Phase 1:

Airline Efficiency Analysis

Group 2:

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Data Source:

The dataset chosen for analysis was obtained from Kaggle, a popular platform for sharing and discovering datasets.

In this case, there was no necessity to combine multiple datasets as the dataset seemed to be comprehensive enough to stand alone for the intended analysis. The decision not to merge multiple datasets was taken because the dataset already contained a rich variety of information that could be explored without the need for additional sources.

The dataset comprises 31 columns and 13,951 rows, indicating a substantial amount of data to work with. The 31 columns represent different variables within the dataset, while the 13,951 rows signify individual cases or observations. This sizeable dataset offers a significant amount of information for analysis and exploration, providing ample opportunities to uncover patterns, trends, and relationships within the data.

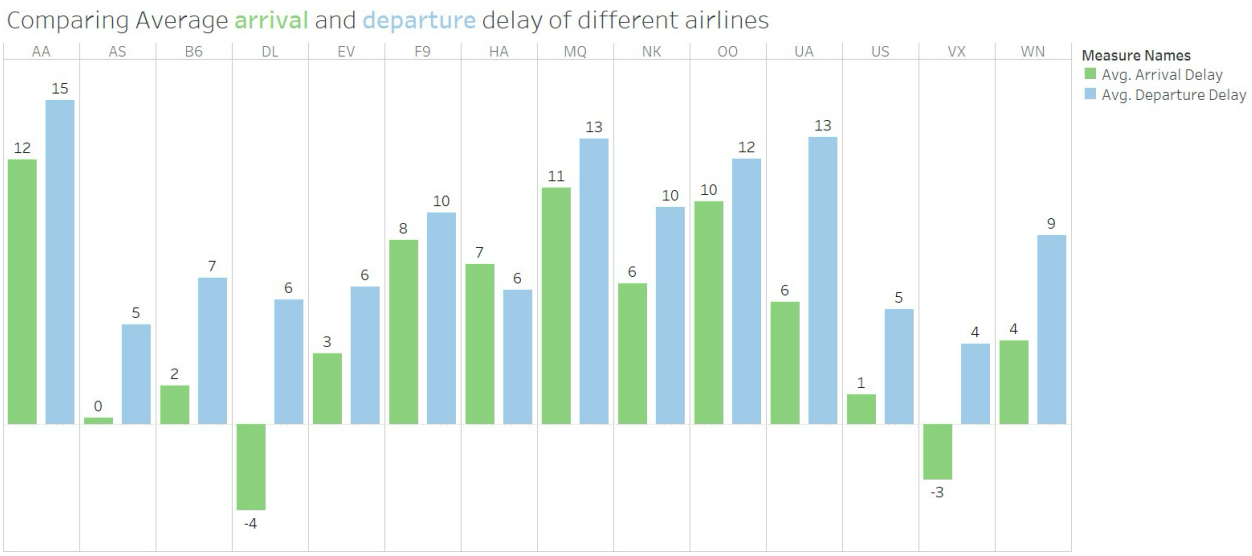
Since the data was sourced from Kaggle, an open platform for sharing datasets, there is no requirement to keep the data confidential.

Questions of Interest:

