**HOTEL BOOKING ANALYSIS – PROJECT OVERVIEW**

**Problem Statement**

Analyse booking patterns, guest preferences, and factors influencing cancellations. Use SQL and Excel to identify trends in booking sources and revenue. Develop a Power BI dashboard for tracking booking trends and optimizing hotel operations.

**Dataset Description**

This dataset contains information on hotel bookings, guest details, meal preferences, booking source, room details, and reservation status.

**Table Explanations**

**Room\_Details**

The Room\_Details table provides information related to room reservations and changes made to them. It is associated with the Booking\_Details table via the booking identifier. This table includes details about the type of room initially reserved, the type of room eventually assigned, and the number of changes made to the booking. It offers insights into room allocation dynamics and booking modifications.

**Reservation\_Status\***

The Reservation\_Status table records the status of reservations over time. It is connected to the Booking\_Details table through the booking identifier. This table captures the reservation's last status (e.g., Canceled, Check-Out) and the date on which this status was recorded. It is valuable for tracking the progression of reservations and understanding their final outcomes.

**Booking\_Details**

The Booking\_Details table contains essential details related to hotel reservations. It includes a unique booking identifier and information about the type of hotel (Resort Hotel or City Hotel). Additionally, it records the booking's cancellation status (0 for not canceled, 1 for canceled), lead time (number of days between booking and arrival), year, month, week number, and day of the month of arrival. The table also captures the number of weekend and weekday nights stayed.

**Guest\_Info**

The Guest\_Info table provides insights into the guests associated with each booking. It is linked to the Booking\_Details table via the booking identifier. This table records the number of adults, children, and babies accompanying the booking, offering an understanding of the composition of guests for each reservation.

**Meal\_And\_Stay\_Details**

The Meal\_And\_Stay\_Details table complements the booking information by specifying meal-related and stay-related attributes. It connects to the Booking\_Details table via the booking identifier. This table includes the type of meal booked (e.g., Bed & Breakfast, Half Board), the Average Daily Rate (ADR) for the stay, the number of required car parking spaces, and the total count of special requests made by the guest.

**Booking\_Source\_and\_History**

The Booking\_Source\_and\_History table is crucial for understanding the source of bookings and the historical behavior of guests. It is connected to the Booking\_Details table via the booking identifier. This table encompasses information such as the market segment (e.g., Online Travel Agents, Direct Booking), distribution channel (e.g., Online Travel Agents, Direct Booking), and whether the guest is a repeated visitor (0 for not repeated, 1 for repeated). Additionally, it records the number of previous booking cancellations, previous bookings that were not canceled, the deposit type (e.g., No Deposit, Non-Refund), the booking agent's ID, the company's ID, the number of days a booking spent on the waiting list, and the customer type (e.g., Transient, Group).

**Key Analysis Areas**

**Booking Patterns and Trends**

* Use the Booking\_Details table to examine the distribution of bookings across different months, seasons, and weekdays.
* Analyze lead times to identify how far in advance guests are likely to book.
* Compare booking trends between different hotel types (Resort Hotel vs. City Hotel).

**Guest Preferences**

* Utilize the Guest\_Info table to understand guest demographics, such as the composition of groups (adults, children, and babies).
* Examine meal preferences in Meal\_And\_Stay\_Details and identify the most popular meal options (e.g., Bed & Breakfast, Full Board).

**Room Allocation Dynamics**

* In the Room\_Details table, track room change patterns to identify if certain room types are frequently reallocated or modified.
* Explore the reasons behind these modifications, which might reveal insights into guest expectations and overbooking strategies.

**Booking Cancellations and Influencing Factors**

* Use Reservation\_Status to study cancellation rates and identify common patterns or months with higher cancellation rates.
* Analyze factors influencing cancellations, such as deposit type, market segment, and lead time. The Booking\_Source\_and\_History table is crucial here as it provides data on previous cancellations, deposit types, and customer type, which could impact cancellation behavior.

