Data and Artificial Intelligence

Cyber Shujaa Program

Week 4 Assignment

Business Intelligence with Power BI – Hotel Management

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Introduction

This assignment focuses on developing **hands-on experience in Business Intelligence using Power BI** for a **Hotel Management** business scenario.
The goal was to analyze and visualize hotel booking and revenue data to gain actionable insights into **occupancy trends, customer preferences, and performance metrics** that support data-driven decisions.

The project objectives were to:

- Understand the hotel business structure and client needs.
- Load, clean, and transform datasets in Power BI.
- Build a **star schema data model** linking dimensions and fact tables.
- Create **DAX measures** for key performance indicators (KPIs).
- Develop an **interactive dashboard** to communicate insights effectively.
- Publish the report to the **Power BI Service** and include it in the project portfolio.

Tasks Completed

Data Loading and Transformation

Datasets Used:

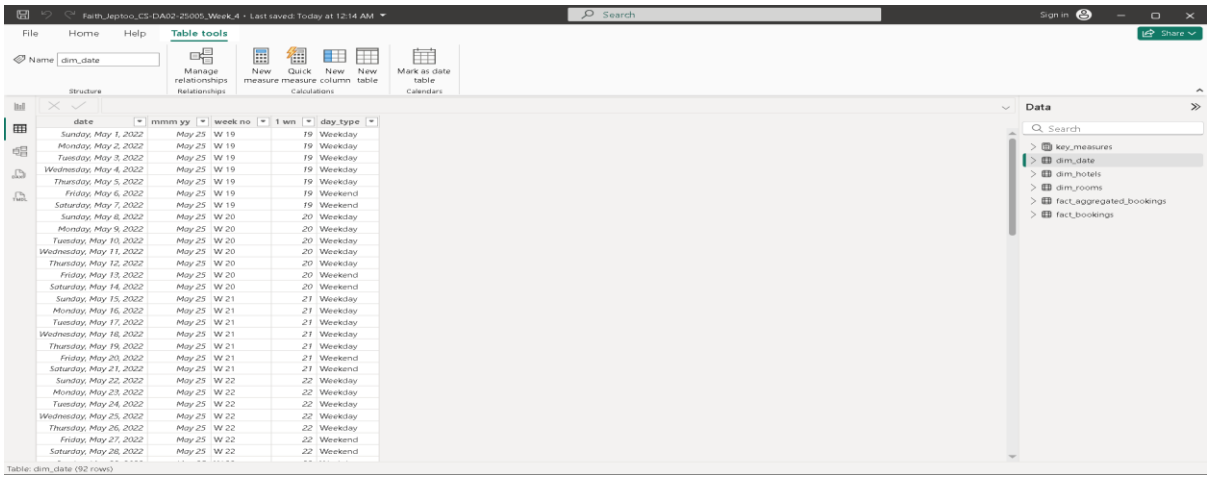
- **dim_date.csv** – calendar data for dates and periods.
- **dim_rooms.csv** – room categories, capacity, and pricing.
- **fact_bookings.csv** – booking transactions, customer details, and revenue.
- **dim_customers.csv** – customer demographics and booking sources.

Data Preparation Steps:

1. Imported all datasets into Power BI using **Get Data → CSV**.
2. Performed transformations in **Power Query Editor**, including:
    - Renaming columns for consistency.
    - Removing null or duplicate records.
    - Changing data types (dates, currency, integers).

- Merging datasets for additional attributes (e.g., combining bookings with room details).

