Sri Lanka Institute of Information Technology

Data Warehousing and Business Intelligence(IT3021)

Assignment 2 – 2025, Semester 1

BY

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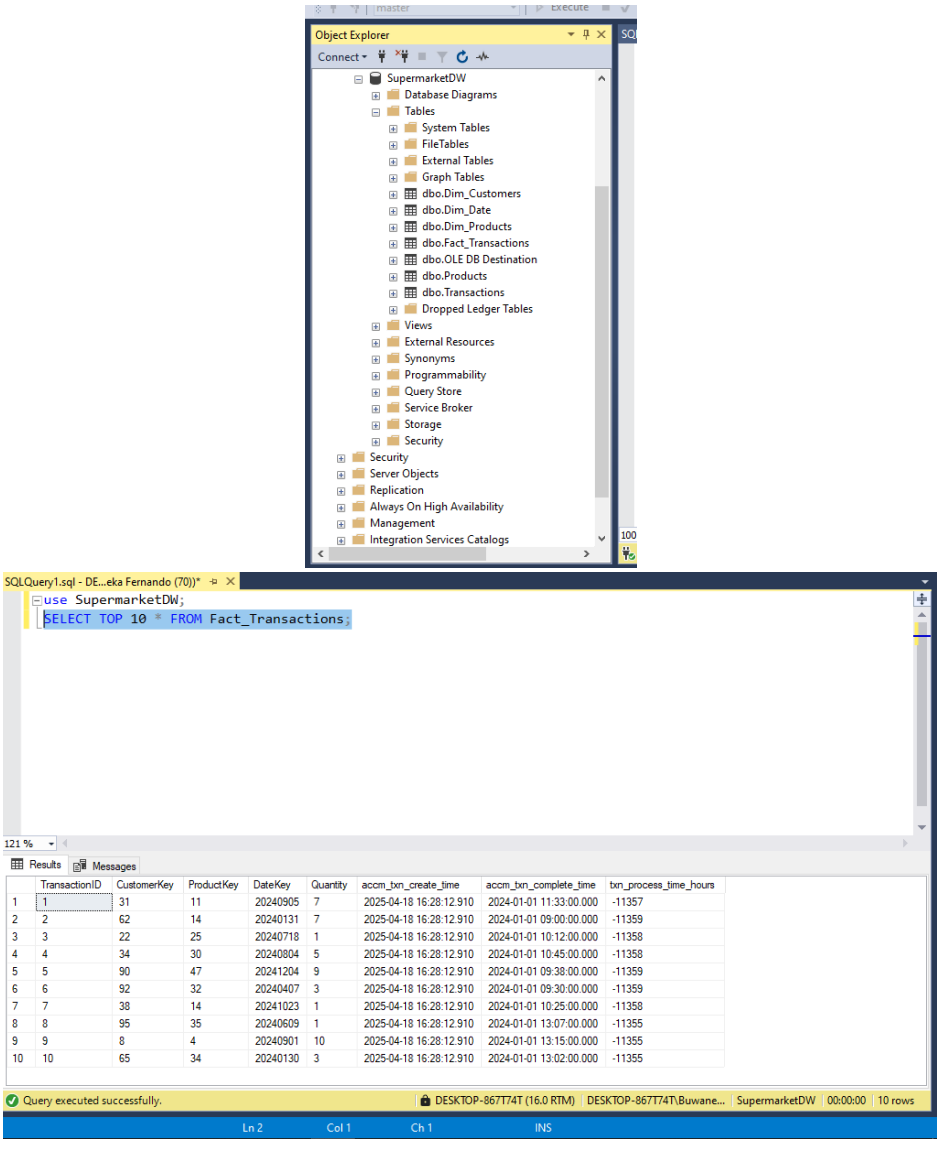
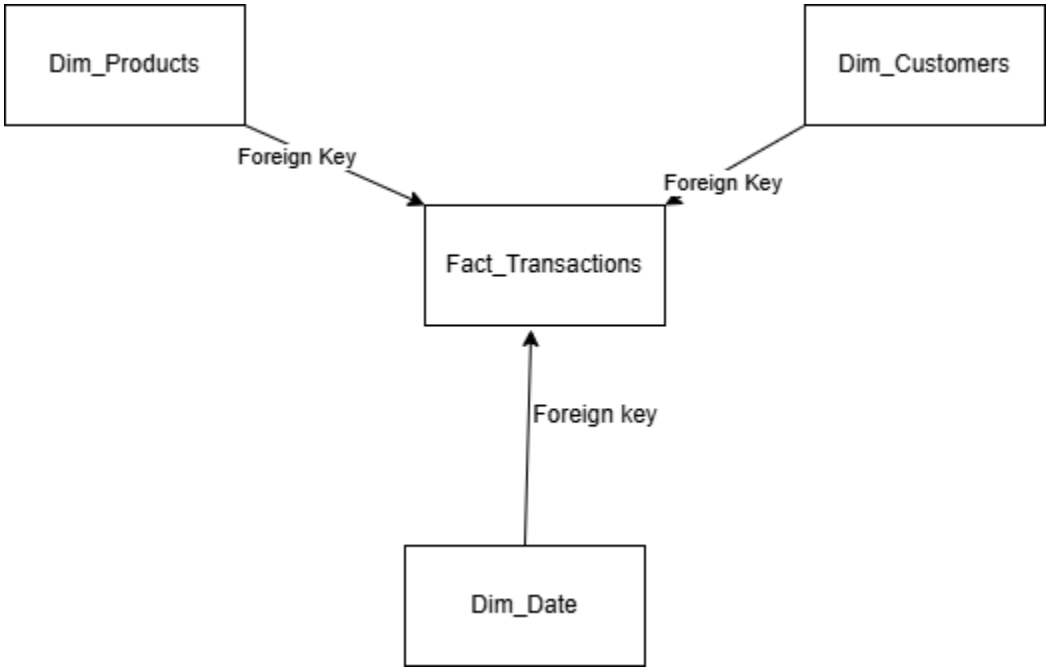
Data source

The date Source used for this project is the Supermarket_DW databases which is taken from the previous assignment 1. This Data source contains dimensional and fact tables as mention below :

- Dim_Customers
- Dim_Products
- Dim_Date
- Fact_Transactions.

