BUISNESS PROBLEM

Our company has been providing high-quality air transportation service to our clients for several years, ensuring a safe, comfortable, and convenient journey for our passengers. We operate a diverse fleet of aircraft, ranging from small business jets to medium-sized machines. However, we currently face challenges due to various factors such as stricter environmental regulations, higher flight taxes, increased interest rates, rising fuel prices, and a tight labor market leading to higher labor costs. These challenges are putting pressure on the company's profitability, and we are actively seeking solutions to address this issue. In order to tackle this challenge, the company is planning to **analyze their database** and **identify opportunities to increase the occupancy rate, thereby boosting the average profit earned per seat.**

Main Business Challenges

1. **Stricter environmental regulations**: The airlines industry is facing increasing pressure to reduce its carbon footprint, leading to the implementation of more stringent environmental laws. These regulations not only raise operating costs but also restrict the potential for expansion.

2. **Higher flight taxes**: Governments worldwide are imposing heavier taxes on aircraft as a means to address environmental concerns and generate revenue. This increase in flight taxes has raised the overall cost of flying, subsequently reducing demand.

3. **Tight labor market resulting in increased labor costs**: The aviation sector is experiencing a scarcity of skilled workers, leading to higher labor costs and an increase in turnover rates.

Objectives

1. **Increase occupancy rate:** By increasing the occupancy rate, we can boost the average profit earned per seat and mitigate the impact of the challenges we're facing.

2. **Improve pricing strategy:** We need to develop a pricing strategy that takes into account the changing market conditions and customer preferences to attract and retain customers.

3. **Enhance customer experience:** We need to focus on providing a seamless and convenient experience for our customers, from booking to arrival to differentiate ourselves in a highly competitive industry and increased customers loyalty.

The end goal of this task would be to identify oppertunities to increase the occupancy rate on low-performing flights, which can ultimately lead to increased profitability for the airline.

Basic data analysis

The basics analysis of data provides insights into the number of planes with more than 100 seats, how the number of tickets booked and total amount earned changed over time, and the average fare for each aircraft with different fare conditions. These findings will be useful in developing strategies to increase occupancy rates and optimize pricing for each aircraft. Table 1 shows the aircraft with more than 100 seats and the actual count of the seats.

	aircraft_code	num_seats
0	319	116
1	320	140
2	321	170
3	733	130
4	763	222
5	773	402

