TWITTER SENTIMENT AIRLINE ANALYSIS DASHBOARD

SKILLUP IMO POWER BI DATA ANALYTICS PROJECT

TWITTER SENTIMENT AIRLINE ANALYSIS REPORT PRESENTED BY

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Introduction

The airline industry is an ever-evolving landscape where passenger experiences and sentiments play a pivotal role in shaping the success and reputation of airlines. In this era of heightened customer expectations and increased competition, understanding the intricate nuances of passenger sentiment and engagement is imperative for airlines striving to not only survive but thrive.

This comprehensive analysis delves into an array of critical variables within the airline industry. We explore passenger sentiment reasons, sentiment percentages, and the total user base for prominent airline companies, seeking to unearth meaningful insights that can drive strategic decisions and actions. By examining these facets in detail, we aim to provide airlines with a comprehensive understanding of their customers' perspectives and preferences, ultimately empowering them to optimise their services, foster customer loyalty, and stay at the forefront of an intensely competitive market.

As we embark on this analysis, we will uncover patterns, trends, and correlations within the data, offering a holistic view of the challenges and opportunities that lie ahead. Through rigorous examination and interpretation, we will present actionable recommendations that can guide airlines in enhancing the passenger experience, addressing pain points, and positioning themselves as industry leaders in an environment where customer satisfaction reigns supreme.

Data source.

The dataset used for this analysis was sourced from kaggle and the link to the dataset was provided by my facilitator at Skillup Imo project. The dataset has 14 columns and 14,604 rows (Pre-cleaning). The dataset has columns that contain tweet id, airline sentiment, airline sentiment confidence, negative reason confidence, airline, airline sentiment gold, name, negative reason gold, retweet count, text, tweet created, tweet location, user timezone and negative reason.

Data cleaning and transformation.

To ensure accuracy in the analysis, there was thorough cleaning and data transformation. As the saying goes, "The better the quality of the dataset, the better chance you have to drive company or institution growth". The data quality dimensions focused on the :

- Accuracy
- Completeness
- Consistency
- Currencies
- Relevancy
- Validity
- Uniqueness

The following data cleaning and transformations were done

- Changed wrong data types

- Replaced wrongly spelt values

- Removed errors

- Removed columns that are not related to the objective of the analysis. This is to reduce the size of the data and help focus on the columns needed for the analysis.

- Renamed column headers for more accuracy.

After the data cleaning and transformation process, we had 9 columns and 14,604 rows.

Problem Statements

The following problem statements would guide the analysis:

1. Developing a model to classify 'airline Sentiment' into negative, neutral, or positive categories based on customer feedback.

2. Analysing airline passenger sentiment data to identify the most common 'airline Sentiment reasons' behind negative customer experiences.

3. Exploring the relationship between sentiment reasons expressed by customers and the overall reputation of airline companies to identify key factors influencing passenger experiences, and developing actionable strategies to enhance customer satisfaction and loyalty within the airline industry.

4. Examining the relationship between sentiment expressed by customers encompassing either negative, positive or neutral and the operational performance of airline companies, aiming to identify patterns and factors that influence passenger sentiment and exploring strategies to improve overall customer satisfaction within the aviation industry.

5. Which airline is the most used airline company by customers?

Analysis and visualisation.

The content will be giving a description of the analysis and the corresponding models that conveys information related to each problem statement.