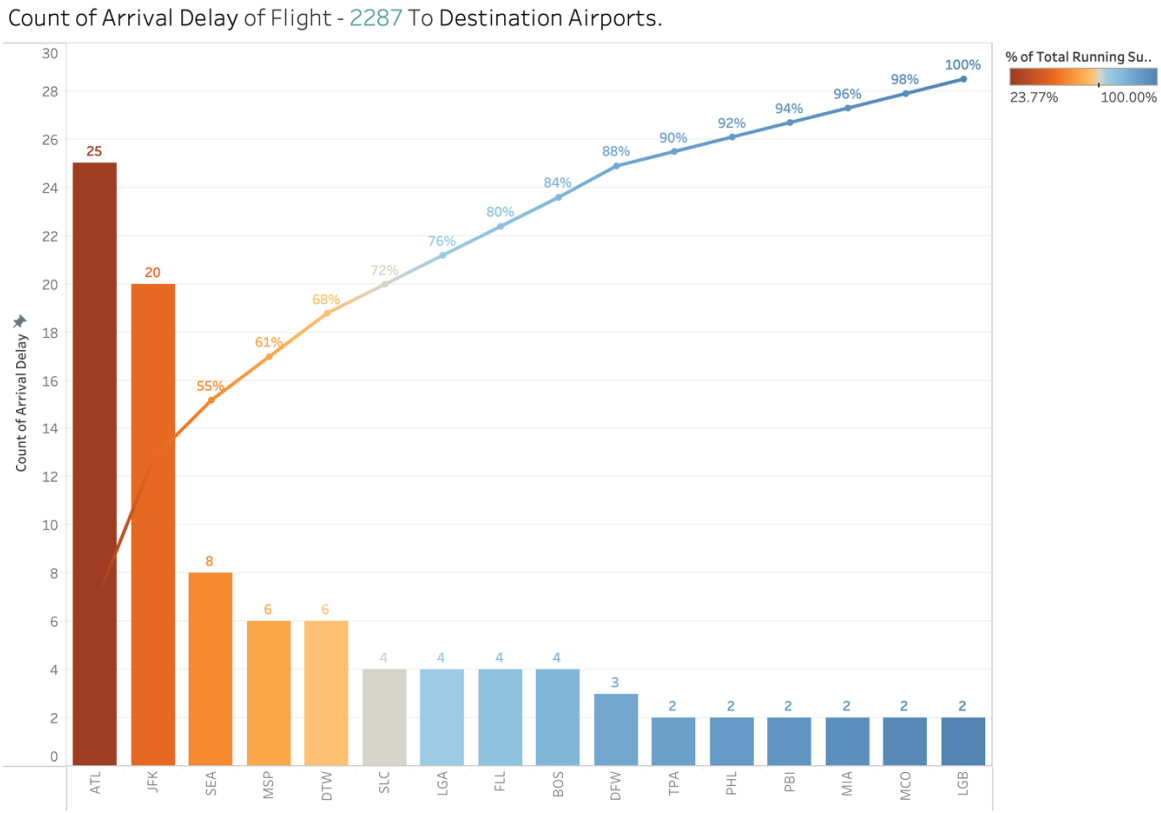
1. Delay caused by various factors with respect to airlines.
2. Are there specific airports with consistently high or low delays.
3. Comparing Avg departure delay to Avg Arrival delay of airlines.
4. What are the on-time performance metrics for different airlines.
5. What are the busiest airports in the USA?
6. What are the efficient airports with respect to Taxi in and Taxi out time.

Initial Data Visualizations:

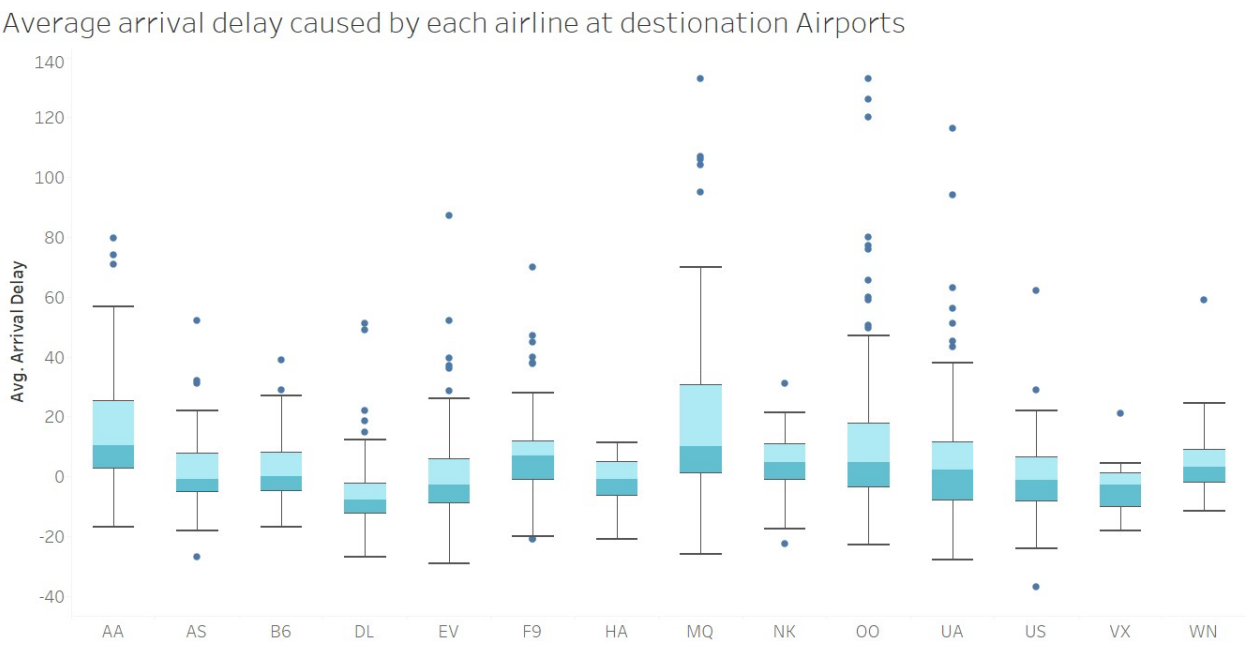
Comparing Average Arrival and Departure delay of different airlines:



Count of Arrival Delay of Fight- 2287 To Destination Airports:



Average arrival delay caused by each airline at destination Airports:



Phase 2:

Airline Efficiency Analysis

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Source and Method of Data Collection:

Data Source: https://www.kaggle.com/

Data Set: Airline Delay and Cancellation Data, 2009 - 2018 (kaggle.com). The data includes details on flight schedules, delays, and airport efficiency, with **31 columns** and nearly **1,30,104 rows**.

Industry: Aviation

Objective: Analyze airline and airport data with the aim of improving overall aviation industry effectiveness and passenger satisfaction.

Project Context:

This project is designed for the stakeholders of American Airlines, including the CEO and other key decision-makers. The insights and recommendations derived from the analysis are crucial, as they have a direct impact on the airline's operational efficiency and customer experience.

The primary goal of this project is to provide a detailed assessment of the types of delays experienced by passengers, not only on American Airlines but also on other major carriers like JetBlue and Delta airlines. This comparative analysis will help pinpoint specific areas where American Airlines can improve its performance relative to its competitors.

The key objectives of this project are to:

Compare the types of delays (e.g., weather, mechanical, air traffic control) experienced by passengers across three major airlines, including American Airlines.

Provide actionable recommendations to the stakeholders that can be implemented to address the identified areas of improvement.

By achieving these objectives, the project will equip American Airlines' stakeholders with the essential information needed to make strategic decisions and implement effective solutions that will advance the airline’s service offerings and strengthen its market position.

Practice 1. The 3-minute Story:

This dataset provides a wealth of information about flights operated by American Airlines (AA), JetBlue Airways (B6), and Delta Air Lines (DL).

The data includes details on flight schedules, delays, and airport efficiency, with 31 columns and nearly 1,30,104 rows.

By analyzing this data, we can gain insights into flight delays, compare airline performance, identify busy airports, and assess ground efficiency.

Understanding the reasons behind delays and evaluating key performance metrics can help improve the overall travel experience for passengers and enhance operational efficiency for American Airline aviation.

Practice 2. Big Idea:

The main point to deliver to the Stake Holders of American Airlines is that this project will provide a comparative analysis of the types of delays experienced by passengers across different airlines, enabling American Airlines to identify specific areas for improvement that can enhance customer satisfaction and operational efficiency.

Practice 3. Storyboarding:

1. In today's competitive airline industry, every takeoff represents an opportunity to soar above the rest. But how can airlines achieve unparalleled heights in operational efficiency and customer satisfaction? The answer lies in the power of data-driven insights

2. Our analysis begins with a comprehensive examination of airline data, providing a bird's eye view of performance across major carriers.

3. By comparing delay patterns, we uncover invaluable insights into each airline's operational performance and potential areas for enhancement.

4. Armed with these insights, American Airlines can implement targeted strategies to mitigate delays, streamline processes, and elevate the overall travel experience for passengers.

5. data as their compass, American Airlines embarks on a journey towards operational excellence, fueled by insights that pave the way for seamless travel experiences.

6. In the dynamic world of aviation, the sky's the limit when it comes to leveraging data-driven insights to transform airline operations and exceed customer expectations. With every data point, we can chart a course towards a future where flying isn't just a means of transportation, but a journey of unparalleled comfort, efficiency, and satisfaction.

Data Visualizations:

Chart 1: Airtime Vs Distance Covered by Each Airline

Each airline demonstrates consistent efficiency in airtime consumption relative to the distance travelled.

