Hotel Booking Performance Analysis

Channel, Cancellation & Revenue Optimization Insights

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1. INTRODUCTION

In this report, ~30,000 booking records obtained from TravClan's booking system are analyzed to explore booking trends, cancellation rates, and revenue streams for different booking types and at varying times.

The above analysis shows the presence of high risks of cancellations for specific booking channels, significant seasonal patterns for booking value and revenue concentration, and notable distinctions related to booking quality for customers and properties.

Finally, considering the implications of these research findings, a series of focused recommendations are made that pertain to a number of areas of the proposed business enterprise.

2.Analysis Framework & Methodology

The analysis was conducted using a structured, exploratory approach on approximately 30,000 hotel booking transactions to identify booking patterns, cancellation drivers, and revenue optimization opportunities. The following methodology was applied:

- **Data Ingestion & Validation:**
  Loaded **~30K** booking records and validated key fields including booking status, booking dates, travel dates, pricing variables, and booking channels. Initial checks confirmed that core identifiers and pricing fields had no critical missing values.

Initial Booking Outcome Distribution
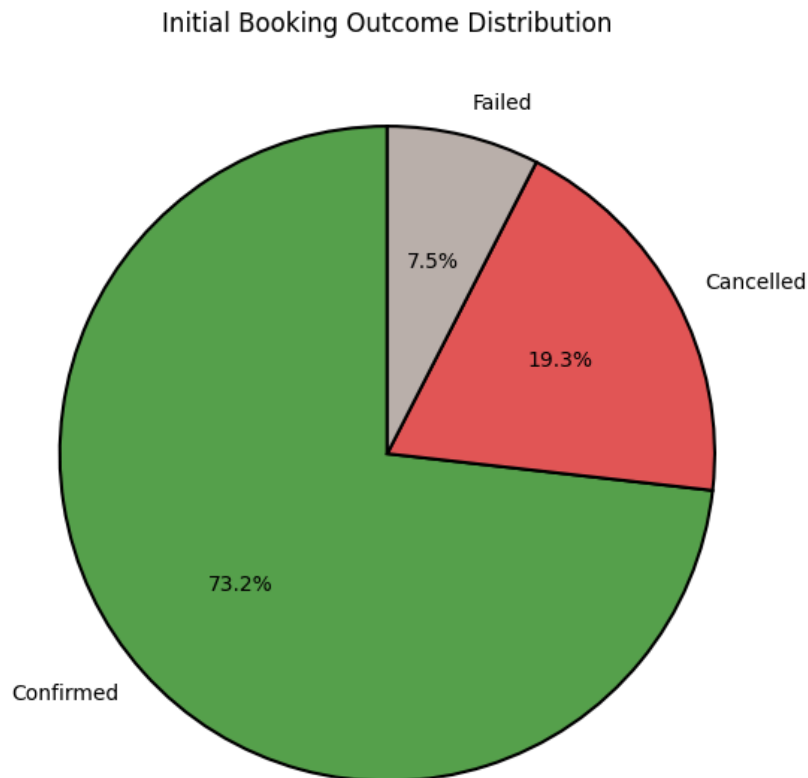
- **Data Cleaning & Filtering:**
  For the purpose of this behavioral analysis, **failed bookings** were excluded to focus strictly on **customer intent** and **cancellation patterns,** ensuring that technical or payment-related failures did not skew the results. Data validation further confirmed that missing check-in and check-out dates were primarily associated with cancelled bookings and were treated as expected nulls within the booking lifecycle rather than data quality issues.

- **Feature Engineering:**
  Created derived features including:

  - Cancellation indicators (is_cancelled)
  - Lead time (booking date to check-in date)
  - Length of stay
  - Booking and travel month indicators,these features enabled behavioral, temporal, and seasonality-based analysis.

- **Exploratory Data Analysis (EDA):**
  Exploratory analysis was performed across booking channels, star ratings, and travel periods to understand variations in booking behavior and outcome quality. The analysis highlighted noticeable differences in cancellation propensity and revenue realization across channels, indicating that booking source is a key determinant of booking reliability and revenue leakage.

- **Cancellation & Root Cause Analysis:**
  Analyzed cancellation behavior across lead-time buckets, booking channels, and property segments. Results showed higher cancellation propensity for medium to long lead-time bookings and elevated cancellation rates in Travel Agent and Mobile App channels, pointing to speculative booking behavior.

