Demo & Step by Step Guide

Using PowerPivot in MS Excel to analyze SQL Server Data

By: Wylie Blanchard - Great Tech Pros

- Use a BI Semantic Model Connection in Excel
- Analyze Data & Present Data with PowerPivot & Power View

Use a BI Semantic Model Connection in Excel

Creating a Tabular Model Project

1. Open **SQL Server Data Tools** (Visual Studio)
2. Go to **File** > **New** > **Project**
3. Select project type **Analysis Services Tabular Project**
4. Insert the name of your Analysis Services Tabular instance
5. An empty model, Model.bim file is created
6. Go to **Model** > **Import From Data Source**
   a. The **Table Import Wizard** window opens

7. Select the **Microsoft SQL Server** option
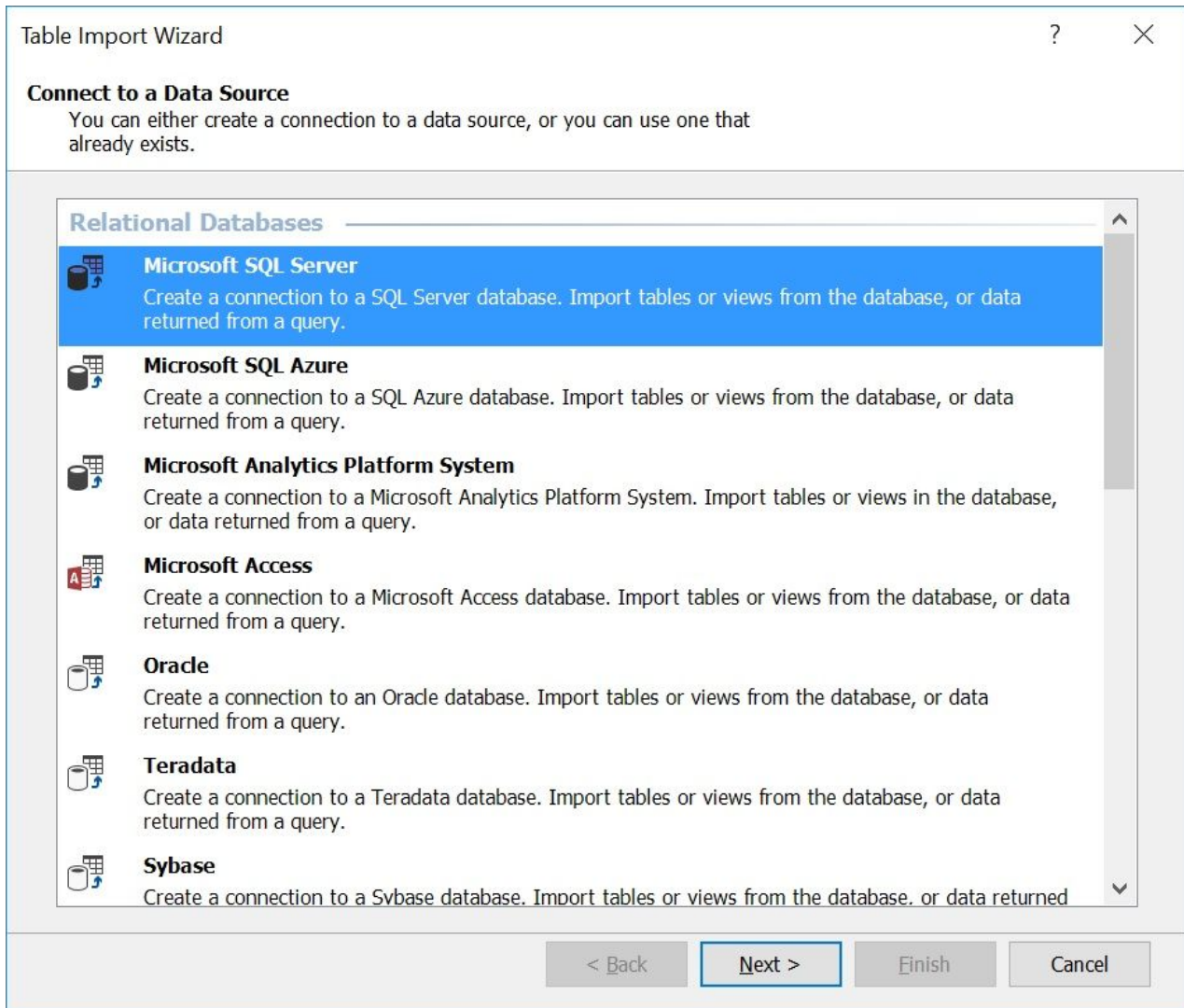
8. On the **Connect to a Microsoft SQL Server Database** screen, Insert the server name of your Data Warehouse (SQL Server) instance and then select the name of the database from the drop down box
9. Click **Next,** and insert your connection on the prompting screens
10. On the **Select the Source Tables and Views** screen place a checkmark next to each tables and views that you want to include in your project
11. Click **Finish**

12. Optionally, you can preview your data before moving

Preview Selected Table
    Use the checkbox to select specific columns. To filter the data in a column, use the drop-down arrow for the column to select values that should be included.
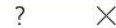
Table Name: **FactInternetSales**

☑	☑ Produ... ▾	☑ OrderDat... ▾	☑ DueDat... ▾	☑ ShipDat... ▾	☑ Custom... ▾	☑ Promotio... ▾	☑ Currenc... ▾	☑ SalesTerritor... ▾	☑ SalesOrderNu... ▾	☑ Sale:
1	310	20050701	20050713	20050708	21768	1	19	6	SO43697	
2	346	20050701	20050713	20050708	28389	1	39	7	SO43698	
3	346	20050701	20050713	20050708	25863	1	100	1	SO43699	
4	336	20050701	20050713	20050708	14501	1	100	4	SO43700	
5	346	20050701	20050713	20050708	11003	1	6	9	SO43701	
6	311	20050702	20050714	20050709	27645	1	100	4	SO43702	
7	310	20050702	20050714	20050709	16624	1	6	9	SO43703	
8	351	20050702	20050714	20050709	11005	1	6	9	SO43704	
9	344	20050702	20050714	20050709	11011	1	6	9	SO43705	
10	312	20050703	20050715	20050710	27621	1	100	4	SO43706	
11	312	20050703	20050715	20050710	27616	1	100	4	SO43707	
12	330	20050703	20050715	20050710	20042	1	98	10	SO43708	
13	313	20050703	20050715	20050710	16351	1	6	9	SO43709	
14	314	20050703	20050715	20050710	16517	1	6	9	SO43710	
15	314	20050704	20050716	20050711	27606	1	100	1	SO43711	

