Redesigning Airplane Interiors via Data Science

DSBA X eleven strategy

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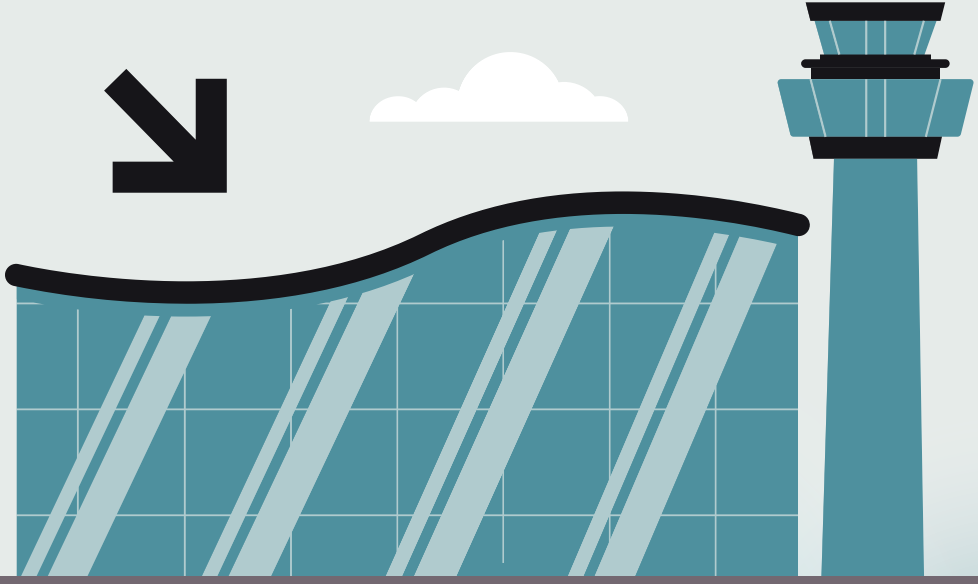
Feburary 18th, 2022

