



**SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY**

**Data Warehouse and Business Intelligence**

**Assignment 02**

**2022**

Submitted By:

Rajapaksha D.S.D

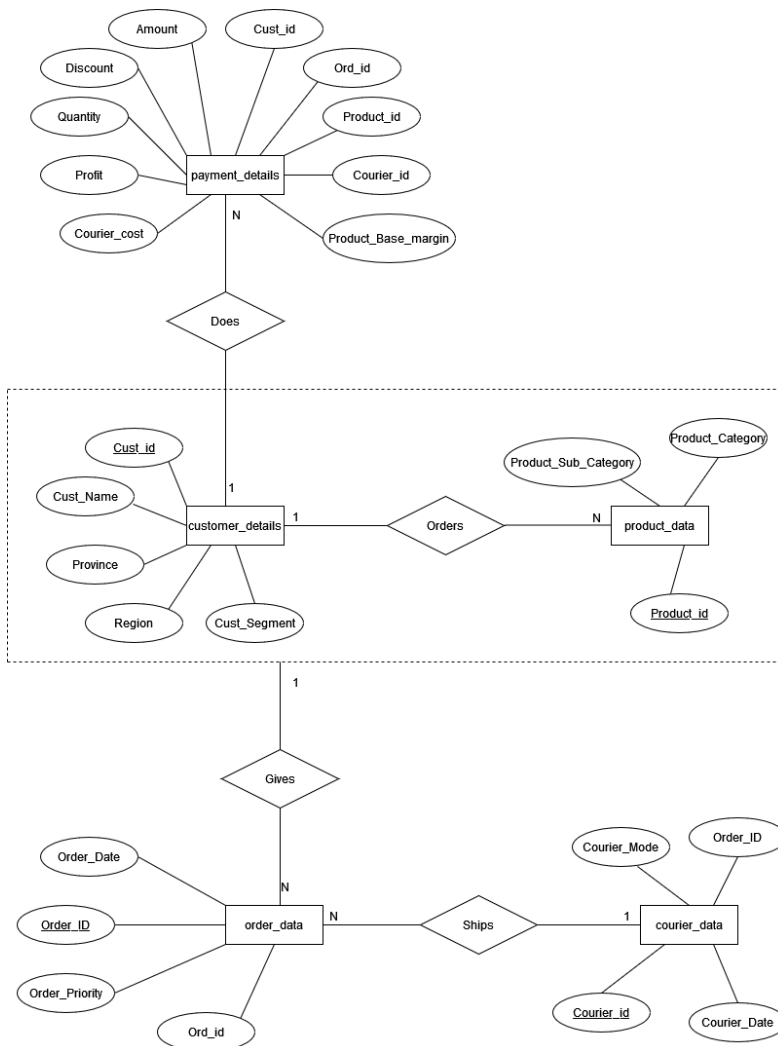
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## Data Source for the Assignment 2

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

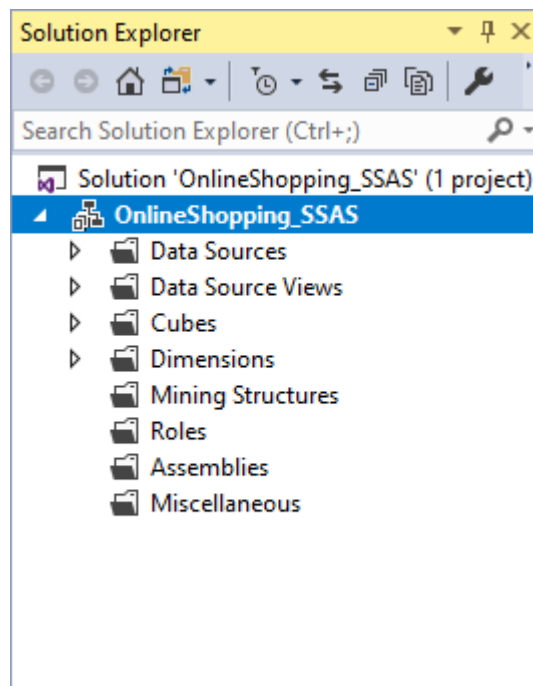
- SQL Server Data Tools
- SQL Server Management Studio.

