



Airlines Business Problem

Medium-sized aircraft and small business jets are among the several fleets operated by our organization. For many years, we have offered top-notch air transportation services, with the main goal being to give our customers a convenient, safe, and enjoyable travel experience. Nevertheless, we are currently facing difficulties as a result of a number of issues, including tighter environmental regulations, higher flight taxes, higher interest rates, rising fuel prices, and a labor shortage that drives up labor costs. The company's profitability is therefore threatened, and they are looking for solutions to this problem. In order to meet this issue, they plan to analyze their database and look for methods to raise their occupancy rate, which will raise the average profit per seat.

Challenges

1. **Stricter environmental regulations:** The demand on the airlines industry to decrease its carbon footprint is growing, which has resulted in more stringent environmental laws that raise operating costs and restrict expansion potential.
2. **Higher flight taxes:** To solve environmental issues and increase money, governments all around the world are taxing aircraft more heavily, which raises the cost of flying and decreases demand.
3. **Tight labor market resulting in increased labor costs:** The lack of trained people in the aviation sector has increased labor costs and increased 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 considers 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 increase customer loyalty.

Finding ways to raise the occupancy rate on underperforming flights is the ultimate objective of this assignment, which could ultimately result in higher airline profits.

Basic Analysis

The number of aircraft with more than 100 seats, the changes in the quantity of tickets purchased and total money earned over time, and the average rate for each aircraft with various fare conditions are all revealed by a basic data analysis. These results will be helpful in formulating plans to raise occupancy rates and maximize each aircraft's price. The airplane having more than 100 seats is displayed in Table 1 together with the exact number of seats.

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

Table 1

We have used a line chart visualization to have a better grasp of the trend of ticket bookings and the money generated by such bookings. The figure shows that, from June 22 to July 7th, there was a progressive increase in the number of tickets booked. After that, there was a fairly stable trend where the most tickets were booked on a single day. It is significant to remember that the amount of money the business receives from these reservations is directly correlated with the quantity of tickets purchased. As a result, we may observe a similar pattern in the company's overall revenue during the course of the analysis. These results imply that in order to boost overall revenue and improve operational methods, more investigation into the elements causing the peak in ticket sales may be helpful.

