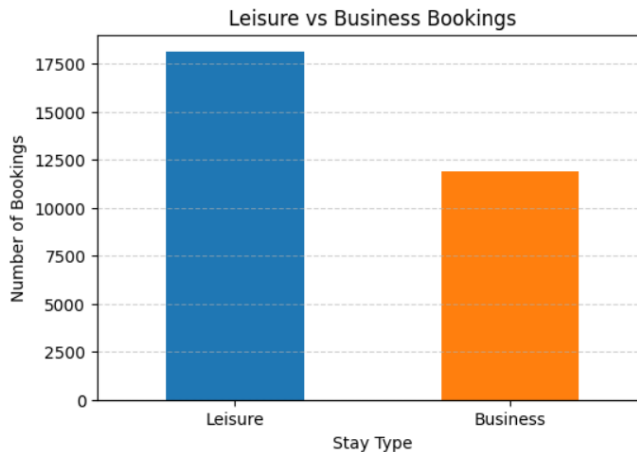


Highlight at least 3 meaningful trends or patterns in the data.

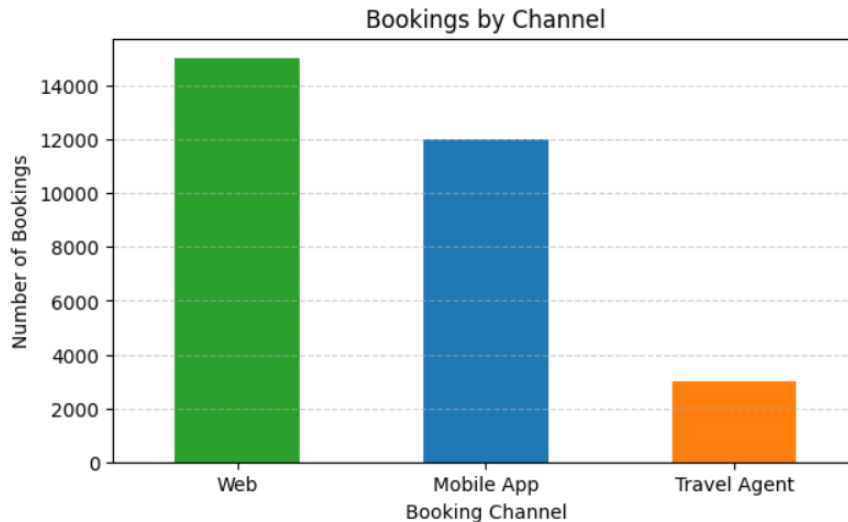
Trend 1: Leisure Travel Dominates Bookings

- Majority of bookings are Leisure stays, not Business.
- Leisure travelers appear across all major cities (San Francisco, Dallas, Los Angeles, Orlando, Miami).
- Even longer stays (4–7 nights) are mostly leisure, indicating vacation or personal travel demand.



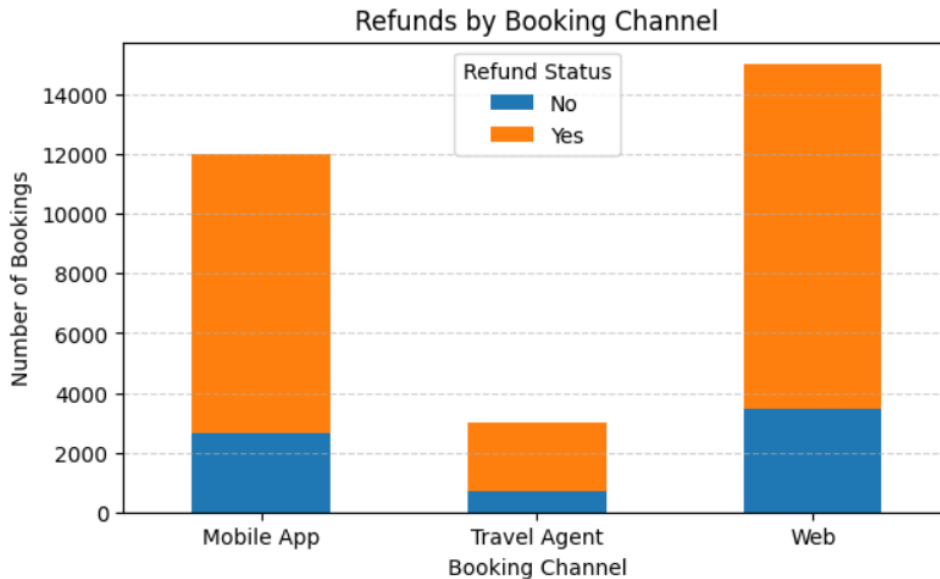
Trend 2: Web & Mobile App Are the Primary Booking Channels