3. Created **calculated columns** such as “Length of Stay” and “Total Revenue.”



Building the Data Model (Star Schema)

A **star schema** model was designed to simplify analysis and relationships:

Fact Table:

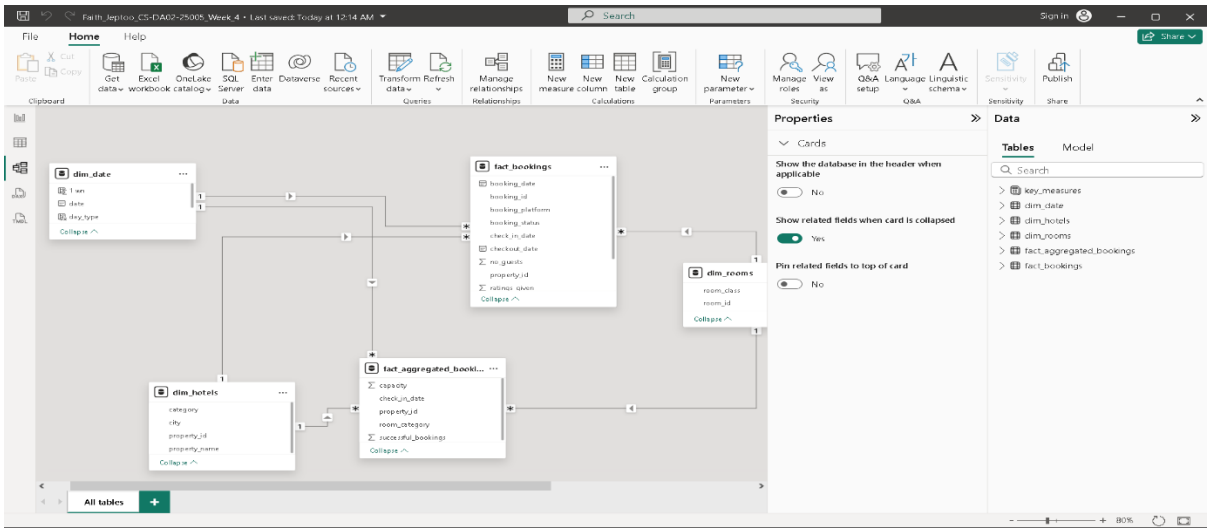
- fact_bookings (contains transactional data like revenue, booking date, room ID, customer ID)

Dimension Tables:

- dim_date → linked via BookingDate
- dim_rooms → linked via RoomID
- dim_customers → linked via CustomerID

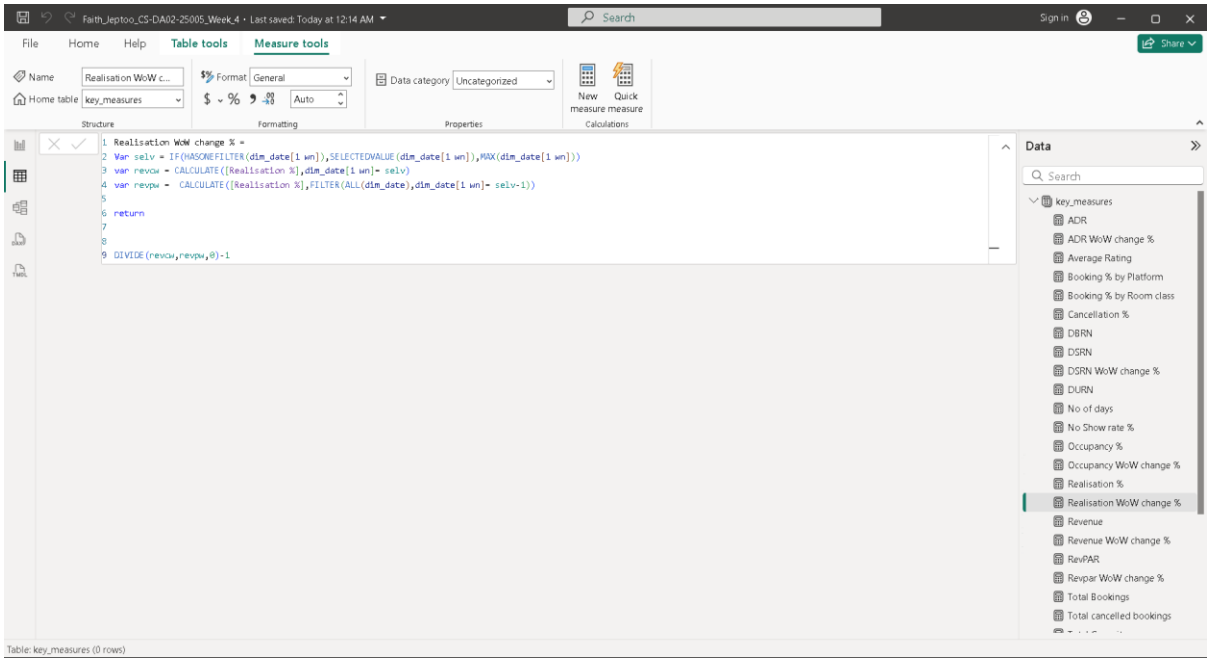
Relationships:

- One-to-Many relationships between dimensions and fact tables.
- Referential integrity enforced to ensure accurate joins.

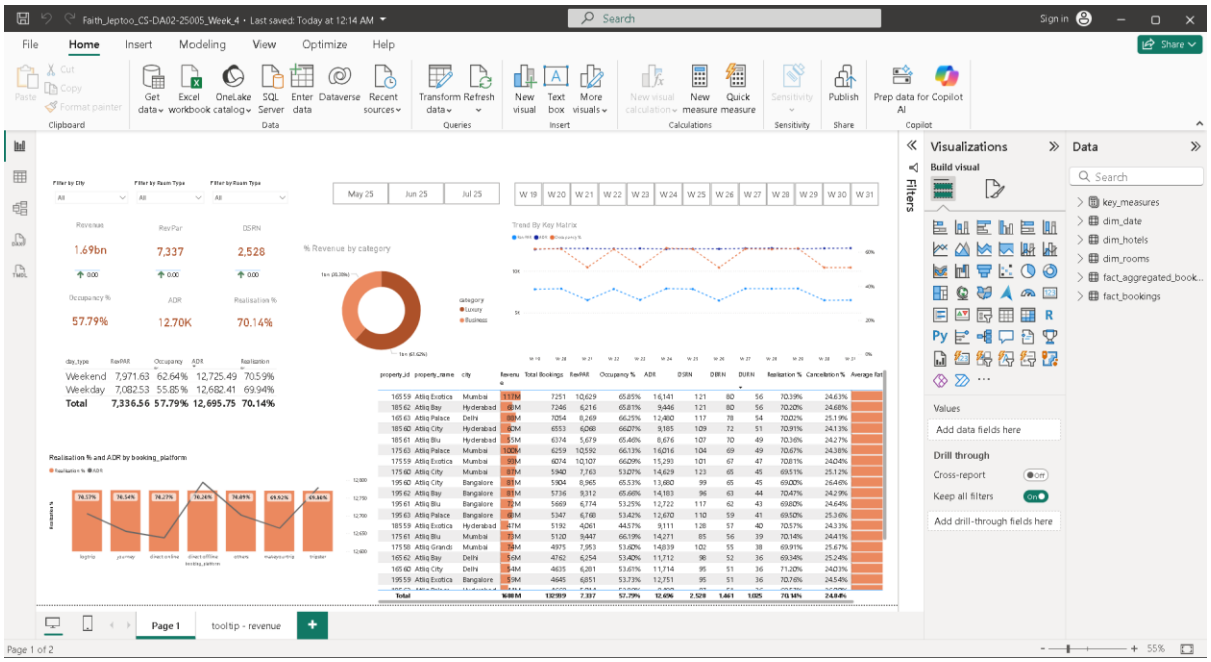


Creating DAX Calculations

Several **DAX measures** were created to analyze performance metrics.
Below is an example of Realisation WoW Change %:



Dashboard Design and Visualization



Conclusion

This project demonstrated the complete **Business Intelligence workflow** using Power BI — from data ingestion and modeling to interactive visualization.
The final dashboard provides hotel managers with valuable insights into:

- **Revenue and occupancy performance.**
- **Customer behavior and booking patterns.**
- **Trends that influence profitability.**

Power BI proved to be a powerful tool for **data-driven decision-making** in the hospitality industry.

Link To Notebook

https://drive.google.com/file/d/1Z8R9eZqT08Yxk37UkoJzFCfmDInBH1G9/view?usp=sharing