### Steps

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

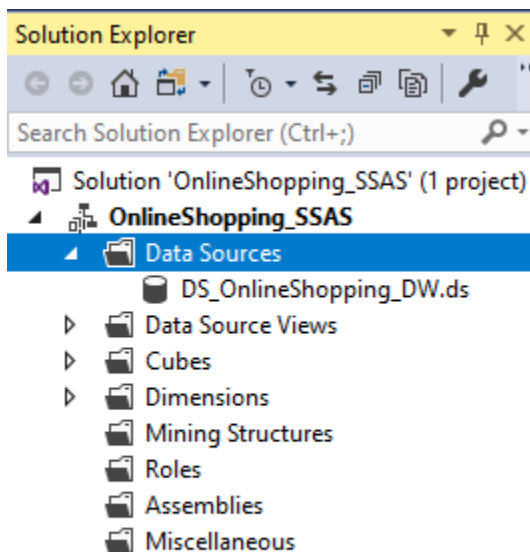
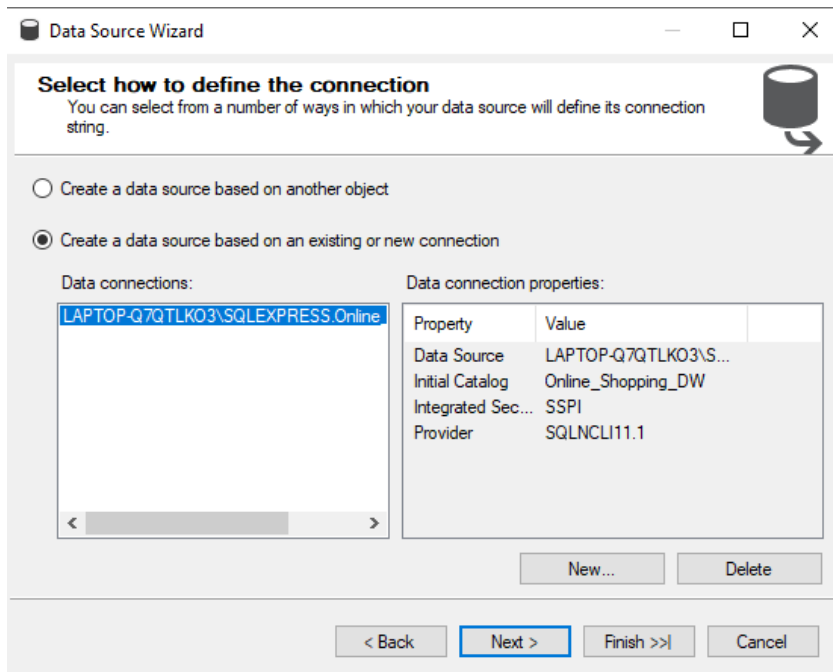
### Step 1 – Creating the SSAS Project

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



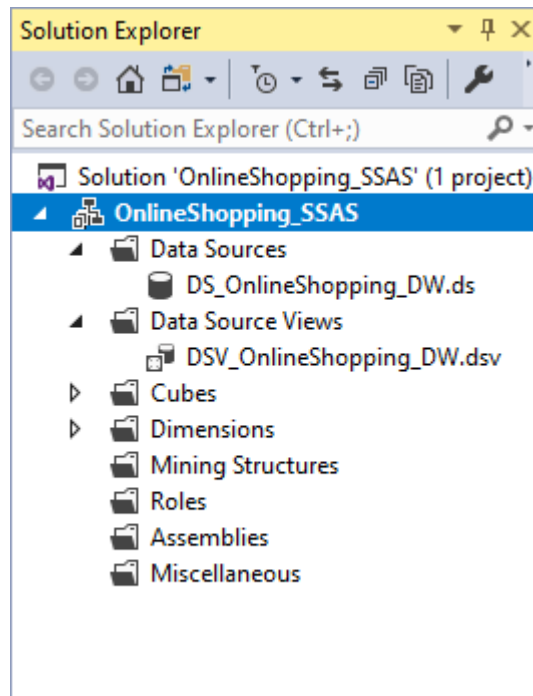
## Step 2 - Creating a Data Source

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.



