

Data and Artificial Intelligence

Cyber Shujaa Program

Week 4 Assignment

Business intelligence using power Bi

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Table of Contents

Data and Artificial Intelligence	1
Cyber Shujaa Program.....	1
Week 4 Assignment Business intelligence using power Bi.....	1
Introduction	4
Objectives	4
Tasks Completed	4
Step 1: load and transform the various data set	4
Step 2: Build the Data Model.....	7
Step 3: Data Analysis Expressions.....	8
Step 4: dashboard.....	11
Link to code.....	12
Conclusion.....	12

Table of figures

Figure 1: screenshot showing the day _type column removed	5
Figure 2: screenshot showing the data set with an added calculated column	5
Figure 3: screenshot showing a fully transformed dataset.....	6
Figure 4: dim_room table before transformation.....	6
Figure 5: dim_room with updated headers	7
Figure 6: data model showing star schema relationship	8
Figure 7: screenshot showing the created dashboard.....	11

Introduction

This week's assignment was to develop hands-on experience in Business Intelligence using Power BI for Hotel Management and publishing my work on the cloud. I had never interacted with power BI before. Power BI is a business analytics service by Microsoft that helps users connect to, visualize, and analyse data to gain actionable insights. It is a unified platform for business intelligence that uses interactive dashboards, reports, and visualizations to make data easier to understand.

Objectives

The purpose of the assignment is to gain hands-on practice:

1. Understand the Hotel business and client needs
2. Load Data
3. Transform Data
4. Build DAX
5. Visualize Dashboard
6. Publish your project as part of your portfolio collection

Tasks Completed

Step 1: load and transform the various data set

I loaded and transformed the dim_date data set. I deleted the mmm yyy column because its values had included the days of the week instead of just month and year. I added a new column with the DAX expression; `FORMAT(dim_date[date], "MMM yyyy")`. all the values in the column were transformed to month and year. I also transformed the date_type column to format Friday and saturdays as the weekend and the rest as weekdays. This was achieved through the following DAX expression: `day_type =`

