

Sri Lanka Institute of Information Technology

Data Warehousing and Business Intelligence - IT3021

Assignment 02



Rathnayake R M C T

Year 3 Semester 2

Group 2.2

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1. Data Source

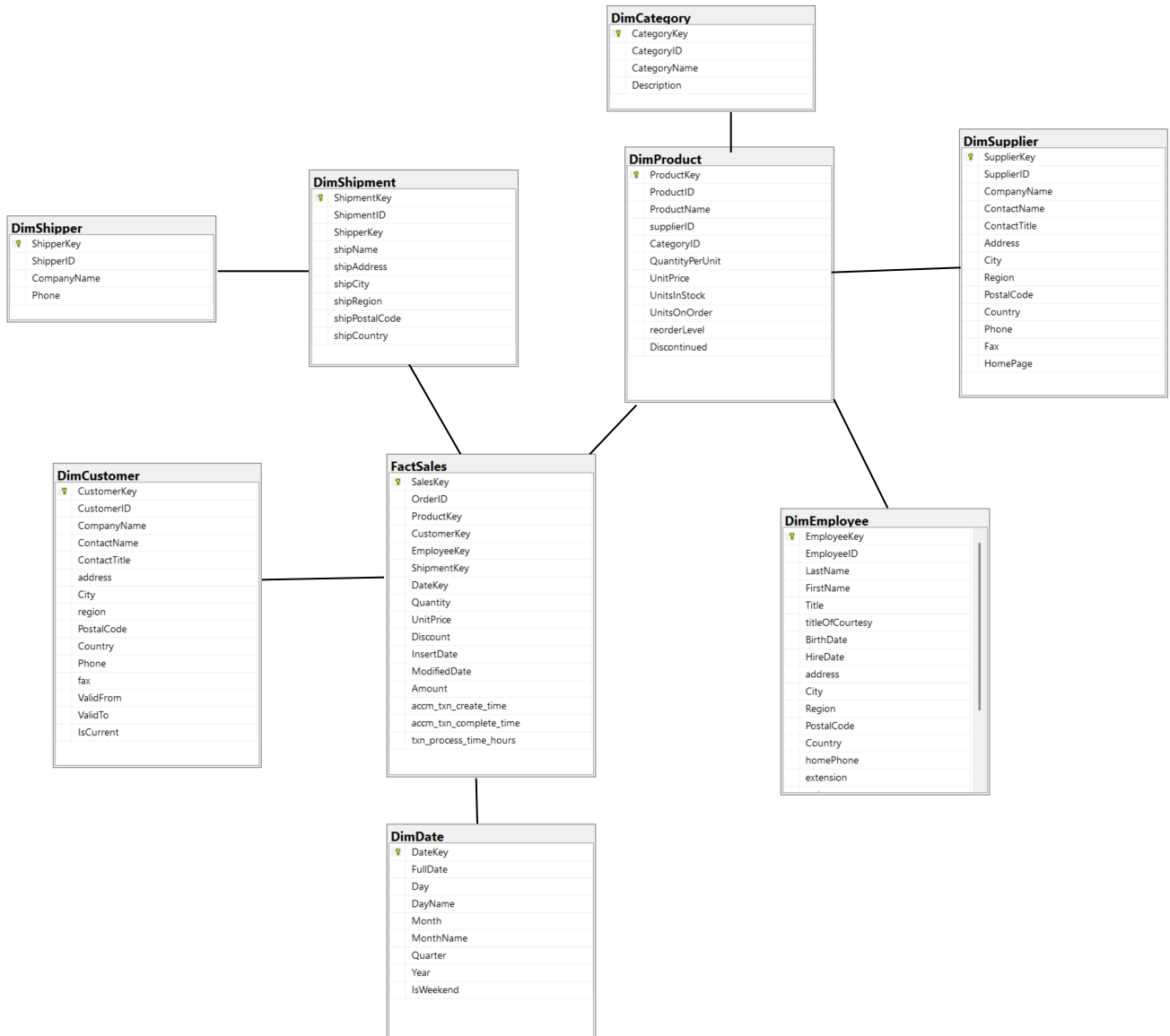


Table Name	Table Type	Primary Key	Business/ Natural Key(s)	Description	Key Attributes / Notes
DimCustomer	Dimension	CustomerKey	CustomerID	Stores details of customers.	Contact details, address, ValidFrom, ValidTo, IsCurrent (for slowly changing dimension support).
DimEmployee	Dimension	EmployeeKey	EmployeeID	Stores details of employees who manage orders.	Hierarchical (ReportsTo), includes birth/hire date, title, PhotoPath.
DimProduct	Dimension	ProductKey	ProductID	Stores product information.	Includes category, supplier, inventory stats, Discontinued flag.
DimDate	Dimension	DateKey	FullDate	Stores date/time breakdown.	Supports time intelligence: Day, Month, Quarter, IsWeekend, etc.
DimSupplier	Dimension	SupplierKey	SupplierID	Stores info about suppliers.	Company contact info, homepage, address.
DimShipment	Dimension	ShipmentKey	ShipmentID	Stores order shipment-related details.	Related to DimShipper via ShipperKey. NOTE: Trailing comma in script will throw error.
DimShipper	Dimension	ShipperKey	ShipperID	Stores shipper company details.	Basic info like name and contact number.
DimCategory	Dimension	CategoryKey	CategoryID	Stores product categories.	Includes name and description of category.

