

Exploring Factors Influencing Passenger Satisfaction in Air Travel

Motivation

I chose this project because I plan to work in marketing research after graduation, where I hope to specialize in analyzing customer satisfaction and advising businesses on how to enhance it. Additionally, I am an avid traveler and have taken many flights during my university years. These factors led me to choose a dataset related to airline passenger satisfaction.

Since the dataset did not disclose the airline company, I referred to United Airlines' service descriptions to define the differences among Economy, Economy Plus, and Business Class. For this analysis, Economy Plus is defined as offering extra legroom and space, while Business Class includes even more legroom, fully reclining seats, and enhanced food and beverage services. Similarly, the dataset did not specify what constitutes a "Loyal Customer," so I defined loyal customers as those who had flown with the airline three or more times.

Summary of Findings

Passenger Profile: Gender distribution was almost even, and the majority of passengers were between their 20s and 50s. The age range of passengers spanned from 7 to 85 years old.

1. Which service categories received the highest or lowest evaluations?

Cleanliness received the highest average score, followed by baggage handling, online support, and legroom service. On the other hand, seat comfort and food and drink received the lowest scores, ranging overall between 2.8 and 3.8. This helps stakeholders prioritize which areas need improvement. Since seat comfort and food, and drink are low-rated, they are key targets for enhancing the in-flight experience.

2. Does satisfaction vary by travel class?

The percentage of satisfied customers was highest in Business Class (70.9%), followed by Economy Plus (42.7%), and lowest in Economy (39.4%). This indicates that higher classes tend to yield higher satisfaction. This insight is useful for pricing strategies and service design. Stakeholders can justify premium pricing or consider adding value to lower classes to boost satisfaction across segments.

3. Do in-flight service evaluations vary by class?

Business Class received the highest scores for onboard service. Surprisingly, Economy Plus scored slightly lower than Economy. For seat comfort, satisfaction ranked Business > Economy > Economy Plus. Though both Business and Economy Plus offer extra legroom, customers didn't find Economy Plus significantly more comfortable. Food ratings were highest in Business, but gaps were small, suggesting premium meals may not strongly influence perception. These findings indicate that Economy Plus may not meet customer expectations, offering stakeholders valuable insight into the need to enhance its features or reposition the product to better reflect its perceived value.

4. Is seat comfort correlated with any other category?

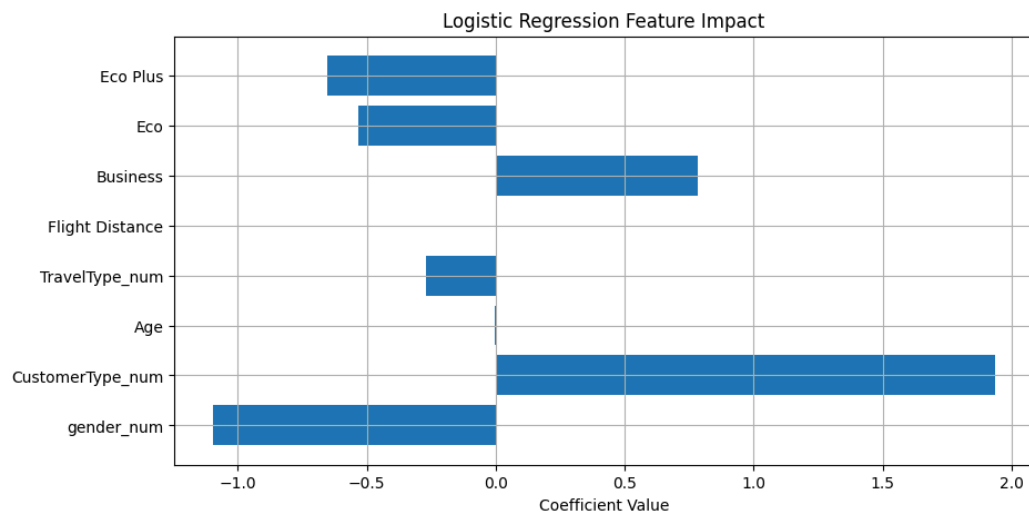
Seat comfort had a relatively strong positive correlation ($r = 0.71$) with food and drink. This may be due to how passengers recall their overall in-flight experience, suggesting these two elements are co-experienced and intertwined in memory. Understanding this correlation allows stakeholders to bundle improvements in these areas together, potentially achieving greater overall impact on satisfaction with fewer resources.

5. Is online booking equally user-friendly for all age groups?

Surprisingly, the 40–59 age group rated online booking the highest, while the 20s gave lower scores. This may be due to middle-aged travelers having more business trip experience. Ratings slightly dropped among passengers aged 70+, indicating the need to maintain or improve offline booking options and enhance digital accessibility for older users. Stakeholders can use this insight to tailor digital interfaces by age group and ensure inclusivity, especially for older users who may rely more on support or alternative booking methods.

6. Can satisfaction be predicted by passenger demographics and behavior?

A logistic regression model was built using variables such as gender, age, customer type, travel type, flight distance, and travel class. The results showed that male passengers and those traveling for personal reasons were less likely to be satisfied. Loyal customers and Business Class passengers were more likely to be satisfied. Age and flight distance had minimal impact. The model achieved an accuracy of 0.75, indicating a reasonably reliable ability to predict passenger satisfaction based on the selected variables. This predictive insight enables stakeholders to proactively identify passenger segments at risk of low satisfaction and target them with tailored service improvements or loyalty incentives.



Impact on Stakeholders

Based on the findings, several actionable recommendations can be made for airlines aiming to improve passenger satisfaction:

- **Enhance food and drink quality:** This category consistently received low ratings across all classes. Offering more variety or improving the source of in-flight meals could make a

difference, especially in Business Class, where expectations are higher. This directly addresses a pain point and may lead to higher overall satisfaction and repeat business.

- Improve seat comfort: Since this is the lowest-rated category and closely related to overall experience, investing in more comfortable seating could boost satisfaction. Addressing this will likely have a large impact due to its strong correlation with other satisfaction metrics.
- Reevaluate Economy Plus services: Given the minimal difference in satisfaction between Economy and Economy Plus, additional benefits, beyond extra legroom, may be necessary to justify the cost and improve customer perception. This can help airlines optimize their class offerings and improve revenue through better differentiation.
- Make online booking more intuitive: Simplifying the booking interface and offering guided support could help first-time or infrequent travelers. Additionally, maintaining alternative (offline) booking methods would support older passengers. Enhancing digital usability broadens the customer base and prevents frustration across age groups.
- Increase loyal customer base: Loyal customers show significantly higher satisfaction. Airlines should promote features that performed well, such as cleanliness and online support, to retain and attract frequent flyers. Focusing on loyalty programs can yield long-term benefits in customer retention and profitability.

Ethical Quandaries

One ethical concern from this analysis is the gender-based satisfaction disparity. The finding that male passengers are statistically less likely to be satisfied must be handled carefully to avoid reinforcing gender stereotypes or discriminatory practices. Data should be used to understand customer needs, not to unfairly prioritize or deprioritize any group. Also, it's important to handle passenger data carefully to protect their privacy, make sure the way the analysis works is clear, and avoid unfair treatment, especially if the results are used to offer different services to different types of customers.

Possible Future Work

This analysis was based solely on quantitative data. Future research could incorporate qualitative feedback, such as open-ended survey responses, to gain deeper insight into customer sentiments. For example, comments about Wi-Fi connectivity or difficulties with in-flight services could highlight specific pain points not captured in numeric ratings.

Reference

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