Data and Artificial Intelligence
Cyber Shujaa Program

Week 4 Assignment
Assignment 4: Business Intelligence on Power BI

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Introduction

This report details the completion of the assignment for this week, which focused on developing an end-to-end Business Intelligence solution using Power BI. The project is based on a real-world scenario in the hospitality domain, using a dataset from a fictional five-star hotel chain, "atli Grands." The primary goal was to process, model, and visualize hotel booking and revenue data to derive actionable insights for management.

Following the provided YouTube tutorial from codebasics, I progressed through all the stages of a data analytics project, from understanding business requirements to building and publishing a final, interactive dashboard. This exercise provided practical, hands-on experience with Power BI Desktop, including data transformation in Power Query, data modeling, and creating calculations using Data Analysis Expressions (DAX).

Objectives
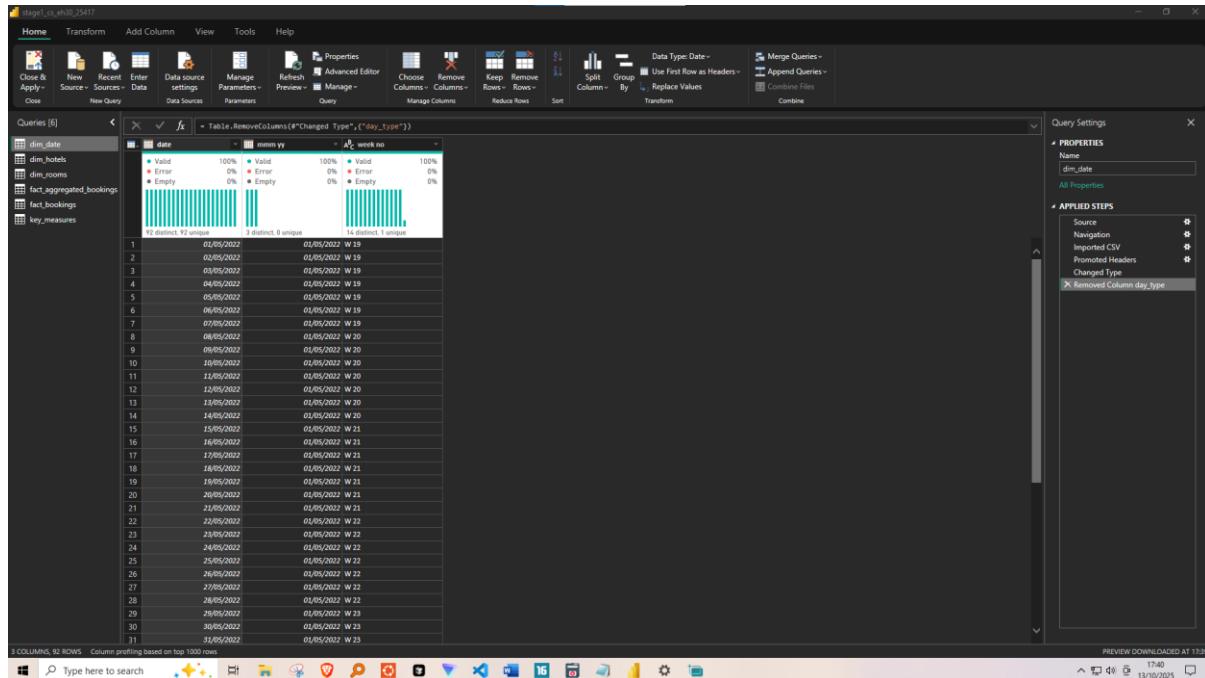
The key objectives for this assignment were to:

1. Understand the business context and stakeholder requirements for a hotel revenue dashboard.

2. Load multiple data sources and perform necessary data cleaning and transformation.

3. Build a relational data model using a star schema to connect the various datasets.

4. Create calculated columns and measures using DAX to derive key business metrics.

5. Develop a compelling and interactive dashboard to visualize the data and enable effective decision-making.

6. Publish the final report to the Power BI service to be shared as a portfolio project.

Tasks Completed
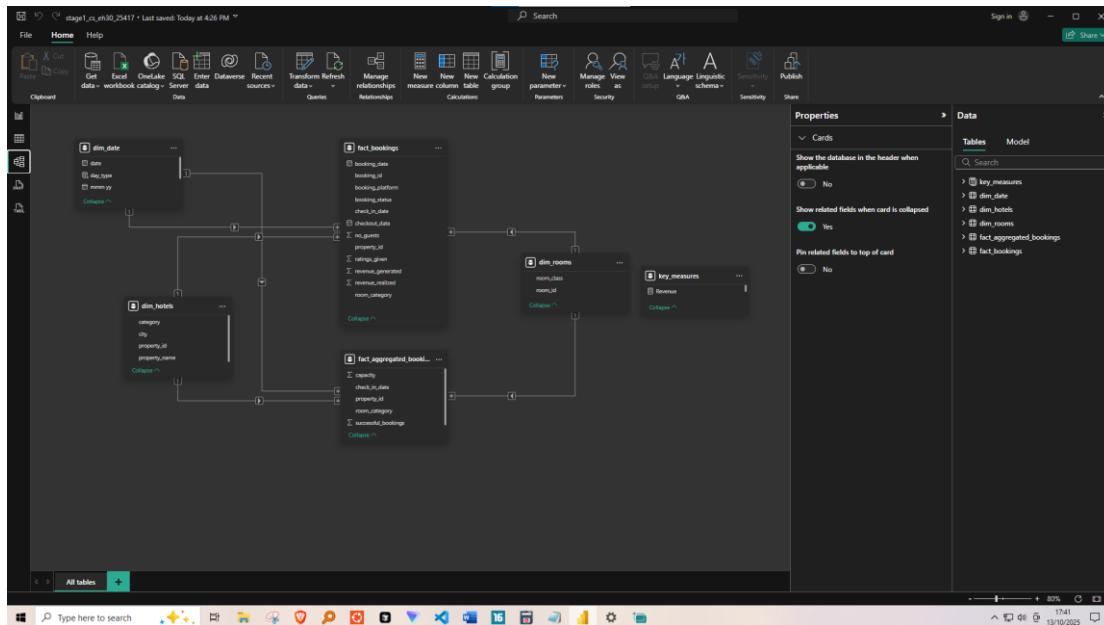
1. Data Loading and Transformation

- I began by connecting to the folder containing the various CSV data files (dim_date, dim_hotels, fact_bookings, etc.). All files were loaded into the Power Query editor for transformation. Key steps here included promoting headers, verifying data types, and removing irrelevant columns to prepare the data for modelling.
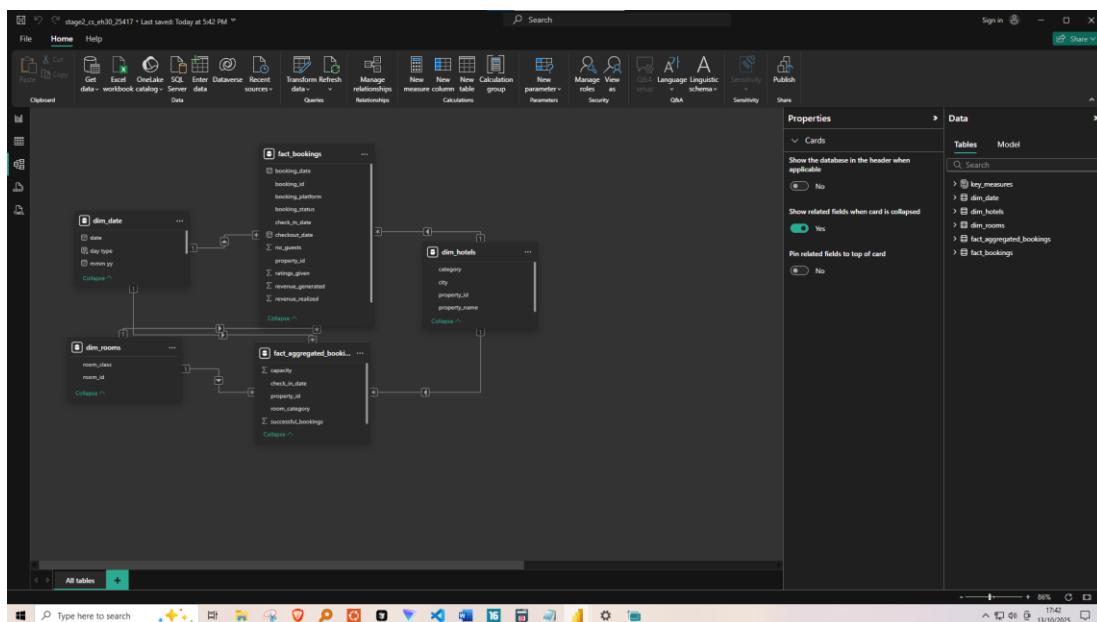
2. Building the Data Model

- After cleaning the data, I moved to the Model view in Power BI to establish relationships between the tables. I organized the tables into a star schema, with the fact_bookings and fact_aggregated_bookings tables at the center (fact tables) and surrounded them with the dim_date, dim_hotels, and dim_rooms tables (dimension tables). Relationships were created by dragging and dropping common keys, such as property_id, room_id, and date

