Hospitality Analysis

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Rishi P

rishipthottathil@gmail.com

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Overview

The hospitality industry is constantly changing, driven by shifting consumer preferences, seasonal travel trends, and competitive pricing strategies. This analysis uses data-driven insights to help optimize operations and increase profitability across different hotel categories. The study covers three months of data (May, June, and July), a time when travel and tourism are typically at their peak due to holidays and vacations.

The main goal of this analysis is to explore and understand key performance indicators (KPIs) such as occupancy rates, revenue per available room (RevPAR), average daily rate (ADR), and cancellation rates. By looking at booking trends, guest preferences, and revenue patterns across various hotel categories, cities, and room types, the report identifies insights that can help improve operations and foster growth.

Key areas of focus in the study include:

1. **Booking Behavior**: Understanding how guest preferences change between weekdays and weekends, as well as identifying which room types and categories are in high demand.
2. **Revenue Trends**: Analyzing the revenue generated by different hotel types, cities, and room categories to find areas with potential for growth and areas that need improvement.
3. **Operational Efficiency**: Assessing occupancy levels and how well hotel capacity is being used to spot inefficiencies and areas that could be improved.
4. **Impact of Cancellations**: Examining how cancellations affect revenue and exploring ways to reduce losses through better booking policies.
5. **Platform Performance**: Looking at how different booking platforms contribute to ADR and overall revenue.

Objective

The primary objective of this hospitality analysis project is to gain a comprehensive understanding of business dynamics and identify actionable strategies to optimize revenue, enhance operational efficiency, and improve guest satisfaction.

The analysis focuses on:

1. Identifying key revenue drivers across room types, hotel classes, and cities to pinpoint high-performing segments and areas of underperformance.
2. Understanding guest booking behavior, including weekday vs. weekend preferences and high-demand room categories, to align offerings with market needs.
3. Assessing occupancy rates and capacity utilization to identify operational inefficiencies and improve resource allocation.
4. Evaluating the impact of cancellations on revenue and formulating strategies to minimize losses through effective booking and pricing policies.
5. Analyzing the performance of booking platforms to understand their contribution to revenue and ADR, enabling data-driven platform optimization.

By combining data exploration, advanced modeling, and insights-driven recommendations, the project aims to provide stakeholders with a holistic framework to address specific business challenges, seize growth opportunities, and implement targeted strategies that enhance profitability and customer experience.

Table description

1. dim_date
2. dim_hotels
3. dim_rooms
4. fact_aggregated_bookings
5. fact_bookings

Column Description for dim_date:
1. date: This column represents the dates present in May, June and July.
2. mmm yy: This column represents the date in the format of mmm yy (monthname year).
3. week no: This column represents the unique week number for that particular date.
4. day_type: This column represents whether the given day is Weekend or Weekeday.

Column Description for dim_hotels:
1. property_id: This column represents the Unique ID for each of the hotels.
2. property_name: This column represents the name of each hotel.
3. category: This column determines which class [Luxury, Business] a particular hotel/property belongs to.
4. city: This column represents where the particular hotel/property resides in.

Column Description for dim_rooms:
1. room_id: This column represents the type of room [RT1, RT2, RT3, RT4] in a hotel.
2. room_class: This column represents to which class [Standard, Elite, Premium, Presidential] particular room type belongs.

Column Description for fact_aggregated_bookings:
1. property_id: This column represents the Unique ID for each of the hotels.
2. check_in_date: This column represents all the check_in_dates of the customers.
3. room_category: This column represents the type of room [RT1, RT2, RT3, RT4] in a hotel.
4. successful_bookings: This column represents all the successful room bookings that happen for a particular room type in that hotel on that particular date.
5. capacity: This column represents the maximum count of rooms available for a particular room type in that hotel on that particular date.

Column Description for fact_bookings:
1. booking_id: This column represents the Unique Booking ID for each customer when they booked their rooms.
2. property_id: This column represents the Unique ID for each of the hotels
3. booking_date: This column represents the date on which the customer booked their rooms.
4. check_in_date: This column represents the date on which the customer check-in(entered) at the hotel.
5. check_out_date: This column represents the date on which the customer check-out(left) of the hotel.
6. no_guests: This column represents the number of guests who stayed in a particular room in that hotel.
7. room_category: This column represents the type of room [RT1, RT2, RT3, RT4] in a hotel.
8. booking_platform: This column represents in which way the customer booked his room.
9. ratings_given: This column represents the ratings given by the customer for hotel services.
10. booking_status: This column represents whether the customer cancelled his booking [Cancelled], successfully stayed in the hotel [Checked Out] or booked his room but not stayed in the hotel [No show].
11. revenue_generated: This column represents the amount of money generated by the hotel from a particular customer.
12. revenue_realized: This column represents the final amount of money that goes to the hotel based on booking status.

