IT3021- Data Warehousing & Business Intelligence

Assignment 2 -Report

IT20237554

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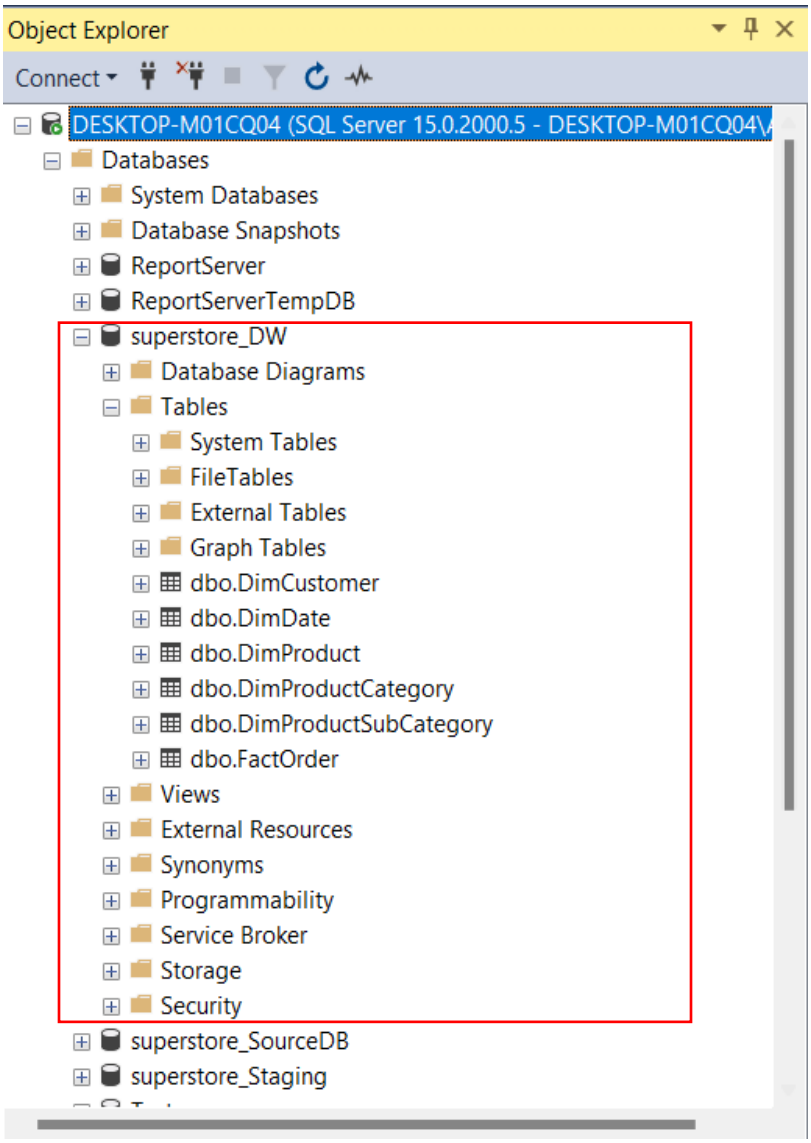
Contents

Step 1: Data source for the assignment 2

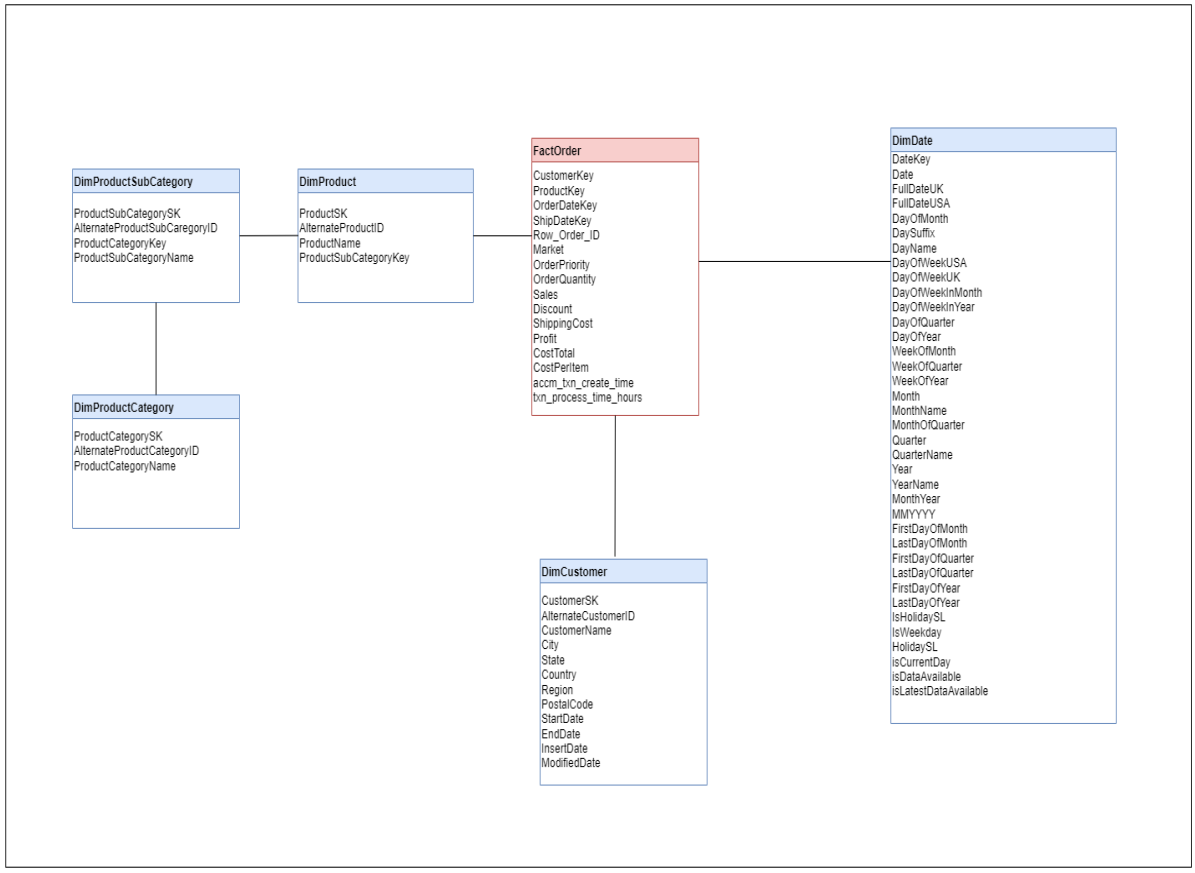
I had used the Data Warehouse (SuperStore_DW) from the assignment 1 which I had created earlier.This Data Warehouse was created using some sales information from year 2011 to 2014 of an online store

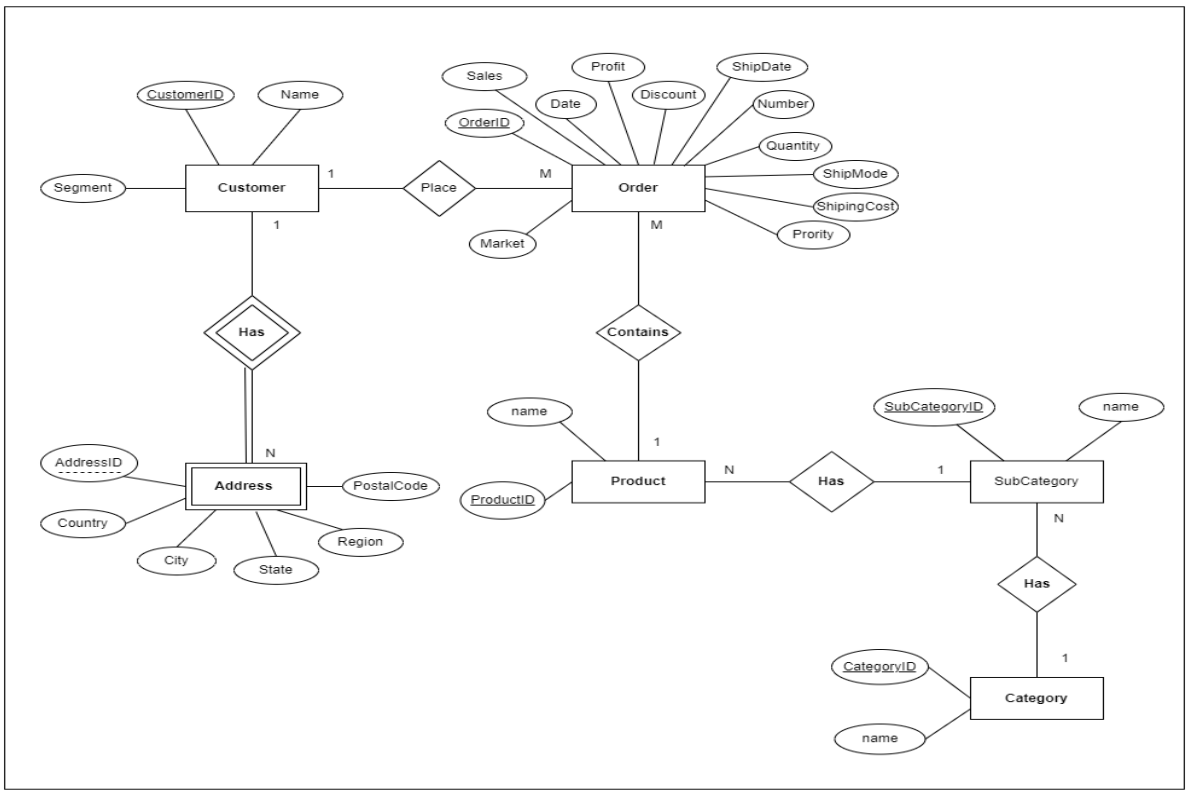
That was my data source which had been used in the assignment 2 for create and deploy the cubes.

My Data Warehouse consists of 5 dimension and 1 fact table as shown below.



- DimCustomer
- DimDate(Common)
- DimProduct
- DimProductCategory
- DimProductSubCategory
- FactOrder


DimProductSubCategory
ProductSubCategorySK
AlternateProductSubCaregoryID
ProductCategoryKey
ProductSubCategoryName
DimProduct
ProductSK
AlternateProductID
ProductName
ProductSubCategoryKey
FactOrder
CustomerKey
ProductKey
OrderDateKey
ShipDateKey
Row_Order_ID
Market
OrderPriority
OrderQuantity
Sales
Discount
ShippingCost
Profit
CostTotal
CostPerItem
accm_txn_create_time
txn_process_time_hours
DimDate
DateKey
Date
FullDateUK
FullDateUSA
DayOfMonth
DaySuffix
DayName
DayOfWeekUSA
DayOfWeekUK
DayOfWeekInMonth
DayOfWeekInYear
DayOfQuarter
DayOfYear
WeekOfMonth
WeekOfQuarter
WeekOfYear
Month
MonthName
MonthOfQuarter
Quarter
QuarterName
Year
YearName
MonthYear
MMYYYY
FirstDayOfMonth
LastDayOfMonth
FirstDayOfQuarter
LastDayOfQuarter
FirstDayOfYear
LastDayOfYear
IsHolidaySL
IsWeekday
HolidaySL
isCurrentDay
isDataAvailable
isLatestDataAvailable
DimProductCategory
ProductCategorySK
AlternateProductCategoryID
ProductCategoryName
DimCustomer
CustomerSK
AlternateCustomerID
CustomerName
City
State
Country
Region
PostalCode
StartDate
EndDate
InsertDate
ModifiedDate


CustomerID
Name
Segment
Customer
1
Place
M
Order
Sales
Profit
ShipDate
Date
Discount
Number
OrderID
Quantity
ShipMode
ShipingCost
Prority
Market
1
M
Has
Contains
N
AddressID
Address
PostalCode
Country
City
State
Region
name
1
ProductID
Product
N
Has
1
SubCategoryID
name
SubCategory
N
Has
1
CategoryID
Category
name

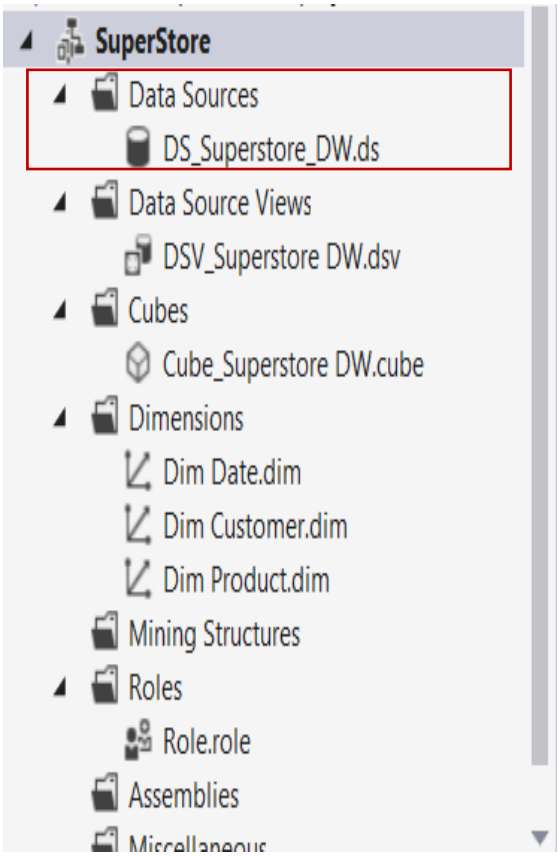
Step 2: SSAS Cube implementation

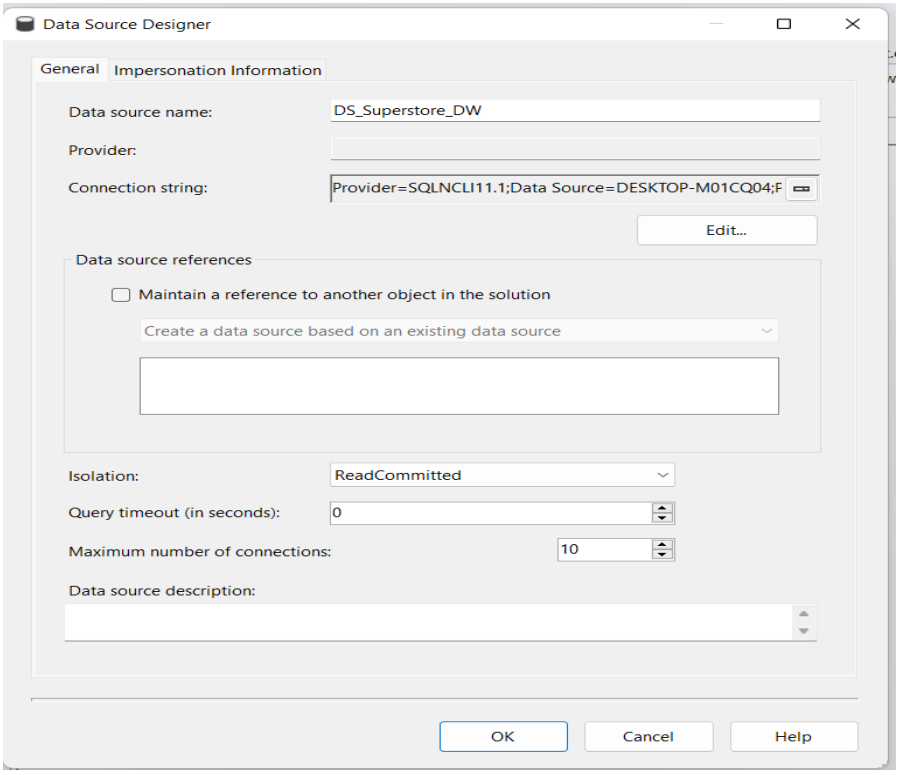
Multidimension data cube is as structure where it contains information for analytical processes. The main part of a cube is Dimensions and measures.

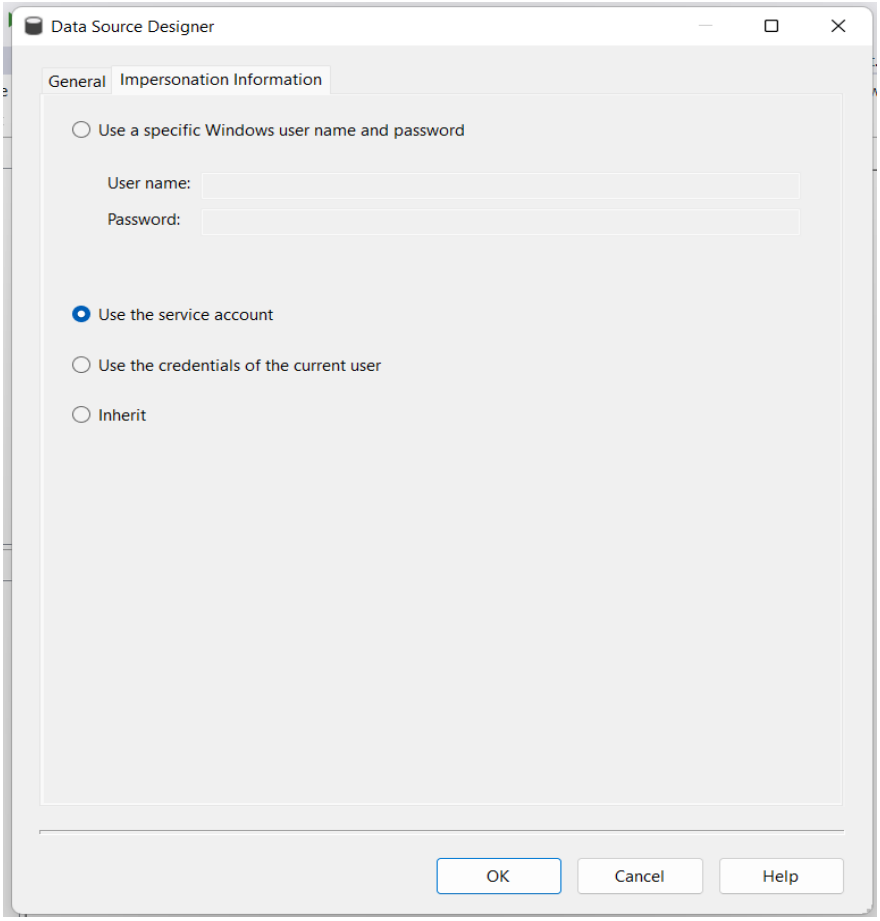
- Dimensions: Define the structure of the cube that we used to slice and dice over
- Measures: Provide an aggregated numerical value of interest of the end users.

Creating Data Source

First, I had Created my Data Source for the cube implementation by connecting the previously (in assignment 1) created Data Warehouse through SQL server management studio.

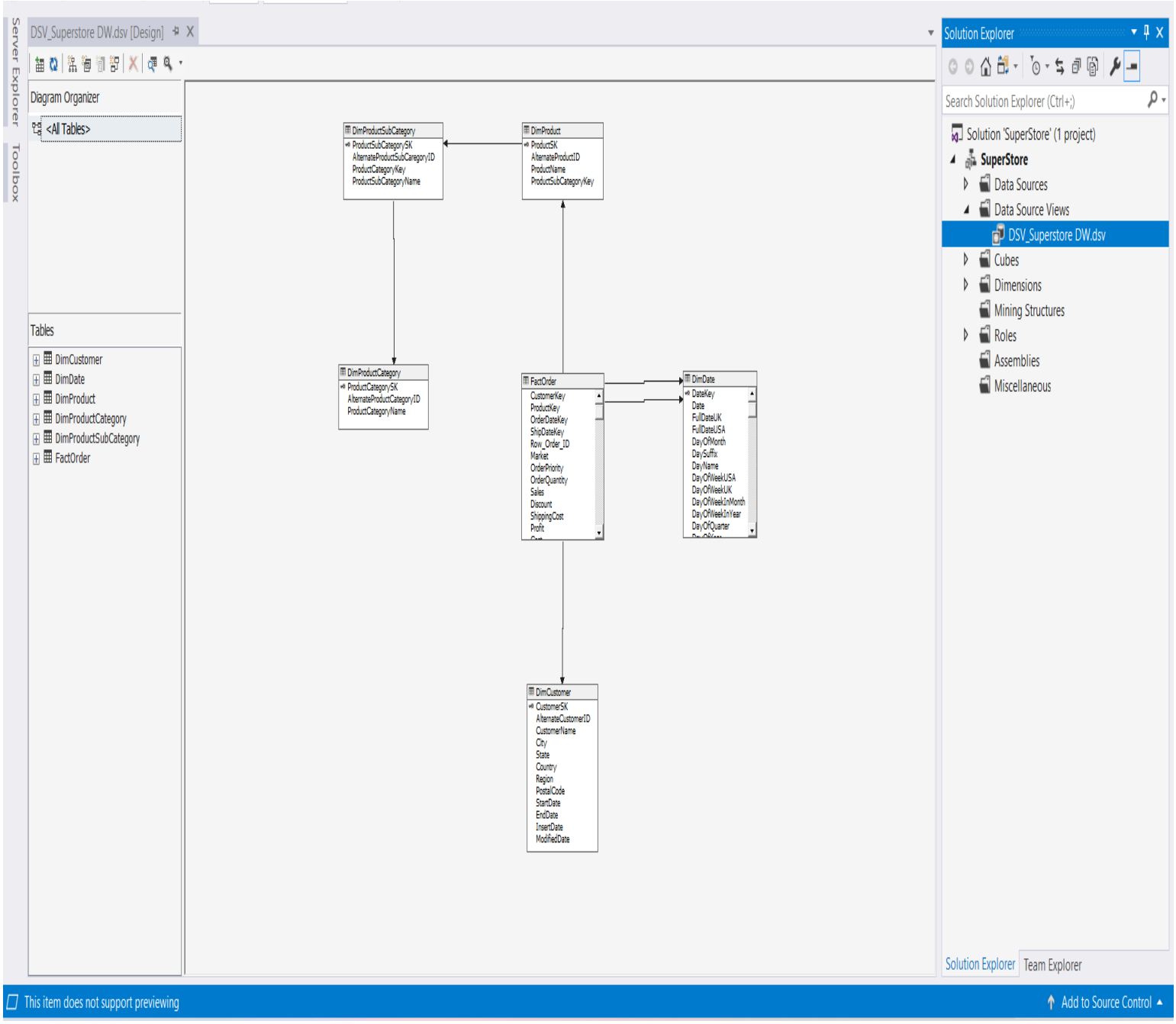



Data Source Designer
General
Impersonation Information
Data source name:
DS_Superstore_DW
Provider:
Connection string:
Provider=SQLNCLI11.1;Data Source=DESKTOP-M01CQ04;F
Edit...
Data source references
Maintain a reference to another object in the solution
Create a data source based on an existing data source
Isolation:
ReadCommitted
Query timeout (in seconds):
0
Maximum number of connections:
10
Data source description:
OK
Cancel
Help

