```
British Airways Passenger Reviews (2016 - 2023)
Analysis
Introduction
This case study is the Capstone Project of Google Data Analytics Professional Certificate. The 6 steps of Data Analysis is used to present this
analysis.
Title: British Airways Reviews Case Study
Author: Musa Naim
Date: 7 November 2023
How can British Airways use customer feedback to make
smarter business decisions?
Step 1: ASK
1.0 Background:
British Airways, one of the world's leading airlines, has been synonymous with excellence and reliability for decades. With a rich history and a
commitment to providing exceptional customer experiences, British Airways continues to be a preferred choice for travelers worldwide.
I believe that valuable insights can be drawn from customer reviews and the leverage data-driven approaches to enhance the airline's services and
customer satisfaction.
1.1 Business Task:
Analyze British Airways Passenger Review Data to gain insights into how different groups of consumers experience with British Airways differed
and discover trends and insights for British Airways' marketing strategy.
1.2 Business Objectives:
• What are the trends identified? • How can British Airways use insights to improve customer experience? • How could these trends help influence
British Airways business strategies?
1.4 Deliverables:

    A clear summary of the business task

   2. A description of all data sources used
   3. Documentation of any cleaning or manipulation of data
   4. A summary of analysis
   5. Supporting visualizations and key findings
   6. High-level content recommendations based on the analysis
1.5 Key Stakeholders:
   1. British Airways Business decisions team
   2. British Airways marketing analytics team
STEP 2: PREPARE
   2. Data has not been updated suce
   3. As data is collected in a survey, hence unable to ascertain the integrity or accuracy of data.
2.1 Information about Data source used
Data Origin and Collection Process: Web scraped from the world renowned Skytrax website by former British Airways Employee as part of a data
science project Time Period: Data set contains Reviews between 2016-2023 Data Format: original data set was in .csv format Data Quality
original data set included unverified reviews. These were removed as part of the data cleansing process Data pertained in the data set: (1)
Reviews, (2) Date, (3) Country, (4) Seat_type, (5) Recommended, (6) Stars, (7) Route, (8) Type_of_Traveller
2.2 Limitations of Data Set:
   1. Data set is only 2498 entries at source
   2. Data set was last updated in March which means the data is not up to date and dose not reflect any business decisions executed after.
2.3 Is Data ROCCC?
A good data source is ROCCC which stands for Reliable, Original, Comprehensive, Current, and Cited.
Reliable - MED - Not reliable as it has 2498 respondents which should be enough to derive data insights with some confluence in trends Original -
HIGH - Sourced and used by former British Airways data scientist Comprehensive - MED - Parameters match most review format parameters (e.g.
stars, reviews, reccomend) Current - High - Data has been sourced upto this year Cited - LOW - Data collected from third party, hence unknown
Overall, the data set is considered decent quality data and it could be a reasonable decision to produce business recommendations based on this
2.4 Data Selection:
The following file is selected and copied for analysis.
   British_Airway_Review.csv
STEP 3: PROCESS
r was used for the preparation and processing of data for this project
3.1 Preparing the environment
The tidyverse and ggplot2 packages are installed.
 # Library Imports
 library(tidyverse)
 library(ggplot2)
3.2 Importing data set
Reading in the selected file.
 # Key data Imports
 BAFeedback <- read.csv('British_Airway_Review.csv')
3.3 Data cleaning and manipulation
Observe and familiarize with data
Check for null or missing values:
   · Excel search carried out for empty cells
Perform sanity check of data:
Firstly I wanted to be able to track each entry with a unique identifier in case of a more detailed business task coming up in the future. I did this by
providing each row with a new column using a combination of date, route and review; ASSUMPTION – The probability there are multiple entries
 with all 3 of these being the same in a data set of this size is near impossible
 BAFeedback$UID <- paste(BAFeedback$reviews, BAFeedback$date, BAFeedback$route, sep = '_')
I doubled the usage of this unique identifier using it as a method of checking for duplicates.
 unique_check <- !duplicated(BAFeedback$UID)</pre>
 unique((unique_check))
  ## [1] TRUE
The returned value is 0. Each entry is unique

    Previewing using head function to show the first 10 rows of daily_activity to familiarize with the data.

  head(BAFeedback)
  ##
  reviews
  ## 1
  ☑ Trip Verified | I had the most fantastic BA Flight today. The cabin crew in my seat zone 6D were of the best
 I have experienced. Although the 777 had the old style rear/front seating - it was comfortable and felt open and
 spacious. BA have done great things with the menu - it was nice not to have to eat breakfast food on the pre-arri
  val meal into HKG at 1730PM local time having left London at 2200 the night before. The dinner offering was equal
