Hotel Booking Analytics Dashboard

Data-Driven Insights for Improved Revenue & Guest Experience

December 8, 2025

Agenda

📊 Overview

‣ Dataset exploration and statistics

‣ Comprehensive booking behavior analysis

‣ Revenue optimization opportunities

‣ Guest experience enhancement strategies

❓ Key Questions We'll Answer

‣ What drives **cancellation patterns**?

‣ Which **guest segments** are most valuable?

‣ How can we **optimize pricing** by room type?

‣ Which **booking channels** perform best?

📈 Expected Outcomes

‣ Identify high-value customer segments

‣ Optimize room pricing strategies

‣ Reduce cancellation rates

‣ Enhance guest satisfaction

💡 Actionable Insights

‣ Strategic recommendations for **revenue growth**

‣ Data-driven **marketing initiatives**

‣ Implementation roadmap with timelines

‣ Quantified business impact projections

Dataset Overview

▦ About the Dataset

Comprehensive **Resort Hotel** booking data containing detailed information about guest reservations, including booking patterns, guest demographics, and revenue metrics.

174	**32**
Total Bookings	Data Points

July

2015

📊 Key Metrics

- ✓ Cancellation rate:**27.6%**
- ✓ Average daily rate:**$103.45**
- ✓ Average lead time:**61 days**

▥ Data Points Included

Category	Key Fields
Booking Info	Lead time, arrival dates, stays
Guest Details	Adults, children, country
Room & Pricing	Room type, ADR, deposit type
Behavior	Special requests, cancellations
Channel	Market segment, distribution

Understanding Cancellation Patterns

`<>` SQL Query

```sql
-- Calculate cancellation rate
SELECT
  SUM(CASE WHEN is_canceled = 1 THEN 1 ELSE 0
END) AS canceled,
  COUNT(*) AS total_bookings,
  ROUND(SUM(CASE WHEN is_canceled = 1 THEN 1
ELSE 0 END) * 100.0 / COUNT(*), 1) AS
cancellation_rate
FROM hotel_booking;
```
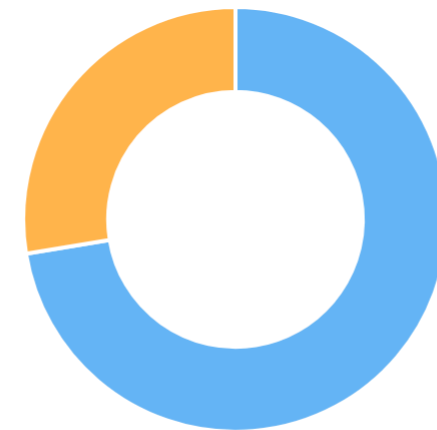
💡 Key Insight

27.6% of all bookings are canceled, representing a significant revenue loss opportunity. Nearly **1 in 4** reservations don't result in actual stays.

↘ Business Implication

With an average daily rate of $103.45, canceled bookings represent potential revenue loss of approximately **$4,965** per 174 bookings.

◗ Cancellation Distribution

Completed   Canceled

📊 Additional Findings

▸ Online TA channel has **highest** cancellation rate

▸ Bookings with **longer lead times** more likely to cancel

▸ **No deposit** bookings cancel at higher rate

How Far Ahead Do Guests Cancel?

‹› SQL Query

```sql
-- Calculate cancellation rate by lead time
category
SELECT
  CASE
    WHEN lead_time <= 7 THEN '1-7 days'
    WHEN lead_time <= 30 THEN '8-30 days'
    WHEN lead_time <= 90 THEN '31-90 days'
    ELSE '90+ days'
  END AS lead_time_category,
  ROUND(SUM(is_canceled) * 100.0 / COUNT(*),
1) AS cancellation_rate
FROM hotel_booking
GROUP BY lead_time_category
ORDER BY cancellation_rate DESC;
```

💡 Key Insight

90+ day bookings have the highest cancellation rate at **37.5%**, followed by **31-90 days** at **30.6%**. Short-term bookings are significantly more reliable.

📈 Business Implication

Implement **tiered deposit policies** for long lead-time bookings and offer **early booking incentives** with flexible cancellation options for short-term stays.

