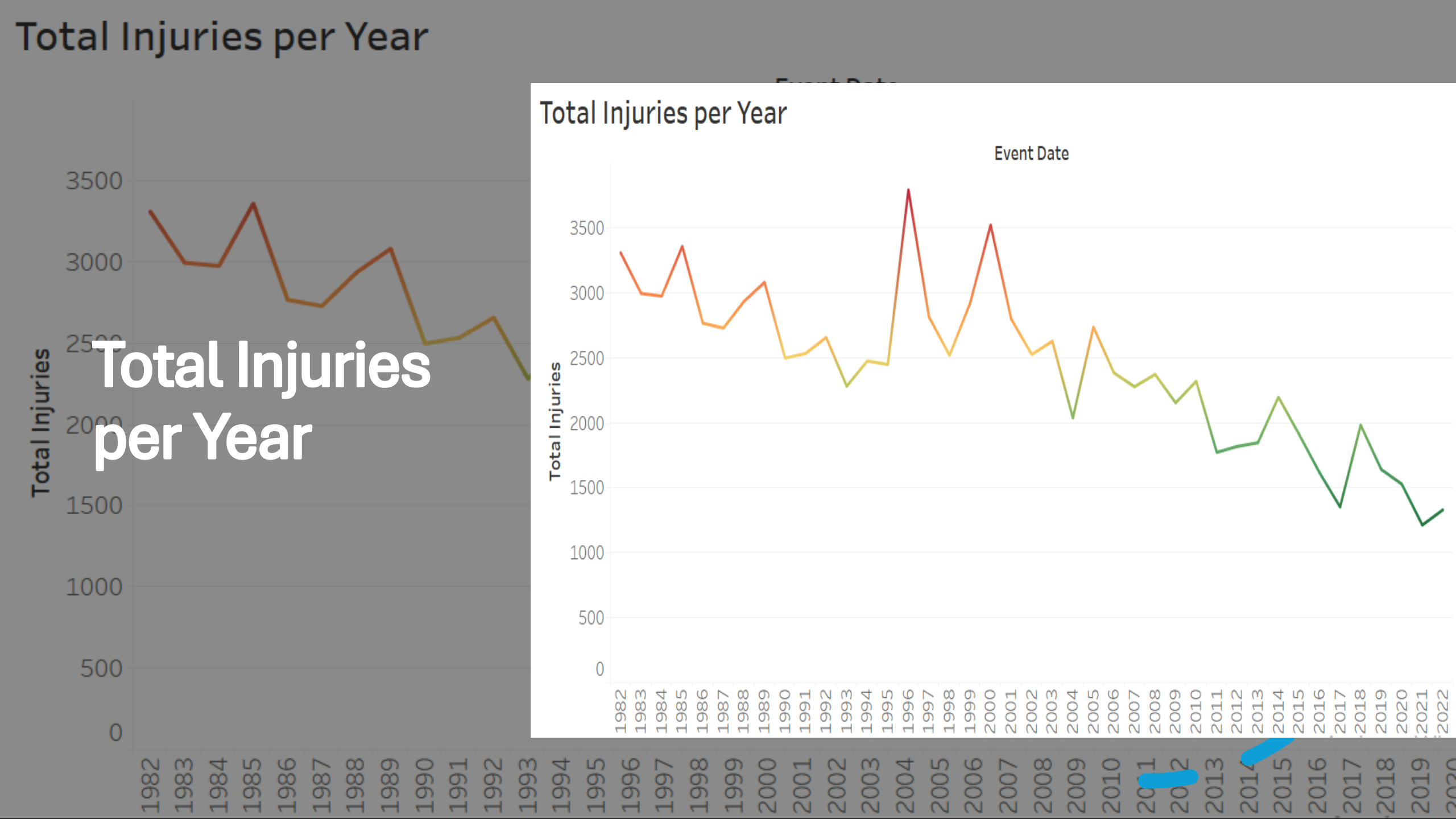
Total Injuries per Year

Data from multiple years was collected and summed up the total the number of injuries for each year.

A line graph was utilized to show the trends of total injuries over the years.

Key findings:

- The visualization shows fluctuations in total injuries over the years, highlighting years with significant spikes.
- The fluctuations were potentially caused by periods of increased risk, potentially correlating with industry changes, regulatory updates, or other external factors.


