Francihelena Uzcategui

Nanodegree-Data Foundations

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Data Visualisation-Project

Links

Question 1 :

1.1. Worst airline delay

https://public.tableau.com/views/1_AirlineAirportworstdelay/1__Worstairlinedelay?:embed=y&:display_count=yes&publish=yes

1.2. Performance of airline by arrival and departure delay

https://public.tableau.com/views/1_AirlineAirportworstdelay/2__Performanceairlinebyarrivalanddeparturedelay?:embed=y&:display_count=yes&publish=yes

1.3. State airport ranking by arrival and departure delay

https://public.tableau.com/views/1_AirlineAirportworstdelay/3__Stateairportrankingbyarrivalanddeparturedelay?:embed=y&:display_count=yes&publish=yes

1.4. Relation arrival and departure delay

https://public.tableau.com/views/1_AirlineAirportworstdelay/4__Relationarrivalanddeparturedelay?:embed=y&:display_count=yes&publish=yes

Question 2 :

2.1. Delayed airline minutes according to States airports

https://public.tableau.com/views/2_CausesofDelay/Delay-state?:embed=y&:display_count=yes&publish=yes

2.2. Arrival and departure delay by day of the week, month, and airline

https://public.tableau.com/views/2_CausesofDelay/Delay-weekdayandmonth?:embed=y&:display_count=yes&publish=yes

Question 3 :

3.1. Diverse causes of delay according to U.S regions and territories

https://public.tableau.com/views/3_U_SRegionsandterritories-delay/Causesdelay-U_Sregionsandterritories?:embed=y&:display_count=yes&publish=yes

3.2. Airline delay by U.S regions and territories

https://public.tableau.com/views/3_U_SRegionsandterritories-delay/Airlinedelay-U_SRegionsandterritories?:embed=y&:display_count=yes&publish=yes

3.3. Security delay according to U.S regions and territories

https://public.tableau.com/views/3_U_SRegionsandterritories-delay/Securitydelay-U_Sregionsandterritories?:embed=y&:display_count=yes&publish=yes

Summary

1._ Which airlines or airports have the worst delays?

In the bar chart of Worst airline delay is relevant the top five worst delayed airlines, which are Southwest (WN), American Airlines (AA), Delta Airlines (DL), Atlantic Southeast Airlines (EV), and United Airlines (UA), respectively. Southwest is the airline with the worst delay within the group of the carrier in the U.S, more than 182,260 delayed minutes, that means four and a half months.

The bar chart of Performance of airline by arrival and departure delay shows that Spirit Airlines (NK) is the carrier with more arrival and departure delayed minutes, although the worst delayed carrier is Southwest (WN), as was mentioned in the previous bar chart. The average of delayed minutes of arrival is 15.73 and departure 17.37, being the exit slight greater than the entry. The carriers with the best standard of time of arrival and departure are Alaska Airlines and Hawaiian Airlines, respectively. The best mean of arrival time is Alaska Airlines (AS) having positive performance on early entry -0.49 seconds, this means without delay. Hawaiian Airlines (HA) has a few seconds of delayed exit 0.17.

The map of State airport ranking by arrival and departure delay compiled all the states and all the airports by the delayed exit – entry. It is readable on the map that California, Texas, Florida, Illinois, and New York are the states with more delay according to his airports. In Illinois- Chicago O'Hare International Airport there is the worst delayed of departure and arrival time. These delayed times represent - Entry delay of 98,900 minutes equivalent to 68 days and Exit delay of 161,133 minutes equal to 112 days.

The scatter plot of Relation arrival and departure delay shows a tied relationship between the delayed departure and entry of flights being a positive and robust correlation between the average of delayed minutes. Using this relation to compare other variables, and expecting accuracy results.

2._ What causes delays?

Cause of delay by state bar chart shows the top five of states with more delayed minutes which are Texas, California, Florida, Georgia, and Illinois, respectively. Being similar to the results showed on the previous question, especially in the map.

Cause of arrival and departure delay by day and month dashboard shows the variation of average delayed minutes over time.

According to the day of the week, in general, the day most busy to depart and arrive is Saturday. This day the average of minutes of wait increasing, arrival 5.785 minutes and departure 10.556 minutes. Being more specific by carrier only twelve of them have critical delays the Saturday, but the average is necessary to mark a tendency. These airlines are American Airlines (AA), Alaska Airlines (AS), JetBlue Airways (B6), Delta Airlines (DL), Atlantic Southeast Airlines (EV), Frontier Airlines (F9), American Eagle Airlines (MQ), Spirit Air Lines (NK), SkyWest Airlines (OO), United Airlines (UA), US Airways (US), Virgin America (VX), and Southwest (WN).

In general, Thursday is the day with least delay, entry 2.498 minutes and exit 8.372 minutes. The carriers with this pattern are JetBlue Airways (B6), Delta Airlines (DL), Atlantic Southeast Airlines (EV), American Eagle Airlines (MQ), SkyWest Airlines (OO), Spirit Airlines (NK), United

Airlines (UA), Virgin America (VX), and Southwest (WN). Highlighting there are missing values in the data, so the weekdays does not include Friday and Sunday.

About the month, is easy to track the three picks on the line chart, the first on February, second on June, and the last on December. We can notice those of three high values are related to the seasons Winter and Summer.

Only the carriers Delta Airlines (DL) and Atlantic Southeast Airlines (EV) follow the exact pattern with the three picks of delays along the year, the rest of the carriers are busy at least in one of this season of the year. Highlighting there are missing values in the data, so the months do not include October.

