ANALYSIS OF CUSTOMER BOOKING BEHAVIOR: INSIGHTS INTO BOOKING COMPLETION RATES

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INTRODUCTION

Understanding customer booking behavior is essential for businesses looking to optimize their booking processes, improve customer engagement, and reduce booking abandonment rates. By analyzing these behaviors, businesses can develop strategies to encourage customers to complete their bookings. This analysis can also guide targeted strategies for promoting early bookings and preference-based services.

This project focused on examining booking completion rates in airline bookings and identifying the key factors that influence whether a customer completes or abandons their booking.

Analyzing factors such as customer preferences, trip types, flight times, and other variables, provided actionable insights for improving booking processes and customer engagement.

OBJECTIVE OF THE ANALYSIS

The objective of this analysis was to explore customer booking behavior, with a particular focus on booking completion rates. I aimed to identify the factors that influence whether a customer completes or abandons their booking.

Objectives:

1. Identify key factors affecting booking completion rates.
2. Examine the relationship between customer preferences and completion rates.
3. Explore how flight time and trip type influence booking behavior.
4. Determine the most impactful variables driving completion rates.

METHODOLOGY

Dataset Overview

The dataset used for this analysis was sourced from Kaggle.com, an online platform for data science projects. The dataset contained 50,000 rows. It initially contained customer booking information, including attributes such as trip type, sales channel, flight time, customer preferences (want extra baggage, want preferred seats and want in-flight meals), purchase lead time, and booking completion status.

Data Modifications

To enhance the analysis, several additional columns were created:

- Extra baggage, preferred seat, and in-flight meal columns were derived by using IF analysis to convert the original binary values (1 and 0) from the columns 'want extra baggage', 'want preferred seat', and 'want in-flight meal' into yes and no values. This transformation helped simplify customer preference analysis.
- The complete booking column was derived from the booking complete column using IF analysis to classify the booking status as complete or incomplete (0 = incomplete and 1 = complete).
- The flight time column was derived from the flight hour column, using IF analysis to categorize times as morning (below 12), afternoon (below 18), and evening (above 18). This allowed us to analyze booking behaviors based on the time of day.

Tools and Techniques Used:

- Microsoft Excel was used for data analysis
- Pivot tables were used to explore relationships between booking attributes and booking completion.
- Bar charts, pie charts, and line charts were used to visualize the data and uncover trends.
- Slicers were added to filter the data to enable a deeper understanding of specific patterns and trends.
- Grouping was done for the Purchase lead time to analyze its effect on booking completion rates.
- ANOVA was used to test for significant differences across groups.
- Correlation was used to measure relationships between variables.

ANALYSIS AND FINDINGS

Overview of Booking Completion Rates

Understanding the overall booking completion rate helped establish a baseline for further analysis. By identifying the percentage of completed and incomplete bookings, we explored potential factors influencing customer decisions.

The analysis revealed that only 14.96% of bookings were completed, while 85.04% remained incomplete. This suggests potential barriers in the booking process that prevent customers from finalizing their transactions.

The high percentage of incomplete bookings indicates a need to explore factors influencing completion rates, such as customer preferences, trip type, flight time, and booking origin.

A deeper analysis of customer behavior may help determine what motivates customers to complete bookings.

Effect of Customer Preferences on Booking Completion Rates

Customer preferences, such as Extra Baggage, Preferred Seat, and In-Flight Meals, may influence whether a booking is completed. This analysis examined how these preferences impact completion rates.

The completion rates for customers selecting preferences were:

Extra Baggage: 16.67%

Preferred Seat: 17.71%

In-Flight Meals: 16.05%

Customers who did not select preferences had lower completion rates.

ANOVA results (P-value = 1.56E-52) confirmed that preferences have a significant effect on completion rates.

Customers who selected Preferred Seat and Extra Baggage were more likely to complete their bookings. This suggests that offering personalized options could help increase completion rates.

Impact of Purchase Lead Time on Booking Completion Rates

Purchase lead time represents the number of days between booking and departure. This analysis determined whether booking in advance impacts completion rates.

Correlation analysis resulted in a correlation coefficient of -0.0221, indicating no significant relationship between purchase lead time and booking completion rates. Since no significant relationship was found, it suggests that customers do not necessarily complete bookings earlier or later based on time factors alone.

Other factors, such as trip type and preferences, may play a more critical role.

Influence of Trip Type on Booking Completion Rates

The type of trip (Round Trip, One-Way, Circle Trip) may influence the likelihood of completing a booking. This section examined completion rates across different trip types.

