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# Twitter Airline Analysis & Investigation



# Executive Summary

## 5 Key Points

1. Twitter data is a way to keep track of current events, this data contains important data such as time zones & text data to extract insights.

2. The data had a hot spot of negative tweets from around 2/22-2/24/2015, especially with American.

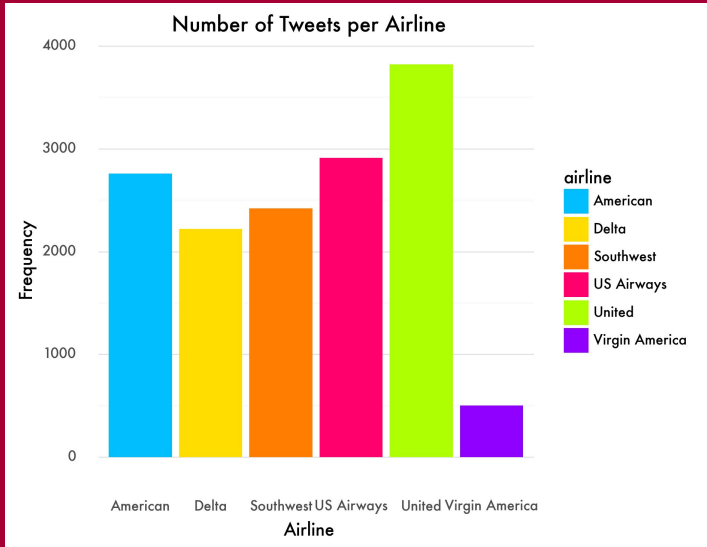
3. Virgin had the best reviews. The most common complaint was about Customer Service.

4. American & Delta had an uptick of Customer Service and Late Flight complaints higher than the rest. This was due to a storm at the big hub of JFK airport.

5. Properly training and preparing for as normal as possible operation during winter storms can preserve brand image and keep customers happy

# The Data

- Airline Data Taken in 2015 with > 14000 tweets
- Useful variables such as sentiment, tweet content, tweet created (date), timezone, airline, & complaint reason
  - Many of the variables were not documented well and therefore not used.
- Tweet location was removed, but with a more in depth analysis, movement patterns could be tracked per user.
- Only had missing values in the "negativereason" and in the "user\_timezone"
  - These rows were still used, but with them as blank.



Plot is the count of tweets per airline.

Note: Almost a proxy to how big each airline.  
Virgin being the smallest  
& United the largest

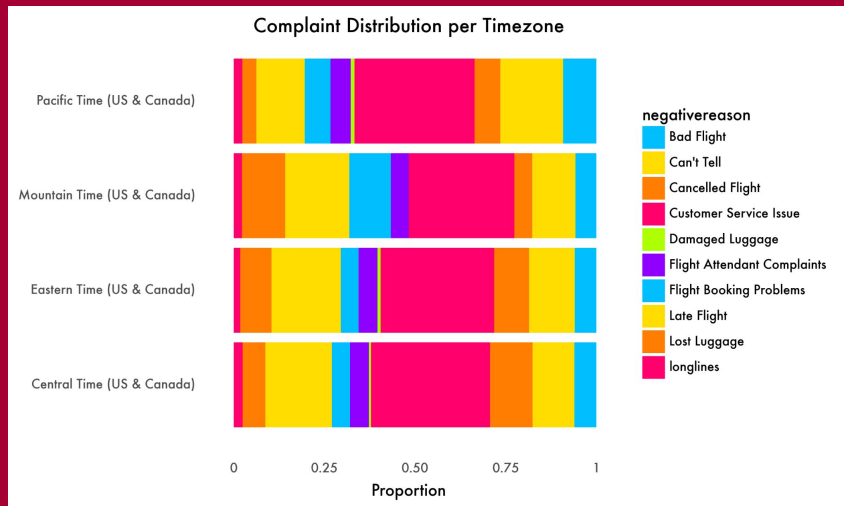
Wordcloud represents words described in the tweets, larger being more frequent

Note: I took out mentions of specific airlines or flights to get a better picture.