3._ U.S Regions and territories delay

Making more readable the geographical information of the fifty states and territories we compiled into groups: U.S Regions and territories.

Diverse causes of delay according to U.S regions and territories bar chart presents the general reasons for the delay, highlighting the minimum and maximum values. Within the reasons of delay are air system, airline, arrival, departure, late aircraft, security, and weather. According to the regions graph, the South has more delayed minutes than the other places, in overall, with a max value of 1,010,147 minutes to Departure delay, being equivalent to 701 days. Along the five groups, the average max value comes from Departure delay, rather than the minimum amount that comes from Security delay 1,764 minutes or approximately one day. As shows this general graph, we assume that TSA security lines do not represent the main reason for late flights, despite the media and passengers pointed them. Along the regions, the security checks have the minimum value rather than causes relating to aircraft and airline. In overall, the primary reason for the delay is by Departure late, and the least reason is by Security checks, these are the same pattern in all regions.

In the bar graph of Airline delay by U.S regions and territories, is easy to look the primary carrier's responsibilities of delay. For example, in the South, there are four carriers with critical delayed minutes, Southwest (WN), Atlantic Southeast Airlines (EV), American Airlines (AA) and

Delta Airlines (DL), respectively. The slow performance of Southwest airline confirms divers graphs aforementioned.

The dot graph of Security delay shows that the South is the region with more delayed minutes 1,764 or approximately one day, and the least is U.S territories with 184 minutes.

Design

Question 1

The bar chart of Worst airline delay includes only two categorical airline delay and carriers. The airline is a qualitative variable so was simple the view on bars, and sort airline was descending by Airline delay. By suggestion of the reviewer, we swap the axes to improve the visualisation, as well edited the alias of airline abbreviations to the whole name of the carrier.

Performance of airline by arrival and departure delay bar chart, we erased repeating labels on the graph, already exposed in the legend by color.

State airport ranking by arrival and departure delay maps was the result of previous bar chart of Arrival and departure delay by state, airline, and airport, after the suggestion of the reviewer. This plan was a challenge, we combined several variables, including of geographical kind. So, after reviewed many options in Tableau help and Youtube, we designed a useful and straightforward map. A map filled with pie charts by each state, it's with colors to avoid misleading, those pie charts included all the airports in this regions. Adding the filters of states and airports, so that whenever you select a state appeared his airports. Also, we added the filters and legends of Sum of arrival and departure delay, by size.

The scatter plot of arrival and departure delay came from the constant use of these variables, such as a verified pattern to follow within the report. Satisfied the arrival and departure variables have a robust relationship between them, so we consider is util. We added the filters to read the airlines easily.

Finally, we changed the story format used because we cannot put the titles on each the graphs; so after reading the section of Tableau help the best way to keep the titles is by worksheets, otherwise through dashboard inserted on the story, so we keep the spreadsheets.

Question 2

Cause of arrival and departure delay by day and month dashboard - is represented by a line chart that shows the variation of average delayed minutes over time. Also, we added the dual axis to better comprehension. And we used a dashboard because there are two close variables such as day of week and month, both relating to measuring time. We avoid overlapping the graph with the legend. Highlighting the missing values on weekdays and months.
Cause of delay by state bar chart, include two categorical variables: airline delay and state. We sort State was descending by Airline delay to make readable the top five of delayed minutes. Used the worksheets format because it shows the titles of causes of delays graphs, rather than the story format, being an issue aforementioned in the previous question.

Question 3

Diverse causes of delay according to U.S regions and territories bar chart, we changed the spot as suggested the reviewer. Furthermore, we added a color legend with the classification of various cause of delays and hid the repeated labels on the graph. Also, there are filters of areas. Lastly, we erased the tags of the maximum and minimum values of delayed minutes, and it edited the alias of airline abbreviations to the whole name of the carrier.
Is a general chart that compiled divers causes along the five regions of U.S, it works as a path to do accurate figures according to the results.
Airline delay by U.S regions and territories is a graph with small bar visuals inside, for each area, and shows all the airlines. We classified by color and added the filters.
Security delay according to U.S regions and territories packed bubbles was the last visual modified, firstly as a reason we choose the Weather rather than Security. This change came because the main graph shows the most and least causes, so is being more accurate take the

Security delay to evaluate. The packed bubble is precise and understandable for the five regions; we added colors and labels to a natural read.

To sum up, we changed the story visual to the worksheet format because it shows the titles.

Resources

Hetter, Katia, and Michael Pearson. “Passengers: TSA Airport Security Lines 'Insane'.”CNN, Cable News Network, 16 May 2016, www.cnn.com/travel/article/tsa-long-lines-us-airports/index.html. Accessed 20 Decembre 2017.

International Air Transport Association. “Air Carrier Codes (Sorted by Carrier Name).” *Census.gov*, www.census.gov/foreign-trade/reference/codes/aircarrier/acname.txt. Accessed 20 Decembre 2017.

“Missing Values.” *Tableau help*, onlinehelp.tableau.com/current/pro/desktop/en-us/missing_values.html. Accessed 06 January 2018.

Smoak, Anthony B. *Create A Map with Multiple Layers in Tableau*. 3 July 2017, www.youtube.com/watch?v=bwUj2NZHTC4&t=94s. Accessed 07 January 2018.

Stuart. “Worksheet Title in Tableau Story.” *Tableau Community*, 31 July 2014, community.tableau.com/thread/146726. Accessed 07 January 2018.