Completion rates by trip type:

Round Trip: 15.06%

One-Way: 5.17%

Circle Trip: 4.31%

ANOVA results (P-value = 2.17E-09) confirmed that trip type significantly impacts completion rates. Round Trips had the highest completion rates, suggesting that customers committing to longer trips are more likely to finalize their bookings. One-Way and Circle Trips had much lower completion rates, which may indicate that these travelers are more price-sensitive or consider alternative transportation.

Completion Rates by Booking Origin

Booking origin refers to the country where the booking was initiated. This section examined variations in completion rates based on geographic location. Some countries had higher completion rates, while others had significantly lower ones. Variations in completion rates suggest that external factors such as regional pricing strategies, payment options, or travel restrictions may influence customer decisions. Markets with low completion rates may require targeted interventions such as localized marketing efforts.

Effects of Number of Passengers on Booking Completion

The number of passengers in a booking may influence whether a customer completes the reservation. This section examined whether bookings with more passengers are more or less likely to be completed.

Completion rates by Number of Passengers:

1 Passenger: 14.21%

2 Passengers: 16.02%

3 Passengers: 16.70%

4 Passengers: 15.41%

5+ Passengers: Varies between 13%–19%

ANOVA P-value = 2.63E-07, indicates a statistically significant difference in completion rates across different group sizes.

Completion rates increase slightly as the number of passengers increases, particularly in 2–3 passenger bookings. Bookings with 5+ passengers show fluctuating completion rates, suggesting potential group booking complexities. Single-passenger bookings have lower completion rates, possibly due to price sensitivity or indecisiveness.

Booking Completion by Flight Day, Flight Time and Sales Channel

The timing and method of booking can influence whether customers complete their reservations. This section examined how Flight Time, Flight Day, and Sales Channel impact booking completion rates.

A. Flight Time Analysis

Completion rates by Flight Time:

Morning: 14.53%

Afternoon: 16.67% (Highest)

Evening: 11.84% (Lowest)

ANOVA P-value = 1.36E-13, confirms a significant difference in completion rates across flight times.

Afternoon flights had the highest completion rates, indicating customer preference for midday departures. Evening flights had the lowest completion rates, possibly due to traveler preferences for daytime flights or lower seat availability.

B. Flight Day Analysis

Completion rates by Flight Day:

Sunday: 14.14%

Monday: 14.86%

Tuesday: 14.71%

Wednesday: 16.31% (Highest)

Thursday: 15.11%

Friday: 14.54%

Saturday: 14.81%

ANOVA P-value = 0.01318, confirms that flight day has a statistically significant effect on completion rates. Wednesdays had the highest completion rates (16.31%), suggesting that mid-

week travelers are more likely to finalize bookings. Completion rates remained relatively stable across other days, with no major fluctuations. Sunday and Friday had slightly lower completion rates, which may be due to increased weekend travel planning but lower actual conversions.

C. Sales Channel Analysis

Completion rates by Sales Channel:
Internet: 15.48%
Mobile: 10.84%
Correlation Coefficient = -0.02246, indicates a weak negative relationship between the sales channel and completion rates.
Internet bookings had higher completion rates than mobile bookings, suggesting that customers prefer booking on larger screens or that mobile experience may need improvements.
Mobile bookings had the lowest completion rates, possibly due to navigation difficulties or distractions while booking on a phone. The weak correlation suggests that while sales channel matters, it is not a primary driver of booking completions.

Cross-Referenced Analysis: Interaction Between Preferences, Flight Time, and Trip Type

This section examined how customer preferences interact with flight time and trip type to influence booking completion rates.
Completion rates vary depending on trip type and flight time:
Circle Trips had the highest completion rates in Morning Flights with preferences for Extra Baggage and Preferred Seat (100% completion in some cases).
One-Way Trips saw higher completion rates in Morning Flights but with no preferences selected.
Round Trips performed best in Afternoon Flights, with Extra Baggage (66.83%) being the most selected preference.
Morning flights were preferred for Circle Trips, but Afternoon flights dominated for Round Trips.
Customers selecting preferences (especially Extra Baggage) were more likely to complete their bookings.
One-Way travelers prefer minimal add-ons, reinforcing the idea that they may be more cost-conscious.

RECOMMENDATIONS

Based on the analysis of customer booking behavior, the following recommendations are proposed to improve booking completion rates:

1. Leverage Customer Preferences to Increase Conversions

Preferences such as Extra Baggage and Preferred Seat were associated with higher completion rates.

Recommendation: Airlines should highlight personalized options during the booking process to encourage completion.

2. Prioritize Round Trips for Marketing and Promotions

Round Trips had the highest completion rates (15.06%), while One-Way and Circle Trips had lower rates.

Recommendation:

Offer targeted discounts for Round Trips.

Simplify the booking process for One-Way travelers to encourage completion.

