SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY

Data Warehouse and Business Intelligence

Assignment 02

2022

Submitted By:

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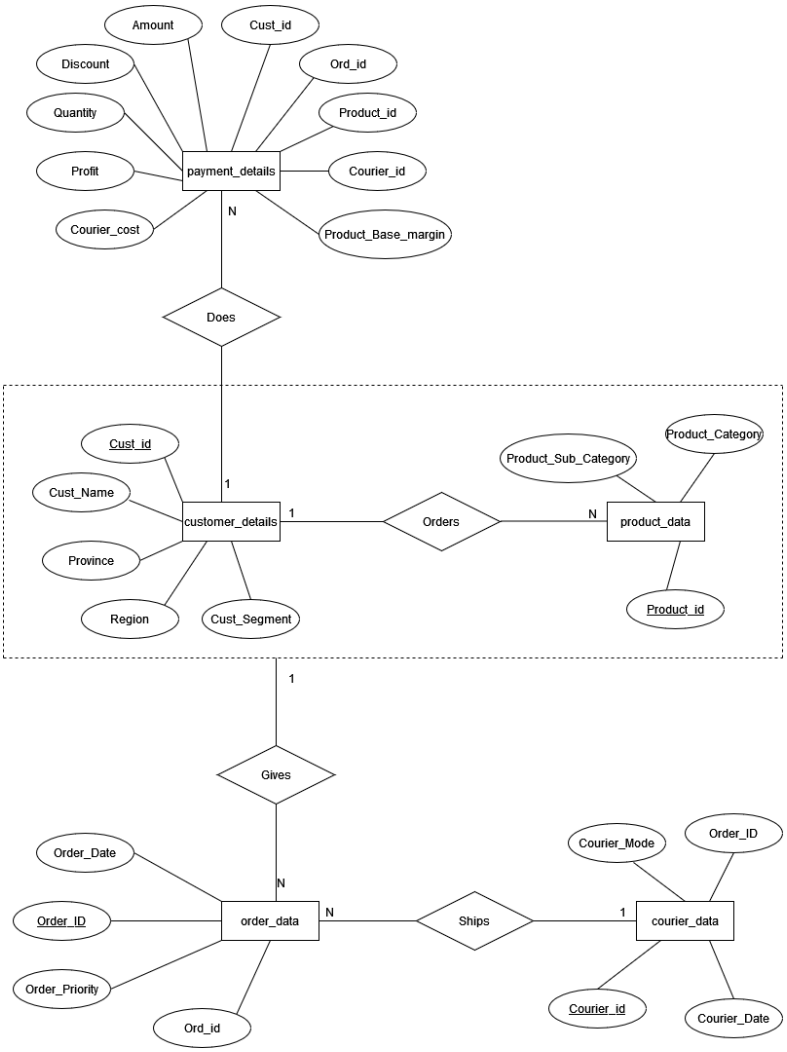
Data Source for the Assignment 2

I selected a data set of an online shopping system which includes the product details that the system has, the customer details, order details and courier details of the products which have ordered by the customers and the details of payments.

https://www.kaggle.com/datasets/tanyadayanand/online-shopping?select=shipping.csv

ER diagram



SSAS Cube Implementation

Tools Used

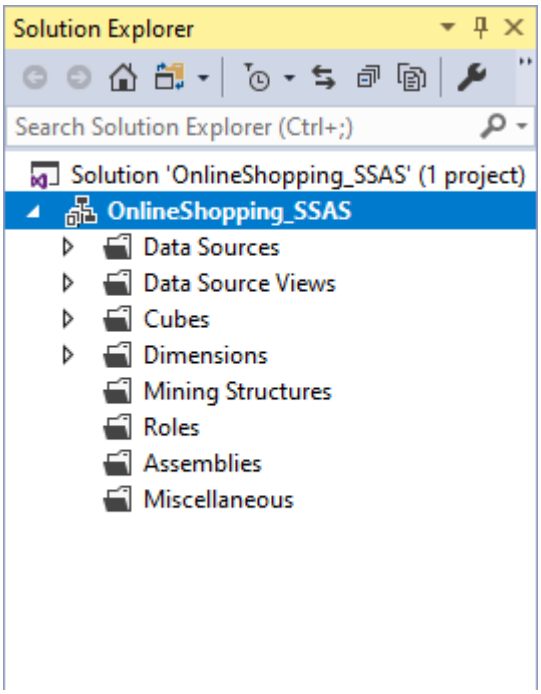
- SQL Server Data Tools
- SQL Server Management Studio.

Steps

- Creating the SSAS Project
- Creating a Data Source
- Creating a Data Source View
- Creating a Cube
- Deploy the cube