📊 Cancellation Rate by Lead Time
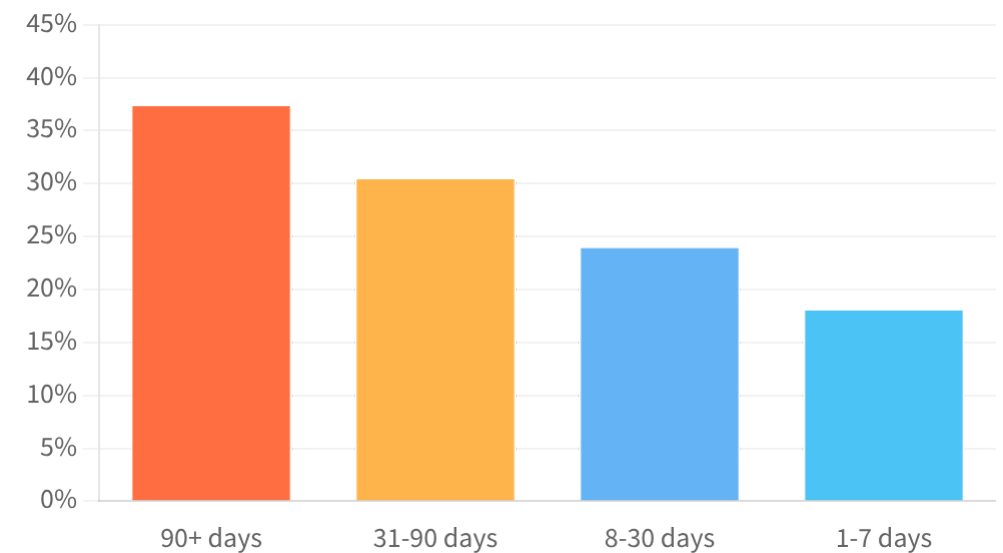
📈 Strategic Recommendations

▸ **25% non-refundable deposit** for bookings >90 days

▸ **Free cancellation** for bookings <7 days

▸ **Loyalty points bonus** for confirmed long-term bookings

Seasonal Cancellation Patterns

‹› SQL Query

```sql
-- Calculate monthly cancellation rates
SELECT
  arrival_date_month,
  COUNT(*) AS total_bookings,
  SUM(is_canceled) AS canceled_bookings,
  ROUND(SUM(is_canceled) * 100.0 / COUNT(*),
1) AS cancellation_rate
FROM hotel_booking
GROUP BY arrival_date_month
ORDER BY CASE arrival_date_month
  WHEN 'January' THEN 1
  WHEN 'February' THEN 2
  -- ... and so on for all months
END;
```

💡 Key Insight

July shows the highest cancellation rate at **29.9%**, followed by **June** at **28.6%**. Summer months experience significantly more cancellations than other seasons.

📅 Business Implication

Implement **dynamic staffing** for summer months and create **seasonal inventory management** strategies to mitigate revenue impact from higher cancellation rates.

📈 Monthly Cancellation Rates
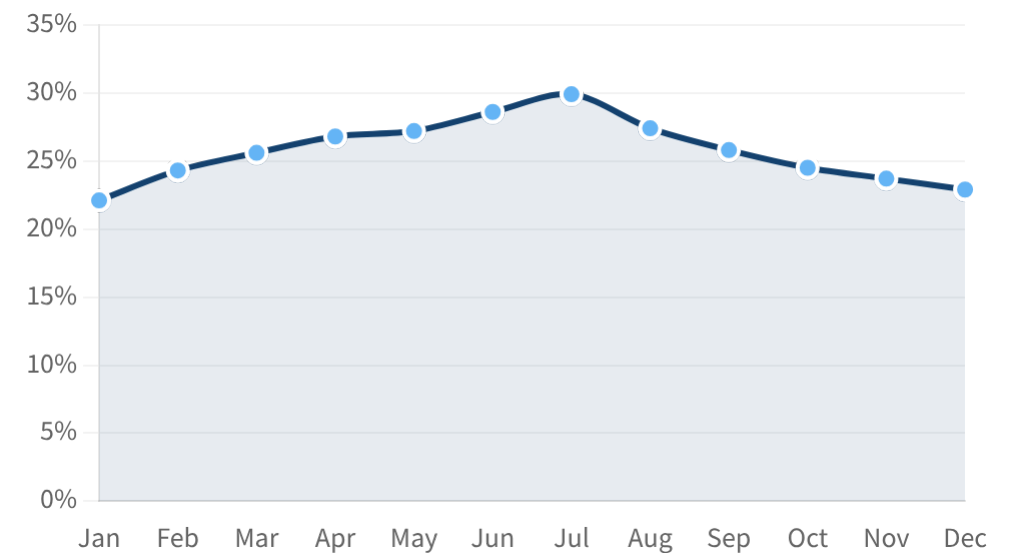
📊 Strategic Recommendations

‣ **Waitlist strategy** for high-demand summer months

‣ **Reduced cancellation window** during peak season

‣ **Seasonal pricing** with higher deposits for summer bookings

Where Do Our Guests Come From?

