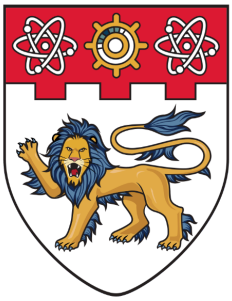

NANYANG TECHNOLOGICAL UNIVERSITY
SINGAPORE

BC2402 - Design & Dev Databases

Group Project Report

Decoding Airline Success

SEM 1 - S05

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Content Page

1. Question 6

[customer_booking] For each sales_channel and each route, display the following ratios

- average length_of_stay / average flight_hour
- average wants_extra_baggage / average flight_hour
- average wants_preferred_seat / average flight_hour
- average wants_in_flight_meals / average flight_hour

Our underlying objective: Are there any correlations between flight hours, length of stay, and various preferences (i.e., extra baggage, preferred seats, in-flight meals)?

1.1 Data Insights

The raw data has flight hours ranging from “0” to “23”. For flight hour = “0”, the ratio will be NULL, and the data cannot be used. Hence, we create a view where we change flight hour = “0” to flight hour = “24” to allow midnight flights to be included when conducting our analysis.

To find the correlation between the flight hours and other measures:

(a) length_of_stay

(b) wants_extra_baggage

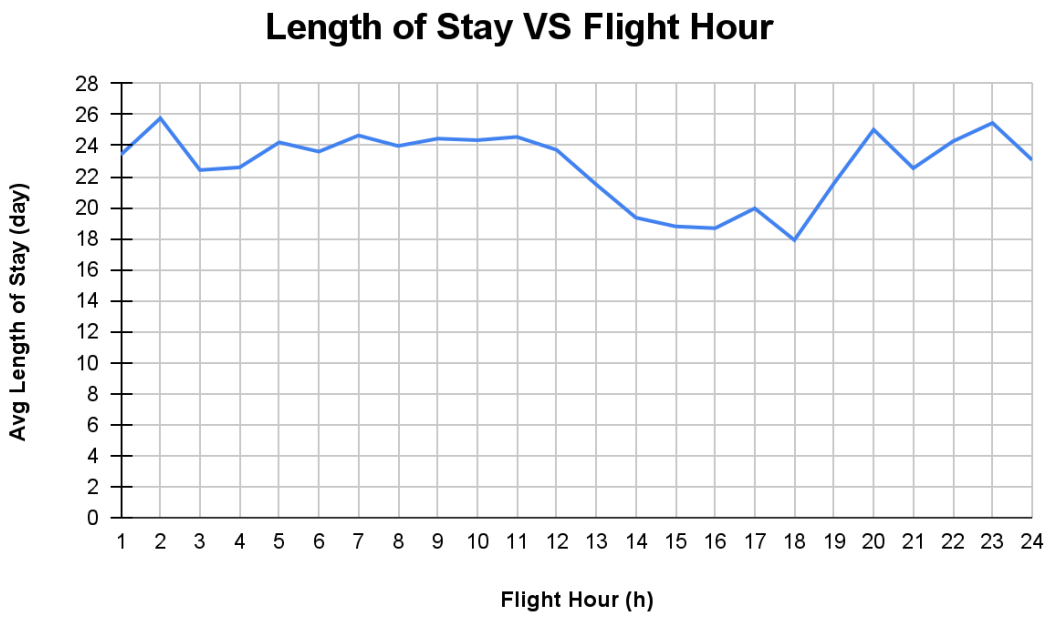
(c) wants_preferred_seat

(d) wants_in_flight_meals

We will look at the average of each measure against the flight hour.

The data for (a) is different from (b) - (d). The average value for (a) > 1.0 while the average value for (b) - (d) < 1.0, thus we present the data on two different graphs.

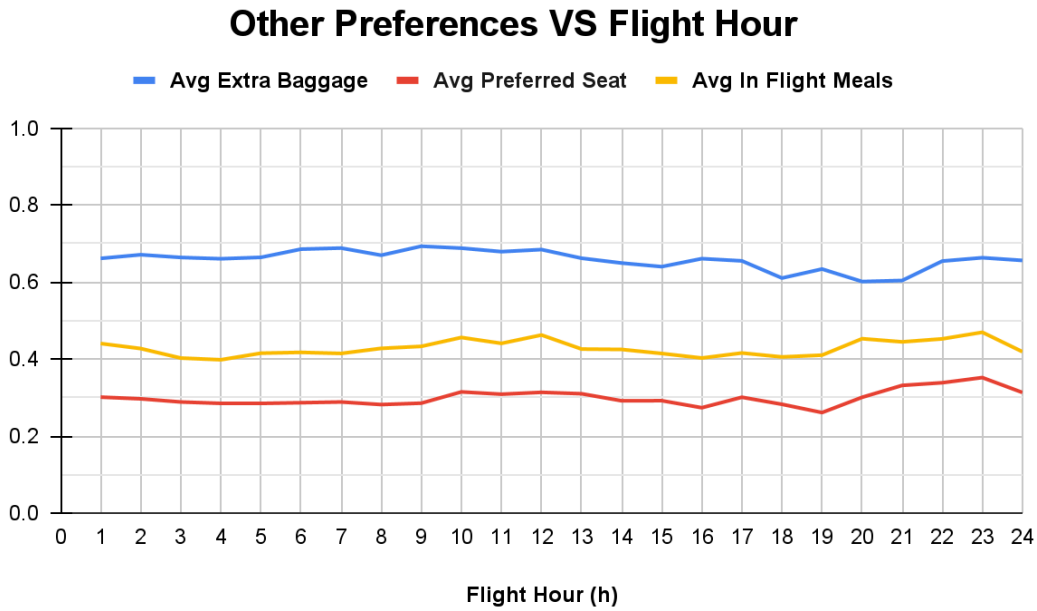
Graph showing the relationship between Average Length of Stay (day) and Flight Hour (h):



From 11h to 18h, there is a drastic plunge in the length of stay. This may suggest that there are more short-trip travellers taking flights during this period compared to the rest. One of the traveller groups could be passengers travelling for business reasons. These travellers will usually travel one day early before their business meeting so they have time to settle down and rest for one night before their meeting the next morning.

From 24h to 11h and 18h to 24h, the length of stay remains relatively high. This suggests that a bulk of passengers travelling at this time period are families. They tend to go for holiday trips which are longer. Parents may be working in the day thus families tend to take flights at night from 18h to 24h or early in the morning from 24h to 11h after their work the previous day.

Graph showing the relationship between Other Preference and Flight Hour (h):



Preferred Seat Preference (Red Line):

From 24h to 9h, preference for specific seating remains relatively low. This suggests that more passengers are satisfied with the random allocation of seats. One reason may be that morning flights are less crowded as most passengers do not want to wake up early, thus better random seats and a reduced need to choose seating.

From 9h to 17h, there is a spike in preferred seating. This may be due to an increase in crowd in the airport.

From 17h to 19h, there is a dip in preferred seating.

From 19h to 23h, preference for specific seating rises to it's highest. This suggests that passengers prioritise seat comfort for evening flights due to a desire for relaxation at the end of the day.

Extra Baggage Preference (Blue Line):

Demand for extra baggage remains consistently high throughout the day, with a gradual decrease from 12 h to 21 h. This suggests that passengers travelling from 12h to 21h have better efficiency for packing their luggage. This may be due to a peak in energy and decision-making capabilities in the day thus reducing the need to request extra baggage. Passengers travelling at 24h to 12h and 21h to 24h may be lethargic and thus miscalculate their baggage space thus requiring extra baggage.

In-Flight Meal Preference (Yellow Line):

While interest in inflight meals remains relatively stable, a noticeable peak occurs from 19h to 23h. This indicates a greater emphasis on food during the dinner period. Passengers travelling at this hour may have just finished work and are hungry. Dinner may also be the most important meal for them thus causing an increase in food demand. Moreover, there is also a high demand for food during the lunch period from 9h to 12h. This suggests that airlines could prioritise meal servings and ensure a sufficient inventory for night and afternoon flights to enhance passengers' satisfaction.