Clear Row Filters   OK   Cancel

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

✅ **Success**   Total: 7   Cancelled: 0
                                                                   Success: 7   Error: 0

Details:

	Work Item	Status	Message
✅	Customer	Success. 18,484 rows transferred.	
✅	Date	Success. 2,191 rows transferred.	
✅	Geography	Success. 655 rows transferred.	
✅	Product	Success. 606 rows transferred.	
✅	Product Category	Success. 4 rows transferred.	
✅	Product Subcategory	Success. 37 rows transferred.	
✅	Internet Sales	Success. 60,398 rows transferred.	
✅	Data preparation	Completed	Details

Stop Import   Close

13. Final view of the model (below) - note the tabs at the bottom of the screen

Deploy the Tabular Model

1. Right-click the project name
2. select **Properties**
   a. Properties box opens
3. Ensure that the **Server** property displays the name of your Tabular instance
4. Click **Ok**
5. Go to Build > **Deploy TabularProject 1** (the name of your project)
6. Your project is now deployed to the server

Deploy	?	✕

Deploying

The deployment operation may take several minutes to complete.

✅ **Success**

	8	Total	0	Cancelled
	8	Success	0	Error

Details:

	Work Item	Status	Message
✅	Deploy metadata	Success. Metadata deployed.	
✅	Customer	Success. 18,484 rows transferred.	
✅	Date	Success. 2,191 rows transferred.	
✅	Geography	Success. 655 rows transferred.	
✅	Product	Success. 606 rows transferred.	
✅	Product Category	Success. 4 rows transferred.	
✅	Product Subcategory	Success. 37 rows transferred.	
✅	Internet Sales	Success. 60,398 rows transferred.	

Analyze & Present Data with PowerPivot & Power View

Activate PowerPivot MS Excel add-in

1. Open MS Excel 2013
2. Go to **File** > **Options** > **Add-Ins**
3. In the Manage box, click **COM Add-ins**> Go
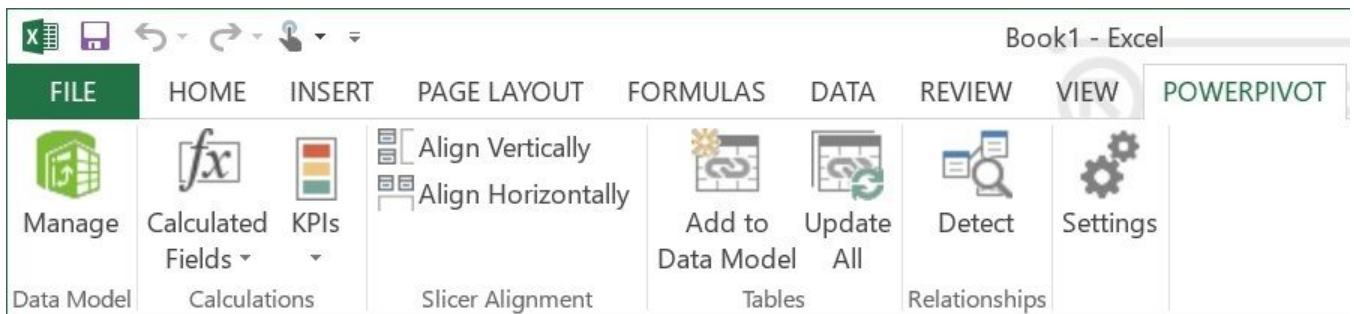4. Check the **Microsoft Office PowerPivot** & **Power View** boxes
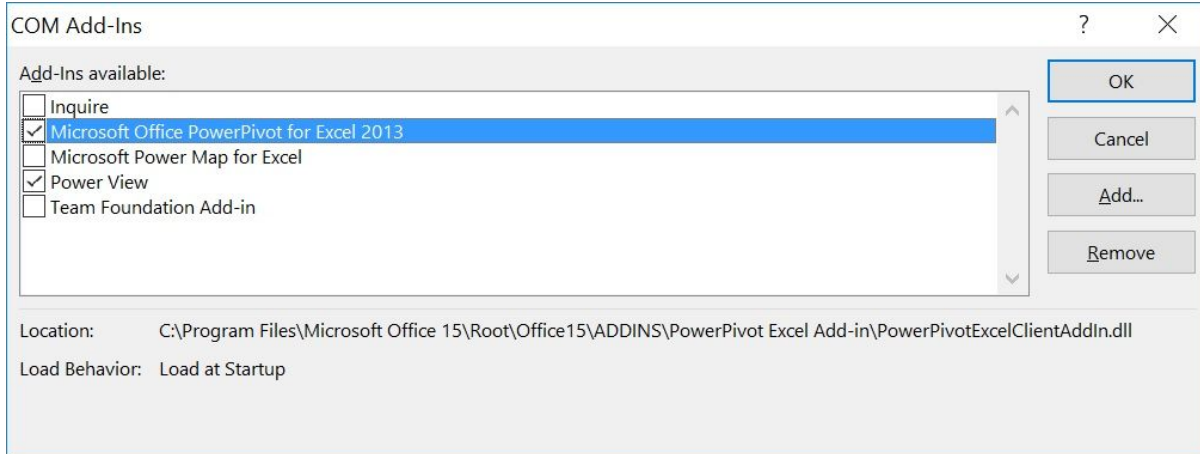
PowerPivot tab