`IF(`

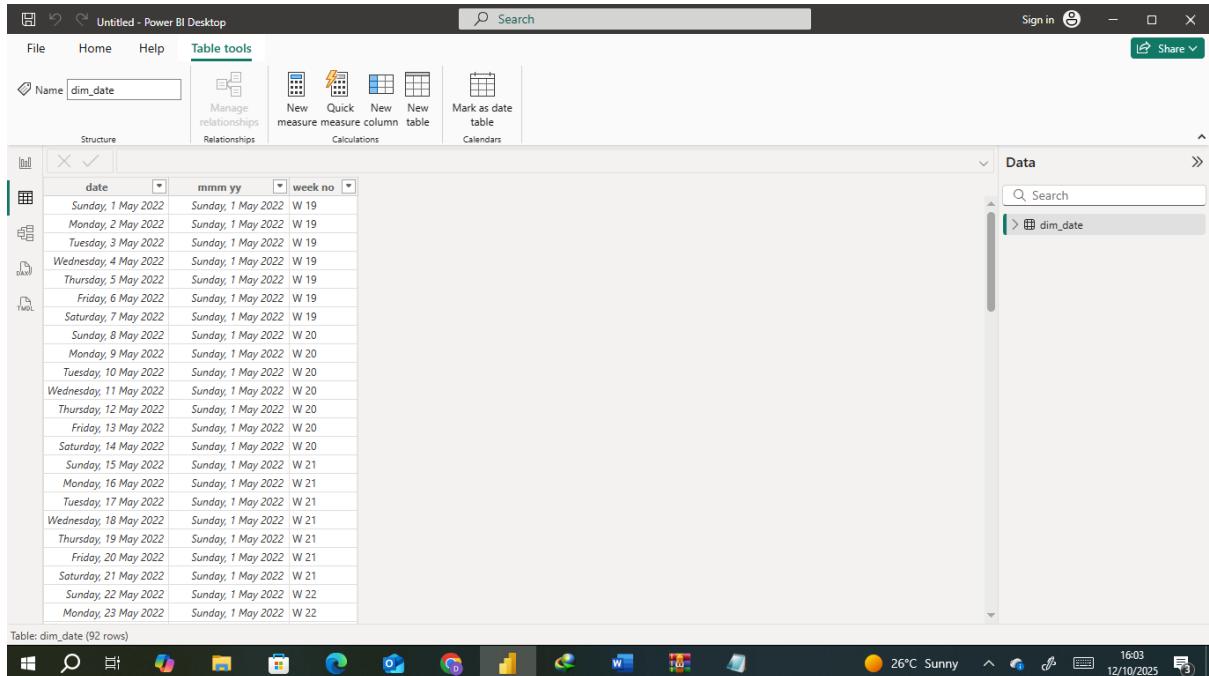
`WEEKDAY(dim_date[date], 2) IN {5, 6},`

`"Weekend",`

"Weekday"

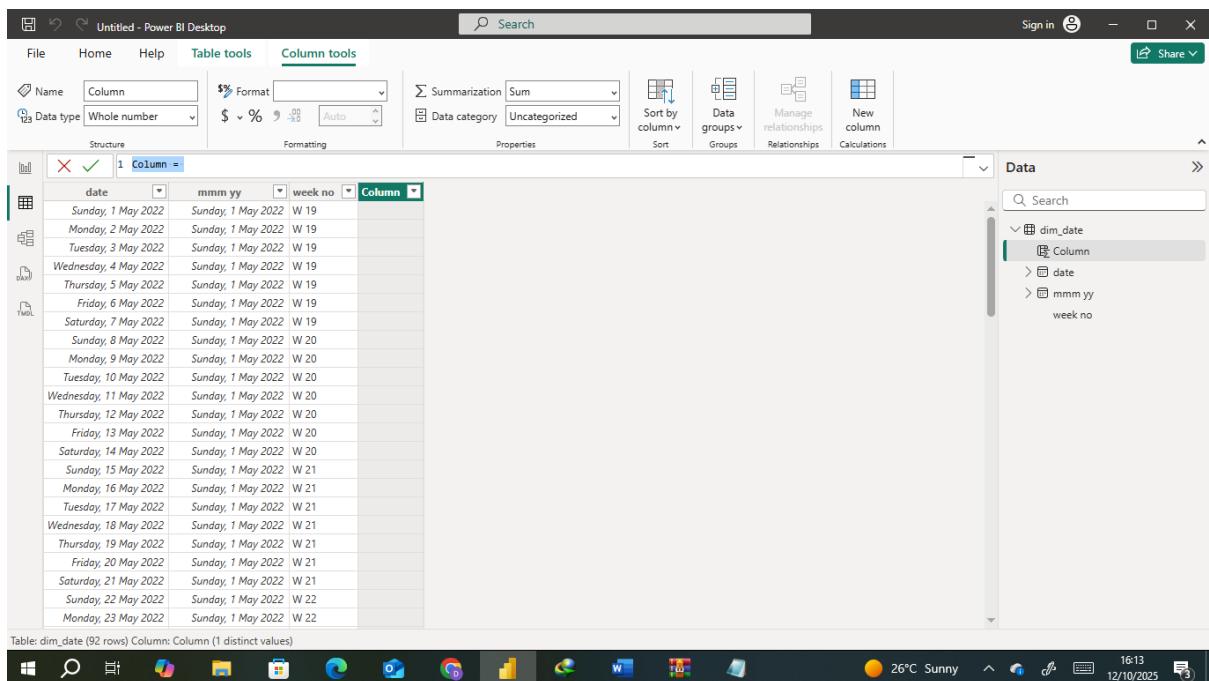
)