These tables are based on a **Star Schema design** and include with 1 year simulated retail transaction data, prepared for OLAP analysis.





Star Schema

The database was created and popularized using SSIS ETL pipelines and present in Microsoft SQL Server and used as souces for both SQL Server Analysis Services (SSAS) and Power BI.

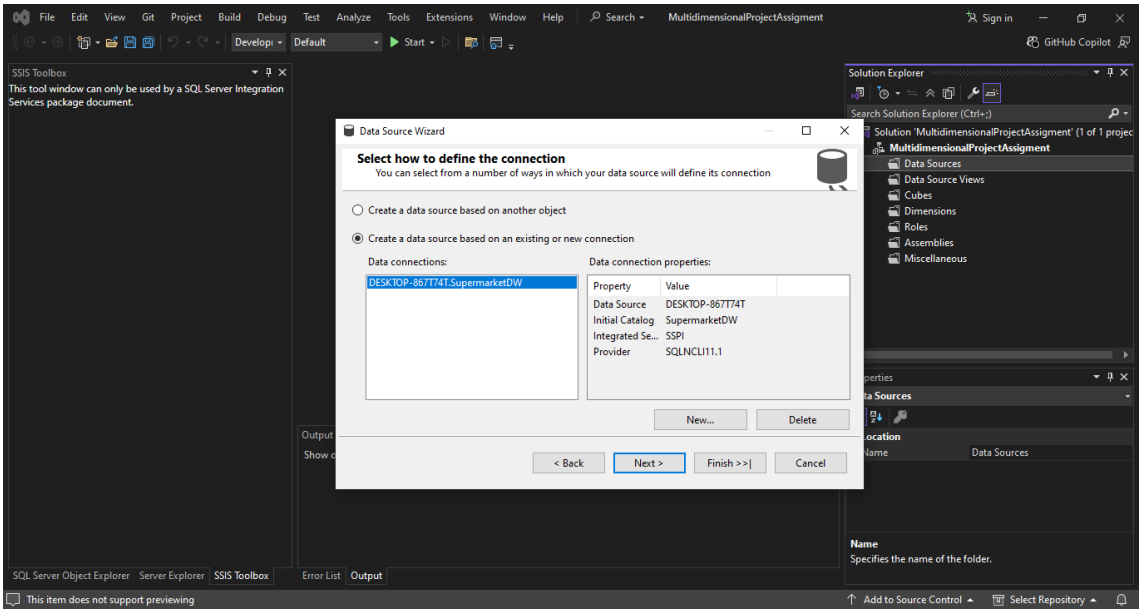
SSAS Cube Implementation

The cude called **SupermarketDWCube** was created in SQL Server Analysis Services and developed using SQL Server Data tools and the following dimensions