2. Question 7

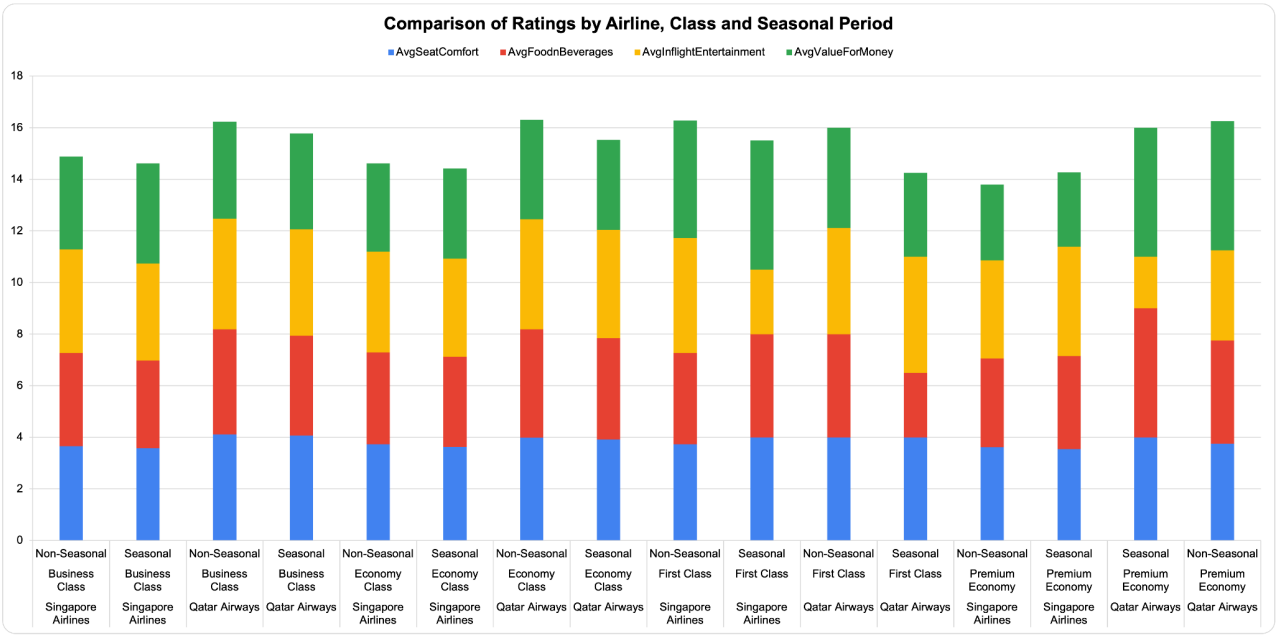
[airlines_reviews] Airline seasonality.

For each Airline and Class, display the averages of SeatComfort, FoodnBeverages, InflightEntertainment, ValueForMoney, and OverallRating for the seasonal and non-seasonal periods, respectively.

Note: June to September is seasonal, while the remaining period is non-seasonal.

2.1 Data Insights

Graph showing the Comparison of Ratings by Airline, Class and Seasonal Period:



In terms of Airline Class:

First & Business Class consistently have the highest score, especially in Seat Comfort & Food while the score of Economy class is lower, particularly in Seat Comfort. This suggests that there is significant room for improvement in this aspect, such as enhancing legroom, and seat design or offering additional amenities to increase passengers' comfort level. Addressing these concerns could enhance passenger satisfaction as well as garner loyalty from budget-conscious travellers.

In terms of Seasons:

Ratings for Seat Comfort & Value remain largely stable across seasons. However, there are minor dips in Food & Entertainment during peak seasonal periods, which could possibly be attributed to a high volume of travellers or limitation of resources during the peak periods.

Hence, it highlights the need to maintain consistently high quality, in the area of Food & Entertainment, amidst busy seasons to match up to the expectations the passengers have of the airline.

In terms of Airlines:

Qatar Airways outperforms Singapore Airlines in the Business, Premium Economy & Economy categories, offering exceptional value & services across these categories. However, Singapore Airlines excels in First Class, particularly in the area of delivering top-tier luxury and value for money, making it a standout choice for travellers looking for an elevated flying experience.

To further elevate passengers' overall satisfaction, some strategic improvements we suggest are to focus on:

Economy Class Comfort: Focus on improving legroom space and seat reclination to ensure that the comfort of economy class passengers is not overlooked and to ensure a level of consistency across classes

Seasonal Entertainment Enhancements: Ensure that the seasonal entertainment offerings, in terms of capacity and variety, are sufficient to meet the needs of passengers, especially during peak seasons

Premium Economy Food Quality: Improve the quality of ingredients used & the diversity of options offered to passengers, to better meet the myriad needs of passengers

3. Question 8

*Open-ended question; [airlines_reviews]

What are the common complaints?

For each Airline and TypeofTraveller, list the top 5 common issues.

3.1 Data Insights

Tables from MySQL showing the top 5 common issues for each Airline and TypeofTraveller:

Singapore Airlines:

Airline	TypeofTraveller	Category	Keyword	Frequency	AverageDifference
Singapore Airlines	Business	InflightEntertainment	quality	15	-0.39674000
Singapore Airlines	Business	FoodnBeverages	quality	14	-0.34294286
Singapore Airlines	Business	StaffService	delay	11	-0.07582727
Singapore Airlines	Business	FoodnBeverages	special	10	-0.35298000
Singapore Airlines	Business	ValueForMoney	worth	6	-0.85796667

Airline	TypeofTraveller	Category	Keyword	Frequency	AverageDifference
Singapore Airlines	Couple Leisure	InflightEntertainment	quality	24	-0.23677083
Singapore Airlines	Couple Leisure	FoodnBeverages	special	23	0.12463913
Singapore Airlines	Couple Leisure	StaffService	delay	16	-0.57671250
Singapore Airlines	Couple Leisure	SeatComfort	recline	13	-0.37204615
Singapore Airlines	Couple Leisure	SeatComfort	legroom	13	-0.71622308

Airline	TypeofTraveller	Category	Keyword	Frequency	AverageDifference
Singapore Airlines	Family Leisure	StaffService	delay	16	0.14652500
Singapore Airlines	Family Leisure	FoodnBeverages	special	12	0.05154167
Singapore Airlines	Family Leisure	FoodnBeverages	quality	10	-1.17500000
Singapore Airlines	Family Leisure	InflightEntertainment	quality	9	-0.39725556
Singapore Airlines	Family Leisure	SeatComfort	legroom	8	-0.70000000

Airline	TypeofTraveller	Category	Keyword	Frequency	AverageDifference
Singapore Airlines	Solo Leisure	InflightEntertainment	quality	29	-0.04006897
Singapore Airlines	Solo Leisure	FoodnBeverages	quality	27	-0.31478148
Singapore Airlines	Solo Leisure	FoodnBeverages	special	24	-0.20332500
Singapore Airlines	Solo Leisure	StaffService	luggage	22	-0.15737727
Singapore Airlines	Solo Leisure	SeatComfort	legroom	17	-0.16194118

Qatar Airways:

Airline	TypeofTraveller	Category	Keyword	Frequency	AverageDifference
Qatar Airways	Business	FoodnBeverages	quality	14	-0.58536429
Qatar Airways	Business	InflightEntertainment	quality	14	0.02841429
Qatar Airways	Business	StaffService	luggage	12	-1.15603333
Qatar Airways	Business	FoodnBeverages	special	10	-0.99222000
Qatar Airways	Business	SeatComfort	legroom	3	-0.09003333

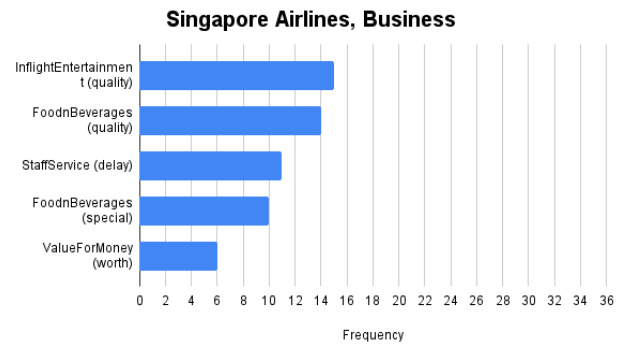
Airline	TypeofTraveller	Category	Keyword	Frequency	AverageDifference
Qatar Airways	Couple Leisure	StaffService	luggage	11	-0.22206364
Qatar Airways	Couple Leisure	FoodnBeverages	quality	11	-0.28384545
Qatar Airways	Couple Leisure	InflightEntertainment	quality	10	-0.07256000
Qatar Airways	Couple Leisure	StaffService	cancel	9	0.13714444
Qatar Airways	Couple Leisure	SeatComfort	recline	3	-2.46510000