**Revenue Insights**

* The Meal\_And\_Stay\_Details table offers the Average Daily Rate (ADR), which is useful for calculating average revenue per booking and identifying revenue trends.
* Explore if there is a correlation between market segments (from Booking\_Source\_and\_History) and revenue to determine the most profitable booking channels.

**Market Segments and Distribution Channels**

* Analyze Booking\_Source\_and\_History to identify which channels bring in the most bookings (e.g., Online Travel Agents vs. Direct Bookings).
* Investigate the behavior of repeated guests to understand customer loyalty and retention rates.

**SQL Analysis Ideas**

* Booking Patterns: SQL queries can help you aggregate bookings by month, day of the week, and hotel type.
* Cancellation Analysis: Use joins between Booking\_Details and Reservation\_Status to examine cancellation patterns.
* Revenue Analysis: Calculate average revenue metrics using ADR from Meal\_And\_Stay\_Details.
* Guest Demographics: Create summaries from Guest\_Info to analyze the average group size per booking.

**Excel Analysis Ideas**

* Pivot Tables for summarizing and filtering data (e.g., bookings by source, cancellations by month).
* Charts and Graphs to visualize booking trends, cancellation rates, and revenue per market segment.

**Power BI Dashboard**

* Booking Trends Overview: Display booking trends over time, broken down by hotel type, month, and market segment.
* Guest Composition: Visualize guest demographics to show average group size and meal preferences.
* Cancellations Dashboard: Highlight trends in cancellations, with filters for deposit type, lead time, and market segment.
* Revenue Analysis: Show ADR trends and revenue insights per booking source.

This setup will give you a comprehensive view of booking dynamics and support data-driven recommendations for the hotel industry.

**Preliminary MECE Breakdown**

1. **Reservation Analysis**
   * **Reservation Status**: Breakdown of reservations by status (Canceled, Checked-Out, etc.).
   * **Cancellation Trends**: Lead time for cancellations, cancellation rate analysis by year/month.
   * **Booking Modifications**: Changes in room types and their frequency.
2. **Guest Demographics**
   * **Guest Composition**: Number of adults, children, and babies per booking.
   * **Customer Type**: Repeated guests vs. new guests.
   * **Guest Preferences**: Analysis of special requests, ADR trends by guest type.
3. **Hotel Performance Metrics**
   * **Occupancy Analysis**: Weekend vs. weekday night stays, total nights booked.
   * **Revenue Metrics**: ADR, total revenue, and its distribution across room types.
   * **Lead Time Analysis**: Impact of lead time on occupancy rates and cancellations.
4. **Meal and Amenities Analysis**
   * **Meal Preferences**: Breakdown of meal types booked (e.g., Bed & Breakfast, Half Board).
   * **Amenity Utilization**: Number of car parking spaces requested, special requests analysis.
5. **Booking Source and Channel Effectiveness**
   * **Market Segments**: Bookings by segment (Online Travel Agents, Direct, etc.).
   * **Distribution Channels**: Performance of channels and cancellation rates per channel.
   * **Historical Behavior**: Analysis of repeated visitors, past cancellations, and waiting list trends.
6. **Room Allocation Dynamics**
   * **Room Type Trends**: Popularity of reserved vs. assigned room types.
   * **Allocation Efficiency**: Frequency of changes to reserved rooms.
7. **Time-based Analysis**
   * **Seasonality**: Booking trends by year, month, and week number.
   * **Peak Periods**: High-demand months and weekdays/weekends.
8. **Impact of External Factors**
   * **Deposit Type**: Influence of deposit type on cancellations.
   * **Waiting List Impact**: Effect of waiting list days on customer behavior.

**Next Steps**

1. Do any of these categories resonate with your analysis goals?
2. Are there specific KPIs you want to prioritize (e.g., ADR, occupancy, cancellation rates)?
3. Shall we dive deeper into any particular section for subcategories or hypotheses?

**Hotel Booking Analysis – MECE Breakdown and Insights**

**1. Overview**

This analysis aims to uncover trends, patterns, and insights from hotel booking data to inform better operational strategies and customer satisfaction improvements.