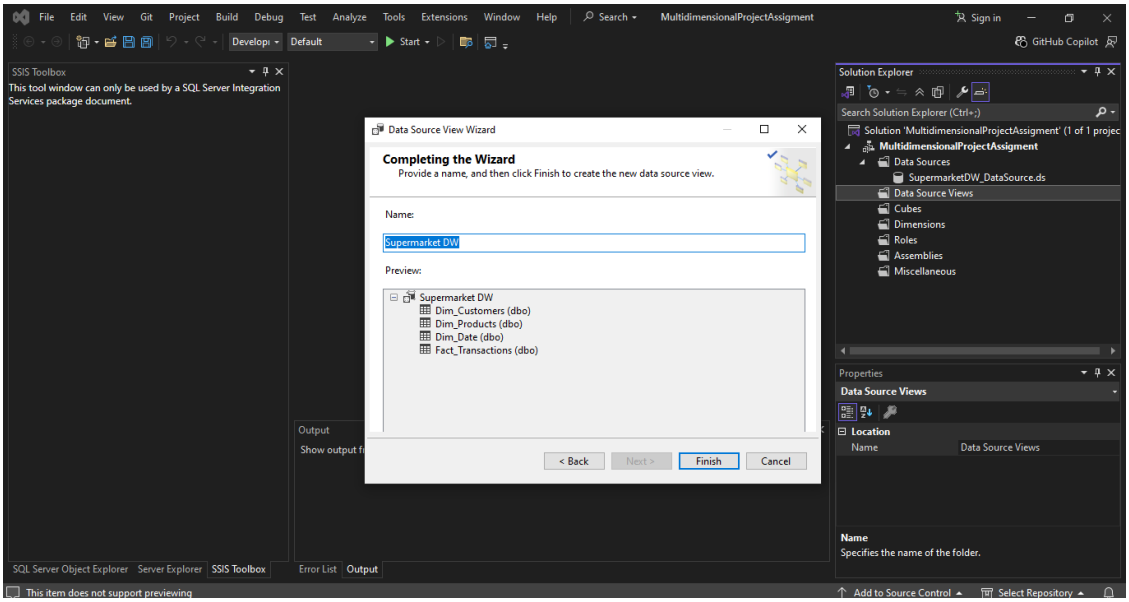
- Dim_Customer
- Dim_Product
- Dim_Date

And the keys that used to include are

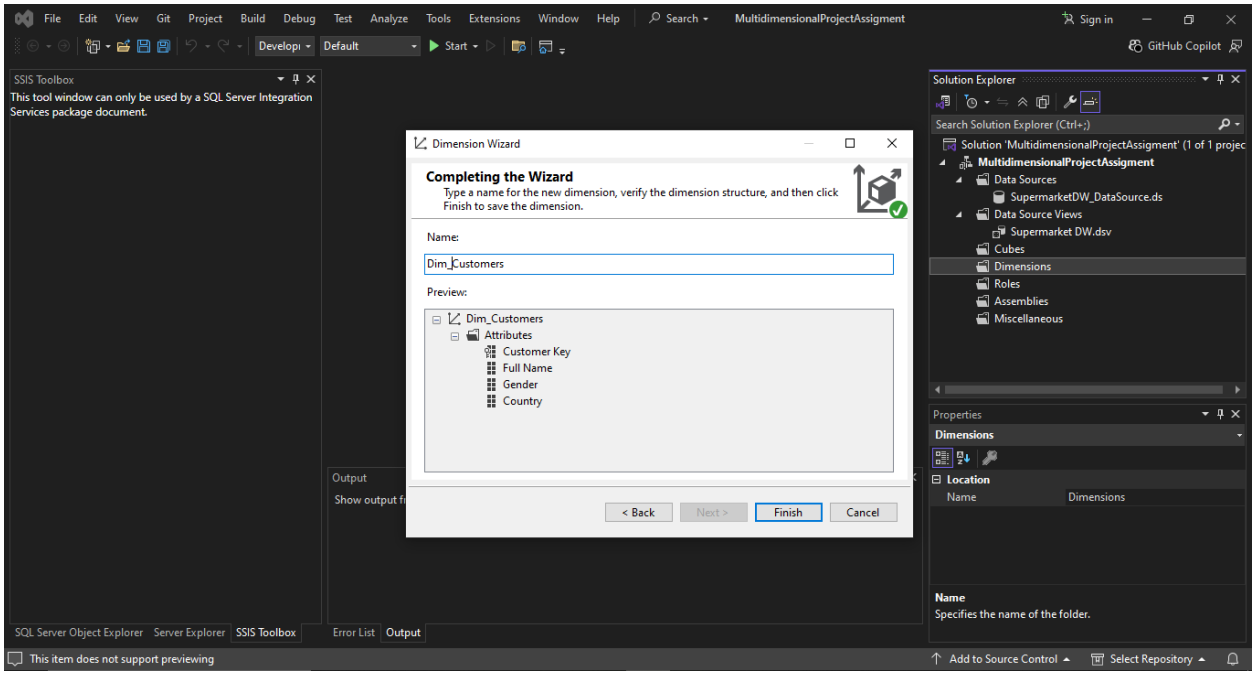
- Quantity in Dim_product
- txn_process_time_hours in dim_date