1. **Developing a model to classify 'Percentage of airline Sentiment' into negative, neutral, or positive categories based on customer feedback.**
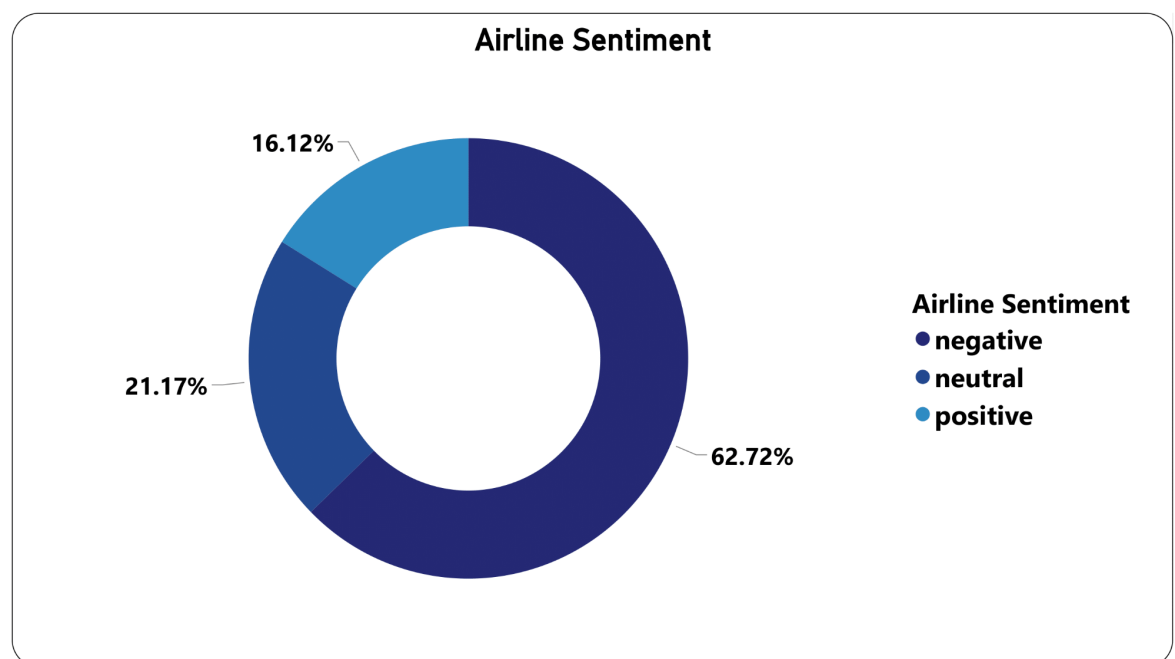
FIG 1: Doughnut Pie Chart showing Percentage Airline Sentiment.

The analysis of airline sentiment percentages reveals a notable distribution of passenger sentiments. The following insights are extracted from the chart:

- Negative Sentiment: Negative sentiments dominate, representing a significant majority at 62.72%. This indicates that a substantial portion of passengers has expressed dissatisfaction or encountered issues during their airline experiences. Airlines should prioritise addressing the specific reasons behind these negative sentiments to improve overall customer satisfaction.

- Positive Sentiment: Positive sentiments account for 16.12% of the total. While this percentage is lower than negative sentiments, it still signifies that there is a noteworthy number of satisfied passengers. Recognizing and reinforcing the factors contributing to positive sentiments can help airlines maintain and build customer loyalty.

- Neutral Sentiment: Neutral sentiments, comprising 21.17% of the total, represent a substantial segment. Passengers in this category may not have strong positive or negative feelings about their experiences. Engaging with passengers expressing neutral sentiments is essential to gather feedback and identify opportunities for improvement.

To enhance their reputation and competitiveness in the airline industry, airlines should focus on addressing the specific issues leading to negative sentiments, nurturing the factors that generate positive sentiments, and engaging with passengers in the neutral category to better understand their expectations and areas where improvements can be made.

