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# Analysis of Cancellations at a Cab Portal Company

Jonathan Pufall  
WISCONSIN SCHOOL OF BUSINESS  
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## Executive Summary

This report provides a comprehensive analysis of cancellations within IndoCabs, focusing on identifying the key factors contributing to the company's cancellation rate, which stands at 8.72%. Using a dataset that captures a wide range of variables, including booking channels, travel types, booking windows, and trip durations, this analysis uncovers critical insights into customer behavior that lead to cancellations.

The analysis highlights a clear relationship between short booking windows and cancellations. Over 80% of cancellations occur when the booking window is within 24 hours before the trip, with a significant 55% occurring within just 6 hours of booking. This suggests a strong correlation between last-minute bookings and customer indecision, which negatively impacts the company's ability to plan and allocate resources efficiently.

Mobile bookings show a higher cancellation rate than bookings made through the website, particularly for customers who book with short lead times. Rideshare services also have a higher cancellation rate compared to private hire services, possibly due to the uncertainty and flexibility of shared rides. Analyzing the peak cancellation hours, we found that cancellations are most frequent around 9:00 AM and 5:00 PM, reflecting the busy hours for many customers, where changes in plans or scheduling conflicts are more likely.

Based on these findings, recommendations for IndoCabs include introducing dynamic cancellation fees to discourage last-minute cancellations, enhancing the mobile app experience, and implementing reminder notifications for trips booked close to the travel time. These strategies will reduce the overall cancellation rate and improve operational efficiency.

## Introduction

IndoCabs operates a digital platform that facilitates cab bookings for various travel needs. A key challenge for the company has been managing cancellations, which disrupt operations and reduce profitability. This report analyzes cancellation patterns and their root causes, focusing on booking windows, trip durations, and customer behavior. Using a comprehensive dataset, we provide insights into how these factors contribute to cancellations and offer targeted recommendations for minimizing cancellations and improving overall service quality.

## Analysis

### A Look at Trip Durations

Trip duration is a critical metric that reflects not only the operational capacity of IndoCabs but also customer expectations. Analyzing trip durations enables us to identify patterns that may correlate with cancellations.

Upon conducting a statistical analysis of trip durations, we found the average trip duration to be 3.74 hours, with a median duration of 1.35 hours. The stark difference between the average and median suggests the presence of outliers, which skew the data upward. These outliers, such as the maximum recorded trip duration of 209.98 hours, may be anomalies that warrant further investigation for potential data entry errors or unique cases such as long-distance journeys.

The standard deviation of 6.89 hours reinforces the inconsistency in trip lengths, contributing to potential misalignments between customer expectations and actual outcomes. The interquartile range (IQR) of 0.92 to 2.36 hours indicates that the majority of trips are relatively short, while outliers—both on the high and low end—may impact customer satisfaction, especially if prolonged durations are unanticipated. These outliers can increase frustration, possibly leading to cancellations if the trips are perceived as inefficient or overly long.

#### Duration and Booking Window Data Across Multiple Statistics

	Trip Duration (Hours)	Booking Window (Hours)
Average	3.74	45.62
Median	1.35	9.62
Minimum	0.09	0.10
Maximum	209.98	769.30

(Figure 1)

#### The Magnitude of the Cancellation Problem at IndoCabs

Understanding the magnitude and underlying causes of cancellations is essential for IndoCabs to develop targeted and effective strategies. By analyzing cancellation patterns, IndoCabs can enhance customer satisfaction and optimize operational efficiency

The dataset reveals 227 cancellations, accounting for 8.72% of all bookings—nearly one in every 11 reservations. This significant cancellation rate poses operational challenges for IndoCabs, directly impacting revenue and profit margins. The loss of nearly 9% of bookings not only results in financial losses but can also damage customer trust and satisfaction, leading to decreased brand loyalty. Additionally, frequent cancellations complicate resource allocation and scheduling, increasing wait times and diminishing service quality. If left unaddressed, these issues could hinder IndoCabs' long-term growth and competitive position, emphasizing the need for strategies to reduce cancellations and improve customer retention.

Breaking cancellations down by travel type reveals telling patterns. Point-to-Point trips see the highest cancellation rate at 9.59%, likely due to the flexible nature of this booking type, where last-minute changes are common. In contrast, Hourly Rental trips have a lower cancellation rate of 5.95%, and Long-Distance trips, with only 2.02% cancellations, suggest that more committed travel plans tend to have fewer cancellations. This data suggests that the flexibility of a trip plays a large role in cancellation likelihood, with more flexible trips prone to higher cancellation rates.

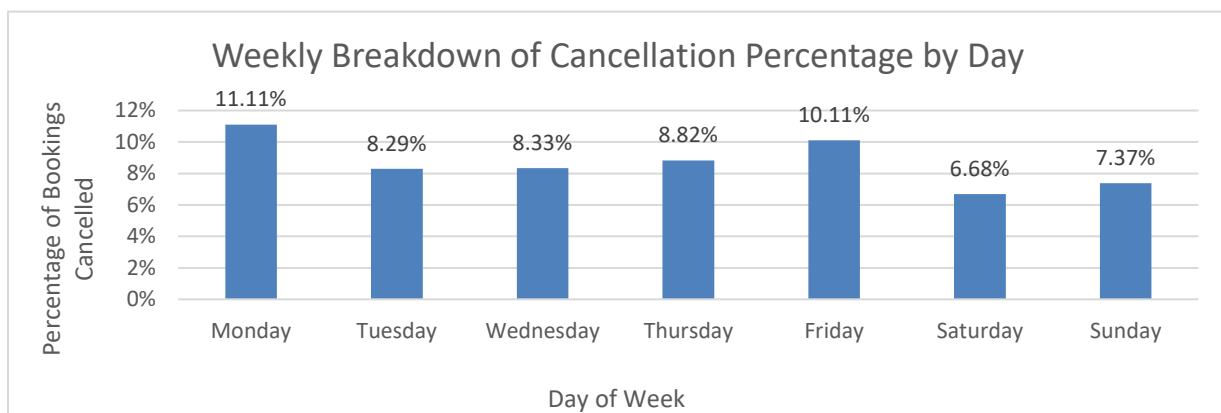
### Booking and Cancellation Data Across Multiple Travel Types

	Number of Bookings	Number of Cancellations	Proportion Cancelled
Long Distance	99	2	0.0202
Point to Point	2085	200	0.0959
Hourly Rental	420	25	0.0595

(Figure 2)

The analysis of booking channels indicates a distinct relationship between the method of booking and the likelihood of cancellations. Online bookings exhibit a cancellation rate of 14%, while mobile bookings show an even higher rate of 15%. This insight suggests that customers using mobile platforms may be more prone to impulsive cancellations, possibly due to the ease of making last-minute changes. Tailoring marketing efforts and cancellation policies specific to these channels could help IndoCabs mitigate this trend.