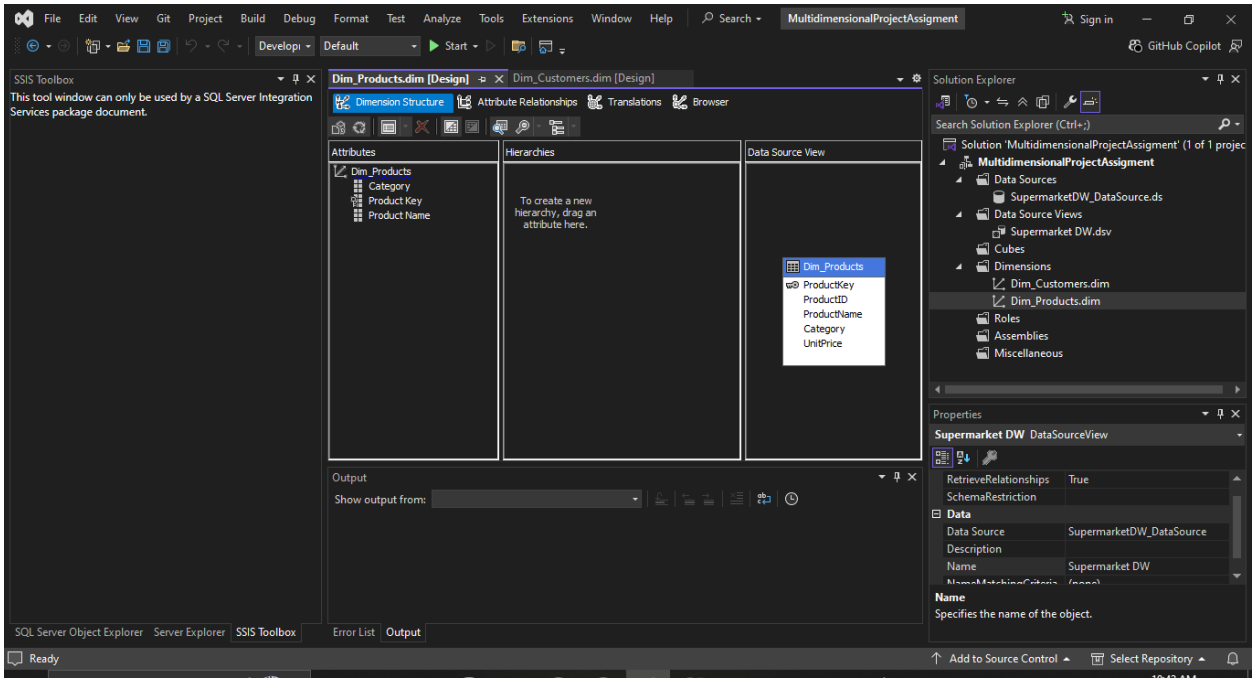
Data Source connection to SupermarketDW



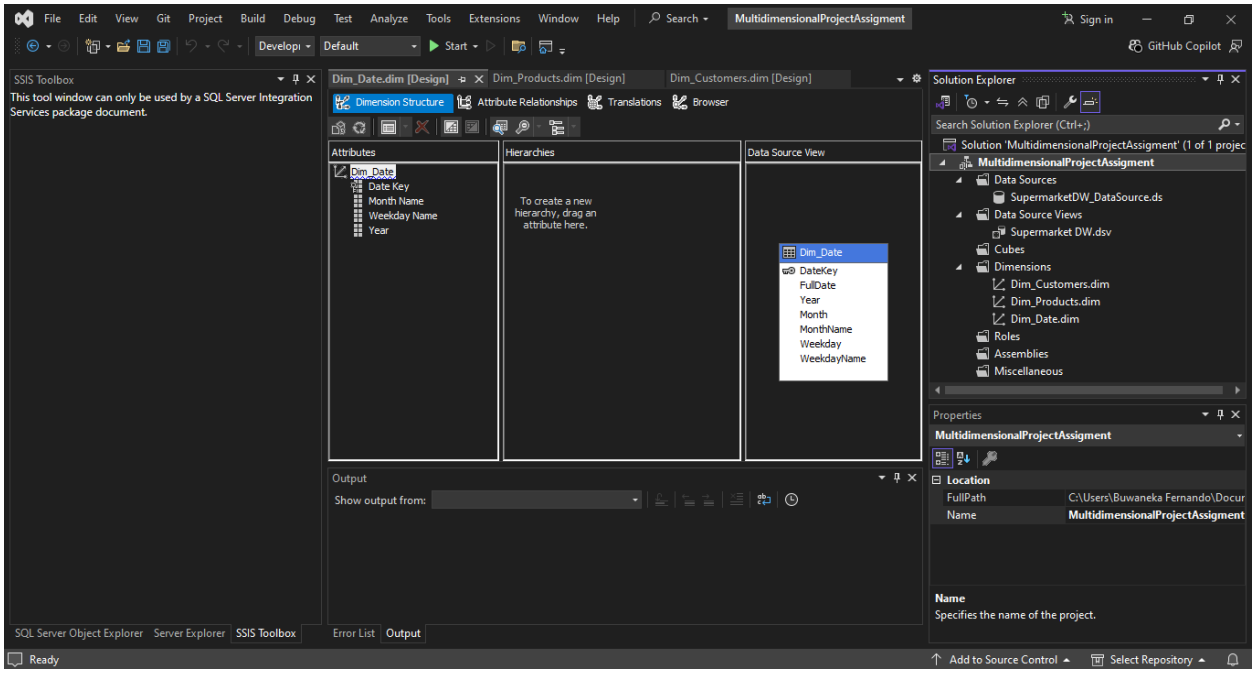
Data Source View (DSV)