2. **Analysing airline passenger sentiment data to identify the most common 'airline Sentiment reasons' behind negative customer experiences.**
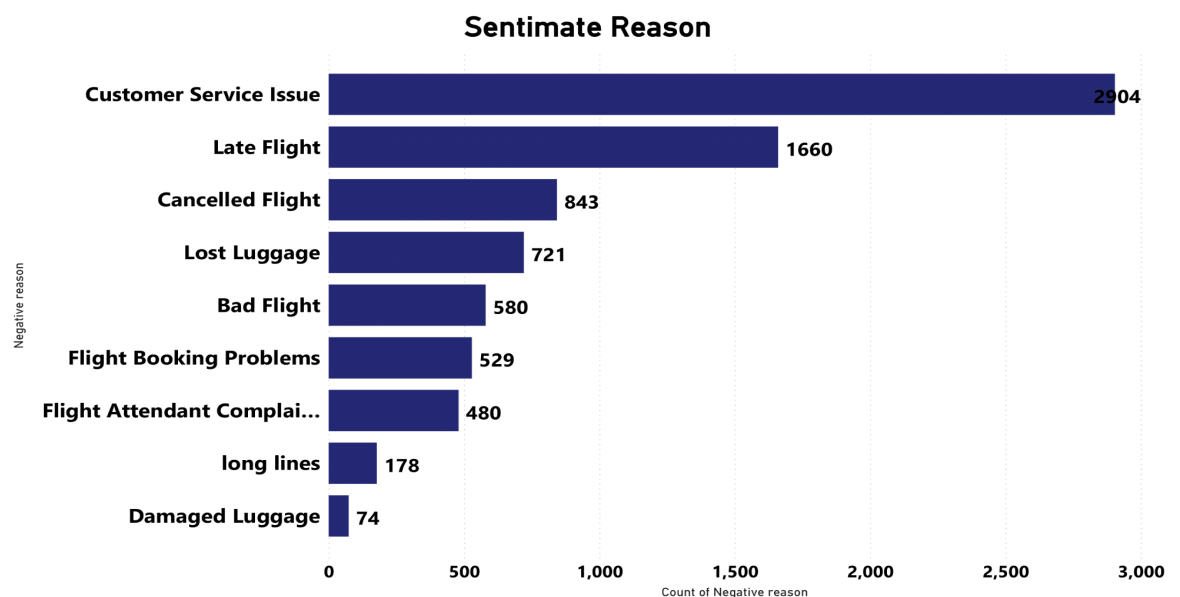
Sentimate Reason

FIG 2: Bar chart showing Airline passengers' sentiment reason

The data model above describes the airline passengers' sentiment behind negative experiences. The model reveals that "Customer service issues" are the most frequently cited reason, with 2904 mentions, indicating that the quality of customer service provided by airlines significantly impacts passenger

experiences. "Late flights" and "Cancelled flights" follow closely behind, with 1660 and 843 mentions, respectively, highlighting the importance of punctuality and reliability in maintaining positive passenger sentiments. "Lost luggage" and "Bad flights" also rank high on the list, emphasising the need for airlines to address baggage handling and flight quality issues. Additionally, "Flight booking problems," "Flight attendance," "Long lines," and "Damaged luggage" are cited as contributing factors to passenger dissatisfaction, indicating areas where airlines can focus on improvement to enhance overall customer satisfaction.

3. Exploring the relationship between sentiment reasons expressed by customers and the overall reputation of airline companies to identify key factors influencing passenger experiences, and developing actionable strategies to enhance customer satisfaction and loyalty within the airline industry.
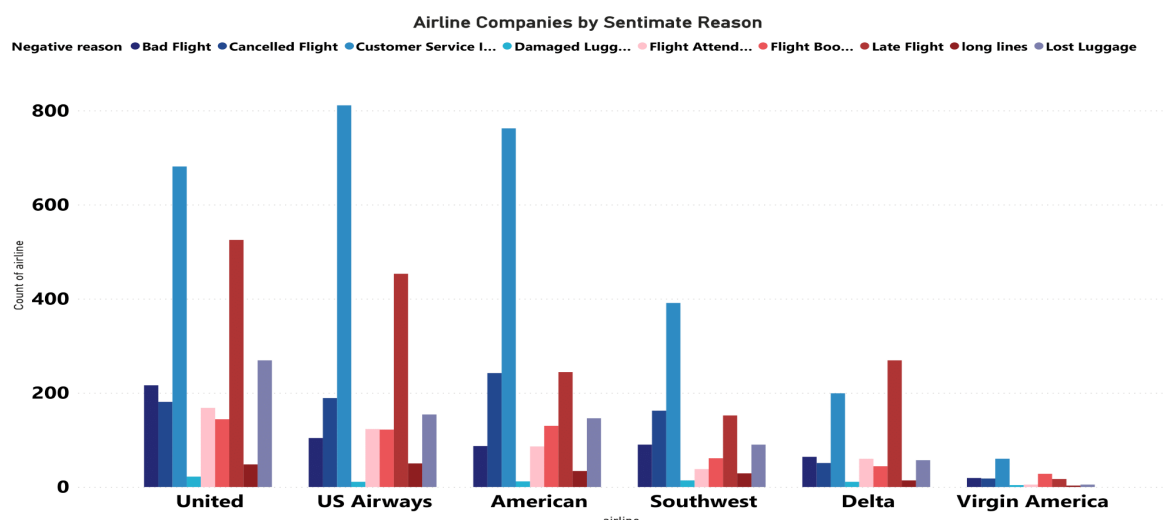

Airline Companies by Sentimate Reason

FIG 3: Clustered column chart showing Airline Companies by Sentiment reason.