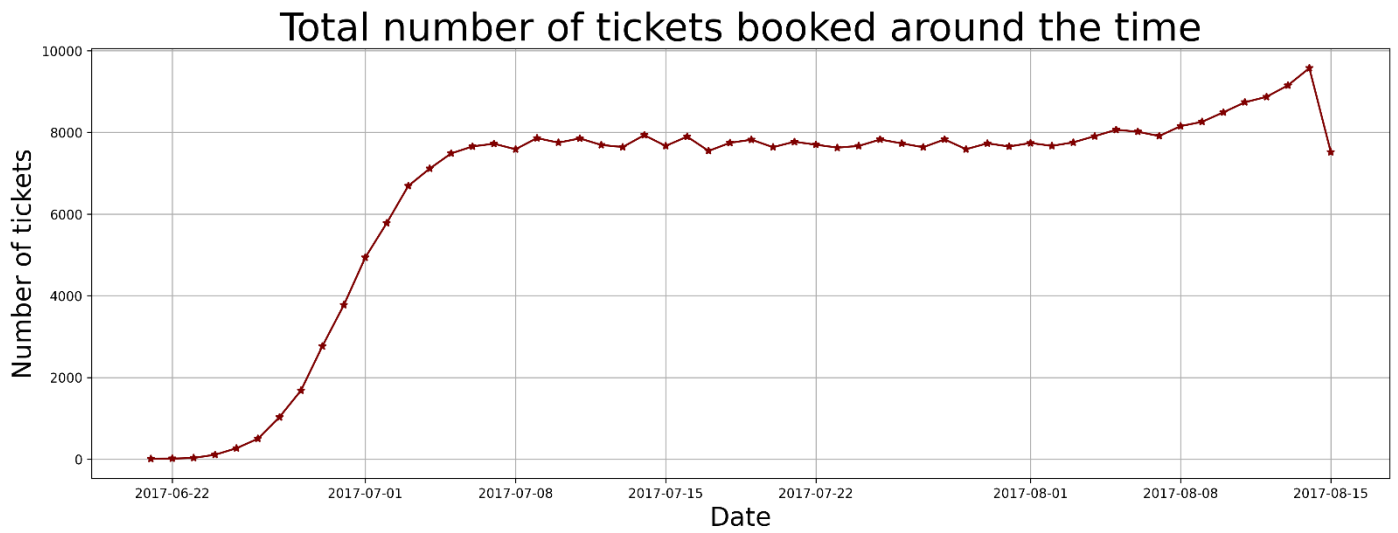


Figure 1

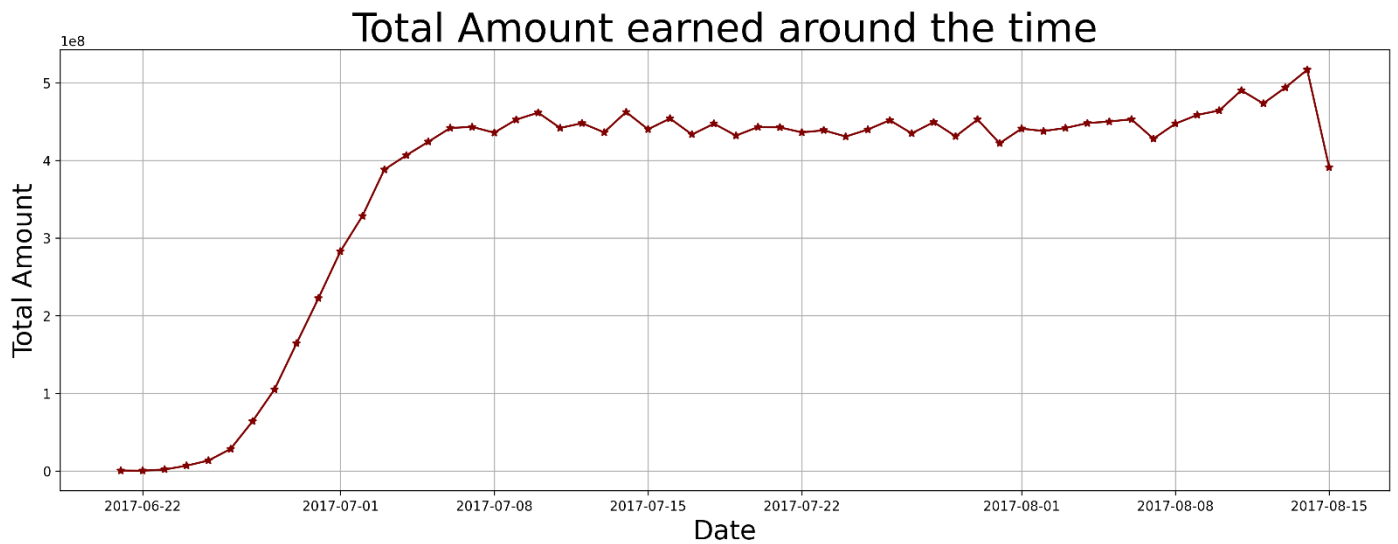


Figure 2

After we finished the calculations for the average expenses associated with various fare conditions for each aircraft, we were able to create a bar graph to visually compare the data. The data for the three meal types—business, economy, and comfort—are displayed in the graph Figure 3. It is important to note that the 773 is the only aircraft that offers the comfort class. However, the sole class offered by the CN1 and CR2 aircraft is economy. When comparing several pricing scenarios inside each aircraft, business class costs are always higher than those of economy class. Regardless of the fare conditions, all flights exhibit this pattern.