Airline	TypeofTraveller	Category	Keyword	Frequency	AverageDifference
Qatar Airways	Family Leisure	StaffService	luggage	13	-0.45996154
Qatar Airways	Family Leisure	FoodnBeverages	special	12	-0.51846667
Qatar Airways	Family Leisure	StaffService	delay	9	-0.51904444
Qatar Airways	Family Leisure	FoodnBeverages	quality	7	-1.48880000
Qatar Airways	Family Leisure	InflightEntertainment	quality	7	0.18170000

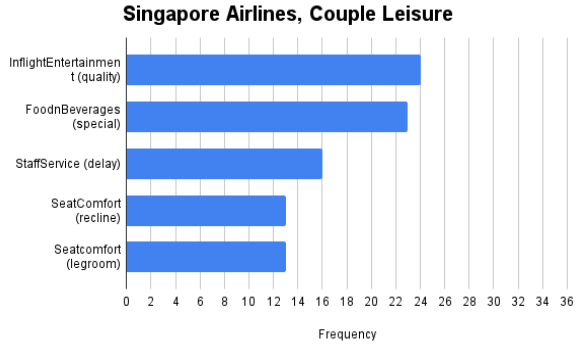
Airline	TypeofTraveller	Category	Keyword	Frequency	AverageDifference
Qatar Airways	Solo Leisure	FoodnBeverages	special	36	-0.41465556
Qatar Airways	Solo Leisure	FoodnBeverages	quality	31	-0.23582903
Qatar Airways	Solo Leisure	InflightEntertainment	quality	31	0.11025806
Qatar Airways	Solo Leisure	StaffService	delay	26	0.03928462
Qatar Airways	Solo Leisure	SeatComfort	uncomfortable	11	-0.02902727

Graphs showing the top 5 common issues faced by passengers of Singapore Airlines

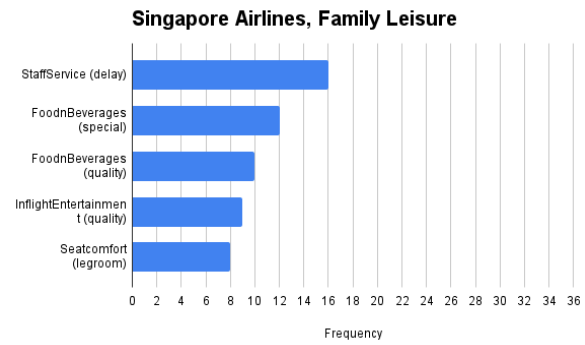
Business:



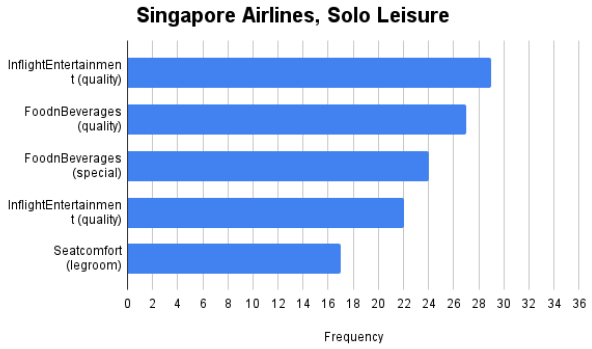
Couple Leisure:



Family Leisure:

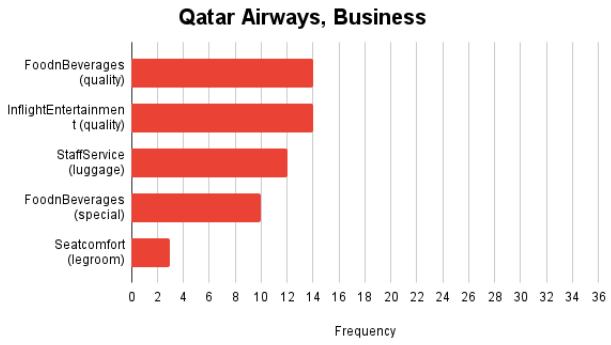


Solo Leisure:

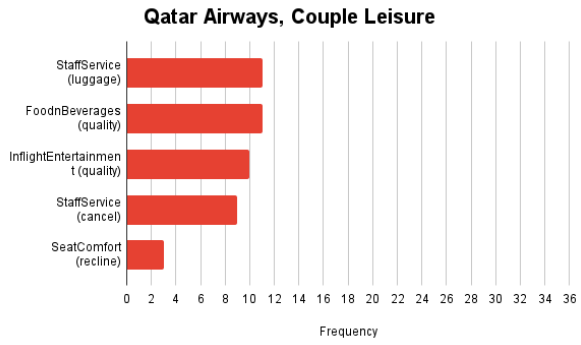


Graphs showing the top 5 common issues faced by passengers of Qatar Airways:

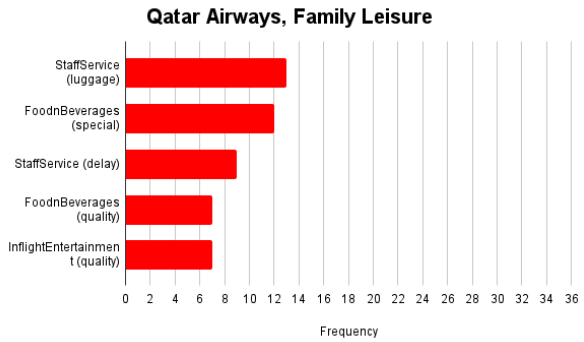
Business:



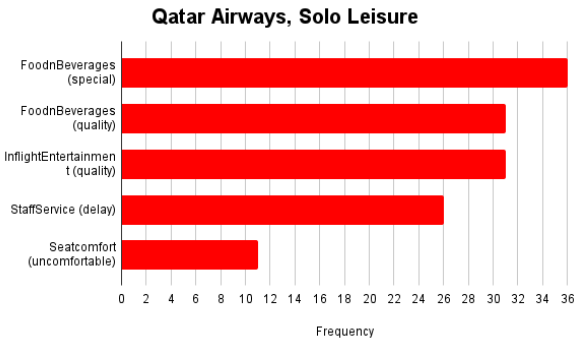
Couple Leisure:



Family Leisure:



Solo Leisure:



Overall, the top 5 common issues across each Airline and TypeofTraveller are regarding:

1. Quality of FoodnBeverages
2. Special Meal Requests of FoodnBeverages
3. Quality of InflightEntertainment
4. StaffService Related to Luggage Handling
5. StaffService During Delays

FoodnBeverages:

Frequent complaints among passengers from each Airline and TypeofTraveller is the poor food quality and limited special meal options. These issues may point to inconsistencies in food catering and a lack of diversity in meal choices, which fail to accommodate the varying dietary needs and preferences of passengers. To address the issue of poor food quality, airlines can offer condiments such as sauces or seasonings alongside meals. This provides passengers with more customisation options and can also improve the taste and flavour of their meals on the plane. For complaints on limited special meal options, airlines should broaden their menu to include a wider range of food choices, for instance, vegan, vegetarian, and allergen-free meals to ensure dietary needs are met. Hence, airlines can invest in higher-quality ingredients and improve meal preparation standards to raise passenger satisfaction.

InflightEntertainment:

Entertainment system quality remains one of the top complaints. Passengers often complained about poor screen resolution or system malfunctioning which has diminished their overall flight experience. As in-flight entertainment is particularly important on long-haul flights, airlines should prioritise regular maintenance checks and upgrades. Improving screen resolution and implementing touch-screen for the in-flight entertainment system can ensure a more seamless and enjoyable experience for passengers.

