

Flying High or Crash Landing?

Analyzing Public Sentiment about the Big Four U.S. Airlines

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Introduction/Abstract:

Air travel is an exciting, yet polarizing experience. In fact, over 60% of all air travel is accounted for domestically across the United States. This project will use public sentiment and review to analyze the performance of the U.S.'s "big four" major airlines – Delta, American, Southwest, and United. First, by scraping the top 1,000 reviews for each airline from airlinequality.com, a csv file will be concatenated to prevent the repeating of a 20+ minute scraping process to ease the future use of sentiment analysis. Following this scraping, sentiment scores will be assigned to each review with a score of -1 to 1 with -1 being the most negative and 1 being the most positive. Each review's score will be grouped by its airline and averaged into a chart that portrays the airline's average score, which will then be ranked to show which airlines are the worst and which are the best. Beyond this, a graphic will be built to show the most common trigger words amongst positive and negative reviews.

Hypotheses:

Before hypothesizing the results of the data analysis, I would pose that the factors we may find most frequent in our reviews are price, leg room, and cabin staff. Because of this, based on personal experiences with all airlines and word of mouth, I suspect Southwest Airlines will be the top rated, followed by United and Delta, leaving American Airlines at a distant last place. Southwest is historically cheaper and easy airline to use without feeling "outclassed" by "first-class passengers." In addition to this, I have flown overseas with Delta, United, and American airlines and found American to be the most uncomfortable seat with the most minimal leg room by a significant margin, leaving them to be my lowest rated airline.

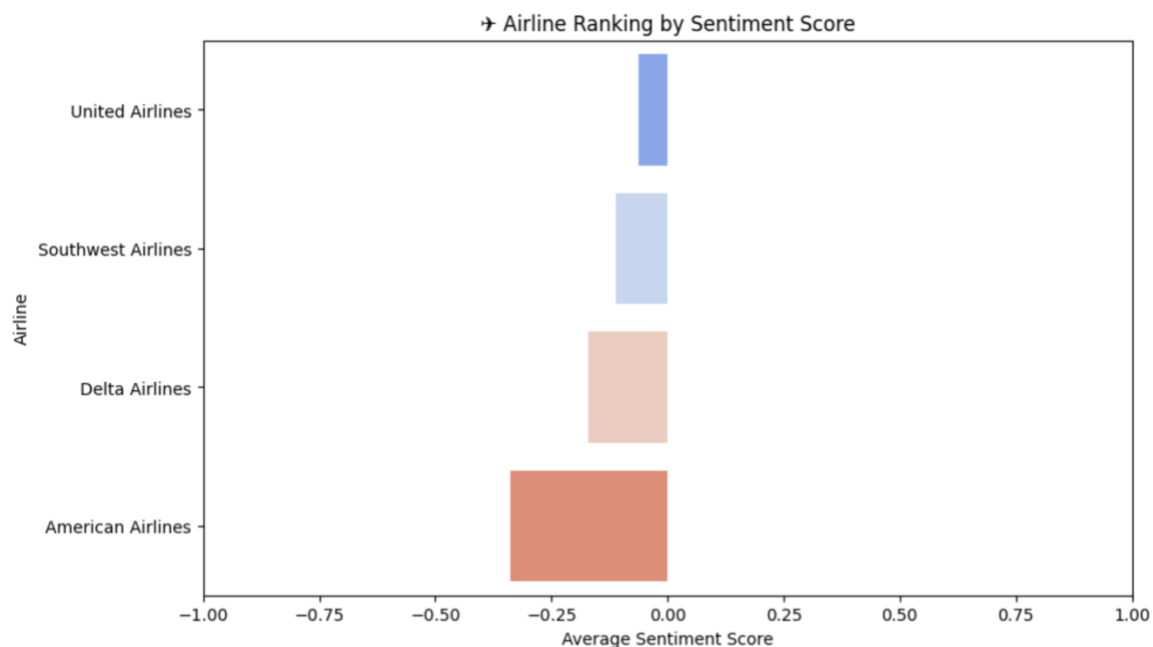
Challenges:

It is important to note that most of the public will only leave reviews when dissatisfied. This could skew the scores to remain below 0 regardless of the airline's ranking. In addition to this, positive experiences - regardless of the extremity of the experience - will not be showcased at a high volume, leaving us to find what might just be the airlines ranked from worst to "least bad." Another challenge is the potential for fake or exaggerated reviews, whether from disgruntled customers, airline promoters, or bots, which could distort the accuracy of the sentiment analysis. Finally, sentiment analysis historically struggles with sarcasm, mixed sentiment reviews, nuanced language, and overweighing strong verbiage beyond the intent of the commentor, leading to incorrect rankings that could impact the final rankings. Despite these challenges, this project will attempt to evaluate the subject matter at hand with the highest effectivity possible.

Results/Conclusion:

The analysis of flyer reviews for the big four American airlines reveals a general pattern of discontent, relating the trend of travelers to write reviews mostly when having an unpleasant experience. As expected, all airlines have sentiment scores below zero, confirming that criticism is more commonly expressed than compliments. With the highest average sentiment score (-0.0626) among the airlines under review, United Airlines leads the pack in favorability (or lack of disapproval?). With a score of -0.1124, Southwest Airlines comes in a close second place, flipping the first two places of my hypothesized rankings. American Airlines earned the lowest sentiment score by a significant margin with a score of -0.3381, making it the airline with the most disapproval in this comparison, while Delta Airlines came in third with a score of 0.1698.

This supports my hypothesis of the 3rd and 4th place rankings amongst these big four. These rankings are graphically portrayed in a bar chart below, with American Airlines having the most negative evaluations and United Airlines being the least criticized of the four. This is consistent with the hypotheses of incidents regarding pricing, luggage handling, in-flight amenities, and service quality. These findings give a broad picture of how consumers evaluate each airline, despite sentiment analysis's drawbacks, which include the possibility of inflated evaluations due to the challenge of deciphering sarcasm. In addition to providing airlines with information on areas where their services may be failing, the findings might also assist passengers in making better judgments when booking travel.



After this, building a word cloud model revealed key trigger words commonly found in positive and negative reviews. Unsurprisingly, “flight” and “plane” are prominent in both categories. This does not have much influence as flights and planes tend to be subject of any air travel reviews. However, something interesting is the prevalence of “Delta,” which appears

equally in both positive and negative sections at a mid-size. This may suggest that Delta delivers a polarizing experience - providing either a decent praise or a short criticism. Meanwhile, the “positive” word cloud highlights that United Airlines consistently provides a positive experience, confirming the findings of the prior model.



Beyond specific airlines, these visualizations reveal factors that may matter most to flyers. “Time” stands out as a critical factor in both reviews, but a higher skew in positive reviews. These reviews likely mention time saved through efficient service and minimal delays quite frequently. Conversely, beyond the detecting of a sentiment analysis, “time” should likely show to be a bigger factor in the negative chart as it plays into the word, “delayed.” Delays are the most common issue with air travel and the complaint of time can take many forms in a grammatical sense, so it may be more useful to account for all variations of the word(s). Another valued aspect is comfort, as seen from the word “seat” in the positive chart, alongside praise for efficient baggage handling through the word, “bag”. Lastly, the prominence of “hour” in the negative chart plays into the “time” argument as people often express frustration by specifying delays in hours. Quantifying the issues can get the point across in an effective manner.

Scraped Links:

<https://www.airlinequality.com/airline-reviews/american-airlines/page/>

<https://www.airlinequality.com/airline-reviews/united-airlines/page/>

<https://www.airlinequality.com/airline-reviews/delta-air-lines/page/>

<https://www.airlinequality.com/airline-reviews/southwest-airlines/page/>