**2. MECE Breakdown of Analysis Areas**

***I. Booking Patterns and Trends***

**A. Time-Based Patterns**

* Monthly, seasonal, and day-of-week booking trends
* Lead time analysis for booking in advance

**B. Hotel Type**

* Comparison of booking trends between Resort and City hotels

***II. Guest Preferences and Demographics***

**Group Composition**

**Average number of adults, children, and babies per booking**

**Identification of common group sizes and family dynamics**

**Meal Preferences**

**Analysis of preferred meal plans (e.g., Bed & Breakfast, Half Board)**

**Correlation between meal preference and booking duration**

**III. Room Allocation Dynamics**

**Room Type Changes**

**Frequency and reasons for room changes from initial reservation to check-in**

**Booking Modifications**

**Patterns in booking modifications, identifying if specific room types or guest profiles are more likely to experience changes**

**IV. Cancellation Analysis**

**Overall Cancellation Rate**

**Monthly and seasonal patterns in cancellation rates**

**Comparison of cancellation rates by hotel type**

**Factors Influencing Cancellations**

**Impact of deposit type, lead time, market segment, and customer type on cancellations**

**Cancellation History**

**Analysis of guest cancellation behavior (e.g., frequency of previous cancellations)**

**V. Revenue Insights**

**Average Daily Rate (ADR)**

**Analysis of revenue per booking based on ADR, segmented by booking source and guest type**

**Revenue by Booking Source**

**Identifying the most profitable booking channels and their ADR impact**

**Revenue vs. Booking Length**

**Correlation between the duration of stay and ADR**

**VI. Market Segments and Booking Sources**

**Market Segments**

**Breakdown of bookings by segment (e.g., Online Travel Agents, Direct Booking)**

**Customer Retention**

**Analysis of repeated guests and retention rates across different booking sources**

**3. Insights Derived from Analysis**

**I. Booking Patterns and Trends**

**Insight 1: High booking volumes in specific months or seasons indicate peak times, helping the hotel optimize staffing and resource allocation.**

**Insight 2: Lead time analysis can guide targeted marketing to capture last-minute bookings or encourage advance reservations.**

**II. Guest Preferences and Demographics**

**Insight 3: A higher average number of family groups (adults and children) may indicate a need for family-oriented services, such as larger room options or child-friendly amenities.**

**Insight 4: Popular meal plans help tailor food services based on demand, potentially reducing costs on less-used meal options.**

**III. Room Allocation Dynamics**

**Insight 5: Frequent room changes may signal issues with room availability or alignment with guest expectations, suggesting improvements in room allocation processes.**

**Insight 6: Patterns in booking modifications reveal if specific guest demographics require flexibility, aiding in targeted communication or dynamic pricing strategies.**

**IV. Cancellation Analysis**

**Insight 7: High cancellation rates in specific periods or guest types allow for adaptive strategies, like flexible cancellation policies or deposit requirements during peak times.**

**Insight 8: Analysis of factors influencing cancellations helps improve forecasting accuracy and reduce revenue loss from last-minute cancellations.**

**V. Revenue Insights**

**Insight 9: ADR analysis by booking source can identify high-revenue channels, allowing the hotel to focus marketing efforts and incentives on the most profitable channels.**

**Insight 10: Revenue insights by stay length inform pricing strategies, as extended stays with consistent ADR might warrant loyalty discounts or package offers.**

**VI. Market Segments and Booking Sources**

**Insight 11: Popularity of certain market segments (like OTAs) can indicate where to increase hotel visibility or negotiate commission structures to balance profit and visibility.**

**Insight 12: Insights on repeated guests and retention rates help in crafting loyalty programs and targeted offers for retaining high-value, repeat customers.**

**4. Concluding Remarks**

**By organizing the analysis through this MECE structure, the hotel can better understand booking patterns, improve guest satisfaction, and optimize revenue generation across different booking channels and guest types.**

**This document will provide a solid foundation for structuring your analysis and highlighting key insights for stakeholders. Let me know if you’d like further details on any specific sections or need additional sections!**