This clustered column chart in FIG 3, shows the airline companies by the customer sentiment reason. This model reveals that of all the airline companies excluding delta airline, represented in this chart, customer service issue was the most repeated issue. While the delta airline has late flight as the most mentioned negative reason. However, for United, US Airways, American and southwest airlines the second most cited issue was late flights while the second most stated issue for delta airline was customer service issue and that of Virgin America airlines was flight booking problems. The chart also revealed other reasons stated by the customers for each of the airline companies. Hence, it is important that these issues be addressed promptly to promote customer satisfaction and consequently result in the success of each airline.

4. Examining the relationship between sentiment expressed by customers encompassing either negative, positive or neutral and the operational performance of airline companies, aiming to identify patterns and factors that influence passenger sentiment and exploring strategies to improve overall customer satisfaction within the aviation industry.
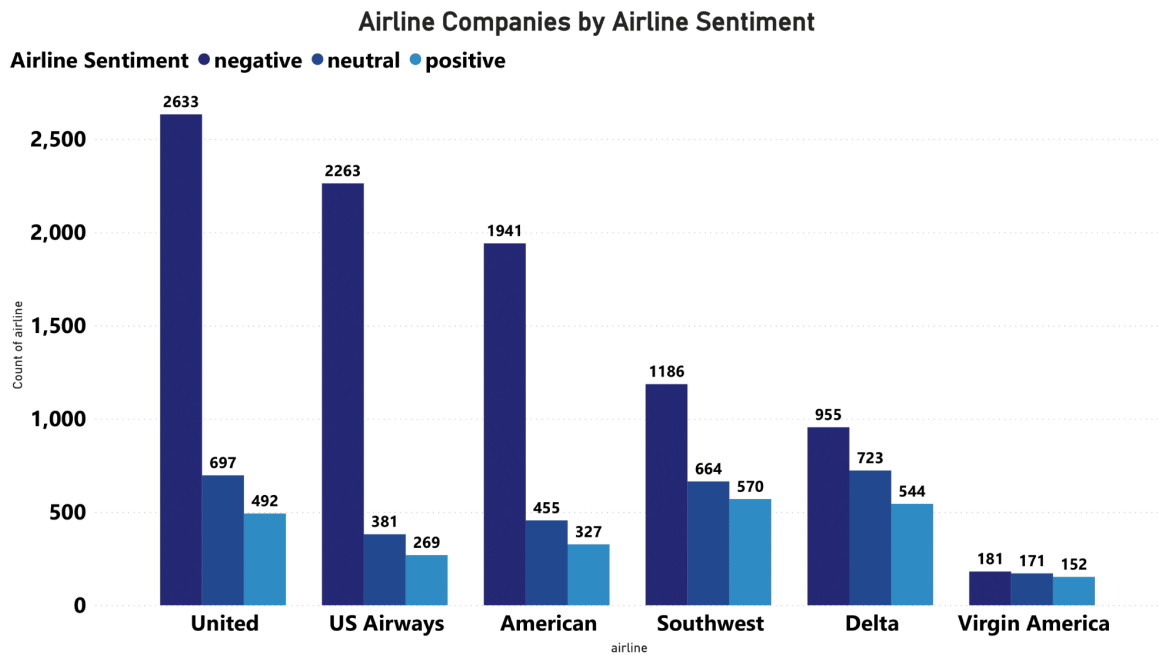
Airline Companies by Airline Sentiment

Airline Sentiment ● negative ● neutral ● positive

FIG 4: Column stacked chart showing airline companies by customers' airline sentiment

Across major airline companies such as United, US Airways, American, Southwest, Delta, and Virgin America, a consistent sentiment pattern emerges. Negative sentiments are the most prevalent among customers, followed by neutral sentiments, while positive sentiments are the least common. This suggests that addressing customer dissatisfaction and improving overall experiences should be a primary focus for these airlines to enhance customer loyalty and competitiveness.