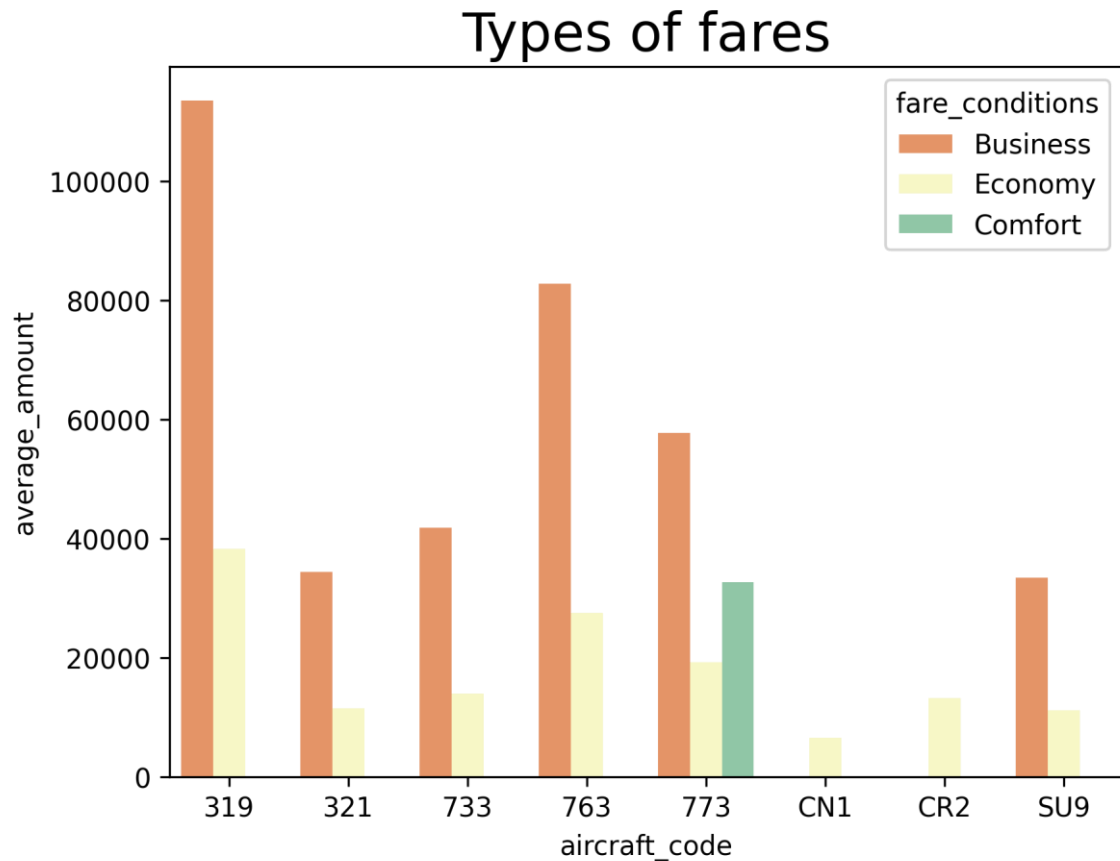


Figure 3

Analyzing Occupancy Rate

To optimize profitability, airlines need to analyze their revenue streams in great detail. Important variables to consider are the average revenue per ticket and annual income for each aircraft. Airlines may utilize this data to adjust their operations based on the identification of the aircraft types and routes that yield the highest revenue. Finding opportunities for pricing optimization and directing resources toward more lucrative routes can both be aided by this research. **Table 2** below lists each aircraft's total revenue, total number of tickets sold, and average revenue per ticket. SU9 is the aircraft with the highest total income, and **Figure 3** shows that this aircraft has the lowest prices for both business and economy class. This may be the case because the majority of individuals purchased this plane ticket due to its lower price when compared to others. The airplane with the lowest overall revenue is CN1, which may be due to its poor condition or lack of amenities. It also only offers economy class at the lowest price.

	aircraft_code	ticket_count	total_revenue	average_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

Table 2

Another important figure to consider is the average occupancy per aircraft. By employing metrics, airlines can track how well they fill seats and identify opportunities to increase occupancy rates. Airlines can reduce the operating costs related to unfilled seats and boost revenue and profitability by achieving higher occupancy rates. A number of variables, including consumer happiness, airline schedules, and pricing strategies, may have an impact on occupancy rates. The average number of reserved seats out of all the seats for each aircraft is displayed in **Table 3** below. By dividing the number of reserved seats by the total number of seats, the occupancy rate is determined. A higher occupancy rate indicates that there are fewer available seats on the airplane and that more seats are reserved.

	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

Table 3

To further investigate the potential advantages of increasing occupancy rates, airlines can determine how much their overall yearly turnover could improve by giving all aircraft a 10% higher occupancy rate. Airlines can use this study to evaluate whether increasing occupancy rates is a viable strategy and to assess the financial impact of doing so. By maximizing pricing strategies and other operational considerations, airlines can increase occupancy rates and revenue while providing customers with superior value and service. **Table 4** below illustrates how revenue rose following a 10% increase in occupancy rate. The data indicates that revenue will rise gradually, indicating that airlines should concentrate more on their pricing tactics.

	aircraft_code	booked_seats	num_seats	occupancy_rate	Inc occupancy rate	Inc Total Annual Turnover
0	319	53.58318098720292	116	0.46192397402761143	0.5081163714303726	2976779410.0
1	321	88.80923076923077	170	0.5224072398190045	0.574647963800905	1801980510.0
2	733	80.25546218487395	130	0.617349709114415	0.6790846800258565	1569207310.0000002
3	763	113.93729372937294	222	0.5132310528350132	0.5645541581185146	4808404810.0
4	773	264.9258064516129	402	0.659019419033863	0.7249213609372492	3774326050.0
5	CN1	6.004431314623338	12	0.5003692762186115	0.5504062038404727	106011180.00000001
6	CR2	21.48284690220174	50	0.42965693804403476	0.4726226318484382	2181036550.0
7	SU9	56.81211267605634	97	0.5856918832583128	0.644261071584144	5625933169.999999

Table 4

Conclusion

In summary, airlines looking to maximize profitability must analyze revenue statistics such as total revenue annually, average revenue per ticket, and average occupancy per aircraft. By evaluating these data, airlines can identify areas for improvement and make changes to their pricing and route schedules. One significant factor that might improve profitability is a higher occupancy rate, which enables airlines to maximize revenue while lowering expenses related to unfilled seats.

The airline ought to review the costs associated with each aircraft, since low and high prices are contributing factors to the decline in ticket sales for each aircraft. They should choose a fair price based on the aircraft's amenities and condition; it shouldn't be extremely low or expensive.

Moreover, increasing occupancy rates shouldn't come at the expense of customers' safety or satisfaction. Airlines need to find a way to reconcile the need to turn a profit with the importance of providing excellent customer service and adhering to safety requirements. Airlines can attain sustained prosperity in a fiercely competitive industry by implementing a data-centric approach to revenue analysis and optimization.