

Group Project Interim Report

Flying First Class:

Improving Business Passenger Experience For ABC Airline
Through Segmentation Analysis



Course: MKTG 6234 Marketing Analytics

Group S:

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Business Problem:

The objective of this project is to understand the satisfaction levels of passengers flying in the business class of ABC airline and identify ways to improve the travel experience for business class passengers. The airline wants to know how different segments of passengers rate their experience on various service aspects and identify the areas where they can improve to increase overall satisfaction levels.

Overview of the Dataset:

1. After we formatted and sampled the dataset¹, it consists of over 100,000 reviews provided by passengers of the ABC airline.
2. The dataset has already been cleaned and contains no missing values.
3. The dataset includes 20 variables.
4. The analysis is focused only on passengers flying business class.
5. Each passenger is identified by a unique ID.
6. The satisfaction levels for each variable are rated on a scale of 0 to 5, with 0 meaning "not applicable" and 1 meaning lowest satisfaction level, while 5 means the highest satisfaction level. The overall satisfaction level is rated as "satisfied", "neutral" or "unsatisfied."
7. In order to improve the airline's service, we only take into account reviews from passengers whose satisfaction level is "neutral or unsatisfied" in business class.
8. 4999 observations are then randomly sampled for further analysis.

Methodology:

The methodology involves conducting a segmentation analysis on the airline customer satisfaction dataset, which includes 4999 reviews provided by business class passengers. The segmentation analysis will group passengers based on their satisfaction levels across the following 14 service aspects:

Departure and Arrival Time Convenience	Satisfaction level with the convenience of the flight departure and arrival times from 1 (lowest) to 5 (highest) - 0 means "not applicable"
Ease of Online Booking	Satisfaction level with the online booking experience from 1 (lowest) to 5 (highest) - 0 means "not applicable"
Check-in Service	Satisfaction level with the check-in service from 1 (lowest) to 5 (highest) - 0 means "not applicable"
Online Boarding	Satisfaction level with the online boarding experience from 1 (lowest) to 5 (highest) - 0 means "not applicable"
Gate Location	Satisfaction level with the gate location in the airport from 1 (lowest) to 5 (highest) - 0 means "not applicable"
On-board Service	Satisfaction level with the on-boarding service in the airport from 1 (lowest) to 5 (highest) - 0 means "not applicable"
Seat Comfort	Satisfaction level with the comfort of the airplane seat from 1 (lowest) to 5 (highest) - 0 means "not applicable"
Leg Room Service	Satisfaction level with the leg room of the airplane seat from 1 (lowest) to 5 (highest) - 0 means "not applicable"
Cleanliness	Satisfaction level with the cleanliness of the airplane from 1 (lowest) to 5 (highest) - 0 means "not applicable"

¹ <https://www.kaggle.com/datasets/teejmahal20/airline-passenger-satisfaction>

Food and Drink	Satisfaction level with the food and drinks on the airplane from 1 (lowest) to 5 (highest) - 0 means "not applicable"
In-flight Service	Satisfaction level with the in-flight service from 1 (lowest) to 5 (highest) - 0 means "not applicable"
In-flight Wifi Service	Satisfaction level with the in-flight Wifi service from 1 (lowest) to 5 (highest) - 0 means "not applicable"
In-flight Entertainment	Satisfaction level with the in-flight entertainment from 1 (lowest) to 5 (highest) - 0 means "not applicable"
Baggage Handling	Satisfaction level with the baggage handling from the airline from 1 (lowest) to 5 (highest) - 0 means "not applicable"