1. Click the **Power Pivot** tab
   a. This is the tab where you work with Power Pivot PivotTables, calculated fields, and key performance indicators (KPIs), and creating linked tables
2. Click **Manage** to open the PowerPivot window to manage data
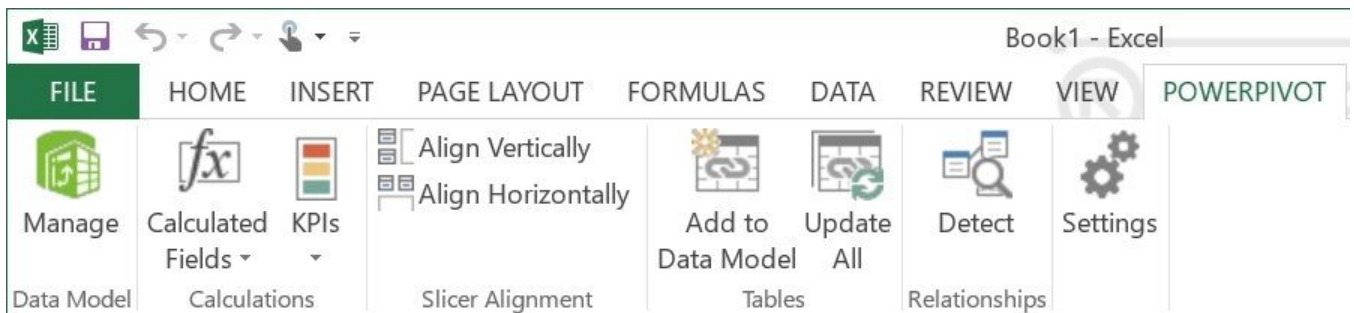
3. Click the **Power Pivot** tab

4. Click **Manage** to open the PowerPivot window
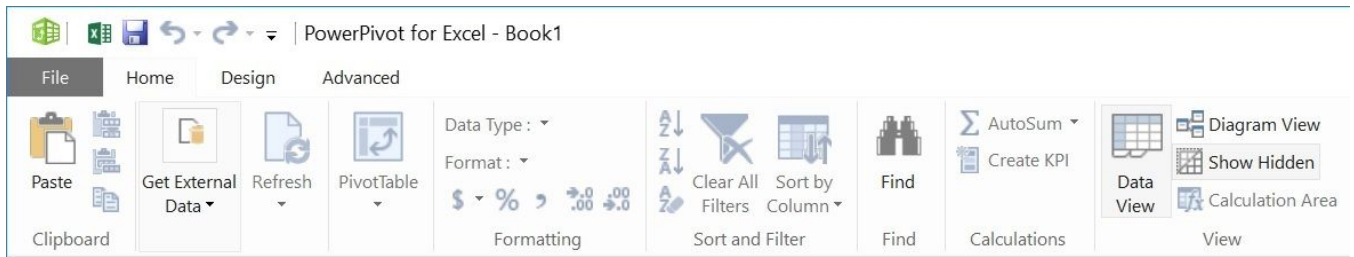
Import Data from SQL Server

1. In the Power Pivot window, click **Get External Data** > **From Database** > **From SQL Server**

2. In **Connect to Microsoft SQL Server Database**, in **Server or File Name**, enter the name of SQL Server instance where your Data Warehouse is located.

3. Click the down arrow to the right of the **Database name** list, and select an Analysis Services database from the list

4. Click **Test Connection** to verify that the server is available.

5. Click **Next**

Table Import Wizard ? ✕

Connect to a Microsoft SQL Server Database

Enter the information required to connect to the Microsoft SQL Server database.

Friendly connection name: SqlServer LAPTOP-P3AJK7V7 AdventureWorksDW2012

Server name: LAPTOP-P3AJK7V7

Log on to the server
- ⦿ Use Windows Authentication
- ◯ Use SQL Server Authentication
  - User name: [   ]
  - Password: [   ]
    - ☐ Save my password

Database name: AdventureWorksDW2012

[Advanced] [Test Connection]

[< Back] [Next >] [Finish] [Cancel]

6. On the **Choose How to Import the Data** screen click the radial button for **Select from a list of tables and views to choose the data to import**
7. Click **Next**
8. Select the tables and views that you want included.
    a. You can change any **Source Table** name to **Friendly Name**
    b. You can click **Preview and FIlter** to exclude columns and data
9. Click **Finish** to complete import process

Table Import Wizard

Select Tables and Views

Select the tables and views that you want to import data from.

Server: LAPTOP-P3AJK7V7

Database: AdventureWorksDW2012

Tables and Views:

		Source Table	Schema	Friendly Name	Filter Details	
	⊞	AdventureWorksDWBuildVersion	dbo			
	⊞	DatabaseLog	dbo			
	⊞	DimAccount	dbo			
	⊞	DimCurrency	dbo			
✓	⊞	DimCustomer	dbo	Customer		
✓	⊞	DimDate	dbo	Date		
	⊞	DimDepartmentGroup	dbo			
	⊞	DimEmployee	dbo			
✓	⊞	DimGeography	dbo	Geography		
	⊞	DimOrganization	dbo			
✓	⊞	DimProduct	dbo	Product		
✓	⊞	DimProductCategory	dbo	Product Category		
✓	⊞	DimProductSubcategory	dbo	Product Subcategory		
	⊞	DimPromotion	dbo			
	⊞	DimReseller	dbo			

Select Related Tables   Preview & Filter

< Back   Next >   Finish   Cancel

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: 7   Cancelled: 0
Success: 7   Error: 0

Details:

Work Item	Status	Message
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✅ Product Subcategory	Success. 37 rows transferred.	
✅ Internet Sales	Success. 60,398 rows transferred.	
✅ Data preparation	Completed	Details

Stop Import   Close

Completed Data Import (below)