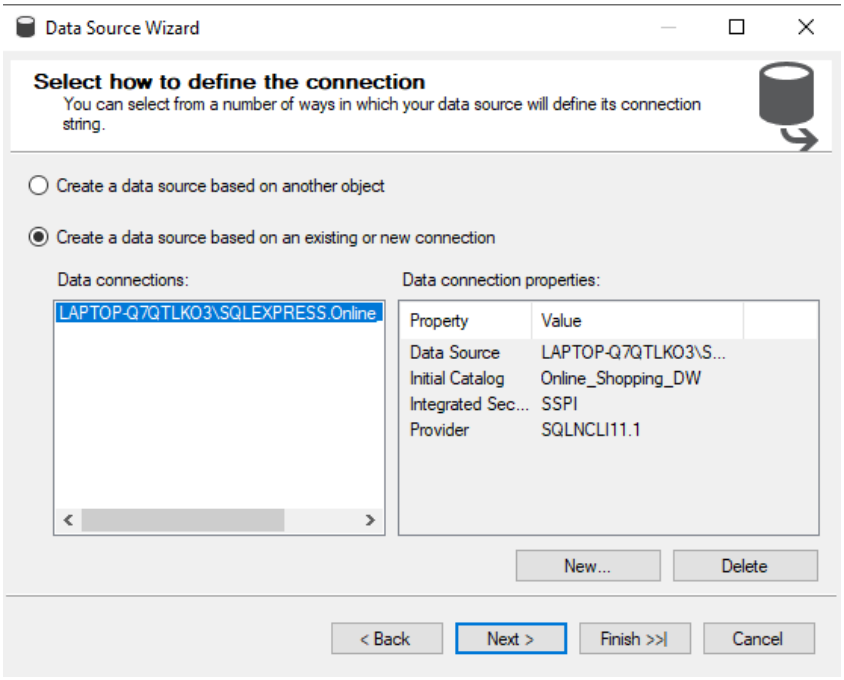
Step 1 – Creating the SSAS Project

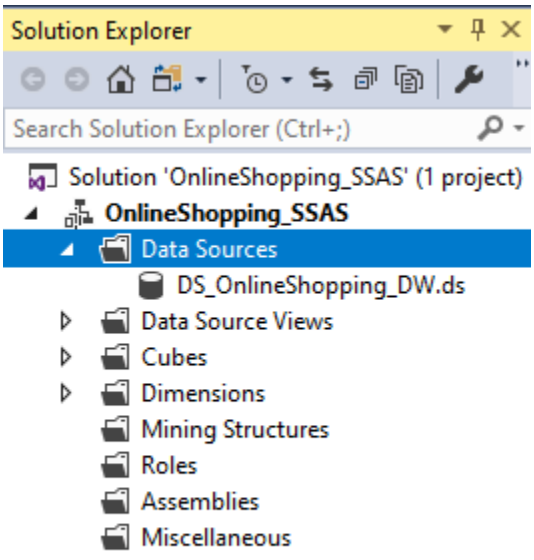
In SQL server data tools, I created an Analysis Services Multidimensional and Data Mining Project and named it as “OnlineShopping_SSAS”.



Step 2 - Creating a Data Source

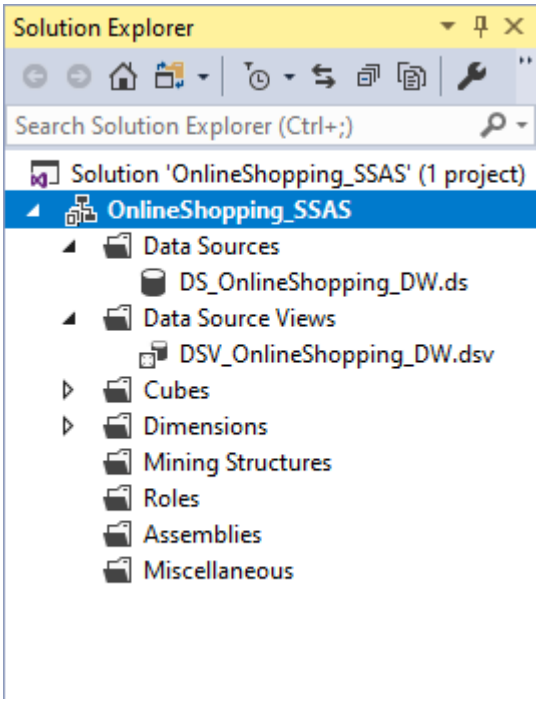
This step is to configure a data source. Data source defines from where the cube is extracting data. I created connection to the data warehouse.





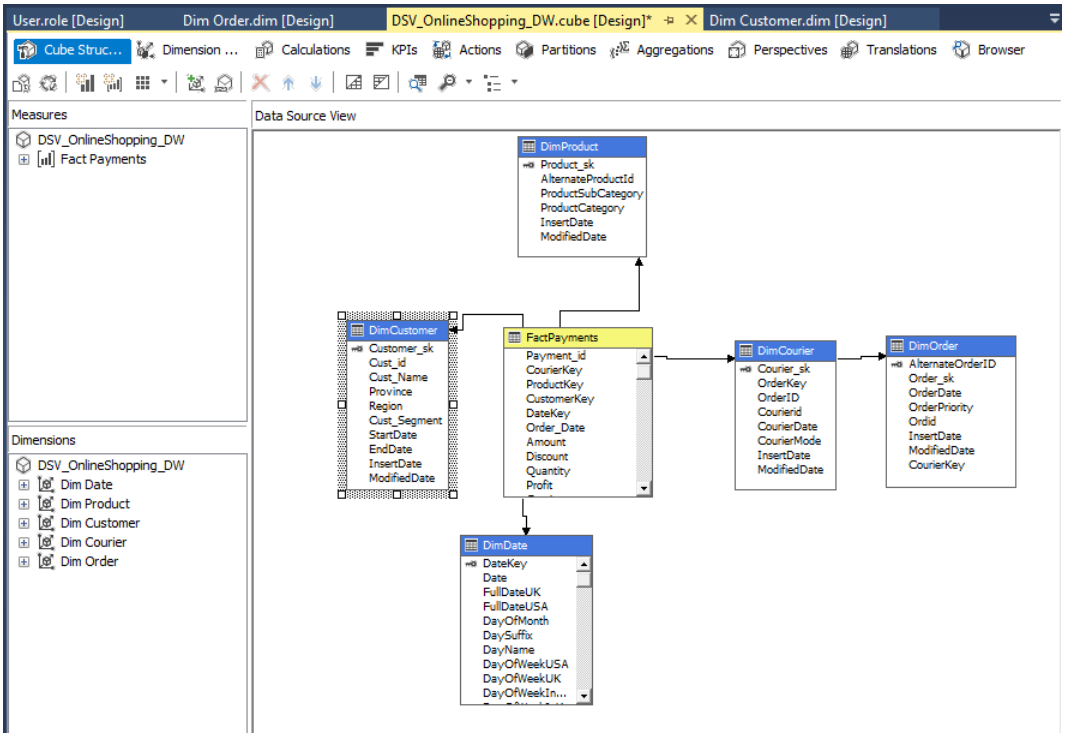
Step 3 – Creating a Data Source Views

I created a new data source view after that selected all dimension tables and fact table and created table links.