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5. Which airline is the most used airline company by customers?
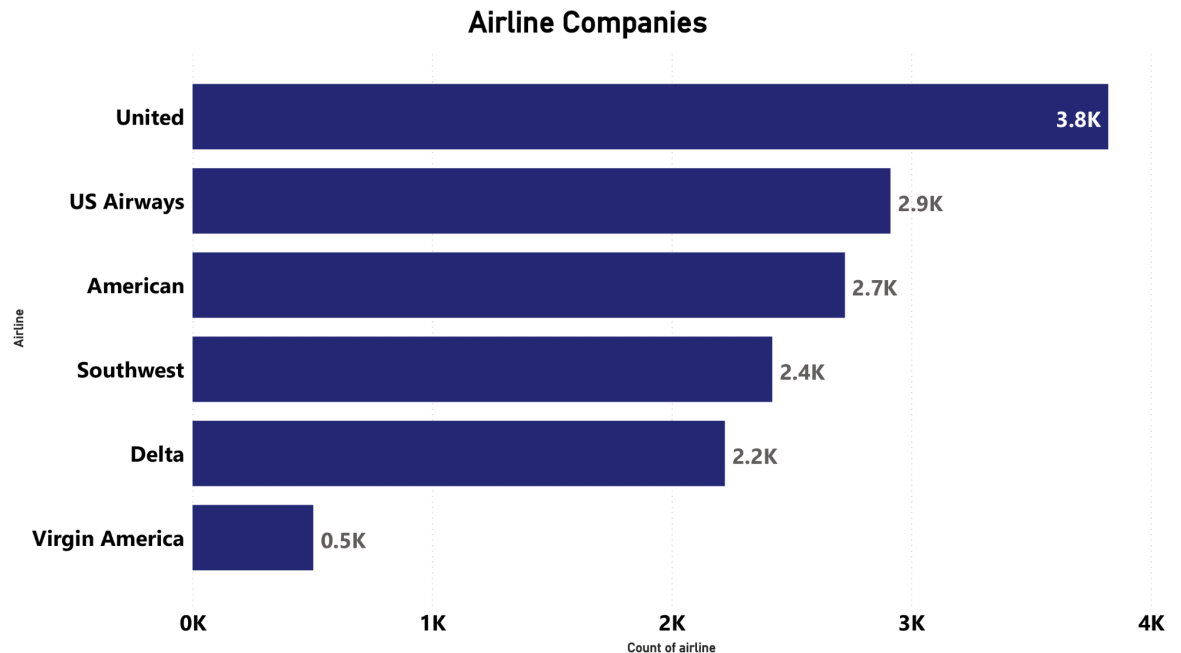

Airline Companies

FIG 5: Bar Chart showing the different airline companies used by customers

The bar chart above indicates that among the analysed airline companies, the distribution of total users reveals varying levels of customer engagement:

- United: Boasts the highest total users at 3,822, indicating a substantial customer base. This presents opportunities for United to leverage its large customer pool for brand loyalty initiatives and marketing efforts.

- US Airways: With 2,913 total users, US Airways also has a significant customer base. Engaging with these customers effectively is crucial for retaining and attracting new passengers.

- American: American Airlines has 2,723 total users, indicating a strong presence. Strategies to cater to the needs and preferences of this customer base can help enhance the airline's competitiveness.

- Southwest: Southwest Airlines has 2,420 total users, demonstrating a solid customer following. Tailoring services and offerings to meet the expectations of these passengers can lead to improved customer satisfaction.

- Delta: Delta Airlines has 2,222 total users, showing a substantial customer reach. Focusing on customer experience and loyalty-building initiatives can further strengthen Delta's position in the market.

- Virgin America: Although Virgin America has a smaller customer base with 504 total users, this presents an opportunity for targeted engagement and service enhancements to attract and retain customers.

In summary, understanding and engaging with their respective customer bases is essential for each airline company to maintain and grow their market presence. Strategies should be tailored to the specific needs and preferences of their customer demographics.

Recommendation.

After a careful analysis process, the following recommendations would help address customers' sentiments and boost customer satisfaction which in turn increase airlines performance and profitability.

1. Based on the analysis of passenger sentiment reasons, here are some key recommendations for airlines:

   - Prioritise Customer Service: With "Customer Service Issues" being the most frequently cited reason, airlines should invest in improving their customer service training and responsiveness to address passenger concerns promptly and effectively.