FactSales	Fact	SalesKey	OrderID	Captures sales transactions.	Foreign keys to all dimensions. Measures: Quantity, UnitPrice, Discount, Amount (calculated). Has process timestamps: accm_txn_create_time, accm_txn_complete_time, txn_process_time_hours (calculated).
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2. SSAS Cube implementation

1. Created project using Analysis Service Multidimensional Project and named it as Northwind_SSAS.

Configure your new project

Analysis Services Multidimensional Project

Project name

Northwind_SSAS

Location

C:\Northwind DW Solution

Solution

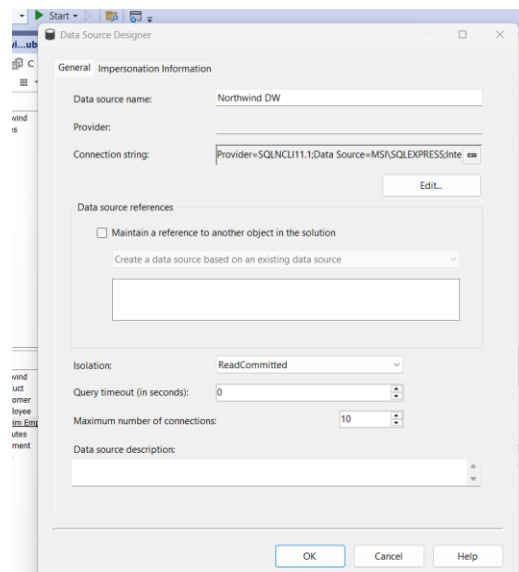
Create new solution

Solution name ⓘ