Table 1

In order to gain a deeper understanding of the trend of tickets bookings and revenue earned through those bookings, we have utilized a line chart visualization. Upon analysis of the chart, we observe that the number of tickets booked exhibits a gradual increase from June 22nd to July 7th, followed by a relatively stable pattern from July 8th until August, with a noticeable peak in ticket bookings where the highest number of tickets were booked on a single day. It is important to note that the revenue earned by the company from these bookings is closely tied to the number of tickets booked. Therefore, we can see a similar trend in the total revenue earned by the company throughout the analyzed time period. These findings suggest that further exploration of the factors contributing to the peak in ticket bookings may be beneficial for increasing overall revenue and optimizing operational strategies
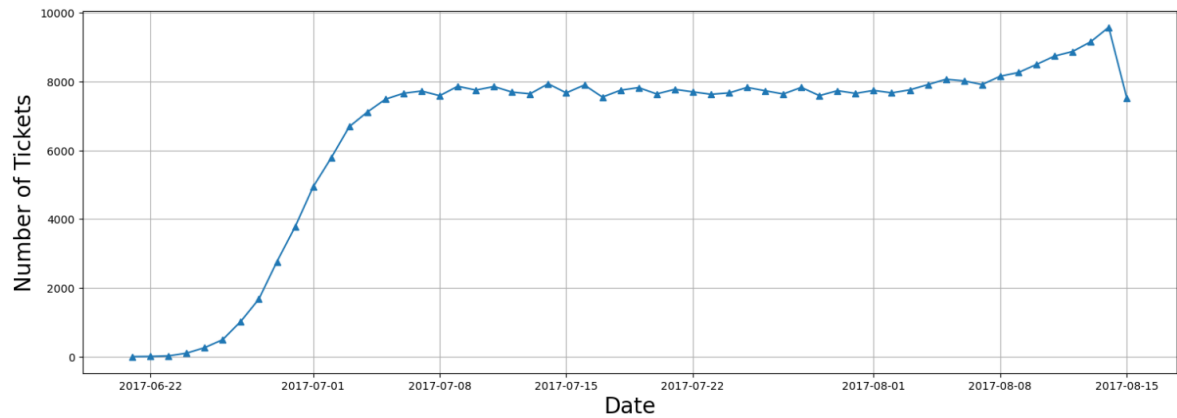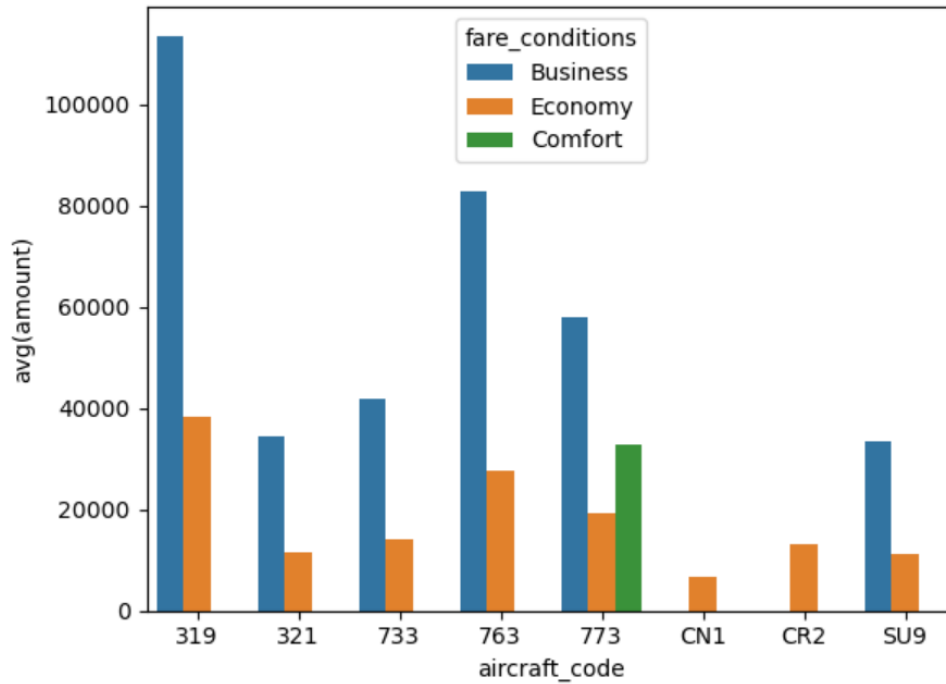
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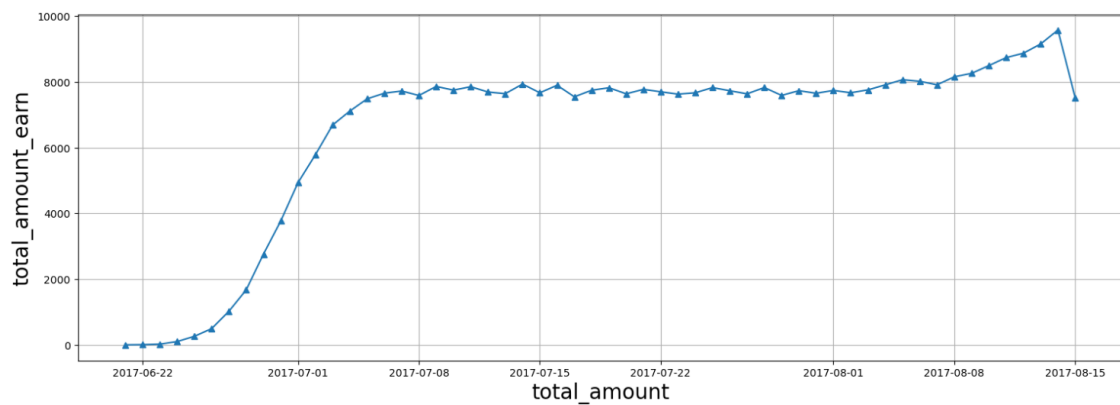
Figure 2

We are able to generate a bar graph to graphically compare the data after we completed the computations for the average costs associated with different fare conditions for each aircraft. The graph Figure 3 shows data for the three types of fare: business, economy, and confort. It is worth mentionning that the comfort class is available on only one craft, the 773. The CN1 and CR2 planes, on the other hand, only procide the economy class. When different pricing circumstances within each aircraft are compared, the charges for business class are consistently greater than those for economy class. This trend may be seen across all planes, regardless of fare conditions.