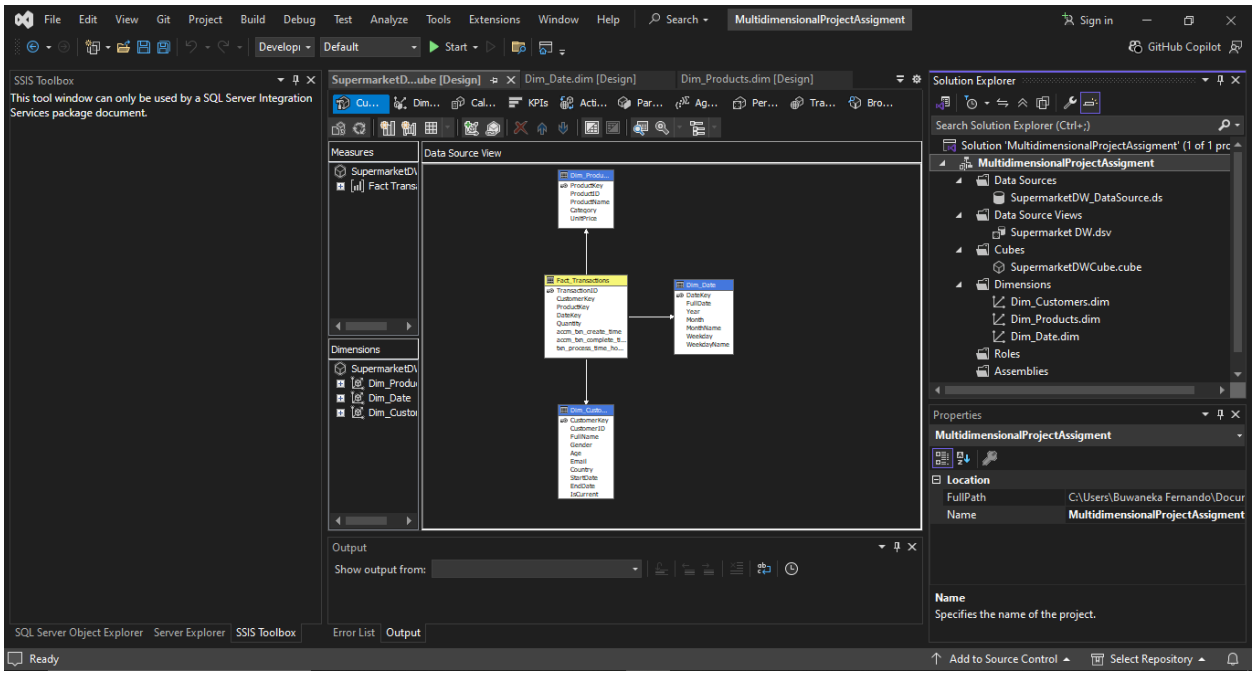
Customer Dimension attribute selection



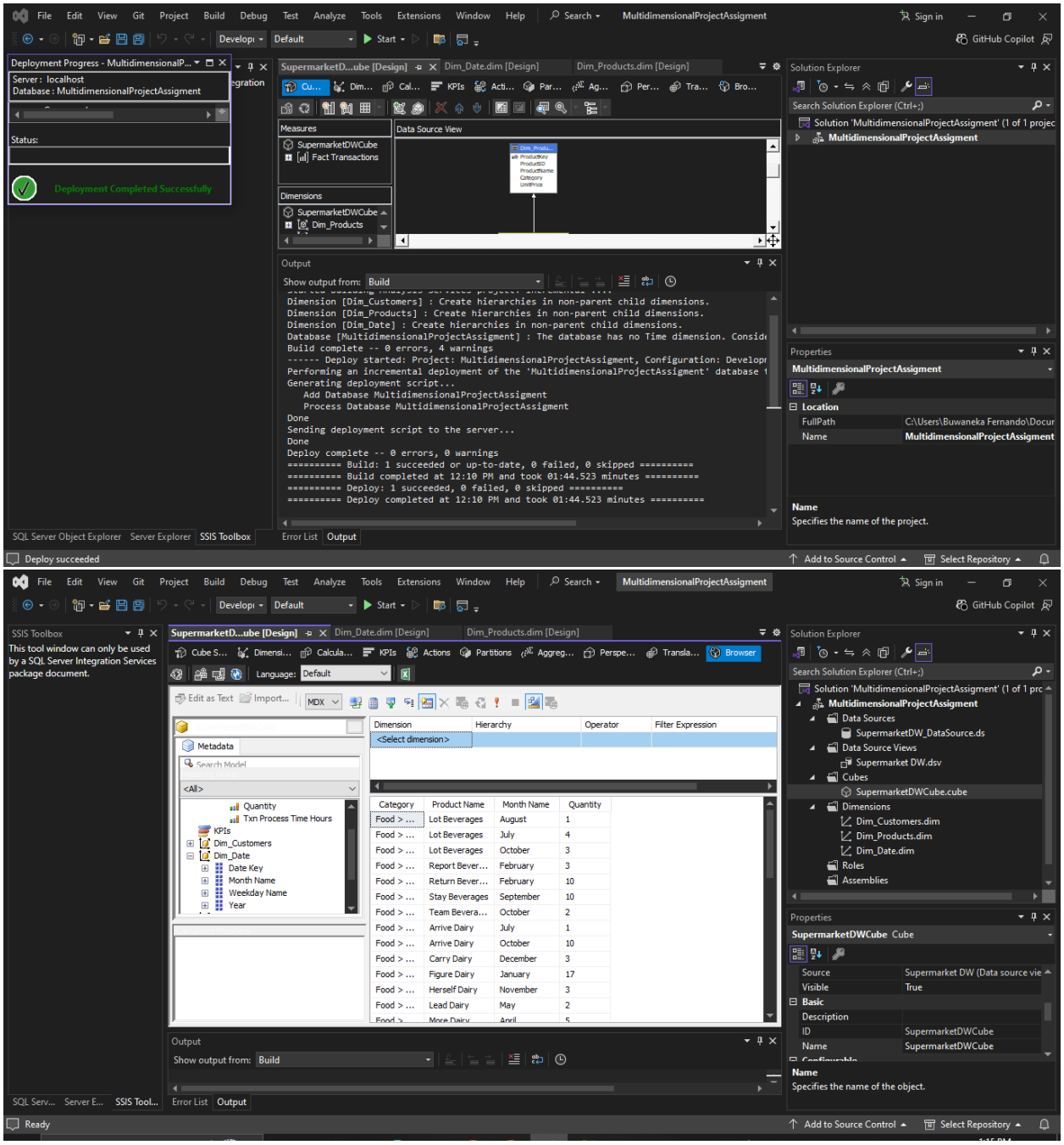
Product Dimension attribute selection



Date Dimension attribute selection



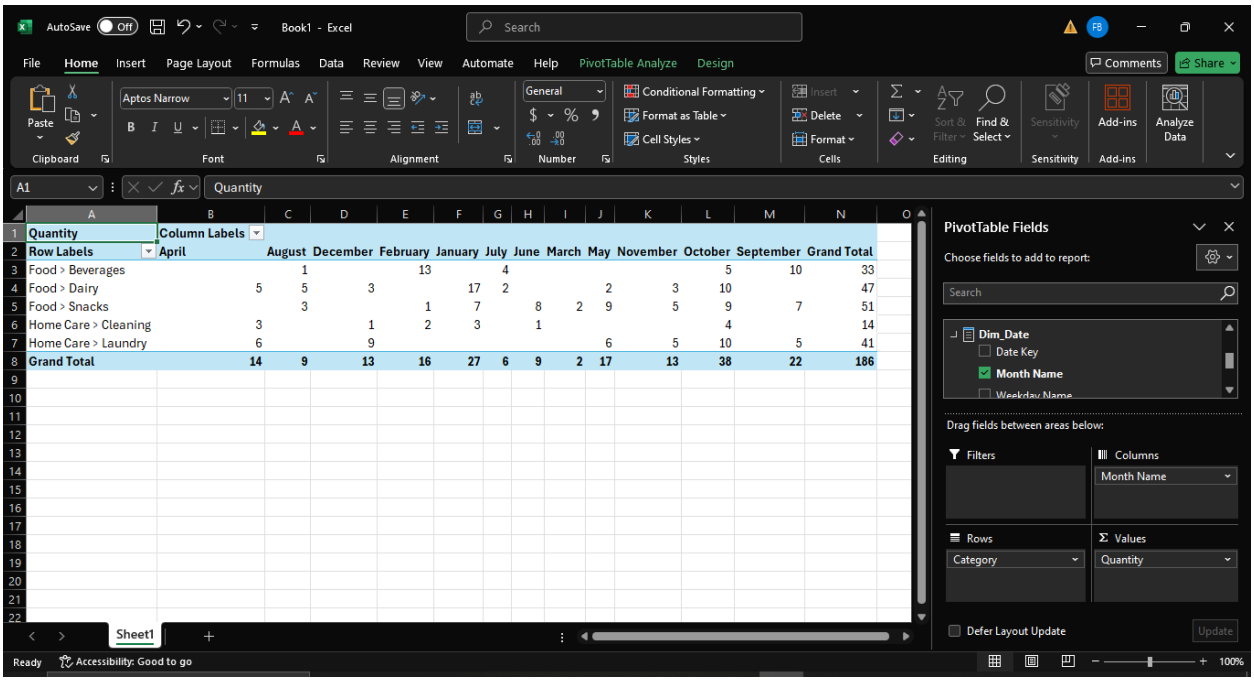
Cube Structure with dimensions and measures



