Airline Delay Time Analysis and Choose Your Best Airline

Url: https://public.tableau.com/profile/papaya6214#!/vizhome/AirlineDelayTimeAnalysis/Story1

https://public.tableau.com/profile/papaya6214#!/vizhome/Chooseyourbestairline/Story2

1. Summary

1.1 Story 1 (Airline Delay Time Analysis)

1.1.1 Which is the best airline?

How to evaluate the best airline? Sometimes punctuality is very important. Then which airline has the lowest average time delay? It appears that airline AS has negative time delay which means that on average its flights arrive earlier than scheduled. NK has the highest time delay which is nearly 9.5 minutes on average.

1.1.2 Consider both departure delay and arrival delay

Analysis above is only based on arrival delay which is the difference between arrival time and scheduled arrival time. Departure delay also matters? On this scatter plot, you can also compare airlines according to both departure delay and arrival delay. It turns out that arrival delay is proportional to departure delay, which also matches our common knowledge. Then the general best airlines locate in the bottom left corner.

1.1.3 What causes the delay?

If you are in an airline, you probably wonder what causes these time delay so you can find approaches to improving your company. Normally, there are five factors. For all airlines, it is the late aircraft that causes the most delay on average, security the lowest. With the standard, we could assess a single airline. For example, NK has its most delay on air system, while delay by late aircraft is almost the same as standard. Then air system would be their focus to figure out.

Meanwhile, airport and season are also essential reasons we cannot ignore. In some airports, because of some reasons like poor facility or out dated systems, the delay will be much more than other airports. For NK, PHL cause the most average delay.

In terms of time of a year, June causes the highest average delay on NK. If you look at other airlines. June is also a delay peak. However, the 5 detailed delay factors vary differently by time and not always reach peak in June.

1.2 Story 2 (Choose Your Best Airline)

1.2.1 Which is the best airline for passengers?

Have you ever been confused about which airline to choose when you are considering a flight ticket? First, passengers need to have a general idea about airlines. Based on limited data sources, we can only select by delay time except many other factors like service quality. On this arrival-departure delay scatter plot. Passengers will know these airlines in a big picture. For those airlines on the upper right corner, you'd better avoid getting on their flights.

1.2.2 Time to travel

Even having your favorite airline in mind does not make any difference sometimes. Because the airline doesn't have a flight from your place. Now these two maps of departure and arrival airports give you the vision to select an airport near you and see what airlines are available. Fill in the departure city and arrival city. Then you can see airports near you and near your destination city.

After narrowing down the airports, all available airlines will in the airline dropdown list. Select one and hover over the airport dot on the map, you can see estimated air time which is the duration in the air and average delay time. The information will help you make your best choice!

1.2.3 Further explore airlines

Too troublesome to clicking each airline? Don't worry, in this plot, after confirming the airports, you can compare all the available airlines in a single picture. Hover over the dots, you will gain more information. Now, fill in the blanks by your own choice and have fun!

2. Design

2.1 Story 1 (Airline Delay Time Analysis)

2.1.1 Which is the best airline?

The simplest metric to analyze the delay is the arrival delay time. Despite of a little departure delay, low or none arrival delay will still be acceptable. Then I plotted average arrival delay bar chart by airline. During the exploration, I found there is only one airline with negative average delay, then I made a set of negative average delay airlines and use different color to highlight it.

2.1.2 Consider both departure delay and arrival delay

If I add departure delay into the plot, then it will become a scatter plot. Besides the color mark of the set, I use shape to differentiate different airlines and add detail into the tooltip so that you can see the number when you hover over the dots.

2.1.3 What causes the delay?

After delay analysis by airline, people wonder what causes the delay. After plotting the reason-delay bar chart for a random selected airline, I found there exists great difference between 5 reasons. Here comes the question. Is the difference a common phenomenon or a special case? To solve this, I made another bar chart for all airlines as standard to compare and colored it orange for differentiation. Other than these five reasons. Do airport and season matter? Then a delay bar chart by airport and overall/5-reason delay line chart by time will answer the question. The dynamic plot will all change when you select different airline. To realize this function, I added a single value list filter by airline and apply it to selected sheets.

2.2 Story 2 (Choose Your Best Airline)

2.2.1 Which is the best airline for passengers?

The first plot here is the same as the second plot in story 1. It shows passengers a big picture.

2.2.2 Time to travel

Select airports on a map will be straightforward. This plot took me much time to construct. I left joined the airports.csv on the departure airport code. Then I left joined the airports.csv again on arrival airport code. To distinguish them, I renamed them. For passengers to fill in the blanks, I added origin airport, departure city, destination city, airline filters and set the latter four filters as only showing relevant values. This could help people narrow down choice. Airports will show up on the map after the filters and additional information was added to the tooltip for reference.

2.2.3 Further explore airlines

When I operated the selection process, I found it inconvenient for you need to change the airline to see different information. How about compare airlines in a single plot? Then arrival delay-cancellation probability scatter plot came up. Other than the position along the axis element, I also added others like air time onto the tooltips.

Reference resources:

N/A