Screenshots



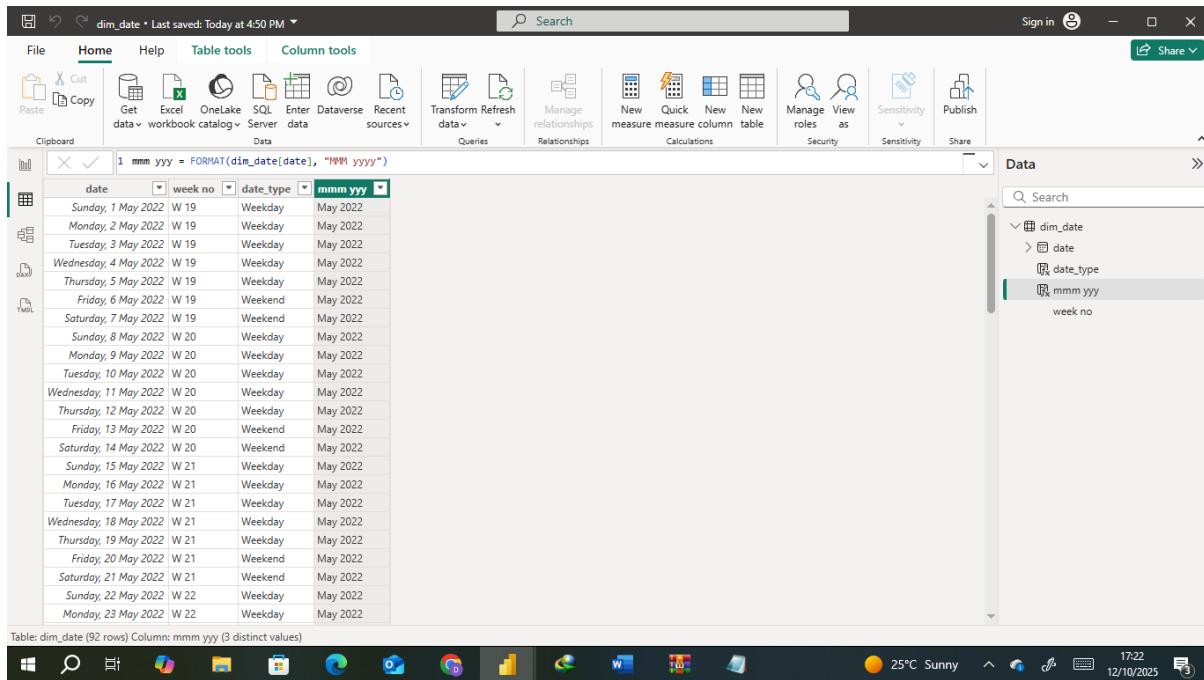
The screenshot shows the Power BI Desktop interface with the 'Table tools' ribbon selected. The 'Structure' tab is active, displaying a table named 'dim_date'. The table has three columns: 'date', 'mmm yy', and 'week no'. The data consists of 92 rows of daily entries from May 1, 2022, to May 23, 2022. The 'Data' pane on the right shows the table structure.

Figure 1: screenshot showing the day _type column removed



The screenshot shows the Power BI Desktop interface with the 'Column tools' ribbon selected. The 'Structure' tab is active, displaying a table named 'dim_date' with four columns: 'date', 'mmm yy', 'week no', and a new calculated column named 'Column'. The data consists of 92 rows of daily entries from May 1, 2022, to May 23, 2022. The 'Data' pane on the right shows the table structure.