Additionally, cancellations are not uniform across the week. As shown in figure 3, Monday emerges as the day with the highest proportion of canceled bookings at 11.11%, suggesting that customer behaviors at the beginning of the week may be less predictable. In contrast, Saturday demonstrates the lowest cancellation rates at 6.68%, indicating that customers are more committed to their travel plans during weekends. Understanding these patterns can help IndoCabs optimize driver allocation and schedule management, particularly during high-cancellation periods early in the week.

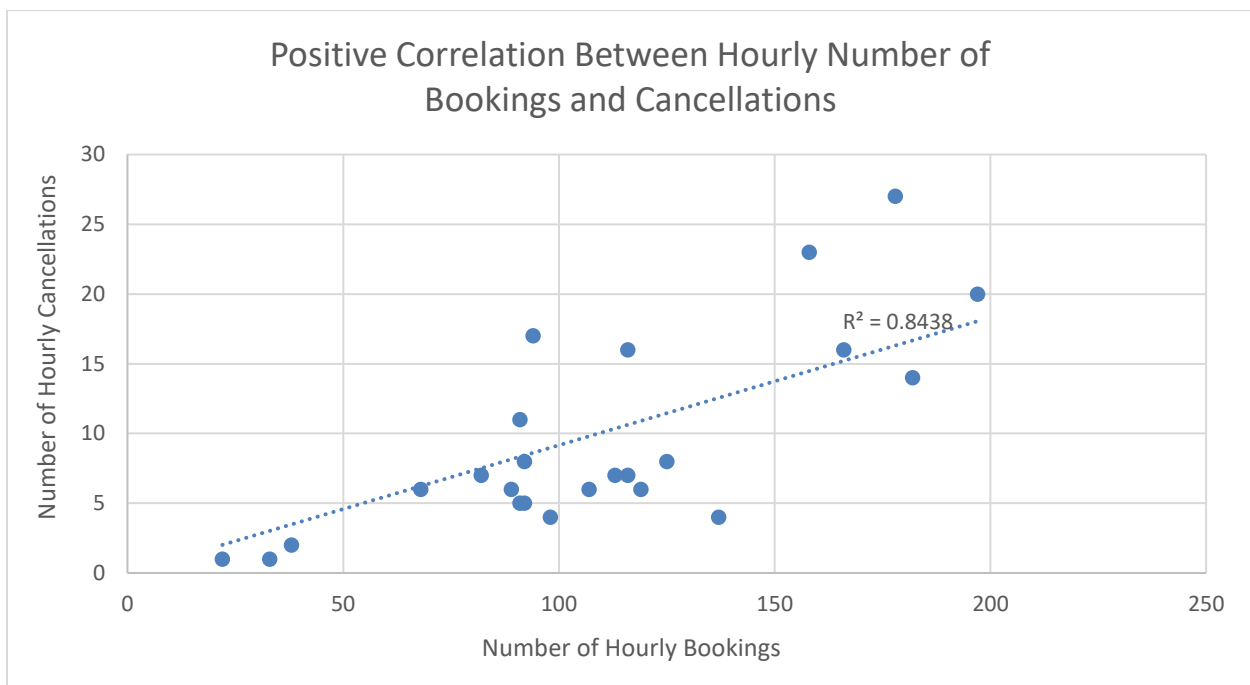


(Figure 3)

### The Relationship between Booking Windows, Cancellations, and Trip Timing

Understanding the booking window—the time elapsed between a booking and the scheduled trip—is vital for forecasting cancellations. This metric not only helps predict customer behavior but also informs resource management and operational planning. A well-defined booking window can aid in determining how flexible or rigid the cancellation policies should be, ultimately shaping customer satisfaction and retention. Analyzing this window allows IndoCabs to identify trends related to customer planning and commitment, helping to enhance marketing strategies.

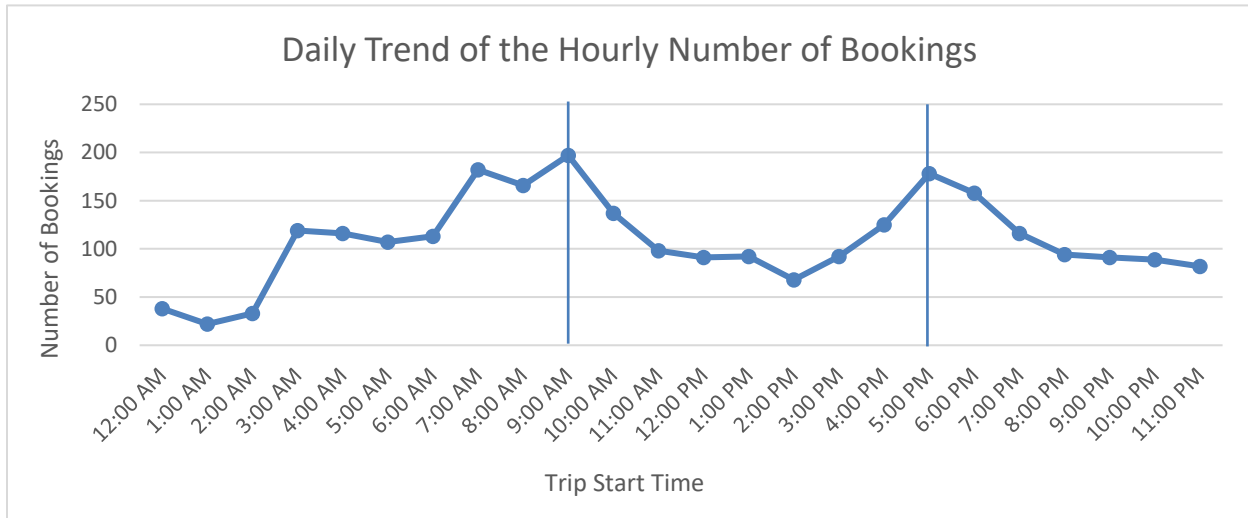
Our analysis shown in Figure 4 demonstrates a clear correlation between the number of bookings and cancellations, with an  $R^2$  value of 0.8438. This strong relationship suggests that as the volume of bookings increases, cancellations tend to rise concurrently. The data points clustered around the trendline indicate a predictable pattern, but the presence of outliers, particularly at higher booking volumes, raises questions about customer behavior during peak times. These outliers might represent scenarios where customer expectations are not met, leading to cancellations.