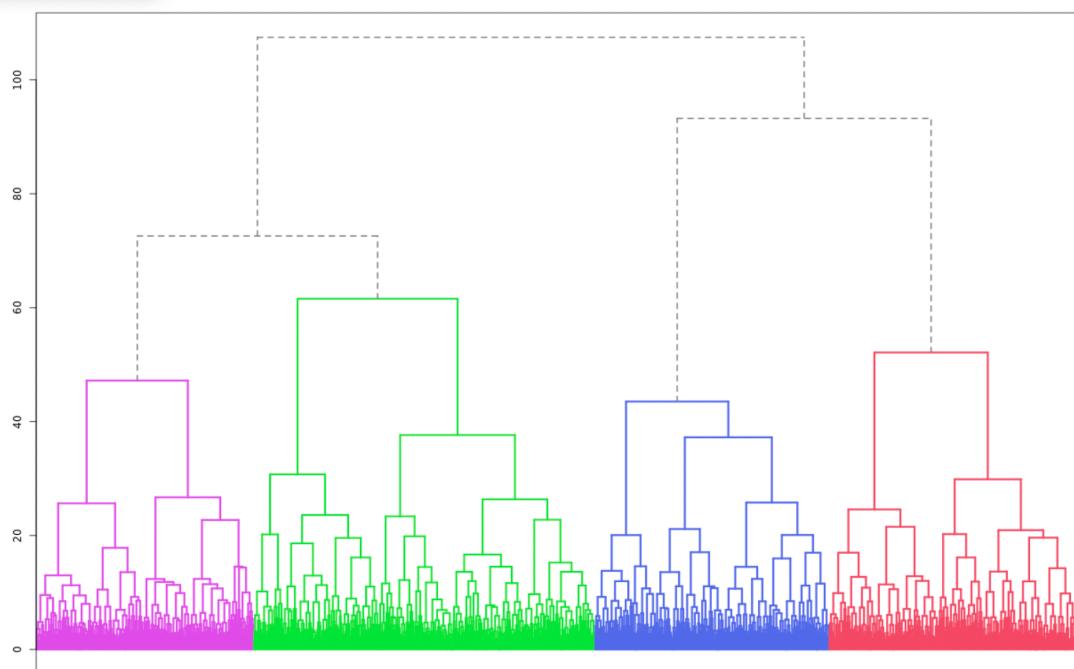
Once the segmentation is complete, a persona for each segment is created, taking into account the following descriptors variables:

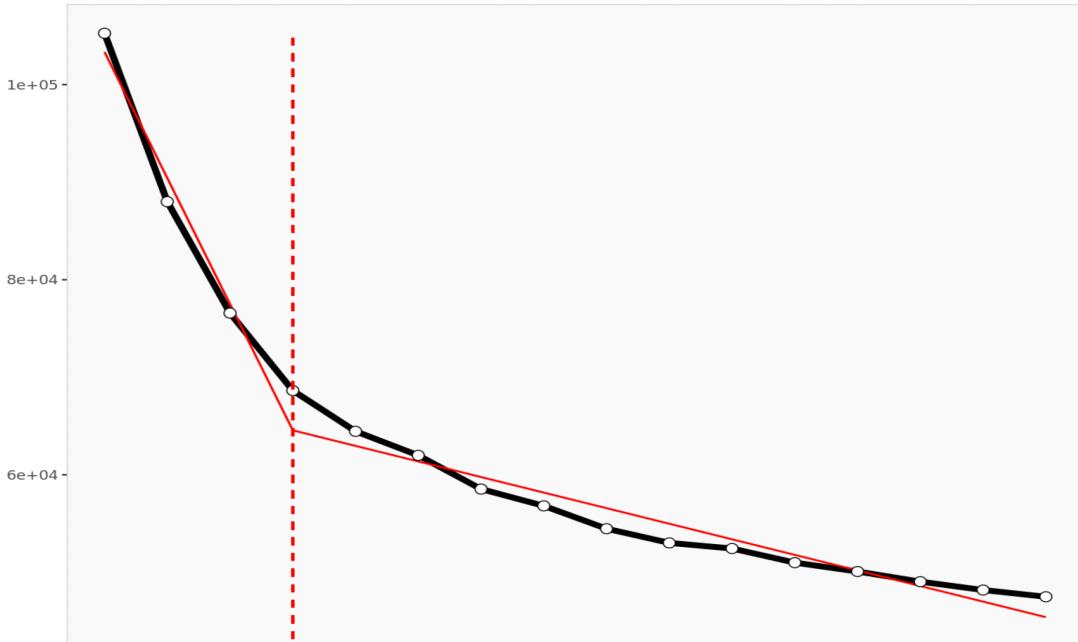
ID	Unique passenger identifier
Gender	Gender of the passenger (Female/Male)
Age	Age of the passenger
Customer Type	Type of airline customer (First-time/Returning)
Type of Travel	Purpose of the flight (Business/Personal)

This will help us understand the needs and preferences of each segment better and identify opportunities to improve their overall travel experience.