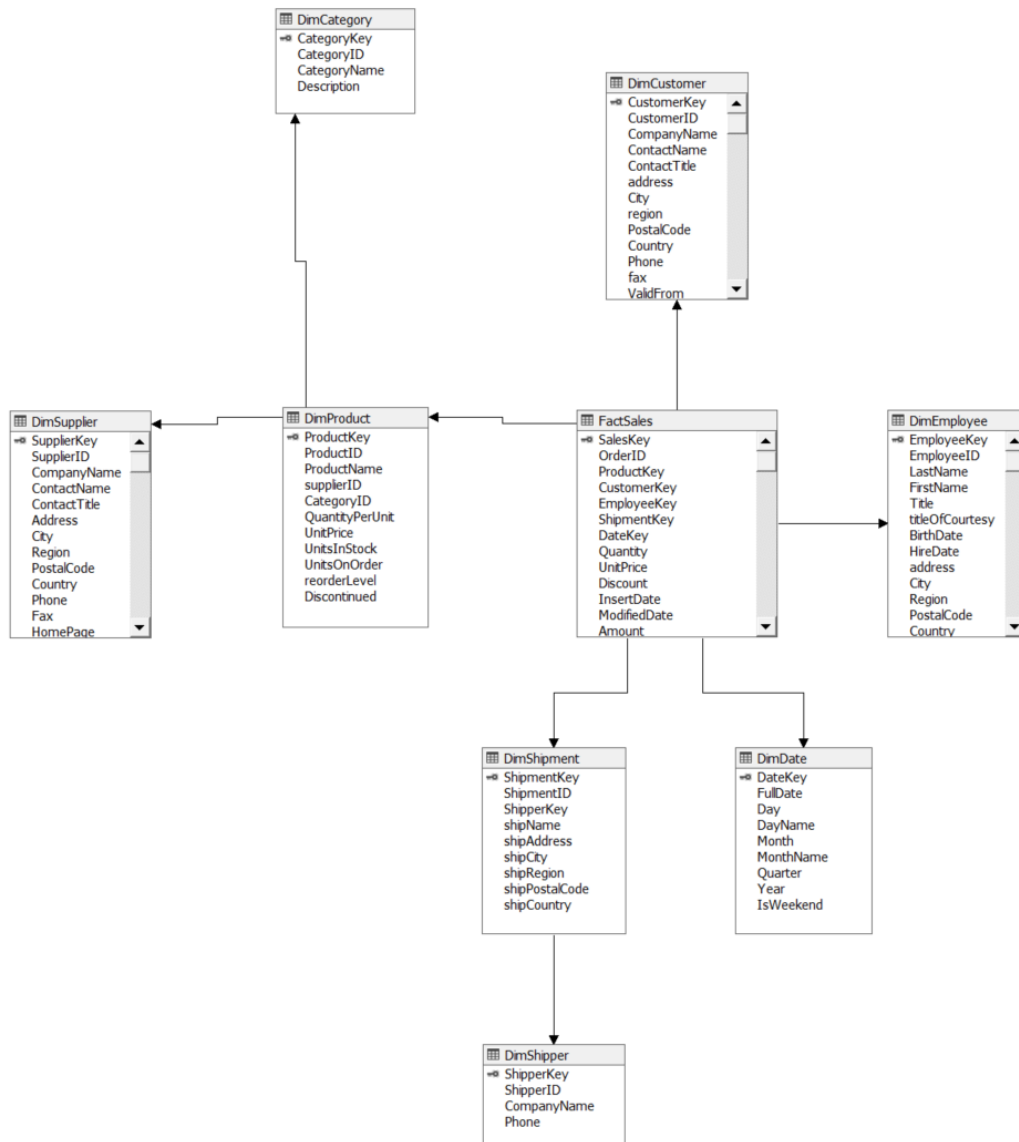
Northwind_SSAS

☒ Place solution and project in the same directory

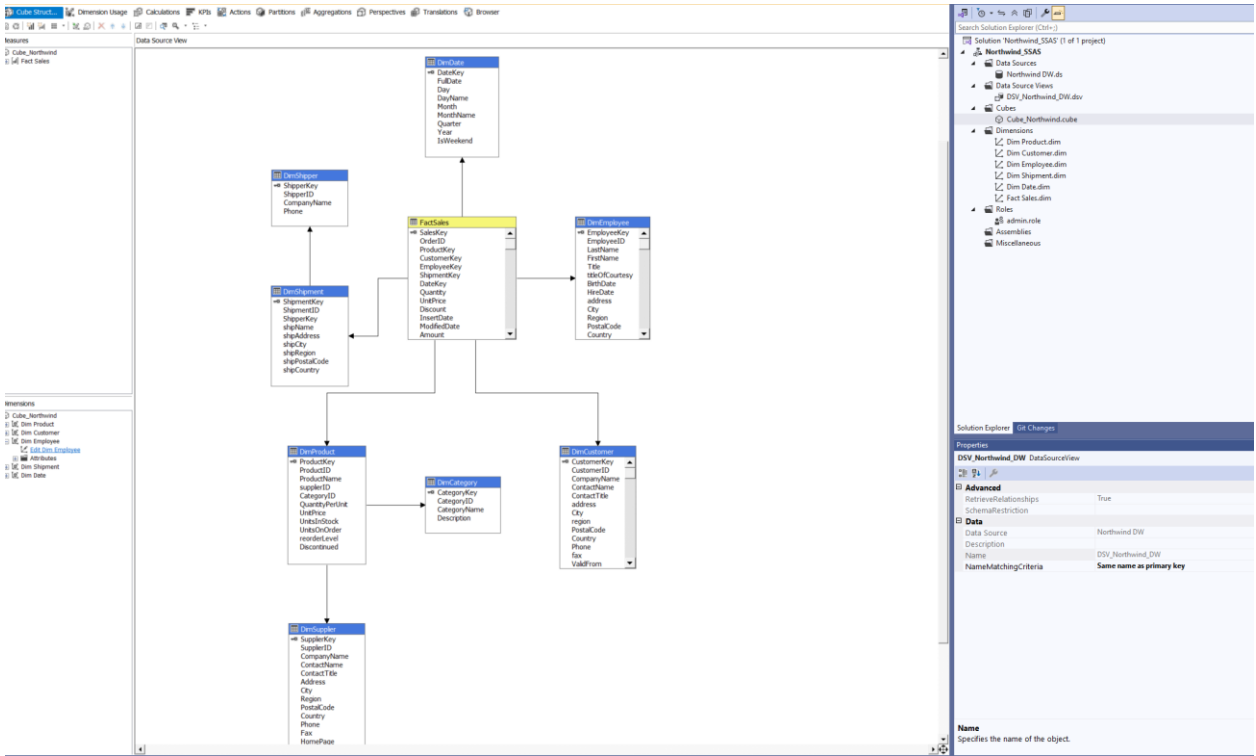
2. Added a Data Source named Northwind_DW and connected the created Northwind Data Warehouse.



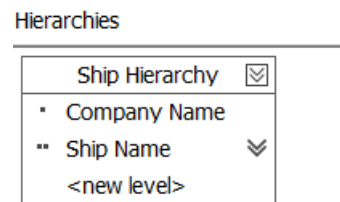
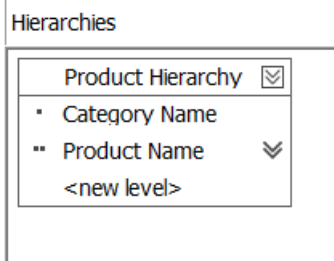
3. Created a Data Source View named DSV_Northwind_DW and added fact table and all the related dimensions.



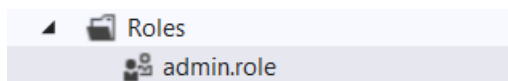
4. Added new Cube named Cube_Northwind_DW and added fact table as the measure table.



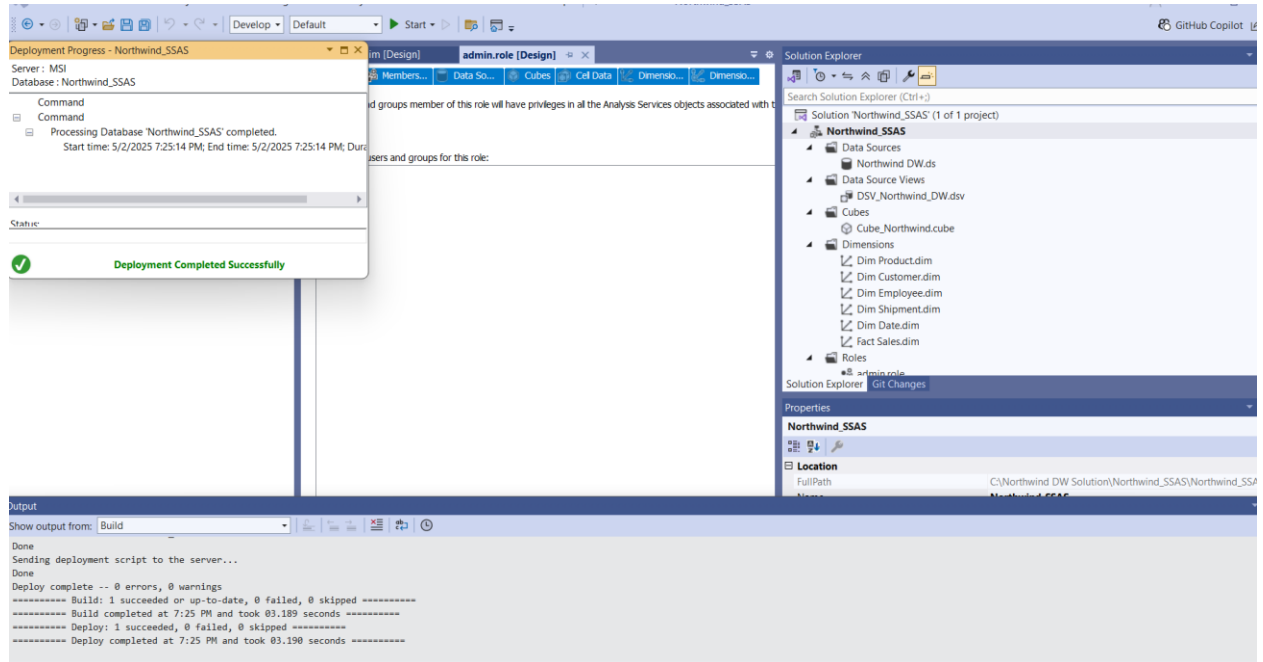
5. Created two hierarchies for Product->Category and Shipment->Shipper.