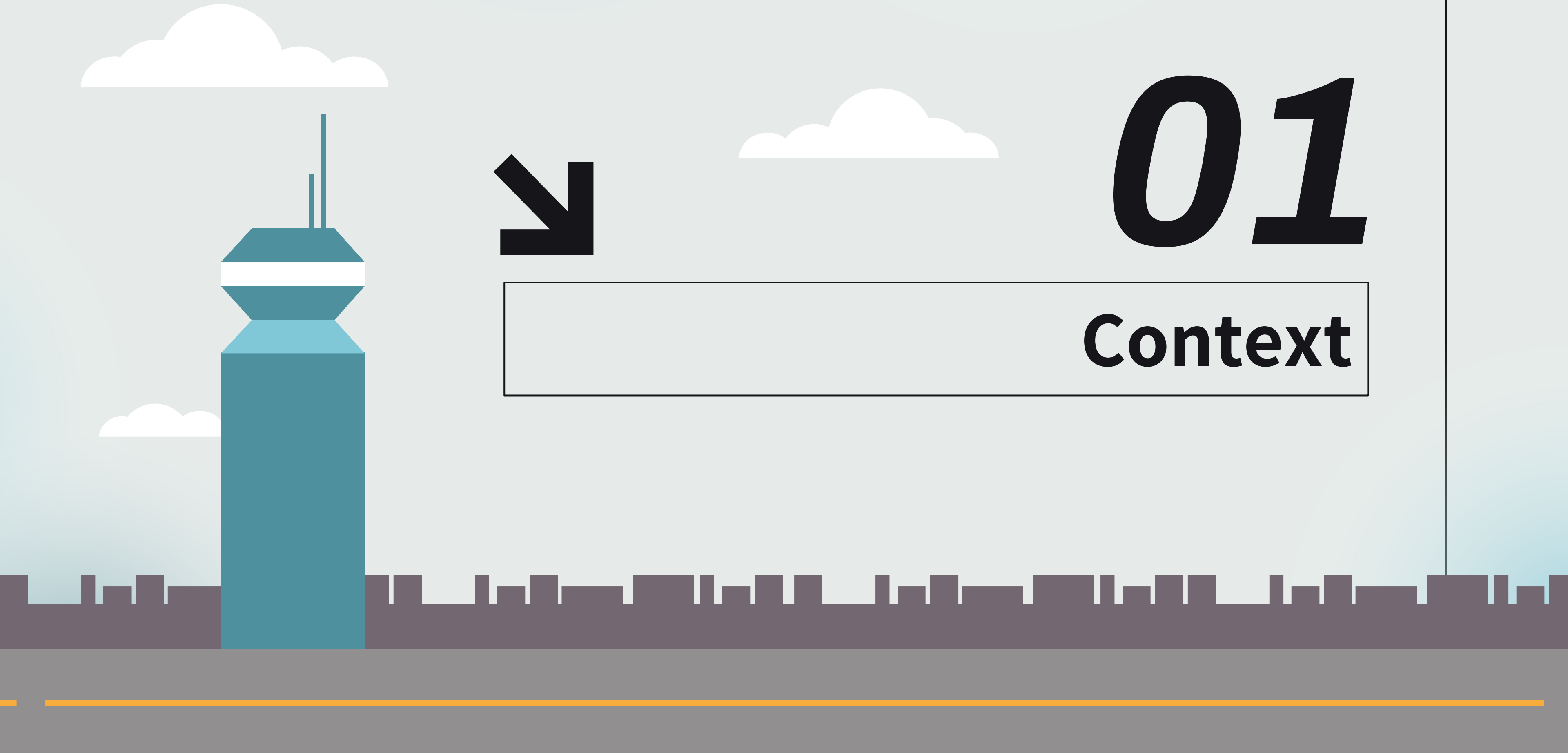


Agenda

1 **Context**

2 **Methodology**

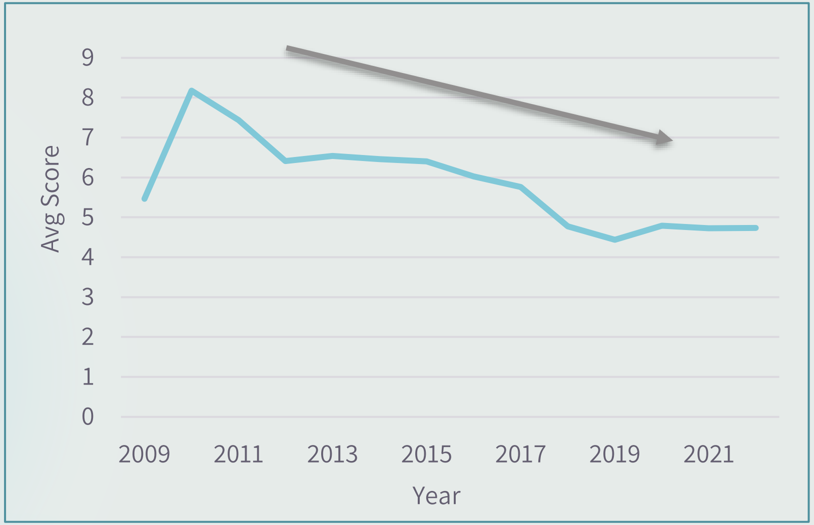
3 **Analysis**



01

Context

Understand how to improve the user experience of airplane passengers



* Samples scrapped from Skytrax

Customer experience is declining in recent years

Identify passengers’ pain points about interior design

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02

Methodology

Methodology

Data

- Web Scrapping
- Data Cleaning

Models

- Topic Modeling
- Sentiment Analysis

Analysis

- Pain Points
- Recommendations

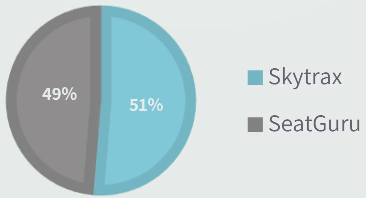
Web scrapping was used to acquire data

Beautiful Soup

SeatGuru by Tripadvisor

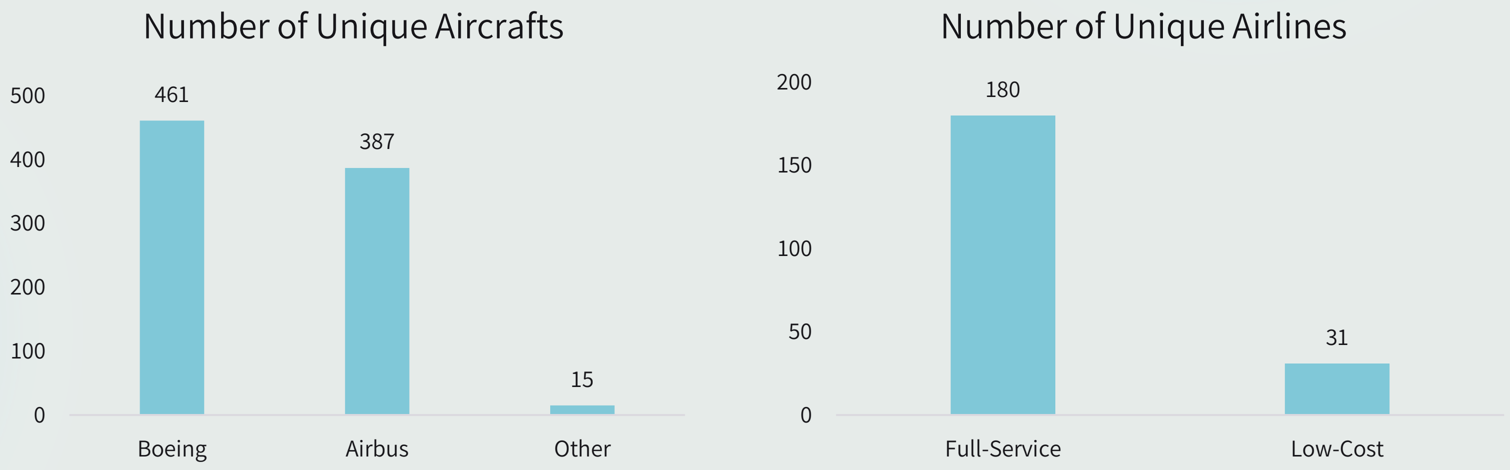
SKYTRAX

34K reviews