 ly ample and delicious. The inflight entertainment had a great collection of TV and current films and the infligh
 t map was first rate. Previously not a huge BA fan - but after this 12 hour flight I could only recommend it with
 out reserve. I flew the new BA suite in J class on a recent Delhi to London flight and enjoyed that product (alth
 ough I felt it slightly more cramped ) but I think BA have stepped up with really comfortable bedding and food an
 d very friendly crew who engaged throughout the flight in the best way. Couldn't recommend BA more on this flight
  ## 2
  Trip Verified | Couldn't book in online. Arrived at check in to find we had been bumped off due to oversellin
 g. No BA staff available. Very helpful Gatwick staff got us a bus to LHR and a flight to Toulouse. Had knock in e
 ffect on our car booking and sharing as the rest of family had been able yo board original flight. Airlines shoul
 d be legally stopped from selling seats twice.
 ## 3
  ☑ Trip Verified | London Heathrow to Mumbai in a Boeing 787-8 in Business Class. The lounge near Terminal 5, Gat
 e B36 at Heathrow was outstanding in its service and offerings. It provides us just the right frame to relax in b
 efore boarding as the departure was delayed by almost 2 hours. The 787-8 on our flight featured the older Club Wo
 rld seating. Not the best in class but comfortable enough. I hear that the new Club Suites configuration is far s
  uperior. British Airways onboard service was outstanding in every respect. All in all, a very comfortable flight.
 One minor irritant: for some reason this aircraft was not fitted with WiFi. We got into Mumbai at 8 am, a civiliz
  ed time to arrive.
  ☑ Trip Verified | Keflavík, Iceland to London Heathrow on an A320 in Business Class. The journey got off on an u
  npleasant note - the Business Class line at Keflavík was so long that it looked like an Economy Class check-in. I
 t took over 30 mins to get through. There was no lounge access offered. The boarding process was well handled. Br
 itish Airways Business Class seats for the Club Europe product are terrible - exactly the same as Economy with th
 e middle seat left vacant. You don't even get extra pitch. What made the overall product tolerable were the good
 onboard service and the inflight WiFi. Also the fact that the flight leaves at a convenient mid-morning time of 1
  ## 5 🔽 Trip Verified | Terrible Experience with British Airways. I booked a flight with BA to travel from Gibral
 tar to London Heathrow on May 10, 2023. My flight was scheduled to leave at 4:00 p.m. in the afternoon. I had ori
 ginally planned on leaving my luggage at Heathrow upon arrival and travelling to visit and overnight at my cousi
 n's place. En route to GIB airport a few hours prior to departure, I checked my flight details and found out that
 my flight had been cancelled. I had a connecting flight booked with Westjet from London Heathrow to Vancouver the
 following day and I had to make that flight, so it was imperative that I got to London. I checked the BA website
  and couldn't find any other flights with them that would work, so unfortunately I made the mistake of requesting
 a refund. I managed to find a flight out of Malaga that got me into London just after 10:00 p.m. so I booked that
 and then called British Airways as I wanted to discuss compensation. That's when they advised me that because I h
  ad requested a refund (they used the phrase "abandoned" travel with them), they were not prepared to do anything
 for me. Apparently, I should have called them first, and then they would have made the arrangements. Of course th
  ey don't explain that on their website - they just ask if you want a refund and then proceed. And even when I ple
  ad my case with the agent at Malaga airport and then followed up with Customer Relations several times via email,
 they flat out refused to budge. I had used a travel voucher to cover the cost of my flight and had used Avios to
 cover the cost of my checked baggage, so in other words no out of pocket costs for the trip. Once this incident h
 appened, I ended up spending 660 euros in airfare and checked baggage charges to get to London from Malaga (i.e.,
 different airport than the one I had originally booked from). And because the luggage storage facility at Heathro
 w had closed by the time I eventually arrived, I ended up booking a night at a hotel since I couldn't travel by t
 rain to my cousin's place any longer (3 bags in tow) and I didn't want to put him out and have him drive to the a
 irport to pick me up. This cost me another £125 in room and meal costs. All BA ended up doing to compensate me wa
 s to give me 5,000 free Avios - a mere pittance compared to my out of pocket expenses. Despite trying to explain
 to them why I requested the refund instead of calling them first, they wouldn't budge. Very easy for them to say
 what I should have done since they work there and know the rules and they weren't the ones scrambling to find alt
 ernative travel arrangements within a few hours. I pointed out that on their website they should simply instruct
 customers to call them when this situation happens, and that way they would never encounter this problem. My feel