StaffService:

Staff service is another area of concern, particularly for Qatar Airways. Qatar Airways has received multiple complaints on its staff service, despite receiving higher ratings on its other areas. Common complaints include poor handling of luggage by staff and poor customer service handling situations like flight/ baggage delays and cancellation of flights. These could highlight potential gaps in staff training. To address this, Qatar Airways can enhance its training programmes, emphasising customer service, consistency and prompt assistance, particularly for handling situations regarding baggage and flight delays and cancellations. There also needs to be a focus on luggage management to emphasise preventive measures to avoid delays and damage. For example, airlines can invest in better technology to optimise baggage tracking

systems to minimise errors. Additionally, staff should be equipped to respond effectively and empathetically to passengers affected by these issues and provide frequent updates.

Solo Leisure:

Solo Leisure travellers have been identified as reporting complaints more frequently than other types of travellers. Airlines could consider introducing a personalised loyalty program specifically for solo travellers such as exclusive entertainment choices or priority services. Tailoring our approach to the demographic of these travellers and proactively addressing their needs can help to improve their overall experience and satisfaction.

4. Question 9

Open-ended question; [airlines_reviews] and additional data

Are there any systematic differences in customer preferences/complaints pre- and post-COVID specific to Singapore Airlines?

Singapore Airlines hands out 8 months' bonus following record annual profit

https://www.channelnewsasia.com/business/singapore-airlines-scoot-employees-get-nearly-8-months-bonus-4340801

In addition to customer satisfaction, what do you think contributed to the strong performance of Singapore Airlines in recent periods?

4.1 Data Insights

Are there any systematic differences in customer preferences/complaints pre- and post-COVID specific to Singapore Airlines?

In this question, pre-COVID is defined to be before March 2020, when the World Health Organisation (WHO) declared the COVID-19 outbreak a global pandemic (Cucinotta & Vanelli, 2020). Post-COVID is defined as the period from May 2023, when WHO announced that the pandemic was no longer a public health emergency (United Nations, n.d.).

Tables from MySQL showing the average ratings for pre- and post-COVID:

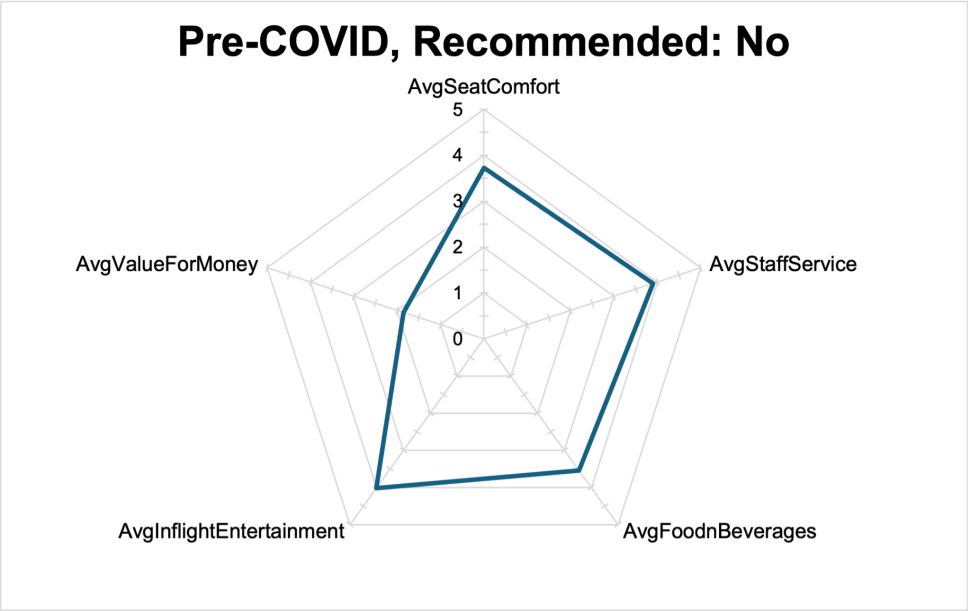
TimePeriod	AvgSeatComfort	AvgStaffService	AvgFoodnBeverages	AvgInflightEntertainment	AvgValueForMoney	AvgOverallRating	RecommendedType	RecommendedTypeCount
Post-COVID	3.4935	4.1688	3.7273	4.0390	4.4675	8.9091	yes	77
Post-COVID	3.5862	3.8793	3.1724	3.7759	1.8276	2.7069	no	58
Pre-COVID	3.7672	4.0172	3.7112	3.8987	4.3491	8.6207	yes	464
Pre-COVID	3.7297	3.8973	3.5405	4.0216	1.8486	2.8811	no	185

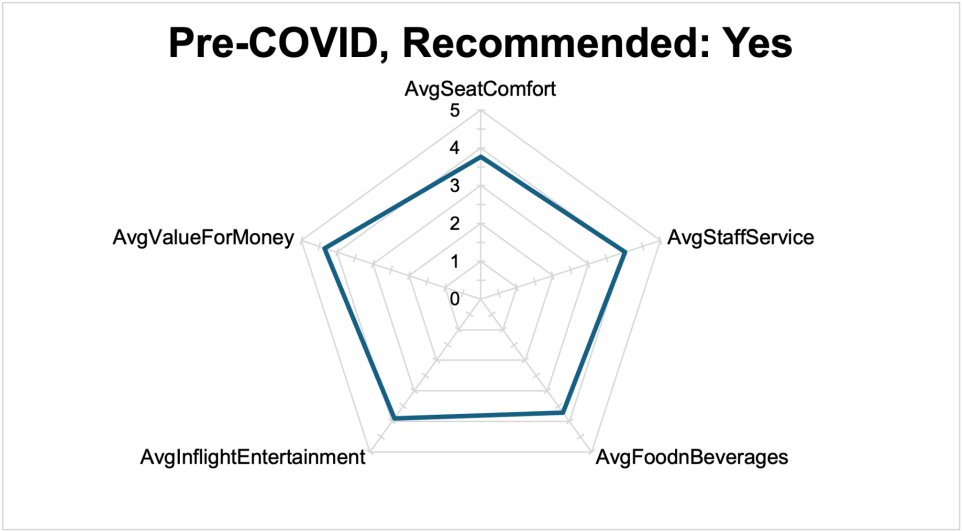
Zoomed-In Figure:

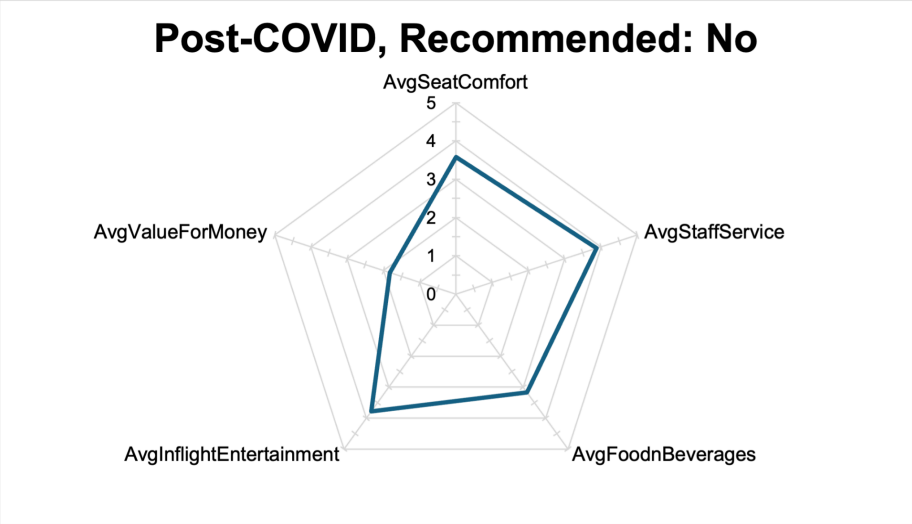
TimePeriod	AvgSeatComfort	AvgStaffService	AvgFoodnBeverages	AvgInflightEntertainment
Post-COVID	3.4935	4.1688	3.7273	4.0390
Post-COVID	3.5862	3.8793	3.1724	3.7759
Pre-COVID	3.7672	4.0172	3.7112	3.8987
Pre-COVID	3.7297	3.8973	3.5405	4.0216