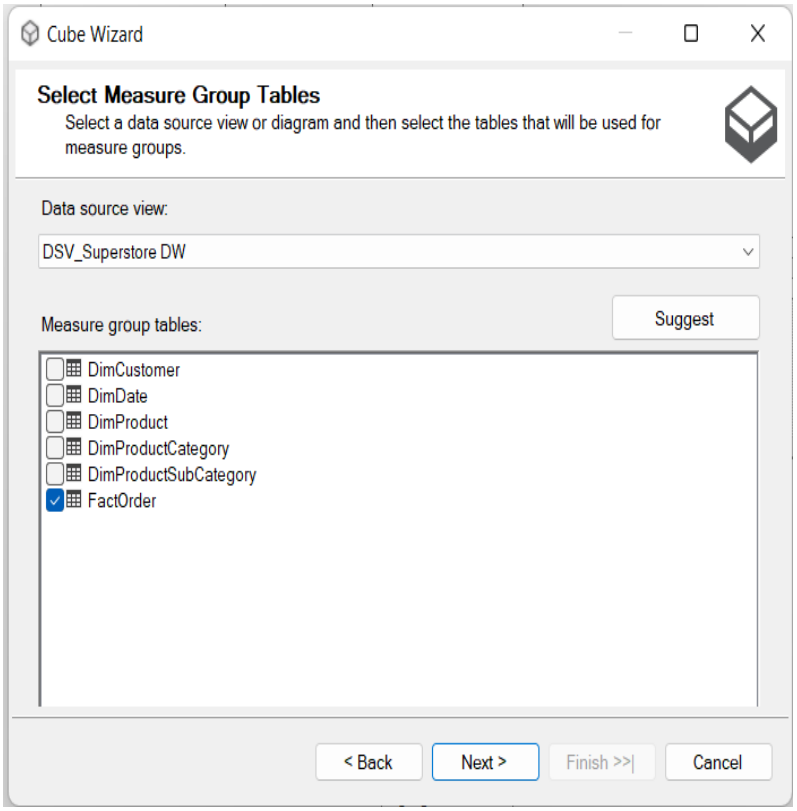

Data Source Designer
General
Impersonation Information
Use a specific Windows user name and password
User name:
Password:
Use the service account
Use the credentials of the current user
Inherit
OK
Cancel
Help

Creating Data Source View

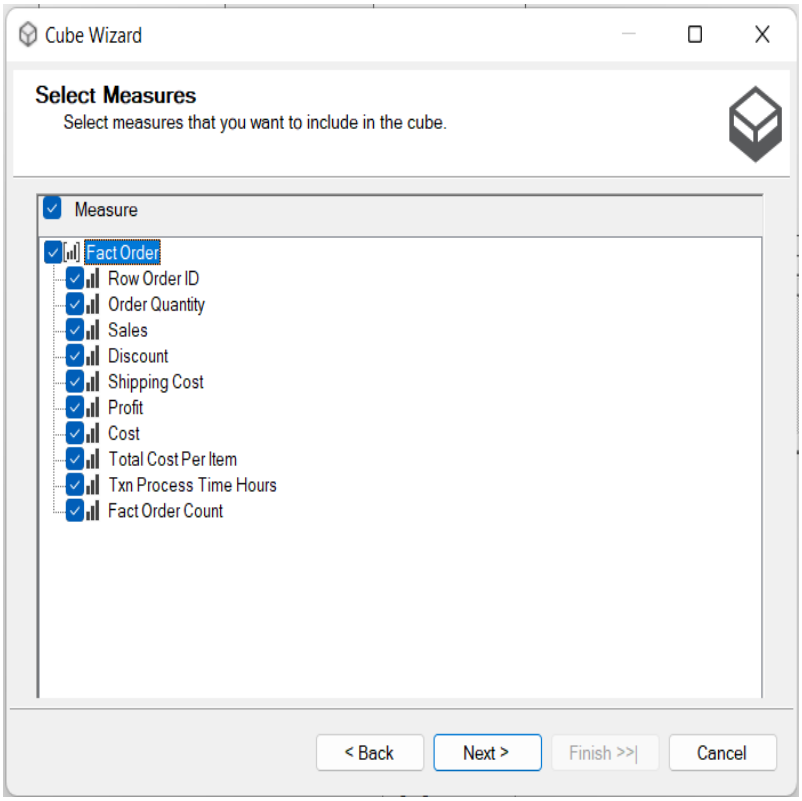
Next, I had created the Data Source Views, here this includes getting the relations and views of our dataset. I had used the above created data source to create the data source view.



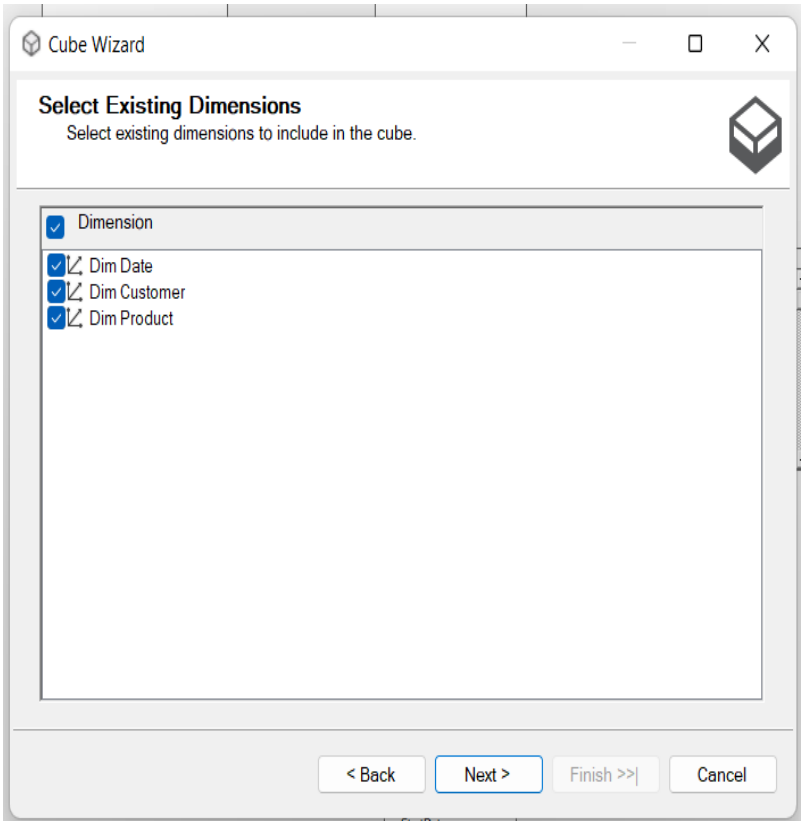
Creating the Cube



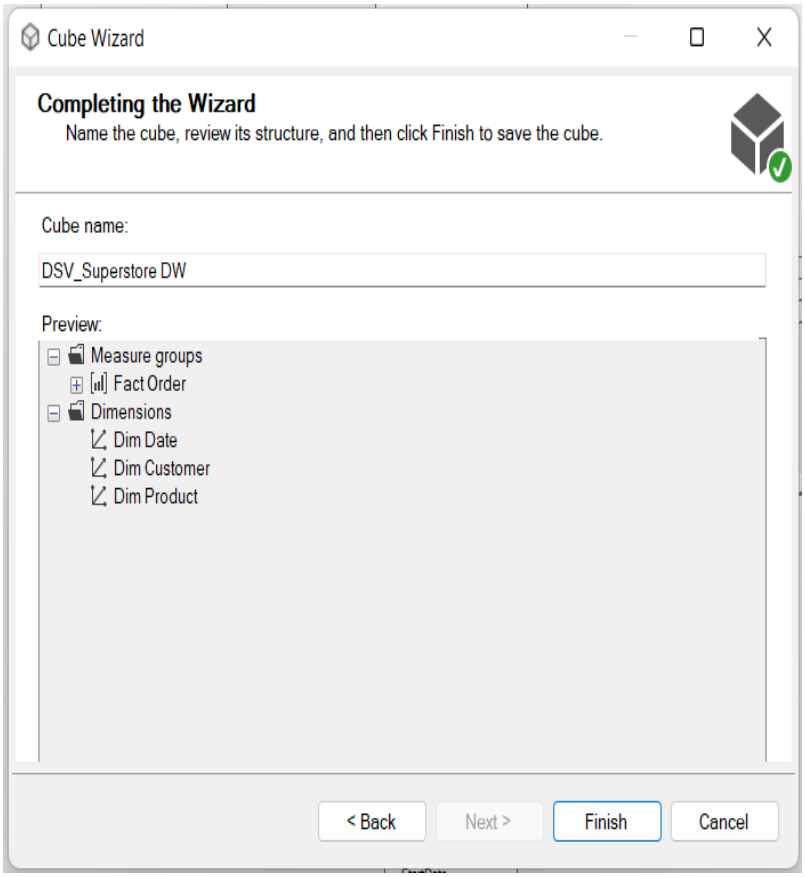
➢ Selected the previously created Data Source View. In here I had selected all the Measure group tables. In my case only FactOrder table is consists of measures that required for analytical process.



➢ Select all the measures is FactOrder Fact table.

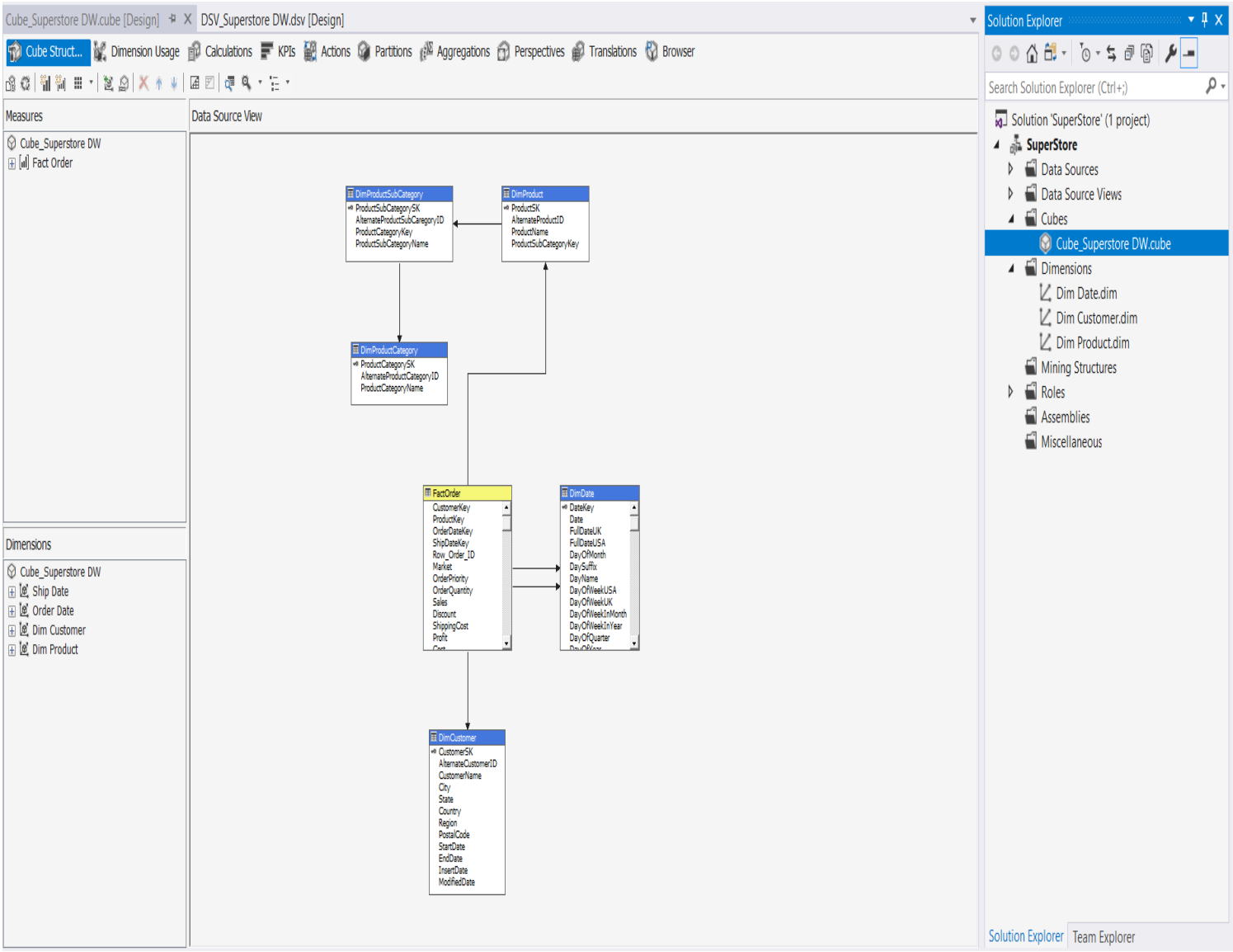


➢ Select all the Dimensions



➢ We can view all the selected Measures and Dimension from here completing the cube wizard.

Implemented Cube



Creating Hierarchies

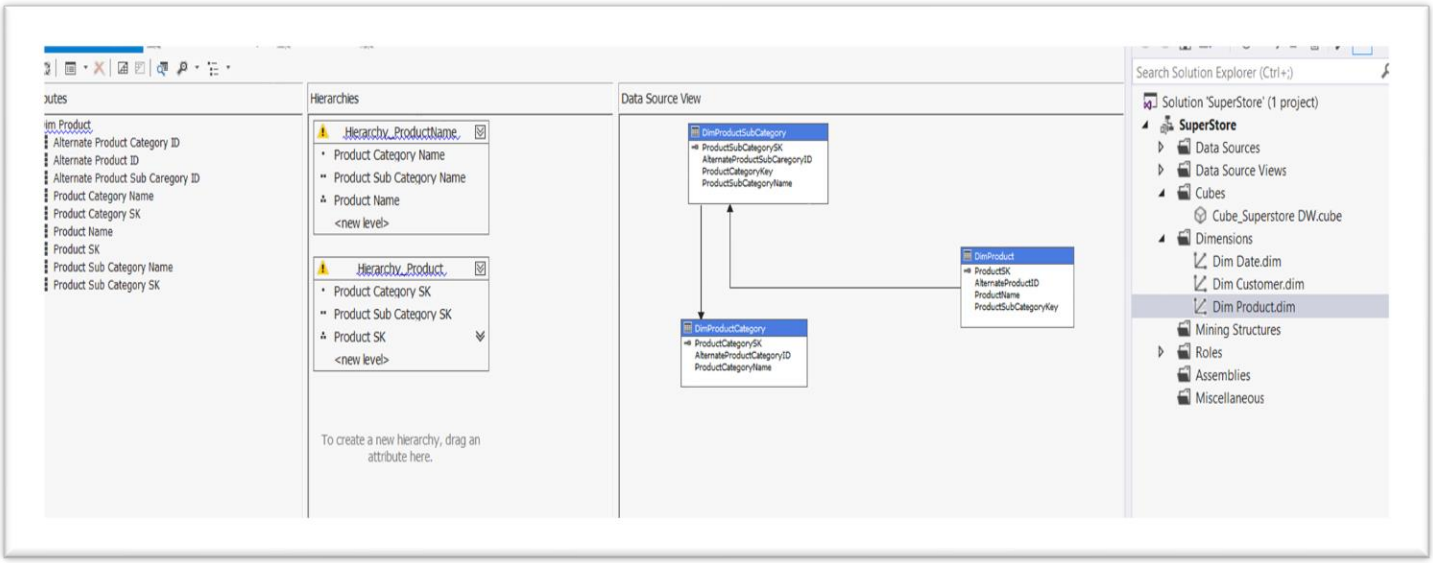
We use Hierarchies in SSAS to reduce the complexity between attributes and lead users into the drill down behaviors.

- Hierarchy_Customer

Created a Hierarchy for the customer dimension using customer address details.

Region → Country → State → City

- Hierarchy_ProductName /Hierarchy_Product

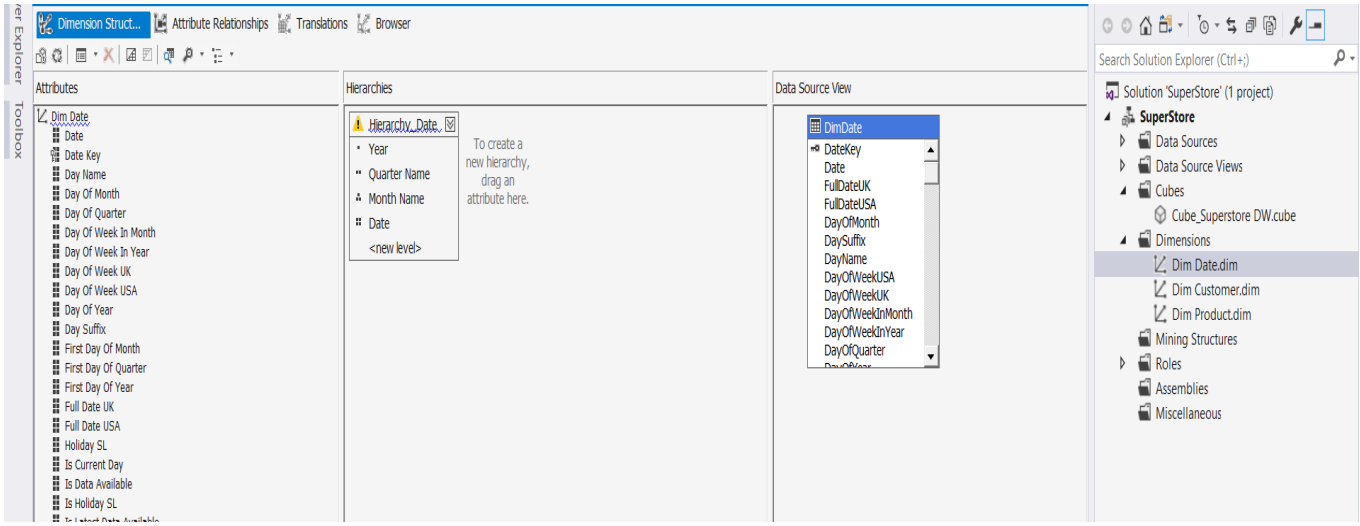


Created 2 hierarchies for product name and product id

Product Category Name → Product Sub Category Name → Product Name

Procut Category SK → Product Sub Category SK → Product SK

- Hierarchy_Date

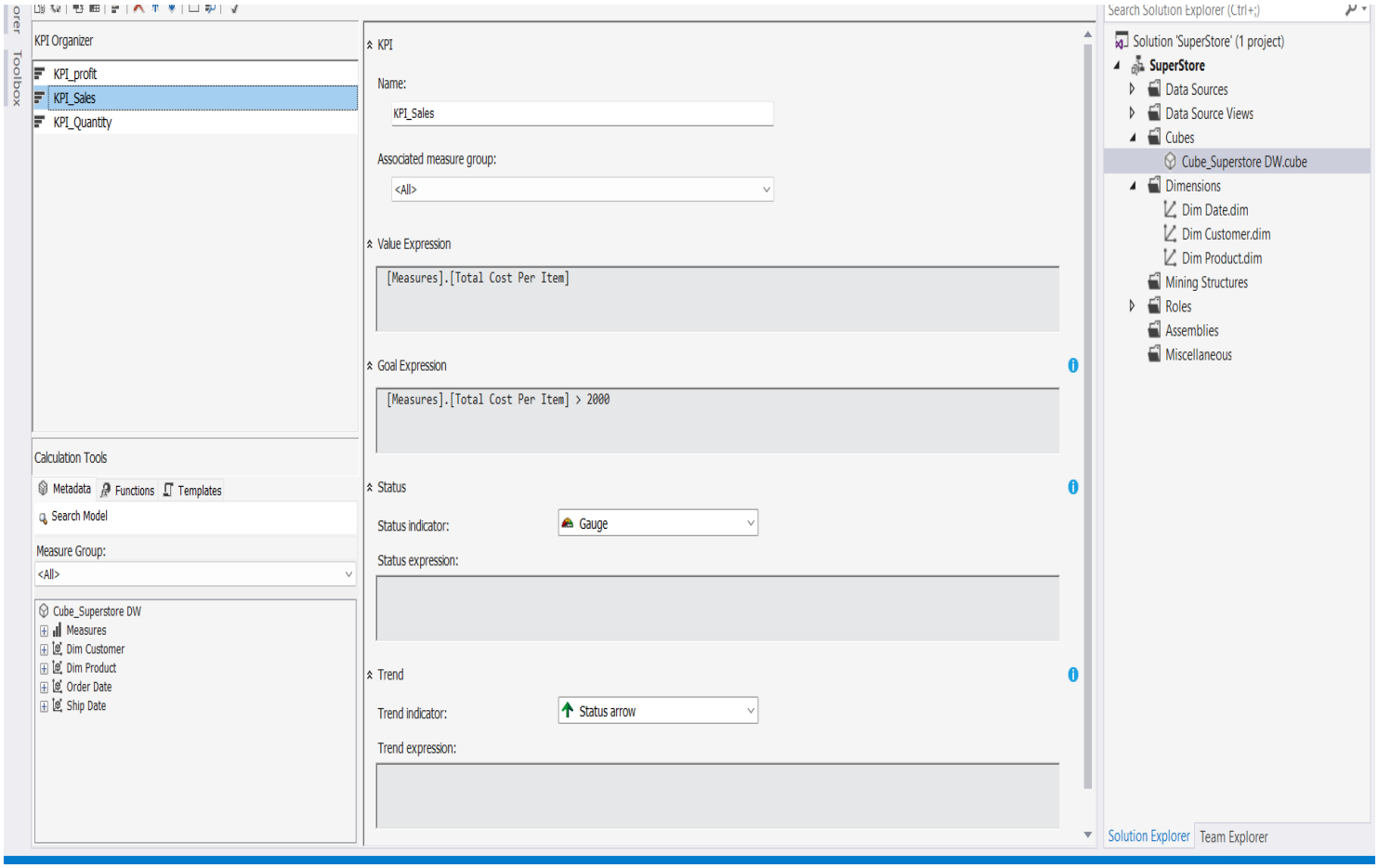


Year → Quarter Name → Month Name → Date

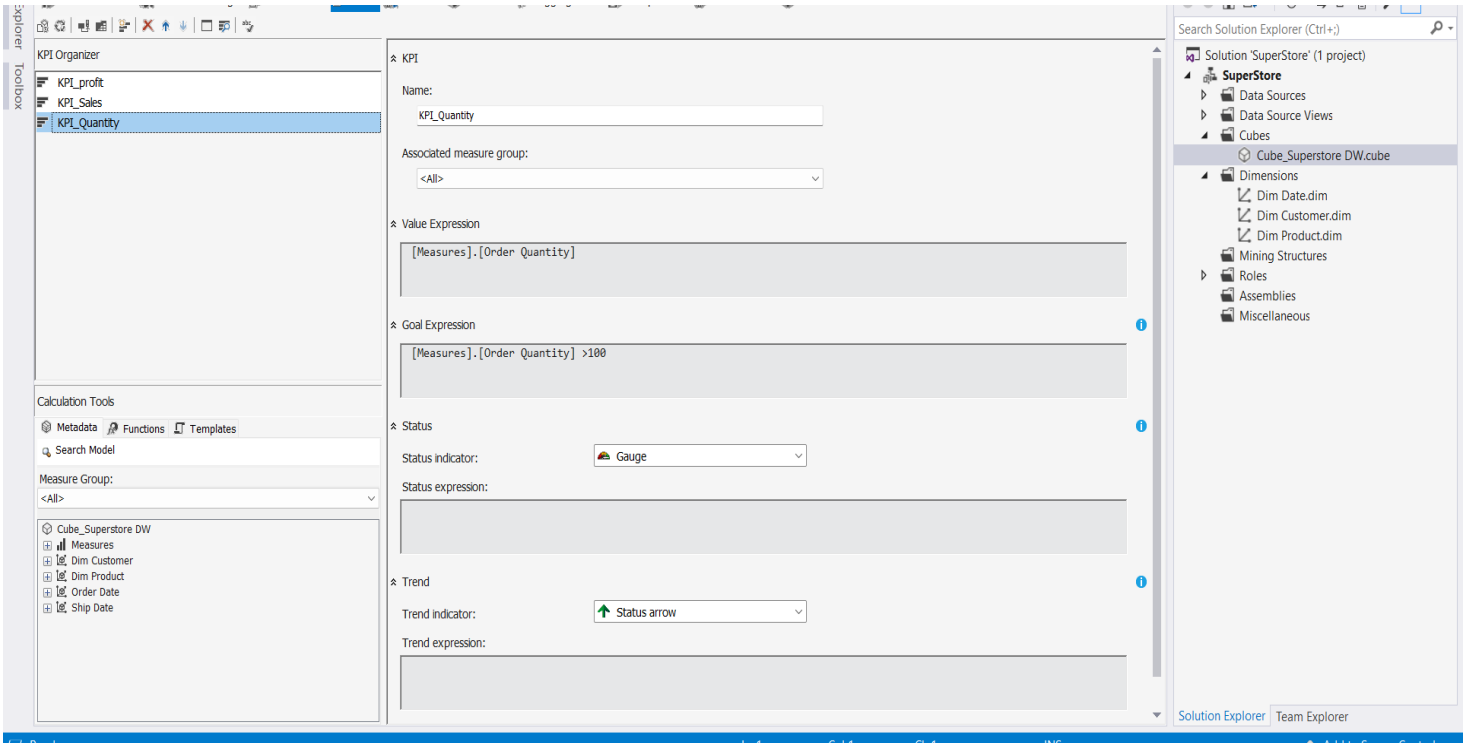
Creating KPI's

In SSAS we can add Key Performance Indicators to our database cube to evaluate the business performance. KPI's associated with a a measure group, and this will depend on what the organization want to monitor and measure. So, I had created 3 KPI's based on the business requirement