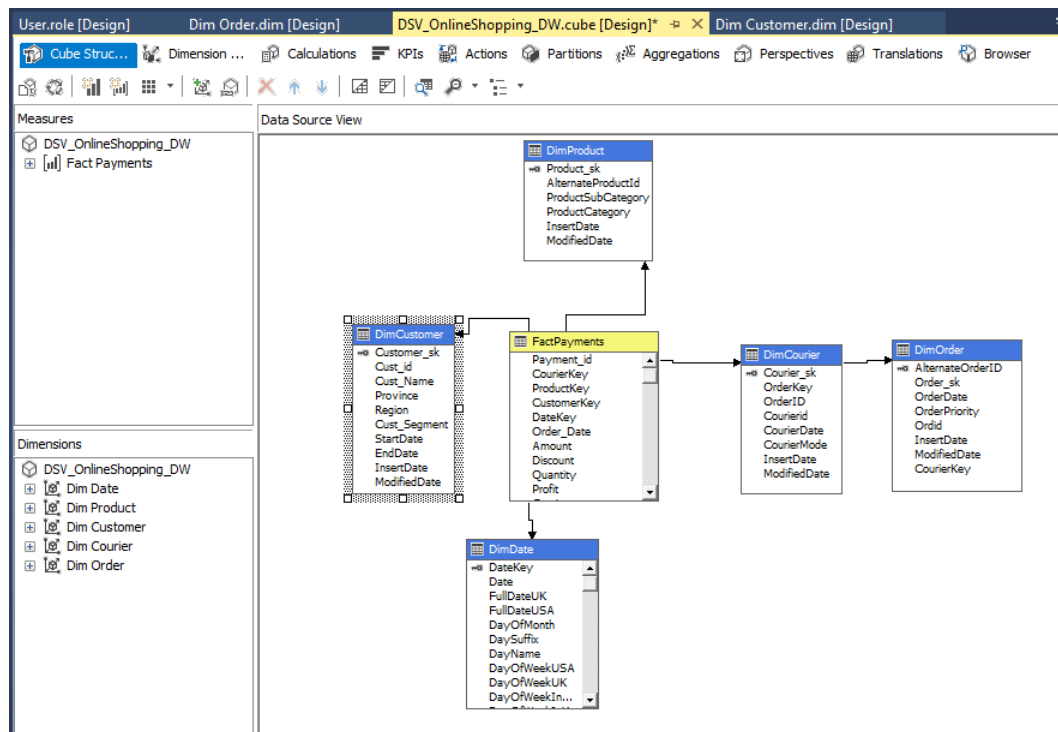
### Step 3 – Creating a Data Source Views

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”

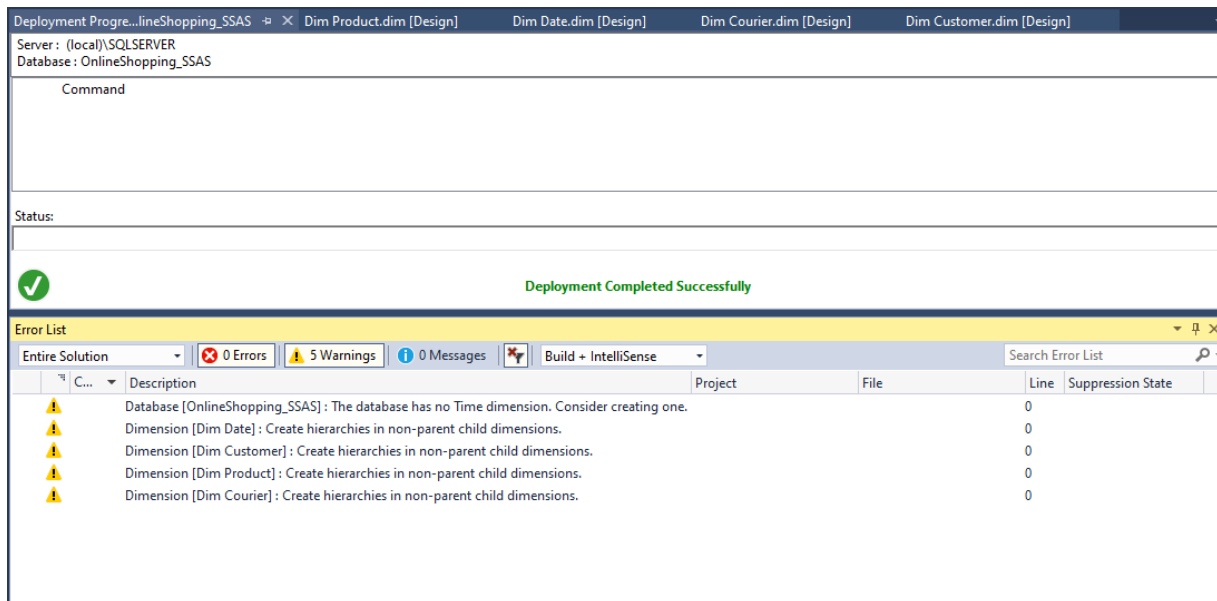


Then, all the attributes were added to the dimension tables except surrogate keys.