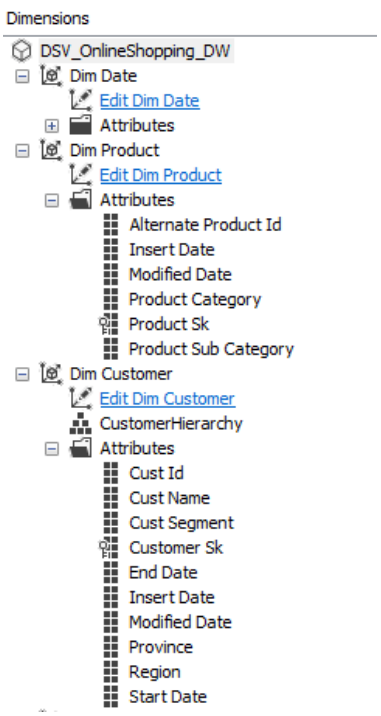


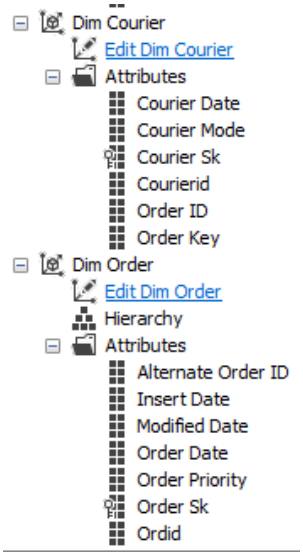
Step 4 – Creating a Cube

1. The data source view has created with the relevant tables in the previous section. We can use this existing data source to create the cube.
2. From the “Cube wizard” select all the measure from the “Fact Table ” fact table which is needed to include in the cube.
3. I provided cube name as “Cubes_OnlineShopping_DW”



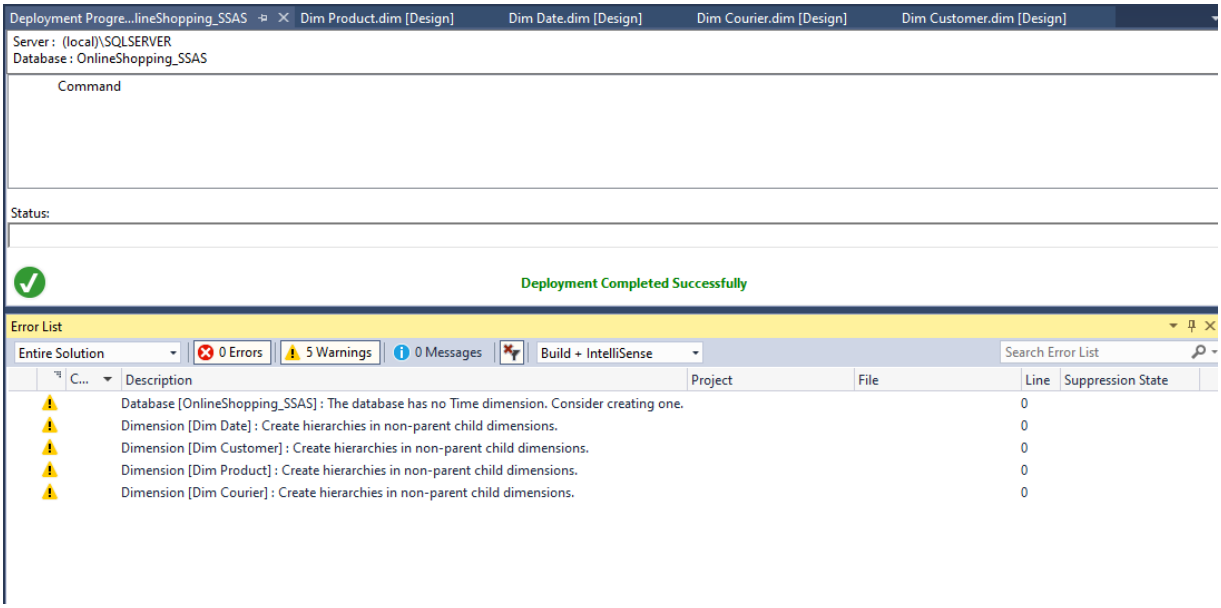
Then, all the attributes were added to the dimension tables except surrogate keys.





Step 5 – Deploying the Cube

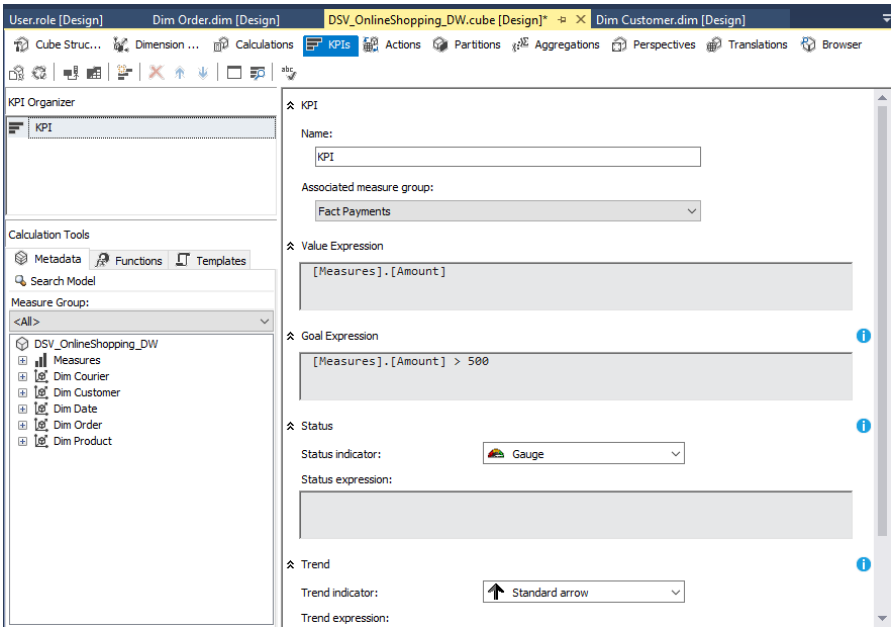
Provide connection credentials and deployed the cube.

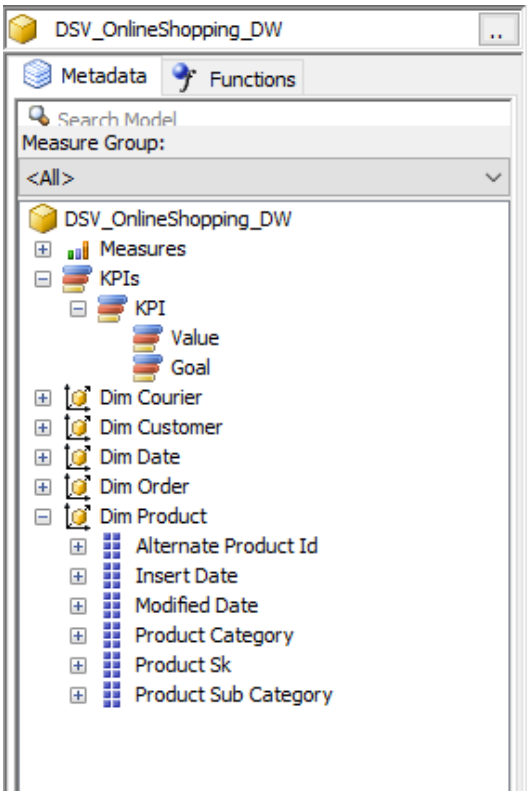


Step 6 – Creating a KPI

KPI's are created based on the business requirements. KPIs depend on what the organization want to monitor and measure.

