Project 4: Build a Dashboard

Data:

On-time performance of US domestic flights operated by large air carriers in 2015

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04th of Jan 2021

The project consists of two dashboards and one story on my Tableau account:

1. Flight delay dashboard
2. Flights total dashboard
3. Story - Variability of Flight Speed with Flight Distance

Flights delay dashboard

https://public.tableau.com/profile/christine.shuttleworth#!/vizhome/FlightsDelayDashboard_16099652259370/Flightdelaydashboard

Summary: The delay dashboard shows the main reasons for delays. The main reasons for flight delays for all airlines and routes are Arrival Delays, followed by Departure Delay and Air System Delays.

On average the longest delays are caused by Late Aircraft Delay with 23 min, followed by Airline delays with 19 min. Security delays are very rare and when they occur they are short.

The map shows that there are some outliers in the data – e.g. Saywer International Airport with an average delay of 266 min. Outliers can be removed by clicking on them and deselecting them. Using the airline filter – we can see that the airline with the highest average delay caused by delayed aircrafts is Southwest Airlines. For most airlines delayed aircraft delays are the longest average delays, but for Delta Airlines and Hawaiian Airlines, airline delays are on average longer than late aircraft delays. Using the map we can also drill down to the airport level to see which airports have longer average total delays

Design: I chose the pie chart to show, which delays are most common, as it gives a quick overview of the composition of all delays. The average delay bar chart shows the actual min of delays that is experienced per category. With the airline and OriginAirport filter, the dashboard can be used to drill down to airport level to find out the most likely reason and length of a delay at any destination airport and a combination of origin and destination airport for each airline. All charts have linked data sources and respond to any of the filters being set.

Resources: Types of delay: https://aspmhelp.faa.gov/index/Types_of_Delay.html

Total Flights dashboard

https://public.tableau.com/profile/christine.shuttleworth#!/vizhome/FlightsTotalDashboard/Flightstotaloverview?publish=yes

Summary: The total flights dashboard visualizes and summarizes the total number of flights. Starting with the total number of flights for 2015 for all major airlines – 274,964. These flights are then presented for four different measures. Total number of flights per airport, per airline, per month of the year and per day of the week. The airport with the most amount of flights throughout the year is Hartsfiled-Jackson in Atlanta, Followed by Chicago O'Hare and Dallas/Fort Worth. The busiest month for flights was July and the least busy was February. The airline with the most flights – almost 60 000 per year – is Southwest Airline Inc. During the week there are more daily flights than on the weekend. The day with the least daily flights is Saturday.

Design: The number of flights is shown in color in the left hand corner with lost of white space to make it stand out. This number is then split up in four different sections of the dashboard with a treemap for all the different airports, a timeline for each of the months in 2015 and two bar charts for the categorical values of airlines and day of the week. The individual charts can be used as filters. Once they have been chosen as a filter e.g. the flights total per month chart, it is possible to click on the chart and choose just one month. The rest of the dashboard is then updated with the values of just this month. The same applies to all other charts. This helps to drill down into individual airports, airline, month and day of the week. All charts have linked data sources and respond to any of the filters being set.

Resources: None

Story – Variability of Flight Speed with Flight Distance

https://public.tableau.com/profile/christine.shuttleworth#!/vizhome/Story-VariabilityofFlightSpeedwithFlightDistance/Story-Flightspeedinvestigation?publish=yes

Summary and Design: An interesting feature of the flights performance data was the speed variability of the flights with the total distance travelled. First, I wanted to look at the total delay with time travelled to find an average ratio of arrival delay with the distance travelled. For this I also looked at the speed, at which the aircrafts travelled to see if there was a difference in the ratio of delay with the speed travelled – which may indicate that different types of aircrafts perform differently. While I looked at the data, I found this interesting graph. With long distance travel (> 1200 km), two groups of flights were apparent. This I wanted to investigate further using a story.

The first slide shows the data on a scatter plot for all of the flights. The tool tip on each of the scatter points, shows the departure and arrival airport name. This helps identifying the difference between the two groups of flights. The second slide, shows the grouping of the data to find out more about the difference between Western and Eastern departure airports. The third slide, shows the same scatterplot as on the first plot but for each of the two groups. This plot clearly shows, that flights from West to the East are faster than flights from the East to the West, above 1200 km. The last slide explains the reason for this increase on speed with the effect of the Jetstream on the flights. This effect is likely also have an impact on shorter flights. To see this, the groupings of the flights needs to be changed, for one group to include all flights that start more Westerly than the arrival point and the other group including all flights that start more Easterly than their arrival point.

Resources: https://help.tableau.com/current/pro/desktop/en-us/maps_howto_origin_destination.htm