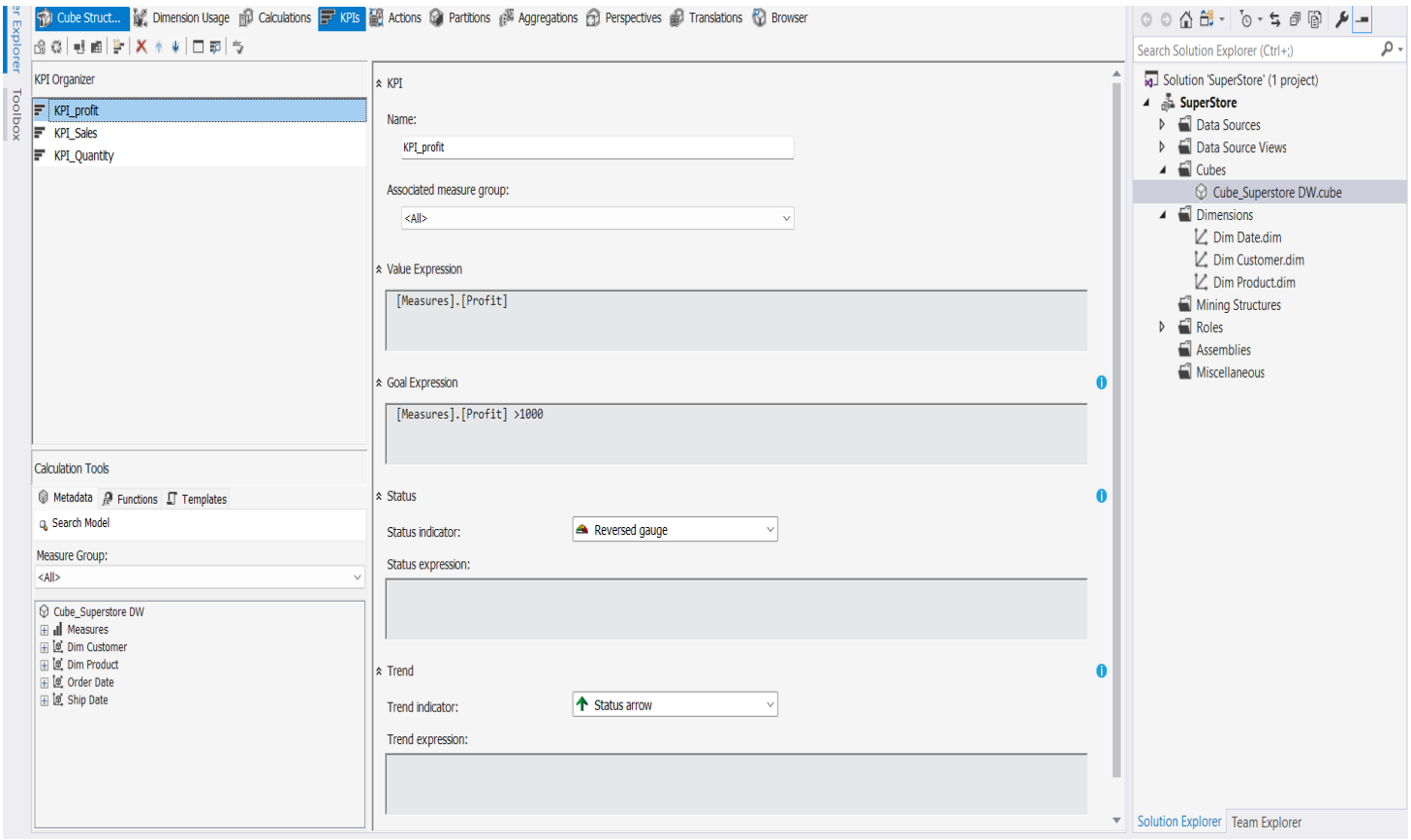
- KPI_Sales



- KPI_Quantity

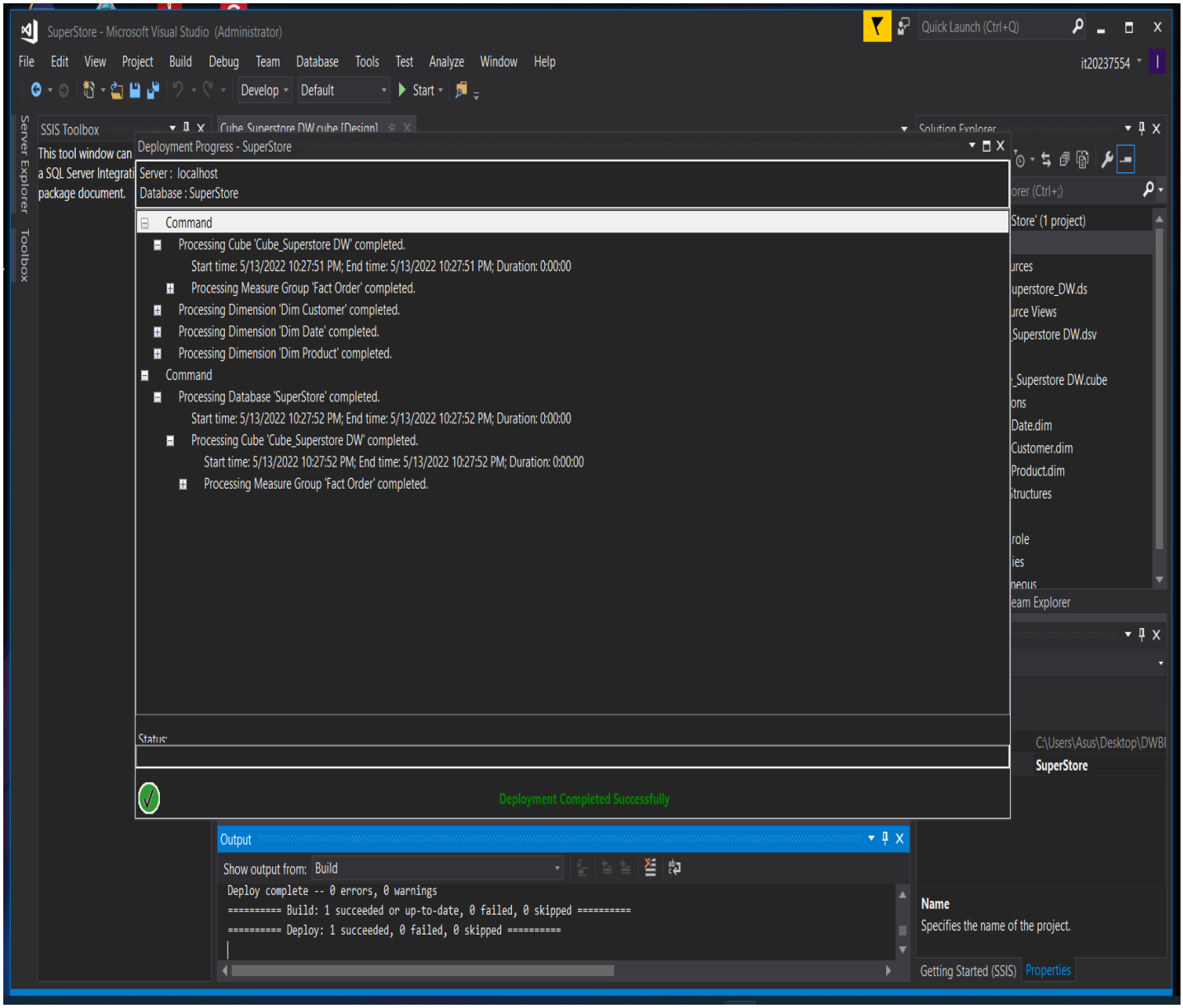


- KPI_Profit



Deploying the implemented Cube

After creating roles and providing the necessary permission to access the data of the cube finally we need to deploy the data cube.



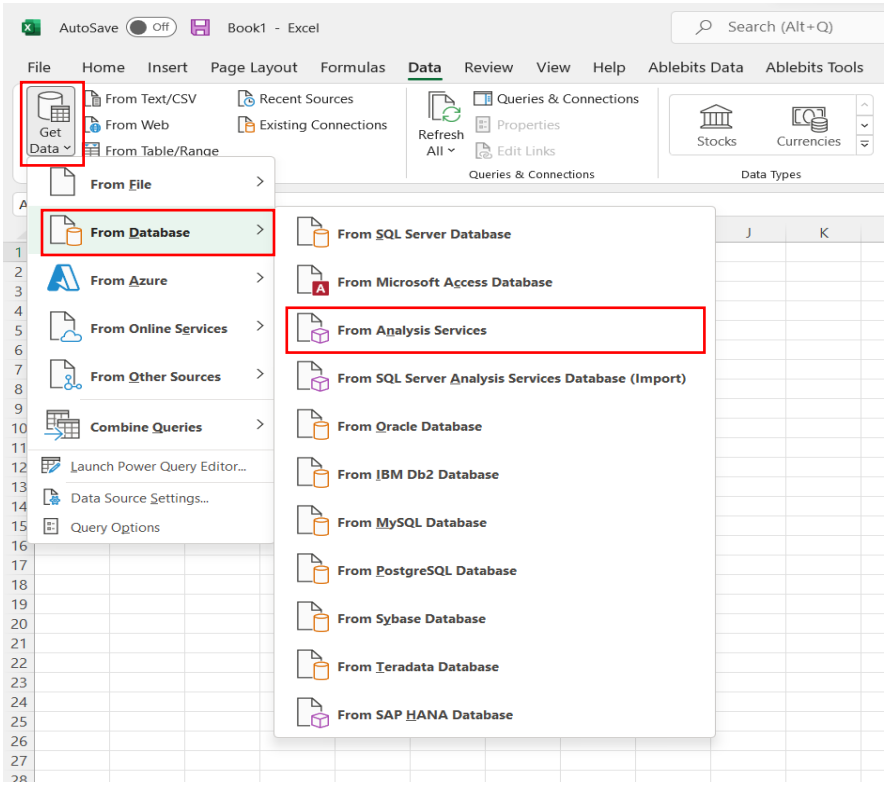
Step 3: Demonstration of OLAP operations

Both business users and IT teams benefit from a successful OLAP system. This is an important aspect of Business Intelligence since it provides sophisticated data mining and trend analysis capabilities. OLAP allows you to quickly evaluate large volumes of data from several viewpoints.

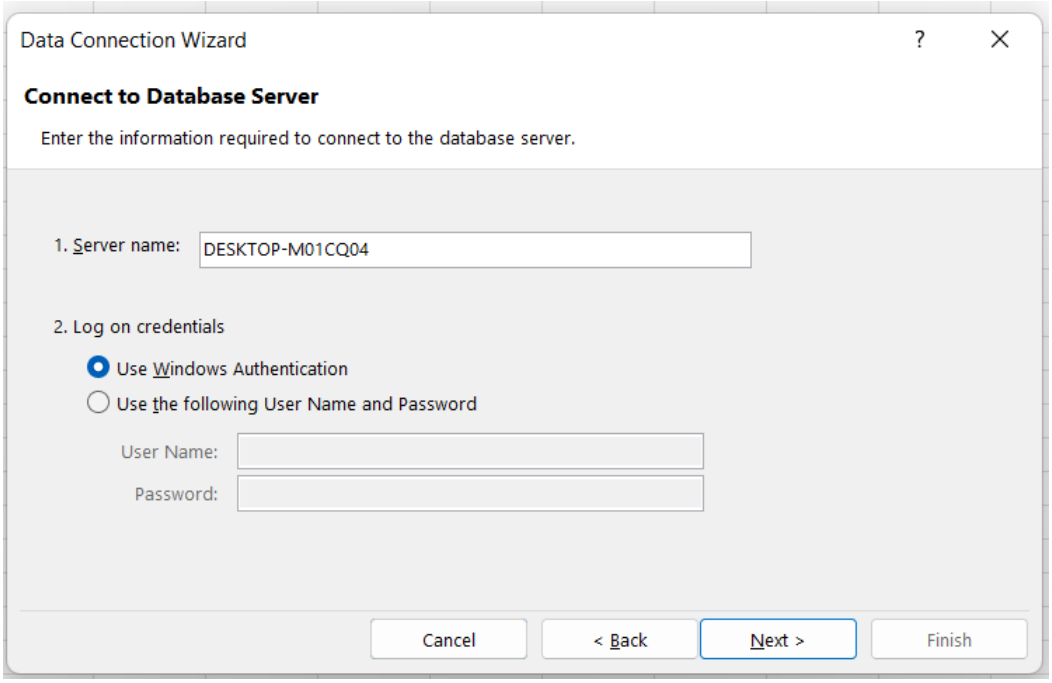
For the demonstration to connect for the excel workbook and to get data from the semantic layer we can use MDX query, we can build MDX query through SSAS project by browsing data from the tables. But here I had not used this MDX query for that I had used the data tab for connecting my SSAS Cube.

Connecting to the SSAS cube

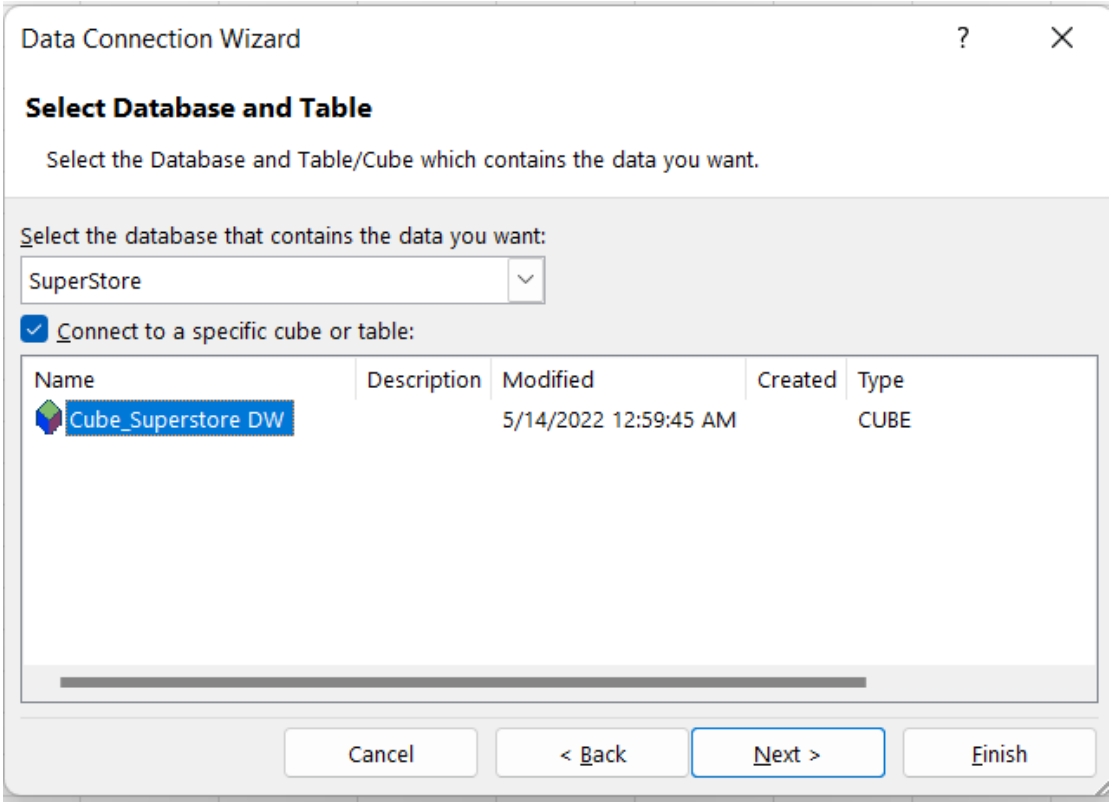
Step 1



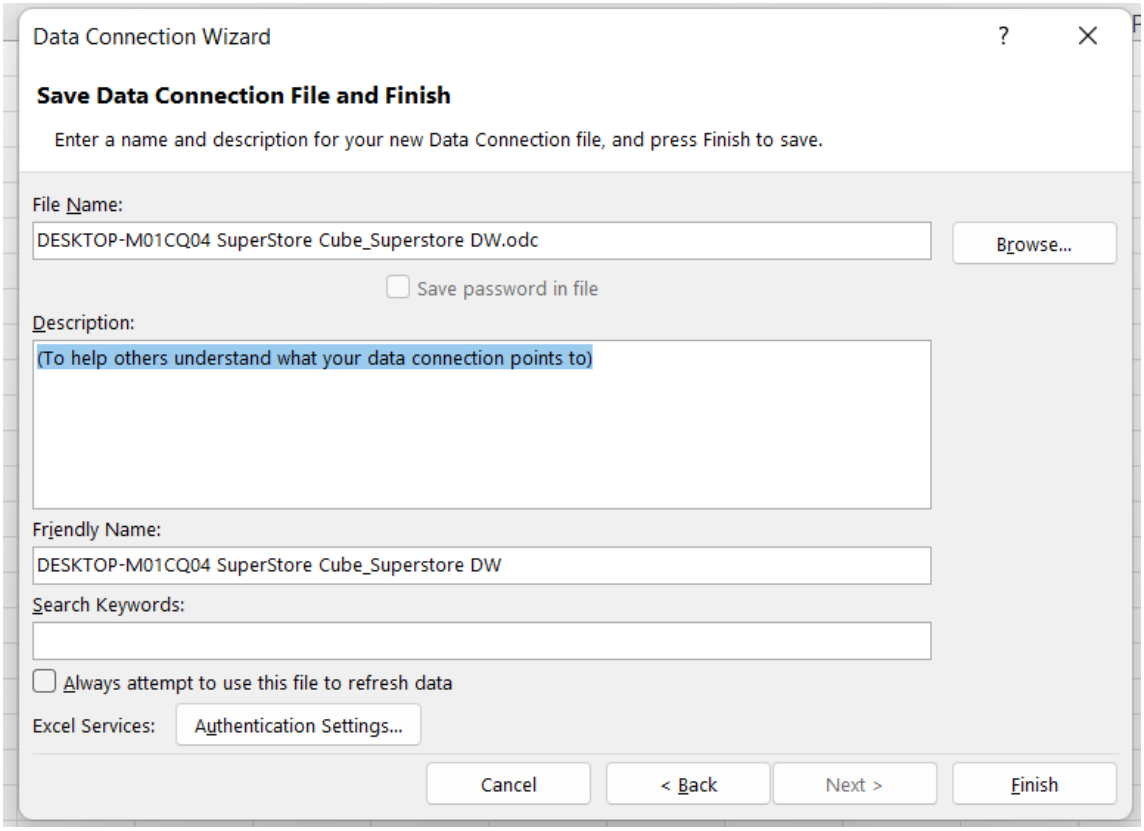
Step 2


Data Connection Wizard
Connect to Database Server
Enter the information required to connect to the database server.
1. Server name:
DESKTOP-M01CQ04
2. Log on credentials
Use Windows Authentication
Use the following User Name and Password
User Name:
Password:
Cancel
< Back
Next >
Finish

Step 3


Data Connection Wizard
Select Database and Table
Select the Database and Table/Cube which contains the data you want.
Select the database that contains the data you want:
SuperStore
Connect to a specific cube or table:
Name
Description
Modified
Created
Type
Cube_Superstore DW
5/14/2022 12:59:45 AM
CUBE
Cancel
< Back
Next >
Finish

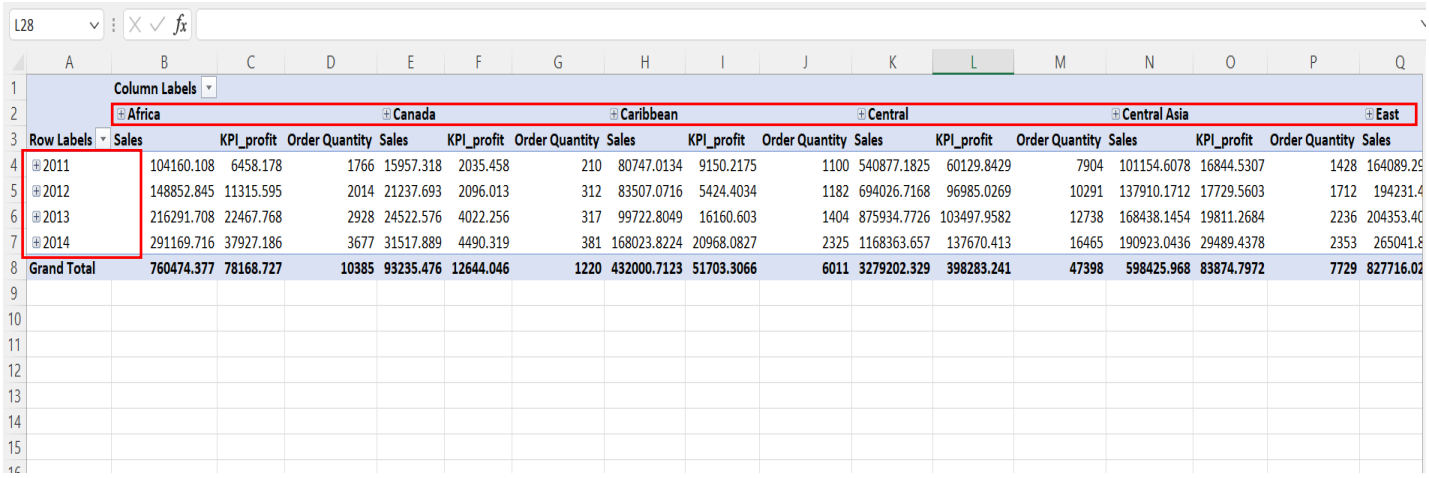
Step 4



Excel Report for OLAP Demonstration

Roll - up

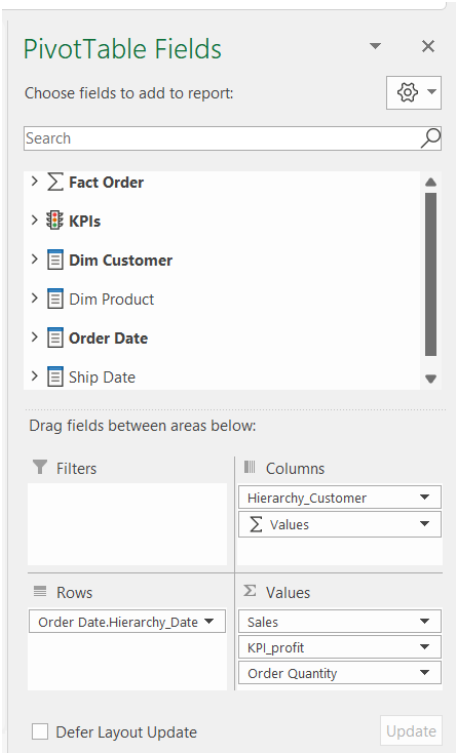
Climbing up a hierarchy of a dimension to aggregate data means the Roll up OLAP operation in cubes.