Diagram View - Table Relationships
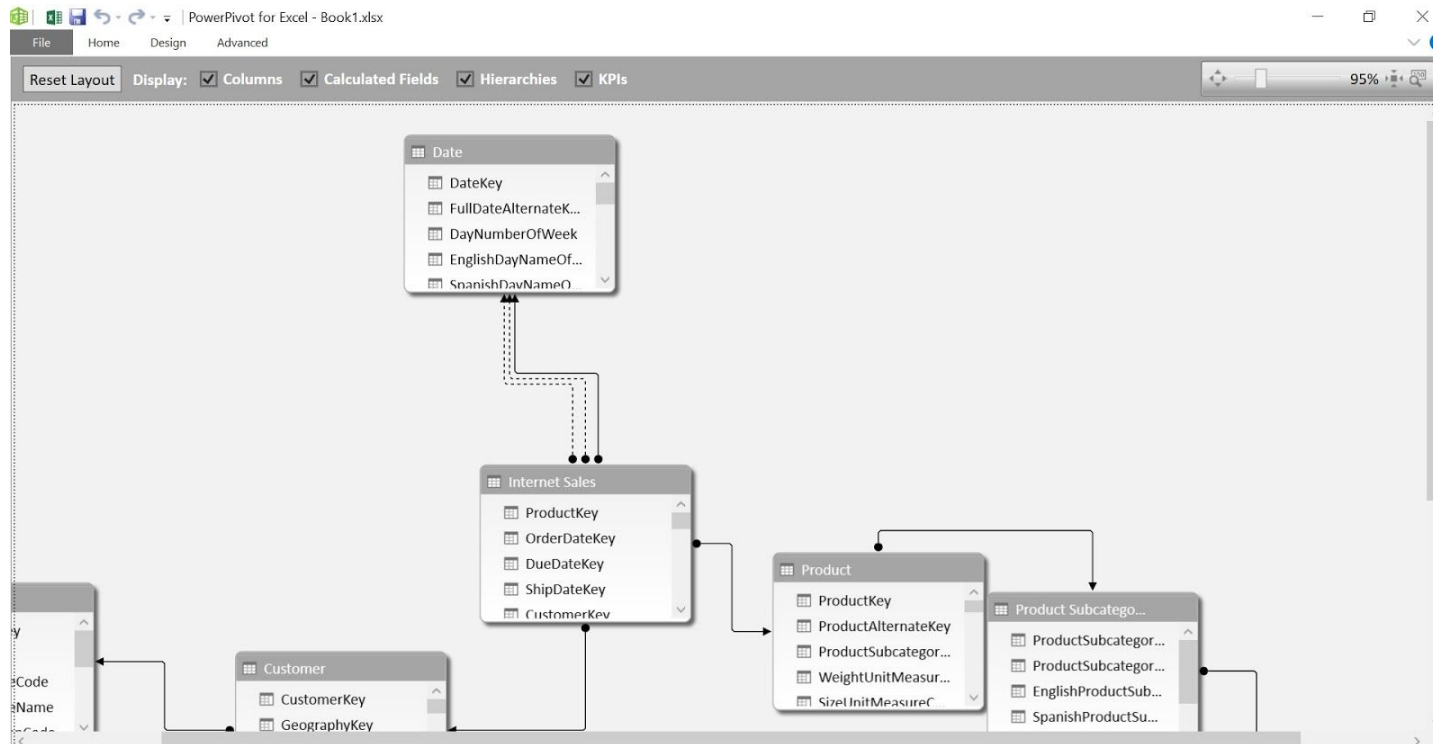
Create a PivotTable

1. While in **PowerPivot** click the **PivotTable** button
2. On the **Create PivotTable** screen select **New Worksheet**
    a. A new PivotTable Worksheet is created
3. Under **PivotTable Fields** do the following
    a. Go to **Product**. Select **ModelName**
    b. Go to **Internet Sales**. Select **OrderQuantity**
4. Give it a title
5. Complete. You've created a **PivotTable**

Add a Hierarchy

1. In **PowerPivot** go to table/sheet **Geography**
2. Click the **Diagram View** button
   a. Find the Geography table in the Diagram View
3. Right Click the table and then Select **Create Hierarchy**
4. Rename the "Hierarchy" to "Region Hierarchy"
5. Drag **EnglishCountryRegionName** to "Region Hierarchy"
6. Drag **StateProvinceName** to "Region Hierarchy" underneath **EnglishCountryRegionName**
7. Click the **Data View** button
8. Go back to your pivot table
9. Under **PivotTable Fields** do the following
   a. Go to **Geography**. Select **Region Hierarchy**
   b. Region Hierarchy appears in the **ROWS** section.
10. Drag Region Hierarchy from the **ROWS** section to the **COLUMNS** section
11. Filter PivotTable to display only the **United States**
12. Click the save button, name the workbook "SQLSatIndy-PowerPivotExcelSQLAnalysis" and close the workbook
13. Complete. You've created a **Hierarchy** and added it to your **PivotTable**

Optional: SASS to Power View Quickly

1. Open **MS Excel**
2. Create a blank workbook
3. Go to **Data** > **From Other Sources** > **Get External Dat**a > **From Analysis Services**
4. In the **Connect to Database Server** screen, in **Server Name**, enter the name of SQL

   Server Analysis instance where your Tabular Model was deployed.