- Most bookings come from Web and Mobile App channels.
- Travel Agent bookings are minimal.
- Mobile App users often use cashback and coupons, while Web bookings show higher average booking values.



Trend 3: Refunds Are Common, Especially in Leisure & App-Based Bookings

- A significant number of bookings show refund status = Yes.
- Refunds are more frequent in:
 - Leisure bookings
 - Mobile App / Android / Web channels
- Even confirmed bookings sometimes include partial refunds.

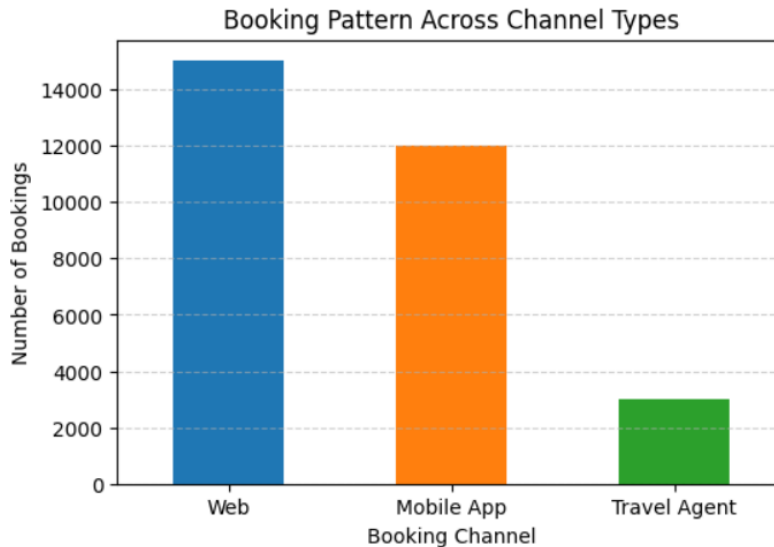


How do booking patterns vary across channels, room types, and star ratings?

1. Booking Patterns by Channel

Observed Pattern

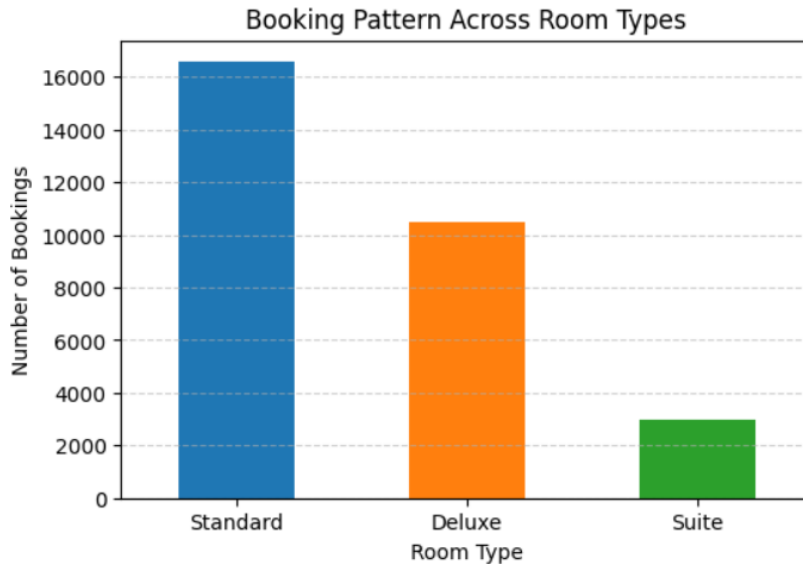
- Web and Mobile App dominate total bookings.
- Mobile App bookings are more common for Standard and Deluxe rooms.
- Travel Agent bookings are rare and mostly linked to higher room categories (Suites).