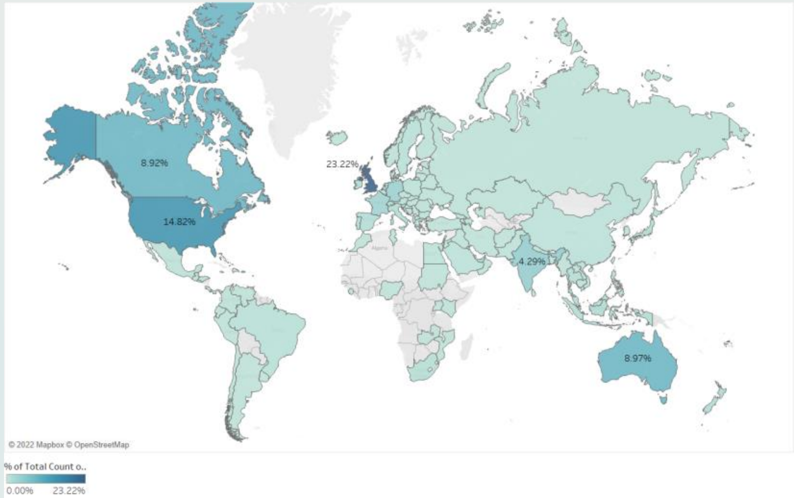


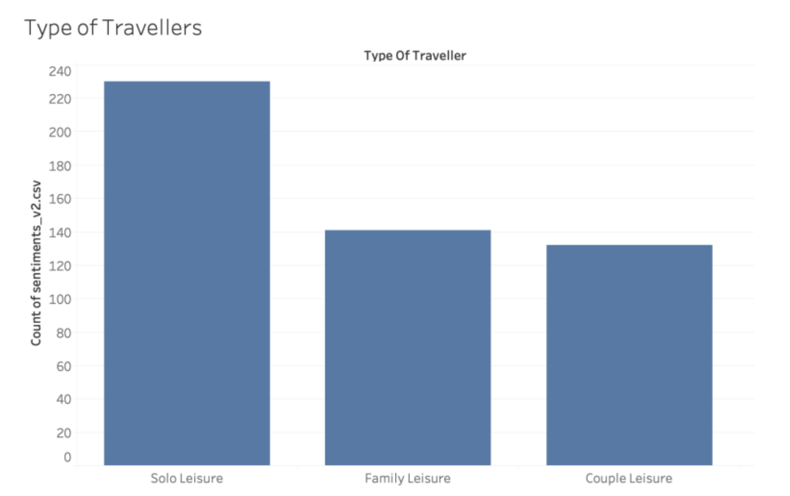
21 related attributes, including review content, scores, airline, aircraft, and etc.

Reviews represent 211 unique airlines and 863 aircrafts



Users are from 71 countries and solo leisure is the major traveller type





For interior design, Full-Service airlines have higher average ratings than Low-Cost airlines

5.5/10

for Full-Service airlines

5.0/10

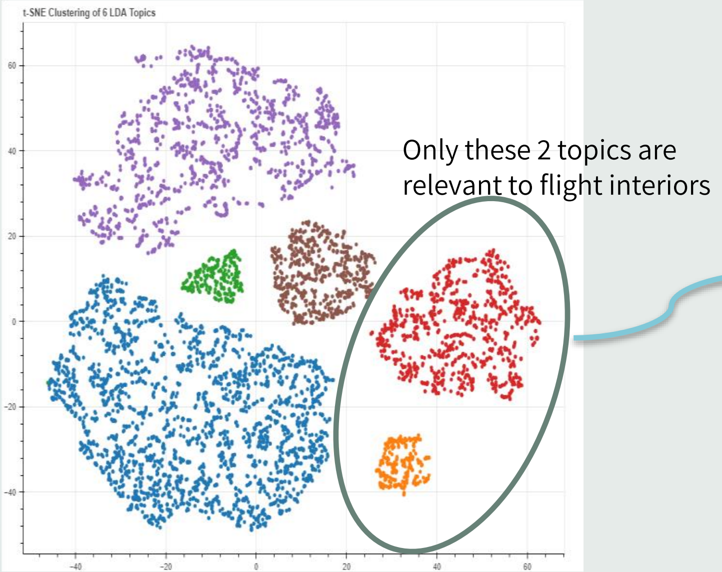
for Low-Cost airlines

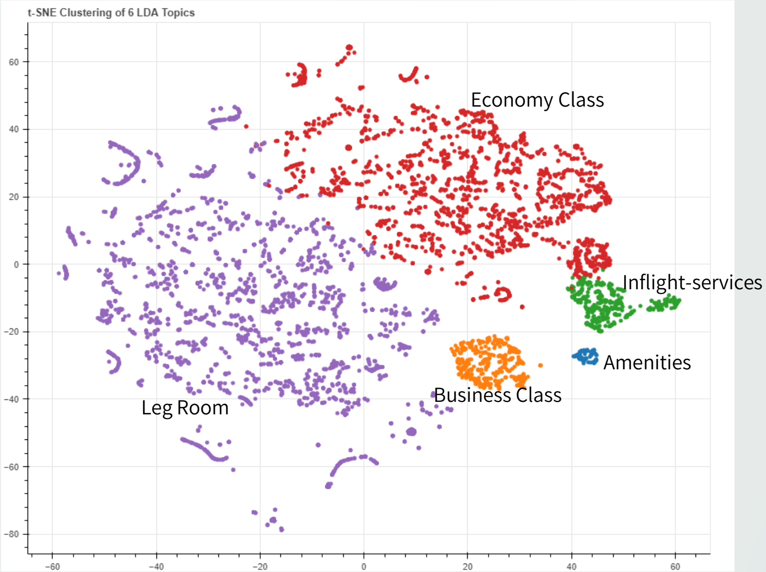
* from Skytrax

The full-service airlines seem to be only marginally better. Ratings are misleading so we need to do a deeper analysis into the text of the reviews, itself. However, it is clear from the ratings that interior design could use a face-lift