5. Select your Tabular Model
6. Select **Next,** then click **Finish**
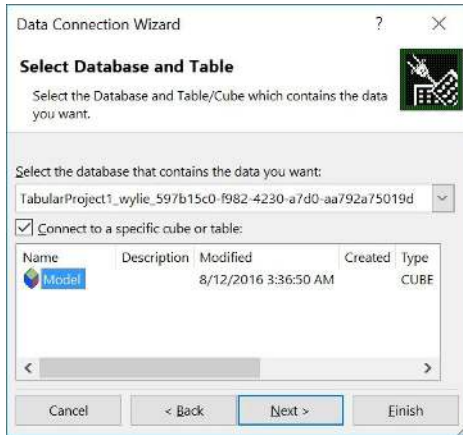
7. On the Import Data screen, select **Power View Report**
8. Excel creates a Power View Sheet with your tabular data model in the Field List.
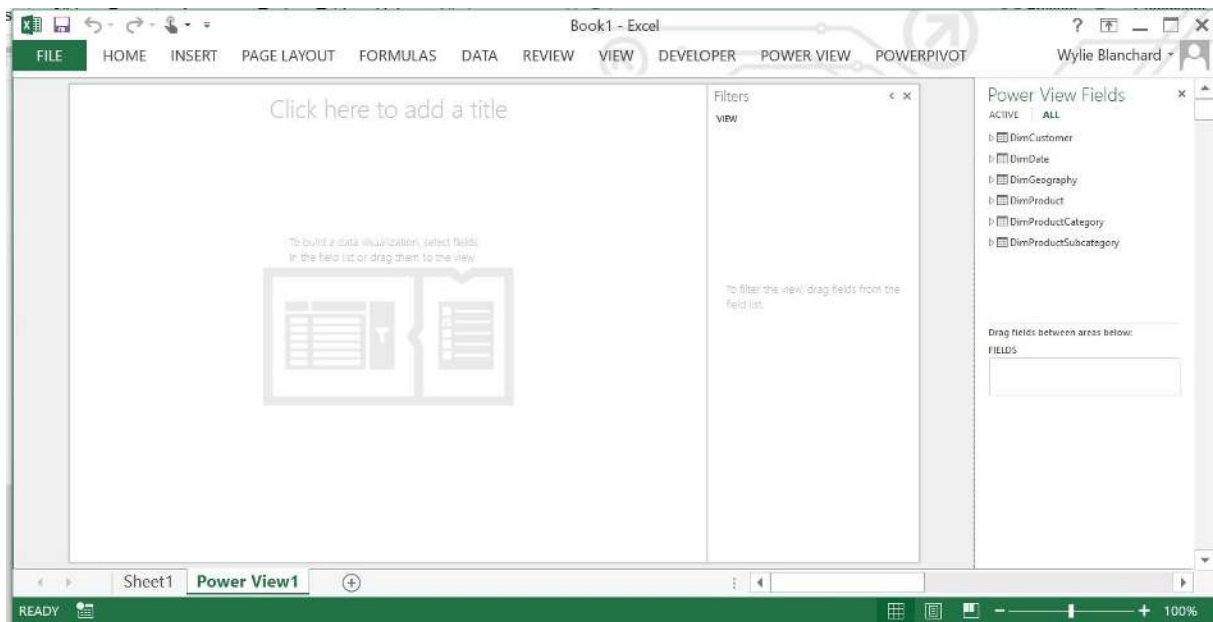
9. In the **Power View Fields** list do the following
   a. Go to **Product**. Select **ModelName**
   b. Go to **Internet Sales**. Select **OrderQuantity**
10. Click where it says, "**Click here to add a title**" and type in "**Order Quantities by Model Name**".
11. Click the save button, name the workbook "SQLSatIndy_SSAStoPower View" and close

the workbook

12. Complete, you've created your first **Power View** report using your **SSAS Tabular Model**

Adding a Calculated Column using DAX

1. Reopen the previously saved workbook "SQLSatIndy-PowerPivotExcelSQLAnalysis"
2. Go to the **PowerPivot** tab at the top of the Workbook
3. Click the **Manage** button
4. Go to a table ("InternetSales")
5. Click a blank column click "**Insert Column**"
   a. Its default name is **CalculatedColumn1.** By right-clicking on the heading, the following options are presented:
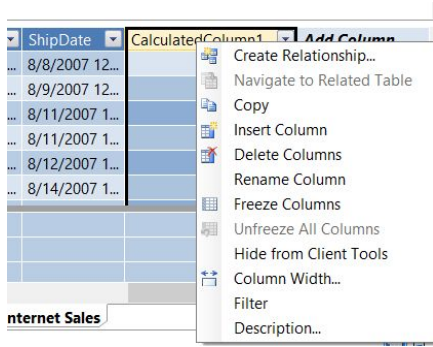
3. Select the "**Rename Column**" option and enter **TotalProfit** as the new column name
4. Create a formula that will subtract the **unit price** (selling price) from the **product cost** (cost to create/sell product) to arrive at the total profit.
   a. DAX formula =[UnitPrice]-[ProductStandardCost]
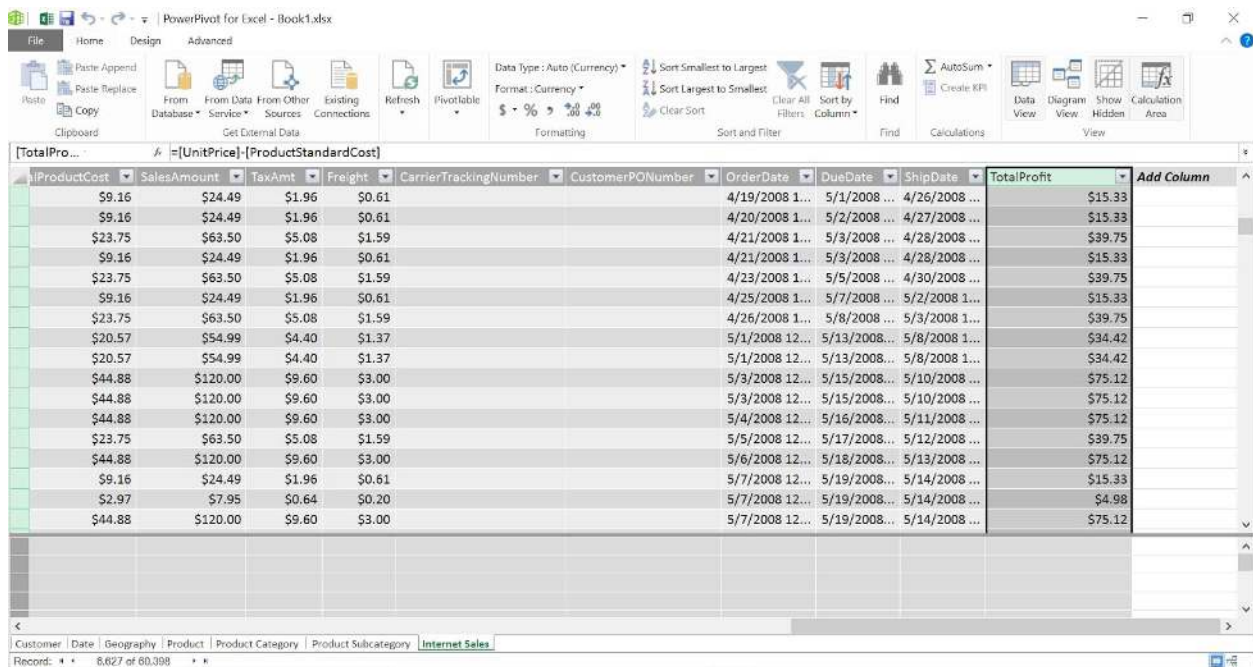
5. Complete, you've created a calculated column using DAX that indicates the total profit