- **Revenue & Profitability Assessment:**
  Evaluated realized revenue and profitability using confirmed bookings only. Total realized revenue exceeded **₹650M**, while total profit (selling price minus cost price) was approximately **₹156M**, highlighting the financial impact of cancellations on revenue realization.

- **Seasonality & Trend Analysis**:
  Examined monthly trends in booking volume, revenue, and average length of stay. Revenue was found to be concentrated in peak travel months, with a noticeable decline in off-peak periods, indicating strong seasonality and revenue concentration risk.

- **Insight Synthesis & Recommendation Design:**
  Integrated insights across cancellations, channels, profitability, and seasonality to develop

targeted business recommendations focused on reducing cancellations, improving revenue realization, and optimizing channel strategy.

3. Key Business Metrics Overview

A high-level review of core business metrics provides an overall snapshot of booking performance and highlights areas of potential revenue leakage. While booking demand remains strong, cancellations and booking quality play a critical role in determining realized revenue and profitability.

Key Metrics Summary

- **Total Bookings Analyzed:** ~22,700

- **Overall Cancellation Rate:** ~4.7%

- **Total Realized Revenue (Confirmed Bookings):** ~₹650 million

- **Total Profit (Confirmed Bookings):** ~₹156 million

- **Average Length of Stay (Confirmed Bookings):** ~4 nights

Booking Status Distribution

Cancelled

4.7%

95.3%

Confirmed
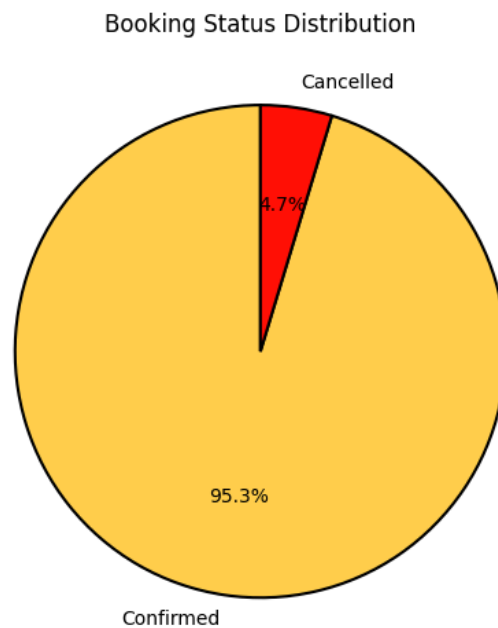
Despite a healthy volume of bookings, not all transactions convert into realized stays. Approximately **4.7% of bookings are cancelled**, representing a **non-trivial source of revenue leakage**. This indicates that booking volume alone is not a sufficient measure of performance, and that improving booking quality and reducing cancellations remain important levers for enhancing revenue realization and profitability.

To better understand the drivers behind these aggregate metrics, the following section explores how booking volume and cancellation behavior vary across channels, customer behavior, and temporal dimensions.

4. Booking and Cancellation Patterns

This section analyzes how booking performance and cancellation behavior vary across booking channels and customer booking timelines. The objective is to identify patterns that explain differences in revenue realization and booking reliability.

4.1 Booking Performance by Channel

Booking channels show clear differences in both revenue contribution and cancellation behavior. The Web channel emerges as the strongest performer, generating the highest share of realized revenue while maintaining the lowest cancellation rate **(~2.3%),** indicating high booking reliability and strong customer intent.

In contrast, the Mobile App channel, while contributing a substantial portion of total revenue, exhibits the highest cancellation rate **(~8.4%)**, suggesting greater booking uncertainty and lower conversion efficiency. Travel Agent bookings generate the lowest realized revenue and show moderate cancellation levels, indicating comparatively weaker booking quality.