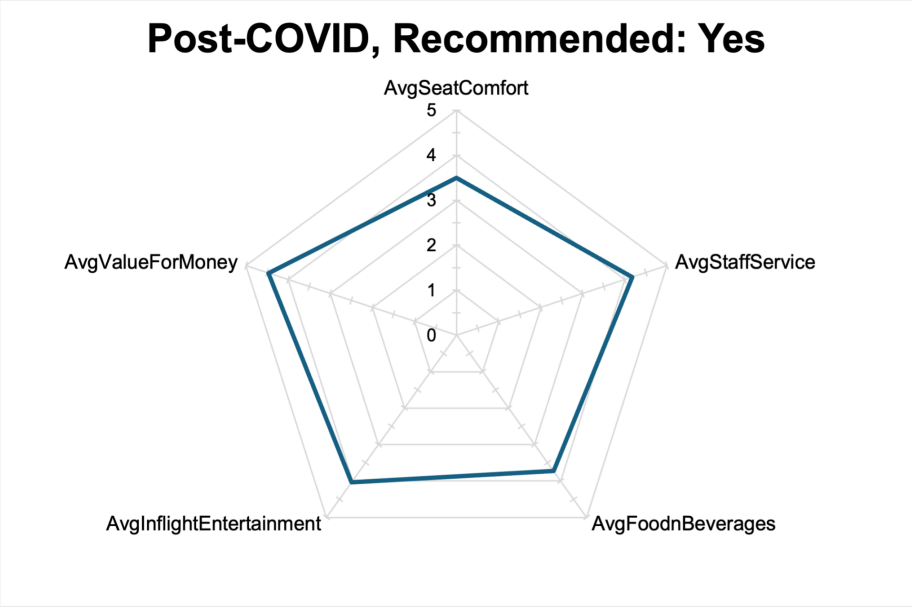
AvgValueForMoney	AvgOverallRating	RecommendedType	RecommendedTypeCount
4.4675	8.9091	yes	77
1.8276	2.7069	no	58
4.3491	8.6207	yes	464
1.8486	2.8811	no	185

Graphs showing average ratings for each category pre- and post-COVID:









Pre-COVID, Recommended VS Post-COVID, Recommended:

Comparing the differences in positive feedback with RecommendedType = Yes pre-COVID and post-COVID, AvgValueForMoney and AvgOverallRating increased, while AvgSeatComfort decreased. In particular, AvgSeatComfort decreased by 7.27%. AvgFoodnBeverages showed no significant changes. This may suggest that for positive reviewers, there are fewer complaints regarding ValueForMoney, while there could be more complaints about SeatComfort such as the reclining function or padding of the seats.

The increase in AvgOverallRating may reflect passengers' appreciation of overall improvements, even if only in some areas like cleanliness or customer service. The larger decrease in AvgSeatComfort may be because Singapore Airlines delayed replacing older seats to maximise post-COVID revenue, to focus on their financial recovery.

Pre-COVID, Not Recommended VS Post-COVID, Not Recommended:

Comparing the differences in negative feedback with RecommendedType = No pre-COVID and post-COVID, AvgValueForMoney, AvgFoodnBeverages, AvgInflightEntertainment and AvgOverallRating decreased. Specifically, there is the largest decrease in AvgFoodnBeverages, where ratings decreased by 10.40%. AvgInflightEntertainment decreased by 6.11%. This may imply that there are more complaints surrounding these categories.

Singapore Airlines may be switching to cheaper catering options or ingredients to cut costs, or thereby reductions in food services to comply with health protocols post-COVID. Similarly, there may be outdated in-flight entertainment systems due to budget constraints. From the customers' point-of-view, they may expect improved experiences post-COVID, given pent-up demand for travel. Thus, the lower ratings may reflect a mismatch between expectations and reality, especially with rising travel costs.

Recommendations:

Some recommendations for Singapore Airlines will be to improve the comfort and dining experiences to address concerns on SeatComfort and FoodnBeverages because these are consistent pain points for both satisfied and dissatisfied customers. Singapore Airlines can be transparent and communicate the reasons behind the change in quality. In addition, Singapore Airlines can look into their pricing structure or service offering to gain deeper insight into the perceived value of their services, and possibly align fares with the perceived value provided to passengers.

Tables showing the frequency of certain destinations pre- and post-COVID with Singapore Airlines:

CleanedDestination	PreCOVIDCount	PostCOVIDCount
Singapore	223	43
London	28	5
Bangkok	22	9
Melbourne	22	4
Sydney	22	5
Perth	19	1
Jakarta	18	3
Hong Kong	17	4
Brisbane	14	2
Tokyo	12	3
Zurich	12	1
Los Angeles	11	1
Manila	11	3
San Francisco	11	1
Amsterdam	10	0
Denpasar	10	3
Kuala Lumpur	10	1
Delhi	9	1
New York	9	6
Frankfurt	8	5
Bali	7	1
Beijing	7	0
Paris	7	2
Auckland	6	7
Bangalore	6	0
Colombo	6	0
Manchester	6	1
Mumbai	6	0
Munich	6	0
Dubai	5	1
Houston	5	0
Seoul	5	0
Shanghai	5	0
Christchurch	4	1
Hanoi	4	0
Ho Chi Minh	4	1
Adelaide	3	1
Canberra	3	0
Istanbul	3	1
Kolkata	3	0

CleanedDestination	PreCOVIDCount	PostCOVIDCount
Moscow	3	0
Surabaya	3	0
Taipei	3	0
Cape Town	2	0
Guangzhou	2	0
Johannesburg	2	1
Milan	2	1
Nagoya	2	0
Newark	2	0
Trivandrum	2	0
Wellington	2	0
Ahmedabad	1	0
Athens	1	0
Bandar Seri Begawan	1	1
Barcelona	1	0
Cairns	1	2
Chennai	1	0
Coimbatore	1	0
Copenhagen	1	1
Dhaka	1	0
Dublin	1	0
Dusseldorf	1	0
Kansai	1	1
Ko Samui	1	0
Kochi	1	0
Koh Samui	1	0
Makassar	1	0
Male	1	0
Narita	1	0
Penang	1	3
Phuket	1	2
Qingdao	1	0
Sao Paulo	1	0
Thailand	1	0
Vientiane	1	0
Xiamen	1	0
Yangon	1	0
Fukuoka	0	1
Phnom Penh	0	3
Seattle	0	2
Zagreb	0	1

From the tables, it may seem that there's a significant decline in passengers flying to Singapore via Singapore Airlines, but it is because the PreCOVIDCount includes data from 2013 to 2020, with a bulk of the data dated from 2016 to 2020, while the PostCOVIDCount only includes comparably less data from May 2023 to Feb 2024.

Singapore is the top destination for Singapore Airlines, reflecting a strategic alignment with its role as Singapore's national carrier. This may suggest that Singaporeans from overseas may prefer to fly back to Singapore with Singapore Airlines as their carrier of choice due to brand trust and familiarity. Tourists may also prefer to visit Singapore with its national airline, because

the airline may offer a preview of the quality and hospitality they can expect in Singapore. It could also be possible that Singapore Airlines markets itself as the start of tourists' Singapore experience by offering Singaporean cuisine, attracting tourists to take the airline to Singapore.

The tables suggest growing interest in destinations like Bangkok and Auckland in the post-COVID time period, potentially reflecting changes in tourist preferences toward closer or nature-orientated destinations. Reasons for this increase can be economic factors, with shorter flights often associated with lower ticket prices. The decrease in passenger counts for long-haul destinations suggests reduced business travel. This may be due to the global shift towards remote work and virtual meetings, which were quickly adapted to working conditions during the pandemic. Moreover, the post-pandemic recovery is likely accompanied by inflationary pressures and higher costs, which may discourage travel to more distant destinations.