  ing is that they put the refund option out there in the hope that customers will make the mistake I did so they c
  an then wash their hands of the situation and ultimately save money. I've been an Executive Club member for years
 and they simply didn't care. They said there was nothing they could do. I'm sure if one of the BA executive's fri
  ends or family members had gone through this, staff there would have been given the instruction to make things ri
 ght. I used to be a fan of BA but they have really gone downhill in my opinion. Once I used up my remaining Avios
 and travel credit, I will cancel my Executive Club membership and never fly with them again.
  🔽 Trip Verified | An airline that lives in their past glory and heading a future of crisis is British Airways. I
  am not joking we are a family of 7 all in Business Class heading for a Norwegian and Arctic Cruise and they lost
 10 of our bags! They will never see me on any of their flights ever a disaster of an airline
                            country seat_type recommended stars
 ## 1 1st August 2023 Hong Kong Business Class
  ## 2 31st July 2023 United Kingdom Economy Class
 ## 3 31st July 2023 Iceland Business Class
                                                              yes 3
  ## 4 31st July 2023
                          Iceland Business Class
                                                              yes 5
                           Canada Economy Class
                                                              no 5
  ## 5 29th July 2023
  ## 6 26th July 2023
                              Qatar Business Class
                                                               no 3
                       route type_of_traveller
  ## 1 Heathrow to Las Vegas Family Leisure
  ## 2 Rome to Heathrow
                                 Solo Leisure
  ## 3 Gatwick to Venice Solo Leisure
 ## 4 London to Luanda Couple Leisure
 ## 5 Denver to Heathrow Family Leisure
  ## 6
                  BKK to LHR
  ##
  UID
  ## 1
  ▼ Trip Verified | I had the most fantastic BA Flight today. The cabin crew in my seat zone 6D were of the best
 I have experienced. Although the 777 had the old style rear/front seating - it was comfortable and felt open and
 spacious. BA have done great things with the menu - it was nice not to have to eat breakfast food on the pre-arri
 val meal into HKG at 1730PM local time having left London at 2200 the night before. The dinner offering was equal
 ly ample and delicious. The inflight entertainment had a great collection of TV and current films and the infligh
 t map was first rate. Previously not a huge BA fan - but after this 12 hour flight I could only recommend it with
 out reserve. I flew the new BA suite in J class on a recent Delhi to London flight and enjoyed that product (alth
 ough I felt it slightly more cramped ) but I think BA have stepped up with really comfortable bedding and food an
 d very friendly crew who engaged throughout the flight in the best way. Couldn't recommend BA more on this flight
 today_1st August 2023_Heathrow to Las Vegas
  ▼ Trip Verified | Couldn't book in online. Arrived at check in to find we had been bumped off due to oversellin
 g. No BA staff available. Very helpful Gatwick staff got us a bus to LHR and a flight to Toulouse. Had knock in e
 ffect on our car booking and sharing as the rest of family had been able yo board original flight. Airlines shoul
 d be legally stopped from selling seats twice._31st July 2023_Rome to Heathrow
 ▼ Trip Verified | London Heathrow to Mumbai in a Boeing 787-8 in Business Class. The lounge near Terminal 5, Gat
 e B36 at Heathrow was outstanding in its service and offerings. It provides us just the right frame to relax in b
 efore boarding as the departure was delayed by almost 2 hours. The 787-8 on our flight featured the older Club Wo
 rld seating. Not the best in class but comfortable enough. I hear that the new Club Suites configuration is far s
  uperior. British Airways onboard service was outstanding in every respect. All in all, a very comfortable flight.
 One minor irritant: for some reason this aircraft was not fitted with WiFi. We got into Mumbai at 8 am, a civiliz
  ed time to arrive._31st July 2023_Gatwick to Venice
  ▼ Trip Verified | Keflavík, Iceland to London Heathrow on an A320 in Business Class. The journey got off on an u
  npleasant note - the Business Class line at Keflavík was so long that it looked like an Economy Class check-in. I
 t took over 30 mins to get through. There was no lounge access offered. The boarding process was well handled. Br
 itish Airways Business Class seats for the Club Europe product are terrible - exactly the same as Economy with th
 e middle seat left vacant. You don't even get extra pitch. What made the overall product tolerable were the good
  onboard service and the inflight WiFi. Also the fact that the flight leaves at a convenient mid-morning time of 1
 0:40 am._31st July 2023_London to Luanda
  ## 5 🔽 Trip Verified | Terrible Experience with British Airways. I booked a flight with BA to travel from Gibral
  tar to London Heathrow on May 10, 2023. My flight was scheduled to leave at 4:00 p.m. in the afternoon. I had ori
 ginally planned on leaving my luggage at Heathrow upon arrival and travelling to visit and overnight at my cousi