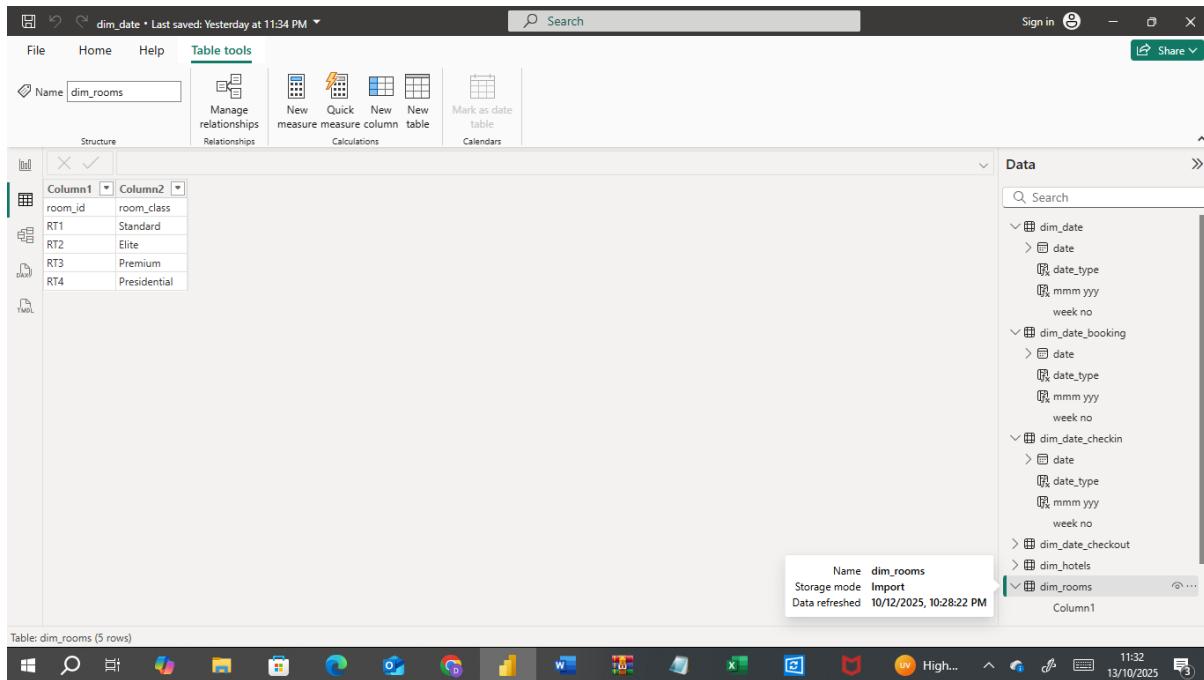
Figure 2: screenshot showing the data set with an added calculated column



The screenshot shows the Power BI desktop application interface. The ribbon is visible at the top with tabs like File, Home, Help, Table tools, and Column tools. The main area displays a table titled 'dim_date' with 92 rows. The columns are 'date', 'week no', 'date_type', and 'mmm yyyy'. The data shows various dates from May 2022, categorized by week number and type (Weekday or Weekend). A search bar and a data pane on the right show the schema of the table, including relationships to other dimensions like 'date' and 'date_type'. The status bar at the bottom indicates the table has 92 rows and the current date is 12/10/2025.

Figure 3: screenshot showing a fully transformed dataset

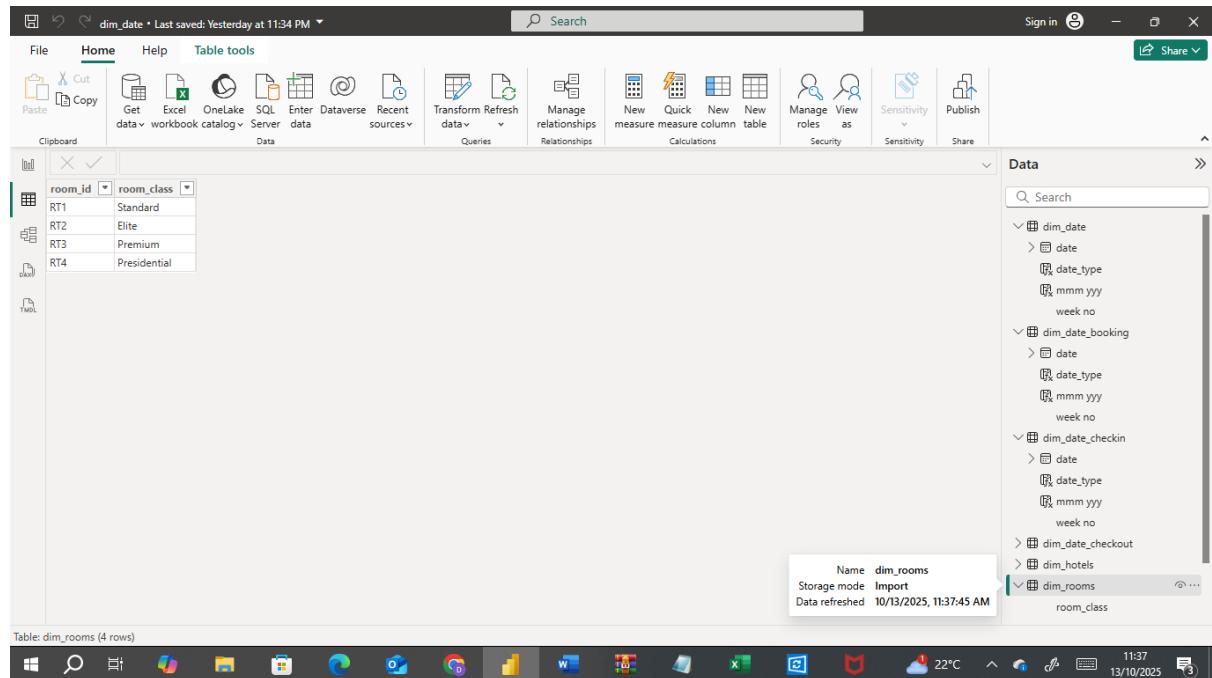
For the table dim_room, Power Bi did not automatically detect the first row as headers.



