Case Study: Flight Delays & Airline Performance Analysis

Objective:

An airline company wants to analyze flight delays and performance metrics to improve operational efficiency and customer satisfaction. They need a **Tableau / Power BI dashboard** that provides insights into flight punctuality, delays, and factors affecting on-time performance.

Your task is to analyze the provided dataset, create insightful visualizations, and derive recommendations to minimize delays and optimize airline operations.

Dataset Description (Flight Performance Data)

1. **Fact Table: Fact_Flight_Performance**

This table contains measurable data related to flight performance, including delays and cancellations.

Column Name	Description
Flight_ID	Unique flight identifier (FK)
Date_ID	Foreign key to Dim_Date
Airline_ID	Foreign key to Dim_Airline
Route_ID	Foreign key to Dim_Route
Scheduled_Departure_Time	Scheduled departure timestamp
Actual_Departure_Time	Actual departure timestamp
Scheduled_Arrival_Time	Scheduled arrival timestamp
Actual_Arrival_Time	Actual arrival timestamp
Delay_Minutes	Total delay in minutes
Weather_Delay_Minutes	Delay caused by weather
Air_Traffic_Delay_Minutes	Delay caused by air traffic congestion
Carrier_Delay_Minutes	Delay caused by airline issues
Security_Delay_Minutes	Delay caused by security reasons
Flight_Status	On-time, Delayed, or Canceled
Passenger_Count	Number of passengers on the flight

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2. **Dimension Table: Dim_Date**

This table stores date-related attributes.

Column Name Description

Date_ID	Unique date identifier (PK)
Date	Full date (YYYY-MM-DD)
Day	Day of the month
Month	Month of the year
Year	Year
Weekday	Name of the day (Monday, Tuesday, etc.)

3. Dimension Table: Dim_Airline

This table contains airline-related attributes.

Column Name Description

Airline_ID	Unique airline identifier (PK)
Airline_Name	Name of the airline

4. Dimension Table: Dim_Route

This table stores flight route information.

Column Name	Description
Route_ID	Unique route identifier (PK)
Flight_Number	Unique flight number
Departure_Airport	Origin airport
Arrival_Airport	Destination airport

Deliverables:

1. **Tableau / Power BI dashboard** with key visualizations.
2. **A one-page report** summarizing key insights and recommendations, with
    1. At least 5 specific findings from the data analyzed.
    2. Proposals to the airline company to address the findings.
3. **Presentation** of findings.