Results:

As the number of observations is too large to perform hierarchical clustering, Enginius used Kmeans instead on the dataset.





Based on the generated dendrogram and scree plot, the dataset was distributed into 4 segments.

Segment size

	Population	Segment 1	Segment 2	Segment 3	Segment 4
Size	4 999	1 507	1 044	1 309	1 139
Relative size	100%	30%	21%	26%	23%

Segment size.

	Population	Segment 1	Segment 2	Segment 3	Segment 4
Gender = Female	0.521	0.525	0.527	0.523	0.507
Age	39.3	37.1	33.6	41.5	44.8
Customer.Type = Returning	0.711	0.472	0.505	0.936	0.958
Type.of.Travel = Business	0.871	0.804	0.896	0.925	0.874

Descriptor data per segment. Average value of each descriptor, overall and within each cluster. Descriptors that are statistically different from the rest of the population are highlighted in red (lower) or green (higher).

Segment 1: “Younger Leisure Flyers”

Within this segment, 30% of individuals are young adults with an average age of 37. Of these young adults, 47% are returning flyers, suggesting that the majority of them are first-time fliers with ABC airline. In contrast to the other segments, individuals in this segment tend to be flying for personal reasons. Notably, this group of young flyers was highly satisfied with ABC's business class in-flight services. However, they expressed slight concerns regarding the ease of online ticket booking and the convenience of the gate location and departure-arrival times.

Segment 2: “Younger Professional Flyers”

Segmented data indicates that 21% of individuals within this specific group are young adults, with an average age of 34. Within this subgroup of young adults, 51% are returning flyers, suggesting a degree of familiarity with the airline. Notably, individuals within this segment

tend to fly for business purposes. However, this particular group did not have a positive experience with seat comfort, cleanliness, food & drinks, and in-flight entertainment. Despite these concerns, they were highly satisfied with the in-flight service and baggage handling services, which was better than the average population's review.

Segment 3: "Middle-aged Executive Flyers"

Within this particular group, 26% of individuals fall into the middle-aged adult category, with an average age of 42. Among these middle-aged adults, 94% are returning flyers, indicating a high level of familiarity with the airline. In comparison to other segments, this particular group has a higher percentage of individuals who are flying for business purposes. Interestingly, this segment reported high levels of satisfaction with ease of online booking, the convenience of gate location, and departure-arrival times compared to other segments. However, they expressed slight concerns with baggage handling and in-flight service.

Segment 4: "Loyal Business Travelers"