Topic Modelling

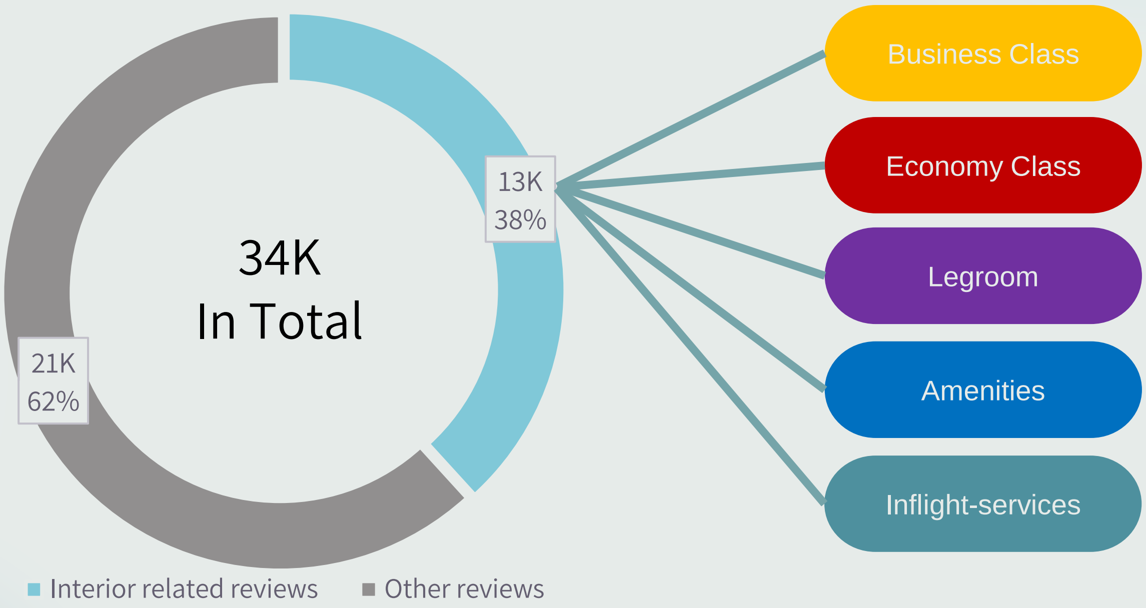
Double Topic Modelling was used to identify major topics relevant to airlines interiors





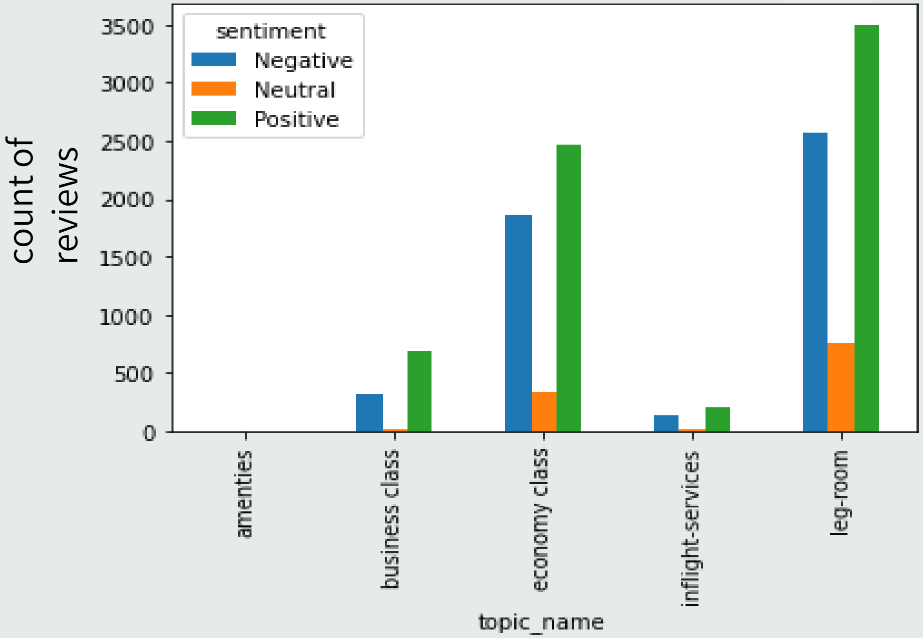
6-cluster segmentation is homogeneous & identifiable