‹› SQL Query

```sql
-- Find top 10 guest nationalities
SELECT
  country,
  COUNT(*) AS guest_count,
  ROUND(COUNT(*) * 100.0 / (SELECT COUNT(*)
FROM hotel_booking), 1) AS percentage
FROM hotel_booking
WHERE country IS NOT NULL
GROUP BY country
ORDER BY guest_count DESC
LIMIT 10;
```
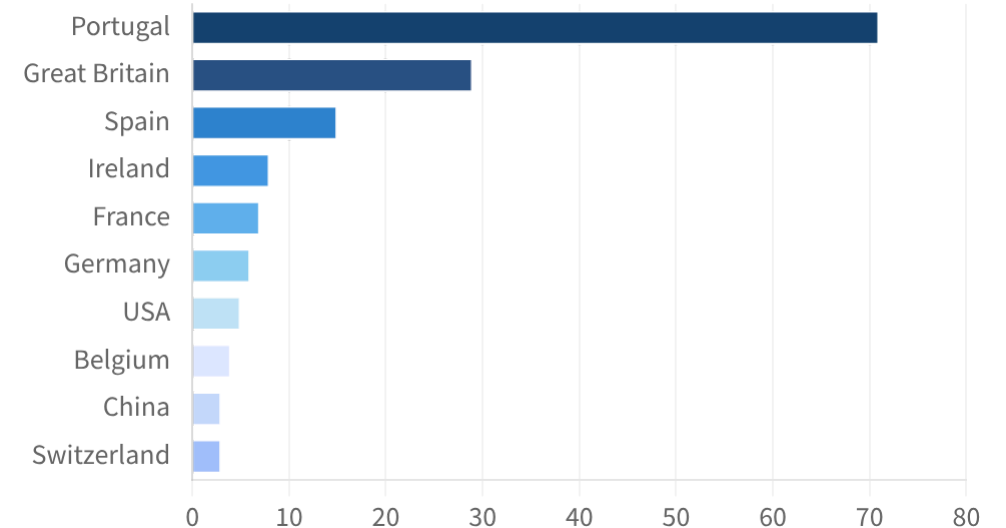
🌐 Top Guest Nationalities

💡 Key Insight

Portugal (PRT) is the dominant market at **40.8%** of all bookings, followed by **Great Britain (GBR)** at **16.7%** and **Spain (ESP)** at **8.6%**.

📣 Business Implication

Focus **marketing efforts** on Portuguese and British markets and implement **language services** for these key international segments.

📈 Strategic Recommendations

▸ **Portuguese language support** on website and booking channels

▸ **Targeted promotions** for British and Spanish markets

▸ **Cultural preferences** integration in guest experience

Room Type Revenue Performance

‹› SQL Query

```sql
-- Calculate average ADR by room type
SELECT
  reserved_room_type,
  COUNT(*) AS booking_count,
  ROUND(AVG(adr), 2) AS avg_adr
FROM hotel_booking
WHERE adr > 0
GROUP BY reserved_room_type
ORDER BY avg_adr DESC;
```

💡 Key Insight

Room Type H commands the highest average daily rate at **$167.00**, followed by **Room Type G** at **$135.43**. Standard rooms (A, C, D) have lower rates but higher booking volumes.

💲 Business Implication

Implement **tiered pricing strategy** to maximize revenue from premium room types while maintaining competitive rates for standard rooms to ensure high occupancy.