Row Labels	Africa Sales	Africa KPI_profit	Africa Order Quantity	Canada Sales	Canada KPI_profit	Canada Order Quantity	Caribbean Sales	Caribbean KPI_profit	Caribbean Order Quantity	Central Sales	Central KPI_profit	Central Order Quantity	Central Asia Sales	Central Asia KPI_profit	Central Asia Order Quantity	East Sales
2011	104160.108	6458.178	1766	15957.318	2035.458	210	80747.0134	9150.2175	1100	540877.1825	60129.8429	7904	101154.6078	16844.5307	1428	164089.29
2012	148852.845	11315.595	2014	21237.693	2096.013	312	83507.0716	5424.4034	1182	694026.7168	96985.0269	10291	137910.1712	17729.5603	1712	194231.4
2013	216291.708	22467.768	2928	24522.576	4022.256	317	99722.8049	16160.603	1404	875934.7726	103497.9582	12738	168438.1454	19811.2684	2236	204353.40
2014	291169.716	37927.186	3677	31517.889	4490.319	381	168023.8224	20968.0827	2325	1168363.657	137670.413	16465	190923.0436	29489.4378	2353	265041.8
Grand Total	**760474.377**	**78168.727**	**10385**	**93235.476**	**12644.046**	**1220**	**432000.7123**	**51703.3066**	**6011**	**3279202.329**	**398283.241**	**47398**	**598425.968**	**83874.7972**	**7729**	**827716.02**

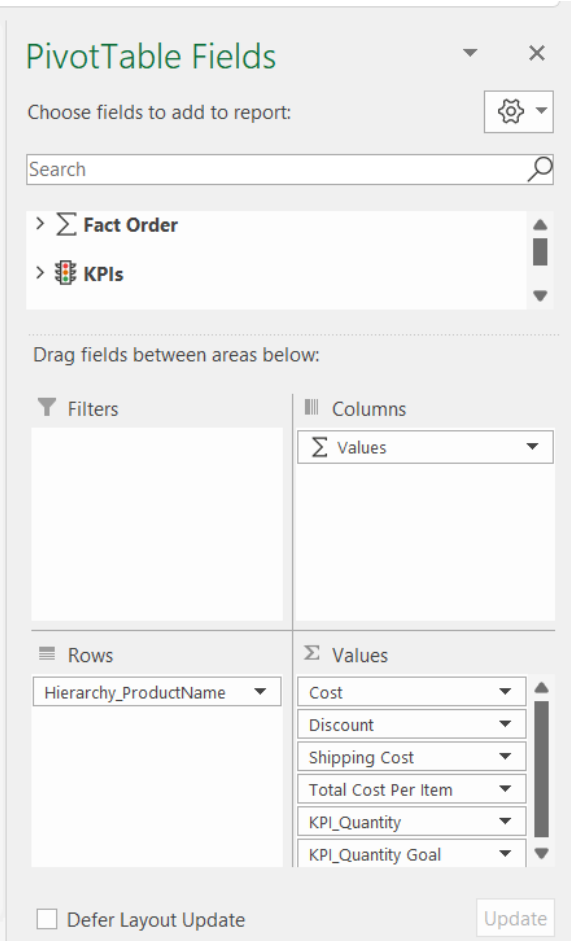
	EMEA			North			North Asia			Oceania			South		
KPI_profit	Order Quantity	Sales	KPI_profit	Order Quantity	Sales	KPI_profit	Order Quantity	Sales	KPI_profit	Order Quantity	Sales	KPI_profit	Order Quantity	Sales	KPI_profit	Order Quanti
20471.0275	2199	151999.278	9537.588	1964	221582.6529	25979.3695	2959	128421.4772	18138.6647	1526	154373.47	22355.4022	2015	298524.3542	38769.752	39
25741.9871	2597	153901.332	8804.742	2220	272302.2296	33161.9039	3852	104123.9587	10443.7557	1379	150303.7016	10075.6918	2230	350967.6105	34777.1123	51
23277.1655	3270	212056.341	15924.591	3007	370173.1155	50478.3186	5376	151080.4427	23395.4241	1867	194508.1256	18553.0184	2725	436636.3434	51393.8848	57
31437.0807	3815	285511.698	25473.798	4122	466913.7858	59673.2845	6418	182149.1106	14767.6804	2623	221235.686	24734.5862	3480	495102.4737	53473.9721	71
100927.2608	**11881**	**803468.649**	**59740.719**	**11313**	**1330971.784**	**169292.8765**	**18605**	**565774.9892**	**66745.5249**	**7395**	**720420.9832**	**75718.6986**	**10450**	**1581230.782**	**178414.7212**	**219**

Southeast Asia			West			Total Sales	Total KPI_profit	Total Order Quantity
Sales	KPI_profit	Order Quantity	Sales	KPI_profit	Order Quantity			
169388.1387	6675.0098	2315	128176.0039	12395.7707	2131	2259450.896	248940.8115	31443
203524.0047	27983.4865	2738	162549.8662	22876.0017	2480	2677438.695	307415.2796	38111
232799.4957	36323.3872	3346	219229.1716	21629.5873	3129	3405746.45	406935.2305	48136
286219.0252	36263.7191	4270	247694.1322	27796.4111	3572	4299865.871	504165.9706	60622
891930.6643	**107245.6026**	**12669**	**757649.1739**	**84697.7708**	**11312**	**12642501.91**	**1467457.292**	**178312**



- This report Shows the totals Sales amount, Total Order Quantity and Total Profit using the KPI_Profit value of the customer
- Here we can Roll-up Months to years from this we can easily view the yearly sale amount and the profit for a particular region. (Months → Years)
- We can also Roll-up City to Region from this we can easily analyze the Total Sales amount and the total profit gain for a particular year according to Region Wise. (City → Region)
- Date, Customer Hierarchies were used in the above report.

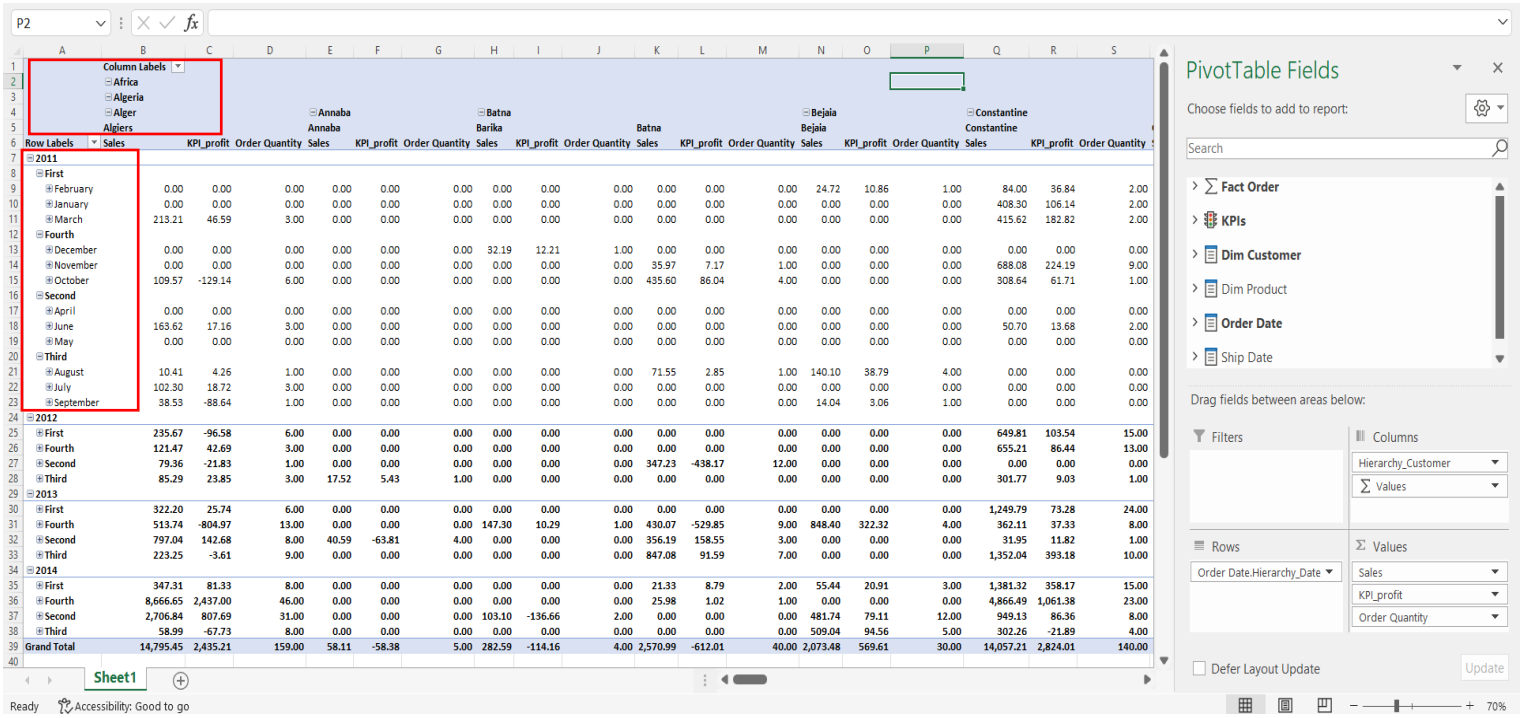
Row Labels	Cost	Discount	Shipping Cost	Total Cost Per Item	KPI_Quantity	KPI_Quantity Goal
⊞Furniture	4,551,194.85	1,660.03	440,320.66	20,523,093.45	34,954.00	TRUE
⊞Office Supplies	4,192,521.52	4,297.19	405,451.29	19,076,256.44	108,182.00	TRUE
⊞Technology	5,251,606.24	1,372.51	507,048.74	23,549,754.24	35,176.00	TRUE
⊞UpdatedTestCategory						FALSE
⊞Unknown						FALSE
Grand Total	**13,995,322.60**	**7,329.73**	**1,352,820.69**	**63,149,104.13**	**178,312.00**	**TRUE**



- This pivot table Shows us the Total cost per item, and the total quantity using the KPI_Quantity value from the customer
- Here we can get all the Product Category wise details.
- We can Roll -up Product to Product category easily to make the analysis. (Product → Product Category)
- ProductName hierarchy were used to create the above report

Drill - Down

Stepping down a hierarchy of a dimension allowing navigation through details means the Drill down OLAP operation in cubes.



Row Labels	Sales	KPI_profit	Order Quantity	Sales	KPI_profit	Order Quantity	Sales	KPI_profit	Order Quantity	Sales	KPI_profit	Order Quantity	Sales	KPI_profit	Order Quantity	Sales	KPI_profit	Order Quantity
	Column Labels																	
	Africa																	
	Algeria																	
	Alger			Annaba			Batna						Bejaia			Constantine		
	Algiers			Annaba			Barika			Batna			Bejaia			Constantine		
2011																		
First																		
February	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.72	10.86	1.00	84.00	36.84	2.00
January	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	408.30	106.14	2.00
March	213.21	46.59	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	415.62	182.82	2.00
Fourth																		
December	0.00	0.00	0.00	0.00	0.00	0.00	32.19	12.21	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
November	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.97	7.17	1.00	0.00	0.00	0.00	688.08	224.19	9.00
October	109.57	-129.14	6.00	0.00	0.00	0.00	0.00	0.00	0.00	435.60	86.04	4.00	0.00	0.00	0.00	308.64	61.71	1.00
Second																		
April	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June	163.62	17.16	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.70	13.68	2.00
May	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Third																		
August	10.41	4.26	1.00	0.00	0.00	0.00	0.00	0.00	0.00	71.55	2.85	1.00	140.10	38.79	4.00	0.00	0.00	0.00
July	102.30	18.72	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
September	38.53	-88.64	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.04	3.06	1.00	0.00	0.00	0.00
2012																		
First	235.67	-96.58	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	649.81	103.54	15.00
Fourth	121.47	42.69	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	655.21	86.44	13.00
Second	79.36	-21.83	1.00	0.00	0.00	0.00	0.00	0.00	0.00	347.23	-438.17	12.00	0.00	0.00	0.00	0.00	0.00	0.00
Third	85.29	23.85	3.00	17.52	5.43	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	301.77	9.03	1.00
2013																		
First	322.20	25.74	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,249.79	73.28	24.00
Fourth	513.74	-804.97	13.00	0.00	0.00	0.00	147.30	10.29	1.00	430.07	-529.85	9.00	848.40	322.32	4.00	362.11	37.33	8.00
Second	797.04	142.68	8.00	40.59	-63.81	4.00	0.00	0.00	0.00	356.19	158.55	3.00	0.00	0.00	0.00	31.95	11.82	1.00
Third	223.25	-3.61	9.00	0.00	0.00	0.00	0.00	0.00	0.00	847.08	91.59	7.00	0.00	0.00	0.00	1,352.04	393.18	10.00
2014																		
First	347.31	81.33	8.00	0.00	0.00	0.00	0.00	0.00	0.00	21.33	8.79	2.00	55.44	20.91	3.00	1,381.32	358.17	15.00
Fourth	8,666.65	2,437.00	46.00	0.00	0.00	0.00	0.00	0.00	0.00	25.98	1.02	1.00	0.00	0.00	0.00	4,866.49	1,061.38	23.00
Second	2,706.84	807.69	31.00	0.00	0.00	0.00	103.10	-136.66	2.00	0.00	0.00	0.00	481.74	79.11	12.00	949.13	86.36	8.00
Third	58.99	-67.73	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	509.04	94.56	5.00	302.26	-21.89	4.00
Grand Total	14,795.45	2,435.21	159.00	58.11	-58.38	5.00	282.59	-114.16	4.00	2,570.99	-612.01	40.00	2,073.48	569.61	30.00	14,057.21	2,824.01	140.00

- Here for the columns, I had used the Customer hierarchy (Region → Country →State →City) from that we can view the address details of the customer Region wise, Country wise, State wise and City wise this it the drill-down used for the columns
- For the Rows I had used Date Hierarchy (Year → Quarter → Month→Date) from that we can view the Annually Sales, quarterly Sales, Monthly Sales, and Daily Sales
- From the above pivot table we can view the Profit Reports for annually, monthly, quarterly, and daily, and also Region Wise, Country Wise, State Wise and City Wise

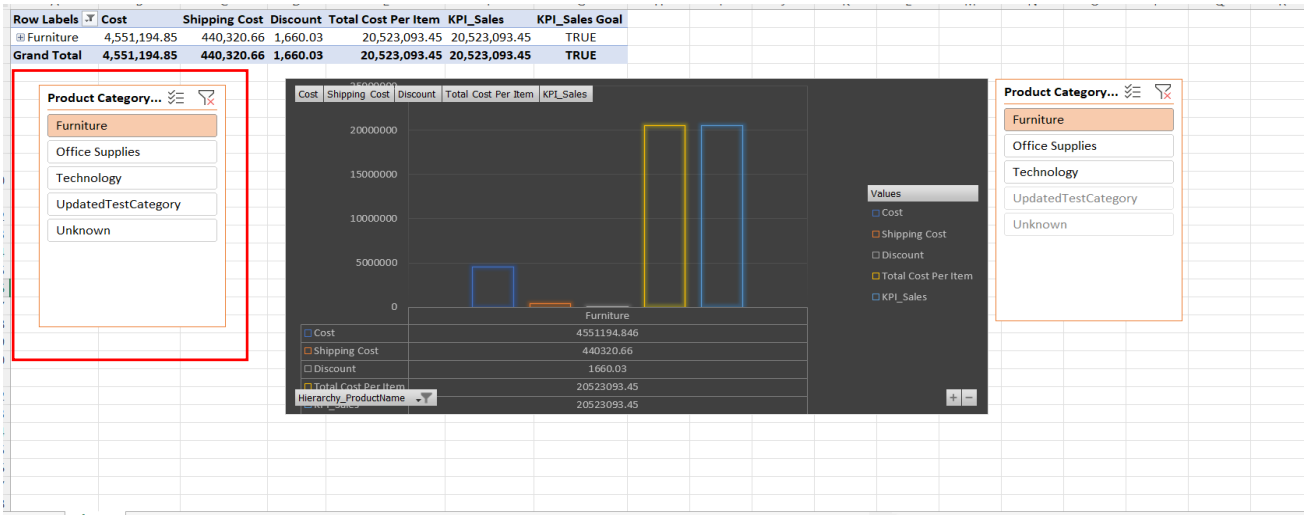
Row Labels	Cost	Discount	Shipping Cost	Total Cost Per Item	KPI_Quantity	KPI_Quantity Goal
Furniture						
Bookcases	1,622,054.47	370.71	155,482.23	7,216,000.61	8,310.00	TRUE
Chairs	1,665,911.61	560.12	164,229.85	7,608,921.67	12,336.00	TRUE
Furnishings	426,325.38	478.88	40,747.12	1,962,697.39	11,225.00	TRUE
Tables	836,903.38	250.32	79,861.46	3,735,473.78	3,083.00	TRUE
Office Supplies						
Appliances	1,119,365.09	248.70	108,300.78	5,136,623.12	6,078.00	TRUE
Art	413,379.44	573.08	41,287.47	1,864,919.25	16,301.00	TRUE
Binders	510,115.24	1,103.68	48,184.08	2,333,478.03	21,433.00	TRUE
Envelopes	189,452.08	320.81	18,547.78	854,800.23	8,380.00	TRUE
Fasteners	92,295.91	340.24	9,053.59	415,671.14	8,390.00	TRUE
Labels	81,442.16	312.69	8,057.79	386,849.88	9,318.00	TRUE
Paper	270,953.01	387.30	26,661.29	1,265,115.37	12,822.00	TRUE
Storage	1,247,632.32	700.49	120,546.46	5,604,459.58	16,917.00	TRUE
Supplies	267,886.27	310.20	24,812.05	1,214,339.84	8,543.00	TRUE
Technology						
Accessories	832,750.60	370.48	83,513.58	3,887,515.64	10,946.00	TRUE
Copiers	1,668,932.76	260.42	159,496.49	7,333,519.82	7,454.00	TRUE
Machines	858,195.97	252.00	79,135.90	3,743,385.45	4,906.00	TRUE
Phones	1,891,726.91	489.61	184,902.77	8,585,333.32	11,870.00	TRUE
UpdatedTestCategory						FALSE
Unknown						FALSE
Grand Total	13,995,322.60	7,329.73	1,352,820.69	63,149,104.13	178,312.00	TRUE