Total Injuries per Year
Total Injuries per Year
Event Date
Total Injuries
3500
3000
2500
2000
1500
1000
500
0
1982
1983
1984
1985
1986
1987
1988
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Total Injuries per Year

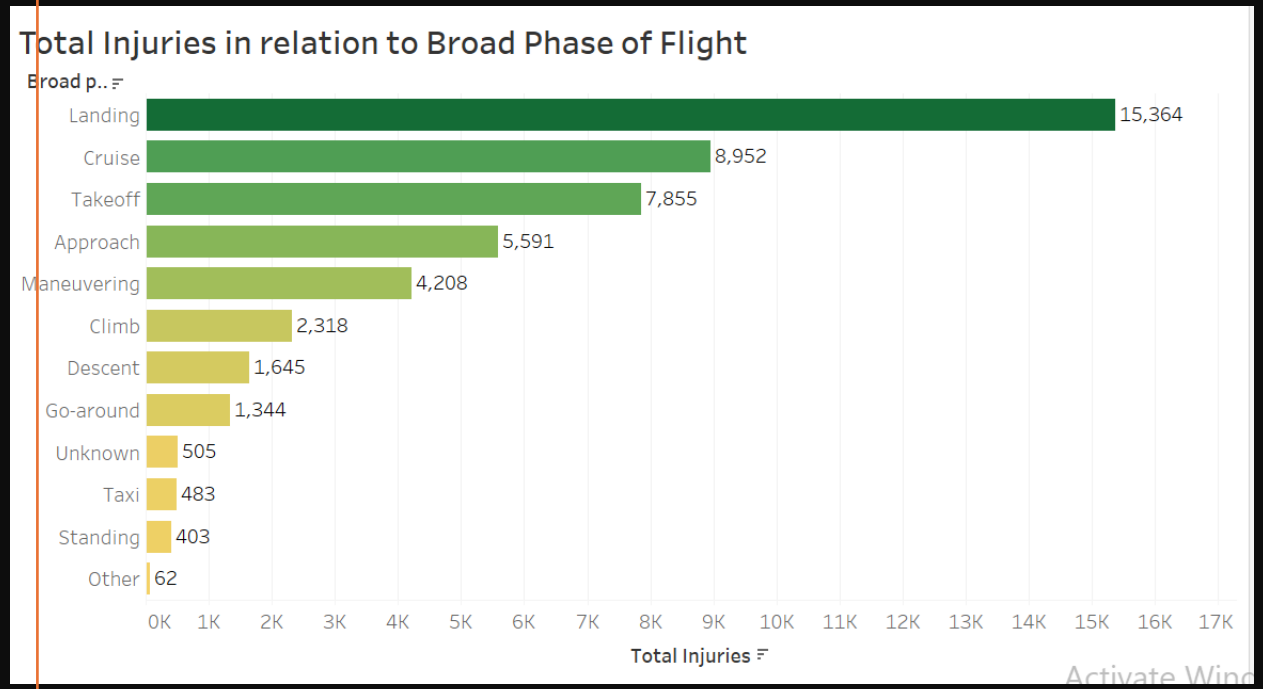
Total Injuries by Broad Phase of Flight

Grouped incident data by the broad phase of flight (e.g., takeoff, cruise, landing).i

This was portrayed by a bar chart representing the number of injuries in each flight phase.

Key findings:

The phase with the highest number of injuries that was identified was the landing phase which leaves a distinctive large gap from the cruising phase which has the second highest number of injuries.



