# 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

You ca alread	o a Data Source an either create a connection to a data source, or you can use one that y exists.	
Rela	tional Databases	^
<b>e1</b>	Microsoft SQL Server Create a connection to a SQL Server database. Import tables or views from the database, or data returned from a query.	
<b>1</b>	Microsoft SQL Azure Create a connection to a SQL Azure database. Import tables or views from the database, or data returned from a query.	
	Microsoft Analytics Platform System Create a connection to a Microsoft Analytics Platform System. Import tables or views in the database, or data returned from a query.	
A	Microsoft Access Create a connection to a Microsoft Access database. Import tables or views from the database, or data returned from a query.	
<b>•</b>	<b>Oracle</b> Create a connection to an Oracle database. Import tables or views from the database, or data returned from a query.	
<b>7</b>	Teradata Create a connection to a Teradata database. Import tables or views from the database, or data returned from a query.	
7	Sybase	~

- 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

Table Import Wizard

#### Select Tables and Views

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

Server:

#### Database: AdventureWorksDW2012

Tables and Views:

		Source Table	Schema	Friendly Name	Filter Details	^
		AdventureWorksDWBuildVers	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			
_	I			<u>S</u> elect	Related Tables	Preview & Filter

12. Optionally, you can preview your data before moving

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Table Import Wizard

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.

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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	e	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	
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De	tails:			
	Work Item	Status	Mes	sage
0	Customer	Success. 18,484 rows transferred.		
0	Date	Success. 2,191 rows transferred.		
2	Geography	Success. 655 rows transferred.		
0	Product	Success. 606 rows transferred.		
0	Product Category	Success. 4 rows transferred.		
0	Product Subcategory	Success. 37 rows transferred.		
2	Internet Sales	Success. 60,398 rows transferred.		
0	Data preparation	Completed	Deta	ails

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

Debug	Model Tabl	e Column	Team Tools	est Analyze Win	dow Help			Wylie Blanchard 🔻
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10	13671	173	AW00012071	Erank	Ramos	FALSE		
11	13826	127	AW00013826	Candice	He	FALSE		
12	13830	237	AW00013830	Andrea	Cox	FALSE		
13	13838	263	AW00013838		Rubio	FALSE		
14	14838	121	AW00014838	Darren	Alvarez	FALSE		
15	14839	238	AW00014839	Natasha	Sanz	FALSE		
16	14840	277	AW00014840	Autumn	Zhu	FALSE	Solution Explorer lean	n Explorer Class View
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Record:	10/18,					1 III III III III III III III III III I	The name of the table, a	as it is stored in the model

# 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

Deploying		
The deployment operation ma	y take several minutes to complete.	
Success	8 Tota	0 Cancelle
Success	8 Succ	ess 0 Error
Work Item	Status	Message
Deploy metadata	Success. Metadata deployed.	
2 Customer	Success. 18,484 rows transferred.	
Date 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.	
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# 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

COM Add-Ins		?	2	×
A <u>d</u> d-Ins availab	le:		OK	
<ul> <li>☐ Inquire</li> <li>✓ Microsoft C</li> <li>Microsoft P</li> </ul>	ffice PowerPivot for Excel 2013		Cancel	I
Power View	Jation Add-in		<u>A</u> dd	
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Location:	C:\Program Files\Microsoft Office 15\Root\Office15\ADDINS\PowerPivot Excel Add-in\PowerPivotExcelCl	lientAdd	In.dll	
Load Behavior:	Load at Startup			

# 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

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FILE	HOME	INSER	PAGE LAYOUT	FORMULAS	DATA	REVIEW	VIEW	POWERPIVOT
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Manage	Calculated	KPIs	, , ,	Add to	Update	Detect	Settings	
	Fields 👻	*		Data Mode	All I			
Data Model	Calculati	ons	Slicer Alignment	Table	es	Relationships		

4. Click Manage to open the PowerPivot window



# Import Data from SQL Server

- 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.
- 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					?	Х
Connect to a Microsoft SQL Server	Database					
Enter the information required to conr	nect to the Microsoft SQL	Server database.				
Friendly <u>c</u> onnection name: SqlSer S <u>e</u> rver name: LAPTO Log on to the server Use <u>W</u> indows Authentication Use S <u>Q</u> L Server Authentication <u>U</u> ser name:	ver LAPTOP-P3AJK7V7	AdventureWorksD\	W2012		,	
Password: Save my pas	sword					
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				Advanced	Test Connection	n
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- 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			
$\checkmark$	DimCustomer	dbo	Customer		
$\checkmark$	DimDate	dbo	Date		
	DimDepartmentGroup	dbo			
	DimEmployee	dbo			
$\checkmark$	DimGeography	dbo	Geography		
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0	Customer	Success. 18,484 rows transferred.		
0	Date	Success. 2,191 rows transferred.		
0	Geography	Success. 655 rows transferred.		
0	Product	Success. 606 rows transferred.		
0	Product Category	Success. 4 rows transferred.		
0	Product Subcategory	Success. 37 rows transferred.		
0	Internet Sales	Success. 60,398 rows transferred.		
0	Data preparation	Completed	De	etails