## Step 5 – Deploying the Cube

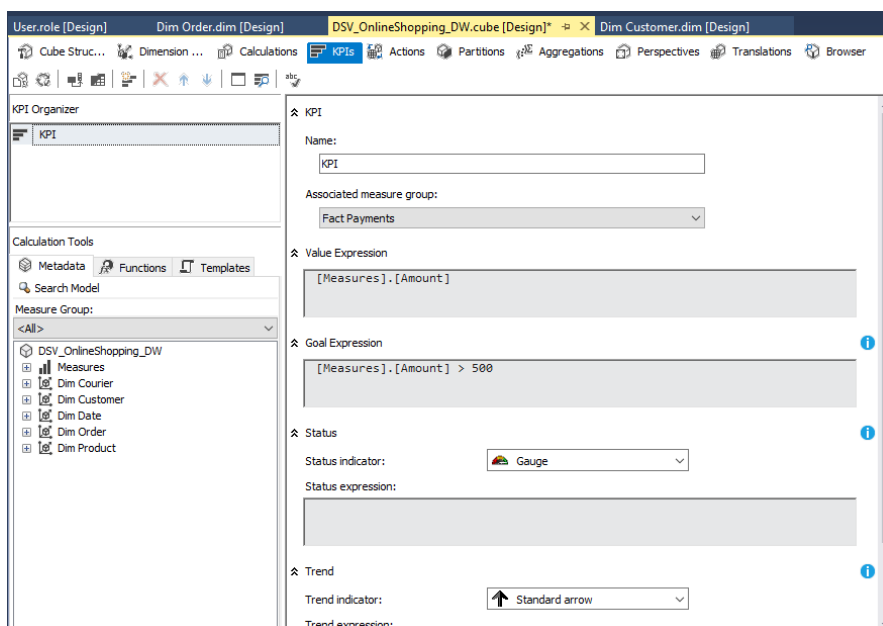
Provide connection credentials and deployed the cube.

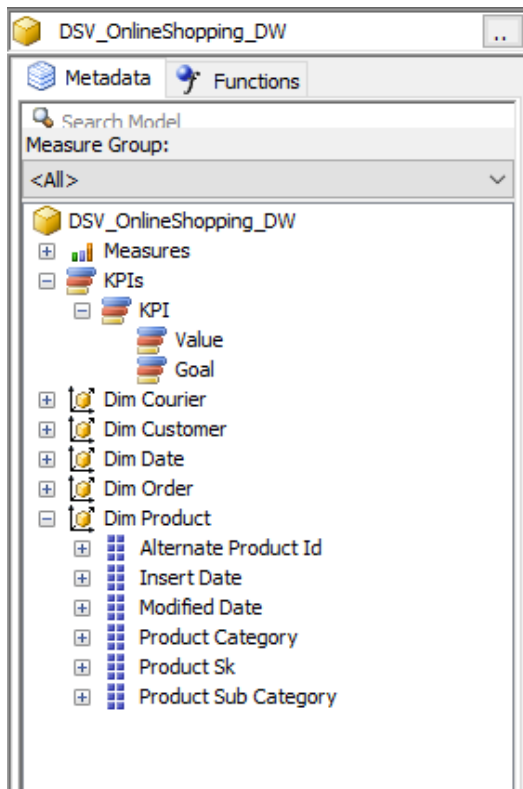


## Step 6 – Creating a KPI

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.

