

- **Project: Sky Analytics Excel Analysis & Dashboard**

- **Tools Used:** Excel, Power Query, Data Visualization, Data Analysis, KPI Tracking, ETL, Data Storytelling.
- **Industry Context:** The travel and hospitality sector has seen rapid evolution with the advent of analytics. As travel demand increases, businesses need to leverage data for improving flight operations, optimizing route management, and enhancing customer satisfaction. This project focuses on analyzing flight operations data to streamline services and improve performance metrics in the travel industry.
- **Recent Examples in Industry Context:**
 - Airlines are increasingly leveraging data analytics for operational efficiency. This involves analyzing vast arrays of flight data, including delays, cancellations, and overall performance metrics.
 - Real-Time Data Utilization: Real-time analytics allows airlines to adjust their operations dynamically based on current conditions, improving responsiveness to changing demand and enhancing customer service capabilities.
 - Key Performance Indicators (KPIs) Tracking: Frequent analysis of KPIs such as flight punctuality, cancellation rates, and customer feedback helps airlines proactively modify strategies for better efficiency and service.
- **Project Objective:**
 - Analyze flight operations data to derive insights into cancellations, delays, and overall performance metrics.
 - Provide actionable recommendations for improving operational efficiency and enhancing the customer experience.
 - Develop an interactive dashboard to visualize key metrics, making data exploration accessible to stakeholders.

- **About Data:** The analysis was performed on flight operations data, tracking metrics such as total flights, cancellations, delays, and the performance of airlines and airports. Key attributes include:
 - Total Flights: Comprehensive count of all flights managed.

- Cancellation Rate: Metrics revealing the frequency of cancellations.
- Average Delays: Measurement of delays recorded for arrivals and departures.
- **Data Preprocessing:**
 - Data Cleaning: Using Power Query in Excel and addressing missing values to ensure robust analysis, especially in crucial metrics like delay times.
 - Feature Engineering: Developing KPIs to categorize performance levels, facilitating easier comparison among airlines and routes.
 - Visualization Preparation: Employing visualization techniques to highlight key insights effectively.
- **Actionable Insights:**
 - Flight Performance Monitoring:

Top Performing Airlines: Delta Air Lines leads with a 70.12% on-time arrival rate, indicating efficient operations. Prioritizing best practices from such airlines could help improve performance across the industry.
 - Cancellation Rates:

WN Airlines has the highest cancellation rate with 408 cancelled flights, indicating a need to assess operational practices for improvement.
 - Delay Causes:

Primary Contributors: The main causes of delays include Late Aircraft (average 22.3 minutes) and Airline issues (average 18.3 minutes). Addressing these issues could significantly reduce overall flight delays.
 - Seasonal Trends:

Monthly Variations: Post-analysis shows that February had a higher cancellation rate (3.41%) compared to January (1.98%), suggesting that operational strategies may need adjustment based on seasonal trends.
 - Airport Connectivity:

Key Hubs: Hartsfield-Jackson Atlanta International Airport is the busiest, serving 241 destinations, emphasizing the need for airlines to focus resources on major hubs to maximize connectivity efficiency.

- **Key Results:**

- Operational Improvements: Enhanced tracking of performance metrics leads to higher efficiencies and reduced operational costs.
- Customer Satisfaction: Alignment of performance metrics with customer feedback improves overall service delivery.
- Total Flights Analyzed: A total of 69,543 flights were operated across 322 airports.
- Cancellations: The overall cancellation rate was 2.56%, with 1,777 cancellations recorded in total.
- Time of Day Insights: Morning flights yielded the least delays, averaging 4.5 minutes, while evening flights saw the highest delays at 14.36 minutes for departures.

- **Business Impact:**

- Operational Efficiency:

By reducing delays primarily caused by Late Aircraft and operational issues, airlines could significantly enhance customer satisfaction and loyalty, leading to increased revenues.

- Resource Allocation:

Insights into peak operational hours suggest that airlines may benefit from strategizing flight schedules to optimize staffing and resource allocation, especially during morning hours when on-time performance is higher.

- Strategic Decision Making:

The identification of top-performing airlines and airports allows for benchmarking and establishing best practices across the industry, fostering a culture of continuous improvement.

- Seasonal Adaptability:

Understanding seasonal patterns can enable airlines to prepare for potential surges in cancellations and delays, leading to improved contingency planning and customer communication.

- **Expected Interview Questions**
- Can you describe the overall structure of your Sky Analytics dashboard? What key metrics and visualizations did you prioritize?
- How did you handle data cleanup and preprocessing in your Excel project? Could you give examples of specific techniques used?
- What challenges did you face with data accuracy, and how did you ensure the quality of the visualizations?
- Can you explain the importance of KPIs in your analysis and how they were utilized in decision-making processes?
- What strategies did you implement for ongoing data maintenance and refreshes for your dashboard?
- How did you incorporate user feedback into the design of your dashboard to ensure it meets stakeholder needs?
- What practices do you recommend for creating effective data visualizations in the travel and hospitality sector?
- How did you address missing values in the flight delay dataset, and what Excel functions did you use to impute or manage these gaps?
- What methodologies would you employ to compare average delays among airlines using pivot tables? Describe how filters can enhance this analysis.

- Explain how you would utilize Excel's charting tools to visually represent the top airports based on traffic volume. What types of charts would you find most effective and why?
- How can you create a scatter plot in Excel to analyze the correlation between flight distance and delay times? What formula or functions would you incorporate to derive insights?
- Which Excel functions would you use to determine if there are seasonal patterns in flight cancellations? How would you structure your dataset for this analysis?
- Describe how you would merge multiple datasets (like airlines and flights) within Excel to analyze on-time performance. What key concepts of data integration should be considered?
- What metrics would you include in your Excel dashboard to track airline performance effectively? How would you ensure that these KPIs are automatically updated?
- How would you utilize Excel What-If Analysis feature to evaluate the impact of different operational strategies on flight cancellations?
- What advanced visualization techniques would you implement in your dashboard to represent delay causes? Discuss how conditional formatting can enhance data readability.
- Illustrate how to use nested functions in Excel to analyze delay types. How would you structure your formulas to ensure accuracy in results?
- Explain how you would calculate the on-time performance rate for each airline. What steps would you take to ensure data accuracy throughout this process?
- How would you incorporate slicers and timelines in your Excel dashboard to provide users with a more interactive experience in analyzing flight data?
- Data Trend Identification:
- What Excel techniques would you use to identify trends in flight operations over varying time periods? How can trendlines improve understanding in dashboards?
- Describe how you would categorize flights based on time slots (morning, afternoon, etc.) using Excel formulas. What insights would you look for in this analysis?