6. Added a Role granting all permissions as admin.



7. Deployed the Northwind_SSAS Analysis project

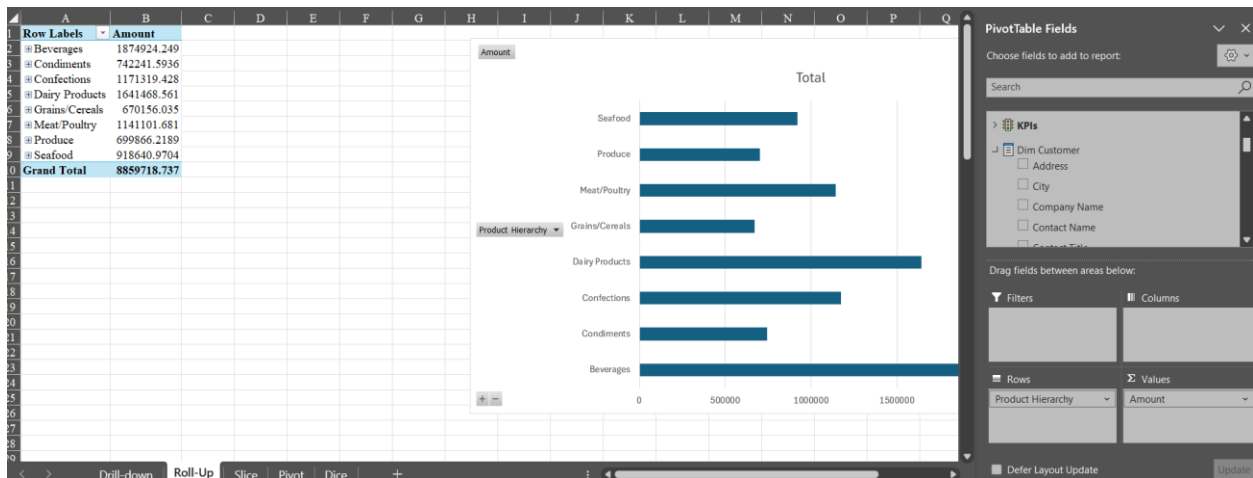


3. Demonstration of OLAP operations

- Opened Excel file and Data->Get Data-> From Database-> From Analysis Service and added Server name, selected I created (Cube_Northwind) and got the cube data to Excel sheet.
- Created PivotTableReports and pivot Charts for Roll-up, Drill-Down, Slice, Dice, Pivot.

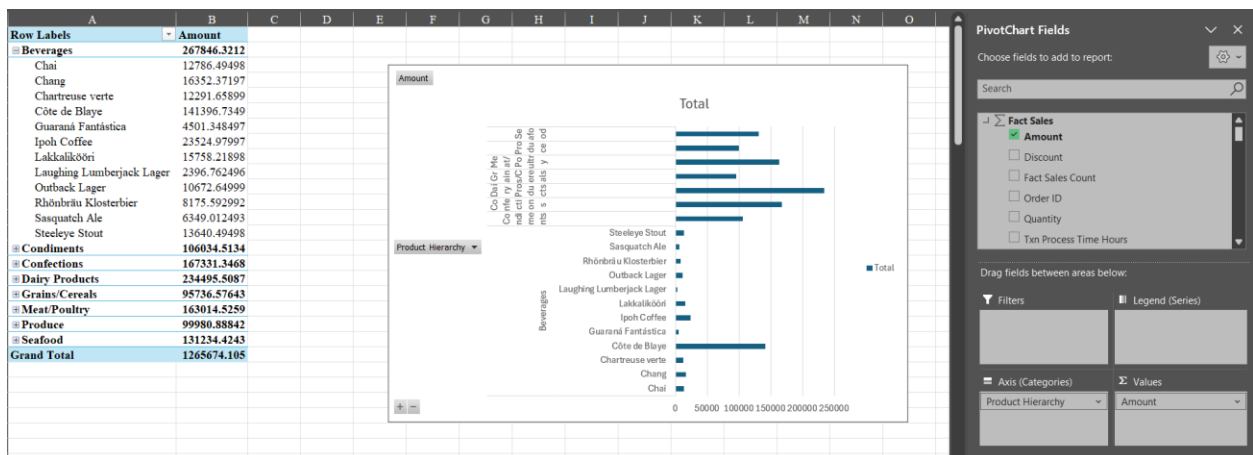
3.1.Roll-up

- Summarized sales from Product → Category level.



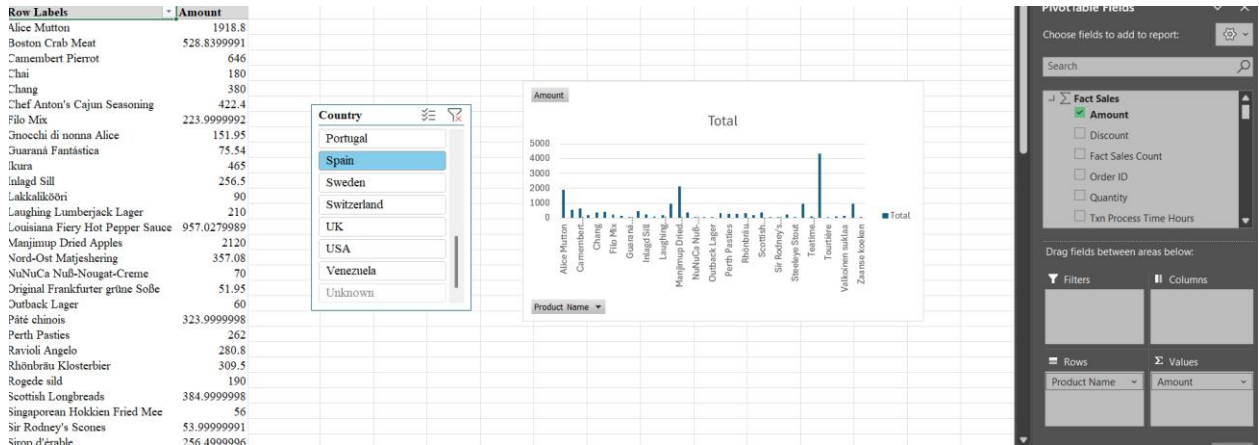
3.2.Drill-Down

- Navigate from categories->individual products with Amount.



