Airlines Data Analysis Report

Business 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.

Key Obstacles

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.

Prime Objectives

1. **Enhance passenger experience:** Focusing on minute details in order to improve the experience of passengers.
2. **Improve pricing strategy:** This should be designed in a way that it is useful according to the current conditions and customer preferences.
3. **Increase occupancy rate:** By doing so , we can improve the average profit earned per seat.

Data Exploration

Tables in the Database

- The database contains several tables, including:

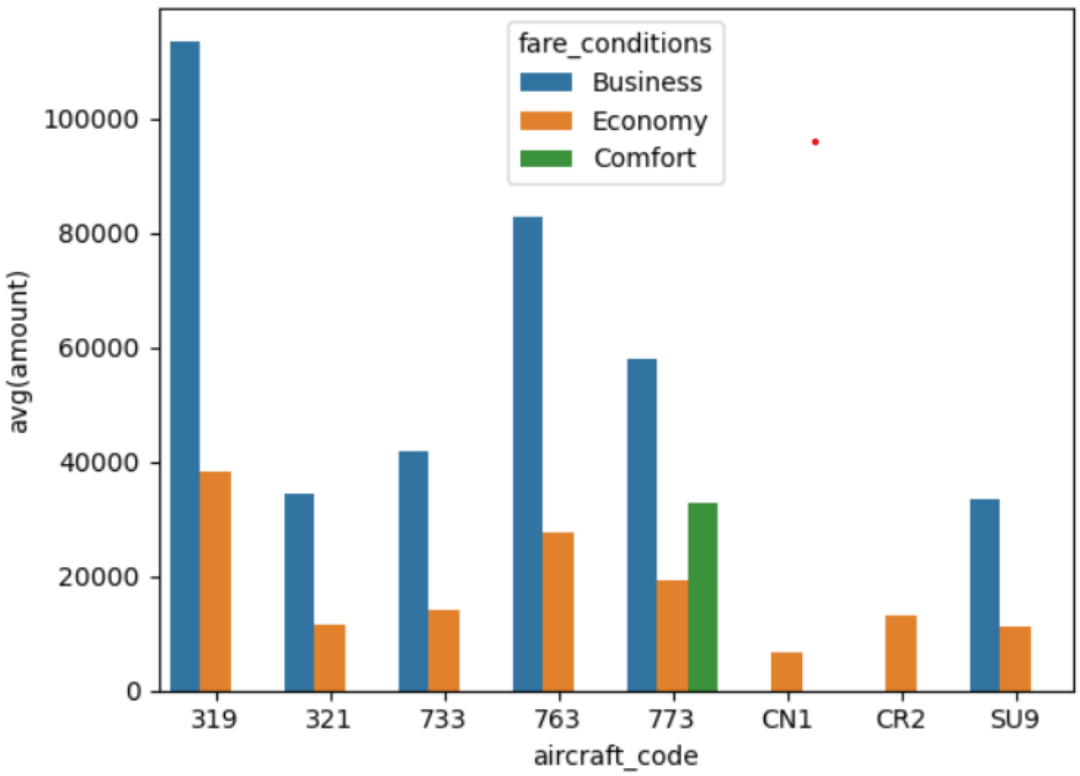
→ aircrafts_data, airports_data, boarding_passes, bookings, flights, seats, ticket_flights, and tickets.

Basic Analysis

1. Number of Planes with More Than 100 Seats

- There are 6 aircrafts with more than 100 seats and aircraft with aircraft_code ‘773’ has maximum seats as 402 seats.

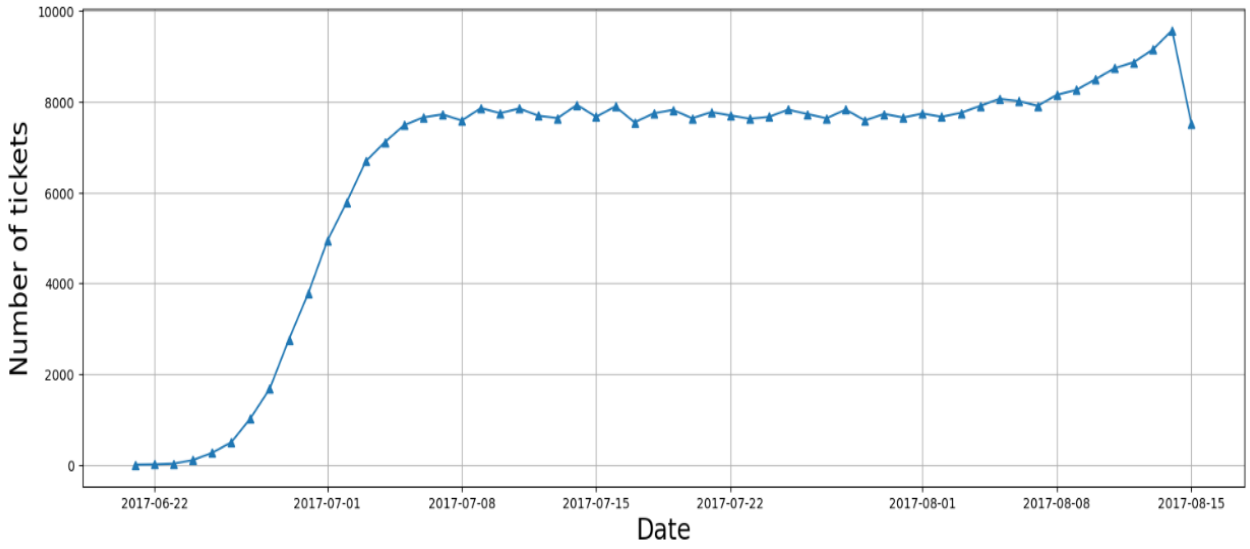
2. Average Charges for Each Aircraft with Different Fare Conditions