(Figure 4)

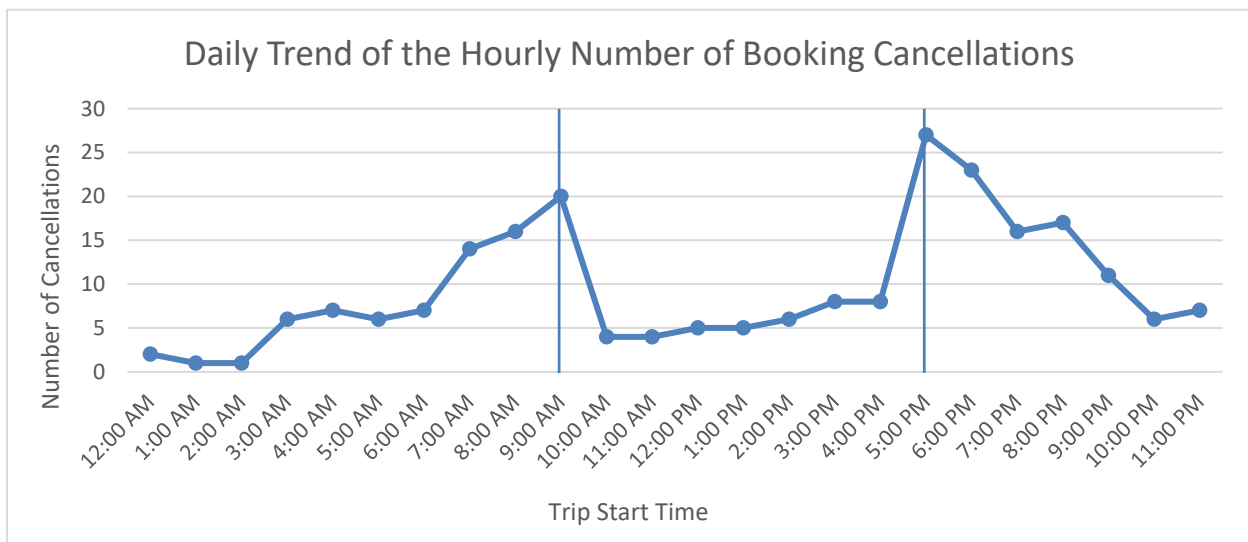
Understanding these dynamics implies that IndoCabs should not only focus on increasing the volume of bookings but also on managing the quality of customer interactions during these peak times. For instance, investing in customer support during high-traffic hours could mitigate cancellation rates, as proactive communication might alleviate uncertainties that lead to last-minute changes. Furthermore, analyzing customer demographics and their typical booking behaviors within these windows could yield insights into tailoring services and offers, thereby reducing the likelihood of cancellations.

Figure 5 illustrates the daily trend of hourly bookings, highlighting that booking frequency fluctuates throughout the day. Notably, there are distinct peaks around 9:00 AM (approximately 200 bookings) and 5:00 PM (around 175 bookings), likely correlating with typical work commute times. This pattern indicates that IndoCabs should anticipate high demand during these hours, allowing for optimal driver allocation.



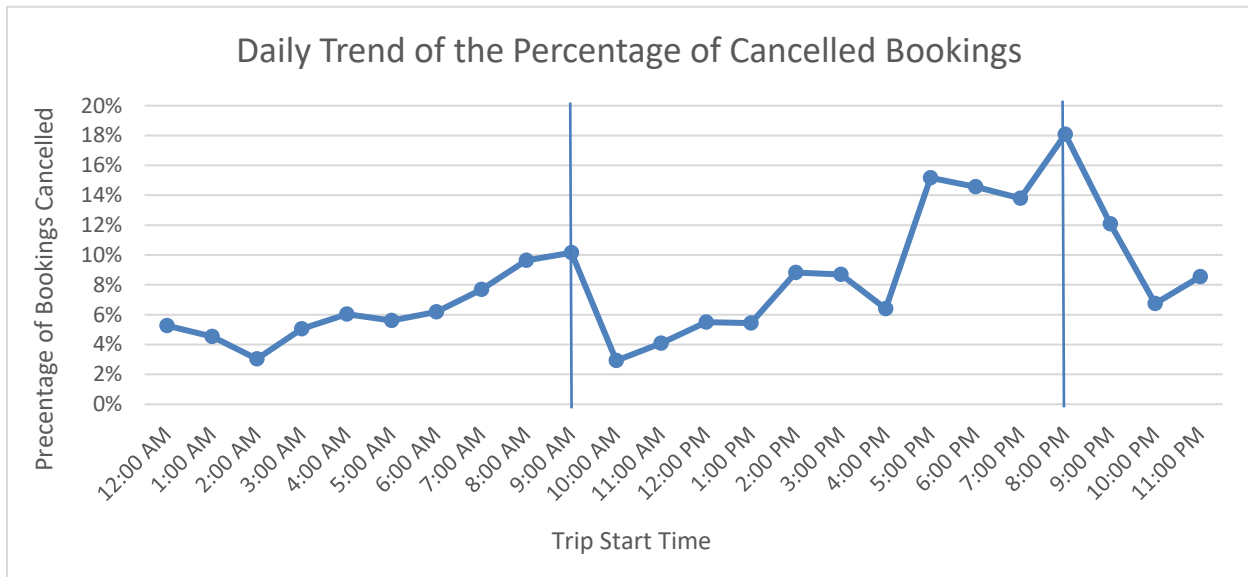
(Figure 5)

Conversely, Figure 6 reveals trends in hourly booking cancellations, with notable peaks around 9:00 AM (about 20 cancellations) and 5:00 PM (approximately 27 cancellations). The pattern is consistent with booking frequency, reinforcing the correlation identified in Figure 4. These spikes suggest that customers may feel overwhelmed during peak times, leading to impulsive cancellations. In addition, while cancellations peak during busy periods, the highest volume of bookings occurs later in the evening around 8 PM, indicating that IndoCabs must strategically manage capacity to accommodate fluctuating demand.