Steps Involved

1. Data Exploration and Cleaning

The data exploration and cleaning process involved the following steps:

1. Imported five table files into Power Query for preprocessing.
2. Clearly defined and set appropriate data types for all columns to ensure data consistency.
3. Updated the dim_Date table by removing the original day_type column, as it categorized weekends incorrectly (Saturday and Sunday). In the hospitality industry, weekends are typically Friday and Saturday.
4. Loaded the cleaned data into the Power BI interface for analysis.
5. Created a new column, day_type, using DAX to accurately classify weekdays and weekends based on the corrected industry standard:

DAX

```
Day_type = IF(WEEKDAY(dim_Date[date]) > 5, "Weekend", "Weekday")
```

6. Generated a new column, W.No., to represent the week number without additional characters. This replaced the original column, which included unwanted text. The formula used in DAX was:

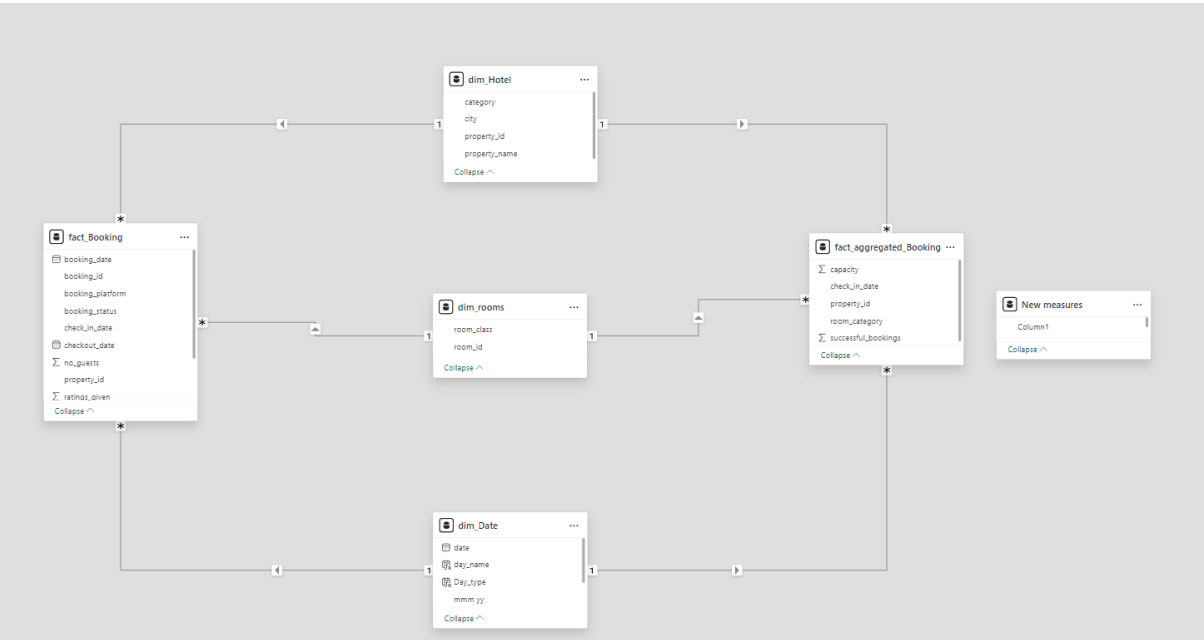
DAX

```
W.No = WEEKNUM(dim_Date[date])
```

These steps ensured the data was clean, accurate, and well-structured for further analysis.

2. **Data Modeling**

Created a star **structure** for understanding:



- fact_bookings. property_id → dim_hotels.property_id).
- fact_bookings. Booking_date→ dim_date.date.
- fact_bookings. Room_category→ dim_room.Room_id.
- fact_aggregated_bookings. property_id → dim_hotels.property_id).
- fact_aggregated_bookings. Check_in_date → dim_date.date).
- fact_aggregated_bookings. Room_category → dim_room.Room_id).