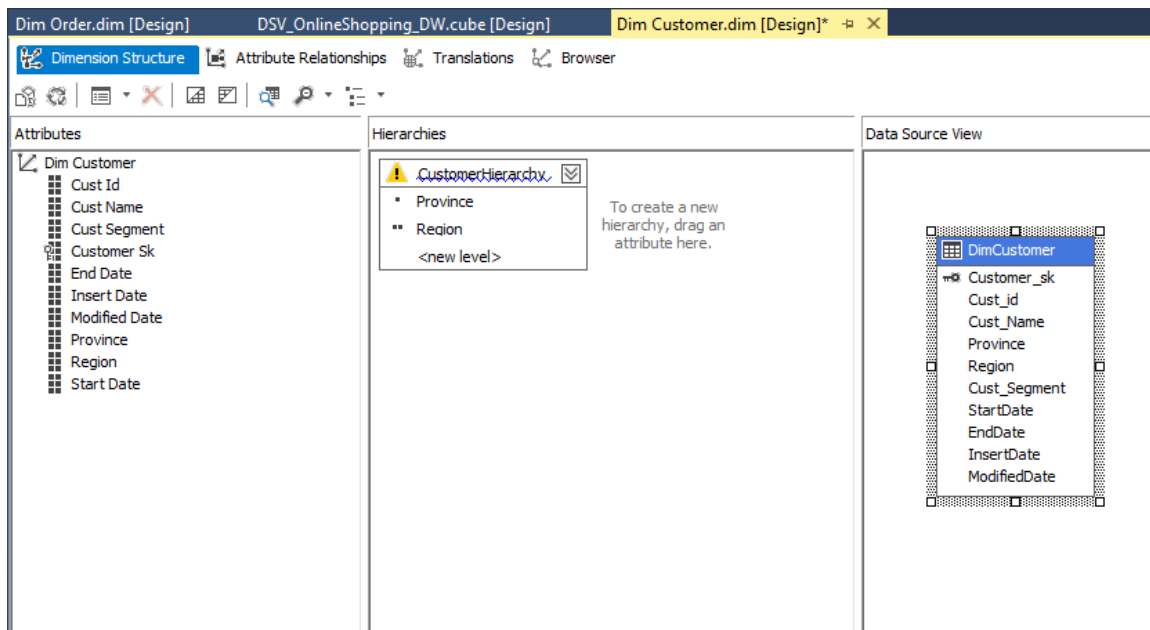




Created KPI can be seen in SQL Server Management Studio

## Step 7 - Creating Hierarchy

Created hierarchy in Customer dimension.





## Step 8 – Creating Role

The database role defines a category of users and groups that have the same permissions on the database.

Role name: Rol

Role description: User Role

Set the database permissions for this role:

- ☒ Full control ( Administrator )
- ☒ Process database
- ☒ Read definition

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.

DSV\_OnlineShopping\_DW [Browse] - SQLQuery1.sql - L:\TLK03\DEHEMI (54)\*

Language: Default

DSV\_OnlineShopping\_DW

Metadata

Measure Group:

<All>

DSV\_OnlineShopping\_DW

Measures

KPI

Value

Goal

Dim Courier

Dim Customer

Dim Date

Dim Order

Dim Product

Alternate Product Id

Insert Date

Modified Date

Product Category

Product Sk

Product Sub Category

Calculated Members

Dimension	Hierarchy	Operator	Filter Expression
<Select dimension>			
Cust Name	Cust Id	Product Category	KPI Goal
AARON B...	Cust_...	FURNITURE	False
AARON B...	Cust_...	OFFICE SUPPLIES	False
AARON B...	Cust_...	TECHNOLOGY	False
AARON B...	Cust_...	Unknown	False
AARON B...	Cust_26	FURNITURE	False
AARON B...	Cust_26	OFFICE SUPPLIES	False
AARON B...	Cust_26	TECHNOLOGY	False
AARON B...	Cust_26	Unknown	False
AARON H...	Cust_...	FURNITURE	False
AARON H...	Cust_...	OFFICE SUPPLIES	False
AARON H...	Cust_...	TECHNOLOGY	False
AARON H...	Cust_...	Unknown	False
AARON H...	Cust_...	FURNITURE	False
AARON H...	Cust_...	OFFICE SUPPLIES	False
AARON H...	Cust_...	TECHNOLOGY	False
AARON H...	Cust_...	Unknown	False
AARON H...	Cust_...	FURNITURE	False
AARON H...	Cust_...	OFFICE SUPPLIES	False
AARON H...	Cust_...	TECHNOLOGY	False
AARON H...	Cust_...	Unknown	False
AARON H...	Cust_...	FURNITURE	False