3. Optimize Flight Scheduling Based on Completion Rates

Afternoon flights had the highest completion rates (16.67%), while Evening flights had the lowest (11.84%).

Wednesdays had the highest completion rates (16.31%), suggesting that mid-week travelers are more likely to finalize bookings.

Recommendation:

Promote Afternoon and Wednesday flights through targeted campaigns.

Offer incentives for Evening flights, such as flexible rebooking or discounted fares, to improve demand.

4. Improve Booking Experience for Low-Performing Sales Channels

Internet bookings (15.48%) outperformed Mobile bookings (10.84%), but the difference was minor.

Recommendation:

Optimize the mobile booking experience with a streamlined interface.

Introduce mobile-exclusive discounts to encourage app usage and increase conversion rates.

5. Implement Region-Specific Strategies for Booking Origin

Completion rates varied by booking origin, suggesting that customer preferences and barriers differ by location.

Recommendation:

Localize promotions and payment options to cater to country-specific booking behaviors.

Identify regions with low completion rates and implement targeted interventions.

6. Address the Low Impact of Purchase Lead Time

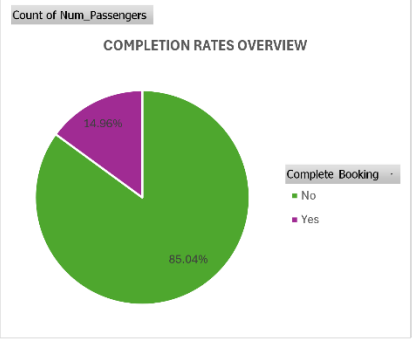
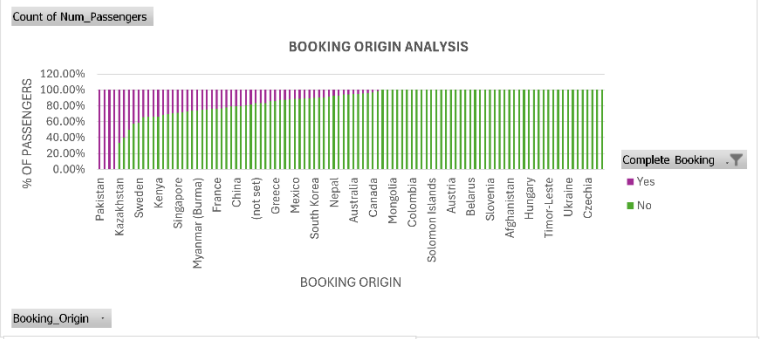