3. New Measures and KPI's

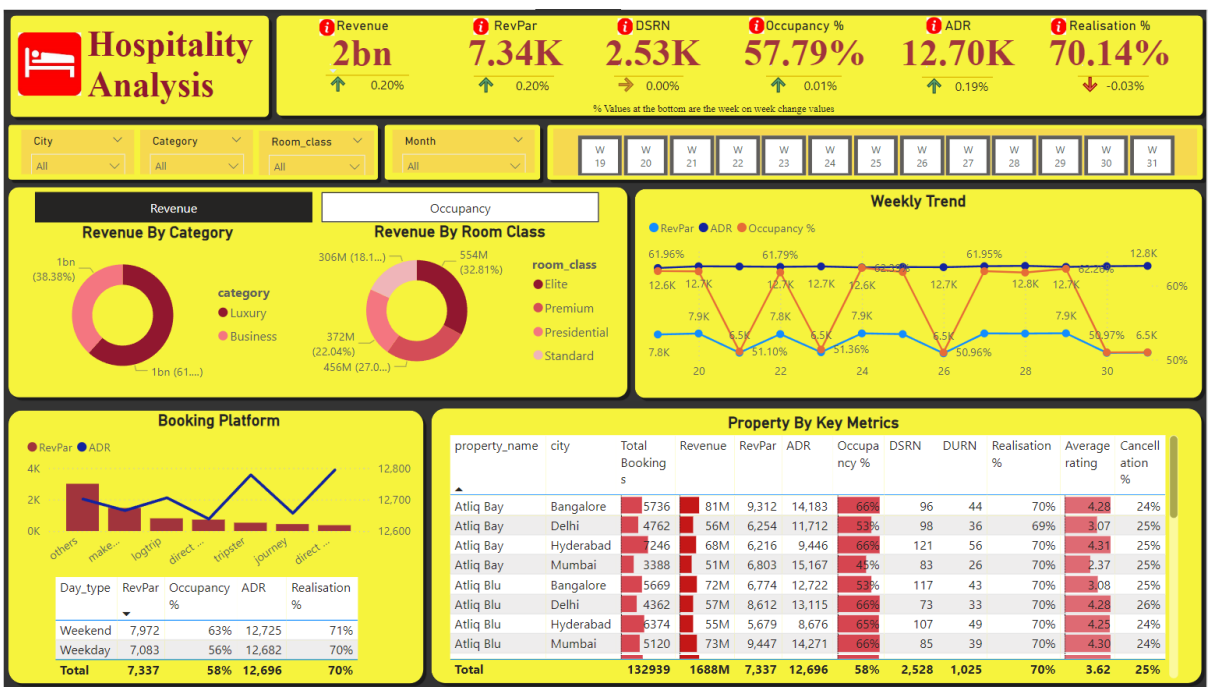
Measures	Description / Purpose
Revenue	To get the total revenue_realized
Total Bookings	To get the total number of bookings happened
Total Capacity	To get the total capacity of rooms present in hotels
Occupancy %	Occupancy means total successful bookings happened to the total rooms available(capacity)
Average Rating	Get the average ratings given by the customers
Total cancelled bookings	To get the"Cancelled" bookings out of all Total bookings happened
Cancellation %	calculating the cancellation percentage.
Total Checked Out	To get the successful 'Checked out' bookings out of all Total bookings happened
Total no show bookings	To get the "No Show" bookings out of all Total bookings happened ("No show" means those customers who neither cancelled nor attend to their booked rooms)
No Show rate %	calculating the no show percentage.
ADR	Calculate the ADR(Average Daily rate) It is the ratio of revenue to the total rooms booked/sold. It is the measure of the average paid for rooms sold in a given time period
Realisation %	calculate the realisation percentage. It is nothing but the successful "checked out" percentage over all bookings happened.
RevPAR	Calculate the RevPAR(Revenue Per Available Room) RevPAR represents the revenue generated per available room, whether or not they are occupied.
DBRN	calculate DBRN(Daily Booked Room Nights) This metrics tells on average how many rooms are booked for a day considering a time period
DSRN	calculate DSRN(Daily Sellable Room Nights) This metrics tells on average how many rooms are ready to sell for a day considering a time period
DURN	calculate DURN(Daily Utilized Room Nights) This metric tells on average how many rooms are successfully utilized by customers for a day considering a time period

Revenue WoW change %	**To get the revenue change percentage week over week.**
Occupancy WoW change %	**To get the occupancy change percentage week over week.**
ADR WoW change %	**To get the ADR(Average Daily rate) change percentage week over week.**
RevPAR WoW change %	**To get the RevPAR(Revenue Per Available Room) change percentage week over week.**
Realisation WoW change %	**To get the Realisation change percentage week over week.**
DSRN WoW change %	**To get the DSRN(Daily Sellable Room Nights) change percentage week over week.**

Data Visualization & Dashboard

The dashboard consists of 8 visuals including:

- Line chart
- Column & Line Chart
- Bar chart
- Donut Chart
- Table
- Card Visuals



Additionally, Bookmarks, Tooltip chart, Images, and slicers were incorporated for improved interactivity and user experience.