Key Insight:
 Booking channel choice significantly impacts both revenue realization and cancellation risk, with Web bookings demonstrating the highest booking quality and reliability.
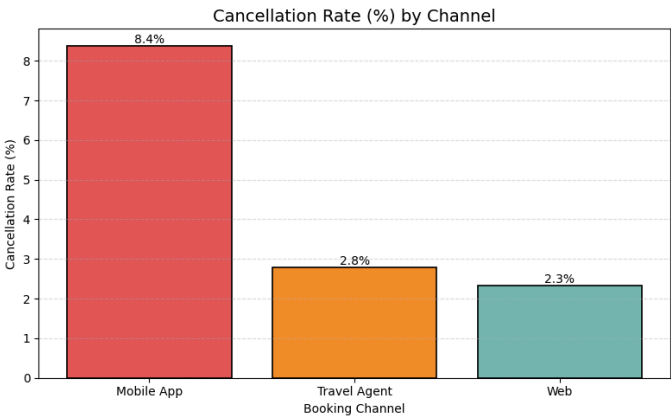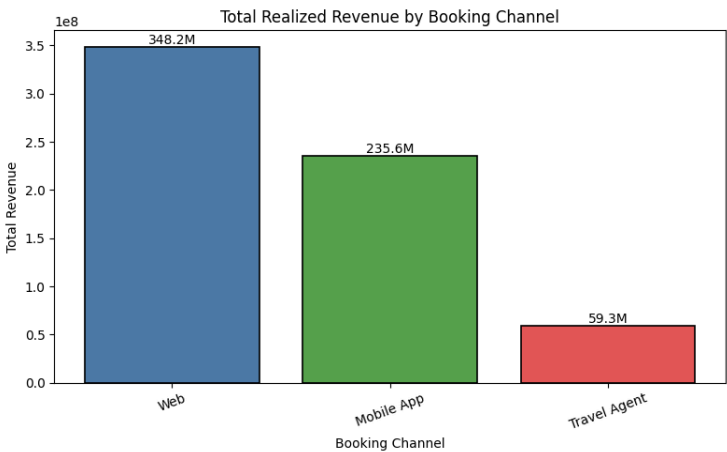
4.2 Lead-Time and Cancellation Behavior
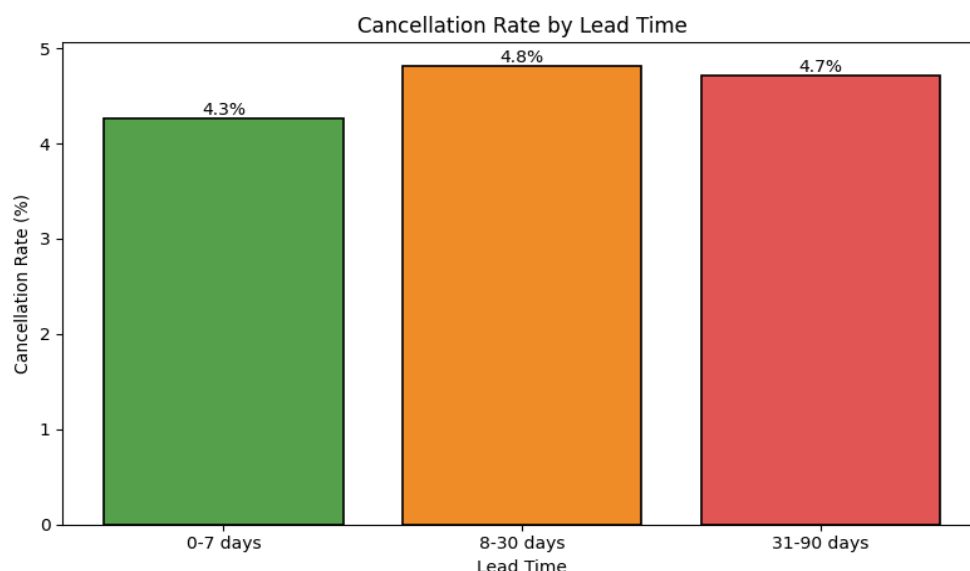
Cancellation behavior varies across booking lead-time segments. Bookings made closer to the travel date (0–7 days) show relatively lower cancellation rates, reflecting higher travel certainty and commitment. In contrast, bookings made further in advance (8–30 days and 31–90 days) exhibit slightly higher cancellation rates, indicating increased uncertainty in long-horizon travel plans.

While the overall variation in cancellation rates across lead-time buckets is moderate, the trend suggests that **longer lead times are associated with marginally higher cancellation propensity**, increasing the risk of revenue leakage for advance bookings.

Key Insight:
Advance bookings carry higher uncertainty, making lead time an important factor in managing cancellation risk and forecasting realized revenue.

4.3 Property Characteristics and Cancellation Risk

Cancellation behavior shows moderate variation across property characteristics, particularly by hotel star rating. Mid-tier properties exhibit slightly higher cancellation rates compared to premium hotels, suggesting relatively lower booking commitment in this segment. In contrast, higher-star properties tend

to demonstrate more stable booking behavior, potentially driven by stronger customer intent, stricter cancellation policies, or higher perceived value associated with premium stays.

