# Team 8

# Customer Service Improvement

# In Airline Industry

## Team Members:

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**Objective:**

The purpose of our final project is to provide useful insights and recommendations to PR team of three chosen Airlines namely Delta, United and American Airlines to improve their customer service. It will be based on the 15,000 tweets collected through Twitter Stream API from all over USA.

**Our approach:**

We have used text mining approaches to analyze the collected tweets and capture people's sentiments about their experience with the Airlines through Sentiment Analysis, Word Cloud to get the positive and negative reactions, Feature Extraction by labeling negative reasons and finally displaying the insights gained through data visualization in Tableau.

**High Level Code**

- We started by downloading 15K tweets with @United, @Delta and @AmericanAir keywords. We collected it in batches due to connection issues. Later, we merged all the chunked tweets into one.
- Sentiment analysis was done on the tweets collected. We defined a function to remove all non-ascii characters as well as digits, punctuations using regular expression and plotted the histogram for Subjectivity and Polarity scores.
- For Word Cloud, we split the tweets into words and saved them into a list. We removed irrelevant words by appending them to the stop words list.
- After removing stop words, we performed stemming using Snowball Stemmer and plotted Word Cloud using the image mask feature in the form of like, dislike button and Airplane shapes.
- With the clarity of the positive and negative experience through these visualizations, we planned to do feature extraction to label negative reasons. We attempted feature extraction but due to time constraint, we couldn't complete it within the given deadline. However, we have gained insights based on Sentiment Analysis and Word Cloud obtained and provide the recommendations to PR teams at the end.

**American Airlines**

*Sentiment Analysis-*

We observed *positive polarity* as number of tweets increased through which we can infer people are positive about this Airline. But we still analyze further the positive tweets for them to continue sustaining and maintaining their brand image and analyze the negative for continued improvement in areas requiring attention.
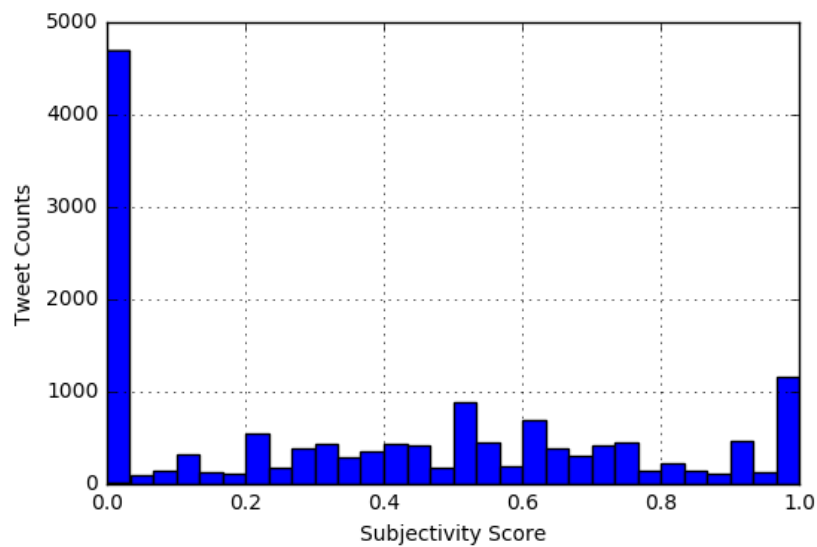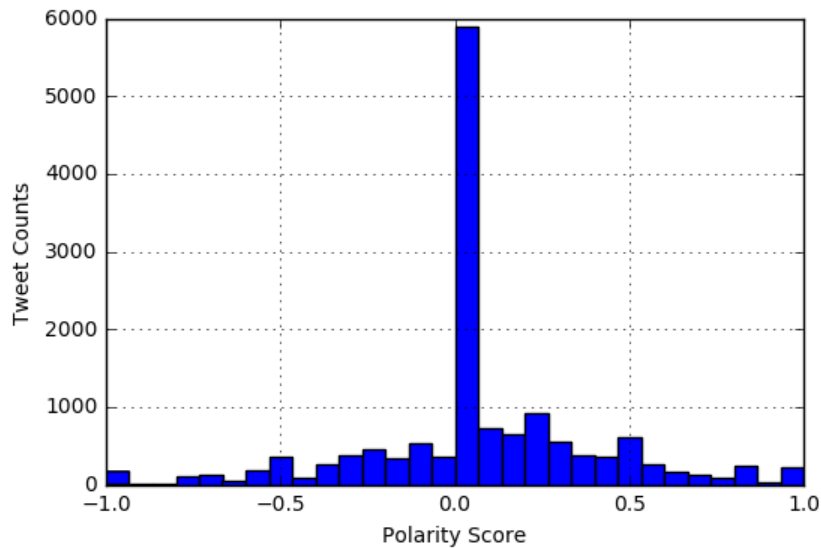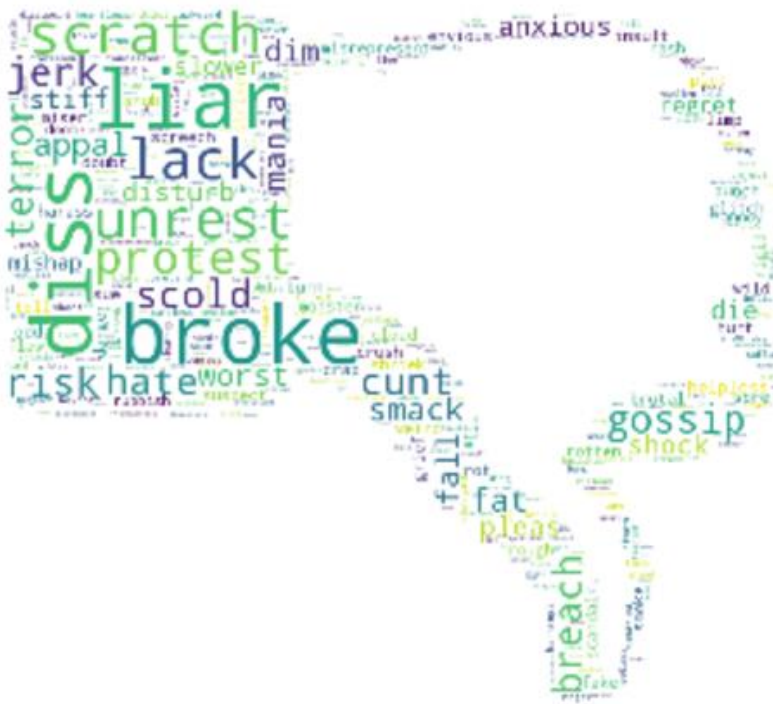




```
Average of Polarity Scores: 0.0572788453239
Average of Subjectivity Scores: 0.381645572682
```