3. Creating DAX Columns and Measures
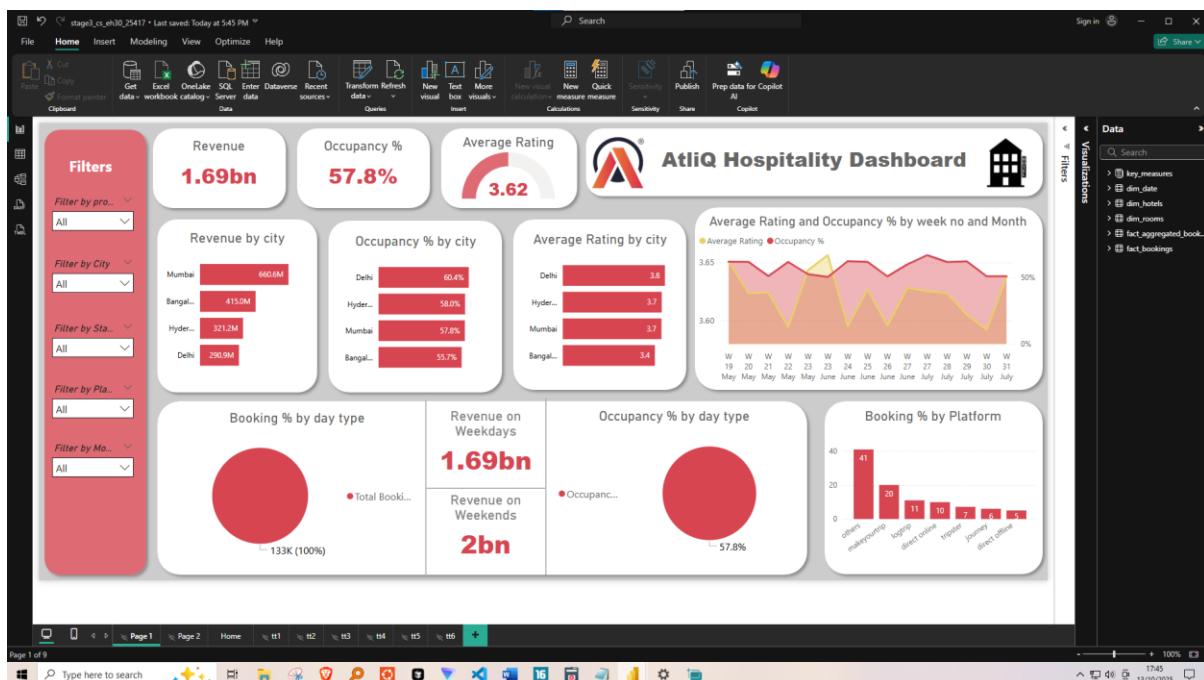
- Calculated Columns: In the dim_date table, I created a day_type column to classify dates as "Weekday" or "Weekend," defining Friday and Saturday as the weekend, per the business requirements discussed in the tutorial.

- Measures: I created a new table named "Key Measures" to hold all my calculations. I wrote DAX formulas for critical KPIs such as Total Revenue, ADR (Average Daily Rate), RevPAR (Revenue Per Available Room), Occupancy %, and Realization %

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4. Visualizing the Dashboard

In the Report view, I designed the dashboard to be insightful and user-friendly.

- Filters/Slicers: I added slicers for filtering the report by City, Room Class, Month, and Week Number, allowing users to drill down into the data.

- KPI Cards: Key metrics like Revenue, RevPAR, and Occupancy were displayed prominently at the top using Card visuals.

- Main Visuals: I created a detailed table showing all key metrics for each hotel property. I also added visuals to show the weekday vs. weekend split for Occupancy, RevPAR, and ADR, as well as a breakdown by booking platform

5. Adding Advanced Features and Final Touches

To enhance interactivity, I implemented a custom tooltip. When a user hovers over a KPI card, a line chart appears, showing the week-by-week trend for that metric, split by Business and Luxury hotel types. I also applied formatting, such as adding data bars to the main table for easier visual comparison and customizing colors to create a professional look and feel.

Link to Report:

Conclusion

This assignment was an excellent practical exercise in using Power BI to build a complete business intelligence solution. I gained a strong understanding of the end-to-end workflow, from interpreting business needs and transforming raw data to creating an interactive dashboard that provides meaningful insights. The project reinforced the importance of a robust data model and the power of

DAX for creating custom business calculations. The final dashboard successfully highlights key performance indicators and uncovers critical insights, such as the hotel chain's lack of a dynamic pricing strategy, which can be used to inform future business decisions. I look forward to applying these skills to more complex projects and building out my data analytics portfolio.