Row Labels	Cost	Discount	Shipping Cost	Total Cost Per Item	KPI_Quantity	KPI_Quantity Goal
Furniture						
Bookcases						
Atlantic Metals Mobile 2-Shelf Bookcases, Custom C	441.57	1.02	41.54	767.96	3.00	FALSE
Atlantic Metals Mobile 3-Shelf Bookcases, Custom C	8,549.54	1.47	1,009.83	37,924.56	35.00	FALSE
Atlantic Metals Mobile 4-Shelf Bookcases, Custom C	5,927.51	1.60	743.43	27,301.54	27.00	FALSE
Atlantic Metals Mobile 5-Shelf Bookcases, Custom C	6,038.42	2.53	545.53	24,233.94	26.00	FALSE
Bestar Classic Bookcase	2,091.05	2.52	193.24	8,628.38	31.00	FALSE
Bush 3-Shelf Cabinet, Metal	6,153.52	1.91	458.41	27,513.67	49.00	FALSE
Bush 3-Shelf Cabinet, Mobile	9,810.76	3.92	936.79	33,921.47	74.00	FALSE
Bush 3-Shelf Cabinet, Pine	3,676.78	1.20	439.88	10,456.83	29.00	FALSE
Bush 3-Shelf Cabinet, Traditional	6,758.77	2.47	646.91	21,720.63	51.00	FALSE
Bush Andora Bookcase, Maple/Graphite Gray Finish	3,775.09	1.50	457.37	16,895.65	34.00	FALSE
Bush Classic Bookcase, Metal	25,900.00	3.97	2,359.94	102,573.97	72.00	FALSE
Bush Classic Bookcase, Mobile	20,427.93	2.44	1,406.23	80,554.44	55.00	FALSE
Bush Classic Bookcase, Pine	8,395.69	1.10	667.13	42,150.14	25.00	FALSE
Bush Classic Bookcase, Traditional	29,408.65	2.00	2,873.33	130,123.79	79.00	FALSE
Bush Corner Shelving, Metal	6,683.74	2.20	675.84	29,519.62	69.00	FALSE
Bush Corner Shelving, Mobile	7,702.12	4.04	870.16	32,274.05	77.00	FALSE
Bush Corner Shelving, Pine	7,477.54	3.17	702.08	30,676.59	71.00	FALSE
Bush Corner Shelving, Traditional	3,323.35	2.30	331.06	20,284.05	38.00	FALSE
Bush Cubix Collection Bookcases, Fully Assembled	789.53	0.70	60.30	1,230.79	4.00	FALSE
Bush Floating Shelf Set, Metal	9,443.42	3.07	772.28	34,785.27	69.00	FALSE
Bush Floating Shelf Set, Mobile	9,216.79	2.37	1,161.04	35,621.13	57.00	FALSE
Bush Floating Shelf Set, Pine	8,455.28	3.11	824.33	29,586.57	58.00	FALSE
Bush Floating Shelf Set, Traditional	5,499.60	2.27	693.76	17,390.27	37.00	FALSE
Bush Heritage Pine Collection 5-Shelf Bookcase, Al	4,158.56	1.87	532.55	22,345.15	34.00	FALSE
Bush Library with Doors, Metal	32,100.22	2.54	3,583.51	151,725.31	88.00	FALSE

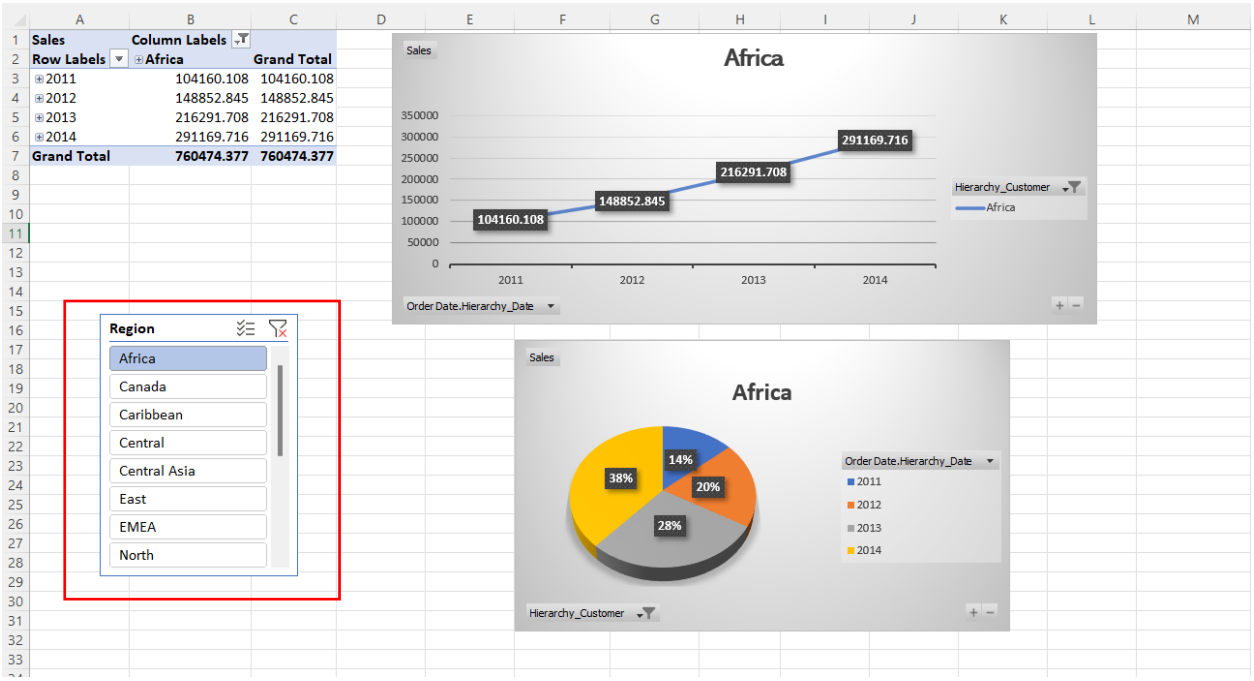
- For the above Pivot table I used the Product Hierarchy where it will be helpful to analyse the most selling products and the total quantity of the sold products, Here we can drill down the products using (Product Category Name → Product Sub Category Name → Product Name).

Slice

In a multidimensional array, a slice is a column of data that corresponds to a single value for one or more-dimension members. It aids the user in seeing and collecting data unique to a dimension.



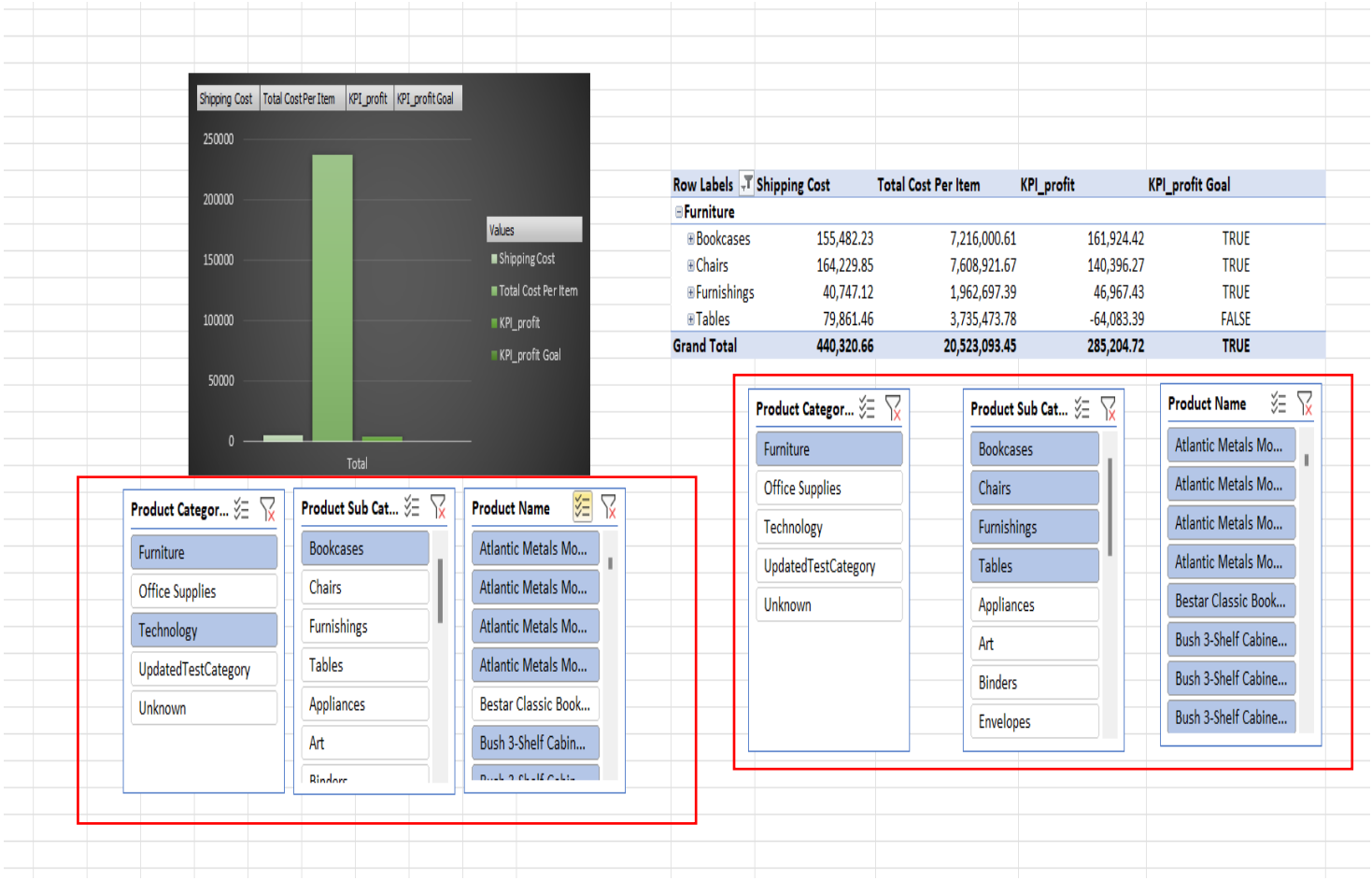
- For the above pivot chart and the pivot table reports shows that the Total Sales, Shipping cost and the total cost per item, here I had used a slicer to filter the details from a product category. Here are shows the details for the Furniture Product category. I can use more than one slicer to filter the results.



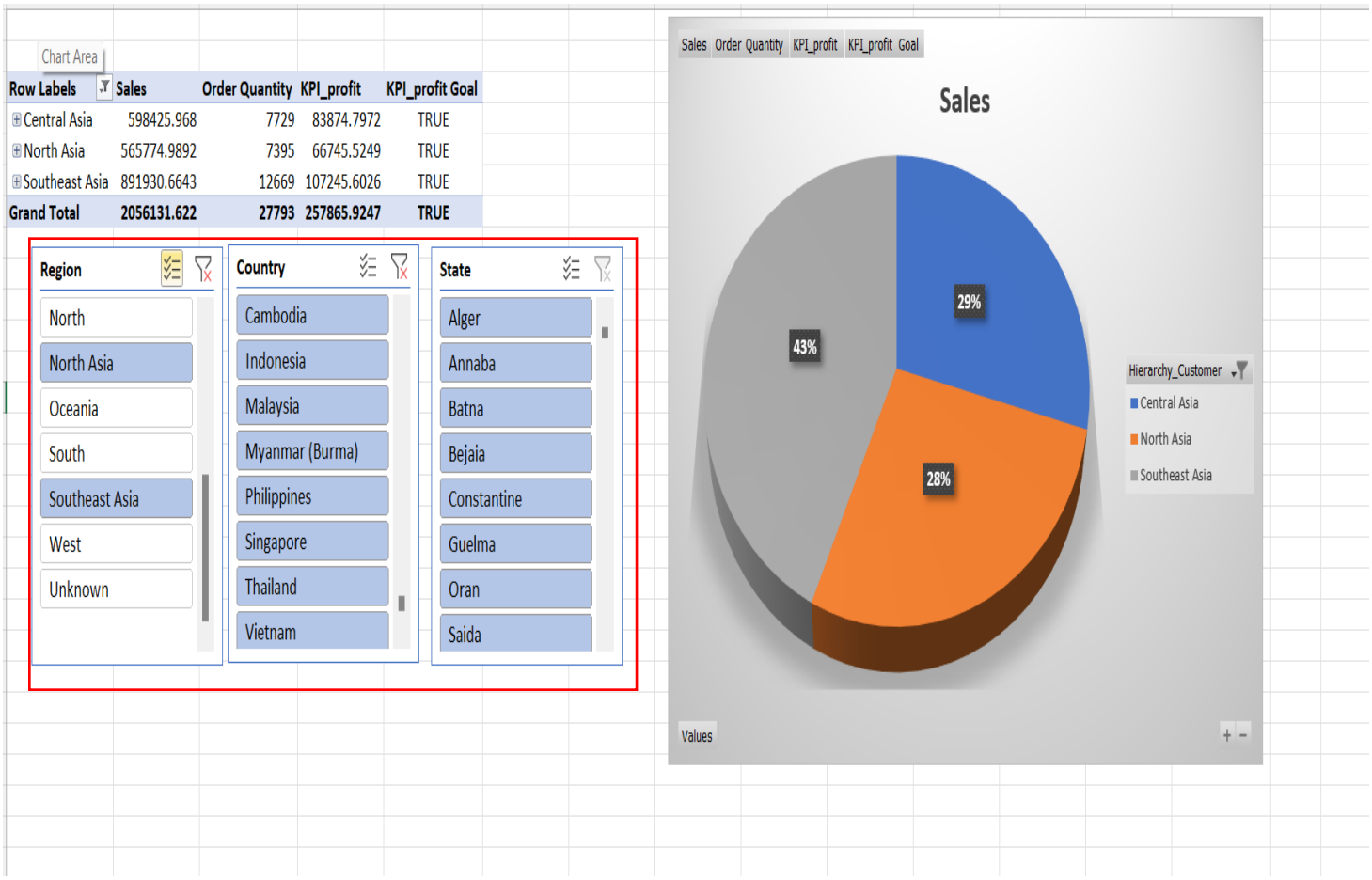
- The above pivot charts and the table shows the Sales amount for a particular year using the region I had used a slicer here as the region, so that it shows the related details for the region named “AFRICA”.

Dice

Dicing is similar to slicing; however, it operates in a slightly different way. Filtering is done to focus on a certain property when thinking of slicing. Dicing, on the other hand, is more of a zoom feature that picks a subset of all the dimensions for certain values.



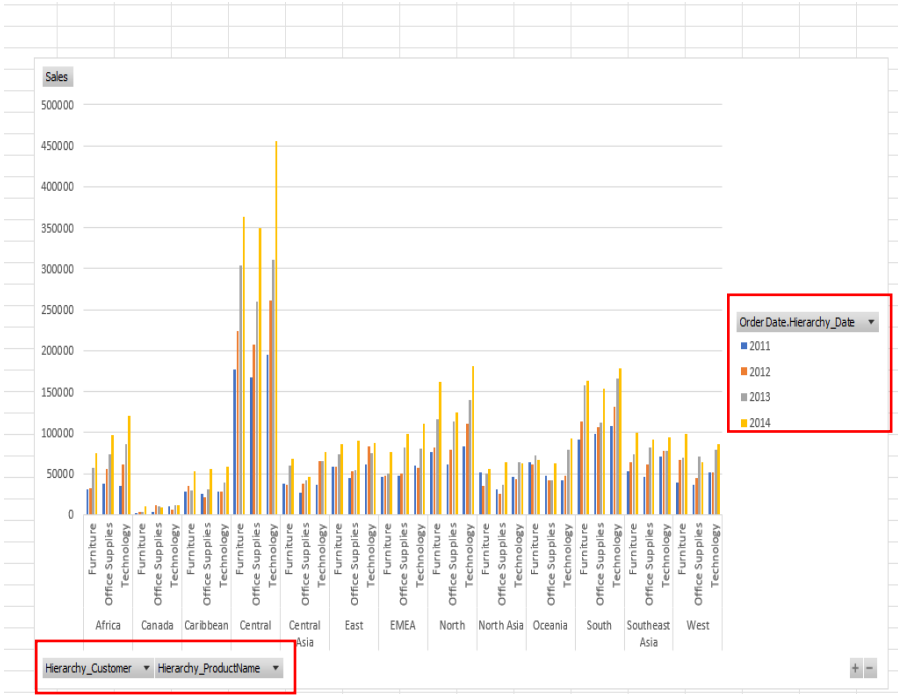
- Here in the pivot table and the chart it represents the Total profit for a selected Categories by its Subcategory and the product name. first, I had used the Product Category slicer and selected product categories and next used a product subcategory slicer and last used a product name slicer to get the above details.



- Here the above pivot pie chart represents the Total sales according to its region for that I had used a Region Slicer to get a particular region and next a country slicer to get the countries that in the selected region and finally used the state slicer to select the states of the countries.

Pivot

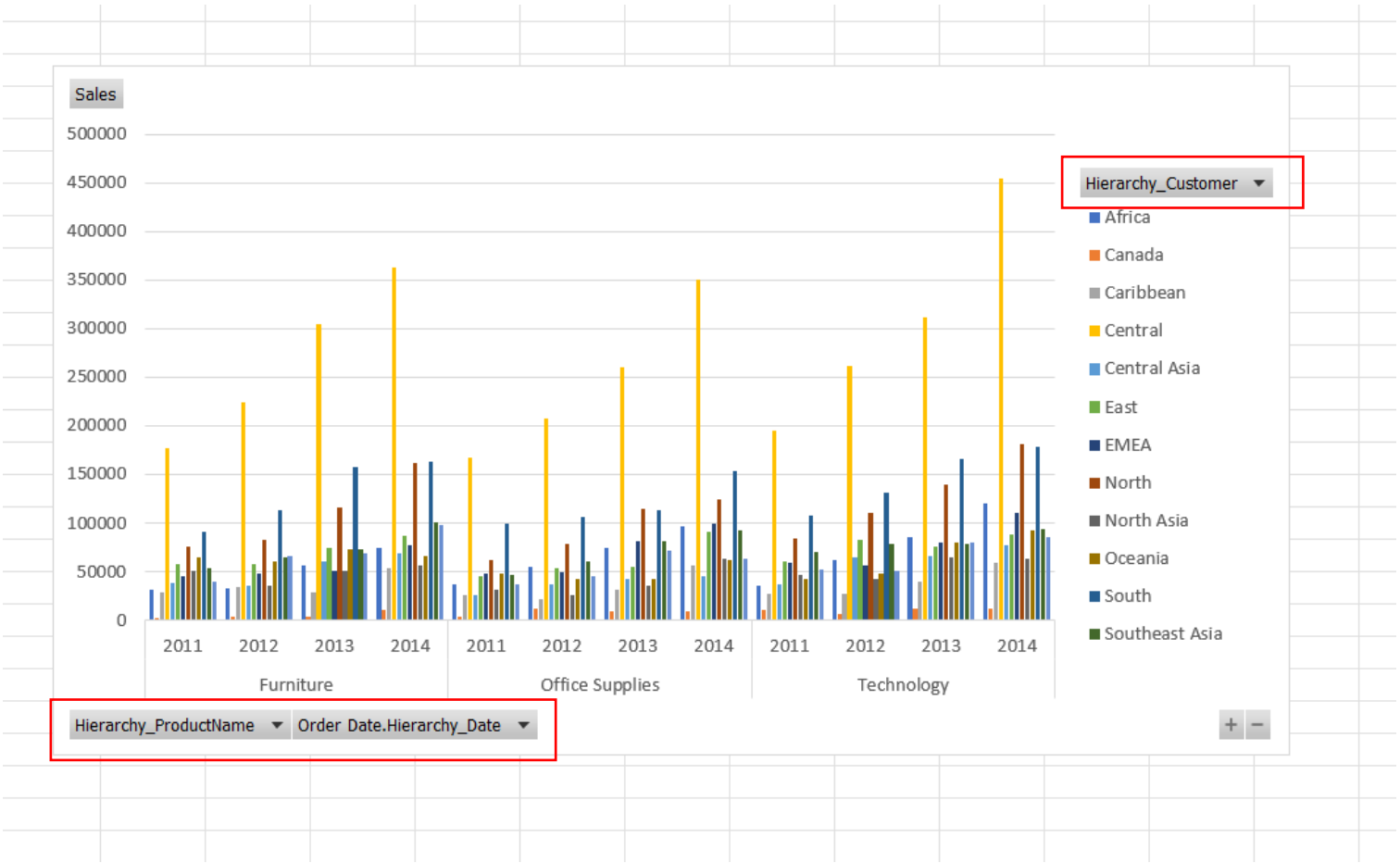
Before Pivot



Sales	Column Labels				
Row Labels	2011	2012	2013	2014	Grand Total
Africa					
Furniture	31,538.23	32,000.31	56,460.20	74,535.00	194,533.74
Office Supplies	37,279.81	55,240.69	73,746.01	96,422.80	262,689.32
Technology	35,342.07	61,611.84	86,085.50	120,211.92	303,251.33
Canada					
Furniture	1,965.76	3,468.10	3,794.55	10,799.62	20,028.03
Office Supplies	3,779.14	11,293.86	9,510.93	8,844.81	33,428.74
Technology	10,212.42	6,475.73	11,217.10	11,873.46	39,778.71
Caribbean					
Furniture	28,167.76	34,464.59	29,002.46	52,822.38	144,457.18
Office Supplies	25,050.27	21,500.25	31,467.11	56,294.30	134,311.93
Technology	27,528.98	27,542.23	39,253.24	58,907.15	153,231.60
Central					
Furniture	177,437.92	224,108.58	304,492.24	363,218.25	1,069,256.98
Office Supplies	167,825.44	208,101.00	259,865.36	350,058.95	985,850.75
Technology	195,613.82	261,817.14	311,577.18	455,086.46	1,224,094.59
Central Asia					
Furniture	37,791.44	36,042.86	60,215.75	68,369.84	202,419.88
Office Supplies	26,372.66	37,181.11	42,573.21	45,795.07	151,922.05
Technology	36,990.50	64,686.21	65,649.19	76,758.14	244,084.04
East					
Furniture	57,771.24	58,155.92	74,184.05	86,690.44	276,801.66
Office Supplies	45,247.31	52,990.76	54,661.66	90,295.35	243,195.07
Technology	61,070.74	83,084.81	75,507.70	88,056.04	307,719.29
EMEA					
Furniture	45,490.43	47,383.37	50,295.70	76,446.79	219,616.29
Office Supplies	47,303.50	49,921.66	81,388.04	98,748.76	277,361.96
Technology	59,205.35	56,596.30	80,372.60	110,316.15	306,490.40
North					
Furniture	76,048.02	82,407.94	116,621.26	161,395.51	436,472.73
Office Supplies	61,574.83	79,078.68	114,253.74	124,434.54	379,341.79
Technology	83,959.80	110,815.60	139,298.12	181,083.74	515,157.26
North Asia					
Furniture	51,211.81	35,570.51	50,428.23	55,792.33	193,002.89
Office Supplies	31,338.39	25,831.10	36,124.04	63,724.39	157,017.92
Technology	45,871.27	42,722.35	64,528.17	62,632.39	215,754.18
Oceania					
Furniture	64,549.89	61,079.93	72,401.21	66,077.50	264,108.53
Office Supplies	47,839.89	41,721.54	42,322.15	62,483.48	194,367.05
Technology	41,983.69	47,502.23	79,784.78	92,674.71	261,945.40
South					
Furniture	91,395.28	113,248.54	157,728.98	163,474.33	525,847.12
Office Supplies	98,970.29	106,631.44	112,609.04	153,329.61	471,540.39
Technology	108,158.78	131,087.63	166,298.33	178,298.53	583,843.28
Southeast Asia					
Furniture	53,121.50	64,522.45	73,171.72	100,029.40	290,845.08
Office Supplies	46,018.28	60,831.85	81,302.80	91,795.06	279,947.99
Technology	70,248.37	78,169.70	78,324.97	94,394.56	321,137.60
West					
Furniture	39,703.10	66,449.46	68,927.22	98,404.31	273,484.09
Office Supplies	37,006.63	44,770.68	70,893.57	63,424.39	216,095.26
Technology	51,466.28	51,329.73	79,408.38	85,865.43	268,069.82
Grand Total	2,259,450.90	2,677,438.69	3,405,746.45	4,299,865.87	12,642,501.91