## *Word Cloud:*

Below is the Word Cloud for all tweets.



Below are the *negative words* extracted from tweets for American Airlines that display customer emotions and dissatisfied experience with the Airlines.

Below are the *positive keywords* that help us analyze what is most liked by the customers and their delightful experience with American Airlines.

**DELTA**

*Sentiment Analysis-*

Below are Polarity and Subjectivity scores plotted using histogram along with their average scores. As we observe a *negative polarity* for Delta, it indicates that the Airlines have some dissatisfied customers and requires some strategy or changes to be adopted for customer service improvement.
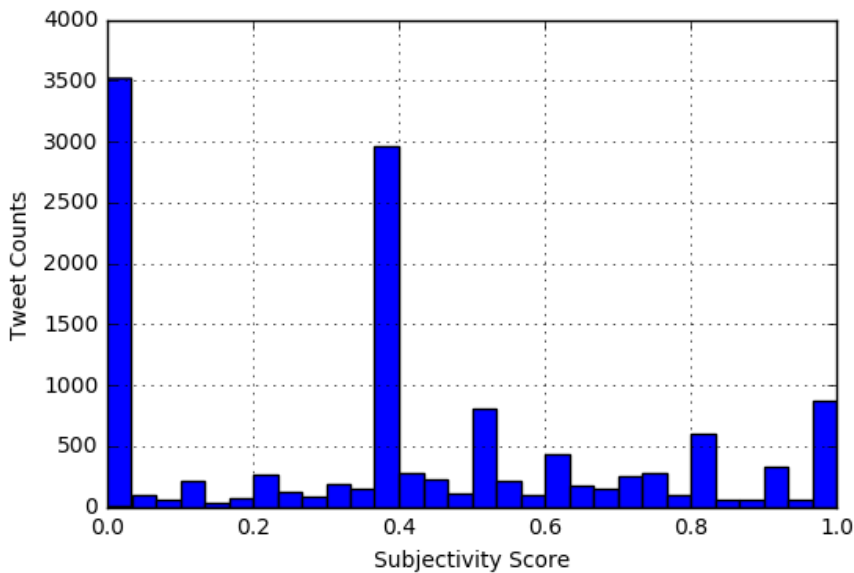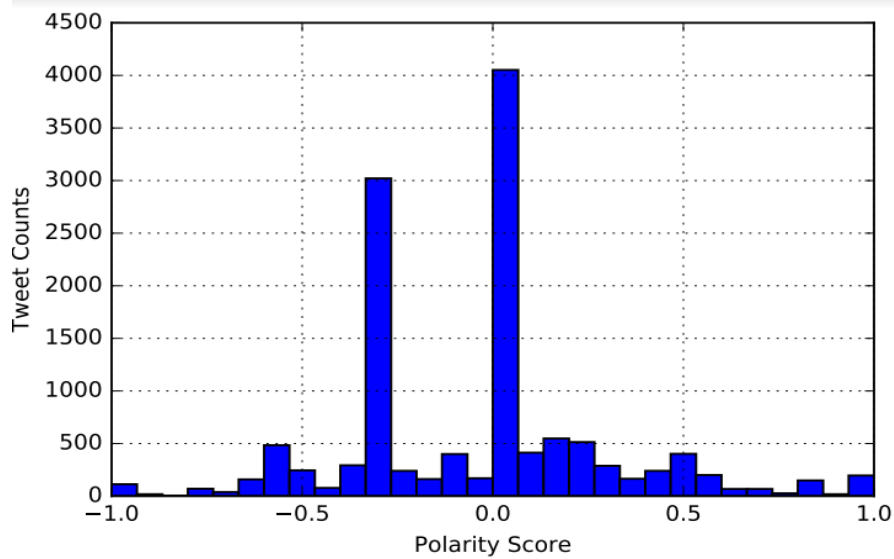