Room-type analysis indicates that standard room categories account for the majority of booking volume, reflecting their broad appeal and affordability. More premium or specialized room types, while contributing a smaller share of total bookings, display comparatively steadier booking behavior, suggesting higher intent among customers selecting these options.

Overall, the findings indicate that property quality and room selection influence booking reliability, with higher-end properties and premium room categories attracting more committed travelers.

Key Insight:
 Higher property quality and premium room selections are associated with greater booking stability and lower cancellation risk.

4.4 Seasonal and Temporal Trends
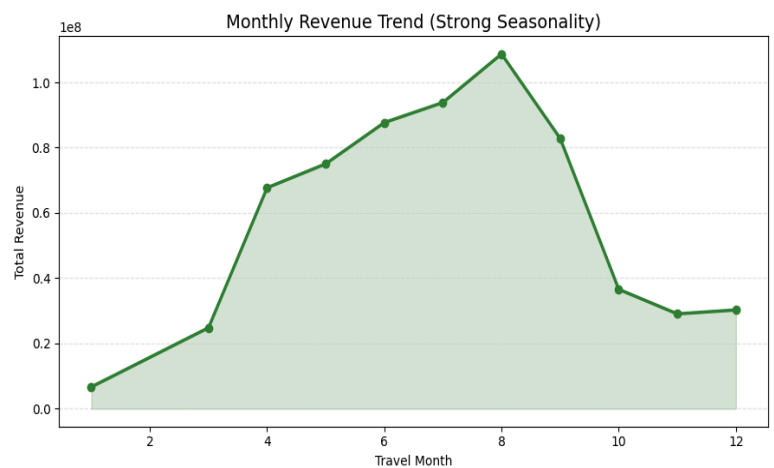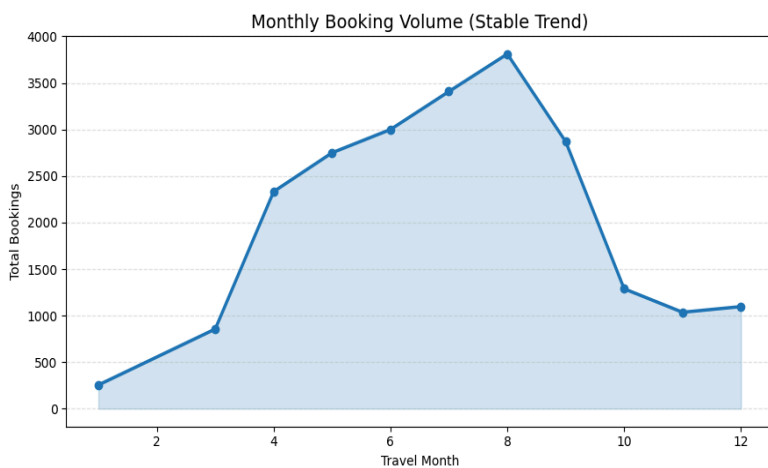
Booking volumes remain relatively stable across travel months, indicating consistent demand throughout the year without sharp seasonal spikes in booking count.

- Revenue shows clear seasonality, with mid-year travel months generating significantly higher realized revenue despite similar booking volumes.

- This divergence suggests that seasonal effects are driven by higher pricing, longer stays, or premium property demand, rather than increased booking frequency.

- Revenue declines during off-peak months are more pronounced than changes in booking volume, highlighting pricing and demand-mix sensitivity across seasons.

Key Insight: Seasonality impacts revenue more strongly than booking volume, making pricing and booking mix critical levers during peak travel periods.
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5. Root Cause Analysis

This section investigates the underlying drivers responsible for booking cancellations and revenue leakage. Root causes are identified using **comparative analysis of booking outcomes**, supported by **distributional differences**, **relative contribution patterns**, and **behavioral metrics**, rather than unstable aggregate cancellation rates.

5.1 Channel-Level Booking Quality

Booking channel emerges as a key determinant of booking reliability. While booking lead time remains broadly consistent across channels (approximately one month), meaningful differences are observed in booking outcomes.

Web bookings contribute a higher share of confirmed stays relative to their booking volume, indicating stronger customer intent and higher booking quality. In contrast, Mobile App and Travel Agent bookings contribute disproportionately to cancelled outcomes, despite similar booking windows. This divergence suggests that channel performance differences are driven by **customer behavior and booking commitment**, not timing.