After Pivot

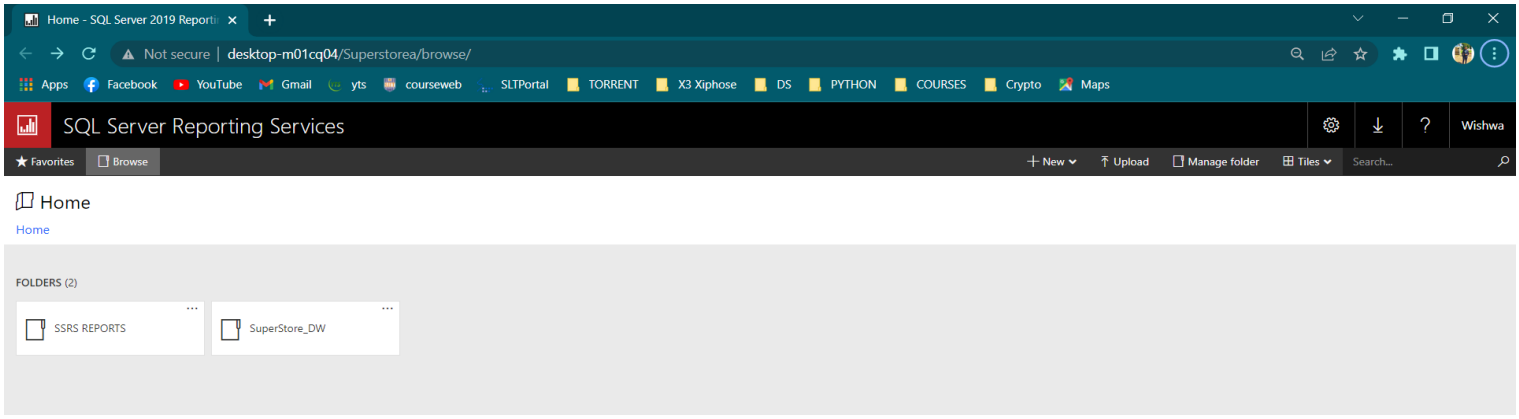
Sales	Column Labels													
Row Labels	Africa	Canada	Caribbean	Central	Central Asia	East	EMEA	North	North Asia	Oceania	South	Southeast Asia	West	Grand Total
Furniture														
2011	31538.229	1965.756	28167.7624	177437.9234	37791.442	57771.2445	45490.428	76048.0232	51211.8126	64549.8918	91395.2783	53121.4978	39703.095	756192.384
2012	32000.31	3468.102	34464.5861	224108.5772	36042.8563	58155.9208	47383.371	82407.9439	35570.5143	61079.9301	113248.535	64522.4514	66449.46	858902.5581
2013	56460.198	3794.547	29002.4553	304492.2354	60215.7453	74184.0518	50295.702	116621.2597	50428.2328	72401.2055	157728.9762	73171.7222	68927.2222	1117723.553
2014	74535	10799.622	52822.3752	363218.2481	68369.8351	86690.442	76446.786	161395.5064	55792.3305	66077.5018	163474.3269	100029.4037	98404.3131	1378055.691
Office Supplies														
2011	37279.812	3779.142	25050.2719	167825.4383	26372.6647	45247.3078	47303.502	61574.8299	31338.3937	47839.8858	98970.2943	46018.2756	37006.6322	675606.4502
2012	55240.692	11293.86	21500.2549	208101.0017	37181.1075	52990.7628	49921.662	79078.6823	25831.0955	41721.5418	106631.4421	60831.8492	44770.6752	795094.627
2013	73746.012	9510.93	31467.1066	259865.3598	42573.2086	54661.6559	81388.038	114253.7383	36124.0408	42322.1451	112609.0381	81302.7992	70893.5695	1010717.642
2014	96422.799	8844.807	56294.2969	350058.9532	45795.0685	90295.3475	98748.759	124434.5439	63724.3917	62483.4788	153329.6122	91795.061	63424.3877	1305651.506
Technology														
2011	35342.067	10212.42	27528.9791	195613.8208	36990.5011	61070.7386	59205.348	83959.7998	45871.2709	41983.6924	108158.7816	70248.3653	51466.2767	827652.0613
2012	61611.843	6475.731	27542.2306	261817.1379	64686.2074	83084.8104	56596.299	110815.6034	42722.3489	47502.2297	131087.6334	78169.7041	51329.731	1023441.51
2013	86085.498	11217.099	39253.243	311577.1774	65649.1915	75507.6996	80372.601	139298.1175	64528.1691	79784.775	166298.3291	78324.9743	79408.3799	1277305.254
2014	120211.917	11873.46	58907.1503	455086.4559	76758.14	88056.0415	110316.153	181083.7355	62632.3884	92674.7054	178298.5346	94394.5605	85865.4314	1616158.674
Grand Total	**760474.377**	**93235.476**	**432000.7123**	**3279202.329**	**598425.968**	**827716.0232**	**803468.649**	**1330971.784**	**565774.9892**	**720420.9832**	**1581230.782**	**891930.6643**	**757649.1739**	**12642501.91**

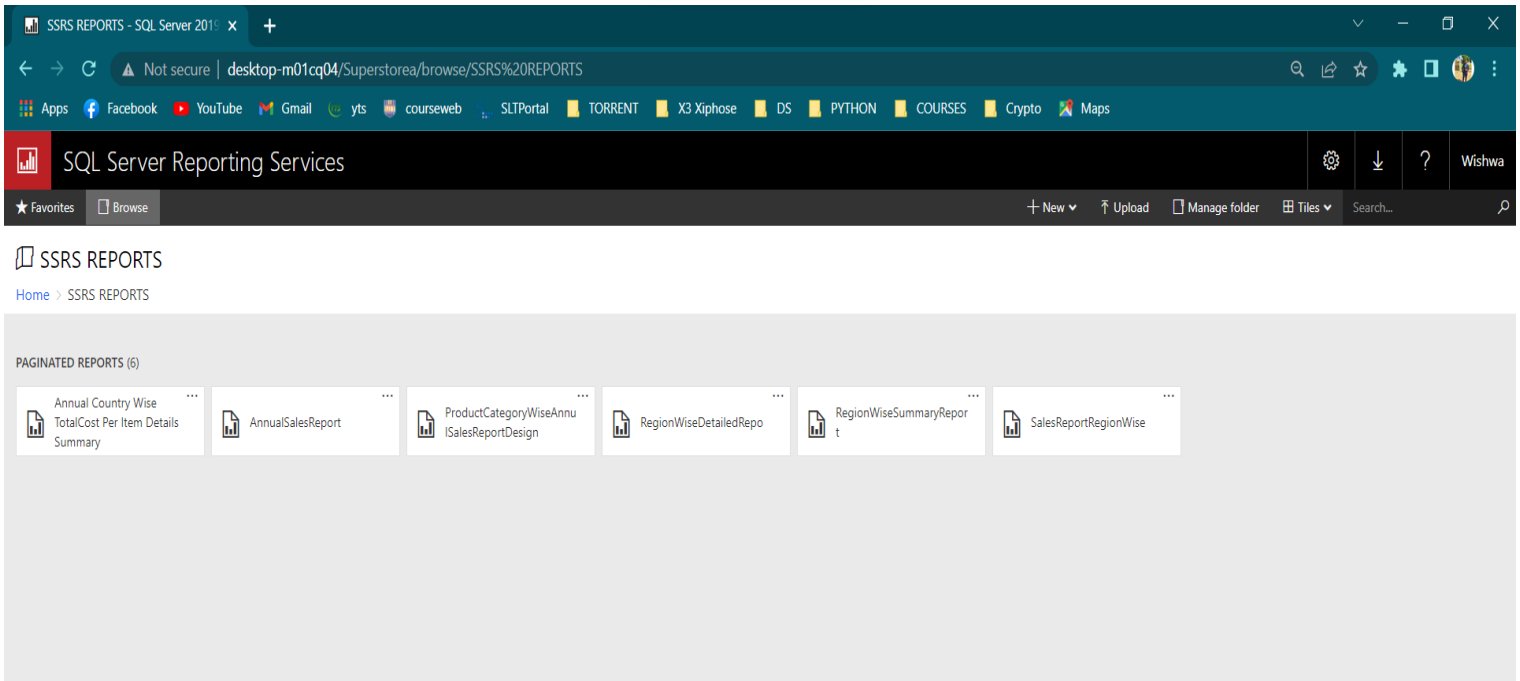


Step 4: SSRS Reports

SQL Server Reporting Service (SSRS) is a reporting tool that lets you create structured reports that include tables, pictures, graphs, and charts. These reports are stored on a server and may be run at any time using user-defined parameters.

A report server's web portal is a web-based experience. You may see reports, mobile reports, KPIs, and browse through the features of your report server instance through the site. You may also manage a single report server instance using the web interface.



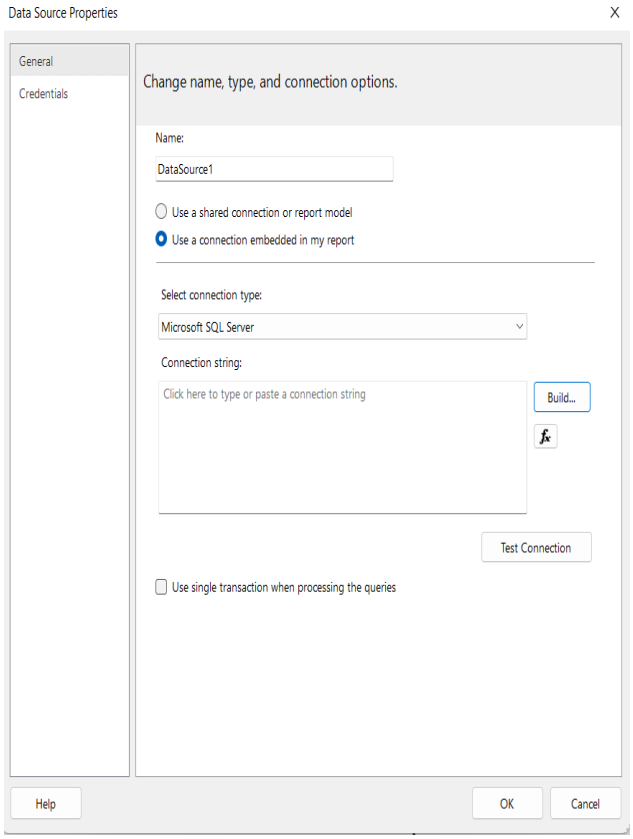


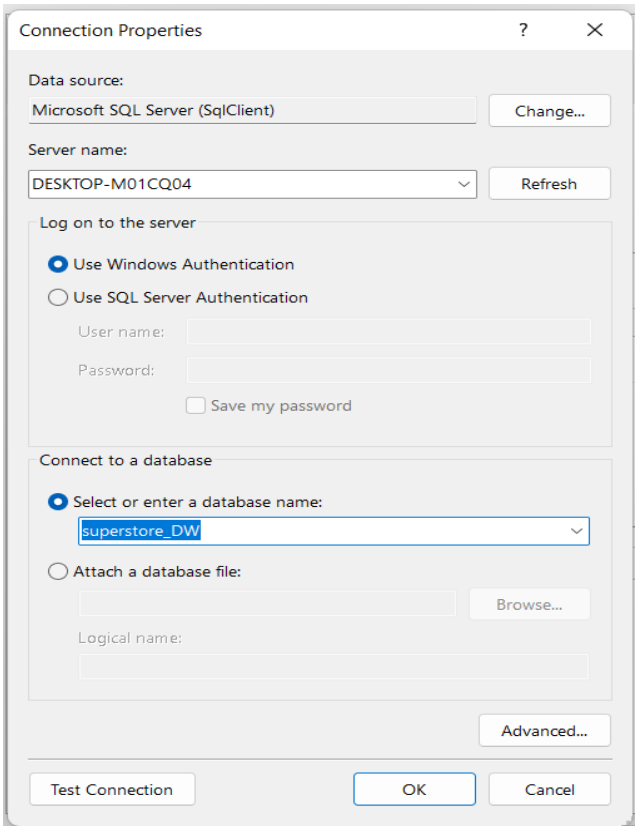
To generate these reports, I had used Report Builder app.

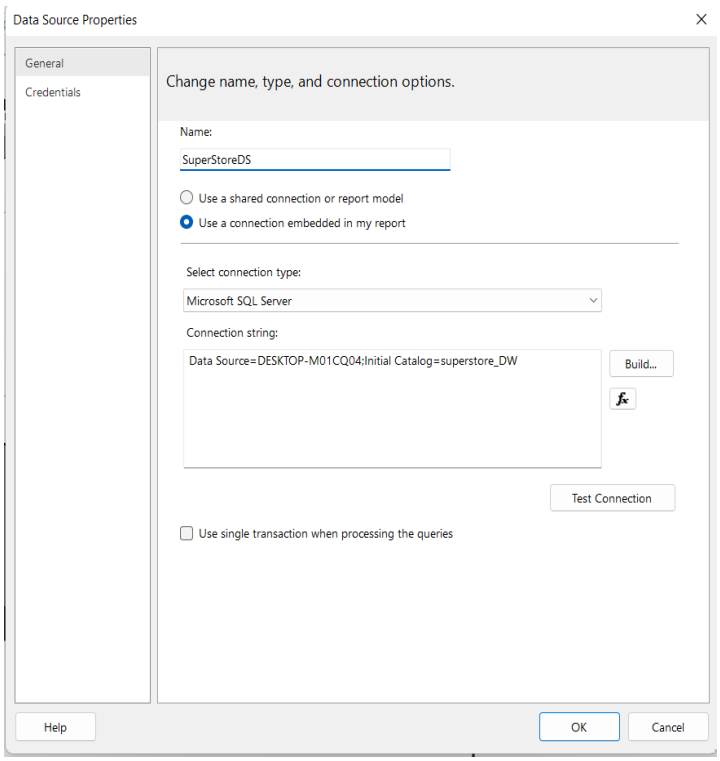
Report Builder app Environment Setting up

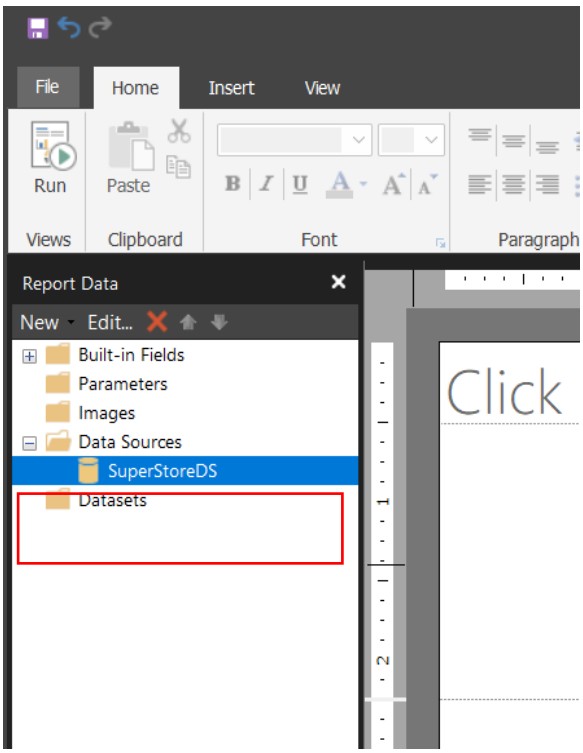
Creating a data source

We connected our Data Warehouse (SuperStore_DW) to our source data in the report builder.



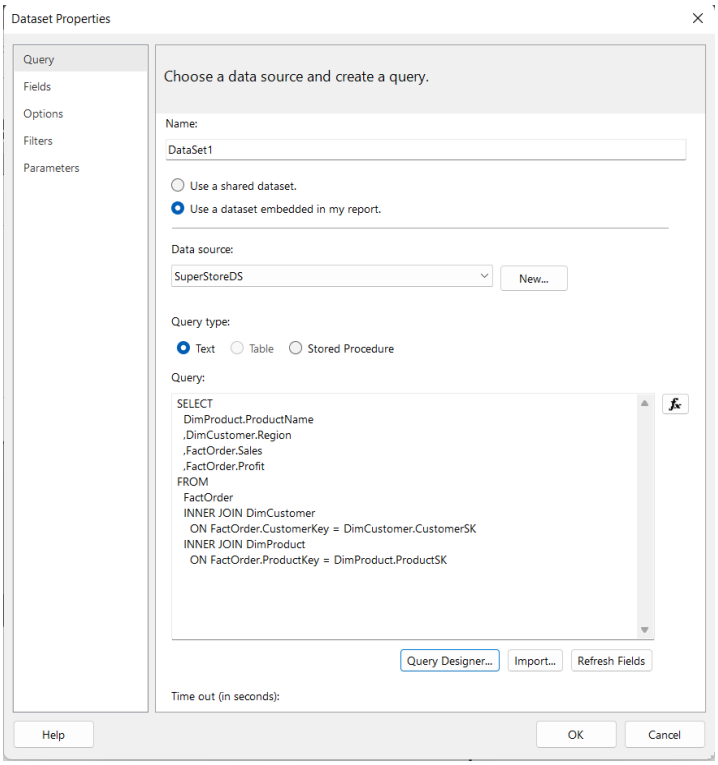


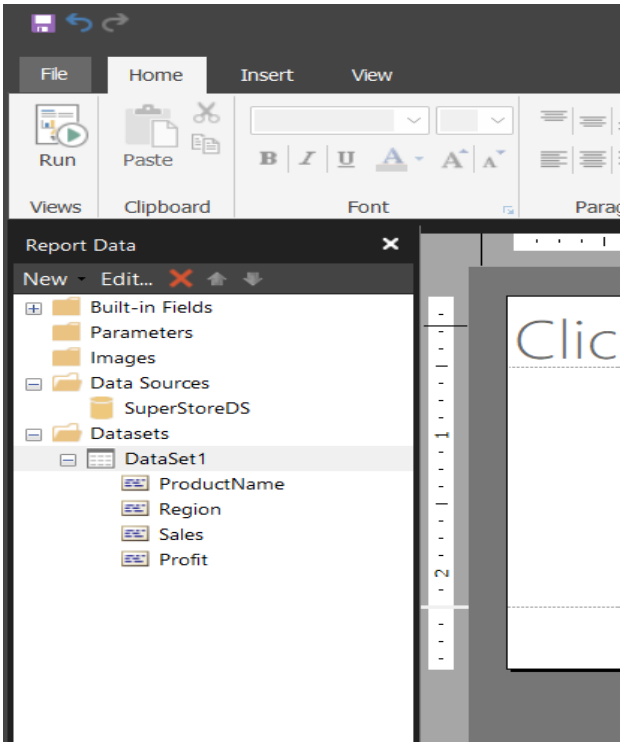




Creating Datasets

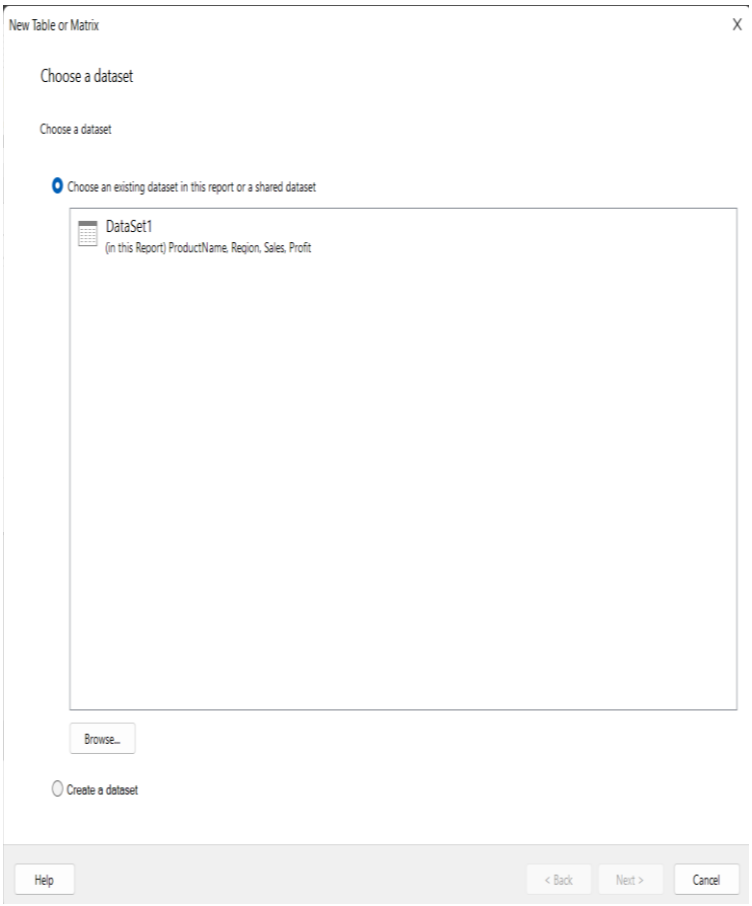
Here we import the necessary data set for our report builder using the query which can also be assigned according to the requirements