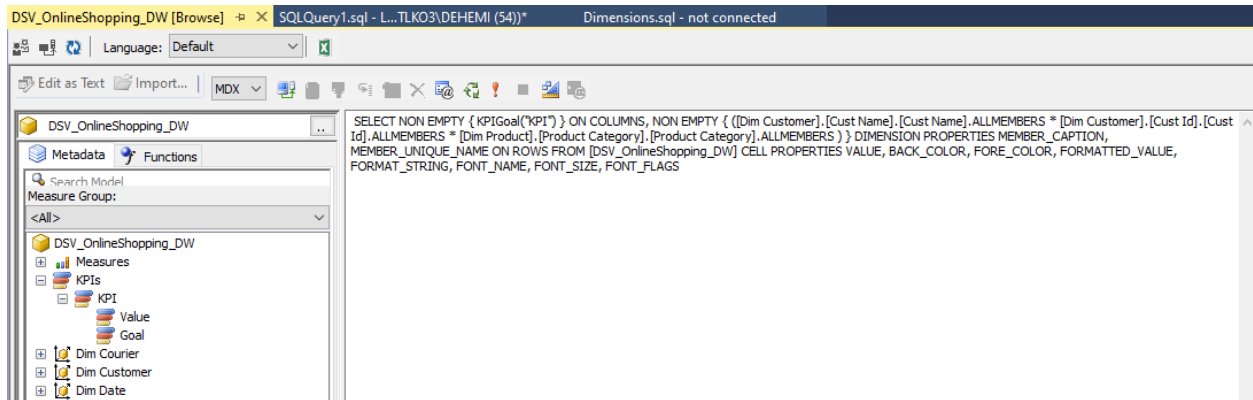
## Demonstration of OLAP Operations

Tools used:

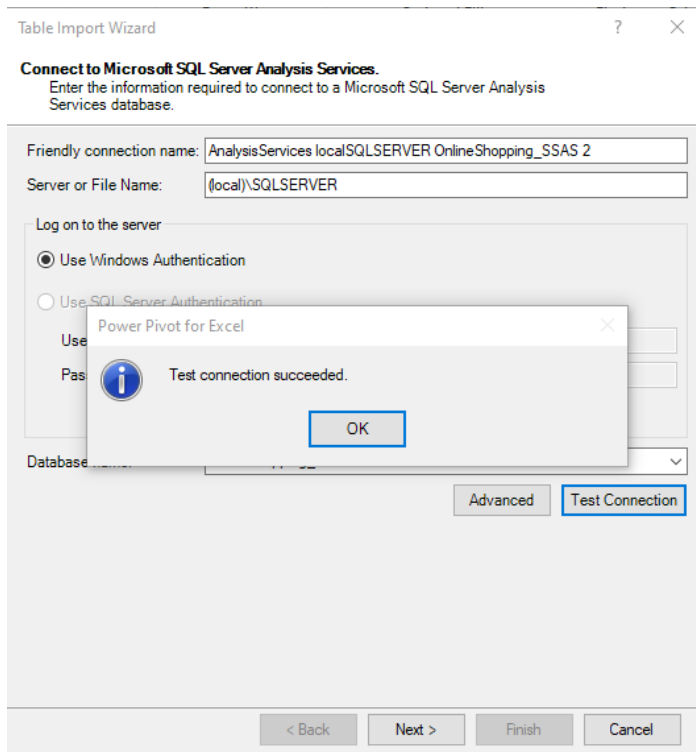
- Microsoft Excel
- SQL Server Management Studio

### 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

Table Import Wizard

**Specify a MDX Query**  
Type or paste a MDX query to select data to import from the source database.

Friendly Query Name:

MDX Statement:

```
SELECT NON EMPTY { [Measures].[Amount], KPIValue("KPI"), KPIGoal("KPI") } ON COLUMNS,
NON EMPTY { ([Dim Customer].[Cust Name].[Cust Name].ALLMEMBERS * [Dim Customer].[Cust
Id].[Cust Id].ALLMEMBERS * [Dim Product].[Product Category].[Product Category].ALLMEMBERS )
} DIMENSION PROPERTIES MEMBER_CAPTION, MEMBER_UNIQUE_NAME ON ROWS FROM
( SELECT ( { ([Dim Customer].[CustomerHierarchy].[All]) } ) ON COLUMNS FROM
[DSV_OnlineShopping_DW]) WHERE ( ([Dim Customer].[CustomerHierarchy].[All]) ) CELL
PROPERTIES VALUE, BACK_COLOR, FORE_COLOR, FORMATTED_VALUE,
FORMAT_STRING, FONT_NAME, FONT_SIZE, FONT_FLAGS
```

☐ Import measures as text


Validate Design...

< Back Next > Finish Cancel


## Importing

Table Import Wizard

**Importing**  
The import operation might take several minutes to complete. To stop the import operation, click the Stop Import button.

 **Success** Total: 1 Cancelled: 0  
Success: 1 Error: 0

Details:

Work Item	Status	Message
 Query	Success. 7,332 rows transferred.	

Stop Import Close

Data was imported successfully.