Here, I created KPI to check the amount of products which are greater than $500.

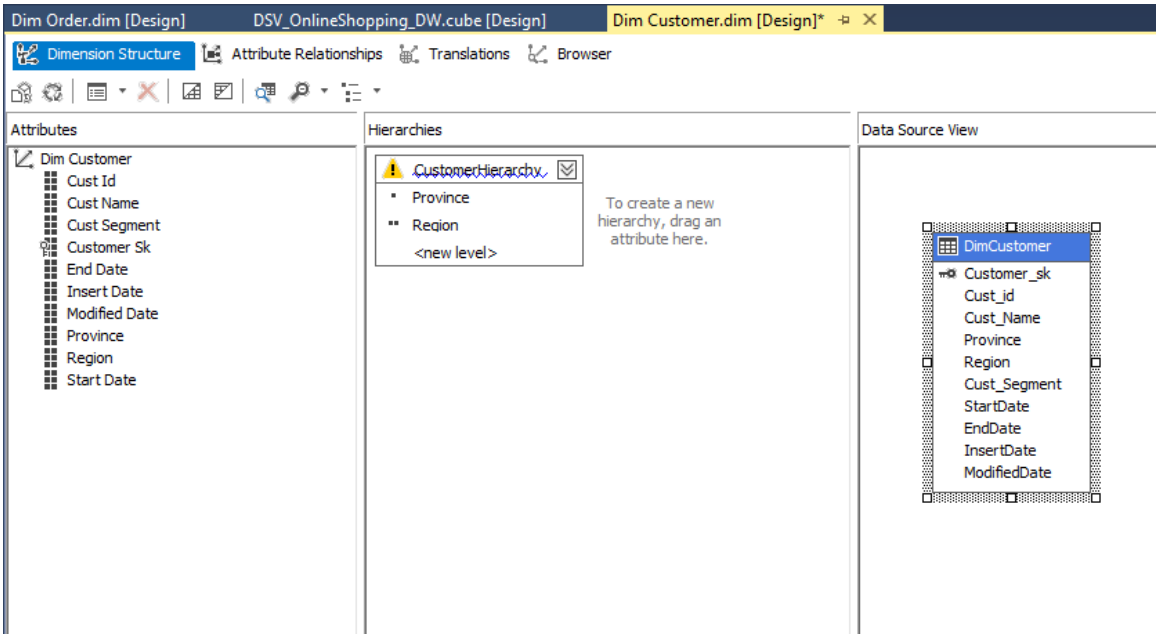




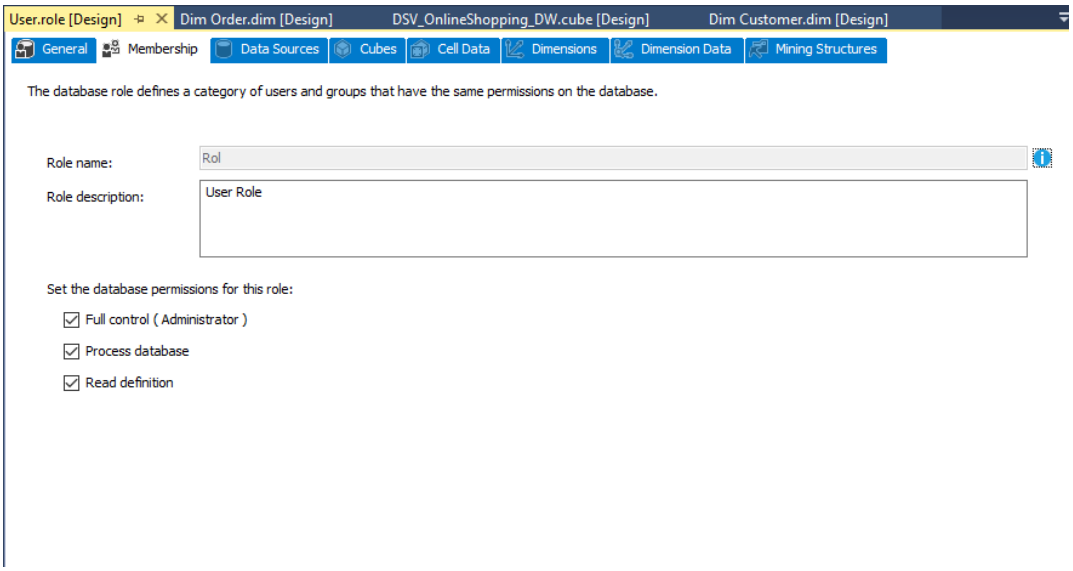
Created KPI can be seen in SQL Server Management Studio

Step 7 - Creating Hierarchy

Created hierarchy in Customer dimension.