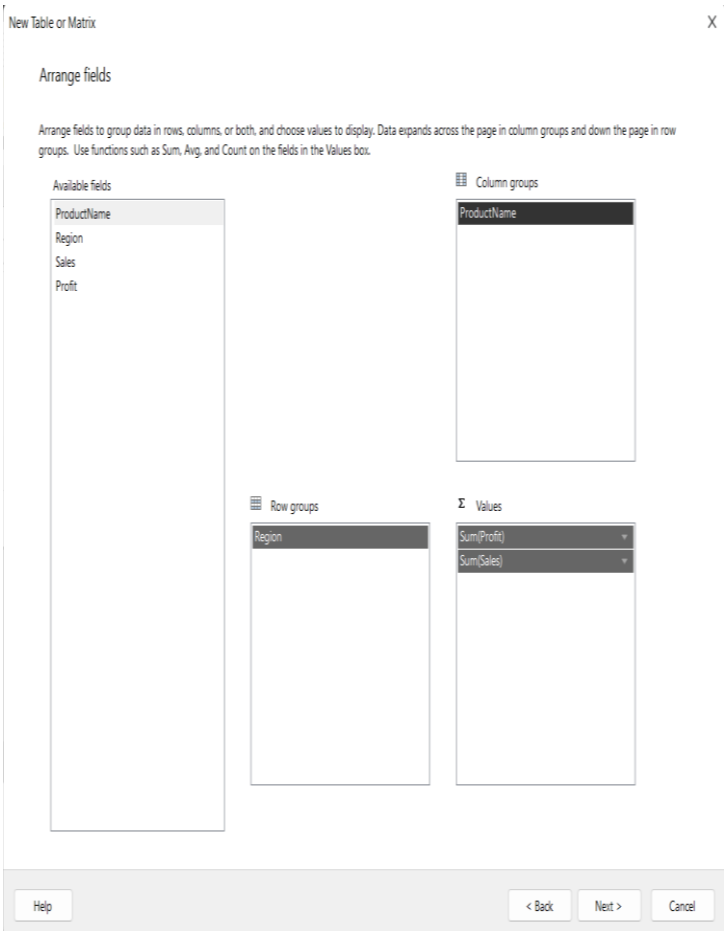




Creating a Matrix or a Table

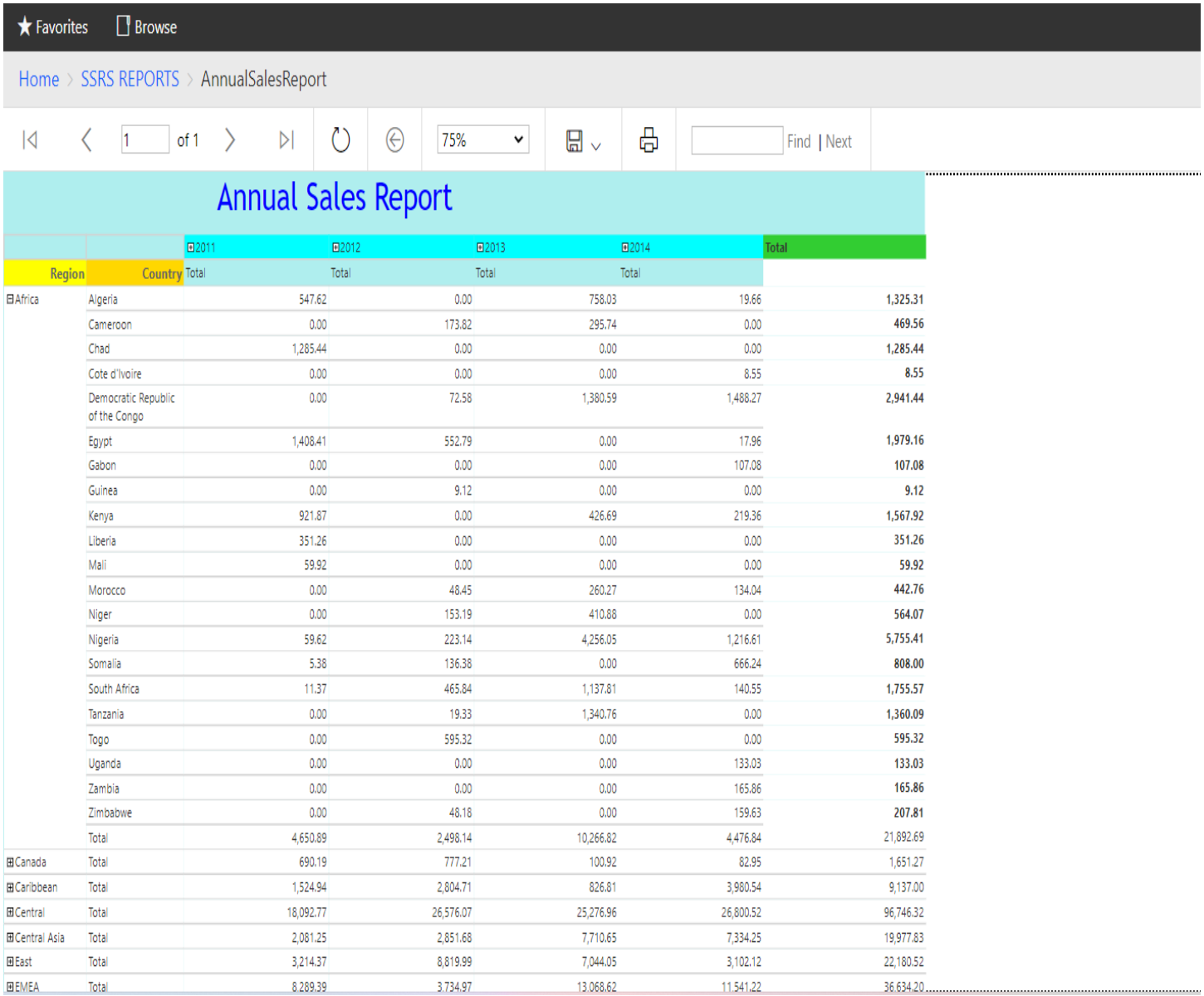
Crate a table or a matrix to represent data where that can be used to generate reports.





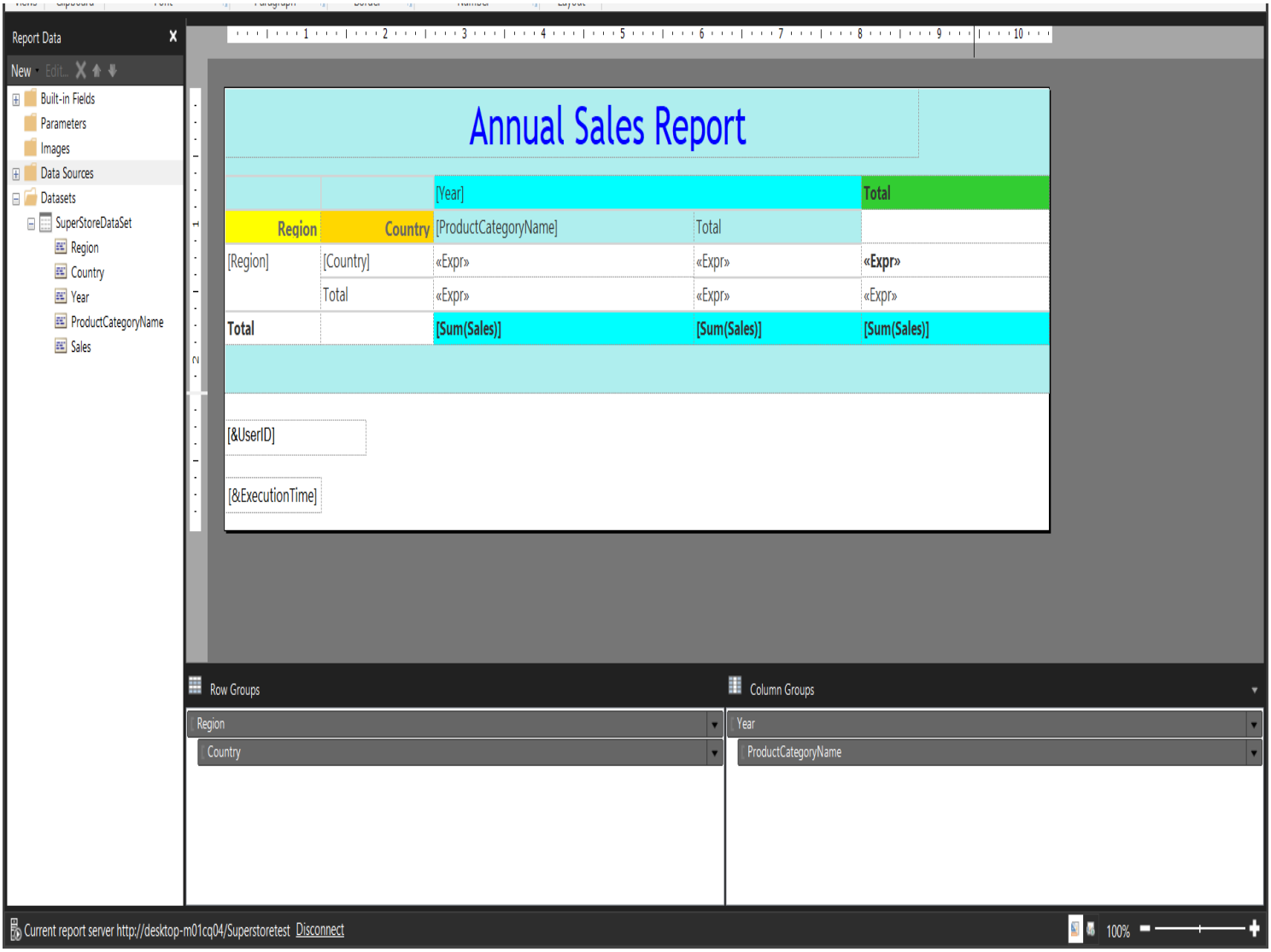
Reports

Report1 -Report with a matrix : Annual Sales Report



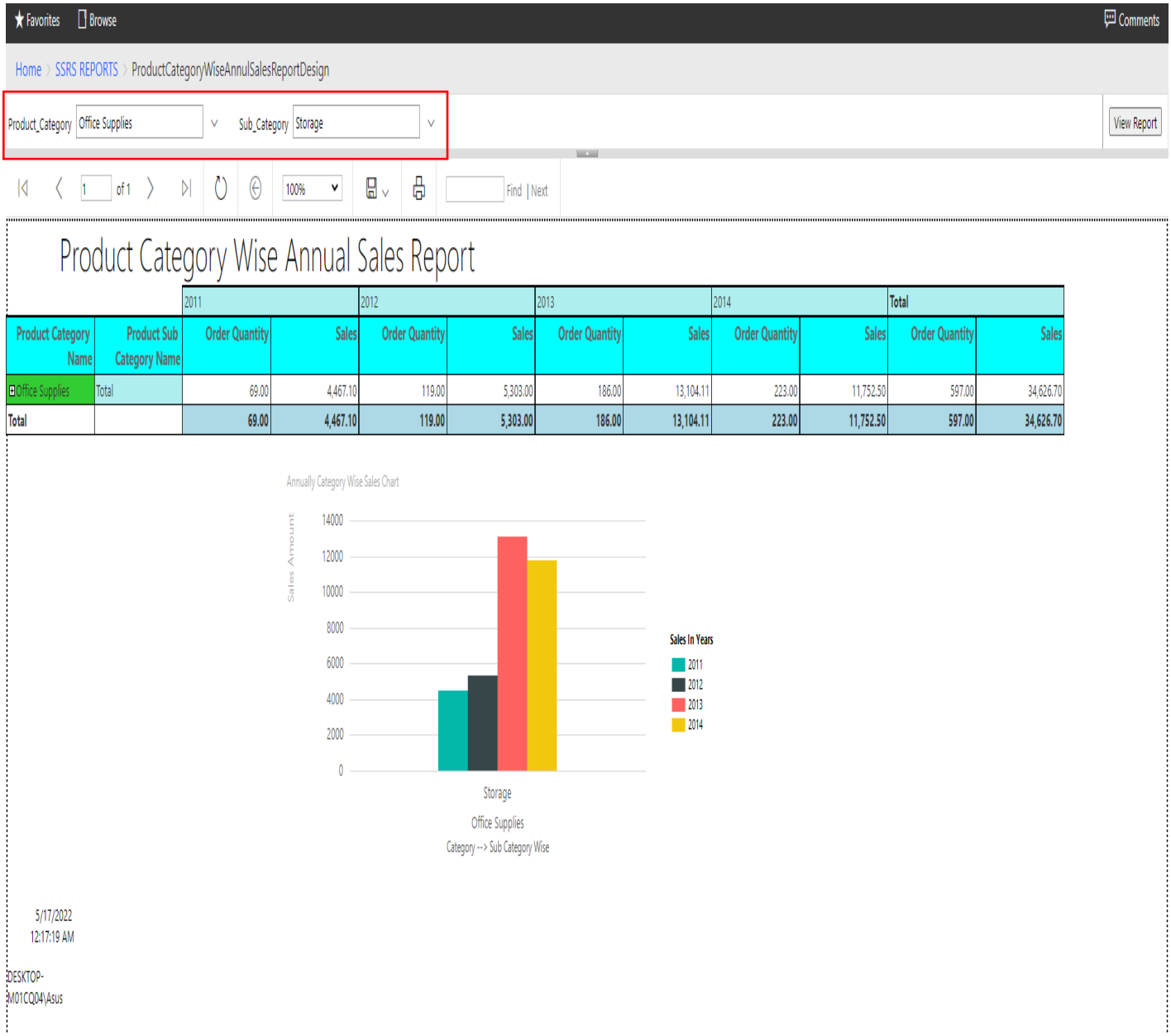
Annual Sales Report

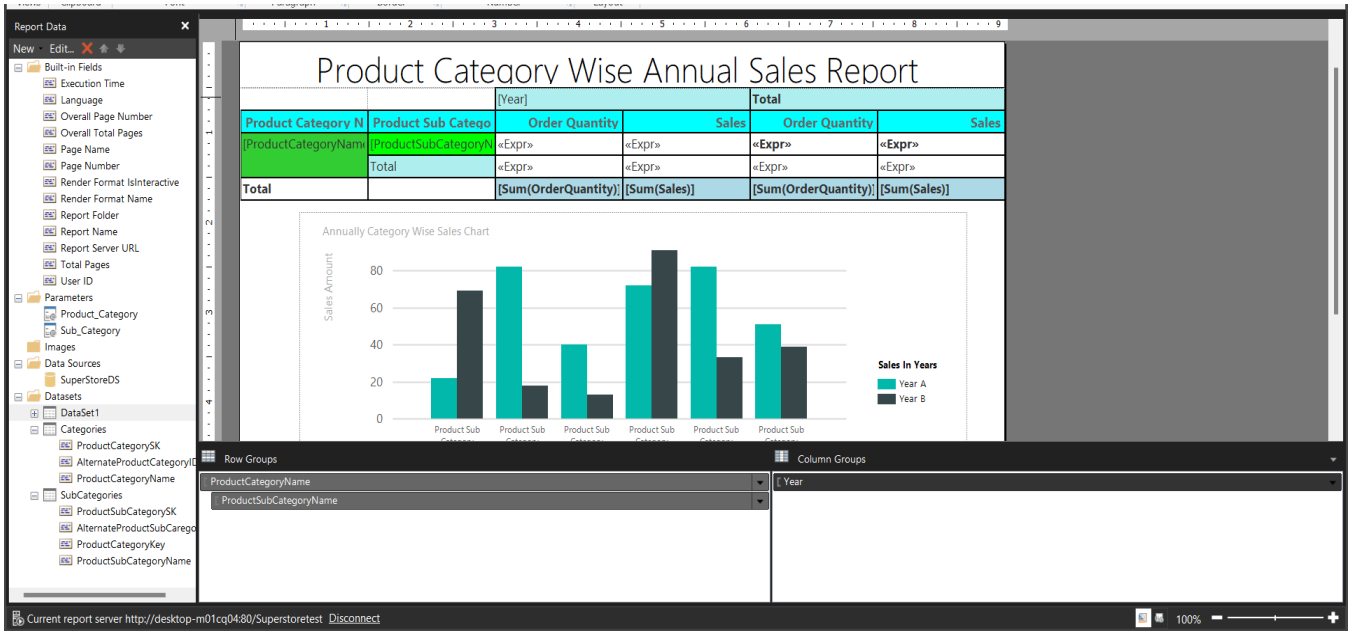
Region	Country	2011 Total	2012 Total	2013 Total	2014 Total	Total
⊟Africa	Algeria	547.62	0.00	758.03	19.66	**1,325.31**
	Cameroon	0.00	173.82	295.74	0.00	**469.56**
	Chad	1,285.44	0.00	0.00	0.00	**1,285.44**
	Cote d'Ivoire	0.00	0.00	0.00	8.55	**8.55**
	Democratic Republic of the Congo	0.00	72.58	1,380.59	1,488.27	**2,941.44**
	Egypt	1,408.41	552.79	0.00	17.96	**1,979.16**
	Gabon	0.00	0.00	0.00	107.08	**107.08**
	Guinea	0.00	9.12	0.00	0.00	**9.12**
	Kenya	921.87	0.00	426.69	219.36	**1,567.92**
	Liberia	351.26	0.00	0.00	0.00	**351.26**
	Mali	59.92	0.00	0.00	0.00	**59.92**
	Morocco	0.00	48.45	260.27	134.04	**442.76**
	Niger	0.00	153.19	410.88	0.00	**564.07**
	Nigeria	59.62	223.14	4,256.05	1,216.61	**5,755.41**
	Somalia	5.38	136.38	0.00	666.24	**808.00**
	South Africa	11.37	465.84	1,137.81	140.55	**1,755.57**
	Tanzania	0.00	19.33	1,340.76	0.00	**1,360.09**
	Togo	0.00	595.32	0.00	0.00	**595.32**
	Uganda	0.00	0.00	0.00	133.03	**133.03**
	Zambia	0.00	0.00	0.00	165.86	**165.86**
	Zimbabwe	0.00	48.18	0.00	159.63	**207.81**
	Total	4,650.89	2,498.14	10,266.82	4,476.84	21,892.69
⊞Canada	Total	690.19	777.21	100.92	82.95	1,651.27
⊞Caribbean	Total	1,524.94	2,804.71	826.81	3,980.54	9,137.00
⊞Central	Total	18,092.77	26,576.07	25,276.96	26,800.52	96,746.32
⊞Central Asia	Total	2,081.25	2,851.68	7,710.65	7,334.25	19,977.83
⊞East	Total	3,214.37	8,819.99	7,044.05	3,102.12	22,180.52
⊞EMEA	Total	8,289.39	3,734.97	13,068.62	11,541.22	36,634.20



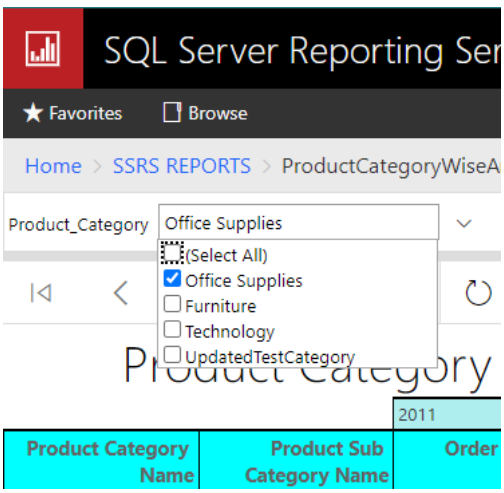
- Matrix is comparable to a table in SSRS, but it is designed to display data organized by columns and rows, with aggregate data at the intersection. A pivot table in a spreadsheet is similar to this.
- We can view the Annual Sales report of all the products categories which was sold on the specific regions
- Here for the table design I had used an Expression;
  =IIf(IsNothing(Sum(Fields!Sales.Value)) =True, 0, Sum(Fields!Sales.Value))
  Where this check the column fields if there is any null values replace those null values into digit 0.

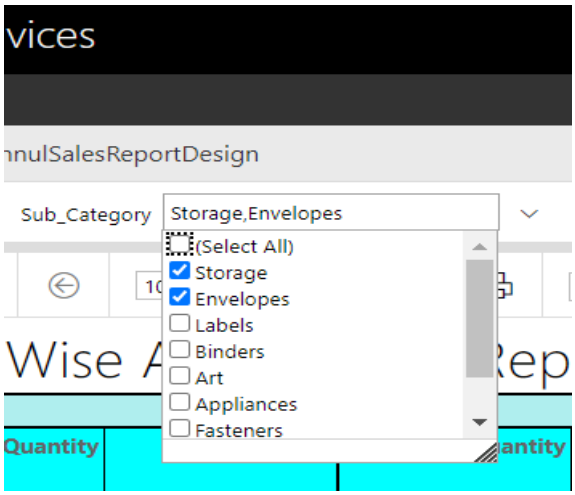
Report 2: Report with more than one parameter (Multiparameter) : Product Category wise annual sales report





- The above report is based on the Product wise annul sales report, where 2 parameters were passe here





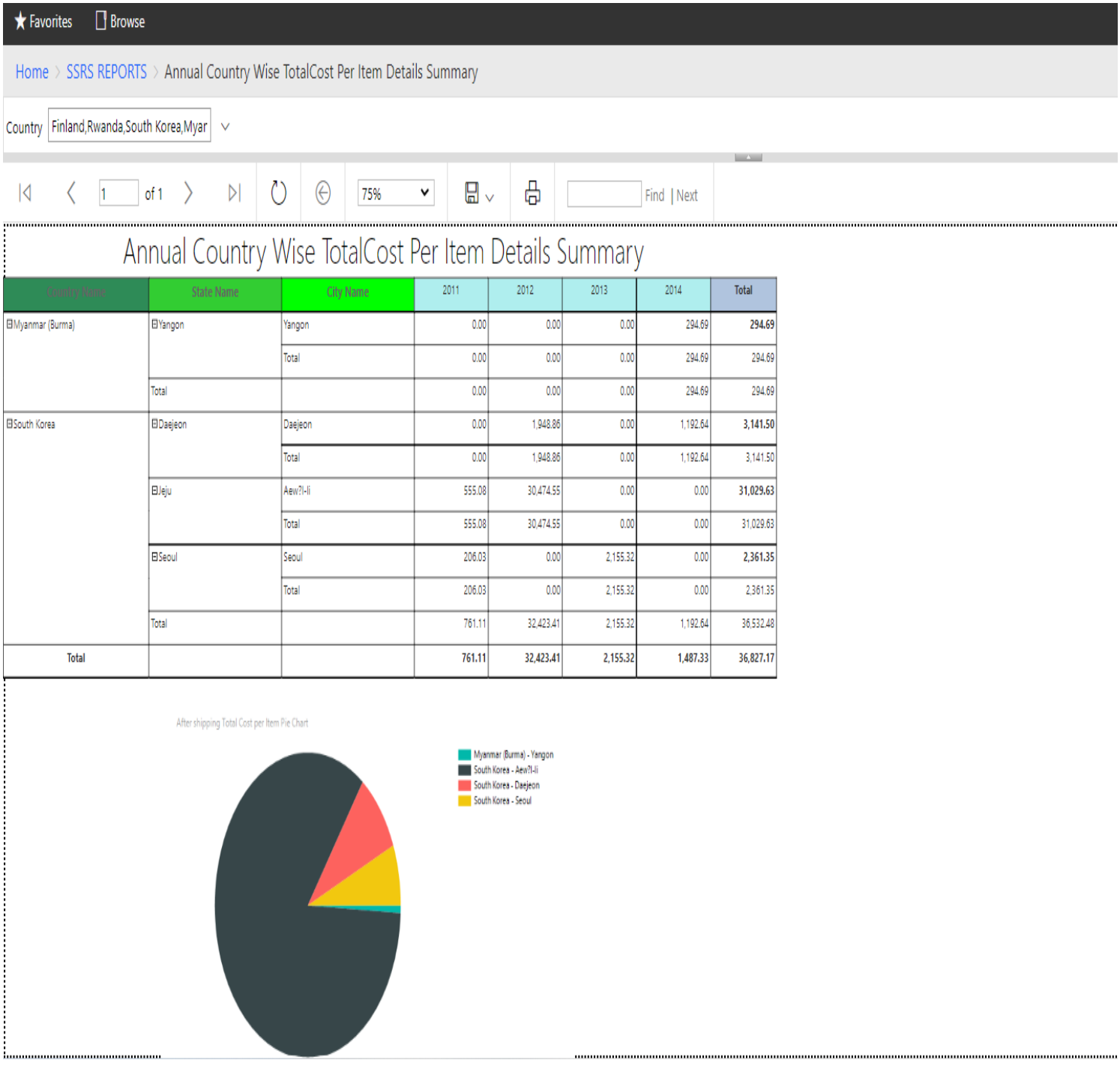
Product Category parameter and Product Subcategory parameter in here you can filter the report by one or multiple product categories and one or multiple product Subcategories.