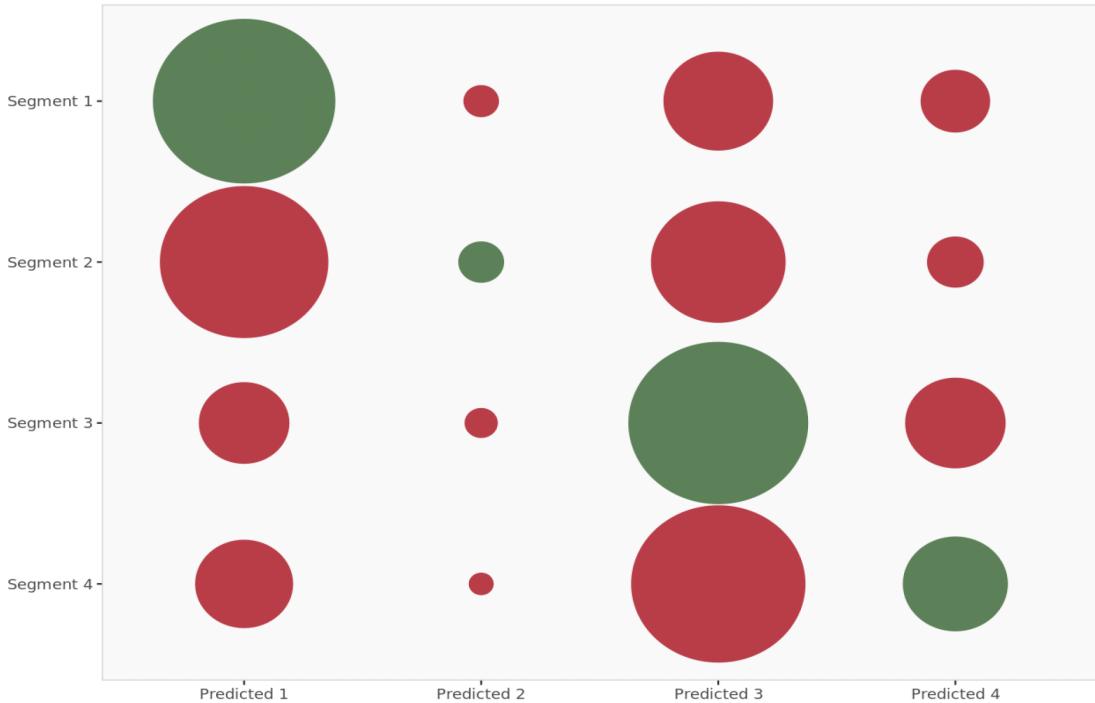
This particular segment is comprised of 23% of individuals with an average age of 45. Within this group, 96% are returning flyers with ABC airline, indicating a high level of loyalty to the airline. Additionally, 87% of individuals within this segment are flying for business purposes, which is close to the average percentage of the population that flies for business trips. Despite being frequent flyers, individuals in this segment reported lower satisfaction with baggage handling, in-flight and onboarding services, as well as the leg room available in business class seats.

	Population	Segment 1	Segment 2	Segment 3	Segment 4
Gender = Female	0.521	0.525	0.527	0.523	0.507
Age	39.3	37.1	33.6	41.5	44.8
Customer.Type = Returning	0.711	0.472	0.505	0.936	0.958
Type.of.Travel = Business	0.871	0.804	0.896	0.925	0.874

Descriptor data per segment. Average value of each descriptor, overall and within each cluster. Descriptors that are statistically different from the rest of the population are highlighted in red (lower) or green (higher).

	Predicted 1	Predicted 2	Predicted 3	Predicted 4	Total
Segment 1	71%	1%	21%	7%	100%
Segment 2	59%	2%	35%	4%	100%
Segment 3	13%	1%	69%	17%	100%
Segment 4	16%	1%	64%	19%	100%

Confusion matrix (%). The global hit rate of the model is 44%. The diagonal elements represent segment-specific hit rates.



Managerial Conclusion:

ABC airline can improve the ease of online booking by collaborating with ticket booking websites and optimizing their own website through SEO. By incorporating relevant keywords, improving the user experience, and investing in paid search ads, they can increase their online visibility and make it easier for customers to book flights.

Furthermore, to address concerns regarding inflight service and cleanliness, ABC airline should consider increasing the training time and quality for their air crew, as well as improving their system of rewards and penalties. By prioritizing the customer experience both before and during the flight, ABC airline can improve customer satisfaction and loyalty.

Future scope:

Since the original dataset was not designed for segmentation analysis, the hit rate of the model is low at 44%. However, a higher hit rate can be achieved if more variables are introduced by means of a survey which are inclined towards studying the segmentation variables from the respondents.

To solve this problem, in our future analysis, we can separate the variables into prior-, during-, and after-flight services and use the linear probability model to predict the percentage change of the satisfaction level by modifying different services. In this case, we can help the airline understand how to improve their services in another way.