38% of scrapped data were used for sentiment analysis

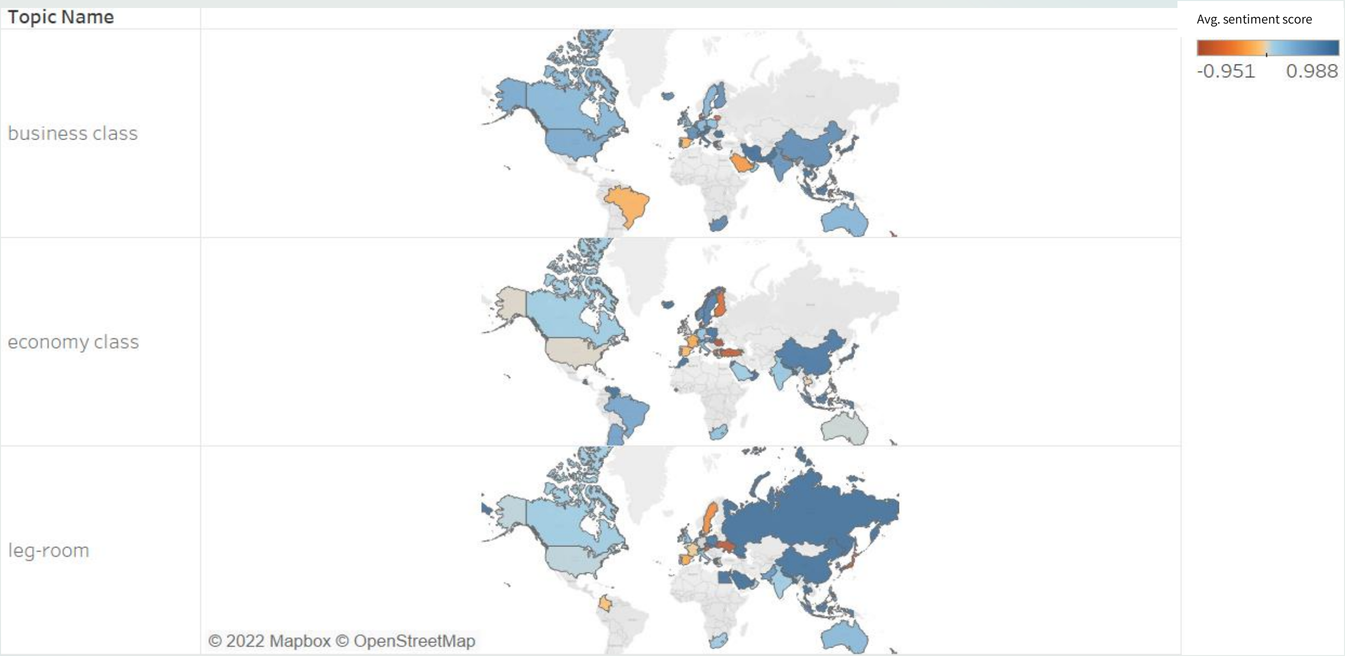


Sentiment Analysis

The proportion of negative reviews is considerable across all topics, showing there is room for significant improvements.



Sentiments for economy class and leg-room are generally negative or less-positive in developed economies, possibly due to higher expectations from customers.



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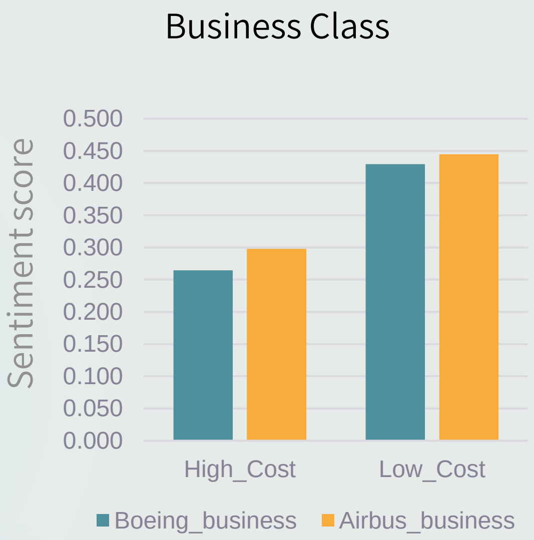
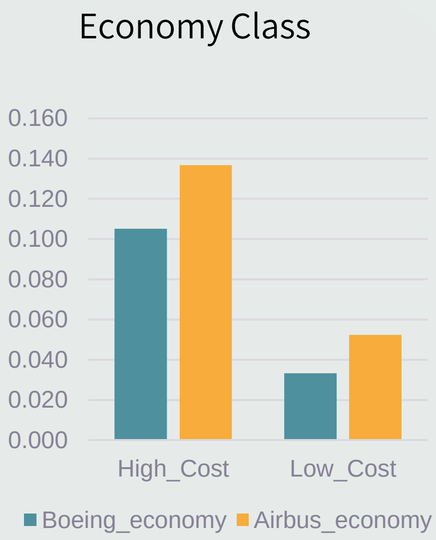
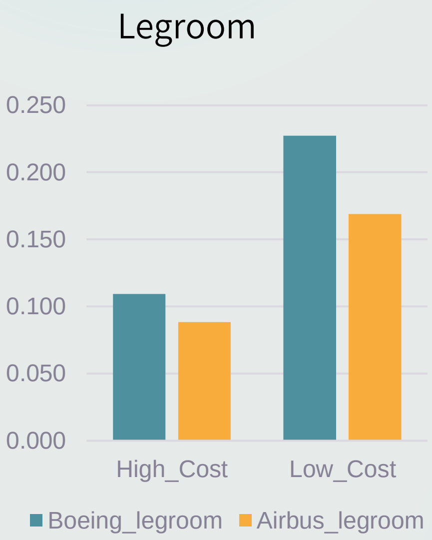
Boeing offers a better legroom in low budget airline, but people prefer the Airbus Economy







03

Analysis

Pain Points Highlighted Per Topic

Uncomfortable flat beds in Business Class

“Seat when adjusted to be flat bed was not comfortable”

Broken seats & unfriendly entertainment UI in Economy

“Lousiest flight I ever took the seat was broken and the airline can t find any replacement the tv-equipment at some of the aisle were also broken”

Cramped Seats with little legroom

“The B777 on the Brisbane to Dubai leg was cramped and dirty. The A380 on the Dubai-Birmingham leg had more leg room.”