The screenshot shows the Power BI desktop application interface. The ribbon is visible at the top with tabs like File, Home, Help, Table tools, and Column tools. The main area displays a table named 'dim_rooms' with 5 rows. The columns are 'room_id' and 'room_class'. The data shows room IDs RT1 through RT4 and their corresponding classes: Standard, Elite, Premium, and Presidential. A search bar and a data pane on the right show the schema of the table, including relationships to other dimensions like 'date', 'date_type', and 'mmm yyyy'. The status bar at the bottom indicates the table has 5 rows and the current date is 13/10/2025.

Figure 4: dim_room table before transformation

I transformed the data by opening the power query and promoted the first row to be the header. This was the result:



The screenshot shows the Microsoft Power BI Data Editor interface. The main area displays a table named 'dim_rooms' with four rows of data:

room_id	room_class
RT1	Standard
RT2	Elite
RT3	Premium
RT4	Presidential

The ribbon at the top has 'Table tools' selected under the 'Home' tab. A context menu is open over the table, showing details: Name: dim_rooms, Storage mode: Import, Data refreshed: 10/13/2025, 11:37:45 AM. To the right, the 'Data' pane lists various dimensions and their columns, such as dim_date, date_type, date, week no, dim_date_booking, dim_date_checkout, dim_date_checkin, dim_hotels, and dim_rooms.

Figure 5: dim_room with updated headers

Step 2: Build the Data Model

in this step I created the date-fact relationship. I connected the date in dim_date booking to booking date column in fact_bookings. Property_id was connected to property id in fact_aggregated bookings and fact_bookings. Cardinality was one to many.

Screenshot:

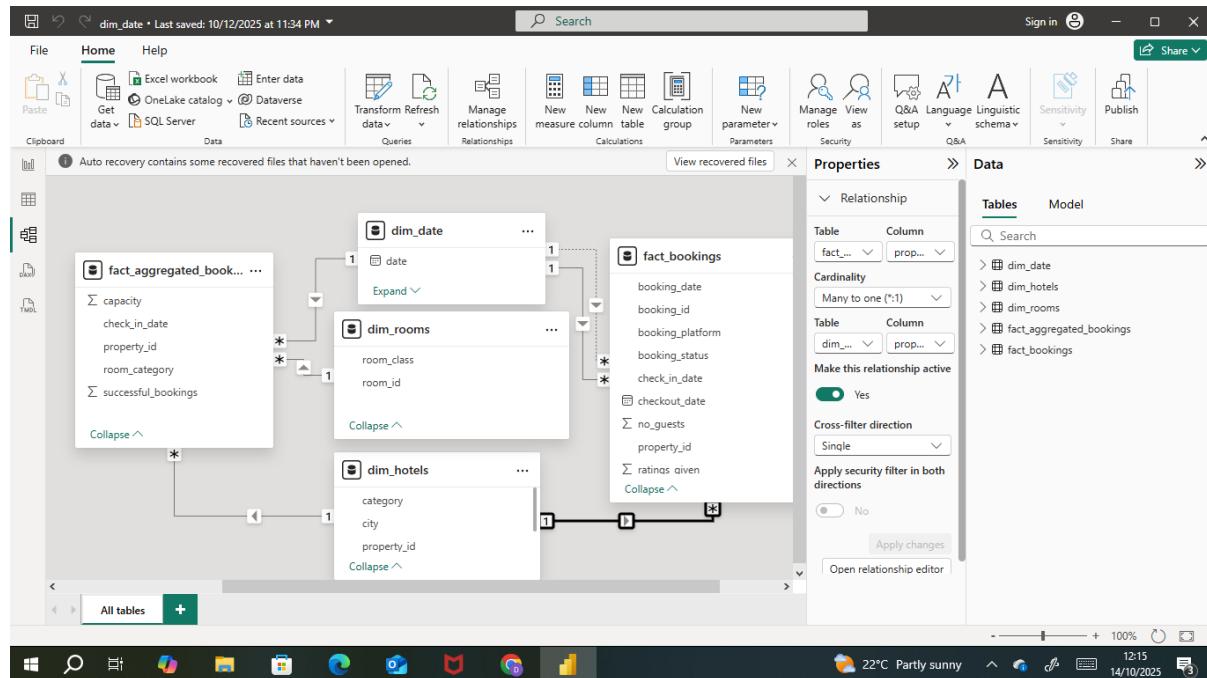


Figure 6: data model showing star schema relationship

Step 3: Data Analysis Expressions

In this step I created a measures table, and added new measures. I inserted the following DAX expressions:

1. Revenue = SUM(fact_bookings[revenue_realized])
2. Total Bookings = COUNT(fact_bookings[booking_id])
3. Total Capacity = SUM(fact_aggregated_bookings[capacity])
4. Total Successful Bookings = SUM(fact_aggregated_bookings[successful_bookings])
5. Occupancy % = DIVIDE([Total Successful Bookings],[Total Capacity],0)
6. Average Rating = AVERAGE(fact_bookings[ratings_given])
7. No of days = DATEDIFF(MIN(dim_date[date]),MAX(dim_date[date]),DAY) + 1
8. Total cancelled bookings = CALCULATE([Total Bookings],fact_bookings[booking_status] = "Cancelled")
9. Cancellation % = DIVIDE([Total cancelled bookings],[Total Bookings])
10. Total Checked Out = CALCULATE([Total Bookings],fact_bookings[booking_status] = "Checked Out")
11. Total no show bookings = CALCULATE([Total Bookings],fact_bookings[booking_status] = "No Show")

12. No Show rate % = DIVIDE([Total no show bookings],[Total Bookings])

13. Booking % by Platform = DIVIDE([Total Bookings],

CALCULATE([Total Bookings],

ALL(fact_bookings[booking_platform])

))*100

14. Booking % by Room class = DIVIDE([Total Bookings],

CALCULATE([Total Bookings],

ALL(dim_rooms[room_class])

))*100

15. ADR = DIVIDE([Revenue], [Total Bookings],0)

16. Realisation % = 1- ([Cancellation %]+[No Show rate %])

17. RevPAR = DIVIDE([Revenue],[Total Capacity])

18. DBRN = DIVIDE([Total Bookings], [No of days])

19. DSRN = DIVIDE([Total Capacity], [No of days])

20. DURN = DIVIDE([Total Checked Out],[No of days])

21. Revenue WoW change % =

Var selv =

```
IF(HASONEFILTER(dim_date[wn]),SELECTEDVALUE(dim_date[wn]),MAX(dim
_date[wn]))
```

```
var revcw = CALCULATE([Revenue],dim_date[wn]= selv)
```

```
var revpw = CALCULATE([Revenue],FILTER(ALL(dim_date),dim_date[wn]=
selv-1))
```

return

DIVIDE(revcw,revpw,0)-1

22. ADR WoW change % =

Var selv =

```
IF(HASONEFILTER(dim_date[wn]),SELECTEDVALUE(dim_date[wn]),MAX(dim
_date[wn]))
```

```
var revcw = CALCULATE([ADR],dim_date[wn]= selv)
```

```
var revpw = CALCULATE([ADR],FILTER(ALL(dim_date),dim_date[wn]= selv-1))
```

return

DIVIDE(revcw,revpw,0)-1

23. Revpar WoW change % =

Var selv =

IF(HASONEFILTER(dim_date[wn]),SELECTEDVALUE(dim_date[wn]),MAX(dim_date[wn]))

var revcw = CALCULATE([RevPAR],dim_date[wn]= selv)

var revpw = CALCULATE([RevPAR],FILTER(ALL(dim_date),dim_date[wn]=selv-1))