Optional: Add two more Calculated Columns using DAX

1. Product Standard Cost < 25% of Unit Price
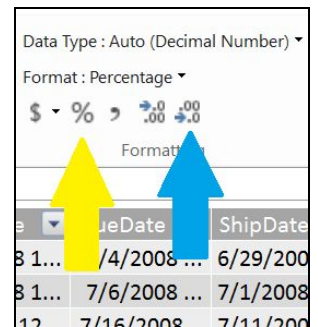   a. Create an additional column

b. Name the column "**ProductStandardCost <25%**"
c. Apply DAX formula **=[ProductStandardCost]<(.40*[UnitPrice])**
d. Your results should look similar to the image below
e. Complete. You've created a **Calculated Column** indicating whether the Product Standard Cost is less than 40% of Unit Price

2. Product Standard Cost % of Unit Price
   a. Create an additional column
   b. Name the column "**ProductStandardCost % of UnitPrice**"
   c. Apply DAX formula **=[ProductStandardCost]/[UnitPrice]**
   d. Use the **Apply Percentage Format** button
   e. Use the **Decrease Decimal** button twice
   f. Your results should look similar to the image below
   g. Complete. You've created a Calculated Column displaying difference between Product Standard Cost and Unit Price as a percentage

Adding a Measure

1. Select the first cell in the bottom grid section (aka the "**Calculation Area**") located just below the separation line

2. In the **formula bar**, located at the top of the worksheet,
   a. type the following: "Sum of Total Profit:=SUM([TotalProfit])

3. Right click the cell in the **Calculation Area**
4. From list, select **Format**
   a. The **Formatting** window opens
5. Select the following in the **Formatting** window
   a. Category = Currency
   b. Symbol = $
   c. Decimal places = 2
6. Click **OK**
7. Complete. You've created a **Measure** to sum the total profit
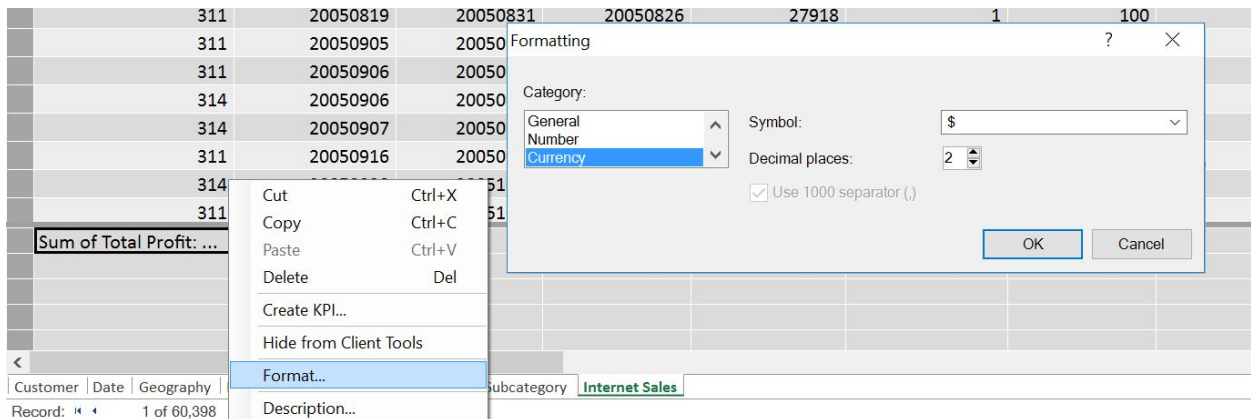
Optional: Add another Measure

1. Click and Highlight the CustomerKey column
2. Then go to the **AutoSum** button and click the drop down symbol.
3. Select **Distinct Count**
4. Complete. You've created a **Measure** to count each unique customer key
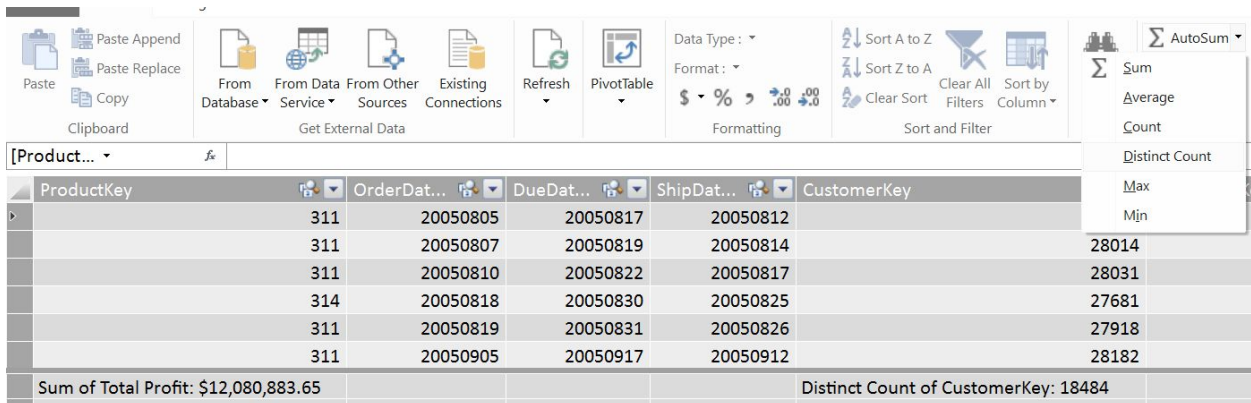
Create a PowerPivot Workbook