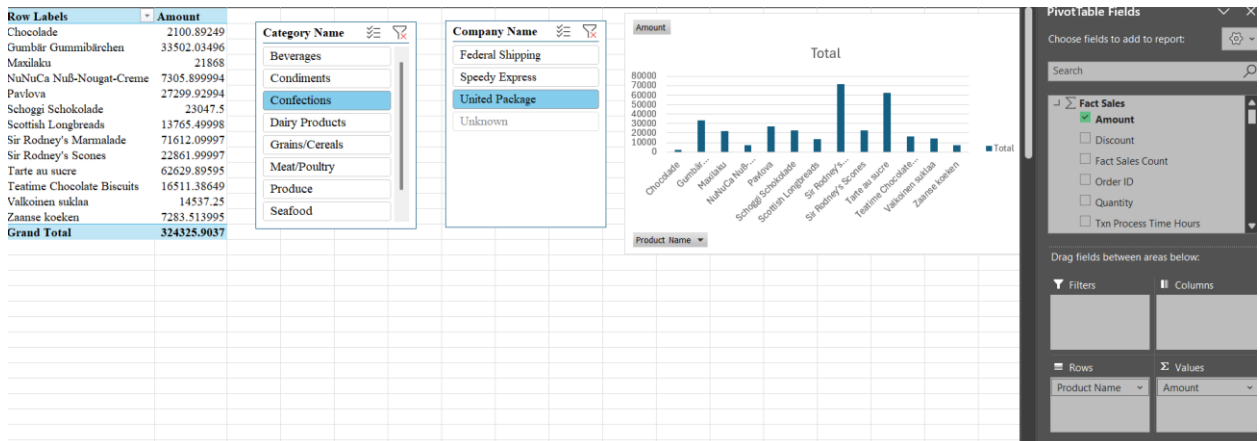
3.3.Slice

- Filter product sales by customer's Country.



