Hotel Booking data Analysis

Hotel Booking Data Analysis Report (2018–2020)
Comprehensive Data Analyst Portfolio Project
Executive Summary

This project delivers a complete end-to-end analytical solution using hotel booking data from **2018 to 2020**, answering core business questions related to **revenue performance**, **parking infrastructure planning**, and **market trends**.

Data transformation and querying were performed in **Microsoft SQL Server Management Studio (SSMS)**, and insights were visualized in **Power BI** using an interactive dashboard.

Key findings include:

Strong revenue growth between **2018 and 2019**

Parking utilization consistently **2%–3%**, indicating no expansion needed

ADR shows a steady **upward trend**, supporting profitable pricing

Clear **seasonality patterns**, beneficial for forecasting

This report provides strategic recommendations in pricing, operations, and forecasting.

Requirements

Build a visual data story or dashboard using Power BI to present to your stakeholders.

"Is our hotel revenue growing by year?"

We have two hotel types so it would be good to segment revenue by hotel type.

"Should we increase our parking lot size?

We want to understand if there is a trend is guest with personal cars.

"What trends can we see in the data?"

Focus on average daily rate and guests to explore seasonality.

Data Analysis Project Pipeline

1 Build a Database

2 Develop the SQL Query

3 Connect Power BI to the Database

4 Visualize

5 Summarize Findings

I. Project Scope, Objectives & Technical Execution

A. Project Objectives

Financial Performance

Measure and segment revenue by hotel type (City Hotel vs. Resort Hotel).

Infrastructure Planning

Assess the need to expand parking capacity.

Operational & Market Dynamics

Understand ADR trends and seasonality for strategic decisions.

B. Technical Pipeline & Achievements

1. SQL Database Engineering

Built project database in SSMS.

Imported raw datasets (2018–2020 bookings, meal_cost, market_segment).

Standardized data types across tables.

2. Consolidation & Structuring

Combined three years using **UNION ALL** (≈100k rows).

Created CTE (**hotels**) for unified analytical structure.

Joined:

- **market_segment** → discount percentage
- **meals_cost** → meal attributes

3. Accurate Revenue Metric

Correct Formula:

Total Room Nights = Stays in Week Nights + Stays in Weekends

Total Revenue = Σ (Total Room Nights × ADR × (1 − Discount%))

Calculated in Power BI for accuracy.

4. Power BI Dashboard

Slicers for date, hotel type, and segment

Revenue segmentation visuals

Parking trend line charts

ADR trend lines

Seasonality graphs

II. Analytical Findings & Business Insights

A. Revenue Performance

Yearly Revenue Summary

2018

→ ~$4M baseline revenue

2019

→ ~$20M, nearly 5x growth

2020

→ ~$14M (incomplete dataset; exclude from YoY comparisons)

Insights

Strong growth from 2018–2019 shows high pre-pandemic momentum.

City Hotel contributes the majority of total revenue.

Resort Hotel also grows but to a smaller scale.

2020 data cannot be considered for forecasting.

Interpretation

→ City Hotel is the primary revenue engine

→ Use 2018–2019 as the benchmark for performance forecasting

B. Parking Infrastructure Assessment

Utilization Rate = 2%–3% consistently

Findings

No increasing trend across three years

City Hotel guests rely more on taxis

Resort guests use slightly more car space but still too low

No seasonal spikes or demand surges

Conclusion

→ Parking expansion is NOT required.

→ Demand does not justify investment.

C. ADR & Market Trends

1. ADR Trend

Consistently increasing YoY

Indicates successful pricing and strong demand

2. Seasonality

Resort: peaks in summer

City Hotel: peaks in Q3 business season

Dips during monsoon & early Q1

3. Segment Profitability

High-discount OTA segments reduce ADR

Direct bookings & corporate segments deliver higher margins

III. Strategic Recommendations

A. Revenue Optimization

Increase ADR during peak seasons

Promote themed packages during low-demand months

Prioritize high-margin segments

- Direct bookings
- Corporate clients

Reduce dependency on OTA discounts

B. Operational Strategy

Invest more in City Hotel

- Strongest and most stable revenue base

Enhance Resort Hotel experiential offerings

- Family packages
- Seasonal getaway bundles

C. Do not expand parking

Convert unused parking areas into:

- EV charging stations
- Outdoor café
- Event hosting zone
- Valet drop space

D. Forecasting & Analytical Roadmap

Use 2018–2019 as the clean forecasting base

Build a monthly demand forecasting model

Perform ADR sensitivity testing

Run segment profitability analysis to identify weak-performing discount groups

DashBoard of the Hotel data Analysis :

Hotel data insights :

$104.47
Average of adr

367.78K
Total Nights

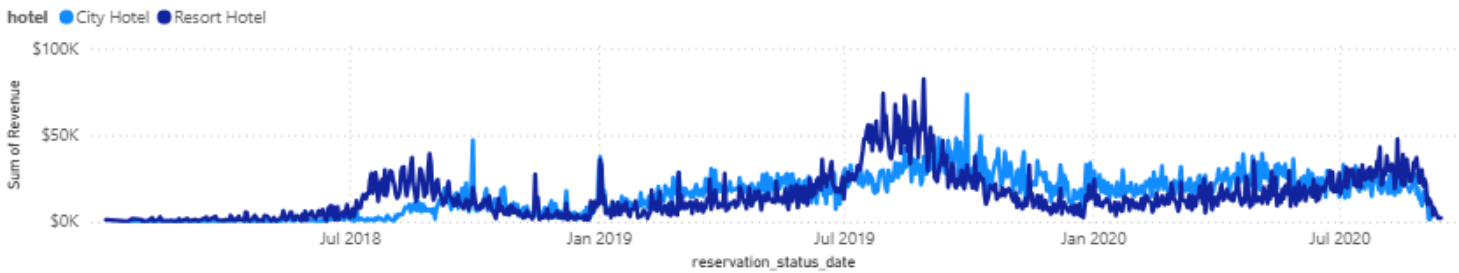
25.81%
Average of Discount

8.69K
Car spaces

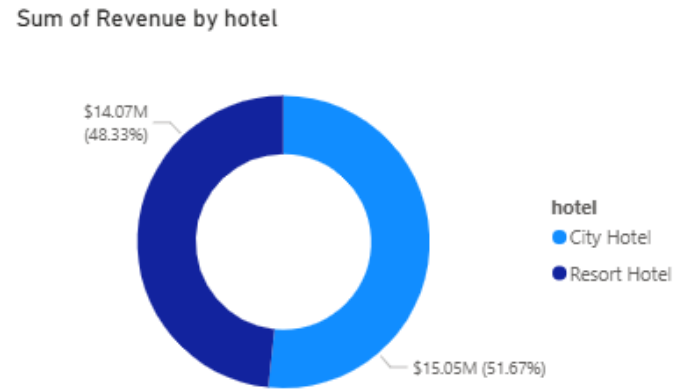
$29.12M
Sum of Revenue

country
All

hotel
All



Year	Sum of Revenue	Parking Percentage	Sum of required_car_parking_spaces
2019	**$1,54,97,129.45449973**	**2.50%**	**5,161.00**
Resort Hotel	$72,52,625.588000067	3.80%	3,777.00
City Hotel	$82,44,503.866499834	1.29%	1,384.00
2020	**$98,96,131.054499906**	**2.05%**	**2,248.00**
2018	**$37,25,019.548500041**	**2.49%**	**1,283.00**
Resort Hotel	$23,86,342.793499998	3.43%	1,098.00
City Hotel	$13,38,676.754999992	0.95%	185.00
Total	**$2,91,18,280.05749968**	**2.36%**	**8,692.00**



Conclusion :

This project gave me the opportunity to build a complete end-to-end analytics workflow — starting from raw Excel files and progressing through SQL-based data engineering, automated metric calculation, and interactive dashboard development in Power BI. Through this process, I was able to extract meaningful insights that directly support hotel business decision-making.

From my analysis, I found clear revenue patterns between hotel types, a reliable assessment of parking space utilization, and strong signals around ADR trends and seasonality. These insights helped me understand how operational data translates into strategic decisions such as pricing, infrastructure investment, and segment targeting.

Beyond the business findings, this project also strengthened several of my core data skills. I learned how to design a structured SQL pipeline, build reproducible CTE-based transformations, apply realistic revenue calculations using discount logic, and translate raw metrics into an executive-level dashboard. It also improved my ability to interpret trends, validate assumptions, and present insights in a format that supports real-world decision-making.

Overall, this work demonstrates my ability to handle the full spectrum of a data analytics project — from cleaning and modeling to visualization and strategic recommendations — while ensuring that every insight is grounded in data, clarity, and business value.

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Thank You