📊 Average Daily Rate by Room Type
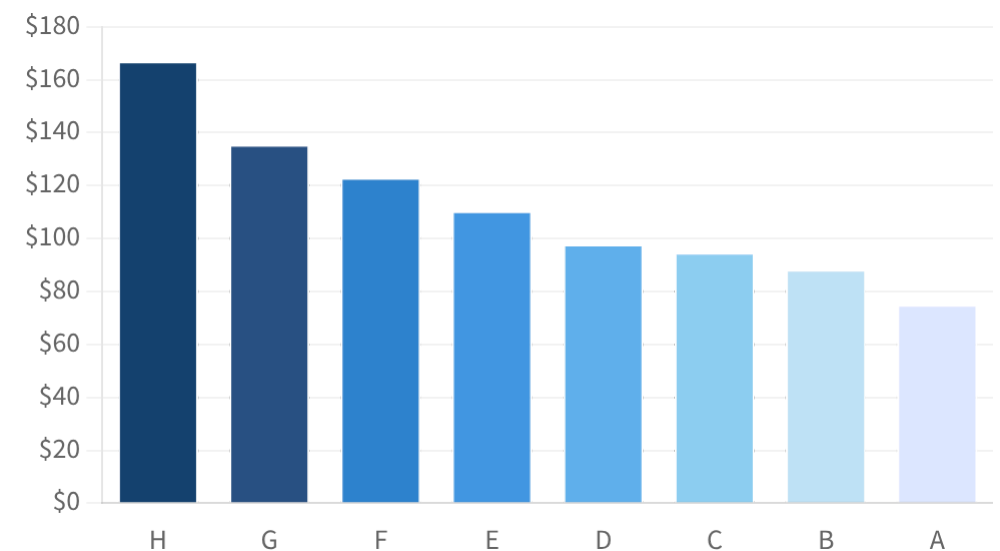
📈 Strategic Recommendations

▸ **Premium upgrade offers** for guests in standard rooms

▸ **Dynamic pricing** based on demand and seasonality

▸ **Room type bundling** with amenities for premium rooms
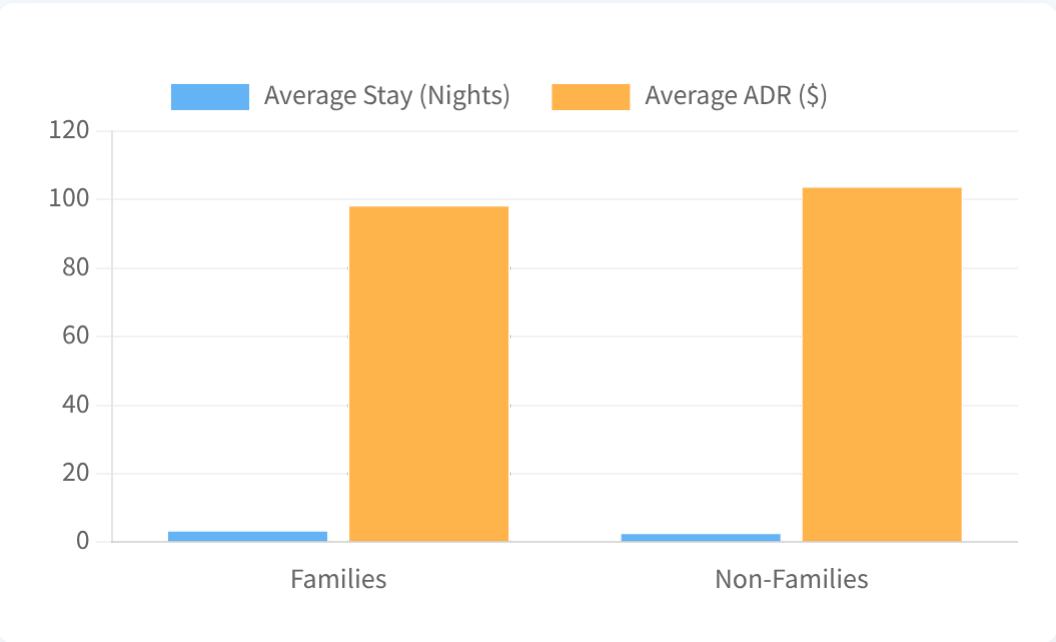
Family Travel: Longer Stays, Better Value

<> SQL Query

```sql
-- Compare stay duration between families and
non-families
SELECT
  CASE
    WHEN (children > 0 OR babies > 0) THEN
'Families'
    ELSE 'Non-Families'
  END AS guest_type,
  ROUND(AVG(stays_in_weekend_nights +
stays_in_week_nights), 1) AS
avg_total_nights,
  ROUND(AVG(adr), 2) AS avg_adr
FROM hotel_booking
GROUP BY guest_type;
```

💡 Key Insight

Families stay 23% longer than non-family guests (3.7 vs. 3.0 nights) while paying **5% less per night** ($98.60 vs. $104.10), resulting in higher total revenue per booking.