Root Cause:
Differences in customer intent and booking behavior across channels lead to structurally different booking reliability, independent of lead time.

Booking Outcome Mix by Channel (%)
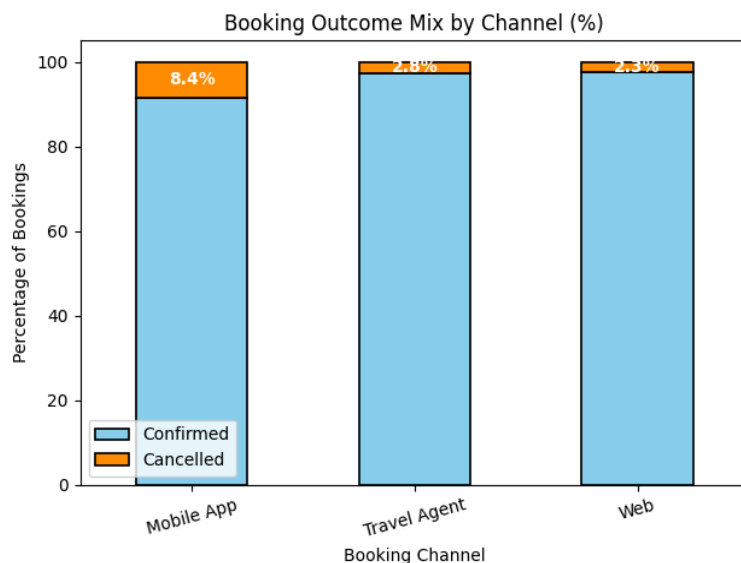
Booking outcome composition varies meaningfully across channels.

Mobile App bookings exhibit the highest cancellation share, indicating lower booking reliability compared to Web and Travel Agent channels. Web bookings demonstrate the strongest conversion quality, with the lowest proportion of cancelled bookings

5.2 Stay Length and Commitment Gap

A clear behavioral separation exists between confirmed and cancelled bookings based on stay length. Cancelled bookings are heavily concentrated among very short or near-zero stay durations, whereas confirmed bookings are associated with materially longer stays.

This indicates that **short-stay and impulse bookings carry significantly higher cancellation risk**, reflecting lower customer commitment. The strength of this separation highlights stay length as one of the most reliable predictors of cancellation behavior in the dataset.

Root Cause:
 Lower booking commitment in short-duration stays increases the likelihood of cancellation.
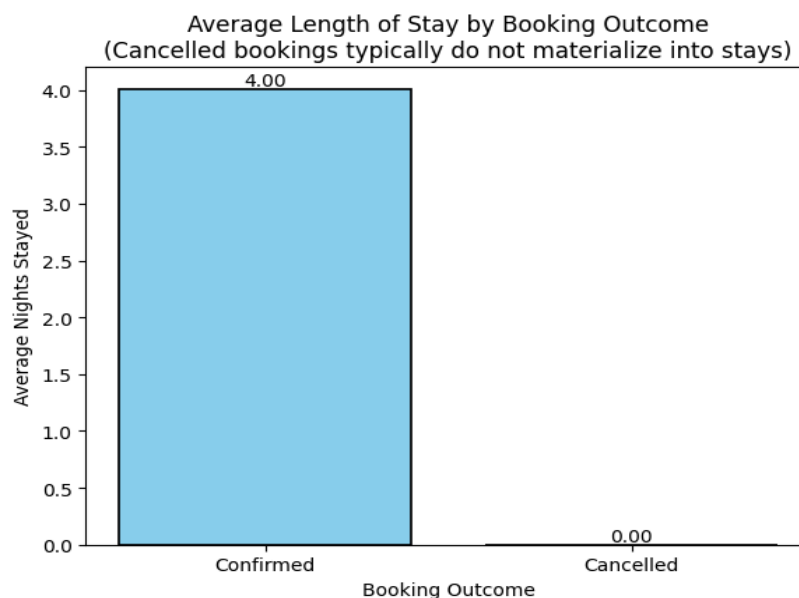
5.3 Seasonal Revenue Exposure

Seasonal analysis shows that booking volumes remain relatively stable across travel months; however, revenue exhibits clear seasonal variation. Peak travel periods generate higher average booking value and longer stays, concentrating revenue during these months.