In addition to customer satisfaction, what do you think contributed to the strong performance of Singapore Airlines in recent periods? (additional data)

Graph showing the Capacity, Passenger Traffic and Load Factor:

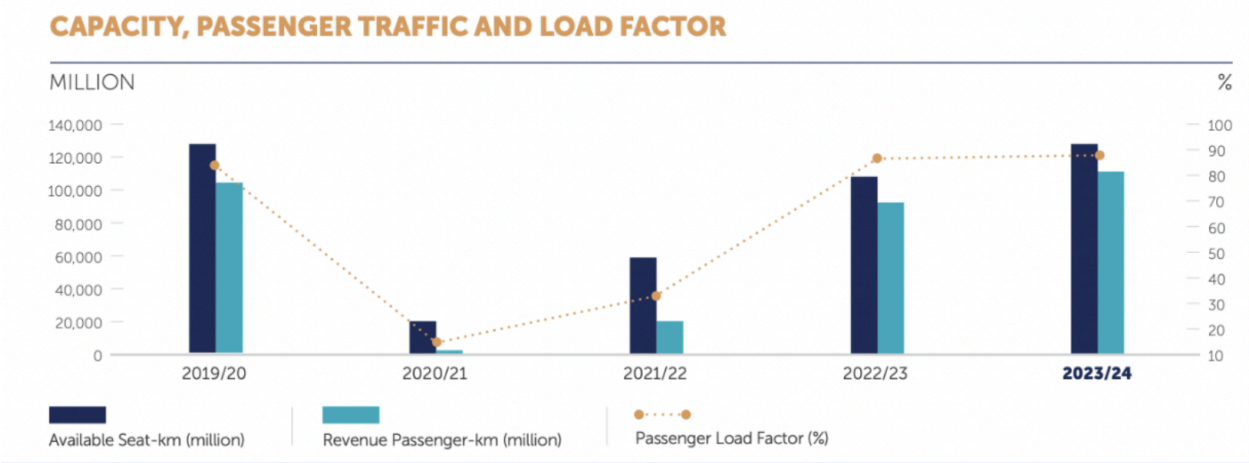


Figure 1: SIA's Capacity, Passenger Traffic and Load Factor (SIA, 2024)

Singapore Airlines achieved record revenue, profits & load factors In FY 2023/24. Their outstanding performance was driven by the significant surge in air travel demand as travel restrictions started to ease post-pandemic and key markets like North Asia reopened, boosting travel across the regions.

Improved Group Load Factor: Singapore Airlines Group Load Factor which measures the percentage of available seats filled by passengers, shows an improvement to 88.0%, which is a strong indicator of the airline's ability to efficiently manage flight capacity relative to demand. A high load factor generally indicates strong operational performance, as it reflects the airline's ability to fill seats and maximise profitability for each operating flight.

Graph showing the ten-year statistical record of Singapore Airlines:

TEN-YEAR STATICTICAL RECORD

		2023/24	2022/23	2021/22	2020/21 [R1]	2019/20	2018/19	2017/18 [R2]	2016/17	2015/16	2014/15
SINGAPORE AIRLINES [R1]											
FINANCIAL											
Total revenue	($ million)	**16,177.1**	15,590.1	7,068.1	3,478.0	13,012.7	13,144.2	12,807.5	11,094.2	11,686.1	12,418.4
Total expenditure	($ million)	**13,541.9**	12,988.9	7,180.0	5,399.0	12,718.5	12,153.7	11,469.4	10,707.8	11,201.0	12,078.2
Operating profit/(loss)	($ million)	**2,635.2**	2,601.2	(111.9)	(1,921.0)	294.2	990.5	1,338.1	386.4	485.1	340.2
Profit/(Loss) before taxation	($ million)	**2,969.7**	2,724.9	(377.4)	(3,777.7)	(290.3)	938.8	1,529.0	579.3	766.2	563.1
Profit/(Loss) after taxation	($ million)	**2,570.8**	2,218.9	(314.0)	(3,183.0)	(283.5)	779.1	1,324.6	514.0	672.0	540.3
Capital disbursements [R3]	($ million)	**1,227.5**	2,243.6	3,605.5	2,692.8	4,859.1	5,005.2	4,358.1	3,425.5	2,309.0	1,788.5
Passenger - yield	(cents/pkm)	**12.1**	12.7	13.1	21.1	10.0	10.1	10.2	10.3	10.6	11.2
- RASK	(cents/ask)	**10.6**	10.9	4.3	2.9	8.2	8.4	8.3	8.2	8.4	8.8

Figure 2: SIA's Ten-year Statitcal Record (SIA, 2024)

A strong Record Revenue Per Available Seat Kilometre (RASK) indicates high passenger demand. After the pandemic, as airlines started to scale up their operations, air travel demand experienced a surge, especially for long-haul flights and leisure destinations, which has significantly contributed to the strong RASK, which also reflects the strong recovery of Singapore Airlines passenger traffic post-pandemic. Singapore Airlines has capitalised on this recovery by improving its services and boosting the flight capacity to cater to the surge in air travel demand.

Another factor that has contributed to the strong performance of Singapore Airlines in recent years is the effective pricing strategies adopted. The record RASK also points to Singapore Airlines' ability to implement effective pricing strategies. Transformation efforts like fleet upgrades and service improvements contributed to record-high RASK in recent years, signalling strong demand and effective pricing strategies.

5. Question 10

Open-ended question; [airlines_reviews], [customer_suppport], and additional data

CAN Explains: Is Singapore Airlines obliged to compensate SQ321 passengers?

https://www.channelnewsasia.com/singapore/sq321-compensation-singapore-airlines-turbulence-cna-explains-4404701

How can a customer service chatbot be designed to help Singapore Airlines in such exceptional circumstances?

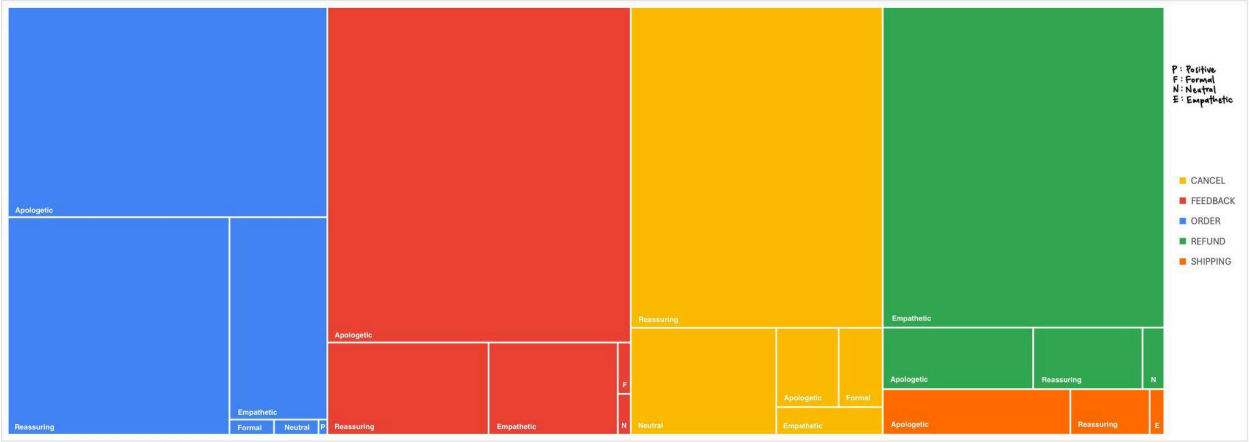
Possible thinking process: Consider airlines_reviews to identify the relevant issues (e.g., safety and compensations). Consider customer_support in the general chatbot responses to various lexical variations. Propose linguistic design considerations for the chatbot (e.g., apologetic tones, detailed explanations, simple sentences).

Notes: When additional datasets are considered, your team must provide formal references/sources to retrieve the original datasets.

Evaluation will be performed with attention to the coherence of your team's narrative. A coherent data narrative can be achieved using a focused dataset. A rich, diversified dataset can muddle the narrative if the data is not meaningfully integrated.