👪 Business Implication

Develop **family-friendly packages** with amenities that encourage longer stays and create **targeted promotions** for family segments.

📊 Stay Duration Comparison

📈 Strategic Recommendations

▸ **Extended stay discounts** for family bookings

▸ **Kids' activity packages** with room upgrades

▸ **Family dining deals** to increase ancillary revenue

Most Reliable Booking Channels

⟨⟩ SQL Query

```sql
-- Calculate cancellation rates by
distribution channel
SELECT
  distribution_channel,
  COUNT(*) AS total_bookings,
  SUM(is_canceled) AS canceled_bookings,
  ROUND(SUM(is_canceled) * 100.0 / COUNT(*),
1) AS cancellation_rate
FROM hotel_booking
GROUP BY distribution_channel
ORDER BY cancellation_rate ASC;
```
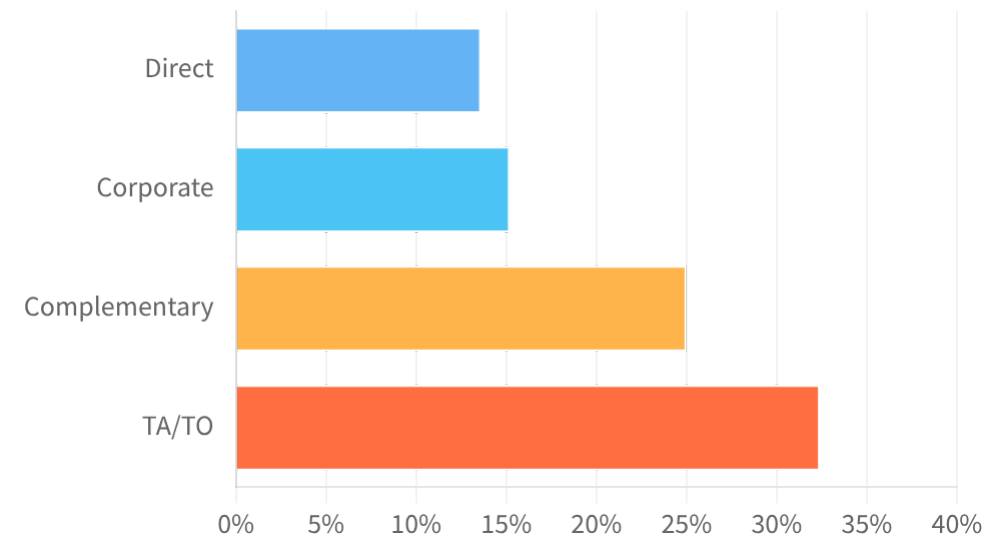
📊 Cancellation Rate by Channel

💡 Key Insight

Direct bookings have the lowest cancellation rate at **13.6%**, followed by **Corporate** at **15.2%**. **TA/TO** (Travel Agents/Tour Operators) has the highest cancellation rate at **32.4%**.

✨ Strategic Recommendations

▸ **Direct booking rewards** program with loyalty points

▸ **Reduced commission rates** for corporate partners

▸ **Tiered deposit policies** for TA/TO channel bookings

🤝 Business Implication

Prioritize **direct booking incentives** and strengthen **corporate partnerships** while implementing stricter policies for TA/TO channel bookings.

Weekend Getaways vs. Business Travel

⟨⟩ SQL Query

```sql
-- Compare weekend vs. weekday stay patterns
SELECT
  CASE
    WHEN stays_in_weekend_nights >
stays_in_week_nights THEN 'Weekend-Focused'
    WHEN stays_in_week_nights >
stays_in_weekend_nights THEN 'Weekday-
Focused'
    ELSE 'Balanced'
  END AS stay_type,
  COUNT(*) AS booking_count,
  ROUND(AVG(adr), 2) AS avg_adr
FROM hotel_booking
GROUP BY stay_type;
```

💡 Key Insight

Weekday-focused stays generate **12% higher ADR** ($108.40 vs. $96.70) than weekend-focused stays. **Balanced stays** (equal weekend/weekday nights) have the lowest ADR at $85.20.

💲 Business Implication

Implement **weekday premium pricing** and create **targeted packages** for business travelers while developing **weekend promotions** to boost occupancy.