Booking Patterns by Room Type

Observed Pattern

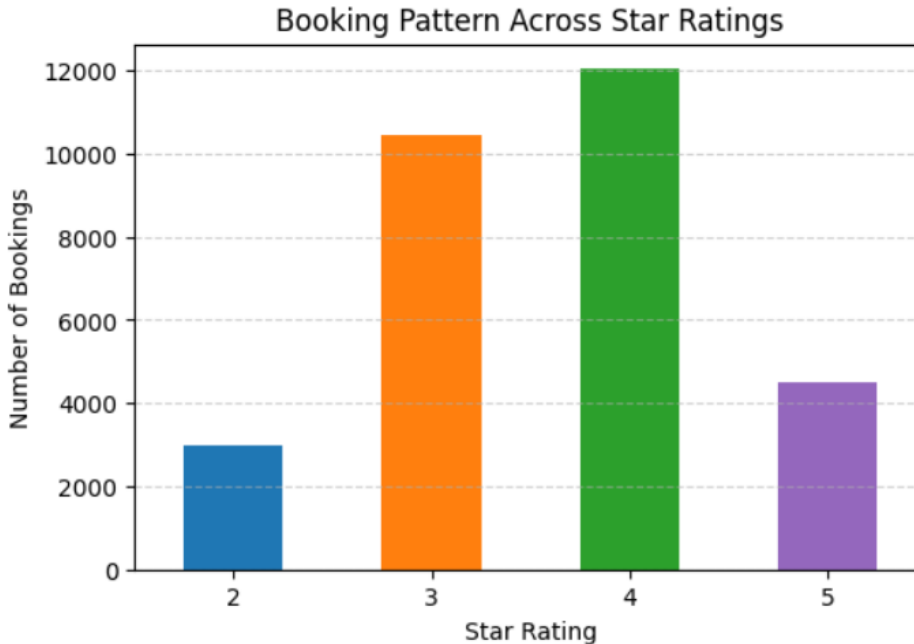
- Standard rooms have the highest booking volume.
- Deluxe rooms are the second most booked, especially for leisure travel.
- Suites have the lowest booking count and are often linked to:
 - Higher star-rated properties
 - Business or agent-based bookings



Booking Patterns by Star Rating

Observed Pattern

- 3-star and 4-star hotels account for most bookings.
- 5-star hotels have fewer bookings but:
 - Higher average selling prices
 - More Deluxe and Suite room bookings
- Lower star hotels mostly sell Standard rooms.



What do you notice about cancellation behavior?

Payment Method Influence

- Possibly because refund processing is easier compared to Bank Transfer or Credit Card.