5.1 Data Insights

Graphs showing the prominence of different tones for different chatbox categories (overall view):

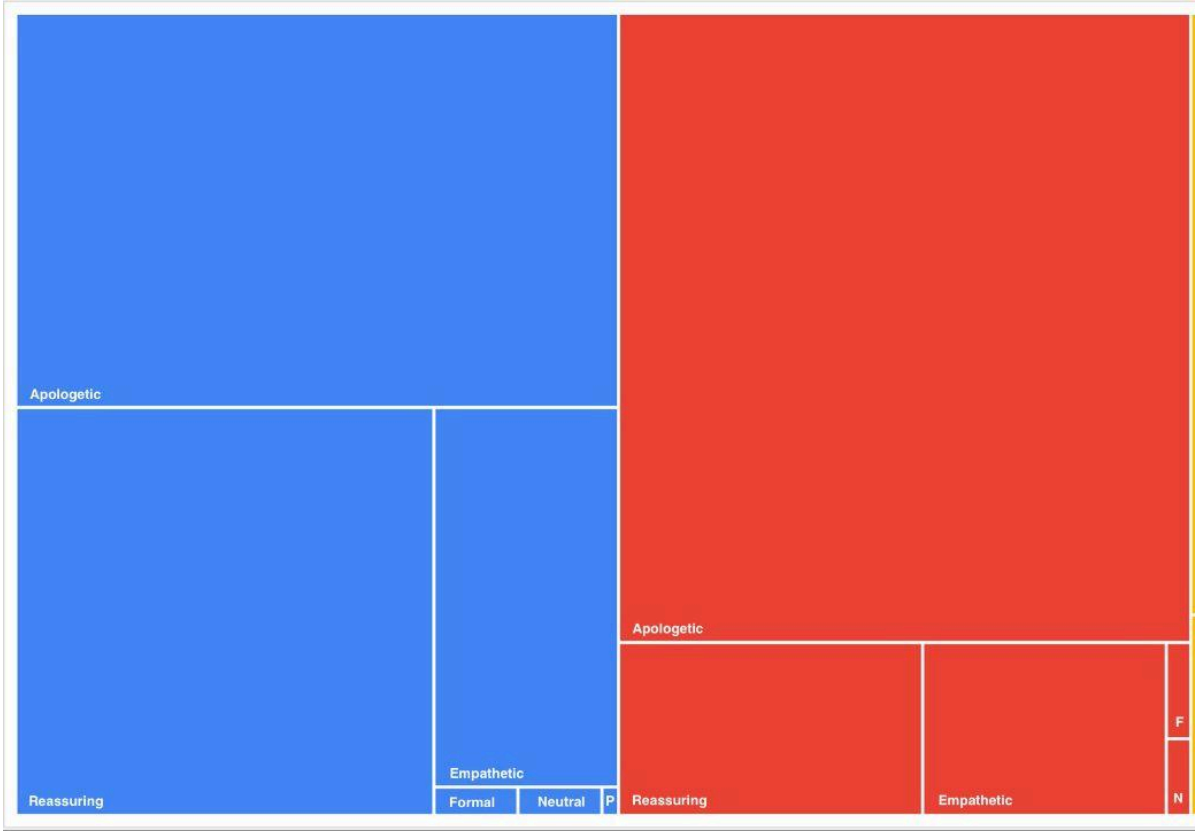


Overall, across all chatbox categories, we observe that apologetic, reassuring and empathetic tones take up a significant portion.

1. Apologetic tone is the most for three categories: order, feedback and shipping
2. Reassuring tone is the most for cancel category
3. Empathetic tone is the most for refund category

This shows that the chatbox responses are generally not robotic and carry emotions that can help improve customers' overall satisfaction when they have to use the chatbox after facing exceptional circumstances as they would usually be feeling emotions of anger, worry, stress etc. The tone of the chatbox can help them to calm down and leave a better impression of the airline as the customers feel that the airline is helpful and they are being understood.

Graphs showing the prominence of different tones for different chatbox categories (zoomed in):



Now zooming into each category:

1. Order

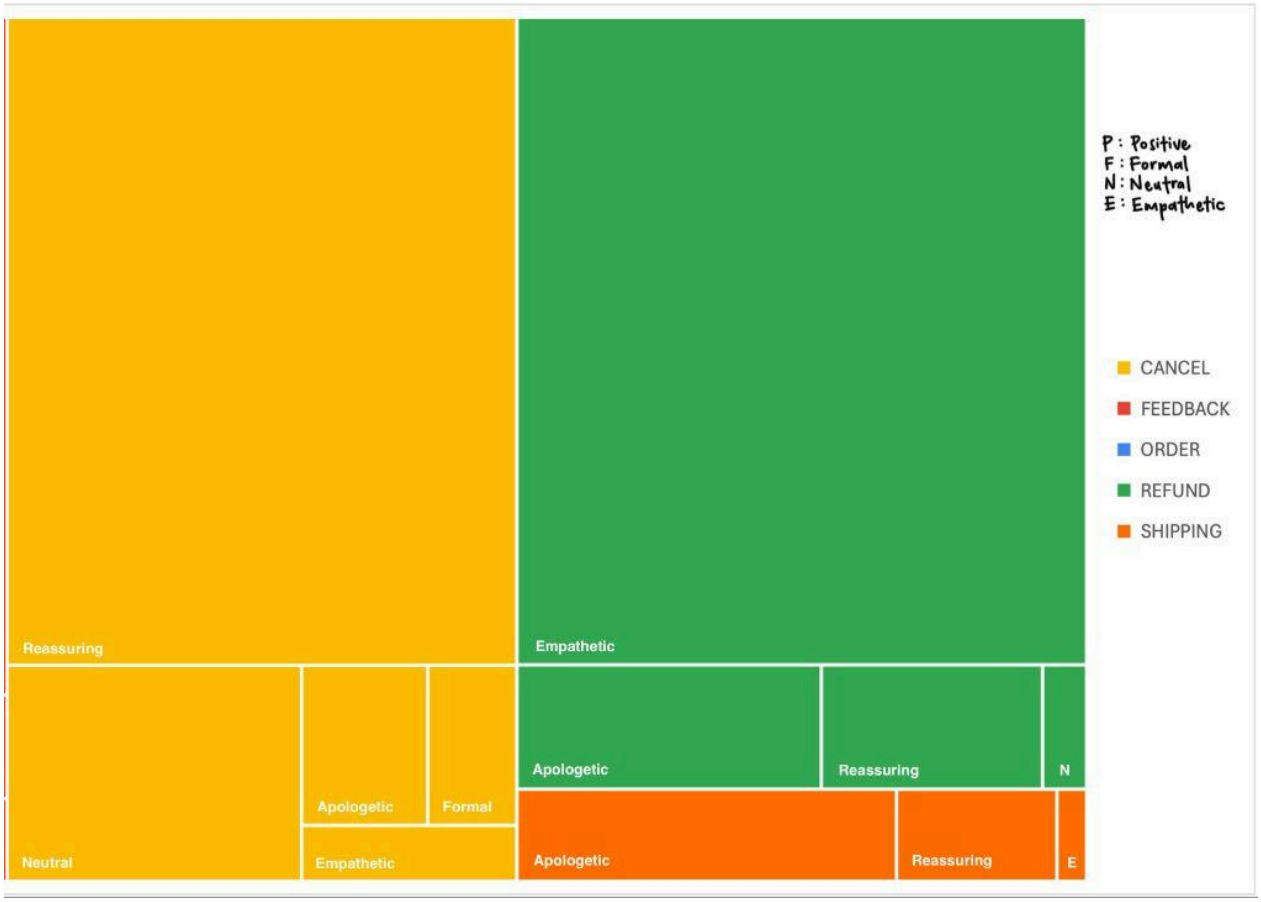
Good: High apologetic and reassuring tones help customers feel that the airlines care for them and are willing to help them with their requests.

Improvement: Positive and empathetic tones can be further increased to build stronger connections with customers and alleviate customers' worries about order cancellations.

2. Feedback

Good: A very prominent apologetic tone as compared to other tones reflects a customer-first approach and shows that the chatbox has a reactive approach to handling feedback and addressing complaints.

Improvement: Greater emphasis on empathetic and reassuring tones can better acknowledge customer concerns and demonstrate actionable follow-up.



3. Cancel

Good: A dominant reassuring tone shows that the chatbox emphasises easing customer concerns about cancellations and alleviating their worries.

Improvement: More formal tones could be used together with the other tones when providing fee breakdowns to ensure professionalism while adding warmth to the responses.

4. Refund

Good: A significant portion of the empathetic tone reflects that the chatbox has an understanding of customer frustrations with refund processes. Together, with apologetic and reassuring tones, they help to build trust with the customers.

