# REPORT

## PROBLEM STATEMENT

The airline company operates a diverse fleet of aircraft ranging from small business jets to medium-sized machines. The company has been providing high-quality air transportation services to its clients for several years, with a primary focus on ensuring a safe, comfortable, and convenient journey for passengers. However, the airline company is currently facing challenges due to several factors such as stricter environmental regulations, higher flight taxes, increased interest rates, rising fuel prices, and a tight labor market resulting in increased labor costs. As a result, the company's profitability is under pressure, and they are seeking ways to address this issue. To tackle this challenge, the airline company is looking to conduct an analysis of its database to find ways to increase its occupancy rate, which can help boost the average profit earned per seat.

## MAIN 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 taxiing 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 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 increase customer loyalty.

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

## BASIC ANALYSIS

The basic 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 | Number of Seats |
|---|---|
| **319** | 116 |
| **320** | 140 |
| **321** | 170 |
| **733** | 130 |
| **763** | 222 |
| **773** | 402 |

***Table 1***

From Figure 1 and Figure 2, we can say,

- The number of ticket bookings gradually increased from June 22nd to July 7th.
- From July 8th until August, there was a relatively stable pattern in ticket bookings.
- There was a noticeable peak in ticket bookings on a single day during this period.
- Revenue earned by the company is closely linked to the number of tickets booked.
- Similar trends were observed in the total revenue earned by the company throughout the analyzed time period.
- Exploring factors contributing to the peak in ticket bookings could help increase overall revenue and optimize operational strategies.