   - Enhance Punctuality and Reliability: "Late Flight" and "Cancelled Flight" reasons indicate the need for airlines to focus on better scheduling, timely departures, and proactive communication in case of disruptions.

   - Improve Baggage Handling: "Lost Luggage" and "Damaged Luggage" issues can be mitigated through better baggage handling processes and increased care. Airlines should invest in technology and training to minimise these incidents.

   - Enhance Flight Quality: "Bad Flight" suggests passengers may have issues with the in-flight experience. Airlines

should pay attention to factors like comfort, cleanliness, and onboard services to improve passenger satisfaction.

- Streamline Booking Processes: "Flight Booking Problems" point to difficulties in booking. Airlines should make their booking systems user-friendly and ensure a seamless experience for passengers.

- Invest in Cabin Crew Training: "Flight Attendance" mentions indicate a need for well-trained and courteous cabin crews. Continuous training and service excellence should be a priority.

- Optimise Airport Operations: "Long Lines" can be addressed by streamlining airport processes and reducing passenger wait times. Airlines should collaborate with airports to improve efficiency.

- Preventive Measures for Damaged Luggage: "Damaged Luggage" incidents can be minimised through better handling practices and safeguards during baggage handling.

By addressing these recommendations, airlines can enhance the overall passenger experience, increase customer satisfaction, and strengthen their reputation in the competitive aviation industry.

2. Based on the analysis of airline sentiment percentages, the following recommendations can be made:

- Address Negative Sentiment: Given that negative sentiment is the most prevalent at 62.72%, airlines should prioritise identifying and addressing the root causes of dissatisfaction among passengers. Implementing improvements in areas that lead to negative sentiments, such as customer service, on-time performance, and baggage handling, can significantly enhance overall customer satisfaction.

- Enhance Positive Sentiment: Although positive sentiment accounts for a smaller percentage at 16.12%, airlines should focus on strengthening the factors that contribute to positive passenger experiences. This includes providing exceptional service, comfort, and amenities to create memorable and enjoyable flights.

- Engage with Neutral Passengers: With 21.17% expressing neutral sentiments, airlines should actively engage with passengers in this category to gather feedback and gain insights into what aspects of their experiences can be improved. By converting neutral experiences into positive ones, airlines can increase customer loyalty and advocacy.

- Continuous Monitoring: Airlines should implement robust sentiment analysis tools and monitoring systems to keep track of passenger sentiments in real-time. This allows for timely interventions and adjustments based on evolving customer feedback.

- Feedback Channels: Provide passengers with convenient channels to share their feedback and experiences. Actively seek and listen to customer input to understand their needs and expectations better.

- Training and Employee Engagement: Ensure that airline staff, from customer service representatives to cabin crews, are well-trained, motivated, and engaged in delivering exceptional service. Happy and motivated employees can contribute to more positive passenger experiences.

By implementing these recommendations, airlines can work towards improving passenger sentiments, enhancing customer loyalty, and maintaining a competitive edge in the aviation industry.

Conclusion.

In conclusion, the analysis of various variables related to airline passenger sentiment and customer engagement reveals several key insights for airline companies:

- Sentiment Distribution: Negative sentiments are consistently the most prevalent among passengers, followed by neutral sentiments, with positive sentiments being the least frequent. This emphasises the importance of addressing customer dissatisfaction as a top priority for airlines.

- Specific Areas of Concern: Passenger sentiment reasons such as "Customer service issues," "Late flights," and "Cancelled flights" are commonly cited across different airlines, indicating areas that require immediate attention and improvement.

- Diverse Customer Bases: Airlines like United, US Airways, American, Southwest, Delta, and Virgin America have varying customer bases in terms of size. Understanding and catering to the specific needs and preferences of these customer segments is critical for maintaining and enhancing market competitiveness.

- Continuous Monitoring and Engagement: Airlines should invest in sentiment analysis tools, customer feedback channels, and staff training to continuously monitor passenger sentiments and engage with customers to gather insights and improve their services.

- Operational Improvements: Enhancements in customer service, punctuality, baggage handling, booking processes, in-flight experiences,

and airport operations are essential to address the underlying issues contributing to negative sentiments.

By focusing on these insights and implementing strategic recommendations, airlines can work towards improving overall customer satisfaction, loyalty, and competitiveness in the dynamic aviation industry.