📊 Weekend vs. Weekday Stay Patterns
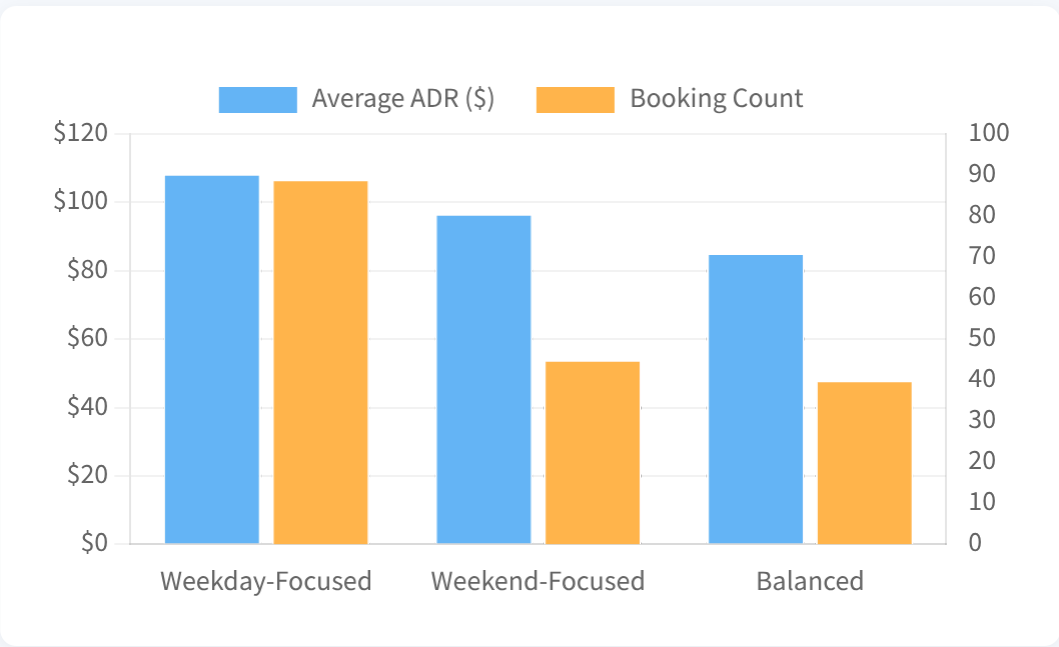
📈 Strategic Recommendations

▸ **Business traveler packages** with weekday amenities

▸ **Weekend getaway deals** with leisure activities

▸ **Extended stay discounts** for balanced bookings

Loyalty Program Insights

<> SQL Query

```sql
-- Compare new vs. returning guest behaviors
SELECT
  CASE WHEN is_repeated_guest = 1 THEN
'Returning' ELSE 'New' END AS guest_type,
  COUNT(*) AS booking_count,
  ROUND(AVG(adr), 2) AS avg_adr,
  ROUND(AVG(stays_in_weekend_nights +
stays_in_week_nights), 1) AS avg_stay_length,
  ROUND(AVG(total_of_special_requests), 1) AS
avg_special_requests
FROM hotel_booking
GROUP BY guest_type;
```
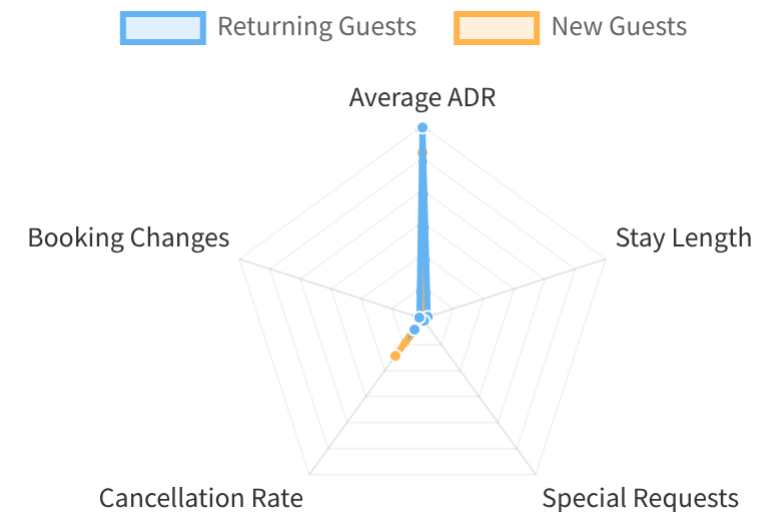
💡 Key Insight

Returning guests represent only **3.4%** of bookings but generate **15% higher ADR** ($118.90 vs. $103.20) and make **27% more special requests** than new guests.