- For design this table I had used some expressions.

- =IIf(IsNothing(Sum(Fields!OrderQuantity.Value)) =True, 0, Sum(Fields!OrderQuantity.Value))
- =IIf(IsNothing(Sum(Fields!Sales.Value)) =True, 0, Sum(Fields!Sales.Value))

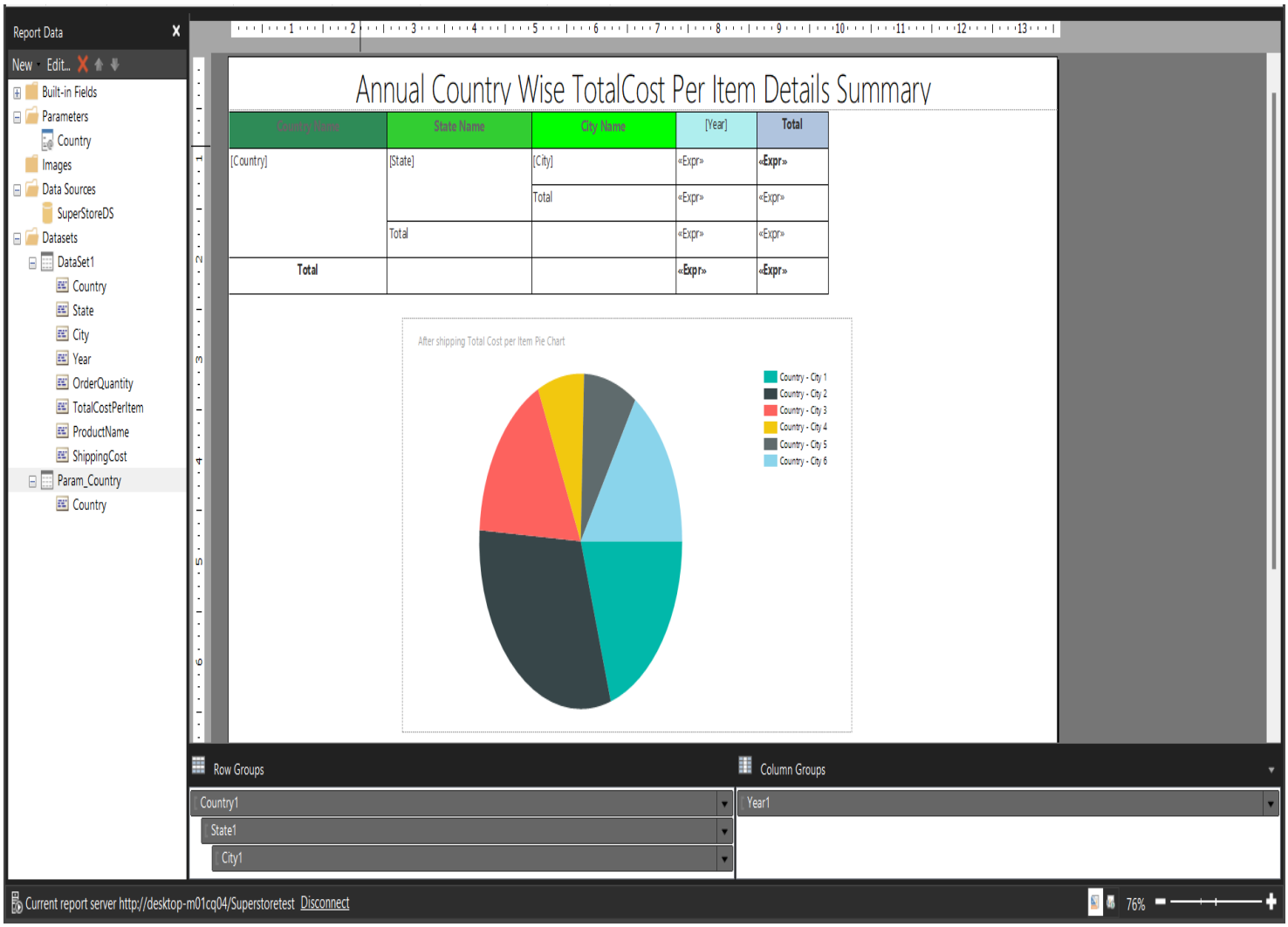
Where these 2-expression search if there is any null value in the column and replace that null value with digit 0

Report 3: SSRS drill-down report: Annual Country Wise TotalCostPerItem report



Annual Country Wise TotalCost Per Item Details Summary

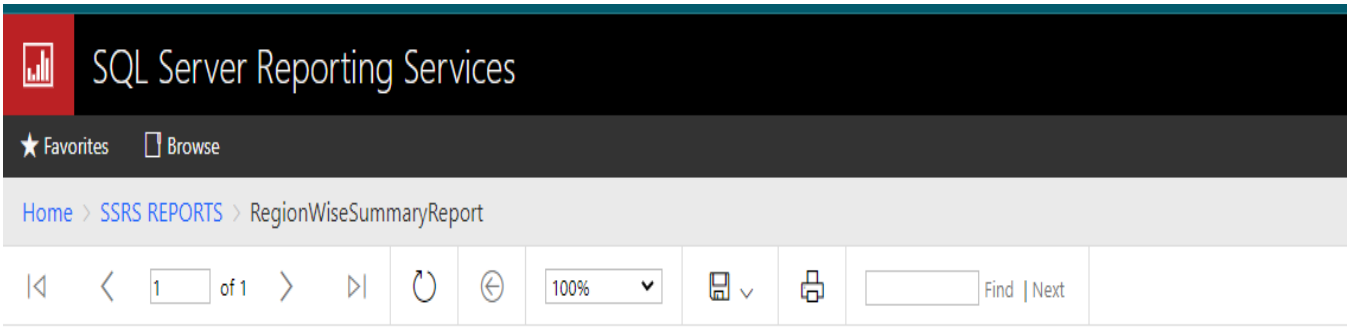
Country Name	State Name	City Name	2011	2012	2013	2014	Total
⊟Myanmar (Burma)	⊟Yangon	Yangon	0.00	0.00	0.00	294.69	**294.69**
		Total	0.00	0.00	0.00	294.69	294.69
	Total		0.00	0.00	0.00	294.69	294.69
⊟South Korea	⊟Daejeon	Daejeon	0.00	1,948.86	0.00	1,192.64	**3,141.50**
		Total	0.00	1,948.86	0.00	1,192.64	3,141.50
	⊟Jeju	Aew?l-li	555.08	30,474.55	0.00	0.00	**31,029.63**
		Total	555.08	30,474.55	0.00	0.00	31,029.63
	⊟Seoul	Seoul	206.03	0.00	2,155.32	0.00	**2,361.35**
		Total	206.03	0.00	2,155.32	0.00	2,361.35
	Total		761.11	32,423.41	2,155.32	1,192.64	36,532.48
Total			**761.11**	**32,423.41**	**2,155.32**	**1,487.33**	**36,827.17**



- The above reports show us the Annual Country wise totalcostperItem report where we can find out the total cost per item after shipping to a specific country
- The drill down used here is Country →State →City
- Where we can see the total for a country or total for a specific state or a specific city
- For design this table I had used some expression
    - =IIf(IsNothing(Sum(Fields!TotalCostPerItem.Value)) =True, 0, Sum(Fields!TotalCostPerItem.Value))

  Where this check the column fields if there is any null values replace those null values into digit 0.

Report 4 - SSRS drill-through report:RegionWiseCostDetails



Region Wise Summary Report

Region	Order Quantity	Total Cost Per Item
Africa	10,385.00	3,181,218.27
Canada	1,220.00	341,431.04
Caribbean	6,011.00	2,292,913.28
Central	47,398.00	16,668,959.47
Central Asia	7,729.00	3,156,440.43
East	11,881.00	4,370,067.26
EMEA	11,313.00	3,343,290.29
North	18,605.00	6,788,375.39
North Asia	7,395.00	2,878,378.34
Oceania	10,450.00	3,730,776.45
South	21,944.00	7,998,917.42
Southeast Asia	12,669.00	4,533,898.62
West	11,312.00	3,864,437.86
Total	**178312**	**63149104.1317**

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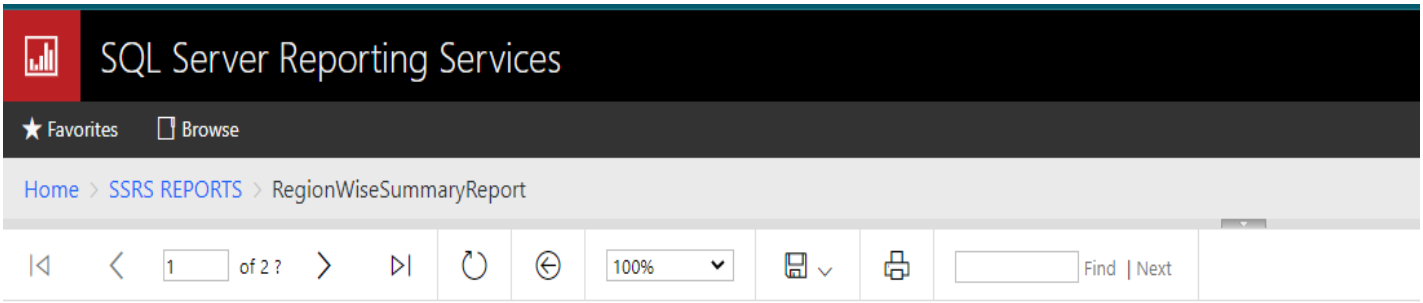
This report shows the Region wise summary report for the cost and sales here if you want to see a detailed report according to the region you can click on a specific region column cell to retrieve an detailed report.

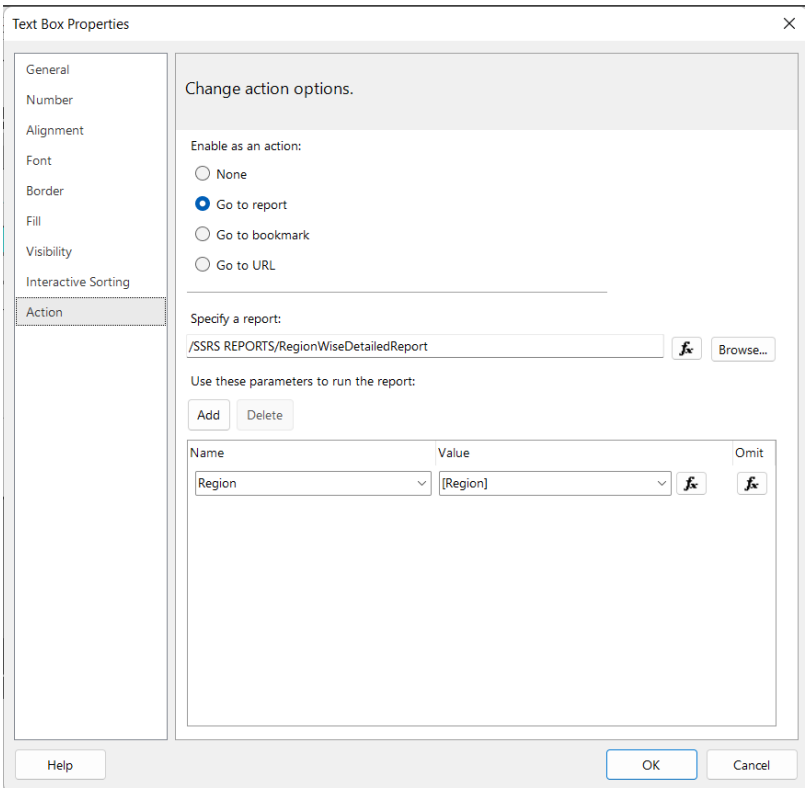
Example: if you click on the Africa Region, you will display an details report as below



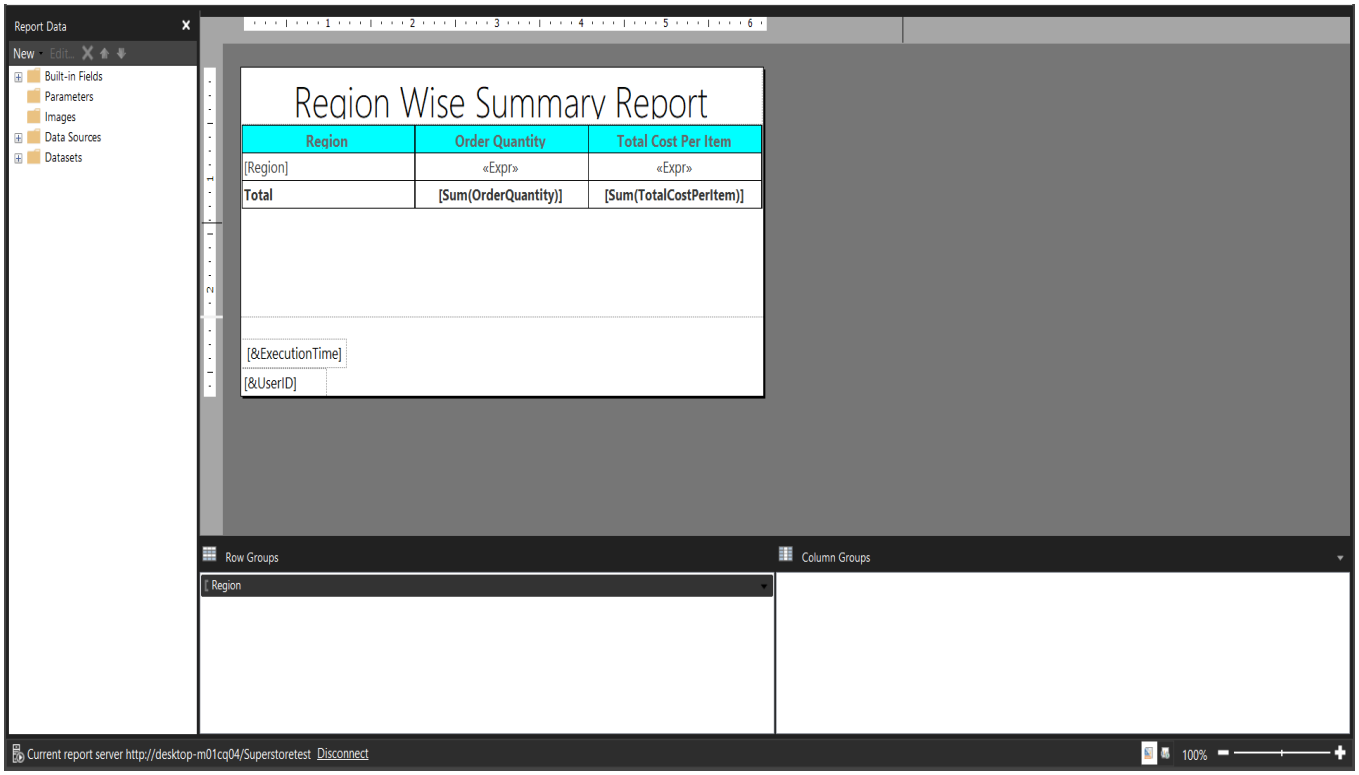
Region Wise Detailed Report

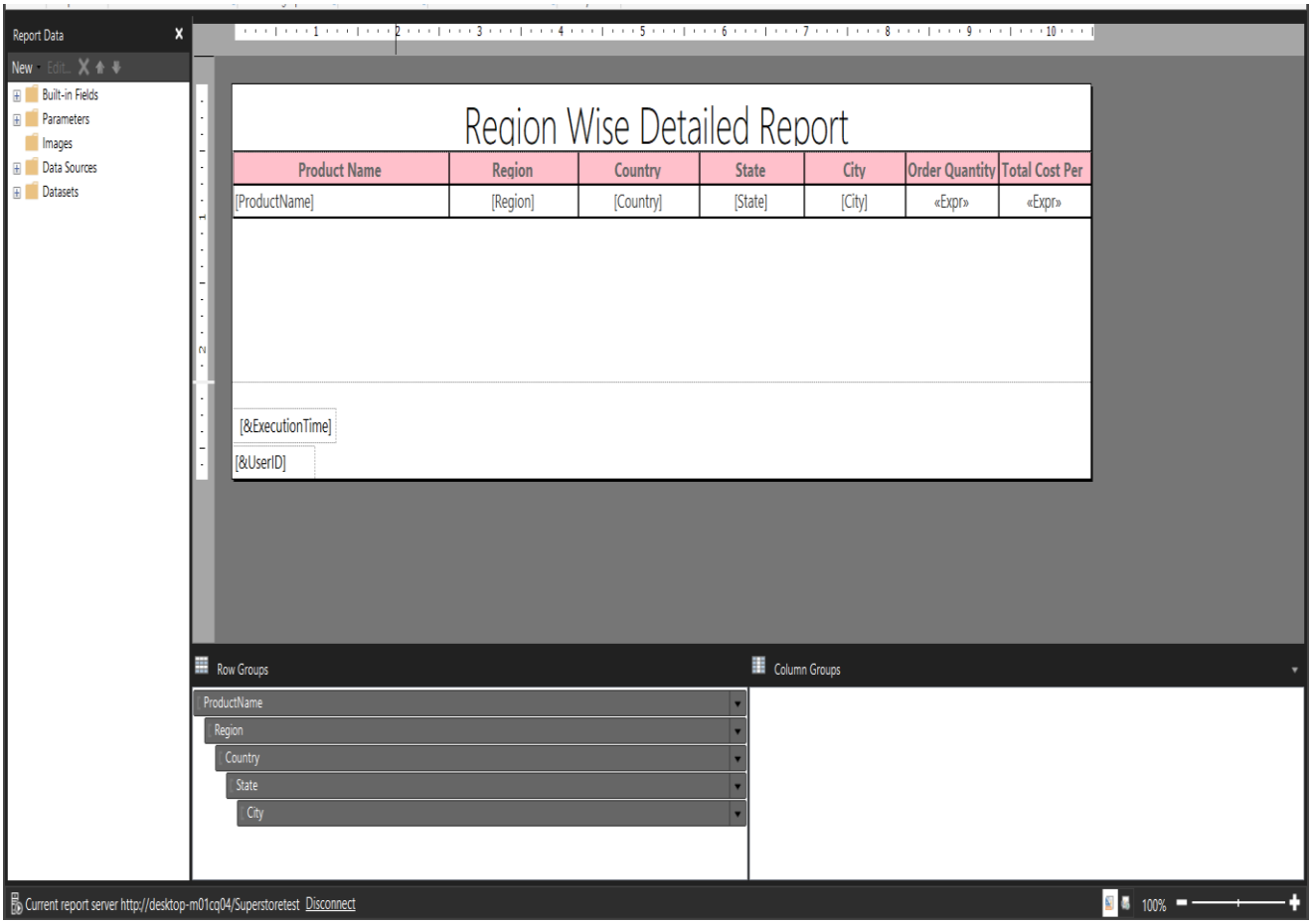
Product Name	Region	Country	State	City	Order Quantity	Total Cost Per Item
Acco 3-Hole Punch, Clear	Africa	Cameroon	Littoral	Loum	1.00	9.33
		Democratic Republic of the Congo	Kinshasa	Kinshasa	2.00	123.42
		Gabon	Estuaire	Libreville	1.00	16.14
		Mozambique	Sofala	Beira	1.00	34.98
		Nigeria	Enugu	Enugu	1.00	8.60
		South Africa	Gauteng	Randfontein	1.00	32.99
		Tanzania	Mwanza	Mwanza	1.00	33.58
Acco 3-Hole Punch, Durable	Africa	Algeria	Tipaza	Baraki	1.00	34.02
		Egypt	Asyut	Asyut	1.00	35.52
		Morocco	Gharb-Chrarda-Béni Hssen	Kenitra	2.00	139.46
		Nigeria	Edo	Benin City	1.00	34.30
		South Africa	Gauteng	Johannesburg	2.00	131.59
Acco 3-Hole Punch, Economy	Africa	Democratic Republic of the Congo	Kasai-Oriental	Mbuji-mayi	2.00	124.64
		Egypt	Asyut	Asyut	1.00	32.88
		Kenya	Nairobi	Nairobi	1.00	35.85
		Morocco	Rabat-Salé-Zemmour-Zaer	Rabat	2.00	128.43
		Sierra Leone	Eastern	Koidu	1.00	33.73
Acco 3-Hole Punch, Recycled	Africa	Morocco	Grand Casablanca	Casablanca	1.00	12.36
		Nigeria	Cross River	Calabar	4.00	490.82
		Tanzania	Dar Es Salaam	Dar es Salaam	10.00	1,617.21
		Zimbabwe	Harare	Chitungwiza	1.00	32.09
Acco Binder Covers, Clear	Africa	Democratic Republic	Kinshasa	Kinshasa	1.00	3.82

Here the button click action will be set for the main report on required text box.



Then the parameter named Region will be passed to my second sub report (Detailed report).in there it will use that passed parameter to get the required data according to the passed Region.




Report Data
New
Edit...
Built-in Fields
Parameters
Images
Data Sources
Datasets
Region Wise Detailed Report
Product Name
Region
Country
State
City
Order Quantity
Total Cost Per
[ProductName]
[Region]
[Country]
[State]
[City]
«Expr»
«Expr»
[&ExecutionTime]
[&UserID]
Row Groups
Column Groups
ProductName
Region
Country
State
City
Current report server http://desktop-m01cq04/Superstoretest Disconnect
100%