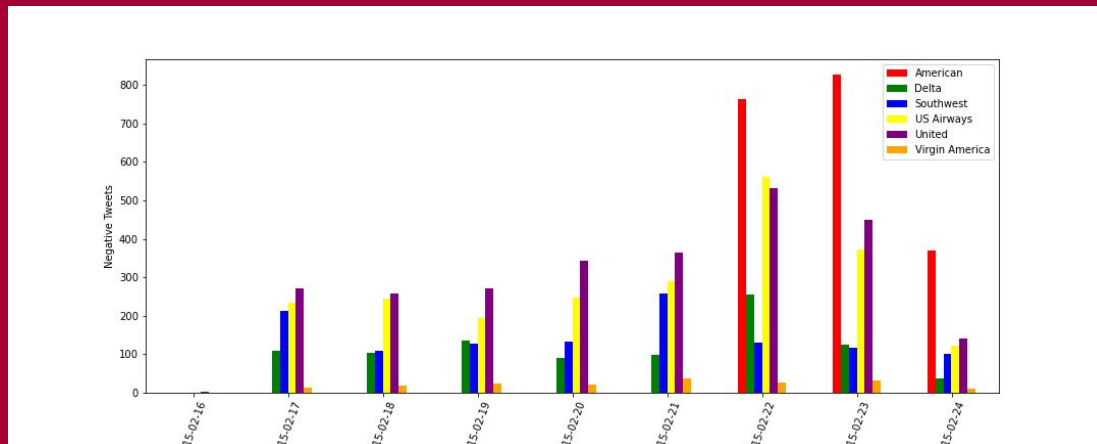
# Evaluating Time Data

- Looking at time zones may offer an interesting look to see if one area over another more or less of different reasons. Generally though, no specific complaint sticks out for a time zone
- Looking at number of complaints over time, there was a big uptick on 2/22 & 2/23



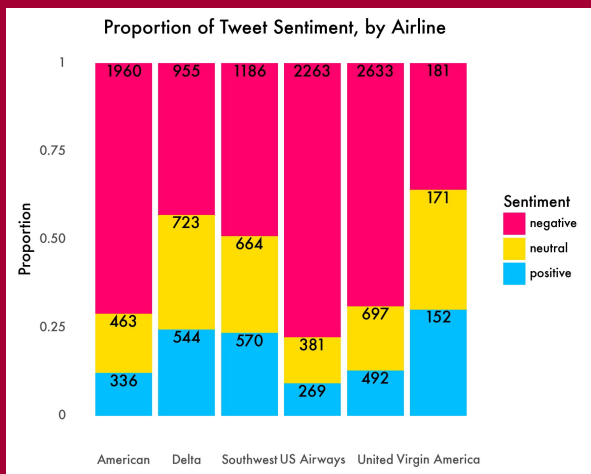
Proportional distribution of complaints throughout time zones.

This is a bar chart of how different airlines had differing number of complaints for each day during a certain period

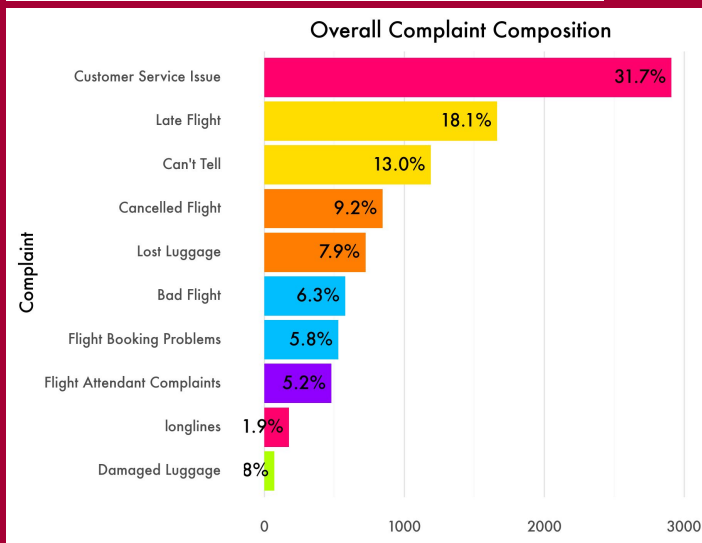


# Evaluating Sentiment & Complaints

- Virgin America had the best distribution of sentiment, while US Airways had the worst.
  - The second best is Southwest, and Delta is a close third.
- In terms of the composition of complains, Customer Service & Late Flight were the most common, representing 49.8% of complaints
- Slide below will detail the complaints per airline