Cube Browser

OLAP Operations in Excel

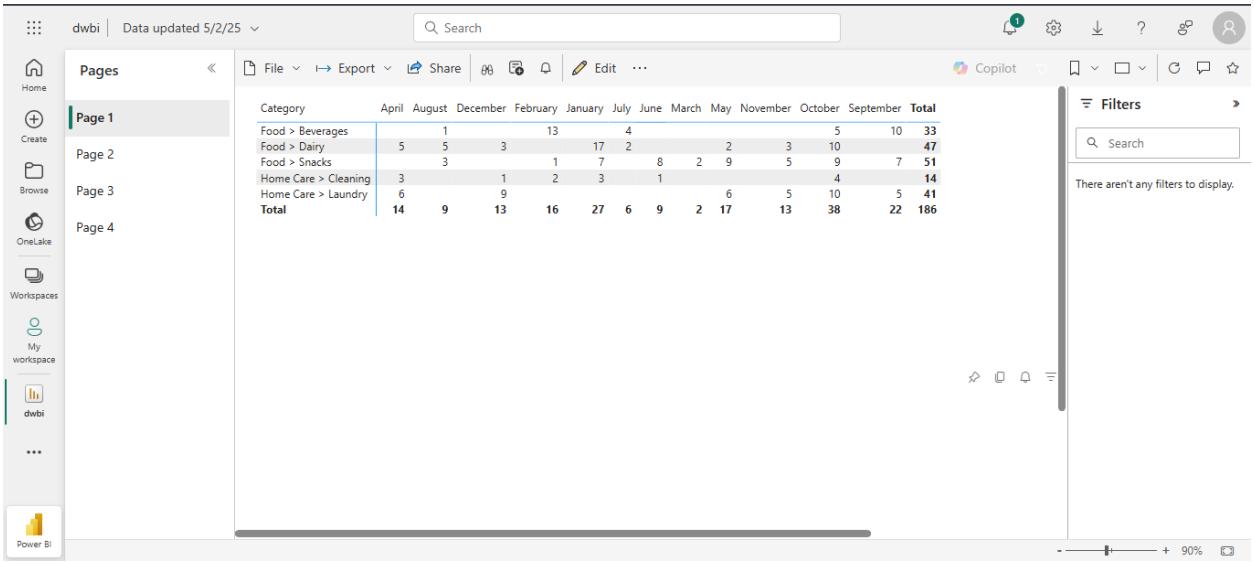
Excel was connected to the SSAS cube using the Analysis Services connector. In Excel Sheet, PivotTable was created to analyze the quantity sold by product category across months.



Excel PivotTable

Power BI Reports

Report 1: Matrix Visual



Category	April	August	December	February	January	July	June	March	May	November	October	September	Total
Food > Beverages		1		13		4					5	10	33
Food > Dairy	5	5	3		17	2			2	3	10		47
Food > Snacks		3		1	7		8	2	9	5	9	7	51
Home Care > Cleaning	3		1	2	3		1				4		14
Home Care > Laundry	6		9						6	5	10	5	41
Total	**14**	**9**	**13**	**16**	**27**	**6**	**9**	**2**	**17**	**13**	**38**	**22**	**186**

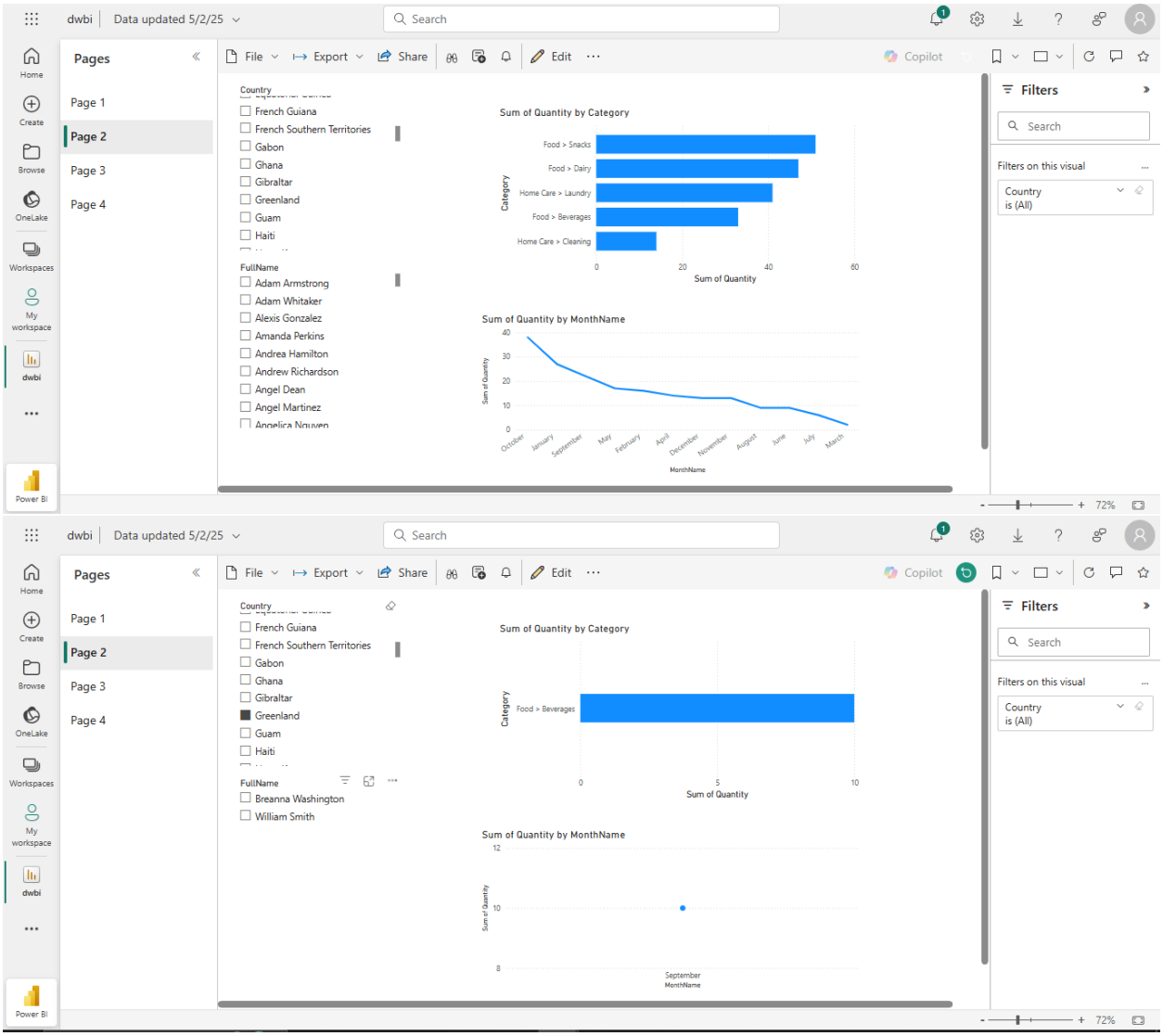
In this Report, it uses a matrix visual in Power BI to display the values of Quantity by Category from Product which is in rows and MonthName from Date which is in columns.