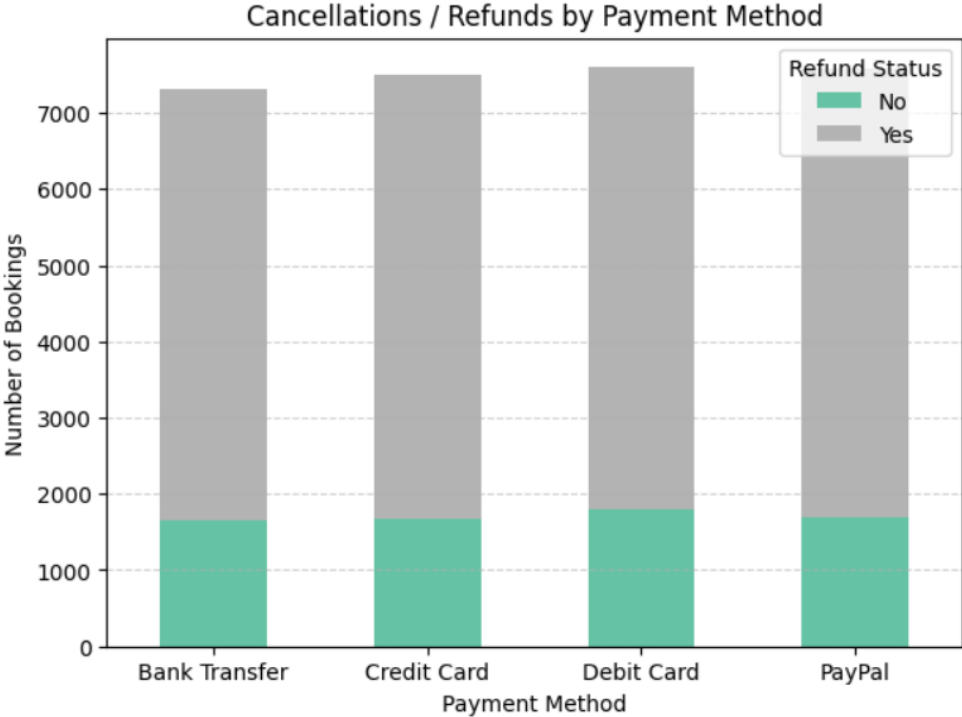
Booking Lead Time / Advance Booking

- Bookings made weeks or months in advance are more likely to be canceled.
- Travelers often cancel or modify plans if their check-in date is far away.

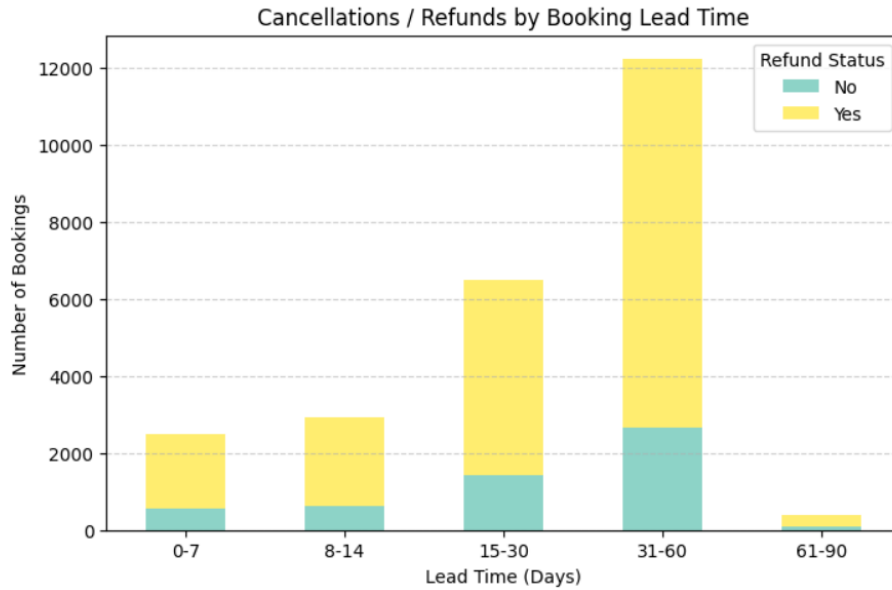
Stay Length

- Short stays (1–2 nights) are more likely to be canceled than longer stays.
- Longer stays are often planned carefully and less flexible.
- Some payment methods (like PayPal or Debit Card) tend to have higher cancellations.