(Figure 6)

Figure 7 illustrates the daily trend of the percentage of bookings that are canceled, revealing consistent patterns throughout the day. The first notable peak in cancellations occurs at 9:00 AM, with approximately 10% of bookings being canceled. A subsequent spike is observed at 5:00 PM, where cancellations rise to around 15%. However, the highest cancellation rate is recorded at 8:00 PM, reaching nearly 18%. This escalation in cancellation rates during key timeframes underscores a critical need for IndoCabs to analyze customer behaviors and sentiments during these periods to develop effective strategies for mitigating cancellation risks.



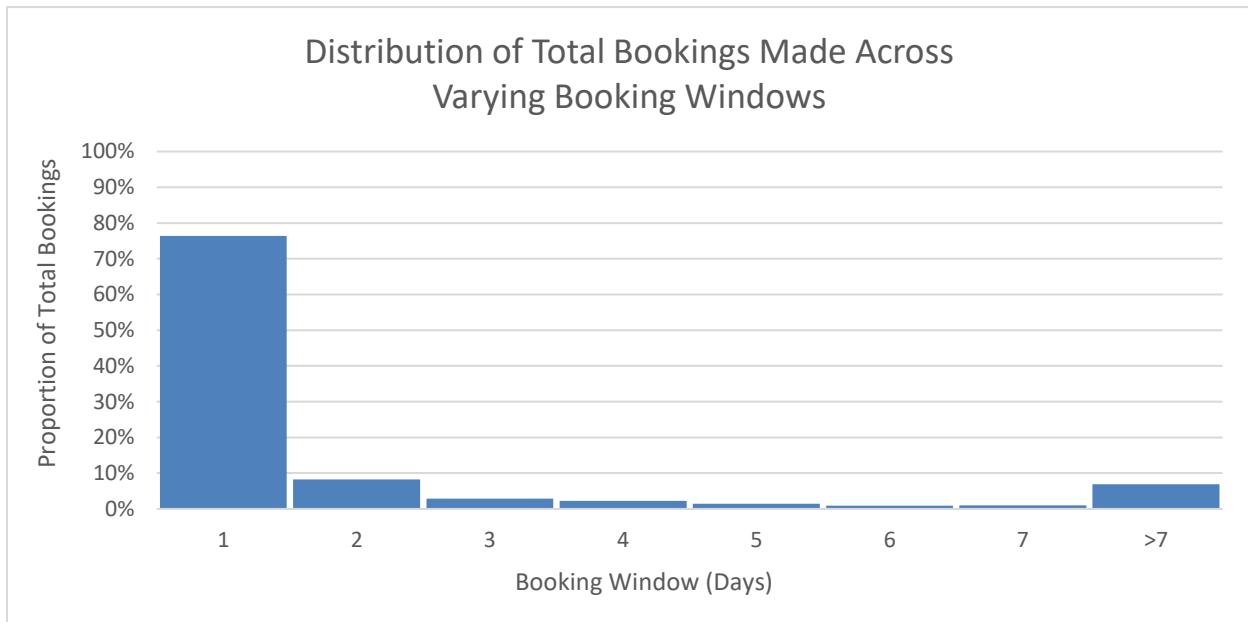
(Figure 7)

Understanding the timing of cancellations is essential for IndoCabs, as it offers insights into customer decision-making processes. The morning peak at 9:00 AM may reflect last-minute reconsiderations from customers who booked their rides in advance but have since changed their plans, possibly due to unexpected changes in their schedules. Similarly, the afternoon peak around 5:00 PM could be associated with the end of the workday, when customers reassess their travel needs or opt for alternative transportation options. Notably, the highest cancellation rate at 8:00 PM might suggest a pattern where customers, perhaps feeling fatigued or uncertain about their travel, choose to cancel their bookings rather than commit to a trip.

By recognizing these behavioral trends, IndoCabs can implement targeted strategies to minimize cancellations and enhance overall customer satisfaction. For instance, offering flexible cancellation policies or incentives for customers to maintain their bookings during peak times could help reduce cancellation rates. Additionally, proactive communication, such as reminders or check-ins before these peak hours, can provide customers with reassurance about their travel plans, potentially lowering the likelihood of cancellations.

### Analysis of Booking Windows and Cancellations

Figures 8 and 9 depict the distribution of bookings across varying booking windows, highlighting key trends in customer behavior that IndoCabs can leverage for operational optimization. Notably, 76% of all bookings occur within a one-day booking window, emphasizing a pronounced tendency among customers to make last-minute reservations. This behavior is especially prevalent for shorter trips, where immediacy is often a driving factor in decision-making. The fact that 36% of bookings occur within the first six hours indicates that many customers are not committing to their travel plans until shortly before their desired departure time, which can create a dynamic and unpredictable demand environment.