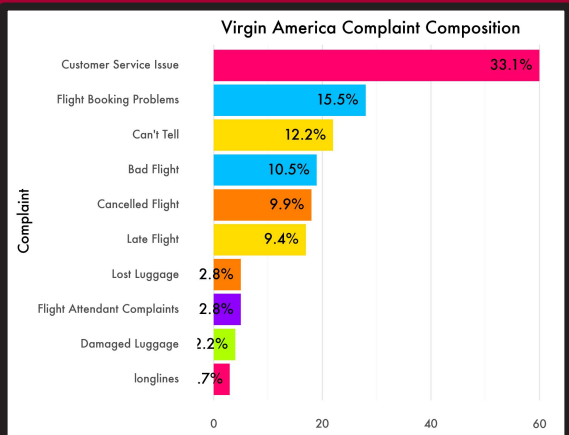
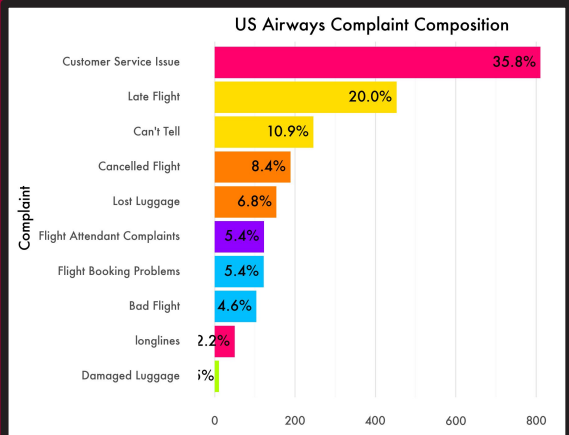
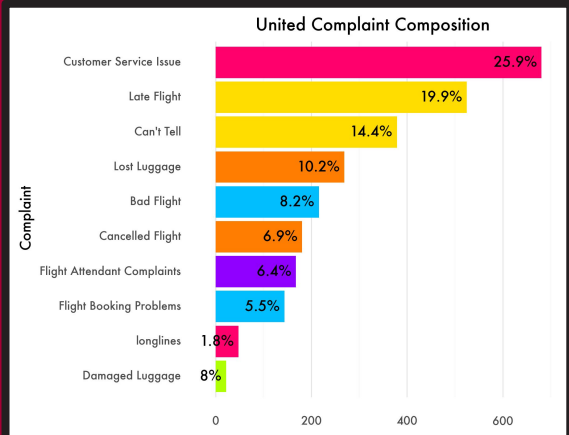
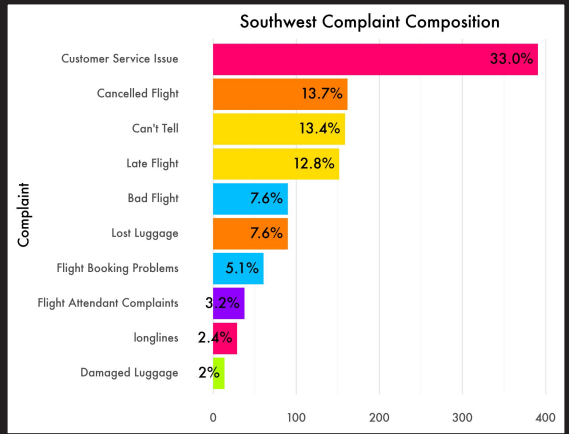
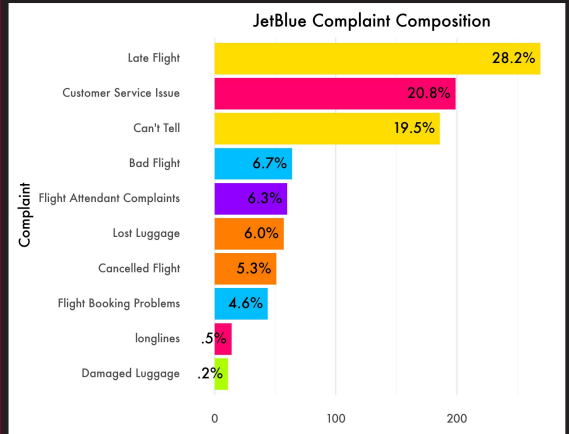
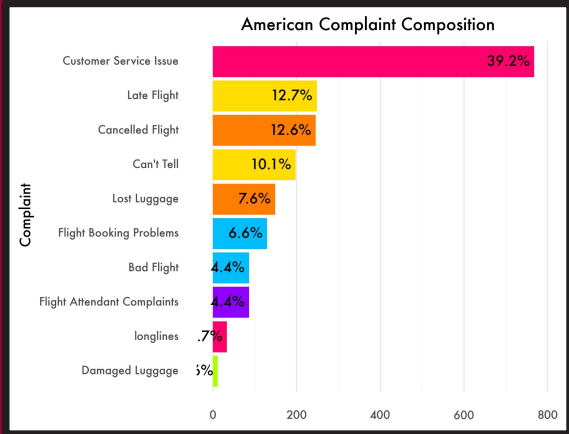