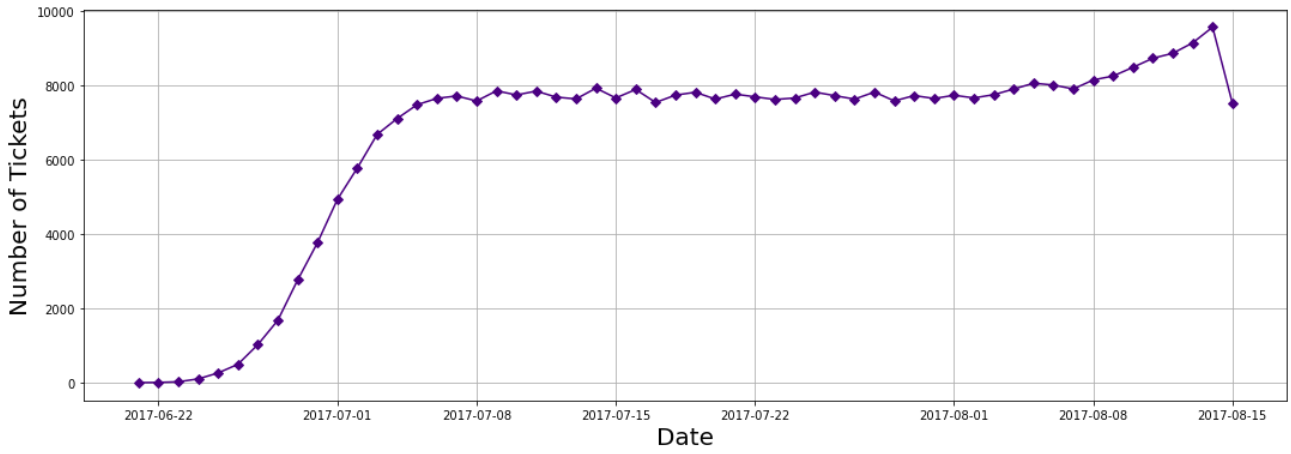



***Figure 1***

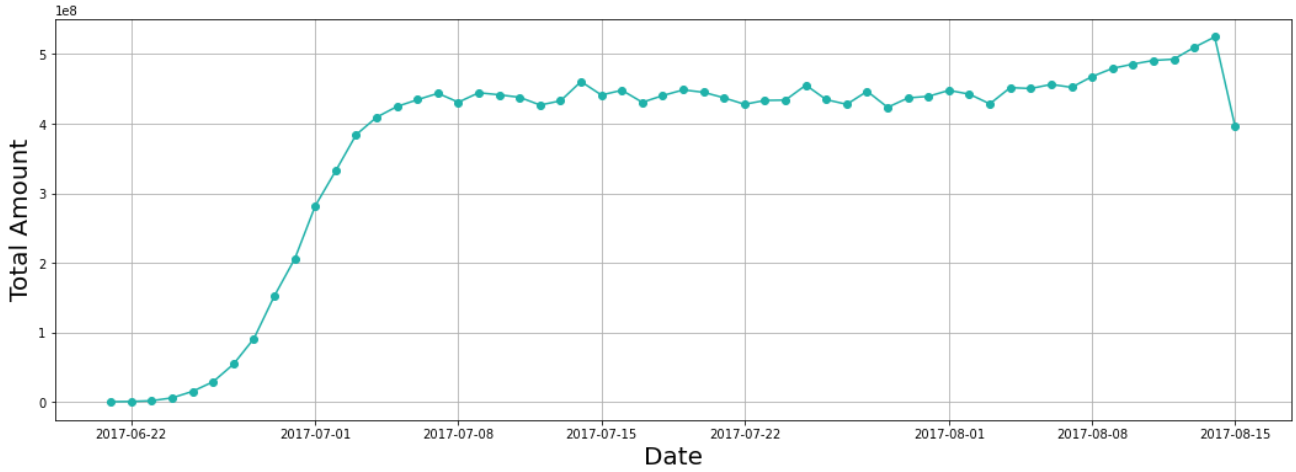
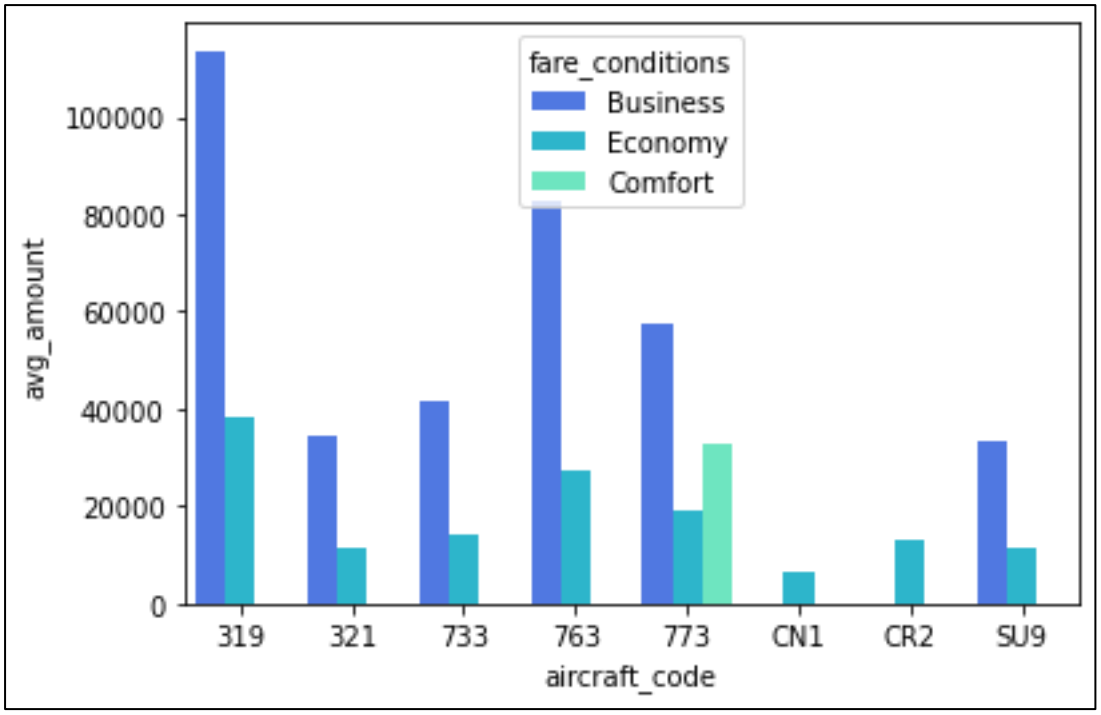



***Figure 2***

- The bar graph compares average costs associated with different fare conditions for each aircraft.
- Three types of fares are depicted: business, economy, and comfort.
- Comfort class is available exclusively on one aircraft, the 773.
- CN1 and CR2 planes only offer the economy class.
- Across all planes, charges for business class consistently exceed those for economy class, irrespective of fare conditions.