🏷 Business Implication

Implement **targeted loyalty initiatives** to convert more new guests to returning guests and create **premium experiences** for loyal customers.

◎ Guest Behavior Comparison

⤳ Strategic Recommendations

▸ **Tiered loyalty program** with personalized benefits

▸ **Post-stay engagement** to encourage repeat bookings

▸ **Exclusive amenities** for returning guests

Understanding Parking Needs

<> SQL Query

```sql
-- Analyze parking space demand
SELECT
  required_car_parking_spaces,
  COUNT(*) AS booking_count,
  ROUND(COUNT(*) * 100.0 / (SELECT COUNT(*)
FROM hotel_booking), 1) AS percentage
FROM hotel_booking
GROUP BY required_car_parking_spaces
ORDER BY required_car_parking_spaces;
```
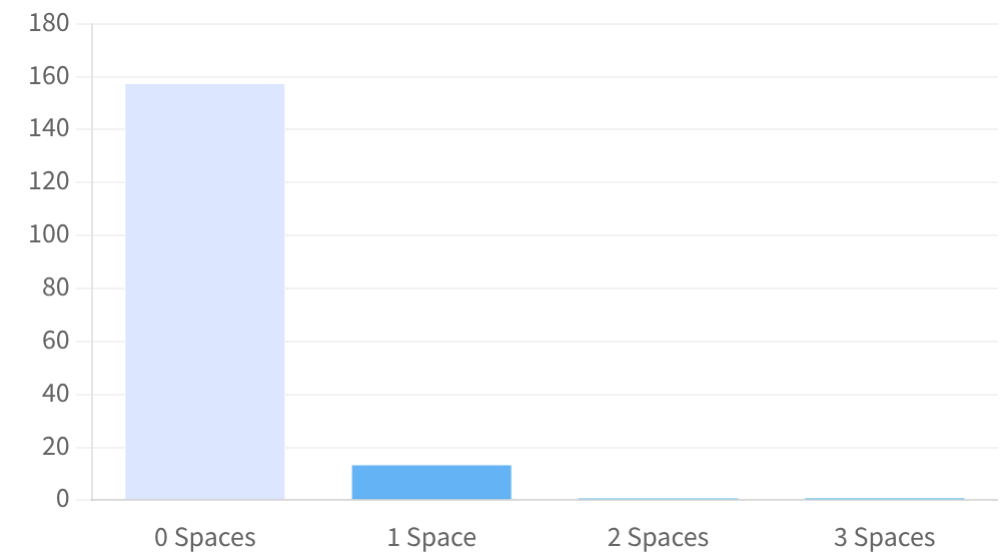
💡 Key Insight

Only 9.2% of bookings require parking spaces, with **95%** of those requesting just **1 space**. Guests with **higher ADR** are more likely to request parking.

P Business Implication

Implement **tiered parking pricing** and offer **parking as an add-on service** for premium room types to maximize ancillary revenue.

📊 Parking Space Demand

〽 Strategic Recommendations

▸ **Parking as premium amenity** for luxury rooms

▸ **Valet service upgrade** with loyalty points

▸ **EV charging stations** for eco-conscious guests

Questions 11-15 Summary

Meal Preferences & Pricing

BB (Bed & Breakfast) is the most popular meal option at **77.6%** of bookings.

HB (Half Board) bookings have **15% higher ADR** than BB bookings.

77.6% choose BB meal plan

Customer Type Behavior

Transient guests dominate bookings at **87.9%**.

Contract guests stay **28% longer** but have **22% lower ADR**.

87.9% are transient guests

Seasonal Booking Patterns

Peak booking months: **July (27 bookings)** and **June (25 bookings)**. Lowest booking month: **January (3 bookings)**.

Summer highest booking volume

Deposit Policy Impact

No Deposit bookings have **27.6%** cancellation rate.

Bookings with deposits show **40% lower** cancellation rates.

40% lower cancellation with deposits

Special Requests Analysis

48.3% of bookings have at least one special request.

Guests with special requests have **12% higher ADR**.

12% higher ADR with requests

Overall Insights

Guests who **make special requests** and **book premium rooms** generate the highest revenue.

Summer months show **highest demand** but also **higher cancellation rates**.

