

British Airways – Forage Internship

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EXECUTIVE SUMMARY

Over 3,000 reviews for British Airways flights have been analyzed. They are broadly negative (2,383 classified as negative, versus 938 being positive). Six topics have been identified (business class, in-flight experience, customer services, check-in and seating, positive experiences, and comparison to budget airlines) and frequent words for each topic have been identified.

CONTENTS

Executive Summary.....	1
Introduction	1
Methodology.....	2
Results.....	2
Scraping.....	2
Sentiment Analysis.....	3
Topic Modelling	3
Word clouds	3
Discussion.....	3
Limitations	4
Conclusion.....	4
Appendices.....	5
Word clouds	5

INTRODUCTION

We have been tasked to report on the experiences had by customers of British Airways (BA), the flag carrier airline of the UK. Focusing on feedback in the form of customer reviews of flight experiences that have been left on the website Skytrax, we aim to understand customers' feelings and needs, and to determine any important feedback.

METHODOLOGY

The process involved several key steps:

1. Scraping to collect passenger reviews. Using a Jupyter notebook provided by the BA team and Forage we scraped the website www.airlinequality.com for passenger reviews concerning British Airways flights.
2. Data preprocessing. Using Pandas the scraped data was tidied.
3. Sentiment analysis. This was performed using the pretrained model *DistilBERT base uncased finetuned SST-2* from Hugging Face, using the *transformers* package and *TensorFlow*. The reviews were tokenized using the associated tokenizer before running through the model.
4. Topic modelling. We used the *sci-kit learn* implementation of Latent Dirichlet Allocation (LDA) to classify each review into one of three topics (Business Class, Customer Service, Other). To determine the number of topics we compared perplexity and log-likelihood scores for values from 3 topics to 10. Before running the LDA model, we needed to prepare the data by removing stopwords, and lemmatizing (e.g. 'looking' becomes 'look'). These tasks were performed using the *Gensim* and *spaCy* packages. We tokenize it, using
5. Creating word clouds. For each topic, and for all topics combines, we created word clouds for all positive and all negative reviews to find the key themes. We used the *wordcloud* package.

For each step we used a jupyter notebook and python. Pandas was used to manage the dataset, sci-kit learn was used to the vectorization (either tf-idf or count).

RESULTS

Scraping

We scraped 3,451 reviews from www.airlinequality.com. A brief extract from a small sample of these is shown below:

This is the worst experience I have ever had with any airline. I flew with British Airline on August 21st 2022. I had one checked bag that was lost at Heathrow Airport. I am aware that at that time there was a system error with the baggage belt and many travelers were affected.

Cheery, friendly crew - biggest problem is the excessive hand baggage allowance permitted on BA. Selfish people take huge cases on board, filling up the lockers so everyone with more modestly sized items can't get a look in. Cabin crew quite stressed trying to move cases around lockers to get everyone sat down.

British Airways call themselves a "full service" airline. This they seem to think means providing a packet of crisps or a cookie with your drink of choice. How can it be called "full service" if they even run out of crisps on a 45 minute flight between London City and Amsterdam? Really poor.

Flew Newcastle to San Francisco via London Heathrow with British Airways. One issue after another! The flight from Newcastle boarded early but due to weather conditions in London, we departed late. We should have had a two hour lay-over for our connecting flight but arrived only

thirty minutes prior to departure to San Francisco and were told at disembarkation that we had been re-routed via Washington! Our booked flight to San Francisco also departed late and we sat in the lounge watching it push back.

Sentiment Analysis

Of the 3,451 reviews, we identified that the majority were negative reviews. Those with strong sentiments counted as follows:

- Positive: 938
- Negative: 2,383

Topic Modelling

Using the Latent Dirichlet Allocation, we identified three main topic areas, with the following counts of reviews having the given themes. The sentiment ratings are between 0 (bad) and 1 (good).

- Business class: 560 (16%)
 - These reviews mentioned business class.
 - Average sentiment: 0.175
- Customer service: 651 (19%)
 - These reviews mention delays, cancellations and dealing with customer services.
 - Average sentiment: 0.028
- In-flight experience (not business class): 823 (24%)
 - Mostly talking about food, but also the in-flight entertainment.
 - Average sentiment: 0.110
- Budget airline comparison: 338 (10%)
 - Discussing a downhill trend of BA service and comparing with Easyjet and RyanAir.
 - Average sentiment: 0.106
- Check-in and seating: 190 (6%)
 - Check-in experience and seat assignments.
 - Average sentiment: 0.247
- Positive reviews: 1,000 (29%)
 - Reviews using words like 'good', 'excellent' etc.
 - Average sentiment: 0.813

Note that reviews can be assigned to more than one topic, or none at all.

