American Airlines On-time Performance

Motivation: I like to travel to different cities and explore their culture. I like to plan my travel trips to travel smoothly. But like any other traveler, I have always come across some delays in the flights or cancellations that have also disappointed me, and wondered why flights get delayed or what could be the reason behind several cancellations therefore, I became interested in evaluating the on-time performance of American Airlines and its operations.
Link: This dataset was taken from https://www.transtats.bts.gov/
Tools: Tableau, Excel
Analysis: The dataset that I worked with consists of the data for All airlines for the year 2021.

In this graph, we are analyzing the average flights of both American and Southwest across all the US Airports. Dallas Fort Worth (DFW) is the busiest airport in 2021 and has the largest number of flights at 132,256, followed by Pheonix and Midway Airports. The least busiest airport was Daytona Beach Airport(DAB) with only 4 flights in 2021.

Airline-wise delays- locations
For Southwest, the busiest airport is Denver followed by Chicago-Midway, Las Vegas, and Baltimore.

For American, the busiest airport is Dallas followed by Charlotte, Miami, and Phoenix.

Average Airline delays

Airline wise delays

Op Uni..	Avg. Arr Delay	Avg. Dep Delay
AA	3.07	11.41
WN	5.50	13.33

For American Airlines, the average departure delay was 11.41 minutes vs 13.33 minutes for Southwest Airlines.
Whereas, the average arrival delay for American Airlines was 3.07 minutes vs 5.50 minutes for Southwest Airlines.

Cancellation Rates:

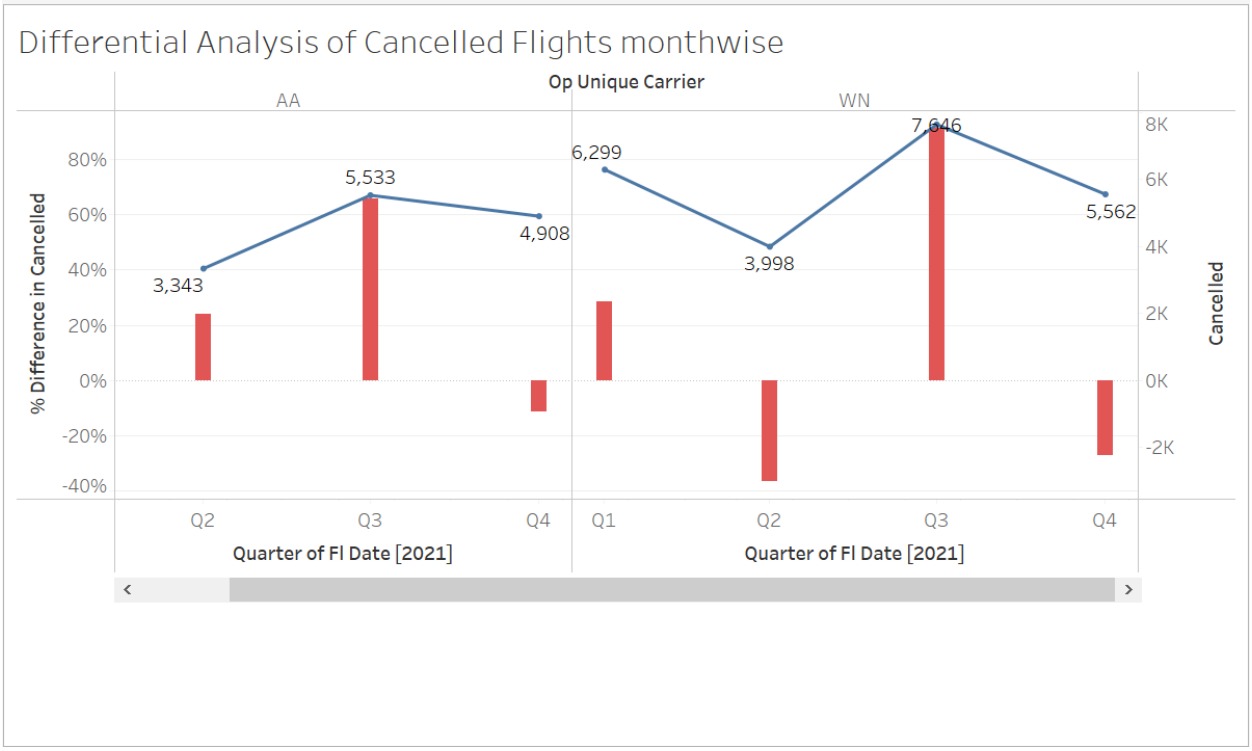
Cancellation rate or ratio is calculated as:
Cancellation Ratio=(Cancelled Flights/ Total Flights)*100