Figure 3

Analyzing occupancy rate

Airlines must thoroughly analyze their revenue streams in order to maximize profitability. The overall income per year and average revenue per ticket for each aircraft are important metrics to consider. Airlines may use this information to determine which aircraft types and itineraries generate the most income and alter their operations appropriately. This research can also assist in identifying potntial for pricing optimization and allocating resources to more profitable routes. The below figure 4 shows the total revenue, total tickets and average revenue made per ticket for each aircraft. The aircraft with the highest total revenue is SU9 and from the figure 3 it can be seen that the price of the business class and economy class is the lowest in this aircraft. This can be the reason that most of the people bought this aircraft ticket as its cost is less compared to others. The aircraft with least total revenue is CN1, and the possible reason behind this is it only offers economy class with very least price and it might be becuase of its poor conditions or less facilities.

	aircraft_code	ticket_count	total_revenue	avg_revenue_per_ticket
0	319	52853	2706163100	51201
1	321	107129	1638164100	15291
2	733	86102	1426552100	16568
3	763	124774	4371277100	35033
4	773	144376	3431205500	23765
5	CN1	14672	96373800	6568
6	CR2	150122	1982760500	13207
7	SU9	365698	5114484700	13985

The average occupancy per aircraft is another critical number to consider. Airlines may measure how successfully they fill their seats and discover chances to boost occupancy rate by using this metric. Higher occuapancy rates can help airlines increase revenue and profitability while lowering operational expenses associated with vacant seats. Pricing strategy, airline schedules, and customer statisfaction are all factor that might influence occupancy rates. The below figure 5 shows the average booked seats from the total number of seats for each aircraft. The occupancy rate is calculated by dividing the booked seats by the total number of seats. Higher occupancy rate means the aircraft seats are more booked and only few seats are left unbooked.

	aircraft_code	booked_seats	num_seats	occupancy_rate
0	319	53.583181	116	0.461924
1	321	88.809231	170	0.522407
2	733	80.255462	130	0.617350
3	763	113.937294	222	0.513231
4	773	264.925806	402	0.659019
5	CN1	6.004431	12	0.500369
6	CR2	21.482847	50	0.429657
7	SU9	56.812113	97	0.585692

Airlines can assess how much their total yearly turnover could improve by providing all aircraft a 10% higher occupancy rate to further examine the possible benefits of raising occupancy rates. This research can assist airlines in determining the financial impact of boosting occupancy rates and if it is a realistic strategy. Airline may enhance occupancy rates and revenue while delivering greater value and service to consumers. by optimizing pricing tactics and other operational considerations. The below figure shows how the total revenue increased after increasing the occupancy rate by 10% and it gives the result that it will increase gradually so airlines should be more focused on the pricing strategies.

	aircraft_code	booked_seats	num_seats	occupancy_rate	inc occupancy rate	Inc Total Annual Turnover
0	319	53.58318098720292	116	0.46192397402761143	1.023847948055223	5998172194.613443
1	321	88.80923076923077	170	0.5224072398190045	1.144814479638009	3589908099.9584246
2	733	80.25546218487395	130	0.617349709114415	1.33469941822883	3084181023.871252
3	763	113.93729372937294	222	0.5132310528350132	1.1264621056700266	9594271389.724533
4	773	264.9258064516129	402	0.659019419033863	1.418038838067726	7383064170.589454
5	CN1	6.004431314623338	12	0.5003692762186115	1.100738552437223	212008135.08487087
6	CR2	21.48284690220174	50	0.42965693804403476	0.9593138760880695	4426996266.529222
7	SU9	56.81211267605634	97	0.5856918832583128	1.2713837665166257	11102207504.572523

<u>CONCLUSION</u>

To summarize, analyzing revenue data such as total revenue per year, average revenue per ticket, and average occupancy per aircraft is critical for airlines seeking to maximize profitability. Airlines can find areas for improvement and modify their pricing and route plans as a result of assessing these indicators. A greater occupancy rate is one important feature that can enhance profitability since it allows airlines to maximize revenue while minimizing costs associated with vacant seats. The airline should revise the price for each aircraft as the lower price and high price is also the factor that people are not buying tickets from those aircrafts. They should decide the reasonable price according to the condition and facility of the aircraft and it should not be very cheap or high.

Furthermore, boosting occuoancy rates should not come at the price of consumer happines or safety. Airlines must strike a balance between the necessity for profit and the significance of delivering high-quality service and upholding safety regulations. Airlines may achieve long-term success in a highly competitive business by adopting a data-driven strategy to revenue analysis and optimisation.