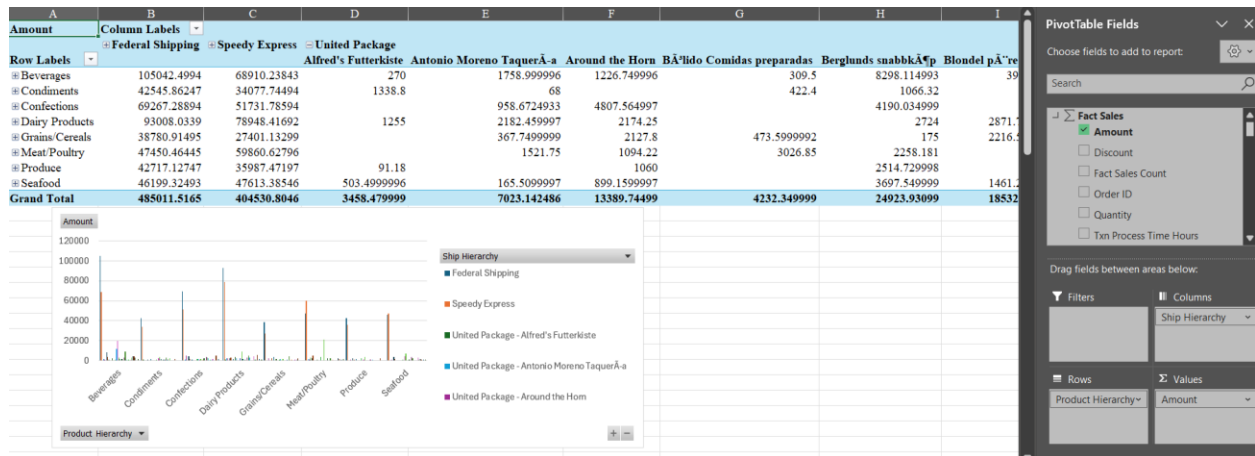
3.4.Dice

- Filter Product by Category & Customer's Company



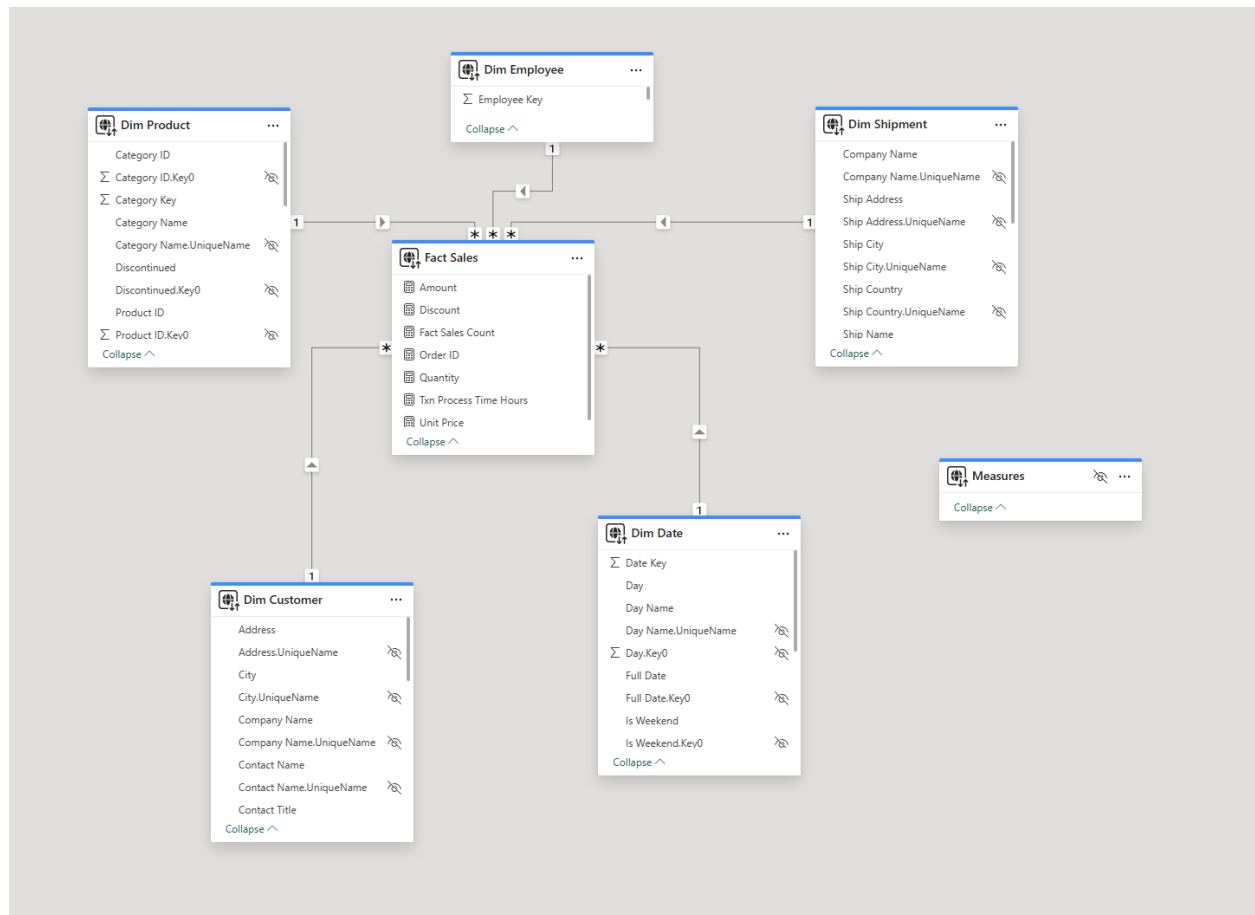
3.5.Pivot

- Compare sales by Category (rows) vs. Shipper (columns)



4. PowerBI Reports

- Connect to SSAS OLAP cube:
 - Opened Power BI Desktop and Home-> Get Data-> Analysis Services
 - Added my server and connected live for the server which includes the SSAS database.
 - Chooosed Cube_Northwind cube I created in SSAS project and loaded the data to Power BI.



4.1. Report 1: Matrix Visual with Row/Column Groupings

- This report uses a Matrix visual to display detailed sales data with hierarchical grouping by Year and Quarter (columns), and Product Category and Product Name (rows). It helps users analyze performance trends across time and with subtotals and clean formatting for easy navigation.
 - In the Report view added Matrix visual from Visualization pane.

Country	2022	2023	2024	Total
Poland	459.00	987.32	2,085.48	3,531.80
Warszawa	459.00	987.32	2,085.48	3,531.80
Wolski Zajazd	459.00	987.32	2,085.48	3,531.80
Norway	3,506.53	1,169.95	1,058.25	5,734.73
Stavern	3,506.53	1,169.95	1,058.25	5,734.73
SantÅ© Gourmet	3,506.53	1,169.95	1,058.25	5,734.73
Argentina	5,131.44	2,219.95	767.22	8,118.61
Buenos Aires	5,131.44	2,219.95	767.22	8,118.61
Cactus Comidas para llevar	680.40	477.00	657.22	1,814.62
Rancho grande	1,911.84	932.00		2,843.84
OcÅ©ano AtlÅ©ntico Ltda.	2,539.20	810.95	110.00	3,460.15
Portugal	3,130.59	7,973.19	367.05	11,470.83
Lisboa	3,130.59	7,973.19	367.05	11,470.83
Princesa Isabel Vinhos	1,136.04	3,908.32		5,044.36
Furia Bacalhau e Frutos do Mar	1,994.55	4,064.87	367.05	6,426.47
Italy	7,718.79	3,598.32	4,450.56	15,767.67
Torino	18.39	1,123.45	403.78	1,545.62
Franchi S.p.A.	18.39	1,123.45	403.78	1,545.62
Reggio Emilia	4,090.92	1,240.34	1,716.24	7,047.50
Reggiani Caseifici	4,090.92	1,240.34	1,716.24	7,047.50
Bergamo	3,609.48	1,234.53	2,330.54	7,174.55
Magazzini Alimentari Riuniti	3,609.48	1,234.53	2,330.54	7,174.55
Spain	5,999.97	5,360.75	6,620.60	17,981.32
Barcelona	338.15	362.50	135.90	836.55
GalerÅ©a del gastrÅ©nomo	338.15	362.50	135.90	836.55
Madrid	3,629.65	1,480.00	589.88	5,699.53
Romero y tomillo	602.80	498.50	365.88	1,467.18
BÅ©lido Comidas preparadas	3,026.85	981.50	224.00	4,232.35
Sevilla	2,032.17	3,518.25	5,894.82	11,445.24
Godos Cocina TÅ©pica	2,032.17	3,518.25	5,894.82	11,445.24
Finland	4,415.40	11,748.72	2,644.43	18,808.54
Helsinki	909.55	2,251.43		3,160.98
Wilmann Kala				
Total	476,806.89	358,371.74	430,495.47	1,265,674.11