[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

Data Connection Wizard

?

×

**Connect to Database Server**

Enter the information required to connect to the database server.

1. Server name:

(local)\SQLSERVER

2. Log on credentials

☒ Use Windows Authentication

☐ Use the following User Name and Password

User Name:

Password:

Cancel

< Back

Next >

Finish

Data Connection Wizard ? X


**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:

OnlineShopping\_SSAS

☒ Connect to a specific cube or table:

Name	Description	Modified	Created	Type
 DSV_OnlineShopping_DW		5/18/2022 9:29:28 PM		CUBE

< >

Cancel < Back **Next >** Finish

## 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
<b>Grand Total</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>68</b>

## Slice

A new sub cube is created using a one dimension

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
3		Count of MeasuresKPI Goal	Column Labels												
4		Row Labels	FURNITURE	OFFICE SUPPLIES	TECHNOLOGY	Unknown	Grand Total								
5		AARON BERGMAN	2	2	2	2	8								
6		AARON HAWKINS	5	5	5	5	20		Row Labels	Sum of 2	Sum of 22	Sum of 23	Sum of 24	Sum of 8	
7		AARON SMAYLING	2	2	2	2	8		ADAM BELLAVANCE	2	2	2	2	8	
8		ADAM BELLAVANCE	2	2	2	2	8		ADAM HART	2	2	2	2	8	
9		ADAM HART	2	2	2	2	8		ADRIAN HANE	3	3	3	3	12	
10		ADAM SHILLINGSBURG	1	1	1	1	4		BETH PAIGE	2	2	2	2	8	
11		ADRIAN BARTON	1	1	1	1	4		BILL EPLETT	4	4	4	4	16	
12		ADRIAN HANE	3	3	3	3	12		Grand Total	13	13	13	13	52	
13		ADRIAN SHAMI	1	1	1	1	4								
14		AIMEE BIXBY	2	2	2	2	8								
15		ALAN BARNES	2	2	2	2	8								
16		ALAN DOMINGUEZ	1	1	1	1	4								
17		ALAN HAINES	2	2	2	2	8								
18		ALAN HWANG	4	4	4	4	16								
19		ALAN SCHOENBERGER	3	3	3	3	12								
20		ALAN SHONELY	3	3	3	3	12								
21		ALEJANDRO BALLENTINE	1	1	1	1	4								
22		ALEJANDRO GROVE	2	2	2	2	8								
23		ALEJANDRO SAVELY	2	2	2	2	8								
24		ALEKSANDRA GANNAWAY	6	6	6	6	24								
25		ALEX AVILA	2	2	2	2	8								