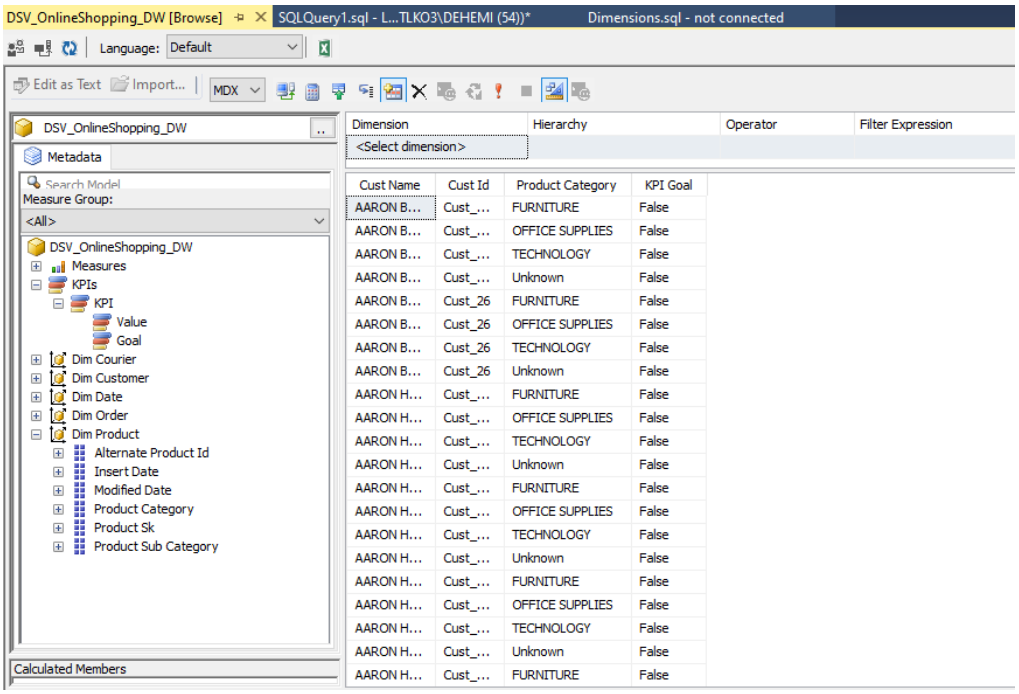
Step 8 – Creating Role



Purpose of user roles is to provide control access and permission on who can do what.

Step 9 – Browsing Cube Data

General browsing (analysis) can be done via the development tool; Data Tools or in SSMS.



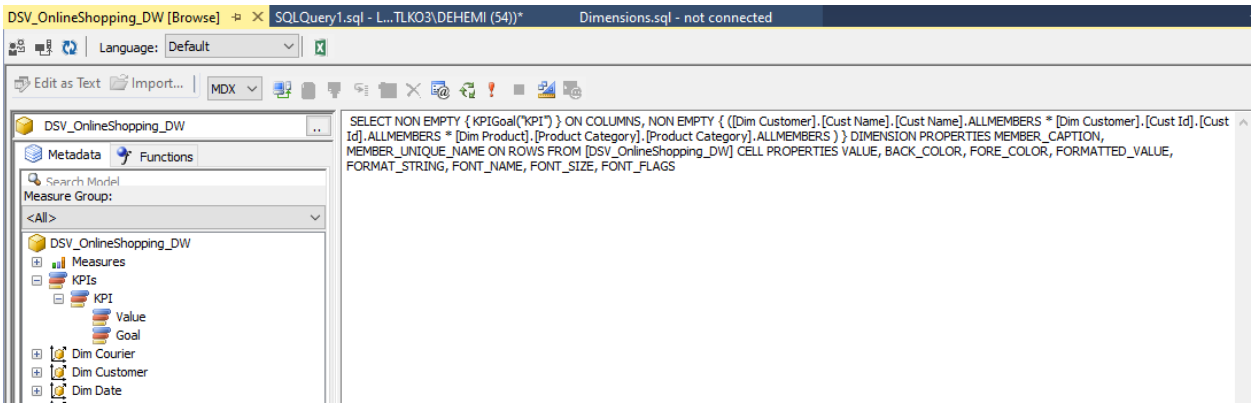
Demonstration of OLAP Operations

Tools used:

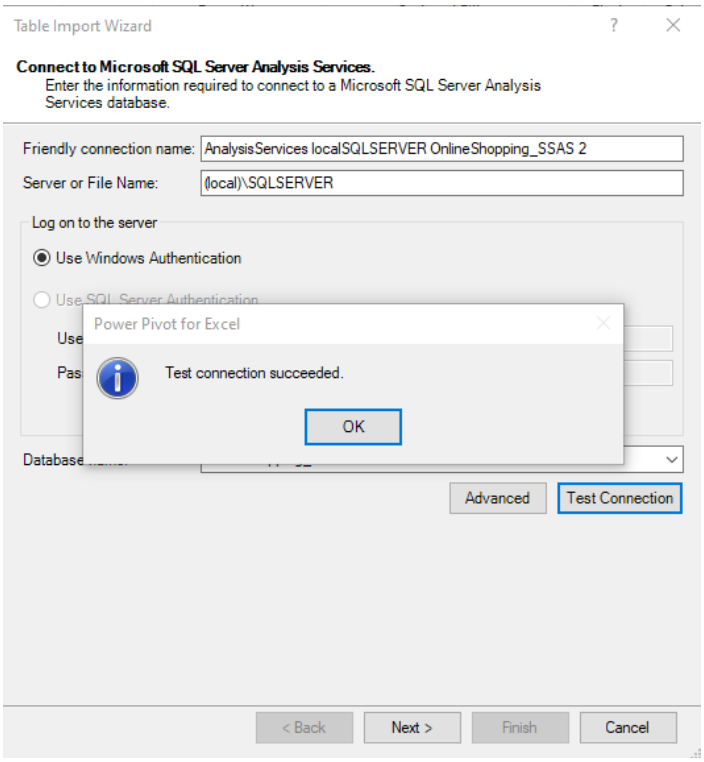
- Microsoft Excel
- SQL Server Management Studio

Connecting Excel to SSAS Cube using a MDX Query

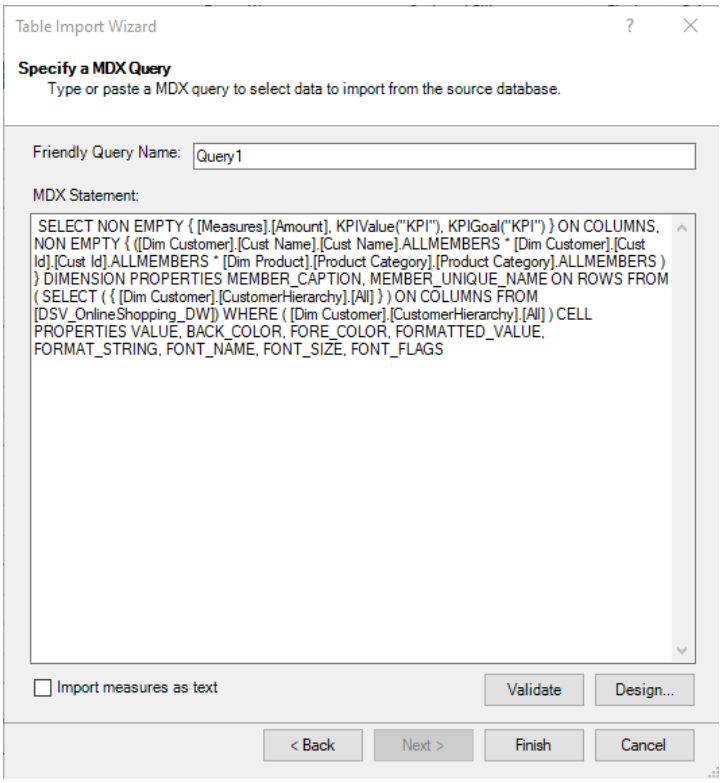
We can generate MDX query in SSAS browser.