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Average of Polarity Scores: -0.0583709089602
Average of Subjectivity Scores: 0.384450817449
```

## *Word Cloud:*

For PR teams to understand what is in favor and against them, we have extracted the negative and positive words from the tweets collected to focus on the two areas separately.



Below screenshot is a Word Cloud from the negative tweets.

Below screenshot is a Word Cloud from positive tweets.

**United Airlines:**

*Sentiment Analysis-*

Below are the Polarity and Subjectivity scores plotted using histogram for United Airlines.

As the graph suggests, the polarity is fairly positive despite the recent unfortunate scenario where the passenger was dragged off the plane due to lack of management by United Airlines. However, they might have taken measures for improvement and therefore seeing better and positive results now. It is important to analyze and provide insights for continued improvement.
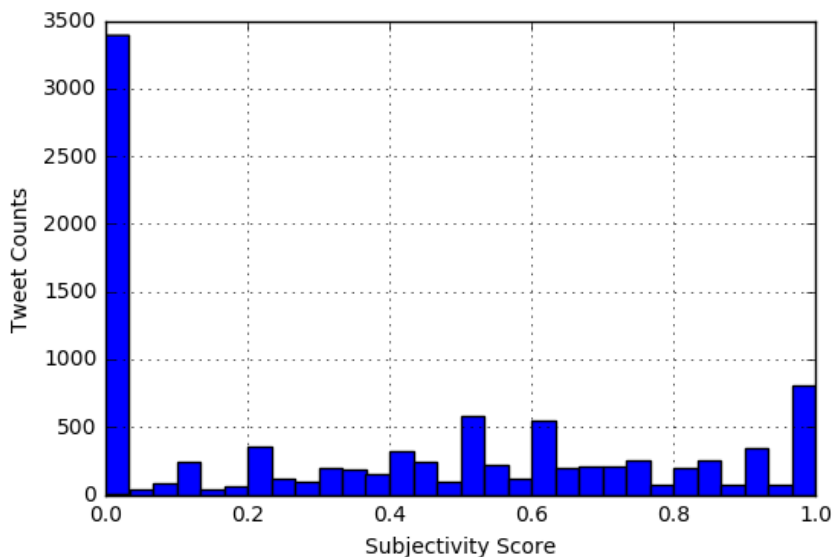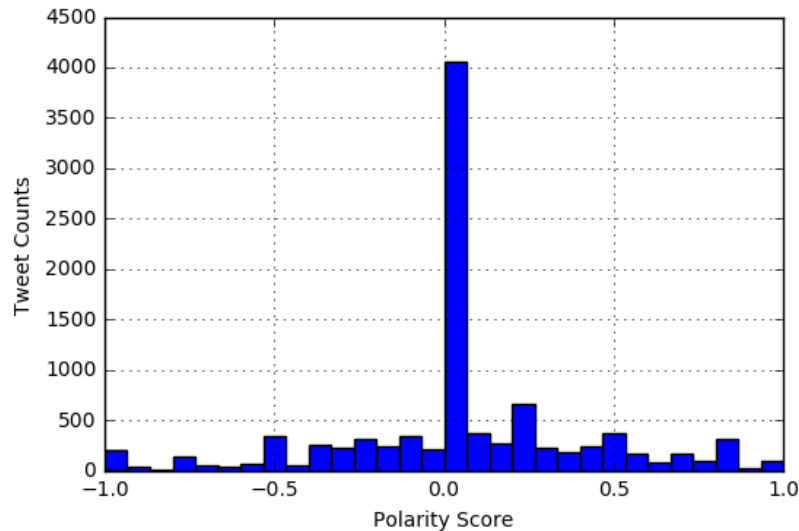




Average of Polarity Scores: 0.0417215367133
Average of Subjectivity Scores: 0.382696202587

*Word Cloud:*



The negative words extracted from tweets for United Airlines.

The positive words extracted from tweets for United Airlines.



**Insights:**

As we understand, in today's world people openly express their sentiments and opinions over Social media platforms and it becomes very important for PR or branding teams to maintain and build the brand image of their company or service. Through the above analysis, we have derived following insights for the three chosen Airlines.

For American Airlines:
- ➢ Some passengers with platinum membership have been complaining about the recliner **seats broken** or not functioning and AmericanAir not providing the facilities to privileged members.
- ➢ **Breach** of disability protocol experienced by some passengers which has created outrage.
- ➢ **Baggage lost** due to flight transfers of passengers.
- ➢ Customers happy with the benefits of **gold** membership of the Two-million-mile program.
- ➢ Comparison with United Airlines where customers feel AmericanAir have better customer service than United.

Recommendations:
- ➢ Important to ensure the airplane seats are fixed and provide comfort to passengers.
- ➢ Equality among passengers to be maintained, avoiding discrimination or disabled passengers feeling less privileged with less facilities.
- ➢ Strict Maintenance and baggage tracking measures.
- ➢ Continue offering beneficial programs to loyal customers for continuous improvement.

For Delta:

- People are worried about **delay**.
- It seems the flight is too **cold** and no temperature control is provided to the customers.
- People are **boycotting** the flight due to some reasons.
- Some have **missed** their luggage.
- Some are talking about **assault.**
- **Trash** is not being handled properly**.**
- Some are stuck in the queue and talking about the **meltdown.**

Recommendations:

- PR team should work on informing the customers about any kind of delays.
- Luggage should be properly handled.
- Training should be given to all flight crew to behave nicely even in extreme situations.
- Proper guidelines should be provided to the people for addressing queue.
- Trash should be handled properly and the flight should be maintained neat and clean.

For United:

- Some are talking about **insult.**
- People are talking about **attack** (this could be the attack in which a women passenger was kicked by a Pilot)
- Comparisons of United with Delta indicating both are not doing well.

Recommendations:

- If accommodating a passenger from first class to economy, proper compensation should be given and not take passengers for granted.
- Many complaints about not taking care of the loyal, frequent fliers. It is very important to ensure retention of loyal customers with the good treatment, service, and compensations if any.
- Ensuring better baggage control systems.

**References:**

1. Video lectures, code by Prof. Gene Moo Lee
2. https://stackoverflow.com
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4. http://www.heidislojewski.com/blog/
5. http://ipullrank.com/step-step-twitter-sentiment-analysis-visualizing-united-airlines-pr-crisis/
6. https://apps.twitter.com/