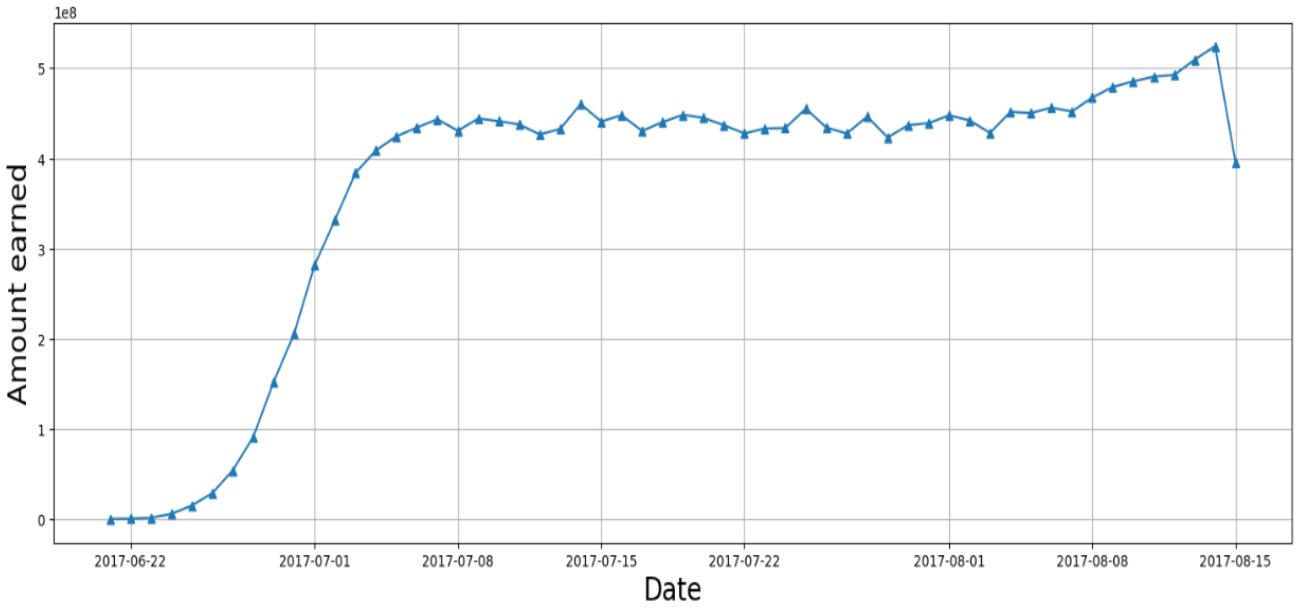


It is conclusive from the above plot that aircraft ‘319’ has comparatively higher average amount with Business and Economy condition. However aircraft ‘773’ shows high charges for granting comfort flights.

3. The plot below shows how number of tickets and total amount earned changes with time:

For no.of tickets , there is a spike rise between 22nd of June and 1st of July and from around 8th of July , the number of tickets sold remain kind of constant with time. Around 10th of August , there is again a small rise in the sale of tickets but by the mid of August it comes down to the normal and average trend. Almost a similar trend is observed in case of amount earned with time.





Analyzing Occupancy Rate

To maximise profitability, airlines must carefully examine their revenue sources. Important data to take into account are the annual total revenues and the average revenue per ticket for each aircraft. Airports may

select the aircraft types and routes to employ using this information.

create the greatest revenue and adjust their business practises. This

Research can also be used to find opportunities for pricing optimisation and shifting funds to more lucrative paths.

Increase in Total Annual Turnover with 10% Higher Occupancy Rate

- We projected the potential increase in total annual turnover by giving all aircraft a 10% higher occupancy rate.

	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

To further explore the potential advantages of increasing occupancy rates, airlines can calculate how much their whole yearly turnover could increase by giving all aircraft a 10% higher occupancy rate. This study can help airlines decide whether increasing occupancy rates is a practical strategy and will have a positive financial impact. By maximising pricing strategies and other operational factors, airlines may increase occupancy rates and revenue while providing customers with superior value and service. The picture below demonstrates how total income increased when the occupancy rate was raised by 10%. It indicates that this increase will

happen gradually, therefore airlines should concentrate more on pricing strategies.

Conclusion

In conclusion, studying revenue information such as year total revenue,

For airlines looking to maximise their profits, average ticket prices and average aircraft occupancy are crucial. Airports can locate spaces for

because of improvement and modifications to their prices and schedules

Evaluation of these indicators. One crucial factor is a higher occupancy rate--- function that can increase profitability since it enables airlines to maximise revenue while reducing expenses related to empty seats. air carrier should adjust the cost for each aircraft because the difference between the low and high prices the fact that fewer individuals are purchasing tickets for those flights.

According to the aircraft's condition and amenities, they should determine a fair price that is neither too low nor too excessive. Additionally, improving occupancy rates shouldn't come at the expense of patron safety or satisfaction. Airlines need to balance the importance of making a profit with the importance of providing top-notch service and maintaining safety rules. Airlines that use a data-driven approach to revenue analysis and optimisation may find long-term success in a highly competitive industry.