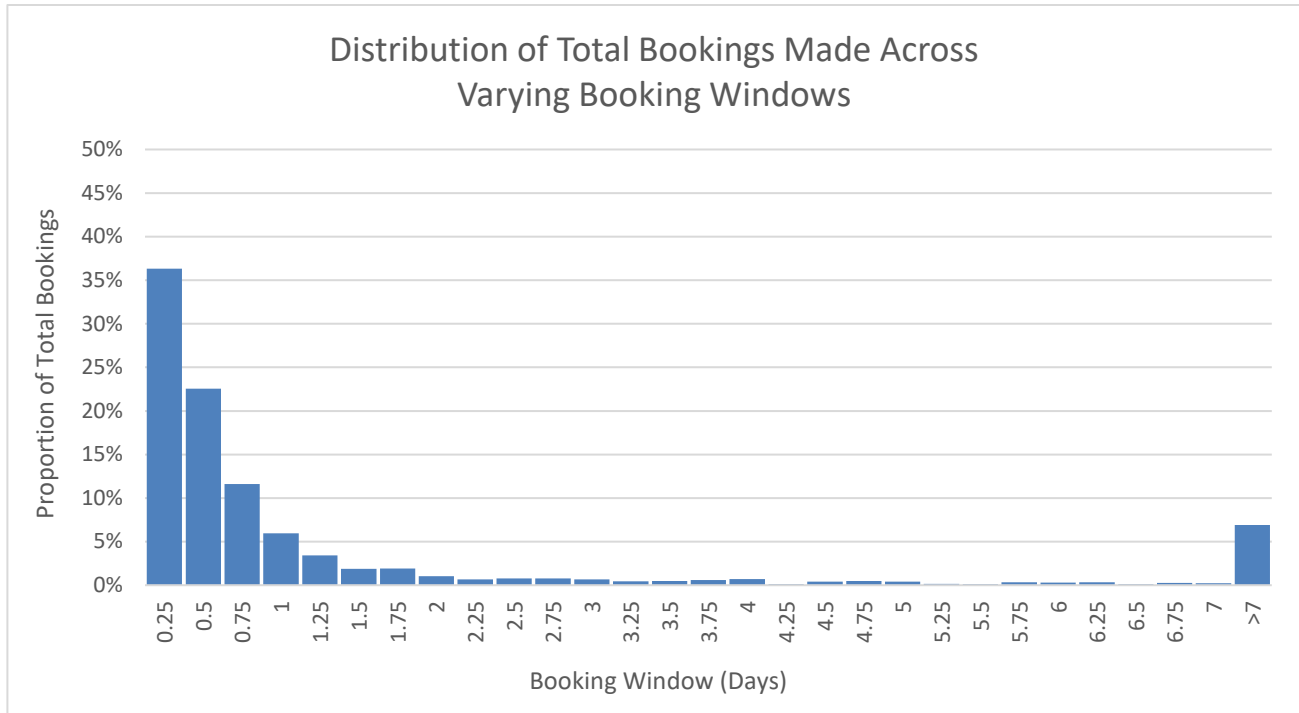


(Figure 8)

The breakdown of bookings by quarter-day intervals, as shown in Figure 9, enhances our understanding of booking behavior. The data reveals that 22% of bookings fall within the 6-12 hour window, while 12% occur between 12-18 hours, and a smaller 5% within the 18-24 hour range. This distribution indicates that the initial hours following a booking are critical, as they are associated with a higher likelihood of cancellations—particularly for those who book close to their departure time.

The implications of this insight include:

- Customer Engagement:** IndoCabs should prioritize enhancing customer communication during these early hours. This could include timely reminders, confirmations, or even value-added services that encourage customers to follow through with their plans. Strategies could also involve personalized messages that reinforce the customer's travel intent and address any concerns they might have.
- Resource Management:** The need for efficient resource allocation becomes critical. IndoCabs can utilize predictive analytics to anticipate demand during these high-risk cancellation windows, ensuring that enough drivers are available to meet potential surges in demand while minimizing idle time.



(Figure 9)

The last-minute nature of bookings presents both challenges and opportunities for IndoCabs. While the high percentage of last-minute bookings increases the risk of cancellations, it also opens doors for the company to improve its marketing and operations.

**Promotional Strategies:** By offering discounts or loyalty points for customers who book in advance, IndoCabs can encourage more people to plan ahead. This could help reduce the number of last-minute cancellations and create a more predictable demand.

**Dynamic Pricing Models:** Introducing a dynamic pricing model that adjusts fares based on how far in advance a customer books could also motivate earlier reservations. This would allow IndoCabs to maximize revenue during busy times while discouraging last-minute bookings by charging higher prices.

**Proactive Resource Alignment:** Understanding when most bookings occur allows IndoCabs to anticipate demand surges better. For instance, knowing that many bookings happen within the first six hours helps the company ensure enough drivers are available during peak times. This can improve service reliability and customer satisfaction by reducing wait times and ensuring a smooth experience.

Overall, analyzing booking patterns gives IndoCabs valuable insights to refine its operational strategies. By addressing the trends of last-minute bookings and cancellations, the company can improve service delivery, retain customers, and drive revenue growth. By implementing targeted strategies and managing resources effectively, IndoCabs can better respond to customer behavior and gain a competitive edge in the cab service market.