Steps :

- Open page and drag Matrix Icon from Visualization
- Draging the fields from dim tables which Category from DimProduct to Rows , Month Name from Dim_Date to Column ,and Quantity from Fact_Transaction to Values

Report 2: Cascading Slicers + Charts

The Country slicer filters available values in the Customer Name slicer, ensuring dynamic user control. Two interactive visuals bar chart and line chat which were created to analyze product categories with quantity and time-based on quantity in each month trends.



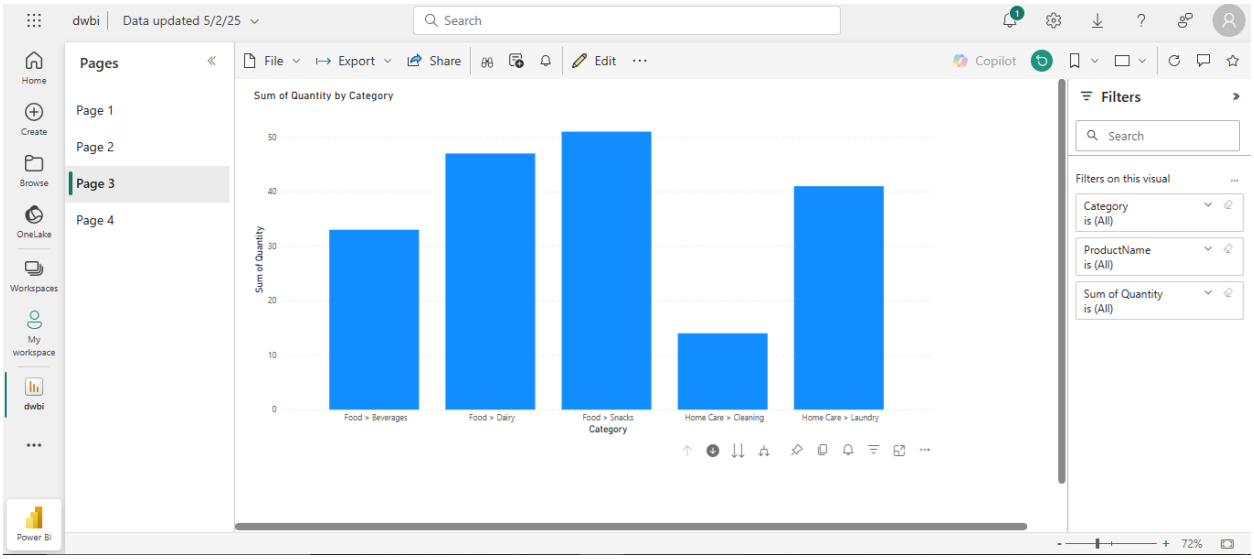
Steps:

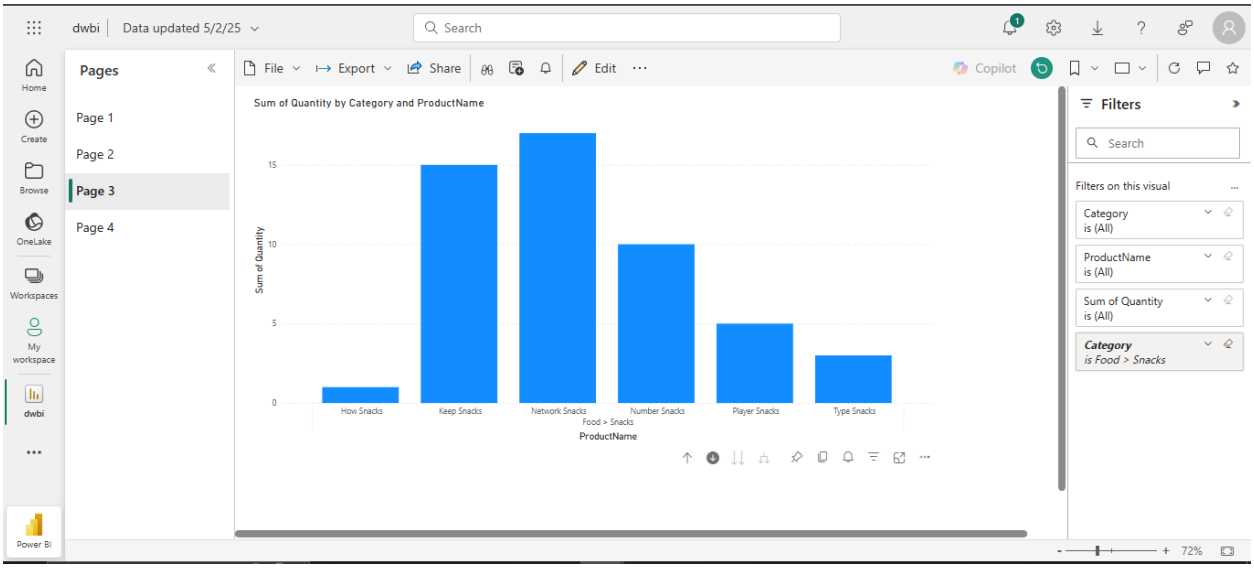
- Open page and drag two slicer for country and Full name for the customer
- Drag Two charts and include related fields

- Then the chart will present the data according to the slicer selection or whole data

Report 3: Drill-Down

In this report, it used a drill-down from Product Category to Product Name using a column chart. This helps users to explore how product categories break down into individual item with their Quantity.