 n's place. En route to GIB airport a few hours prior to departure, I checked my flight details and found out that
  my flight had been cancelled. I had a connecting flight booked with Westjet from London Heathrow to Vancouver the
 following day and I had to make that flight, so it was imperative that I got to London. I checked the BA website
  and couldn't find any other flights with them that would work, so unfortunately I made the mistake of requesting
 a refund. I managed to find a flight out of Malaga that got me into London just after 10:00 p.m. so I booked that
  and then called British Airways as I wanted to discuss compensation. That's when they advised me that because I h
  ad requested a refund (they used the phrase "abandoned" travel with them), they were not prepared to do anything
 for me. Apparently, I should have called them first, and then they would have made the arrangements. Of course th
  ey don't explain that on their website - they just ask if you want a refund and then proceed. And even when I ple
  ad my case with the agent at Malaga airport and then followed up with Customer Relations several times via email,
 they flat out refused to budge. I had used a travel voucher to cover the cost of my flight and had used Avios to
  cover the cost of my checked baggage, so in other words no out of pocket costs for the trip. Once this incident h
 appened, I ended up spending 660 euros in airfare and checked baggage charges to get to London from Malaga (i.e.,
 different airport than the one I had originally booked from). And because the luggage storage facility at Heathro
  w had closed by the time I eventually arrived, I ended up booking a night at a hotel since I couldn't travel by t
 rain to my cousin's place any longer (3 bags in tow) and I didn't want to put him out and have him drive to the a
 irport to pick me up. This cost me another £125 in room and meal costs. All BA ended up doing to compensate me wa
 s to give me 5,000 free Avios - a mere pittance compared to my out of pocket expenses. Despite trying to explain
 to them why I requested the refund instead of calling them first, they wouldn't budge. Very easy for them to say
  what I should have done since they work there and know the rules and they weren't the ones scrambling to find alt
  ernative travel arrangements within a few hours. I pointed out that on their website they should simply instruct
 customers to call them when this situation happens, and that way they would never encounter this problem. My feel
  ing is that they put the refund option out there in the hope that customers will make the mistake I did so they c
  an then wash their hands of the situation and ultimately save money. I've been an Executive Club member for years
 and they simply didn't care. They said there was nothing they could do. I'm sure if one of the BA executive's fri
  ends or family members had gone through this, staff there would have been given the instruction to make things ri
  ght. I used to be a fan of BA but they have really gone downhill in my opinion. Once I used up my remaining Avios
  and travel credit, I will cancel my Executive Club membership and never fly with them again._29th July 2023_Denve
 r to Heathrow
  ## 6
  ☑ Trip Verified | An airline that lives in their past glory and heading a future of crisis is British Airways. I
 am not joking we are a family of 7 all in Business Class heading for a Norwegian and Arctic Cruise and they lost
 10 of our bags! They will never see me on any of their flights ever a disaster of an airline_26th July 2023_BKK t

    As I am working on this project for a stakeholder based in the UK the formatting of the date is critical to be in the British format. As such the

     following lines of code were used to ensure that the formatting was in the date - month - year format. The formatted date check returns the
     class of the date column. Finally, The class is returned. We get a positive check for date formatting.
  ## Ensure date format is compliant with British formatting
  BAFeedback$date <- as.Date(BAFeedback$date, format = "%d/%m/%Y")
  British_Formatted_Date_Check <- class(BAFeedback$date)</pre>
  head(British_Formatted_Date_Check)
 ## [1] "Date"
As the output is 'date' for the column, we can be confident the date has been setup properly with the British formatting as the parameters.
I wanted to only include verified reviews. This ensures that data was as more reliable as only Reviews from trips that were verified to be taken by
the reviewer will be included. To do this I created a new data set called BAFeedbackClean and only included entries that did not have the words
'not verified' in them.
 BAFeedback_Clean <- BAFeedback[!grepl("Not Verified", BAFeedback$reviews, ignore.case = TRUE), ]
Lastly, I confirmed the number of rows after all my sanitation and manipulation had been completed.
I ensured to use the clean data set, hence only counting the verified reviews.
  # counting only the rows from the clean data set.
  VerifiedRows <- nrow(BAFeedback_Clean)</pre>
  # Returning Value
  print(VerifiedRows)
  ## [1] 2289
We are working with 2289 rows after all the cleansing. These rows will provide the best quality data from the data set. Improving reliability of