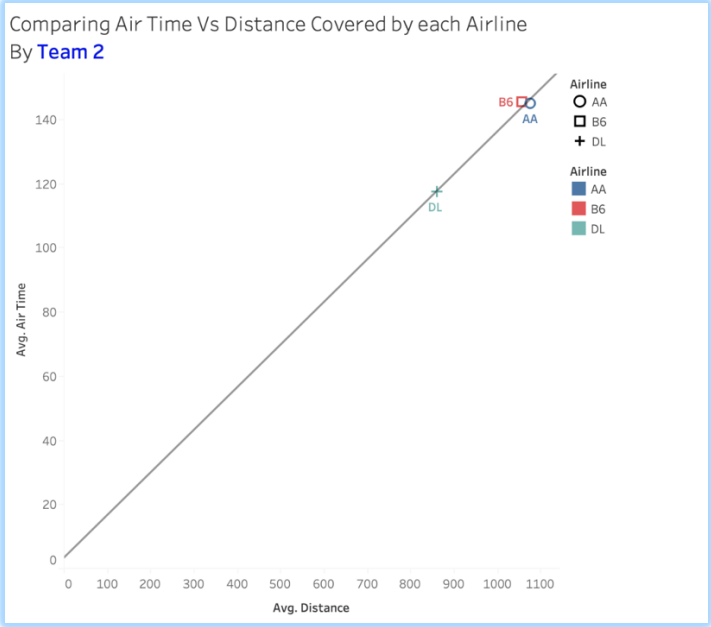

Chart 2: Relation between day of a week to total delays.

AA maintains consistent performance compared to competitors (DL, B6) throughout the weekdays, with increased delays observed on weekends.

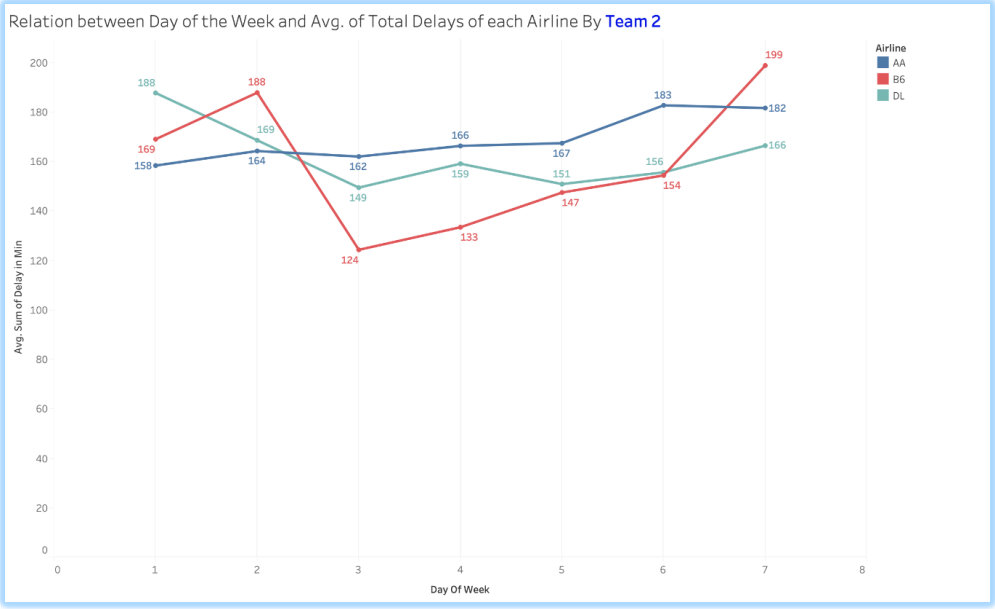

Chart 3: Number of Cancellations for Various Reasons:

Number of flight cancellations by each airlines for each individual reasons. Where,