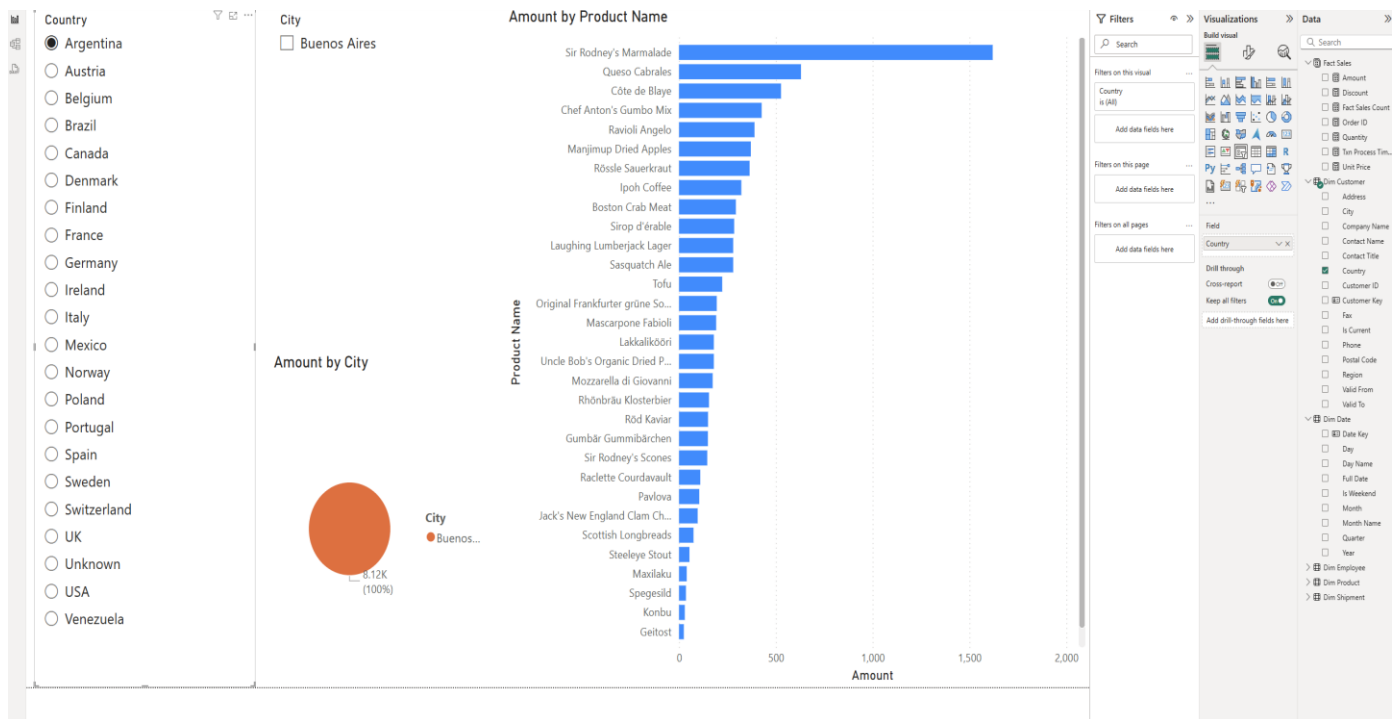
Filters

Visualizations

Data

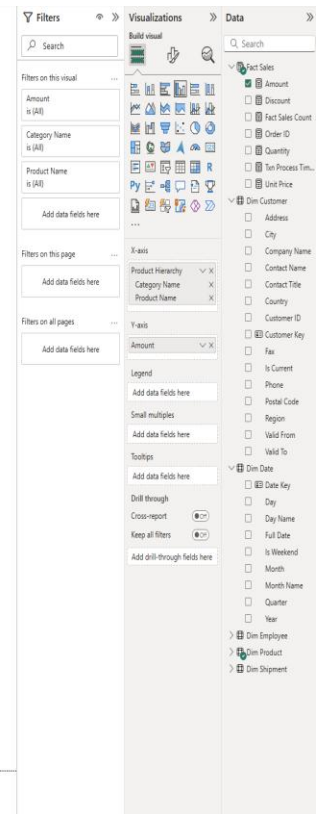
4.2.Report 2: Multiple Slicers with Cascading Filters

- This report uses multiple slices with cascading filters (Country->City), allowing users to dynamically filter the dataset. It includes multiple visuals like bar charts and pie charts to provide insight into sales distribution among Customer's geographical locations.
 - Drag two Slicers from visual and add DimCustomer[Country] as one field for the second slicer added DimCustomer[City] as the field.



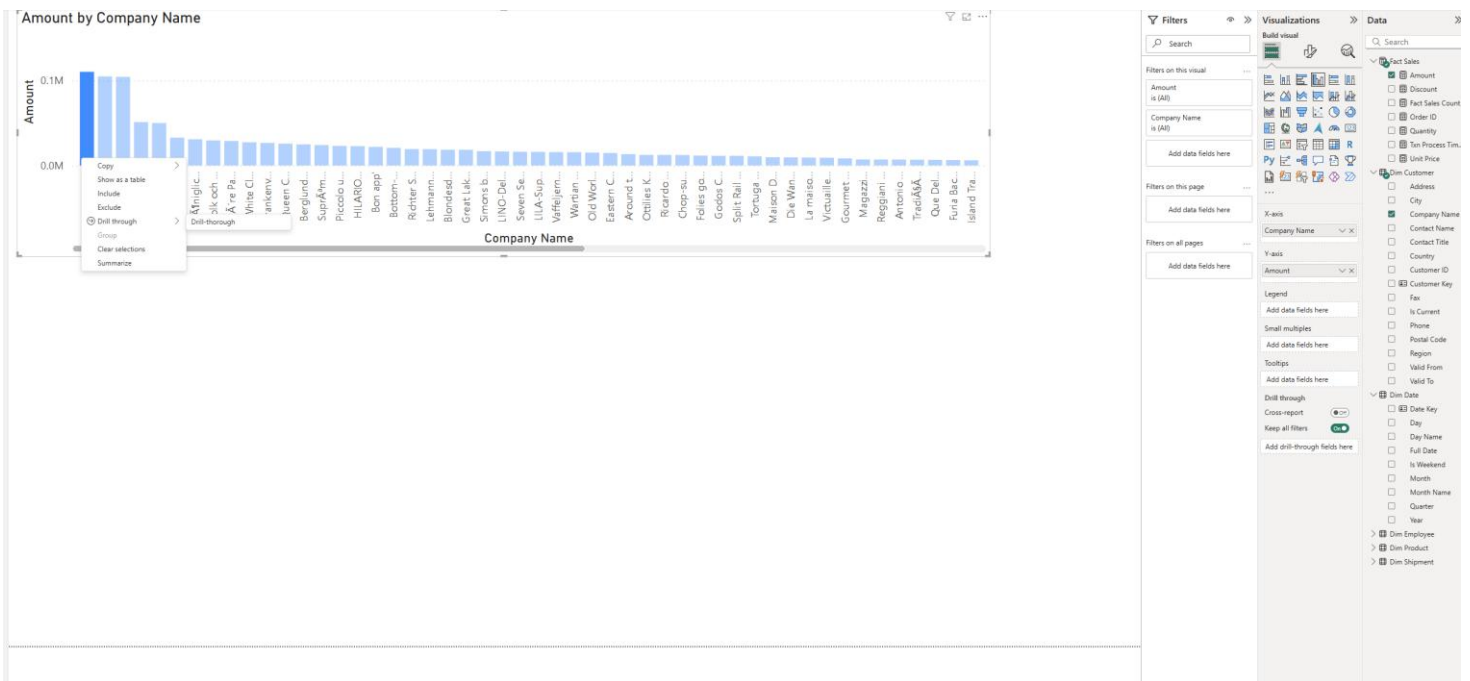
4.3.Report 3 - Drill-Down Report (Hierarchy)