Word clouds

A word cloud was created for each topic. Certain words and phrases were excluded to make them more meaningful. They can be found in the appendix.

DISCUSSION

While the majority of the reviews are negative, this is perhaps to be expected from online reviews, where participation bias means people with grievances are more likely to write a review.

Highlights from particular topics:

- Business class:
 - Privacy is mentioned a lot, as well as the flat bed.
 - Food features often, with some complaints (“overcooked”).
 - The sentiment for these is very negative overall.
- Customer services:
 - A common concern is their luggage. Perhaps training staff to better handle this particular aspect, even if only to pre-emptively sympathise with the customer, but perhaps to actively give advice on this matter.
- In-flight experience:
 - This is essentially food and entertainment.
 - It is important: almost a quarter of reviews focus on it.
- Budget airline comparison:
 - Complaints about the standard of service, including having to buy food and drink on certain flights.
- Check-in and seating:
 - Words like “mother” and “parents” suggest might complain about not being seated near travel companions.
 - The most notable word here is “pillow”.
- Positive:
 - “Afternoon tea”, “food was good”, “concorde room”, “seat was comfortable”, “landed on time”.

Limitations

Participation bias means reviews are more likely to be negative.

The topic modelling was based on word frequencies and is not a perfect model. Attempts were made to improve the performance by standardising some language used, such as changing “world traveller” to “economy”, before fitting the model.

This has only been run for British Airways reviews. Comparing with similar modeling for other similar airlines might better highlight what areas BA can improve in.

CONCLUSION

You can’t please everybody, and some things are out of your control. However, it seems business class customers are largely disappointed. As a substantial revenue source this should be concerning to BA. It is also notable that there are a significant number of reviews (10%) that compare BA to budget airlines. Still, almost a third of the reviews are positive, which is great news.

APPENDICES

Word clouds



Figure 1: Check-in and seat assignment.

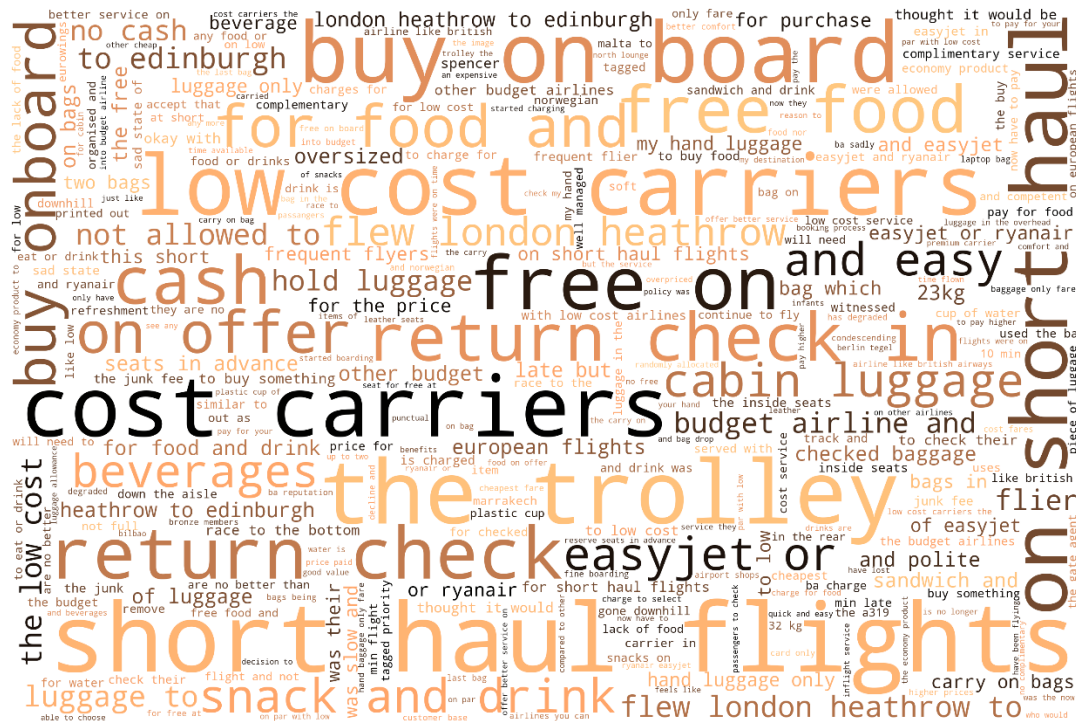


Figure 2: Budget airline comparisons.