Completed Data Import (below)

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14838	121	AW00014838		1	Darren		Alvarez	FALSE	7/26/19	977 S		М	darr	
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# **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**

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													PivotTable	e Fields
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	Row Labels	<ul> <li>Sum of OrderQuantity</li> </ul>											Choose fields to	add to
	All-Purpose Bike Stand	249											report:	
	Bike Wash	908												
	Classic Vest	562											DaysTo	Manufacture
	Cycling Cap	2190											Product	tline
	Fender Set - Mountain	2121												
	Half-Finger Gloves	1430											DealerP	rice
	Hitch Rack - 4-Bike	328											Class	
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	Patch kit	3191												
	Racing Socks	568												
	Road Bottle Cage	1712												

# 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

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# Optional: SASS to Power View Quickly

- 1. Open **MS Excel**
- 2. Create a blank workbook
- 3. Go to Data > From Other Sources > Get External Data > 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**

Data Conne	ction Wizard		?	×
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elect the dat	abase that conta	ins the data you	want:	
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Connect t	o a specific cube	or table:		
Name Model	Description	Modified 8/12/2016 3:36	Created 5:50 AM	Type CUBE
¢				>

- 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.

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- 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** 

FILE HOME INSE	RT PAGE LAYOUT F	ORMULAS DATA REVIEW VIEW	DEVELOPER POWER VIEW POWER	RPIVOT Wylie Blanchard -
ModelName All-Purpose Bike Stand Bike Wash Classic Vest Cycling Cap Fender Set - Mountain Half-Finger Gioves Hitch Rack - 4-Bike HL Mountain Tire HL Road Tire LL Road Tire LL Road Tire LL Road Tire ML Mountain Tire ML Mountain Tire ML Mountain Tire ML Mountain Tire ML Mountain Tire	Order Quantiti 249 908 552 2190 2121 1326 1336 858 733 852 1340 1356 1366 1366 1366 1366 1161 9266 3075	es by Model Name	Filters < x VIEW	Power View Fields       ×         ACTIVE       ALL         OrderDate       >         OrderDate       >         CorderDatekey       >         CorderDatekey       >         CorderDatekey       >         ProductRandardCost       >         PromotionKey       >         SalesOrderIneNumber       >         SalesOrderNumber       >         Drag fields between areas below:       FIELDS
Sheet1	Power View1 (+)		: 4	

# 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:

	ShipDate 8/8/2007 12 8/9/2007 12 8/11/2007 1 8/11/2007 1 8/12/2007 1	Calculate dCo	Create Relationship Navigate to Related Table Copy Insert Column Delete Columns Rename Column Freeze Columns Unfreeze All Columns Hide from Client Tools
nt	ternet Sales		Filter Description

- 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]

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\$44.88	\$120.00	\$9.60	\$3.00					5/3/2008 12	5/15/2008	5/10/2008		\$75.12		
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\$2.97	\$7.95	\$0.64	\$0.20					5/7/2008 12	5/19/2008	. 5/14/2008		\$4.98		
\$44.88	\$120.00	\$9.60	\$3.00					5/7/2008 12	5/19/2008.	. 5/14/2008		\$75.12		

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

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3.578.27	\$286.26	\$89.46				8/18/2005	1 8/30/2005	8/25/2005	\$1,406.98	FALSE	
3,578.27	\$286.26	\$89.46				8/19/2005	1 8/31/2005	8/26/2005	\$1,406.98	FALSE	
3.578.27	\$286.26	\$89.46				9/5/2005	12 9/17/2005	9/12/2005	\$1,406.98	FALSE	
					_						

- 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

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\$89.45					8/7/2005	12 8/1	9/2005	8/14/2005	\$1,406.98		FALSE						61 %
\$89,46					8/10/200	5 1 8/2	2/2005	8/17/2005	\$1,406,98		FALSE						61 %
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Adding a Measure

 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

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Record: 1 of 60,398	Description						

#### 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

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			311		20050819	20	0050831	20050	826			27918	
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	Sum of Total Profit:	\$12,080,8	883.65							Distinct Count of Custom	erKey: 184	84	

# 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



- 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
- Complete, you've applied a filter to your **Power** View table

Filters	< x
VIEW	-
ModelName (All)	∃ ⊘ ×
Show items for which the valu	ie:
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# 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

- 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

### Order Quantities by Model Name



# **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
- A Font \* A Font \* A Text Size \* Themes Themes
- 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

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Title	Legend	Data	Мар
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		Labels	

- 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