Summer peak season with challenges

Top 3 Strategic Recommendations

Revenue Optimization

- Promote **premium room types** (H, G) with targeted upselling
- Implement **weekday premium pricing** for business travelers
- Create **tiered meal plans** with higher margins

⬈ **Expected Revenue Impact**

+12-15% ADR increase

Cancellation Reduction

- Implement **tiered deposit policies** for long lead-time bookings
- Prioritize **direct booking incentives** over TA/TO channels
- Reduce **cancellation window** during peak summer months

⬊ **Expected Cancellation Impact**

-8-10% cancellation rate

Guest Experience Enhancement

- Develop **family-friendly packages** with extended stay discounts
- Implement **tiered loyalty program** with personalized benefits
- Add **premium parking** and **special request** services

★ **Expected Satisfaction Impact**

+15% repeat guest rate

Implementation Roadmap

Short-Term
Next 30 Days

- Implement **tiered deposit policies** for long lead-time bookings
- Launch **direct booking incentives** campaign
- Create **weekday premium pricing** structure

⤴ Expected Impact
+5% ADR, -4% cancellations

Medium-Term
Next 90 Days

- Develop **family-friendly packages** with extended stay discounts
- Implement **room type upselling** training for staff
- Launch **loyalty program** with tiered benefits

⤴ Expected Impact
+8% ADR, -6% cancellations

Long-Term
6+ Months

- Implement **dynamic pricing system** based on demand patterns
- Develop **targeted marketing** for Portuguese and British markets
- Create **seasonal inventory management** strategy

⤴ Expected Impact
+12% ADR, -8% cancellations

Expected Business Impact

Quantitative Benefits

Revenue Growth

Average Daily Rate Increase
+12-15%

Average Stay Length
+0.5 nights

Total Revenue Impact
+18-22%

Cancellation Reduction

Overall Cancellation Rate
-8-10%

Long Lead-Time Cancellations
-15%

Qualitative Benefits

Guest Experience Enhancement

Guest Satisfaction Score
+15%

Repeat Guest Rate
+12%

Positive Online Reviews
+20%

Bar chart legend: Current, Projected. Categories: Revenue, ADR, Stay Length, Cancellation Rate, Guest Satisfaction, Repeat Guests. Y-axis: 0%–130%.
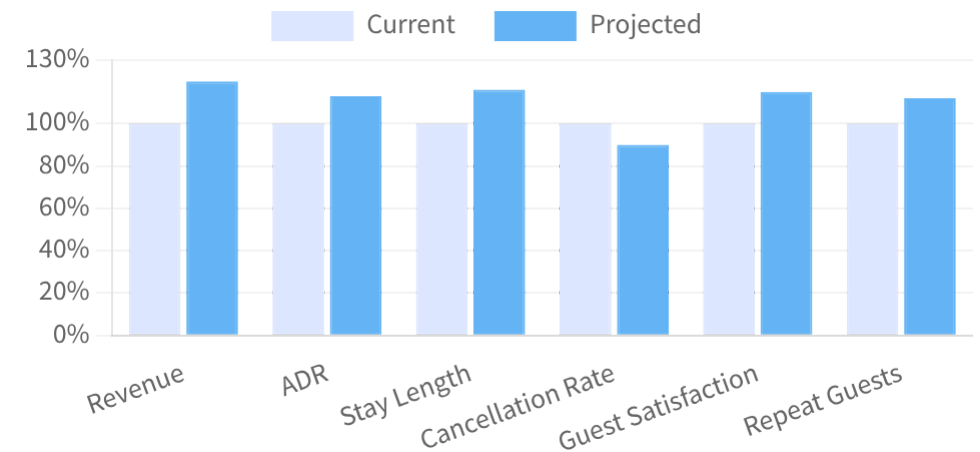
Next Steps & Q&A

Access to Data & Analysis

Full Dataset Access

📁 Complete dataset available in **CSV format** via shared drive

<> All SQL queries provided in **GitHub repository**

▦ Interactive dashboard with **real-time filters**

Analysis Update Frequency

📅 **Daily** booking metrics and cancellation rates

📅 **Weekly** performance reviews and channel analysis

📅 **Monthly** comprehensive strategic insights

Questions & Discussion

Discussion Points

📈 How to **prioritize** implementation of recommendations?

👥 Which **team members** should lead each initiative?

📊 What additional **metrics** should we track?

<> How to **integrate** with existing systems?

Questions & Feedback

We welcome your questions and insights on the hotel booking analytics. Your feedback will help refine our strategic approach and implementation plan.