3.4 STEP SUMMARY

    From the above observation, noted that

    There is no typo, Null or missing values.

   · Data frame has 2289 rows.
The following data manipulation is performed:

    Convert date to date dtype.

    Convert format of date to dd-mm-yyyy.

   • Create new column UID by combining date, review and route into a new column to track individual entries preempting more in depth specific
   • Creating a new Date set which will be put forward into the next step of my data analysis which only included verified data.
STEP 4 ANALYSIS
 Confident in the integrity of my data, I moved onto the analysis of my data.
  ## reviews
                              date
                                           country
                                                              seat_type
                        Min. :NA Length:2289
  ## Length:2289
                                                            Length:2289
  ## Class :character 1st Qu.:NA Class :character Class :character
  ## Mode :character Median :NA
                                        Mode :character Mode :character
  ##
                         Mean :NaN
  ##
                        3rd Qu.:NA
  ##
                         Max. :NA
  ##
                         NA's :2289
  ## recommended
                      stars
                                             route
                                                             type_of_traveller
  ## Length:2289
                         Min. :1.000 Length:2289
                                                             Length:2289
  ## Class :character 1st Qu.:3.000 Class :character Class :character
  ## Mode :character Median :3.000 Mode :character Mode :character
  ##
                         Mean :4.274
                        3rd Qu.:5.000
  ##
  ##
                         Max. :9.000
  ##
          UID
  ## Length:2289
  ## Class :character
  ## Mode :character
  ##
  ##
  ##
  ##
I used the summary function to get a taste for the data set, to familiarize my self with the project data set and to start making ideas on how to tackle
the business problem with the given data.
The following facts were derived from the analysis:

    Min stras was 1

    Max stars was 9

    mean (Average) stars was 4.272

STEP 5 SHARE
Analysing the trends in different groups leaving feedback
Plotting the count of Reviews for different types of travellers
   750 -
 ± 500 ⁻
   250 -
                                                                        Solo Leisure
                                 Couple Leisure
                                                    Family Leisure
               Business
                                         type of traveller
Here we see a plot of the total reviews left by different types of travelers.
The visual shows us that: - Couples travelling for leisure were most likely to leave reviews - Solo leisure travelers were least likely to leave reviews
    1250 -
    1000
    750 -
    500 -
    250
              Business Class
                                 Economy Class
                                                      First Class
                                             seat type
This plot provides us with a plot of the total reviews left by people on different types of seats
This visual shows us that: - Economy class flyers would leave the most feedback - First class flyers provided the least feedback
Next I wanted to find out what rating was left the most. So again I used a bar chart to visualize this.
    1000
    750 -
    500 -
                                                                   7.5
                           2.5
                                               5.0
                                              stars
This visual shows that people who felt their experience was worth 3 stars were the most likely to leave feedback.
British airways could look into targeting people who left 3 star feedback to find out why they decided to leave it and what encouraged them. They
could use their finding to try and encourage other ranges of feedback to also leave reviews.
Analysing how recommendation varied through different groups within the data set
    1.00 -
   0.75 -
                                                                           recommended
 cont
0.50 -
                                                                             yes
   0.00 -
                                          Family Leisure
                                                           Solo Leisure
             Business
                           Couple Leisure
                                   traveller type
here we use the y axis as a percentage to better gauge how recommendations vary between traveler types.
It is clear that:

    Couples travelling for leisure are the least likely to recommend

    Business travelers are most likely to recommend

    1.00 -
   0.75 -
                                                                             recommeded
 conut
                                                                             no
                                            First Class
                                                         Premium Economy
           Business Class
                           Economy Class
```