1. Navigate back to your excel workbook to display your previously created PivotTable
2. Using the top Ribbon, go to Insert and then click the Power View button
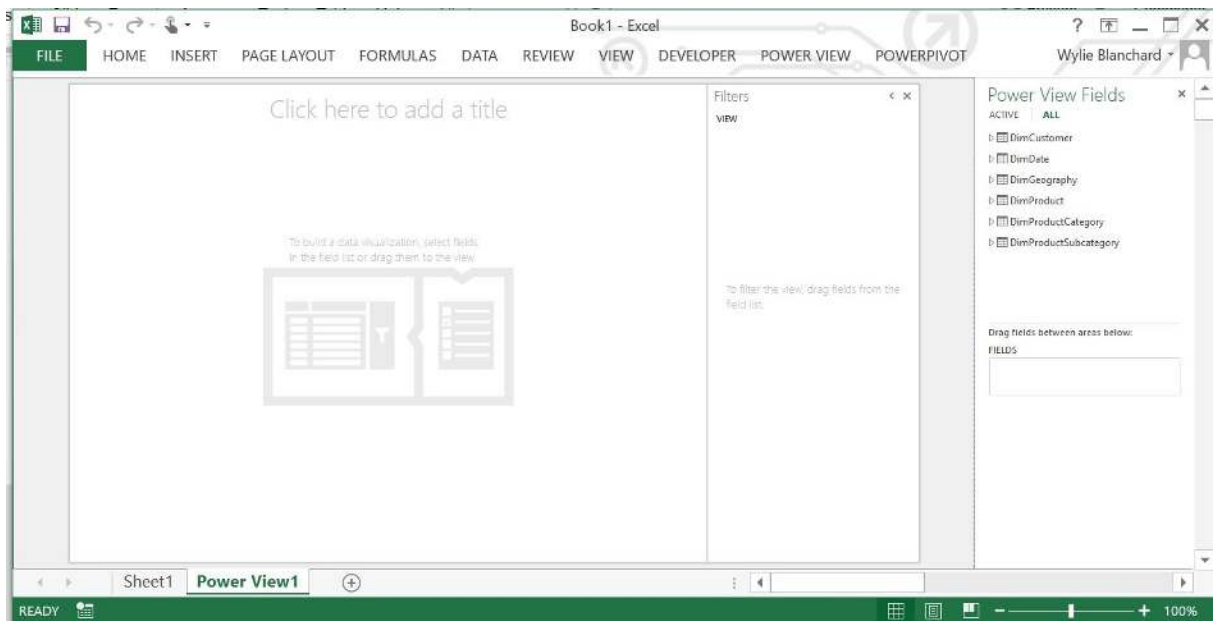3. Excel creates a Power View Sheet with your data model in the Field List

4. In the **Power View Fields** list do the following
   a. Go to **Product**. Select **ModelName**
   b. Go to **Internet Sales**. Select **OrderQuantity**
5. Click where it says, "**Click here to add a title**" and type in "**Order Quantities by Model Name**".
6. Complete, you've created your another **Power View** report using your **SSAS Tabular Model**

Filter the data in Power View using Measure

1. In the Power View Fields Pane, Go to **Product** and find **ModelName**
2. Drag **ModelName** to the **Filter** pane
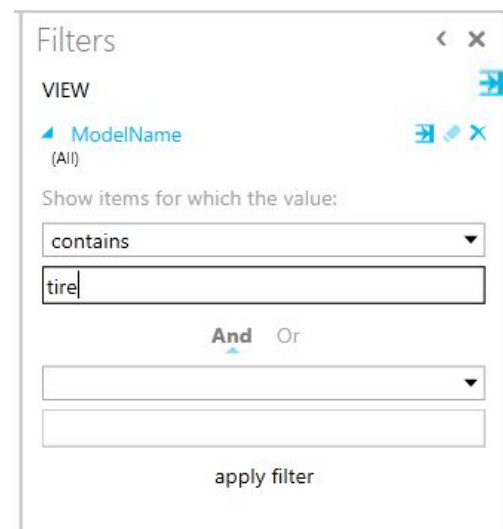   a. The table ModelName and its Columns will display under the Filter pane
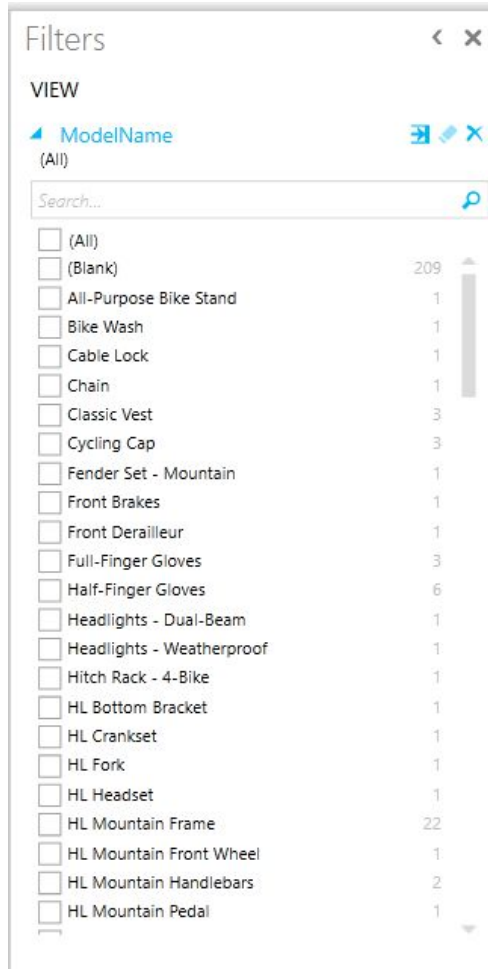
3. Click on the **Advanced Filter Mode** button next to ModelName in the Filter pane
4. In the text box under **contains** type "tire"
5. Click **apply filter**
6. The Power View table displays the order quantities for tires only
7. Complete, you've applied a filter to your **Power View** table

Order Qua

ModelName	OrderQuantity ▲
HL Road Tire	858
LL Mountain Tire	862
ML Road Tire	926
Touring Tire	935
LL Road Tire	1044
ML Mountain Tire	1161
HL Mountain Tire	1396
Touring Tire Tube	1488
Road Tire Tube	2376
Mountain Tire Tube	3095
Total	**14141**