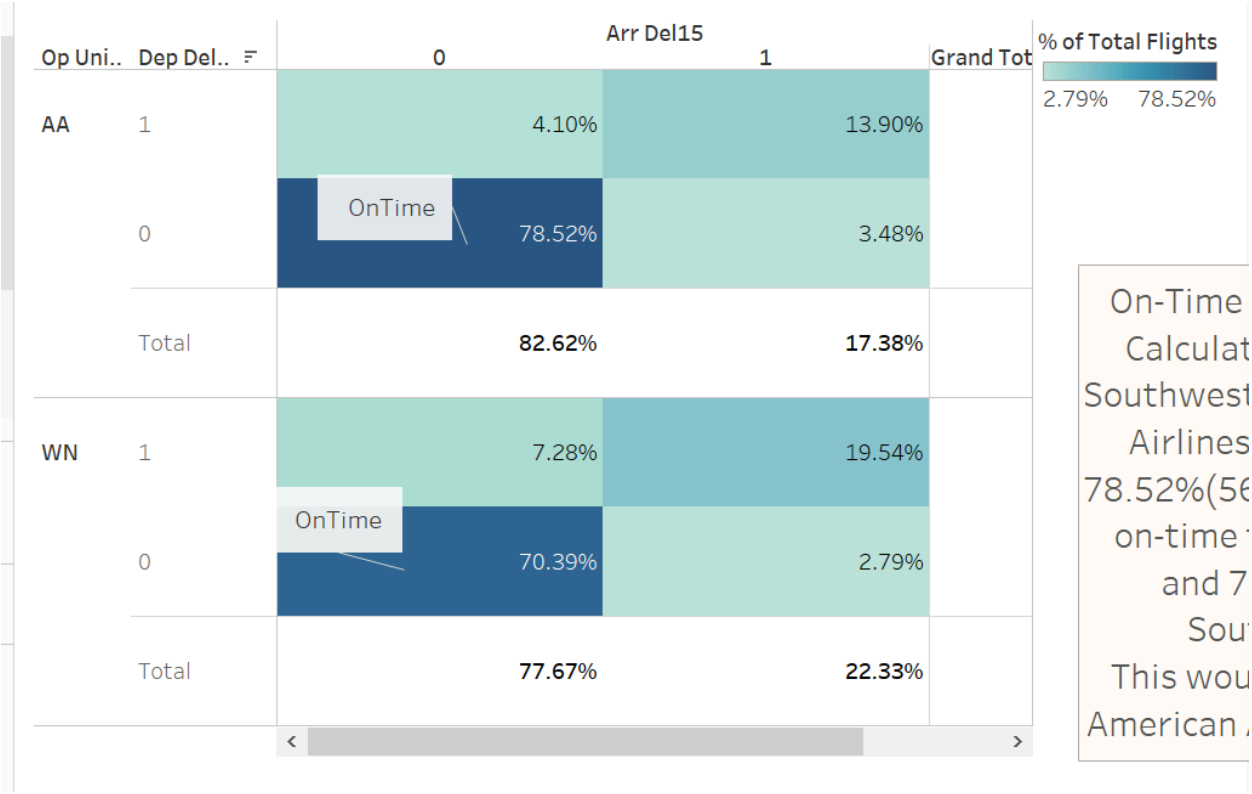
Average cancellation rates

Airline Name	Cancellat..	Cancelled	Flights
American-Airlines	2.238%	16,478	736,399
Southwest Airlin..	2.208%	23,505	1,064,640

The average cancellation ratio is roughly 2.24% slightly greater than Southwest which is roughly 2.21%.
This could be:

1. Southwest has a larger fleet of aircraft
2. It operates more short-distance flights than American that if the fleet size is small.
3. Southwest is cheap compared to American and therefore more people prefer to fly from Southwest.





I calculated the on-time performance of both airlines with the formula:

On-time Performance= (Flights that are on time)/(Flights with Arrival Delay+Flights with Departure Delay+Flights that are on time)
Using this formula, we can observe that for American Airlines, the on-time performance of American Airlines had an on-time performance of 78.52% and for Southwest Airlines, the on-time performance turned out to be 70.39%.
This means that American Airlines can improve its operations by focusing on maximizing the number of on-time flights, that is by reducing the number of arrival and departure delays. This means that a set of policies that can help American Airlines handle its operations that are vulnerable to delays because of weather changes, inefficient handling of delayed flights, inadequate staff, or failure or upgrading the existing aircraft and technologies can help reduce the delays and increase overall performance.

Key Takeaways:

1. American Airlines to tweak its policies towards optimizing operations considering factors like staff, weather, handling of delayed flights, and aircraft design issues.
2. American Airlines can reduce the burden over the most busiest airports by operating more flights from a secondary nearby airport.
3. American Airlines can optimize its fleet usage by considering the usage of all the aircraft in its fleet adequately.

4. Airlines can schedule flights during off-peak hours to reduce the proportion of delayed flights.
5. Work on fewer flight cancellations by scheduling more flights in off-peak hours, improve customer satisfaction and other factors related to staff, handle any technical issues, and so on.