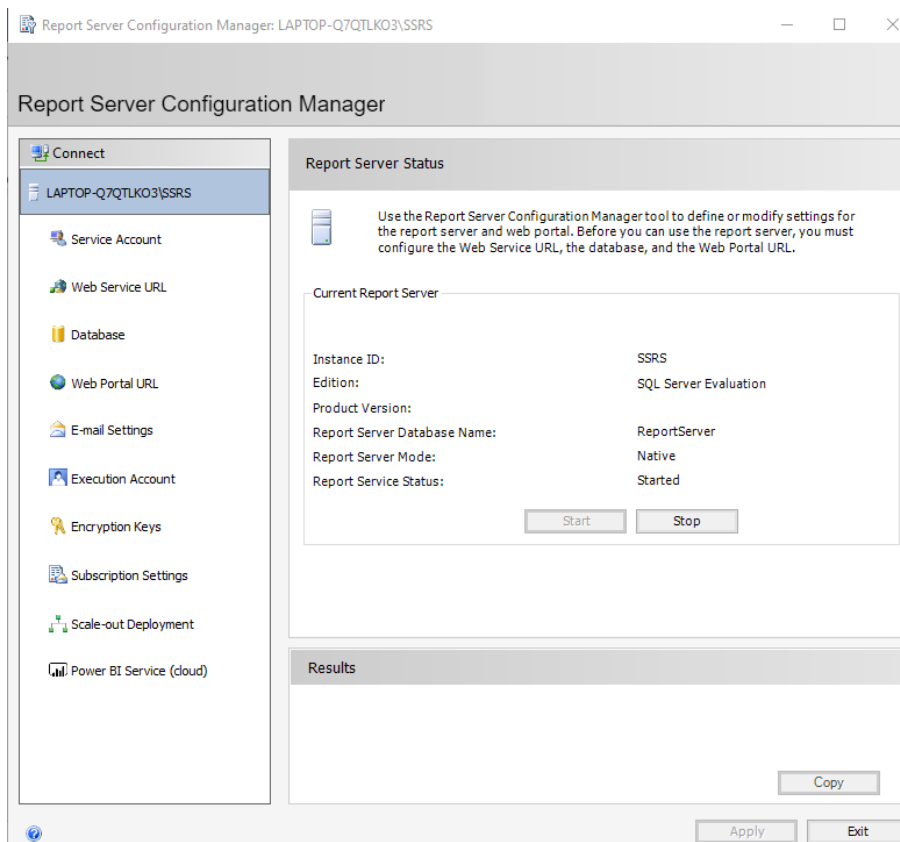
# SSRS Reports

## Tools Required:

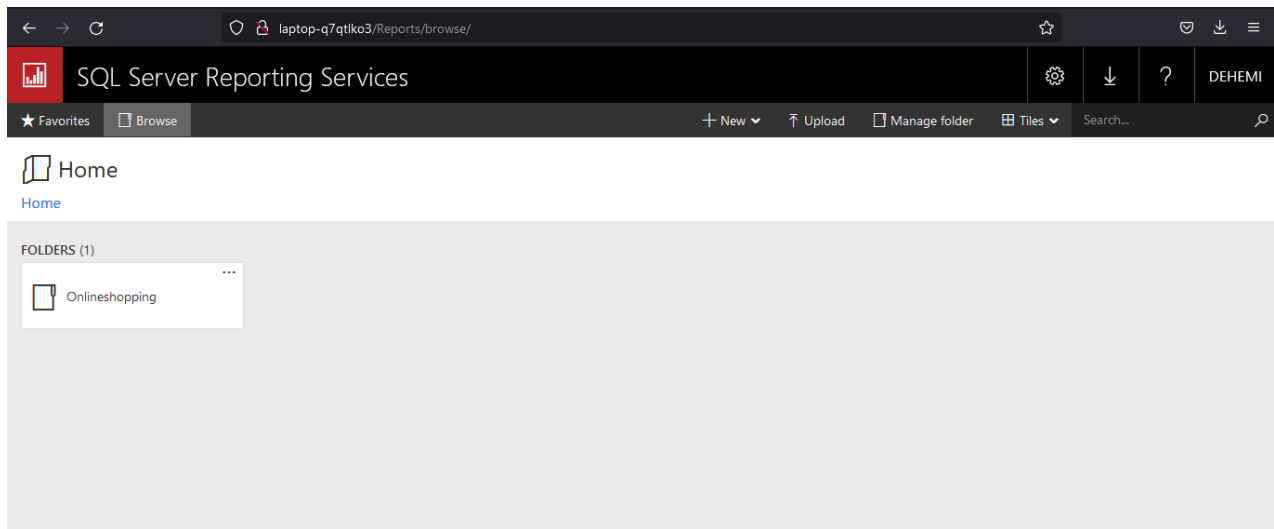
- SQL Server Data Tools or Report Builder
- SQL Server Management Studio

## Configure SQL Server Reporting Services

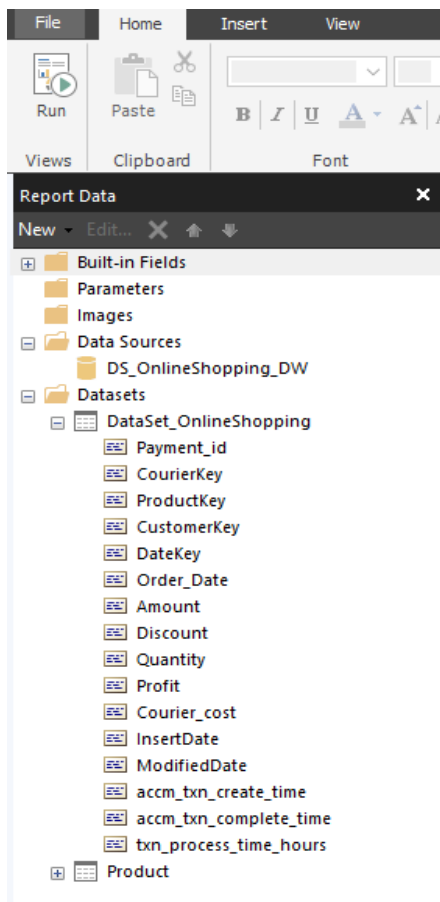
Connect to the server using credentials.



## 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