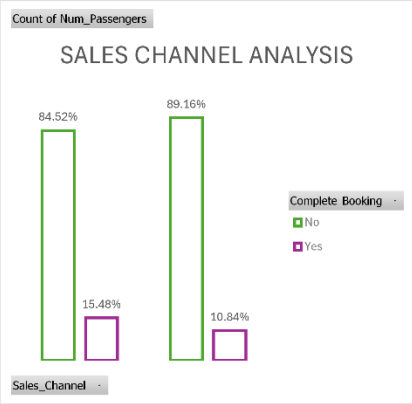
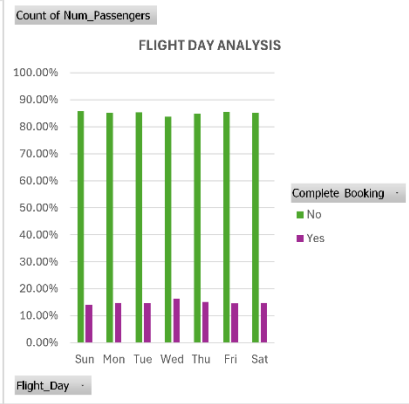
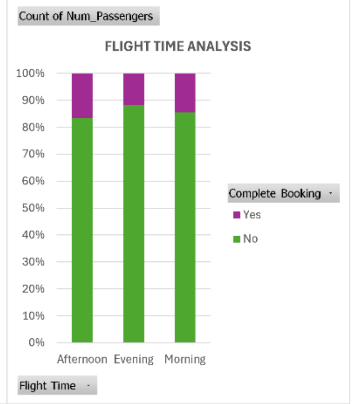
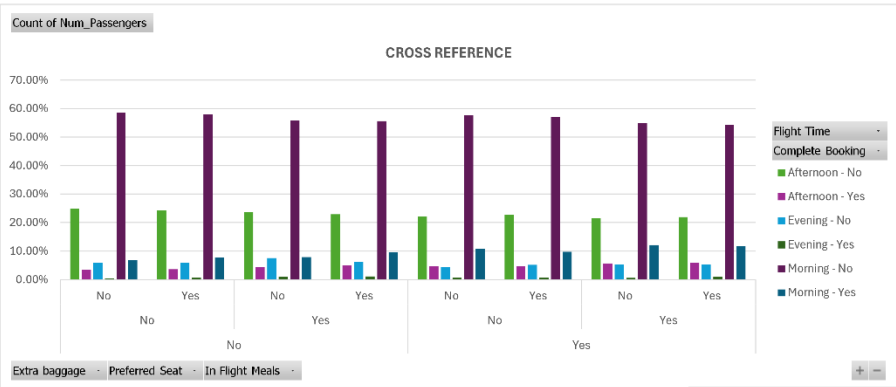
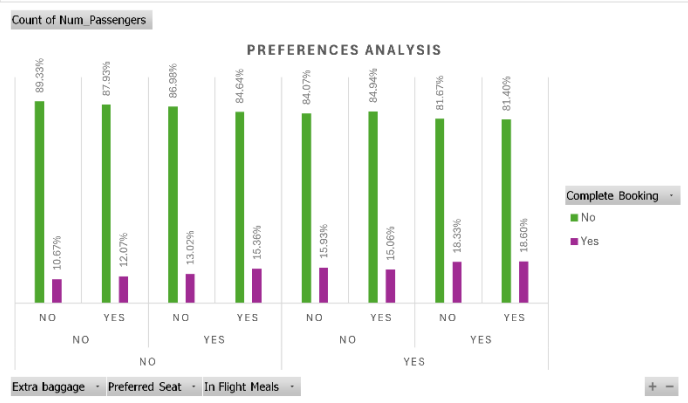
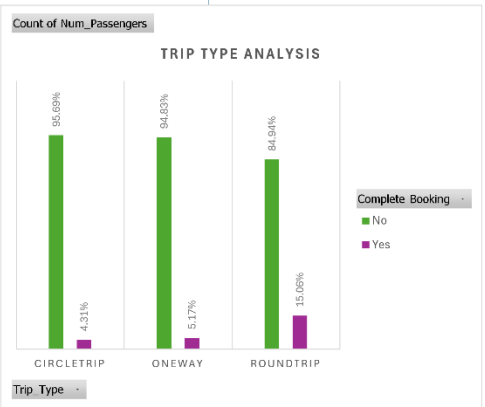
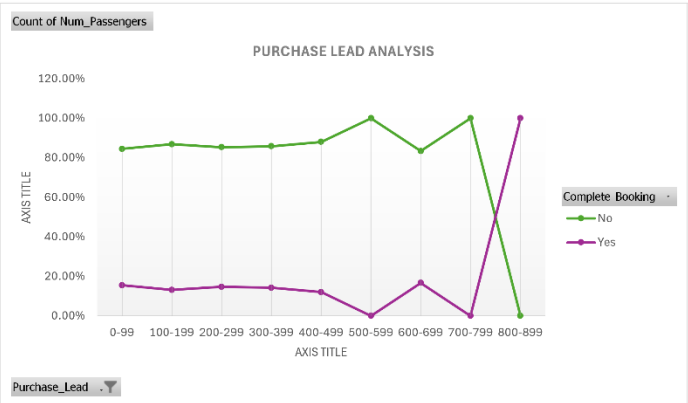
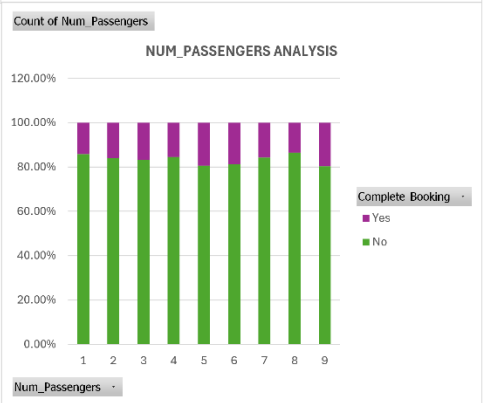
No significant correlation was found between Purchase Lead Time and completion rates.

Recommendation:

Instead of focusing on lead time, invest in dynamic pricing and urgency messaging to encourage early completions.

CONCLUSION

The analysis of booking completion rates revealed that some factors significantly influenced customer decisions to complete their bookings. These factors are ranked based on their statistical significance (e.g., P-values, correlation coefficients) and practical importance (e.g., completion rates).

Customer Preferences, Trip Type, and Flight Time are the most influential factors driving booking completion rates. Sales Channel and Evening flights show areas for improvement, indicating opportunities to enhance the mobile booking experience and promote late-night travel. These findings can help airlines optimize booking strategies, provide actionable insights to tailor marketing strategies and improve customer engagement.

VISUALIZATION OF BOOKING COMPLETION ANALYSIS