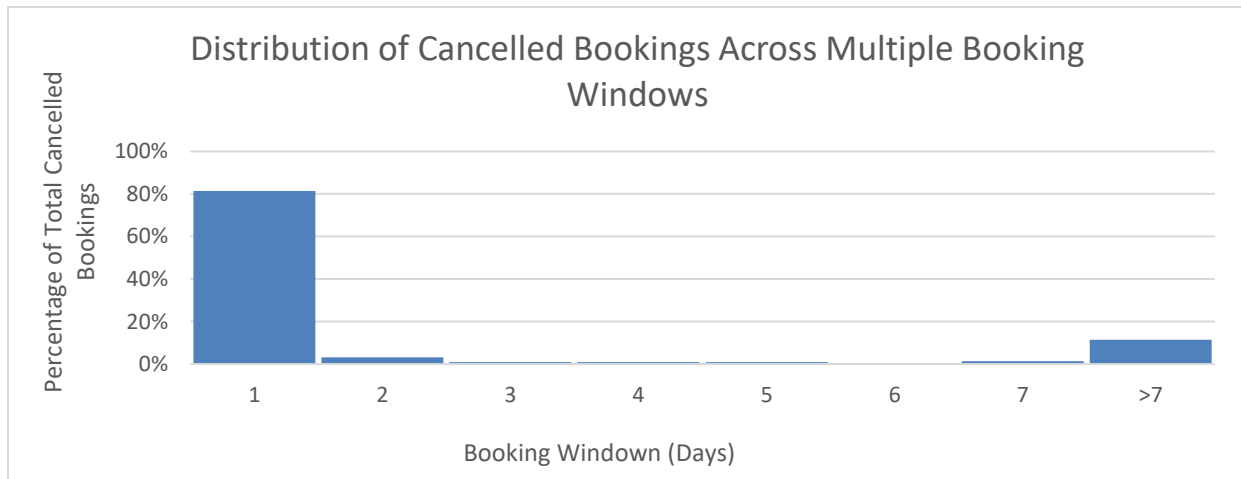


### Cancelled Bookings Analysis

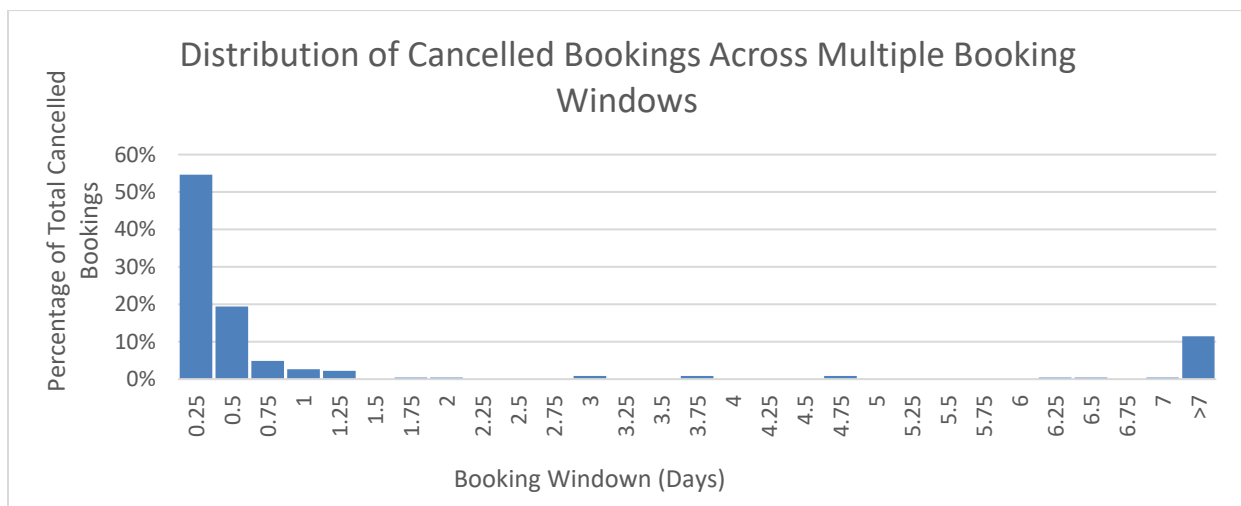
Figures 10 through 15 offer a comprehensive look at the distribution of canceled and non-canceled bookings across various booking windows, revealing significant patterns in customer behavior that IndoCabs can leverage for operational improvements. From Figures 10 and 11, it's evident that over 80% of canceled bookings occur within a one-day booking window. More specifically, about 55% of cancellations happen within the first 6 hours (0-6 hours), indicating a strong tendency for last-minute cancellations. The breakdown shows that:

- Around 20% of cancellations occur in the 6-12 hour window.
- Approximately 4% are within the 12-18 hour window.
- Only 2% occur in the 18-24 hour window.

This data highlights the urgency and impulsiveness in customer booking behavior, particularly for shorter trips. With such a high rate of last-minute cancellations, it's crucial for IndoCabs to develop targeted strategies that specifically address this issue.



(Figure 10)



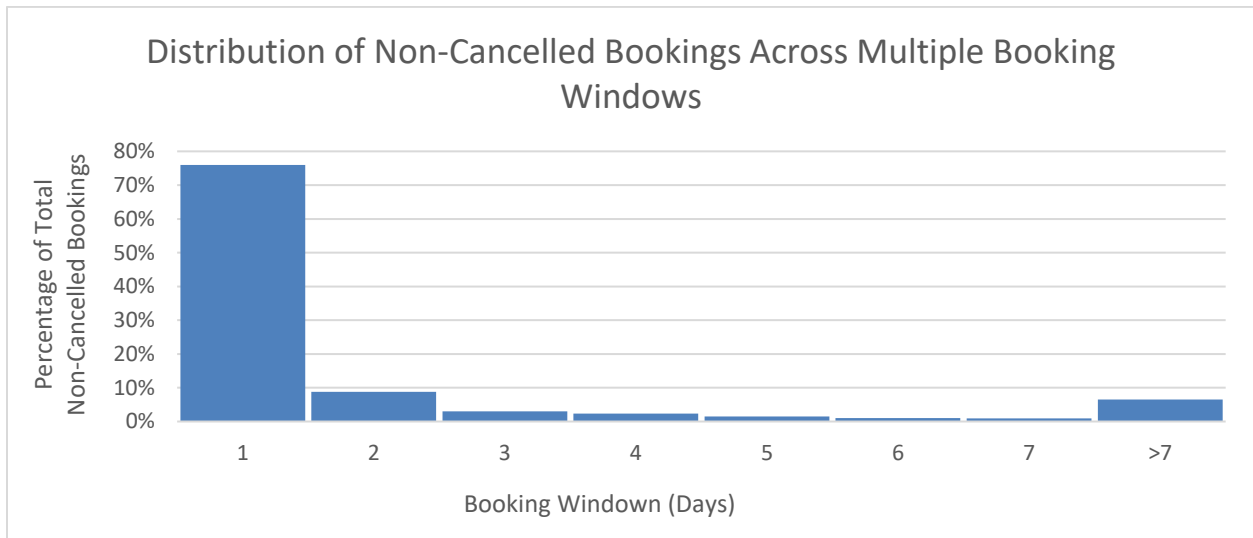
(Figure 11)