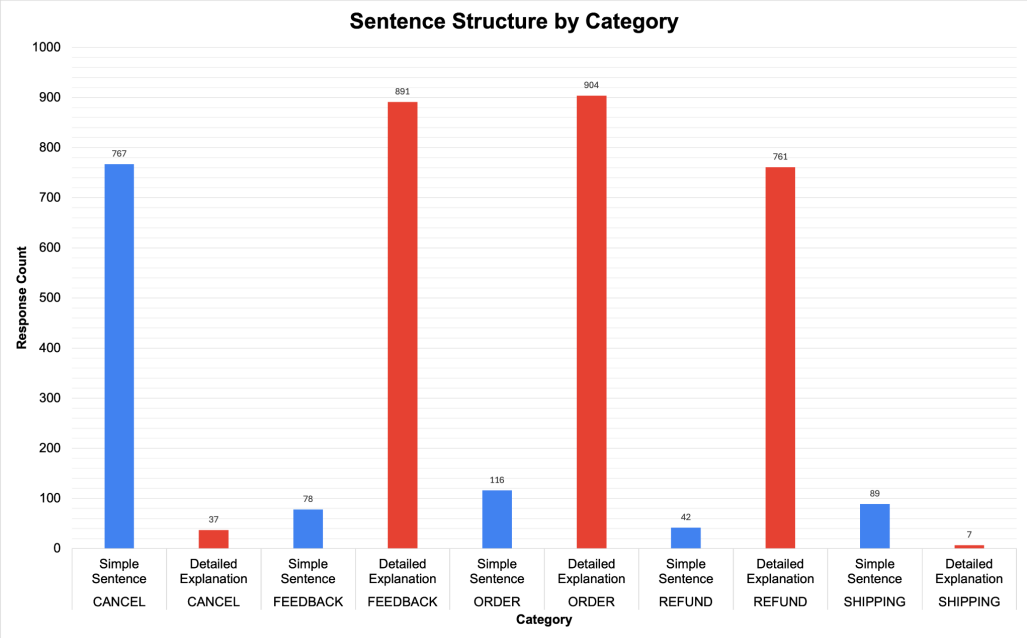
Improvement: Although having an empathetic tone is good, the chatbox needs to avoid overusing it to ensure clarity and actionability in refund communications. Having a blanched mix of tones can help to address refund delays or rejections effectively.

5. Shipping

Good: The general queries and responses to shipping are very low compared to other categories but we can still see that the most frequent tone used, an apologetic tone, is suitable for addressing shipping delays or errors.

Improvement: Empathy should be prioritised in this situatio,n especially during major disruptions or when addressing high-value shipments.

Graph showing Sentence Structure by Category:



1. Cancel

Good: Simple Sentence being heavily dominant suggests the chatbot prioritizes brevity and efficiency in its responses for cancellation-related queries.

Improvement: Detailed explanations are underutilized, which may leave some users dissatisfied when they seek clarity about cancellation policies or fee justifications.

2. Feedback
3. Order
4. Refund

Good: For these three categories, the focus on detailed explanations aligns well to address complaints and customer concerns related to cancellation and refund processes, fees, or policies. This can effectively clear any doubt from the customer and save the trouble of the

customer for the need of doing their own research to find out which can add more frustrations to them when already with with exceptional circumstances.

Improvement: It is important to also focus on simple sentences for customers who used to have quick and straightforward answers, especially for standard cancellation and refund requests. Overuse of detailed explanations may overwhelm the customers with too much information when not needed.

5. Shipping

Good: The chatbot relies heavily on simple sentences to provide concise instructions or confirmations for shipping address changes which is effective for quick actions or confirmations.

Improvement: Minimal usage suggests the chatbot may not adequately explain policies or next steps when users are unable to change their shipping address (e.g., after dispatch). Customers in such scenarios could benefit from additional guidance or alternatives.

How to improve customer service chatbot for exceptional circumstances (additional data)

Figure 3: SIA's Compensation Plan (Ong & Ng, 2024)

A customer service chatbot can be designed to help Singapore Airlines in such exceptional circumstances through the following features:

A customer service chatbot could provide real-time flight updates, and keep passengers informed during exceptional circumstances. It can also provide step-by-step instructions to guide passengers in the event that they need to file a claim, rebook flights, or check their eligibility to receive compensation.

To address common concerns that passengers have in the event of exceptional circumstances, the chatbot can integrate empathetic Frequently Asked Questions (FAQs) into the chatbot such as "What is the next step if my flight is delayed or cancelled?". This ensures that such concerns are answered promptly, giving passengers reassurance on their next step and what to expect.

Recognising lexical variations in queries by recognising various phrases such as “compensation for cancelled flights”, and “reimbursement for delayed travel expenses” by identifying the intent behind these phrases and providing accurate responses to the queries. All these different variations express the same intent which is customers asking for compensation. The customer service chatbot needs to be able to identify informal or incomplete sentences such as “Delay payment?” or “Flight late compensation?” which is crucial, especially during exceptional circumstances where passengers are extremely frustrated and may use unclear or hurried language to express their queries.

By utilising sentiment analysis, the customer service chatbot can detect signs of frustration, stress or anger in the tone of the message, and allow quick and hassle-free escalation of a particular issue to live agent support, ensuring passengers' concerns are promptly addressed, without any added frustrations.

References

Question 9

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- United Nations. (n.d.). WHO chief declares end to COVID-19 as global threat. United Nations. Retrieved November 22, 2024, from https://www.un.org/en/coronavirus#:~:text=WHO%20chief%20declares%20end%20to,no%20longer%20a%20global%20threat

- Singapore Airlines. (2024). Annual report 2023/24. Singapore Airlines. https://www.singaporeair.com/content/dam/sia/web-assets/pdfs/about-us/information-for-investors/annual-report/annualreport2324.pdf

Question 10

- Ong J. G. & Ng A. (2024, June 27). CNA Explains: Is Singapore Airlines obliged to compensate SQ321 passengers?. CNA. https://www.channelnewsasia.com/singapore/sq321-compensation-singapore-airlines-turbulence-cna-explains-4404701

Task Allocation

S/N	Tasks	Member In-charge
1	[relational database] SQL development for Q3 (all queries of Q3)	Amanda
2	[nonrelational database] noSQL development for Q3 (all queries of Q3)	Amanda
3	[relational database] SQL development for Q7 (all queries of Q7)	Amanda
4	[nonrelational database] noSQL development for Q7 (all queries of Q7)	Amanda
8	[relational database] SQL development for Q4 (all queries of Q4)	Jia Hui
9	[nonrelational database] noSQL development for Q4 (all queries of Q4)	Jia Hui
10	[nonrelational database] noSQL development for Q6 (all queries of Q6)	Jia Hui
11	[nonrelational database] noSQL development for Q8 (all queries of Q8)	Jia Hui
12	[relational database] SQL development for Q10 (all queries of Q10) (but relating keywords to different tones from chatbox responses are given by Amanda and Valerie)	Jia Hui
13	[nonrelational database] noSQL development for Q10 (all queries of Q10)	Jia Hui
14	[relational database] SQL development for Q1 (all queries of Q1)	Rena
15	[nonrelational database] noSQL development for Q1 (all queries of Q1)	Rena
16	[relational database] SQL development for Q2 (all queries of Q2)	Rena
17	[nonrelational database] noSQL development for Q2 (all queries of Q2)	Rena
18	[relational database] SQL development for Q6 (specific to query 1 and 2 of Q6)	Rena
22	[relational database] SQL development for Q5 (all queries of Q5)	Valerie

23	[nonrelational database] noSQL development for Q5 (all queries of Q5)	Valerie
24	[relational database] SQL development for Q6 (specific to query 3 of Q6)	Valerie
25	[relational database] SQL development for Q8 (but keywords and synonyms are given by - SeatComfort (Valerie) - StaffService (Jia Hui) - FoodnBeverages (Amanda) - InflightEntertainment (Rena) - ValueForMoney (Valerie and Jia Hui))	Valerie
26	[relational database] SQL development for Q9 (all queries of Q9)	Valerie
27	[nonrelational database] noSQL development for Q9 (all queries of Q9)	Valerie