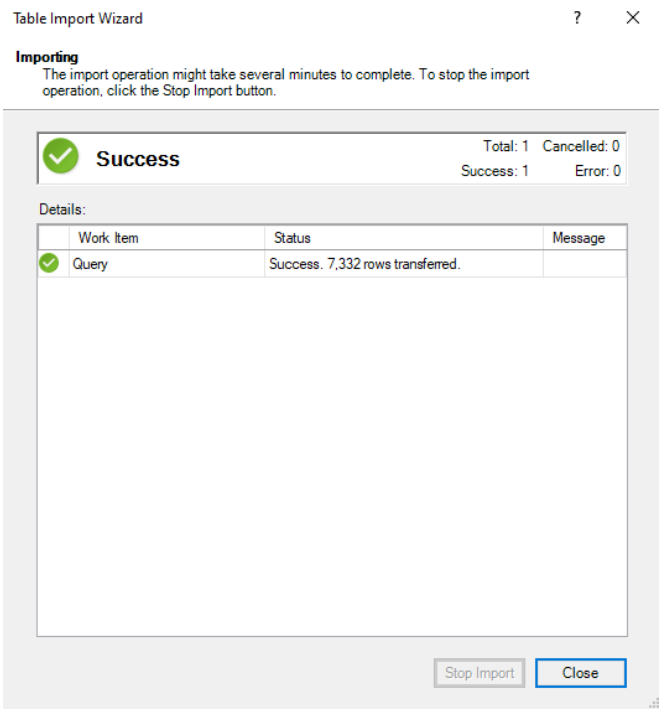
In excel sheet from analysis service or power pivot, we can provide connection details to connect to SSAS Server.



Validation



Importing

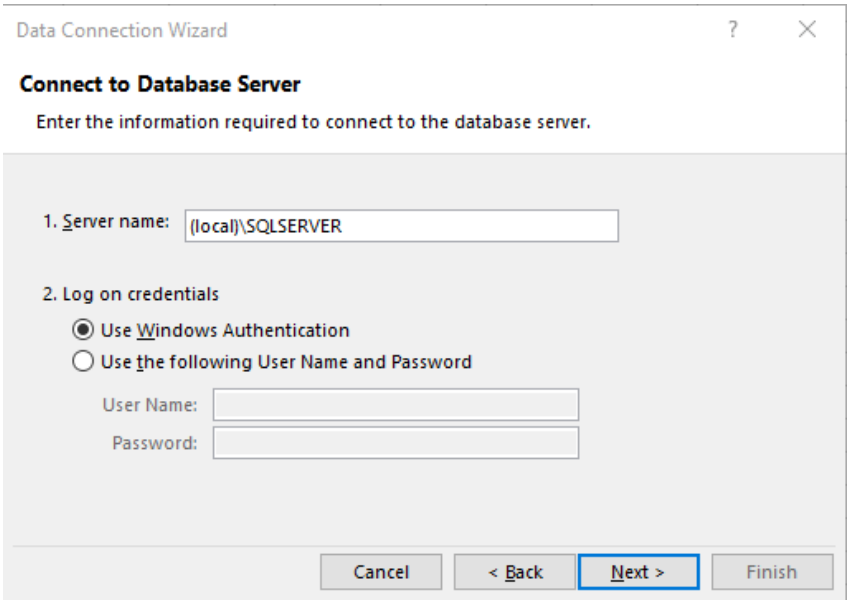


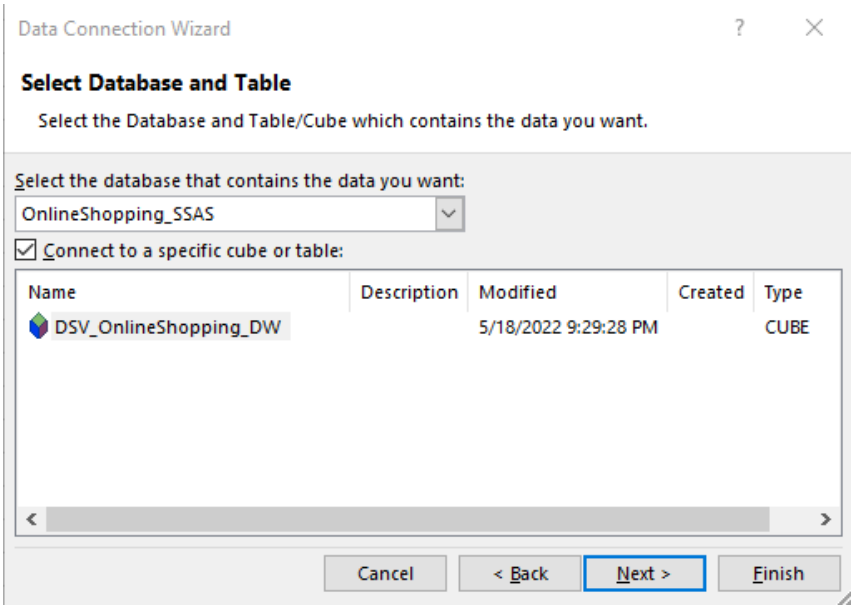
Data was imported successfully.

[Dim Custome... ▾ f_x

	Dim CustomerCust NameCust Name	Dim CustomerCust IdCust Id	Dim ProductProduct CategoryProduct Category	MeasuresKPI Goal	Add Column
1	AARON BERGMAN	Cust_1818	FURNITURE	False	
2	AARON BERGMAN	Cust_26	FURNITURE	False	
3	AARON HAWKINS	Cust_1088	FURNITURE	False	
4	AARON HAWKINS	Cust_1521	FURNITURE	False	
5	AARON HAWKINS	Cust_1641	FURNITURE	False	
6	AARON HAWKINS	Cust_708	FURNITURE	False	
7	AARON HAWKINS	Cust_839	FURNITURE	False	
8	AARON SMAYLING	Cust_371	FURNITURE	False	
9	AARON SMAYLING	Cust_931	FURNITURE	False	
10	ADAM BELLAVANCE	Cust_1710	FURNITURE	False	
11	ADAM BELLAVANCE	Cust_452	FURNITURE	False	
12	ADAM HART	Cust_1474	FURNITURE	False	
13	ADAM HART	Cust_1579	FURNITURE	False	
14	ADAM SHILLINGSBURG	Cust_1749	FURNITURE	False	
15	ADRIAN BARTON	Cust_1758	FURNITURE	False	
16	ADRIAN HANE	Cust_1802	FURNITURE	False	
17	ADRIAN HANE	Cust_36	FURNITURE	False	
18	ADRIAN HANE	Cust_86	FURNITURE	False	
19	ADRIAN SHAMI	Cust_1820	FURNITURE	False	
20	AIMEE BIXBY	Cust_1433	FURNITURE	False	
21	AIMEE BIXBY	Cust_565	FURNITURE	False	