Injuries by Broad Phase of Flight

Airplane Make with Highest Number of Uninjured and Total Injuries

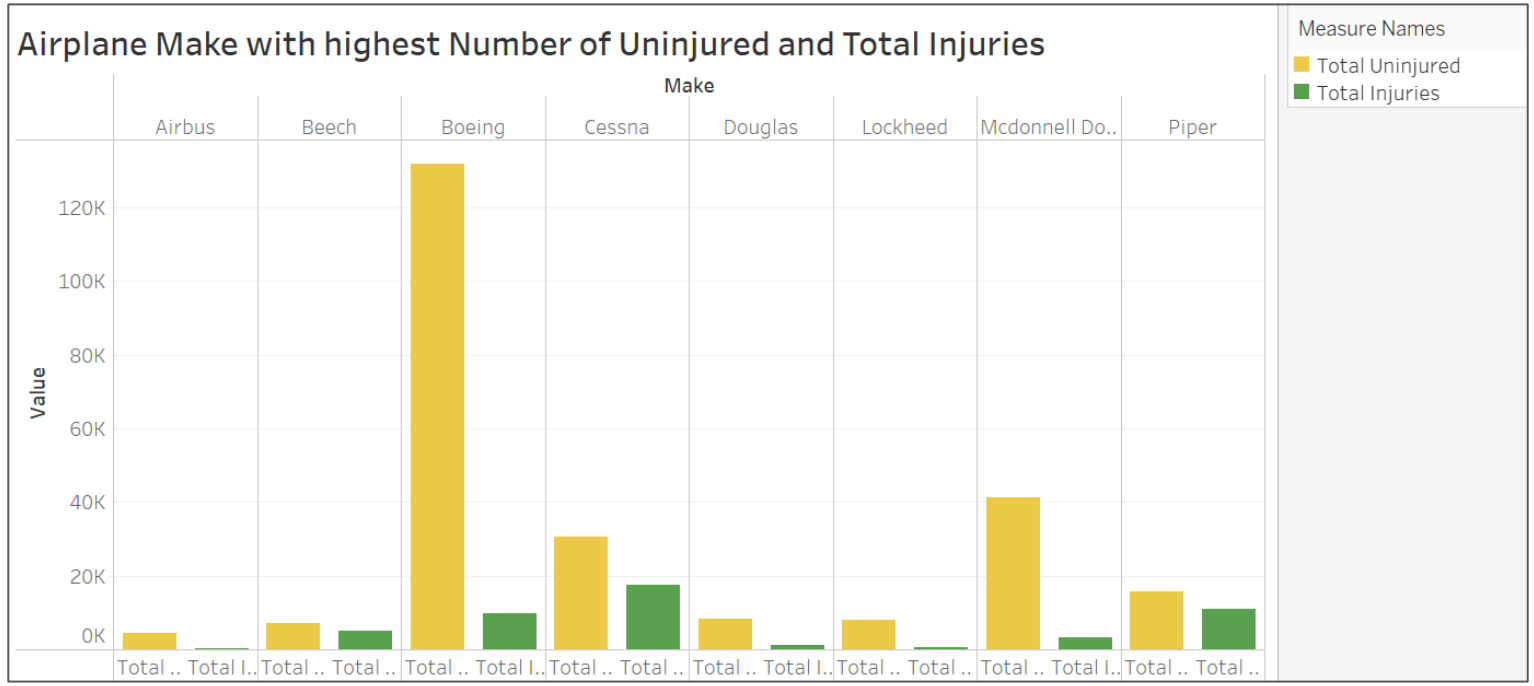
This data was used to identify the airplane makes with the highest number of uninjured individuals.

A dual-axis bar chart showing the number of uninjured and total injuries for top airplane makes was created to portray this information.

Key Findings:

- It is important to ascertain which airplane models to consider for purchase which means we choose the airplane make with the highest number of uninjured and low total injuries from the incident.

Airplane Make with Highest Number of Uninjured and Total Injuries



Recommendations

I would recommend the company to do the following:

1) Prioritize Safety:
Choose aircraft models that have consistently shown low injury rates across various phases of flight, as indicated by historical incident data. This decision ensures that the aircraft we purchase will have a proven track record of safety, reducing operational risks and ensuring the safety of passengers and crew.

Recommendations

2) Enhance Training:
Develop tailored training programs that would target specific flight phases where injuries have been more prevalent. Analyzing where injuries occur most frequently during flights, helps us identify and implement additional training and safety protocols. This approach will enhance our overall flight safety standards and readiness.

3) Continuous Monitoring:
Establish a system to continually monitor safety metrics and adapt to changes in industry standards, informed by insights from our analysis of annual injury trends. This is a proactive strategy would allow us to regularly evaluate and enhance our safety measures, thus keeping them aligned with the latest aviation safety practices and regulations.

Next Steps:

According to the data analysis conducted, the company should create an implementation plan to enable it to expand to this industry:

•**Step 1**

Procurement: Initiate procurement process based on the top three makes that have the highest number of total uninjured, namely: Boeing, McDonnell Douglas, Cessna.

- Since the company is looking to diversify their portfolio, it is important to purchase at least three makes so that we can monitor and analyze which model would be the best fit the company.

- ***NB: Boeing and McDonnell Douglas specialize in commercial airplanes while Cessna specializes in private airplanes.***

Continuation

- **Step 2**

Training Enhancement: Develop and implement targeted training modules focusing on identified high-risk flight phases. This includes using simulations during training of pilots, specifically in the landing phase as it is the stage most prone to accidents.

Having a highly skilled crew can also boost the company reputation

Continuation

- **Step 3**

Monitoring System: A continuous monitoring system ensures regulatory compliance by keeping pace with safety metrics and tracking them in real-time to immediately identify and rectify any violations of aviation safety regulations. Investing in market research enables collection and data analysis on safety incidents and market trends effectively.

To ensure safety of operations, monitoring safety metrics on an ongoing basis will allow our companies to improve safety protocols, maximize operational efficiency all while maintaining consistently high standards across the board.

THE END

ANY QUESTIONS?

Presentation by: Elsie Serem

LinkedIn: www.linkedin.com/in/elsie-serem-237b26287