- This report provides sales performance using Product->Category hierarchy. With a bar chart, users can drill down from broad categories to individual products.
 - Added a bar chart and used Product hierarchy I created in SSAS project as the X axis and FactSales[Amount] as Values.
 - In the top left of the chart enabled Drill Down so we can click the category and go to the products which belong to that category.



4.4.Report 4: Drill-Through Report

- This report allows users to right click on Company data and drill through to a separate page which includes Product sales among different Customers which belongs to that particular Company. It's like a detailed view of a data point.
 - In a blank canvas page drag DimCustomer[CompanyName] to the Drill through section field.
 - Added a Matrix from Visualizations pane and added DimProduct[ProductName] as the row, DimCustomer[FirstName] as the column and FactSales[Amount] as the value field.
 - Created a new page(main report page) and added a bar chart and added DimCustomer[CompanyName] as the X axis and FactSales[Amount] as the Y axis.
 - When we right click on a bar and click on Drill-through we navigate to the page we created before with the details of the customer who belong to that Company.



Main report page

Product Name	Andrew	Anne	Janet	Laura	Margaret	Nancy	Robert	Steven	Total
Zaanse koeken					417.45				417.45
Wimmers gute Semmelknödel				1,596.00	837.90				2,433.90
Uncle Bob's Organic Dried Pears				4,050.00					4,050.00
Tunnbröd				567.00					567.00
Thüringer Rostbratwurst	4,951.60								4,951.60
Teatime Chocolate Biscuits	584.00					436.52			1,020.52
Tarte au sucre	2,365.92			1,576.00					3,941.92
Steeleye Stout				1,844.00					1,844.00
Sirup d'érable					364.64				364.64
Sir Rodney's Scones					600.00				600.00
Sir Rodney's Marmalade			1,215.00		1,539.00				2,754.00
Singaporean Hokkien Fried Mee	1,220.71			529.20	560.00				2,309.91
Scottish Longbreads			437.50						437.50
Schoggi Schokolade	5,268.00								5,268.00
Rogede sild								807.50	807.50
Rhönbräu Klosterbier						294.50			294.50
Raclette Courdavault		2,475.00		1,375.00					3,850.00
Perth Pasties				655.80		754.56			1,410.36
Pavlova	872.50								872.50
Pâté chinois					2,073.60				2,073.60
Outback Lager				750.00		240.00			990.00
Original Frankfurter grüne Soße					1,378.80				1,378.80
Northwoods Cranberry Sauce	2,240.00								2,240.00
Mozzarella di Giovanni		243.53	1,217.65						1,461.18
Mishi Kobe Niku	1,319.20								1,319.20
Manjimup Dried Apples			1,749.00					2,162.40	3,911.40
Louisiana Fiery Hot Pepper Sauce			1,514.88			423.11			1,937.99
Longlife Tofu						120.00			120.00
Lakkalikööri			451.13	792.00		1,296.00			2,539.13
Konbu			90.00	462.00					552.00
Ipoh Coffee	1,840.00		828.00						2,668.00
Inlagd Sill	182.28						513.00		695.28
Ikura			565.21						565.21
Gumbär Gummibärchen			3,215.66						3,215.66
Gula Malacca	466.80	311.20						923.87	1,701.87
Total	42,700.11	4,529.73	22,779.48	15,236.50	12,225.34	6,815.46	1,503.00	4,478.15	110,267.77

Filters

Search

Filters on this page

Add data fields here

Filters on all pages

Add data fields here

Visualizations

Build visual

Bar

Line

Area

Stacked

Waterfall

Table

Map

Pyramid

Funnel

Timeline

Other

Values

Add data fields here

Drill through

Cross-report

Keep all filters

Company Name

is [Dim Customer]

Data

Search

Text Sales

Amount

Discount

Fact Sales Count

Order ID

Quantity

San Process Time

Unit Price

Dim Customer

Address

City

Company Name

Contact Name

Contact Title

Country

Customer ID

Customer Key

Fax

Is Current

Phone

Postal Code

Region

Valid From

Valid To

Year

Dim Date

Date Key

Day

Day Name

Full Date

Is Weekend

Month

Month Name

Quarter

Year

Dim Employee

Dim Product

Dim Shipments

Drill-through page