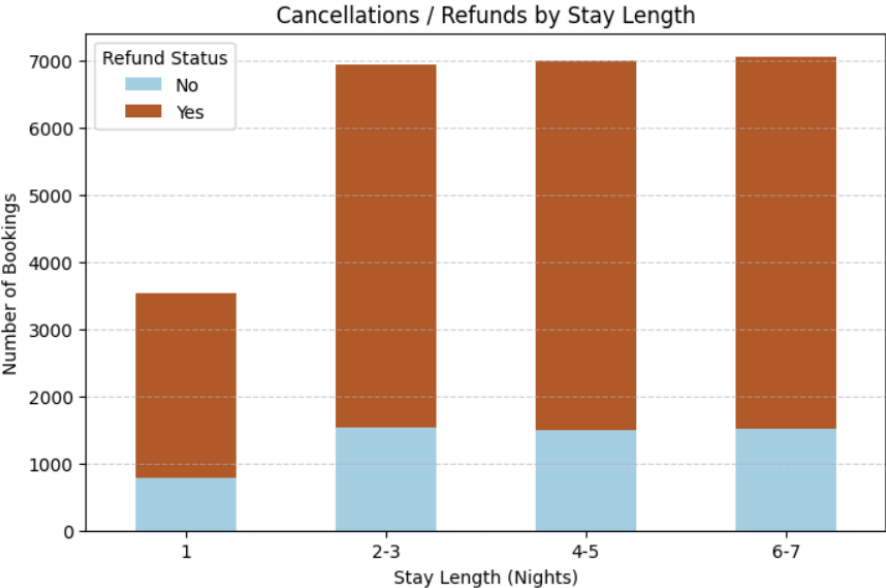
Payment Method Influence



Booking Lead Time

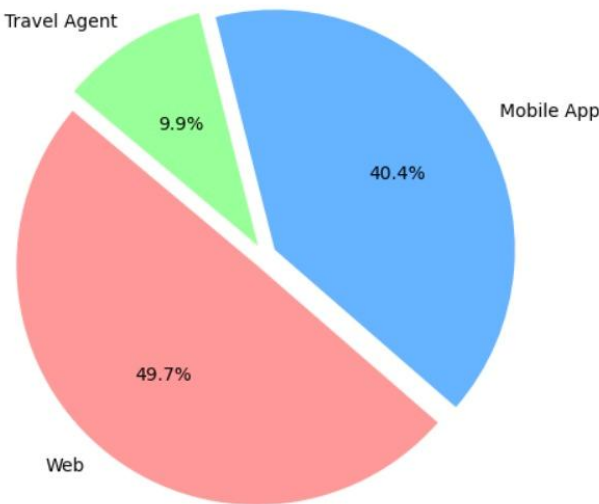


Stay Length



What might be the reasons for the observed cancellation patterns?

Cancellations by Booking Channel (% of Total Cancellations)



1. Web Bookings

Possible Reasons for Cancellations:

- **Ease of Cancellation**
 - Web portals often allow customers to cancel bookings online with minimal friction.
- **Speculative Bookings**
 - Leisure travelers might book multiple options to compare and later cancel the less preferred ones.
- **Payment Method Flexibility**
 - Customers paying via PayPal, Debit Card, or Credit Card can often get **quick refunds**, encouraging cancellations.

2. Mobile App Bookings

Possible Reasons for Cancellations:

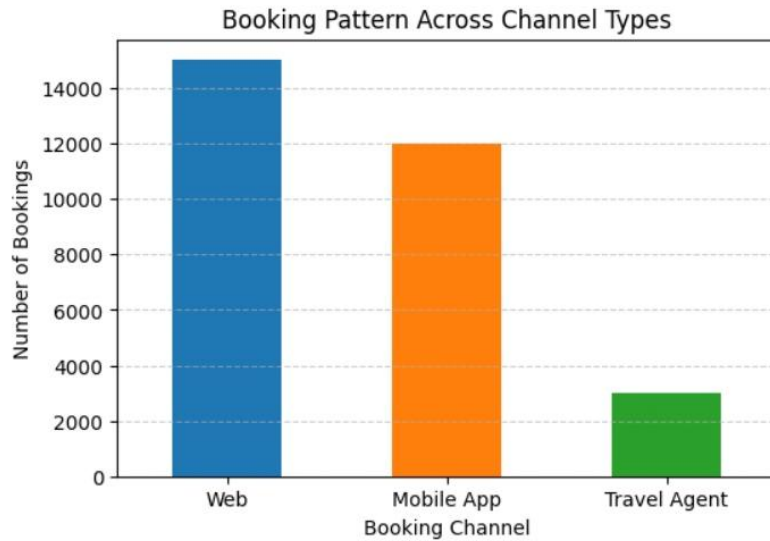
- **High Convenience = Low Commitment**
 - Booking via app is fast and easy; users may cancel if plans change.
- **Impulse Bookings / Promotions**
 - Mobile apps often send **push notifications or offers** that encourage immediate bookings, leading to potential cancellations later.
- **Refund-Friendly Payment Options**
 - Mobile app payments via digital wallets or PayPal make **processing refunds easier**, encouraging users to cancel if needed.