Connecting Excel to SSAS Cube without MDX Query





OLAP Operations

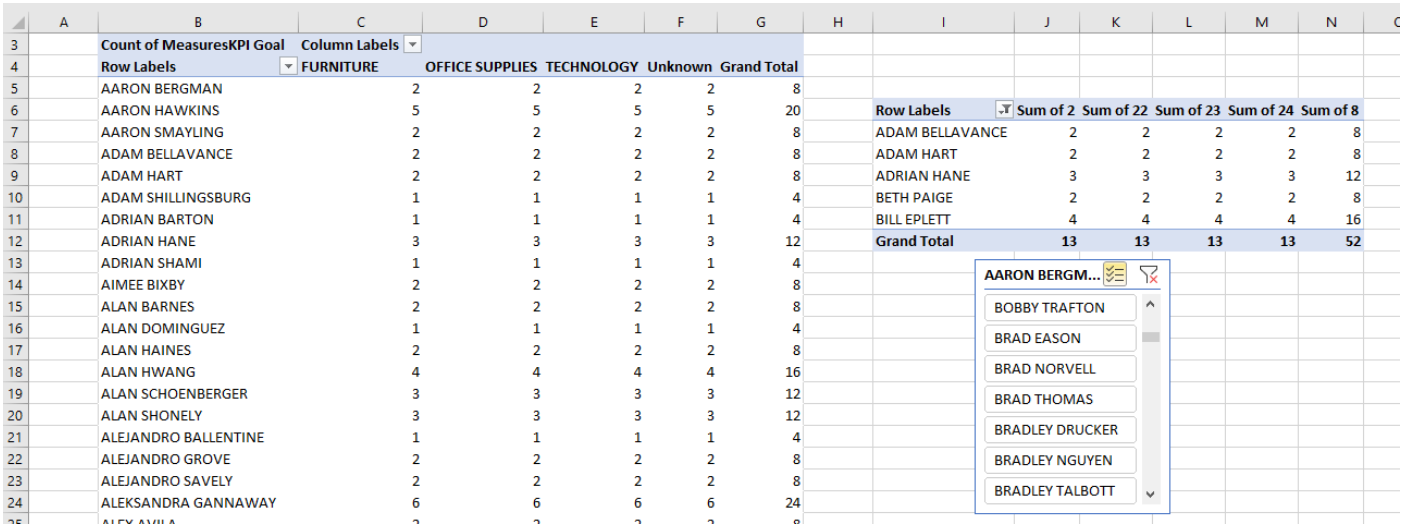
Pivot Table

Pivot is a visualization operation which rotates the data axes in view to provide an alternative presentation of the data

Row Labels	Sum of 2	Sum of 22	Sum of 23	Sum of 24	Sum of 8
ADAM BELLAVANCE	2	2	2	2	8
ADAM HART	2	2	2	2	8
ADRIAN HANE	3	3	3	3	12
ALLEN GOLDEN	1	1	1	1	4
ALYSSA TATE	2	2	2	2	8
ANDREW ALLEN	1	1	1	1	4
BETH PAIGE	2	2	2	2	8
BILL EPLETT	4	4	4	4	16
Grand Total	**17**	**17**	**17**	**17**	**68**

Slice

A new sub cube is created using a one dimension



Count of MeasuresKPI Goal	Column Labels				
Row Labels	FURNITURE	OFFICE SUPPLIES	TECHNOLOGY	Unknown	Grand Total
AARON BERGMAN	2	2	2	2	8
AARON HAWKINS	5	5	5	5	20
AARON SMAYLING	2	2	2	2	8
ADAM BELLAVANCE	2	2	2	2	8
ADAM HART	2	2	2	2	8
ADAM SHILLINGSBURG	1	1	1	1	4
ADRIAN BARTON	1	1	1	1	4
ADRIAN HANE	3	3	3	3	12
ADRIAN SHAMI	1	1	1	1	4
AIMEE BIXBY	2	2	2	2	8
ALAN BARNES	2	2	2	2	8
ALAN DOMINGUEZ	1	1	1	1	4
ALAN HAINES	2	2	2	2	8
ALAN HWANG	4	4	4	4	16
ALAN SCHOENBERGER	3	3	3	3	12
ALAN SHONELY	3	3	3	3	12
ALEJANDRO BALLENTINE	1	1	1	1	4
ALEJANDRO GROVE	2	2	2	2	8
ALEJANDRO SAVELY	2	2	2	2	8
ALEKSANDRA GANNAWAY	6	6	6	6	24

Row Labels	Sum of 2	Sum of 22	Sum of 23	Sum of 24	Sum of 8
ADAM BELLAVANCE	2	2	2	2	8
ADAM HART	2	2	2	2	8
ADRIAN HANE	3	3	3	3	12
BETH PAIGE	2	2	2	2	8
BILL EPLETT	4	4	4	4	16
Grand Total	**13**	**13**	**13**	**13**	**52**