- Airlines need to analyze revenue streams to boost profitability by assessing overall yearly income and average revenue per ticket for each aircraft.
- Understanding which aircraft types and routes generate the most income helps airlines make operational adjustments.
- This analysis aids in identifying opportunities for pricing optimization and allocating resources to more profitable routes.
- Figure 3 illustrates total revenue, total tickets, and average revenue per ticket for each aircraft.
- The aircraft with the highest total revenue is SU9, possibly due to lower prices for both business and economy class tickets.
- Conversely, CN1 has the lowest total revenue, likely because it only offers economy class tickets at a lower price, possibly indicating poorer conditions or fewer amenities.

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

***Figure 3***

- Average occupancy per aircraft is a crucial metric for airlines to assess their seat-filling success and identify opportunities to increase occupancy rates.
- Higher occupancy rates can lead to increased revenue and profitability by reducing operational expenses associated with empty seats.
- Factors such as pricing strategy, airline schedules, and customer satisfaction can influence occupancy rates.
- Figure 4 displays the average booked seats as a percentage of the total number of seats for each aircraft.
- Occupancy rate is calculated by dividing the booked seats by the total number of seats.
- A higher occupancy rate indicates that more seats are booked, leaving fewer seats un-booked.

| | aircraft_code | booked_seats | num_seats | occupancy_rate |
|---|---|---|---|---|
| 0 | 319 | 53.58318098720292 | 116 | 0.46192397402761143 |
| 1 | 321 | 88.80923076923077 | 170 | 0.5224072398190045 |
| 2 | 733 | 80.25546218487395 | 130 | 0.617349709114415 |
| 3 | 763 | 113.93729372937294 | 222 | 0.5132310528350132 |
| 4 | 773 | 264.9258064516129 | 402 | 0.659019419033863 |
| 5 | CN1 | 6.004431314623338 | 12 | 0.5003692762186115 |
| 6 | CR2 | 21.48284690220174 | 50 | 0.42965693804403476 |
| 7 | SU9 | 56.81211267605634 | 97 | 0.5856918832583128 |

***Figure 4***

- Airlines can evaluate the potential increase in total yearly turnover by raising the occupancy rate of all aircraft by 10%, allowing them to assess the benefits of higher occupancy rates.
- This analysis helps airlines understand the financial impact of increasing occupancy rates and determine if it's a feasible strategy.
- Optimizing pricing tactics and other operational considerations can help airlines enhance occupancy rates and revenue while delivering better value and service to customers.
- The figure 5 demonstrates the gradual increase in total revenue after raising the occupancy rate by 10%, indicating the importance of focusing on pricing strategies.

| | 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 |

***Figure 5***

# INFERENCE

In conclusion, thorough analysis of revenue data, including total yearly revenue, average revenue per ticket, and average aircraft occupancy, is essential for airlines aiming to maximize profitability. By examining these metrics, airlines can identify areas for improvement and adjust their pricing and route strategies accordingly. A higher occupancy rate is particularly crucial as it allows airlines to increase revenue while reducing costs associated with empty seats.

It's important for airlines to reassess their pricing strategies for each aircraft, ensuring that prices are reasonable and reflective of the aircraft's condition and amenities. Pricing should strike a balance between being too cheap, which may deter customers, and too expensive, which may lead to underutilized capacity.

However, it's vital that efforts to boost occupancy rates don't compromise customer satisfaction or safety. Airlines must prioritize delivering high-quality service and adhering to safety regulations while pursuing profitability.

By adopting a data-driven approach to revenue analysis and optimization, airlines can achieve long-term success in a competitive industry. This entails continuously analyzing revenue data, adjusting strategies accordingly, and prioritizing customer satisfaction and safety alongside profitability goals.