3. Travel Agent Bookings

Possible Reasons for Cancellations:

- **Lower Cancellation Rate but Still Occurs**
 - Business travelers might book through agents; cancellations usually occur **due to schedule changes or corporate policy**.
- **Payment Method Dependency**
 - Payments via Bank Transfer or Credit Card might be harder to cancel, but exceptions happen for business accounts.
- **Fewer Impulse Cancellations**
 - Unlike Web or App, bookings through Travel Agents involve **human interaction**, reducing impulsive cancellations

Why do some booking channels or property types perform better than others?



```
[27]: booking_channel  
Web      50.00  
Mobile App  40.03  
Travel Agent  9.97  
Name: count, dtype: float64
```

- High Booking Volume**

- Web portals are easily accessible to a **large audience**, including domestic and international travelers.

- This ensures **higher total bookings** compared to Mobile App or Travel Agents.

- Convenience and Self-Service**

- Customers can **search, compare, and book anytime** without depending on agents.

- Self-service reduces friction and improves the customer experience.

- Marketing and Promotions**

- Hotels often run **special discounts, coupons, and cashback offers** online.

- These incentives encourage **more customers to book through the Web.**

- Flexibility and Planning**

- Web bookings allow users to **modify or cancel bookings** if needed.

- This flexibility appeals especially to **leisure travelers**, increasing booking numbers.

Affordability & Accessibility

- Standard rooms are typically the most affordable option, making them accessible to a broader range of travelers, including budget-conscious leisure travelers and small business travelers.
- This wider customer base drives higher booking volumes

Higher Demand & Volume

- Due to affordability and accessibility, Standard rooms attract the most bookings, which naturally leads to a larger share in the dataset.
- This high volume helps hotels maintain steady occupancy and revenue.

Flexible Booking Behavior

- Travelers who book Standard rooms often have flexible plans and might book or cancel more frequently compared to guests booking premium rooms.
- This behavior increases the total number of bookings, making Standard rooms a consistent revenue driver.

1. Core Product Offering

1. Standard rooms are considered the core inventory for most hotels.
2. They serve a wide range of traveler needs without the exclusivity or premium pricing of Suites or Deluxe rooms.

Are there seasonal or temporal trends influencing booking values or stay lengths?

Seasonal Trends Affect Booking Values:

- Prices are higher during busy seasons like holidays when many people travel.
- Prices drop in quieter seasons to attract more guests.

Temporal Trends Influence Stay Lengths:

- People stay longer during holidays and breaks.

Weekend vs. Weekday Effects:

- Weekend stays tend to be longer than weekday stays.

Booking Lead Time Variation:

- In busy times, people book earlier.
- In slow times, many book closer to their travel date.
- Business travelers usually stay shorter during the week.

Suggest strategies to reduce cancellations.

Flexible Cancellation Policies with Fees

- Allow cancellations but charge a small fee to discourage casual cancellations.
- Offer options like non-refundable rates at a discount to encourage commitment

Improved Communication

- Send timely reminders and confirmations via email or SMS.
- Provide easy ways to modify bookings instead of canceling.

Incentives for Keeping Bookings

- Offer discounts, upgrades, or loyalty points for guests who do not cancel.
- Provide special perks for early or confirmed bookings.

Better Payment Methods

- Use payment options that encourage commitment, like partial prepayments or deposits.
- Limit payment methods that have easy refund options which encourage cancellations.

Targeted Promotions and Policies

- Tailor cancellation policies based on customer type (e.g., stricter for business travelers).
- Use promotions that require commitment, such as advance purchase deals.

Offer Loyalty Programs

- Reward repeat customers with points, discounts, or special perks.
- Encourage guests to book again with exclusive benefits.

Upsell and Cross-Sell

- Offer room upgrades, add-ons like breakfast or spa services during booking.
- This increases revenue per guest without extra acquisition cost.

Targeted Promotions

- Use past booking data to send personalized offers.
- Encourage off-peak bookings to increase occupancy and revenue.

Flexible Pricing Strategies

- Adjust prices based on demand, season, and customer type.
- Optimize room rates to maximize revenue without losing bookings.

Identify opportunities to optimize pricing, promotions, or channel strategy.

By using dynamic pricing, targeted promotions, focusing on high-performing channels, offering value-added packages, and analyzing booking trends, hotels can optimize revenue and profitability, reduce cancellations, attract the right customer segments, and ensure better occupancy throughout the year.