Analysis of Topic: Business class

Most commonly occurring words:

- 'good': 383
- 'first': 255
- 'comfortable': 237,
- 'great': 210

Positive reviews for business-class stems from:

- Excellent food, entertainment and inflight-services
- Polite, friendly and professional staff
- Comfortable seating

Example:

"Seats were comfortable, WiFi worked very well, and crew were lovely."

Most commonly occurring words:

- 'first': 90
- 'flat': 71
- 'uncomfortable': 59
- 'bad': 53

Negative reviews for business-class stems from:

- Flight Delays, slow moving boarding-queues
- Uncomfortable seats or flat-beds
- Bad food quality

Example:

"Seat when adjusted to be flat bed was not comfortable"

Analysis of Topic: Economy class

Most commonly occurring words:
- 'good': 792
- 'comfortable': 698
- 'great': 601
- 'premium': 475

Positive reviews stems from:
- Attentive and friendly-crew
- Generous leg-room and retractable foot-rests
- Ergonomic reclining seats with armrests
- Overhead luggage storage capacity

Example:
"Purchased seat 6A that is an economy and was surprised to find quite a nice leg room , probably at least 32"

Most commonly occurring words:
- 'uncomfortable': 406
- 'premium': 310
- 'other': 298
- 'disappointing': 131

Negative reviews stems from:
- Uncomfortable or non-reclining seats
- Poor leg-room
- Broken entertainment-units
- Hard seats

Example:
"Lousiest flight i ever took the seat was broken and the airline can t find any replacement the tv-equipment at some of the aisle were also broken"

Analysis of Topic: Leg-room

Most commonly occurring words:

- 'good': 1054
- 'great': 795
- 'comfortable': 781
- 'extra': 620

Positive reviews stems from:

- Good leg-space
- Seats designed for tall people
- Premium economy seats with extra leg-room
- Option to pay for seats with extra leg-space

Example:

"Mumbai to Bangalore was a very smooth flight and I was surprised that the check in agent was happy to provide me with an exit row seat with extra leg-room. "

Most commonly occurring words:

- 'uncomfortable': 462
- 'extra': 414
- 'narrow': 243
- 'bad': 220

Negative reviews stems from:

- Crammed seats with little leg-room
- No options to buy seats with extra leg-room
- Lower than standard leg-space
- Long-haul flights

Example:

"The B777 on the Brisbane to Dubai leg was cramped and dirty. The A380 on the Dubai-Birmingham leg had more leg room."

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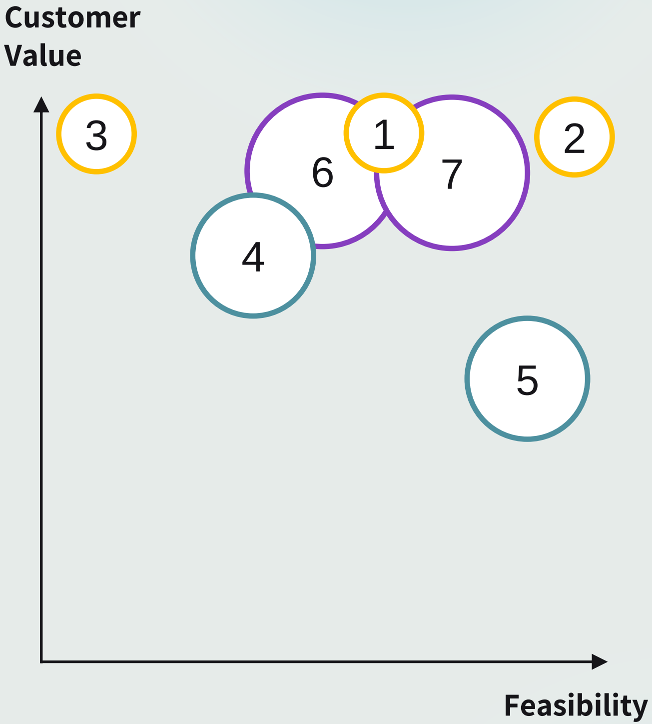
Recommendations

Solutions

1. More reliable flat-bed technology
2. Privacy curtains
3. Update layout of hallways to facilitate on/off-boarding
4. Ergonomically designed seats (leather)
5. Improve UI for Entertainment systems
6. Staggered seats