At the same time, cancellations during peak periods expose a larger share of high-value bookings to revenue loss. This creates a **risk concentration effect**, where cancellations during peak demand periods have a disproportionately high financial impact.

Root Cause:
 Seasonality amplifies revenue risk by concentrating high-value bookings during periods of elevated volatility.

5.4 Property and Room Segment Effects

Property characteristics further influence booking stability. Standard room categories dominate overall booking volume but account for a larger share of cancellations relative to premium room categories. In contrast, Deluxe and Suite bookings demonstrate stronger conversion into confirmed stays despite lower volume.

Similarly, higher-quality properties exhibit more stable booking outcomes compared to lower-tier segments. This pattern suggests that **price sensitivity and lower switching costs in standard segments lead to more speculative booking behavior**.

Root Cause:
 Higher perceived value and customer investment increase booking commitment, reducing cancellation exposure in premium property segments.

5.5 Operational Funnel Leakage (Failed Bookings)

In addition to customer-driven cancellations, failed bookings represent an important source of revenue leakage. These transactions reflect unsuccessful booking attempts due to payment issues, technical failures, or incomplete customer actions.

Although failed bookings are excluded from cancellation metrics, they represent lost conversion opportunities and indicate inefficiencies earlier in the booking funnel.

Root Cause:
 Operational inefficiencies prevent a portion of customer intent from converting into confirmed bookings.

6.Business Recommendations

6.1 Scale the Web Channel as the Primary Revenue Driver

The Web channel emerges as the strongest performer across all key metrics, delivering the lowest cancellation rate (~2.3%), the highest booking volume (~11.9K bookings), and the largest share of total profit (~₹85.5L). This combination indicates significantly higher booking intent and revenue reliability compared to other channels.

To capitalize on this strength, TravClan should prioritize the Web channel in marketing spend and user experience design, supported by Web-exclusive pricing or loyalty benefits. Strengthening this channel is

expected to improve realized revenue while maintaining low cancellation risk, ultimately maximizing profit efficiency per booking.

6.2 Reduce Mobile App Cancellations Through Commitment Controls

Despite contributing substantial volume (~8.7K bookings), the Mobile App records the highest cancellation rate (~8.4%) and lower profit efficiency than the Web channel. This pattern suggests impulse-driven booking behavior, where ease of booking and cancellation reduces commitment.

Introducing light-touch commitment mechanisms—such as booking confirmation reminders, small non-refundable convenience fees, or post-stay cashback incentives—can discourage speculative bookings without suppressing demand. Even a modest 2% reduction in Mobile cancellations would materially improve realized revenue while preserving the channel's scale.

6.3 Maintain the Travel Agent Channel as a Controlled Supplement

The Travel Agent channel contributes the lowest booking volume (~2K bookings), moderate cancellation levels (~2.8%), and the smallest share of total profit (~₹14.5L). While it adds incremental demand, its limited scalability and lower profitability make it unsuitable as a core growth channel.

Rather than expanding this channel aggressively, TravClan should retain it selectively for use cases such as corporate bookings or longer-stay customers. This approach prevents margin dilution while keeping operational complexity under control.

6.4 Property and Booking Behavior Considerations

Analysis of booking outcomes indicates that **cancellations occur across a wide range of stay durations**, with cancelled and confirmed bookings exhibiting similar average lengths of stay. This suggests that **stay duration alone is not a reliable predictor of cancellation risk**.

Instead, cancellation behavior appears more closely linked to **booking channel characteristics and booking intent at the time of reservation**, rather than how long the stay was planned to be. As a result, efforts to reduce cancellations should focus less on stay-length-based controls and more on improving booking quality through channel optimization and customer commitment signals.

Impact:
 By shifting attention from stay duration to booking behavior and channel reliability, the platform can address cancellations at their root without introducing restrictive policies that may negatively affect genuine long-stay customers.

6.5 Shift Optimization Focus from Discounting to Retention

With an average confirmed booking value of approximately ₹29.7K and total realized revenue of ₹64.3 Cr, the data indicates that revenue leakage stems primarily from lost confirmed bookings rather than insufficient pricing.

Accordingly, TravClan should shift its optimization strategy away from aggressive discounting and toward post-booking assurance, customer communication, and confirmation mechanisms. Strengthening customer confidence after booking will help protect high-value transactions and improve net profitability [1]without eroding margins.