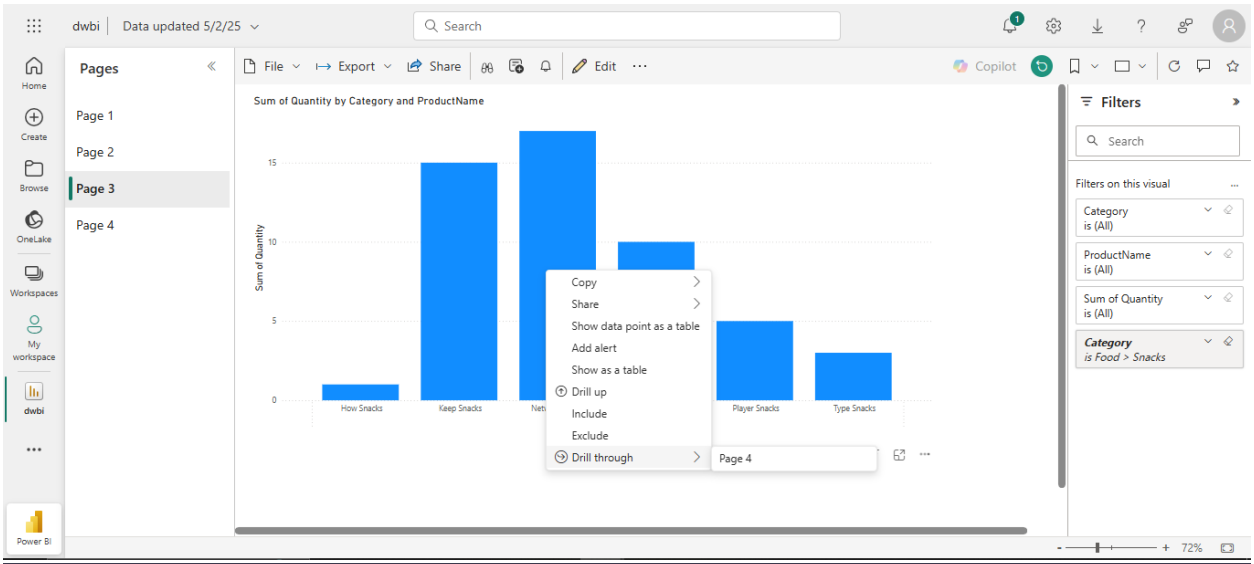
Steps:

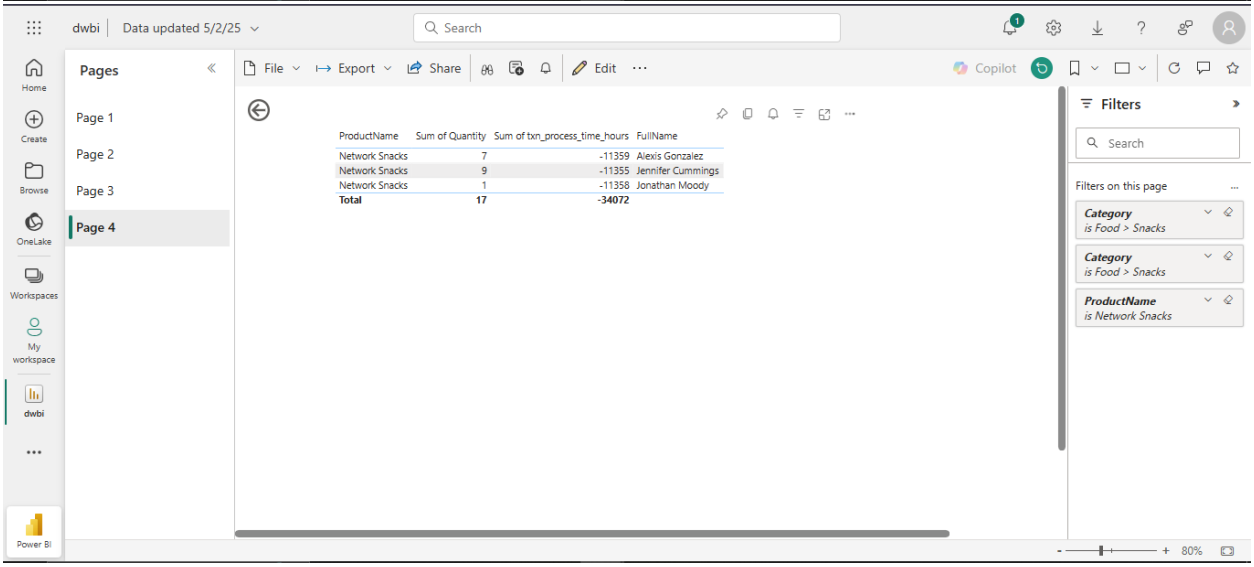
- Drag a chart

- Add the category and the product name to the x axis
- drag Quantity into Values
- Enable Drill-Down

Report 4: Drill-Through Report

implements a drill-through page using Product Category as the filter. When do right-click on a category in the main report and navigate to a detail page, where related transactional records are displayed.





Steps:

- Scroll down to find the section “Drill-through”
- Drag a field
- Add a table and populate with details(Product_name, Quantity**,** Date, CustomerName)
- Back to the page of report 3 chart
- Right click and click Drill-Through
- Then, it will appear the details of the relevant filtered detail.

Conclusion

This assignment use the the complete OLAP lifecycle by demonstrating and using the data warehouse built in Assignment 1.

It added a cude creation with SSAS, OLAP analysis in Excel and interactive report using PowerBI.