while this outcome could have been expected it is important to find out why Economy class would not recommend. It may be an important business

question to ask weather it was the over all experience of the 'economy class' or if something specific was the cause for not recommending.

Comprehensive analysis of how stars varied with seat type and

passenger type with colours filling the bar representing

STEP 6: ACT In the final step, we will be delivering our insights and providing recommendations based on our analysis. Here, we revisit our business questions and share with you our high-level business recommendations. 1. What are the trends identified? First class flyers would leave feedback the least but when they would. It was recommended the most out of all the seat types. People who deemed their experience worthy of 3 stars were most likely to leave feedback couples travelling for leisure left the most feedback whilst solo leisure travelers left the least all first class travelers who rated their experience 9 stars would recommend it to others

This graph shows how recommendation (yes or no) varied between passengers flying different seats

 First class flyers were the most likely to recommend British airways to others Economy class flyers were last likely to recommend British airways to others

It is clear that:

0.75

1.00 -0.75

recommendation

2. How could these trends be used by British Airways to improve customer experience? British airways can target economy class passengers for follow ups on service to find out what encouraged them to not recommend British Airways. In an ideal world you'd follow up with all passengers however this analysis has made it clear that a primary group tp target is solo travelers as they are least likely to recommend British Airways to others. 3. How could these trends help influence British Airways marketing strategy?

British Airways can focus their customer service improvement efforts on Economy seats. They can ask passengers what they think needs improving.

those voting 5 and 9 stars were most likely to recommend with first class flyers having the highest 9 star recommendation and also the lowest 1 star recommendation meaning they were at the extremes. either liked it or not