### Non-Canceled Bookings Analysis

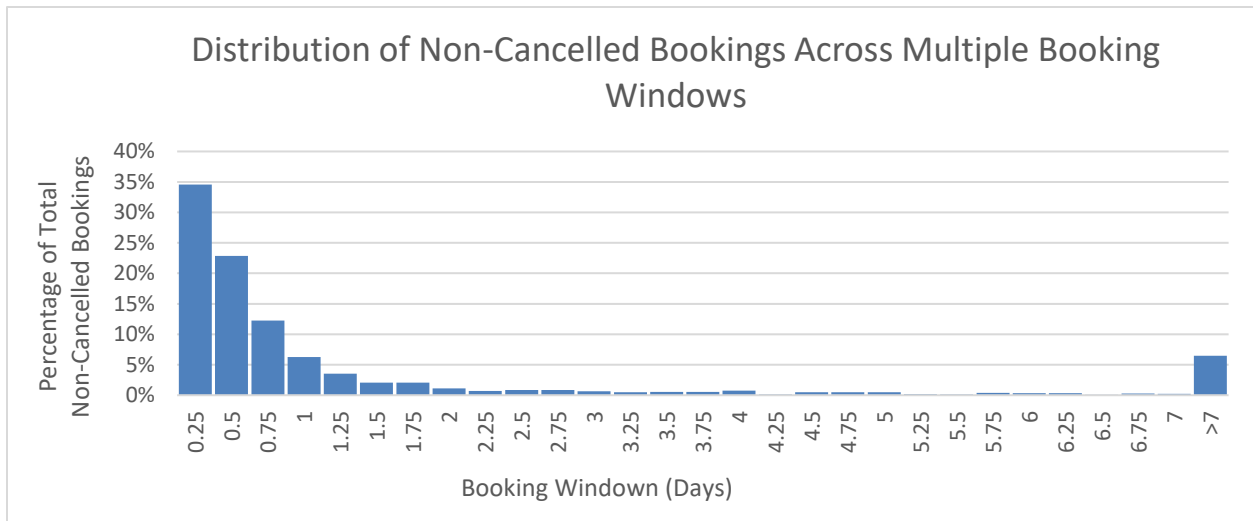
Figures 12 and 13 show the distribution of non-canceled bookings, revealing a similar trend. Approximately 75% of these bookings also fall within a one-day window, with a more detailed breakdown indicating:

- 35% of non-canceled bookings occur within 0-6 hours.
- 23% in the 6-12 hour window.
- 12% in the 12-18 hour window.
- 6% in the 18-24 hour window.

Again, only a small percentage of bookings are made in the 2-7 day window, further underscoring the preference for last-minute reservations. The patterns in non-canceled bookings suggest that IndoCabs could focus marketing efforts on last-minute travelers, tailoring promotions or services to enhance their experience.



(Figure 12)



(Figure 13)

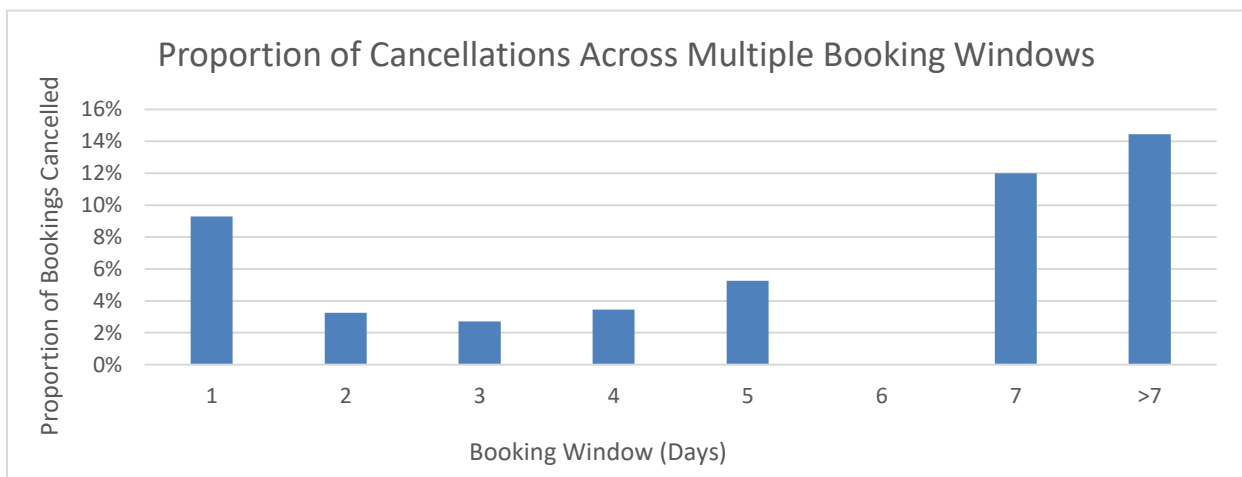
### Proportion of Cancellations Across Booking Windows

Figures 14 and 15 offer valuable insights into the cancellation patterns associated with different booking windows. The analysis of these figures reveals important trends that can inform IndoCabs' operational strategies and customer engagement efforts. Both figures illustrate the proportion of cancellations for various booking windows, shedding light on how customers interact with their travel plans over time. One notable trend is that the proportion of cancellations significantly increases for bookings made 6-7 days or more in advance. This pattern suggests several key implications:

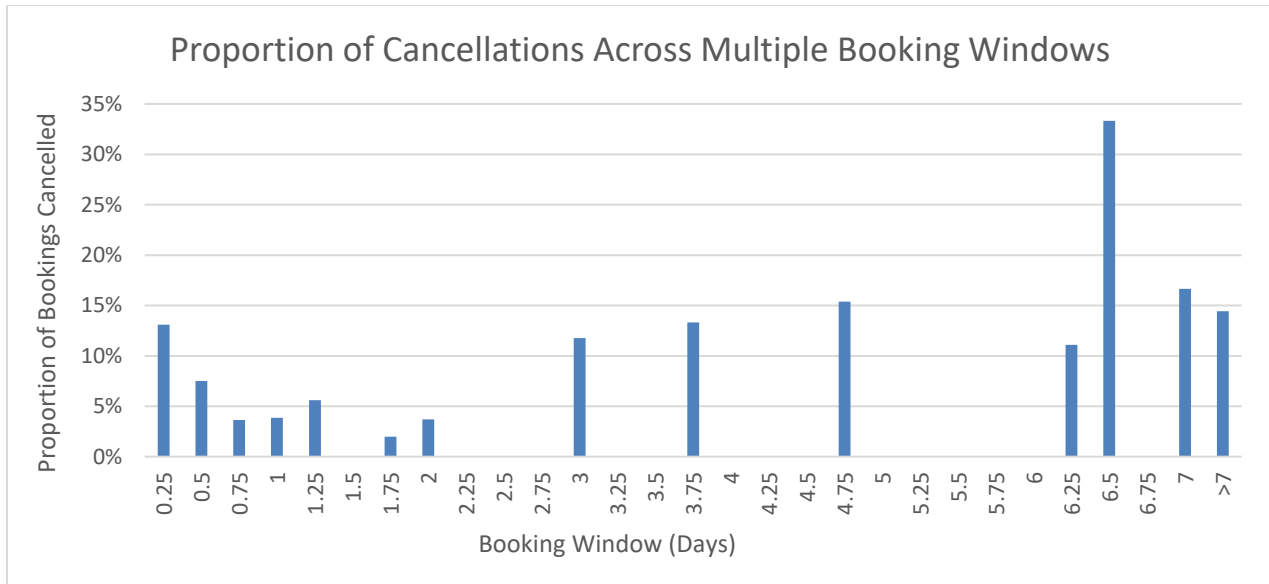
1. **Increased Uncertainty with Long-Term Planning:** Customers who book trips a week or more in advance may face greater uncertainties regarding their schedules. Life events, such as work commitments or personal obligations, can change unexpectedly, leading to higher cancellation rates. This behavior indicates that customers may lack a firm commitment to their travel plans when booked far in advance.
2. **Impact of External Factors:** Longer booking windows could be affected by external factors, such as seasonal changes, special events, or personal circumstances. As these factors evolve, customers might reconsider their travel arrangements, contributing to cancellations.
3. **Opportunity for Improved Engagement:** The heightened cancellation rates in longer booking windows indicate an opportunity for IndoCabs to enhance customer engagement. By providing regular updates, reminders, or even flexibility in rescheduling, IndoCabs can strengthen the likelihood that customers will follow through with their plans.