Key Insights

Level 1 Insights

- **Weekly Trend Analysis**: By analyzing the weekly trend chart, I observed that the company did not execute any pricing strategy. The chart shows fluctuations in RevPAR and occupancy, but no change in ADR. This suggests that dynamic pricing was not implemented, even during key months (May, June, July), when travel and tourism peak, especially for family vacations.
- **Weekday vs. Weekend Chart**: Similar to the weekly trend chart, the weekday/weekend chart shows fluctuations in RevPAR and occupancy, but no variation in ADR. This further confirms that the company did not implement dynamic pricing, nor did it adopt a weekend-specific pricing strategy.
- **Property by Key Metrics**: By analyzing the property key metrics table, I discovered that properties with lower average ratings also experienced lower occupancy. As a result, the DURN (daily utilised room nights) was low, and the cancellation rate was higher for these properties.
- **Booking Platform Analysis**: The ADR on direct offline booking platforms is higher than that on the hotel's own website (direct online platform). Some hotels may use a differential pricing strategy, offering rooms at discounted prices with coupons on their websites, but this company has not utilized such a strategy, as evidenced by the low ADR on the direct online platform.

Level 2 Insights

- **Revenue by Hotel Type**: Luxury hotels generated more revenue (61%) compared to business hotels (39%). However, the occupancy percentage for both hotel types is almost identical. The total number of bookings for luxury hotels (82K) was significantly higher than for business hotels (50K), which is reflected in the revenue disparity.
- **Revenue by Room Class**: The company earned the most revenue from elite rooms (followed by premium and presidential rooms), with standard rooms bringing in the least. Interestingly, while the total bookings for elite rooms were higher, their ADR and RevPAR were lower (11K and 6K) compared to presidential (23K and 13K) and premium rooms (15K and 8K). This indicates that no pricing strategy was applied to elite rooms.
- **ADR by Location**: Hotels in Mumbai have a higher ADR and lowest for those in Hyderabad.
- **Revenue by Month**: The company earned the most revenue in May, where occupancy was slightly higher. The total number of bookings in May was also higher, but this declined in June and July.

Recommendations

1. **Implement Dynamic Pricing Strategy**: Based on the absence of fluctuations in ADR, I recommend the company adopts a dynamic pricing strategy, especially for peak seasons like May, June, and July. This would help optimize revenue by adjusting rates in real-time based on demand.
2. **Weekend Pricing Strategy**: Given that weekend occupancy fluctuates, introducing a weekend pricing strategy could help capture more revenue during these high-demand periods, particularly by adjusting rates accordingly.
3. **Improve Property Ratings**: The low occupancy and increased cancellations in properties with lower ratings suggest that improving customer satisfaction could directly boost occupancy. Investing in enhancing property quality or implementing guest satisfaction programs could help address this.
4. **Leverage Online Pricing Strategy**: The low ADR on the hotel's own website indicates that the company is not using differential pricing. I recommend implementing this strategy by offering special discounts, promotions, or coupons to encourage direct bookings and increase ADR.
5. **Tailor Strategies for Luxury vs. Business Hotels**: While luxury hotels generate more revenue, the occupancy percentage is similar across both hotel types. The company should consider tailoring pricing strategies or offering packages to maximize occupancy in business hotels, where revenue generation is lower.
6. **Focus on Elite Room Pricing**: The low ADR and RevPAR for elite rooms suggest that there is an opportunity to apply a more strategic pricing model for these rooms. Adjusting the pricing or offering value-added services could help increase the profitability of elite rooms.
7. **Explore Regional Pricing**: The difference in ADR between Mumbai and Hyderabad suggests that regional pricing strategies may be beneficial. The company could further analyze local market trends and adjust pricing to align with regional demand and competition.
8. **Seasonal Promotions**: Given that May saw the highest revenue and bookings, the company should focus on seasonal promotions or targeted marketing campaigns during these months. Additionally, understanding why June and July experienced a drop could help address the issue for future seasons.

Conclusion

In conclusion, the analysis of the company's current performance reveals significant opportunities for improvement in pricing strategies, property management, and booking platforms. The lack of dynamic pricing, both for weekdays and weekends, has led to missed revenue potential, particularly during peak travel periods such as May, June, and July. Additionally, the company has not leveraged differential pricing on its own booking platform, resulting in lower ADR compared to offline channels.

The insights further indicate that properties with lower ratings experience reduced occupancy, suggesting a need for a focus on customer satisfaction. Luxury hotels, while generating more revenue face similar occupancy rates to business hotels, indicating that a tailored approach to each hotel type could improve overall performance. Furthermore, the analysis highlights the need for strategic pricing of elite rooms, as their low ADR and RevPAR suggest missed revenue opportunities.

By implementing dynamic pricing, regional strategies, and enhancing online booking incentives, the company can better align its pricing models with market demands. Improving property ratings and tailoring strategies for specific room types and regions will further drive occupancy and revenue growth. Overall, with the right adjustments, the company has significant potential to increase profitability and optimize its operational efficiency in the hospitality industry.

Project Live Dashboard:
https://app.powerbi.com/view?r=eyJrIjoiMzkwN2FmYjctZDE5MC00ZjU2LTliNjgtZDk0ZjRiMmU5NzBkIiwidCI6IjlmMzA5MDY2LTU1Y2YtNDQ4NS04N2Q0LWViNTljZDdiYzY4NCJ9