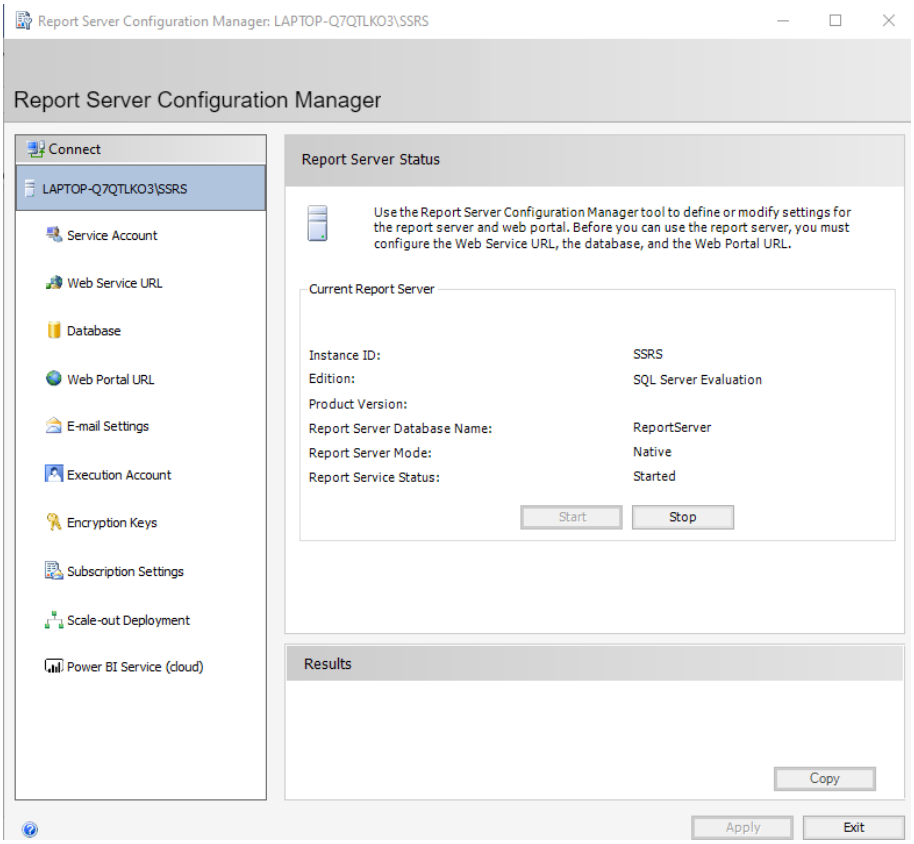
SSRS Reports

Tools Required:

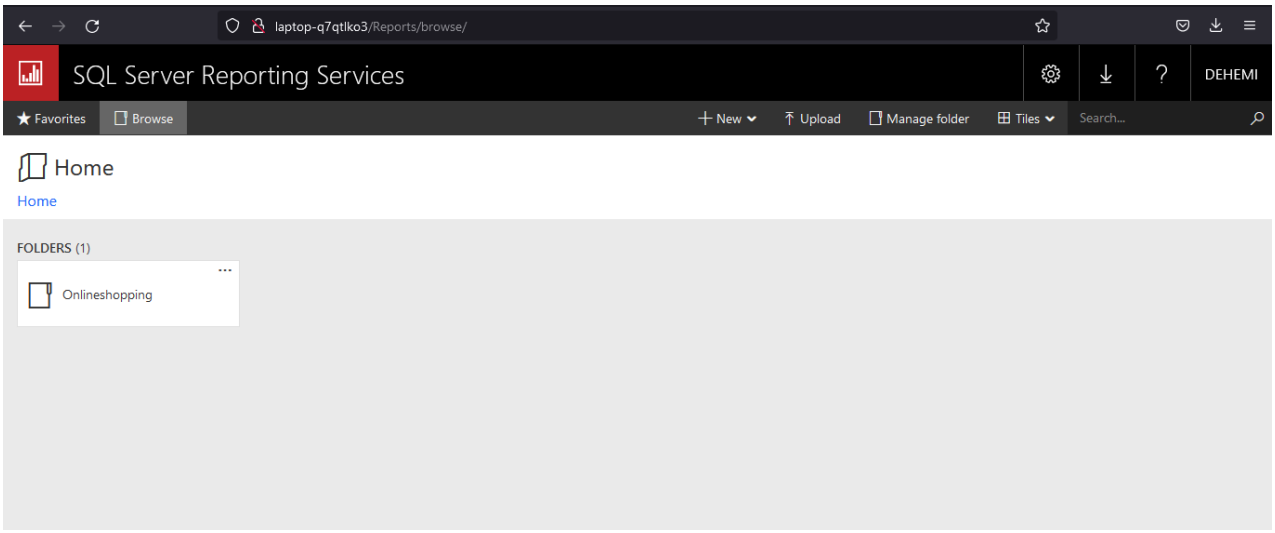
- SQL Server Data Tools or Report Builder
- SQL Server Management Studio

Configure SQL Server Reporting Services

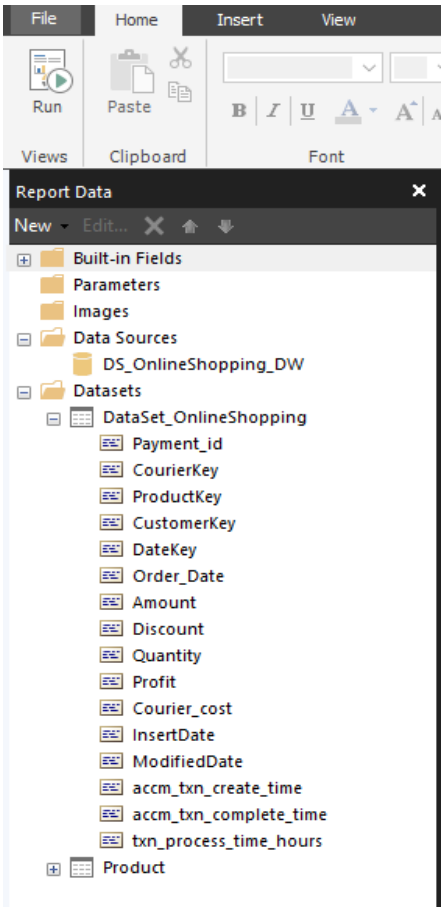
Connect to the server using credentials.



Logging into the SSRS Web Portal



Opening Microsoft Report Builder and creating a new data source and new data sets.



Report 01 – Report with Matrix

Amount-wise Online Shopping Report

Customer Key	Amount	Discount
12	$24,272.39	$0.61
14	$4,812.02	$0.07
22	$2,977.99	$0.40
39	$1,251.18	$0.05
43	$28,876.13	$0.27
56	$17,874.89	$0.10
61	$3,457.39	$0.46
75	$1,733.33	$0.17
82	$2,753.44	$0.19
87	$907.24	$0.07
90	$15,260.63	$0.15
93	$10,390.00	$0.16
98	$13.53	$0.07
100	$305.05	$0.04
103	$135.91	$0.07
112	$2,573.29	$0.04
113	$248.26	$0.07
116	$990.73	$0.02

Report 02 – Create an SSRS drill through report