Plot shows the proportion each airline has with respect to positive, negative, & neutral tweets. Also it shows the raw counts of each.



This plot shows the raw count and the proportion of complaints overall.

# Complaints pear Airline



# Evaluating American & JetBlue

- Both these airlines had an unusual makeup of complaints
- American had an unusually high (~40%) rate of Customer Service Issues compared to the average of ~30-35%
  - Probably not due to American sucking, but due to events at the time
- JetBlue had their worst complaint being Late Flight.
  - Also Likely due to events at the time
- Evaluating this data further, most complaints were in the Eastern Time Zone, and some in the Central Time Zone



### Word Cloud for American Tweets in Eastern Time Zone for Customer Service

```
American                                     user_timezone
Eastern Time (US & Canada)                  150
Central Time (US & Canada)                  123
Pacific Time (US & Canada)                   74
Quito                                         35
London                                       17
Atlantic Time (Canada)                      15
```



## Word Cloud for JetBlue Tweets in Eastern Time Zone for Late Flights

Delta	user_timezone
Eastern Time (US & Canada)	130
Central Time (US & Canada)	230
Atlantic Time (Canada)	170
Quito	150
Pacific Time (US & Canada)	90

# Evaluating American & JetBlue

- Lots of complaints from JFK.
  - Common word on WordCloud
  - Reading tweets directly from filtered data
  - \*Mostly serviced by American & Delta
- After reading some of the filtered tweets by hand, I pulled a few ones out. Seems like chaos at JFK airport due to Weather and Organizational delays.
  - Double whammy because weather stops planes and it also throws a wrench in the operations of airport staff.

## American Tweets

@AmericanAir The pilot admitted to us that this delay is entirely because of AA incompetence and poor equip checks. -2/24/2015

@AmericanAir when the pilot announces that the plane has been unused for 2 days and maintenance is dealing with another aircraft.. 2/24/2015

@AmericanAir sitting on plane in Columbus, supposed to leave an hour ago. Now the mechanic can't find a tool to service the shock absorber. 2/24/2015

@AmericanAir @BDinDallas The personal touch you're known for, AA. Other cool perks: blaming understaffing on weather. And 3 hr hold times.

## JetBlue Tweets

@JetBlue Issue is JFK. Pilot explained once JFK reopens we can get scheduled back there, but why can't we divert to LGA? Closer than ACY! - 2/22/2015

@JetBlue Flight 1562 had a 4 1/2 hour weather delay, but what is the 45 minute delay in getting bags to tired passengers? - 2/22/2015



# Suggestions for Airlines

- Weather delays aren't necessarily something that can be explicitly planned for, but the airlines can do their best to train staff to be prepared for this kind of weather and work as normally as possible.
  - JFK shuts down every so often due to snow storms
- These methods can be used to some extent in live time to see when anomalies happen and when customers are dissatisfied.





# Thank you!

Refer Any Questions to [lydon@chapman.edu](mailto:lydon@chapman.edu)

Appendix: Code is attached in the additional file or found here: