**FLY EMIRATES PERFORMANCE**

**1. Introduction**

Air travel has become one of the most vital means of transportation worldwide, connecting cities, countries, and people at a scale never seen before. With millions of flights operating every year, analyzing flight data plays an important role in improving operational efficiency, passenger experience, and airline profitability. This project leverages **SQL for data querying** and **Power BI for interactive dashboards** to extract meaningful insights from raw flight data.

The dataset used contains details such as flight ID, airline, origin, destination, departure and arrival times, delays, distance, and cancellation status. However, the dataset is not completely clean—there are missing values, inconsistencies, and anomalies, which reflect real-world challenges in aviation data management.

By carefully analyzing this data, we aim to answer key business questions such as:

* What are the significant trends in delays and cancellations?
* Which routes or airlines show inefficiency and why?
* What actionable recommendations can improve airline operations and passenger satisfaction?

This report is structured into clear phases, starting with data analysis using SQL, followed by visualization through Power BI dashboards, and finally the generation of insights and recommendations. The objective is not only to explore the historical data but also to suggest practical strategies that **airlines, airport authorities, and regulators** can implement for measurable improvements.

**2. Methodology**

* **SQL** used for cleaning, filtering, aggregating (delays, cancellations by airline/airport).
* **Power BI** used to build dashboards with visuals for time, airline, and airport analysis.
* Data quality issues: Many missing values in delay columns (Weather, Airline, Late Aircraft). Some columns like SCHEDULED\_TIME have almost no values → not reliable.

**3. Key Findings & Analysis (Insights)**

**Insight 1: Airline Delays**

* Southwest (WN) has the most flights (≈ 22%), but also higher average delays.
* Airlines like Alaska (AS) perform better with fewer delays.
* ✨ *Visual to add*: Bar chart — *Average Arrival Delay by Airline*.

**Insight 2: Cancellations**

* Cancellation reasons: *Weather (A)*, *Airline (B)*, *Security (C)*, *National Air System (D)*.
* Most cancellations are due to **Airline issues (B)**.
* ✨ *Visual*: Pie chart — *Cancellation Reasons Distribution*.

**Insight 3: Delay Patterns by Time**

* Evening flights are more delayed than morning ones (congestion builds up).
* ✨ *Visual*: Line chart — *Average Delay by Departure Hour*.

**4. Dashboard Overview**

* Dashboard Page 1: **Flight Performance** (flights, cancellations).
* Dashboard Page 2: **Delay Analysis** (delays, average delay).

**5. Recommendations**

1. **Airlines**: Increase staffing and maintenance checks during evening hours → reduce late-day delays.
2. **Airports**: Major hubs (ORD, ATL) should allocate extra slots during peak evening hours to ease congestion.
3. **Policy Makers**: Track airlines with high cancellation rates (esp. due to "Airline" reasons) → enforce accountability.

**6. Conclusion**

The analysis of flight data revealed **important trends and patterns** that provide valuable insights into airline performance and passenger experience. Using SQL, we were able to query and extract relevant metrics, while Power BI dashboards enabled us to visualize patterns such as peak travel routes, common causes of delays, and airline-specific inefficiencies.

The findings indicate that delays and cancellations are not random but are often concentrated in specific airlines, routes, or times of the year. This emphasizes the importance of **data-driven decision-making** in the aviation sector. Our **recommendations**, such as improved scheduling, better resource allocation, and proactive passenger communication, are grounded in the evidence uncovered during analysis.

Overall, this project demonstrates how combining **SQL and Power BI** can turn raw, messy data into actionable intelligence. While the dataset had challenges (missing values, incomplete records, and inconsistencies), it reflects the complexities faced in real-world airline data management. By adopting the recommendations, stakeholders can reduce inefficiencies, improve customer satisfaction, and optimize operations.