return

DIVIDE(revcw,revpw,0)-1

24. Realisation WoW change % =

Var selv =

IF(HASONEFILTER(dim_date[wn]),SELECTEDVALUE(dim_date[wn]),MAX(dim_date[wn]))

var revcw = CALCULATE([Realisation %],dim_date[wn]= selv)

var revpw = CALCULATE([Realisation %],FILTER(ALL(dim_date),dim_date[wn]=selv-1))

return

DIVIDE(revcw,revpw,0)-1

25. DSRN WoW change % =

Var selv =

IF(HASONEFILTER(dim_date[wn]),SELECTEDVALUE(dim_date[wn]),MAX(dim

```

_)_date[wn])))

var revcw = CALCULATE([DSRN],dim_date[wn]= selv)
var revpw = CALCULATE([DSRN],FILTER(ALL(dim_date),dim_date[wn]= selv-
1))

return

DIVIDE(revcw,revpw,0)-1

```

Step 4: dashboard

In this step I created an interactive dashboard in the report view

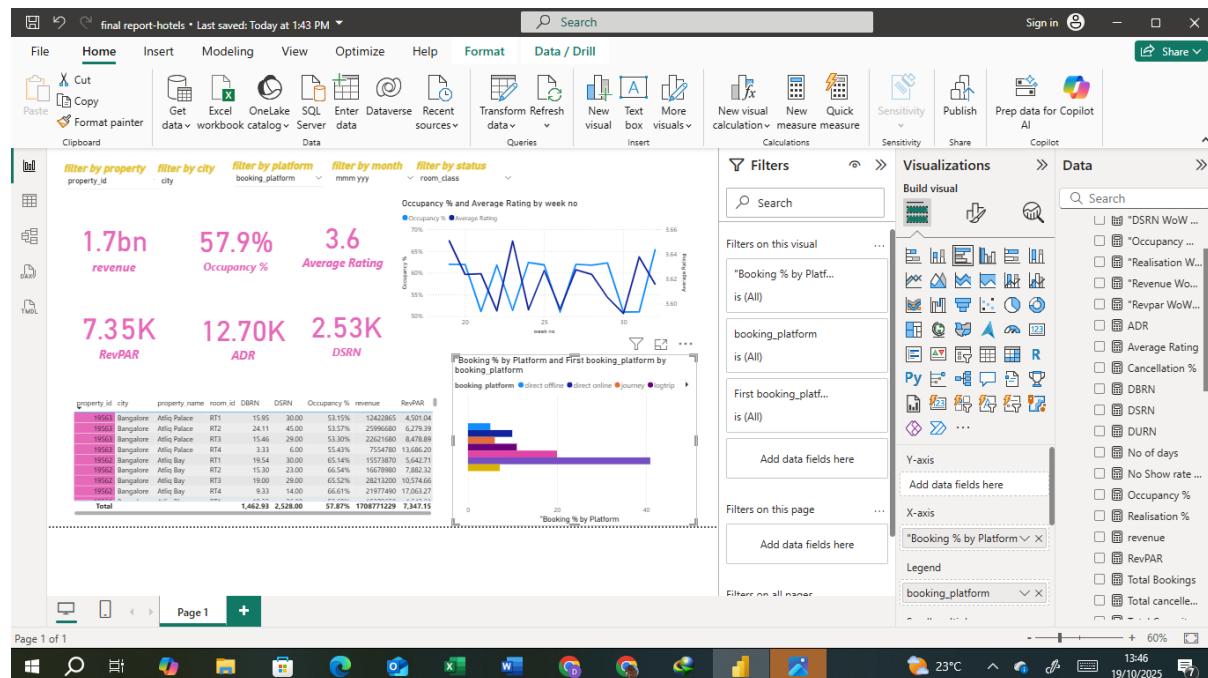


Figure 7: screenshot showing the created dashboard

Link to code**Link to Code:**

<https://drive.google.com/drive/folders/1PPem3NkpDq6RPFhnyOGvdKReFmKt1nKd?usp=sharing>

Conclusion

This week's project has helped me interact with Power BI. It is a really helpful tool in data visualization. It provides a clear and concise way to communicate complex data, improves efficiency, and enables interactive exploration of insights.