7. Design few seats for taller people (maybe also for smaller people)



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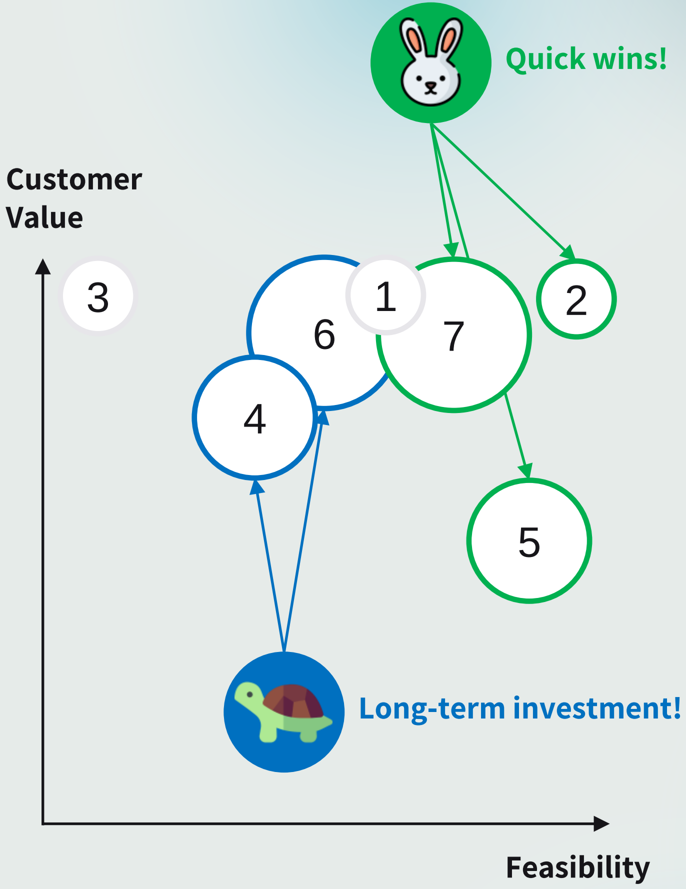

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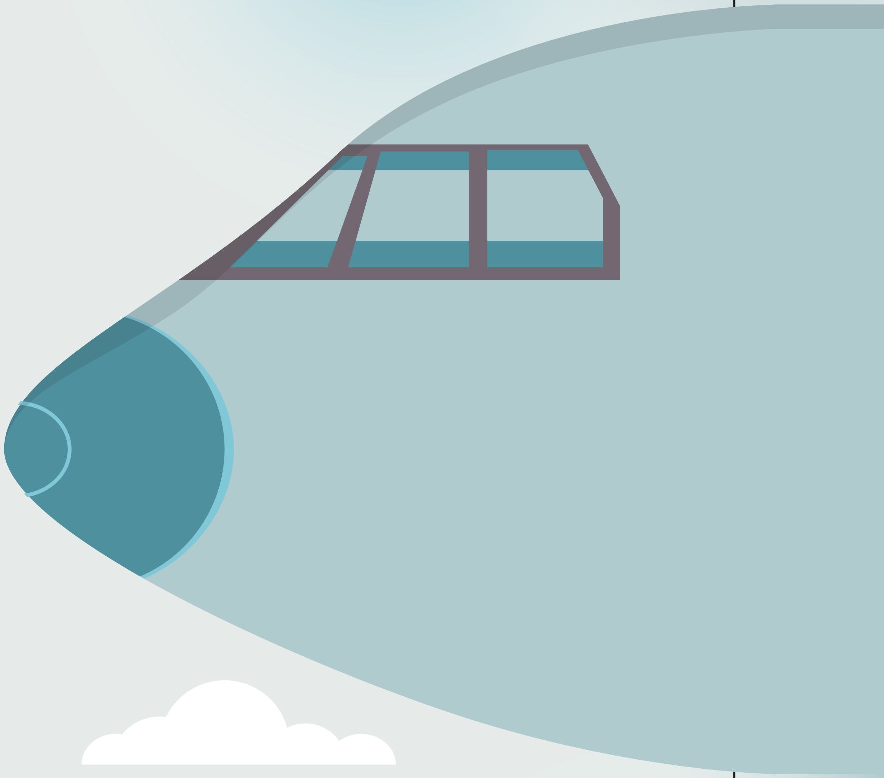
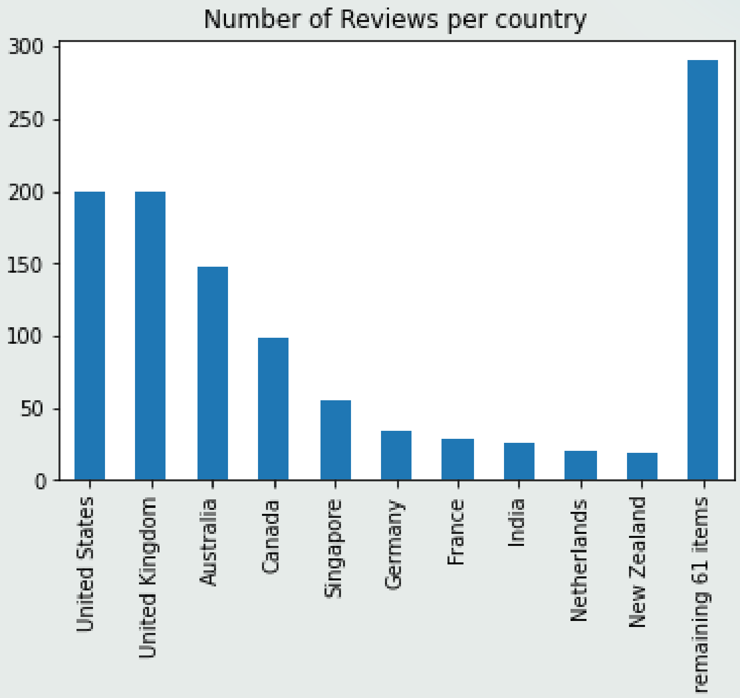
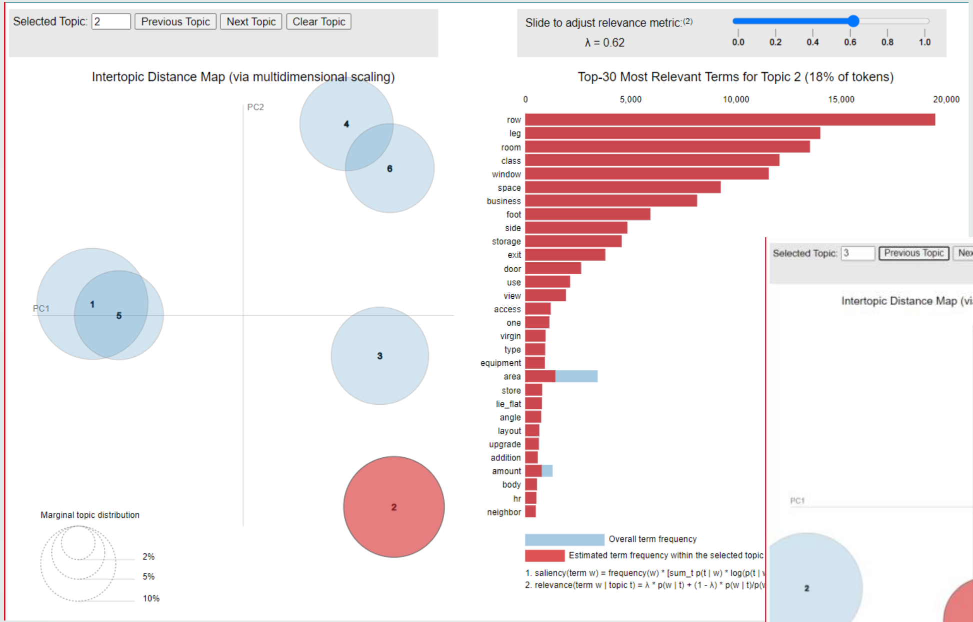
Q&A