Reason A: Airline Or Carrier

Reason B: Weather

Reason C: National Air System

Reason D: Security

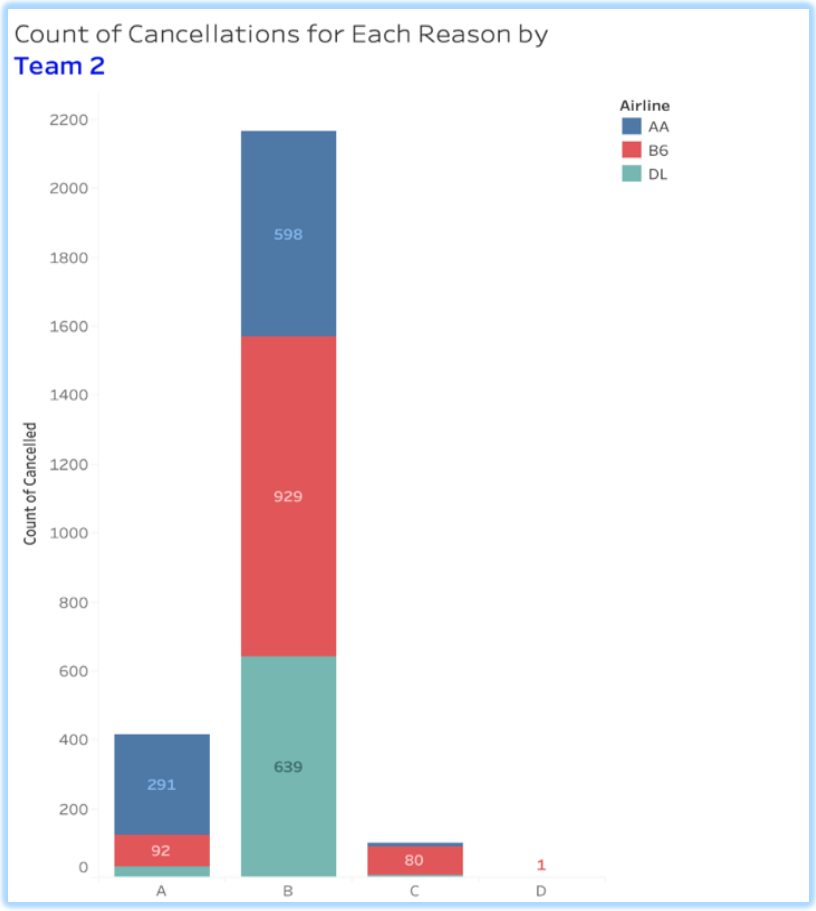

Chart 4: 80/20 Rule (Pareto Chart):

20% of airports (DFW, MIA, ORD) contribute to 80% of the delays experienced by American Airlines at its destination airports.

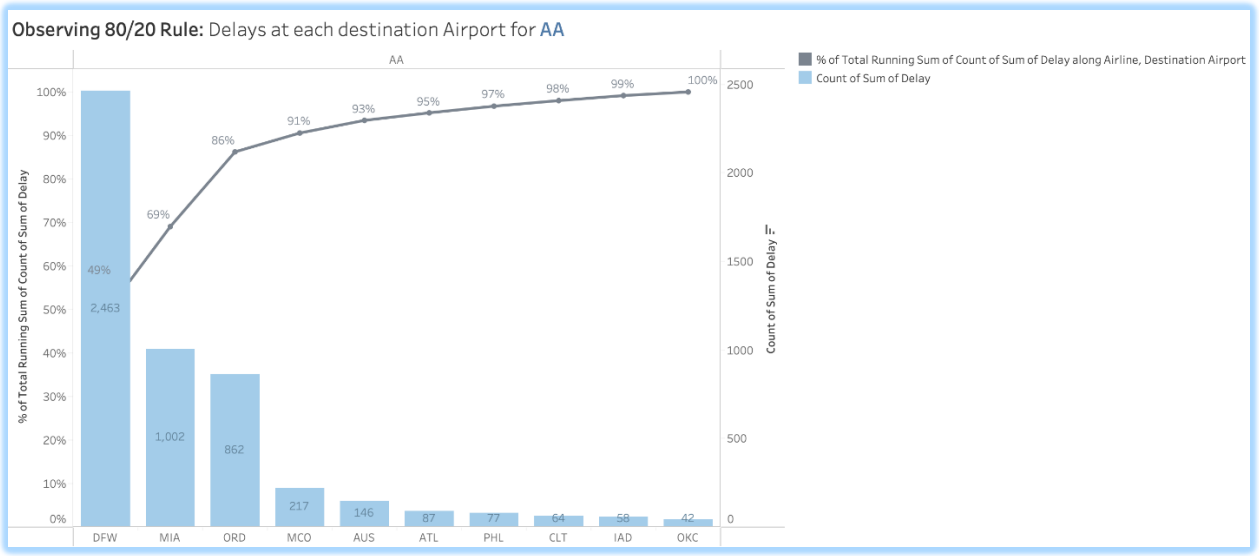

Chart 5: Number of flights by Airline from Origin to Destination:

This chart provides insights into the number of flights operated by each airline from a given origin airport to its corresponding destination Airport.

Interactive Dashboard:

In this interactive dashboard, stakeholders have the ability to select specific Origin and Destination airports. The dashboard provides detailed insights including the number of flights operated between these airports by major airlines such as American Airlines, JetBlue, and Delta. Additionally, it offers comparative data on the average departure delay and airline-specific delays. The dashboard also displays the number of flights cancelled, categorizing them by the reasons for cancellation. Furthermore, it provides an analysis of the average total delays caused by each airline throughout the week. This enables stakeholders to gain a deeper understanding of operational efficiencies and challenges faced on specific routes by different carriers.