Insights from the Figures:

- Figure 14 presents a broader overview of cancellation proportions across various booking windows. While it is useful for identifying general trends, the larger step sizes can obscure finer details in the data.
- Figure 15, with its smaller step sizes, provides a more granular look at the cancellation proportions. This detail allows for a more precise understanding of customer behavior within narrower timeframes, which can be critical for developing targeted interventions.



(Figure 14)



(Figure 15)

## Recommendations and Conclusion

Based on the comprehensive analysis of trip durations, cancellations, booking behaviors, and customer interactions, several actionable recommendations can be put forth for IndoCabs to address its operational challenges and enhance customer satisfaction:

1. **Refine Cancellation Policies:** Given the high cancellation rate of 8.72% and the particularly high rates associated with point-to-point bookings (9.59%) and online/mobile channels (14%-15%), IndoCabs should consider implementing a tiered cancellation policy. For instance, offering partial refunds for cancellations made within a specified time frame before the scheduled trip could reduce last-minute cancellations and encourage commitment.
2. **Enhance Customer Communication:** The analysis indicates that many cancellations occur within the first few hours of booking. IndoCabs should implement proactive communication strategies, including automated reminders and confirmations that highlight the importance of the booking. Personalized messages emphasizing the travel plan could reinforce customer commitment.
3. **Dynamic Pricing Strategies:** Introducing a dynamic pricing model could encourage customers to book in advance. By adjusting fares based on how far in advance a booking is made, IndoCabs can incentivize early bookings while charging a premium for last-minute reservations, helping to mitigate last-minute cancellations.
4. **Targeted Marketing Campaigns:** Given the behavioral patterns observed, marketing efforts should focus on last-minute travelers and emphasize the convenience of booking with IndoCabs. Promotional discounts for bookings made within specific time frames (e.g., within 6 hours) can enhance customer engagement and loyalty.

5. **Data-Driven Resource Management:** IndoCabs should leverage the insights from the data regarding peak booking times (9:00 AM and 5:00 PM) to optimize driver allocation. Increasing driver availability during these hours can enhance service reliability and reduce customer wait times, thus improving satisfaction.
6. **Monitor Trip Durations and Customer Satisfaction:** Continuous monitoring of trip durations is vital, especially considering the outlier issues. Implementing a feedback mechanism where customers can report their trip experiences can help identify inefficiencies and improve operational effectiveness. Adjustments in route management or driver training can be initiated based on this feedback.
7. **Analyze Cancellations by Day:** The trend of higher cancellations on Mondays suggests the need for targeted strategies on these days. Implementing incentives or additional support on Mondays could help improve retention rates during these peak cancellation periods.

## Elevator Charts

The three charts listed below provide us with the most influential data and trends:

**Figure 3: Cancellation Rates by Day of the Week** - Figure 3 showcases the cancellation rates across different days of the week, with Monday exhibiting the highest rate at 11.11% and Saturday the lowest at 6.68%. This insight indicates that customer behaviors vary significantly depending on the day, suggesting that last-minute changes or uncertain travel plans are more common at the week's start. By optimizing resource allocation and driver scheduling during high-cancellation days, IndoCabs can improve service reliability and customer satisfaction.

**Figure 7: Daily Trend of Cancellations** - This chart illustrates the daily trend of booking cancellations, revealing critical peaks at 9:00 AM, 5:00 PM, and 8:00 PM. The data indicates that a significant proportion of cancellations occurs during these times, highlighting a potential correlation between customer behavior and decision-making processes. Understanding these trends allows IndoCabs to implement targeted strategies, such as proactive communication and flexible cancellation policies, to mitigate cancellations during high-risk periods.

**Figure 15: Proportion of Cancellations Across Booking Windows** - This chart reveals the cancellation patterns associated with various booking windows, highlighting a notable increase in cancellations for bookings made 6-7 days or more in advance. The data underscores the uncertainty customers face with long-term planning, presenting an opportunity for IndoCabs to enhance customer engagement through regular updates and flexible rescheduling options. Addressing these trends can lead to improved customer retention and reduced cancellation rates.

## Notes on Data Preparation

The data preparation process for this analysis involved meticulous cleaning and organizing of a comprehensive dataset encompassing trip durations, cancellations, and booking behaviors. A thorough examination for duplicates and erroneous records was conducted, revealing minimal issues, which underscores a high level of data quality. Key metrics, including averages, medians, and proportions for cancellations across various parameters, were derived to facilitate in-depth analyses.

However, some concerns were identified regarding the presence of outliers, particularly within the trip duration data. These outliers could potentially skew results and may require further investigation to ensure that analyses reflect accurate customer behaviors. Overall, the dataset provides a solid foundation for analysis and informed decision-making, enabling IndoCabs to develop strategies that directly address customer needs and improve overall service delivery.