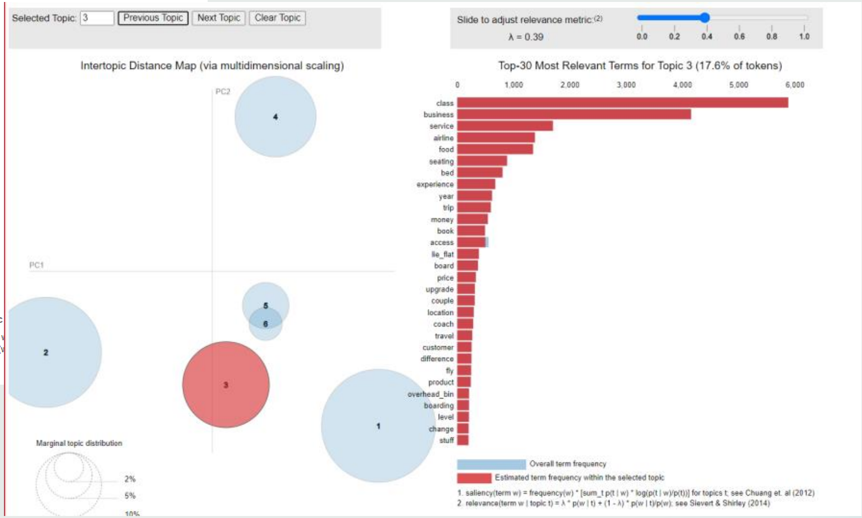


Appendix


Number of Reviews per country
300
250
200
150
100
50
0
United States
United Kingdom
Australia
Canada
Singapore
Germany
France
India
Netherlands
New Zealand
remaining 61 items

Interactive segmentation plot





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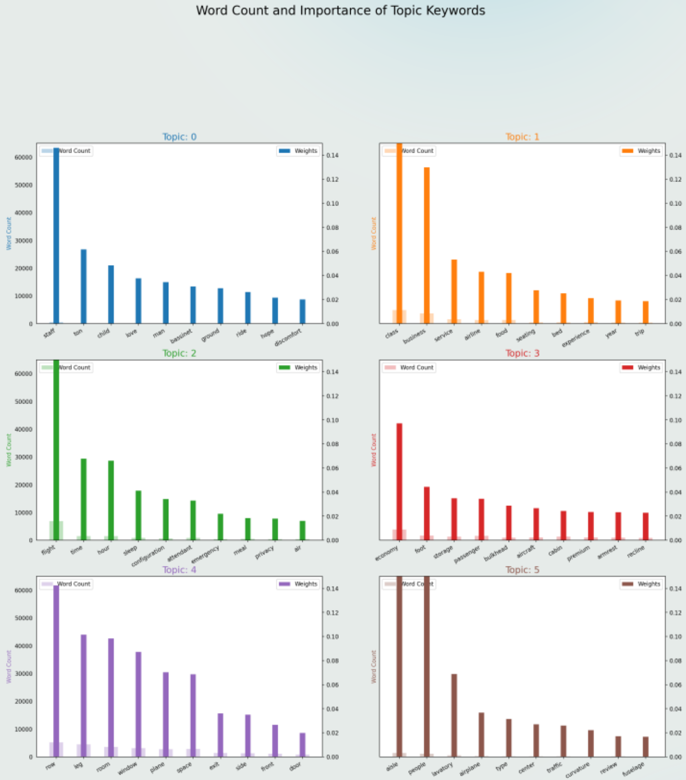
Topic weights



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