Visualize your Data

1. Click the table
2. Go to the **Design** tab in the **Ribbon**
3. In the **Switch Visualization** section, click the **Other Chart** button
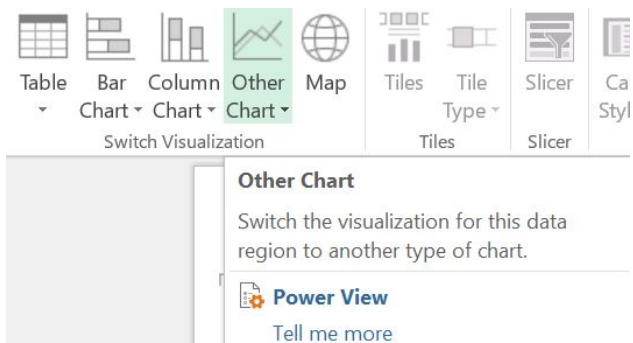
4. The table changes to a chart with a legend

Order Quantities by Model Name

OrderQuantity by ModelName
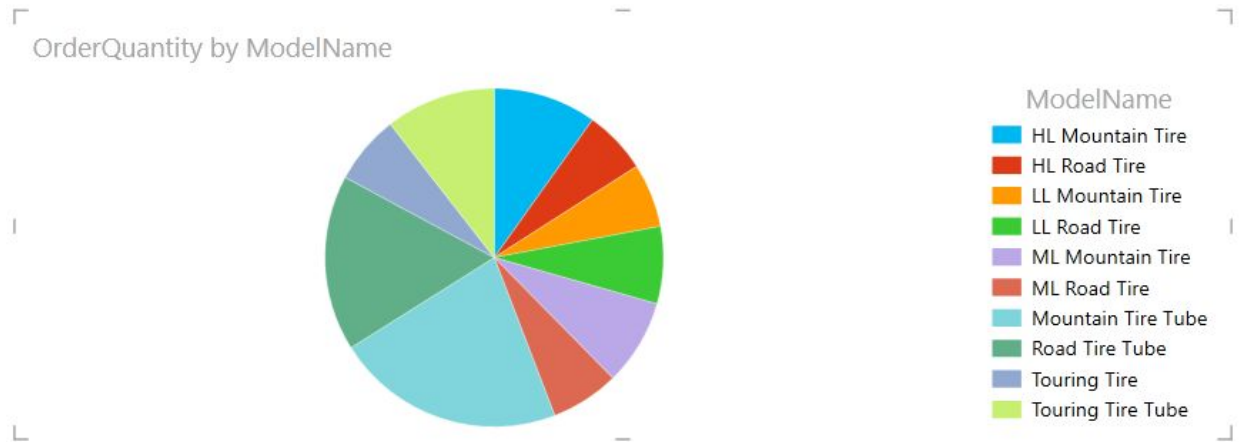

ModelName
- HL Mountain Tire
- HL Road Tire
- LL Mountain Tire
- LL Road Tire
- ML Mountain Tire
- ML Road Tire
- Mountain Tire Tube
- Road Tire Tube
- Touring Tire
- Touring Tire Tube

5. **Right click** the chart and select the **Copy** option
6. **Right click** the chart and select the **Paste** button
   a. A duplicate chart is created
7. Click on one of the charts and then using the top **Ribbon:**
   a. select the **Column Chart** button in the **Switch Visualization** section
   b. Select **Stacked Column**, which changes the visualization to a different chart type

Note**: Interactivity:** By clicking on any part of either chart, the visualization will interact and react to your selection by highlighting/emphasizing your specific
Note: **Interactivity**: Direct your mouse/pointer to any portion of your chart - PowerView will display additional data about that specific section
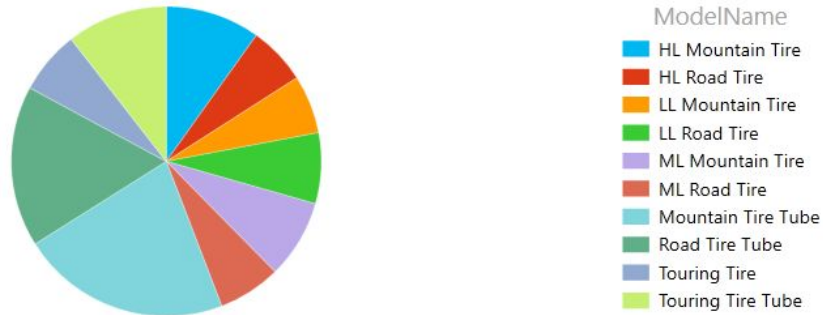
Note**: Use the **Filters** pane to change data is displayed in your visualization what is displayed in your charts
Note: You can change or add to the view by making additional selection from the **Power View Fields** pane

8. Click the **Save** button
9. Complete, you've created a **Power View** visualization of your analyzed data
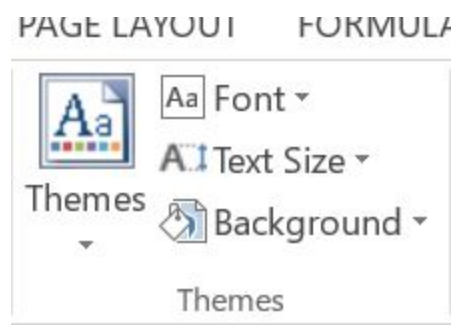
Optional: Power View Themes

8. Using the top Ribbon, click on the **Power View** tab
9. In the **Themes** section there are several options that allow you to further change your visualization
   a. Themes
   b. Fonts
   c. Text Size
   d. Background
10. Utilize each option to further enhance your Power View Visualization

11. Using the top Ribbon, click on the **Layout** tab
12. In the **Labels** section there are several options that allow you to further change your visualization
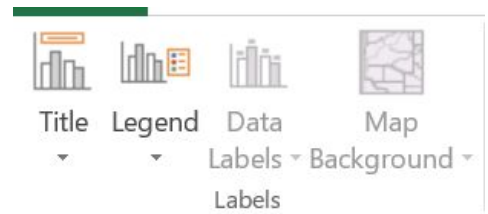
        a. Title
        b. Legend
        c. Data Labels
        d. Mao Background

13. Utilize each option to further enhance your Power View Visualization
14. Complete, you've further enhanced your **Power View** report