PowerExcel User Manual

PowerExcel

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POWEREXCEL

USER MANUAL

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PowerExcel User Manual

1. INTRODUCTION to PowerExcel

PowerExcel is a simple, powerful way for Excel users to connect to a highly efficient, collaborative business-modeling platform hosted in the cloud. That platform is available from PARIS Technologies, Inc., the developer of PowerExcel.

With PowerExcel, users access data from a business model for all manner of reporting, analytics and planning: for example, financial reports, departmental budgets, sales forecasts. Users can also model *new* analytics and plan versions, creating limitless data views from a single spreadsheet.

All this can be done via the standard Microsoft Excel install that exists on virtually every business user's computer—so, as a user, you can experience PowerExcel simply by opening the tool you work with every day.

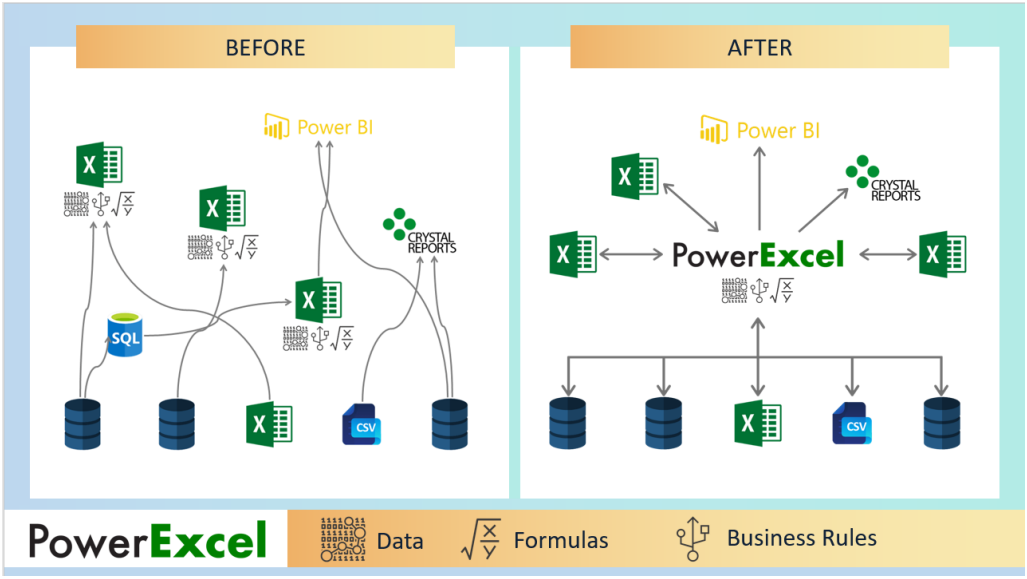
The only requirement is a **PowerExcel Add-In** to reach Cloud-based models. [Note that the following image shows a single user connecting to a PowerExcel Cloud Server through use of the PowerExcel Add-in; the PowerExcel Cloud Server is a multi-server configuration, as shown next page, at right, the "After" image.]

The business data resides on a **PowerExcel Cloud Server**—**PARIS Technologies** makes this Cloud Server available for teams to work far more efficiently than can be done with existing, overwhelmingly complex spreadsheet-only systems. Remote users from different locations, whether around the world, or simply using individual machines, will have the capability to work on separate Excel workbooks that are all connected to a shared model on the cloud server. With the PARIS PowerExcel Cloud Server, Excel is transformed into a dynamic access point for critical business decision-making.

If you have installed the PowerExcel Add-In, or have an interest in doing so, contact PARIS Technologies to get underway with your own PowerExcel Starter Team.

In the image below, the *Before* picture, at left, shows a typical scenario with proliferating spreadsheets. This represents the work done presently, by firms large and small, in spreadsheet-only models. *Without* PowerExcel, individual workbook(s) contain the entire business model(s)—a huge problem, because Excel becomes an unwieldy database itself, freighted with innumerable links, formulas, macros and the like. Spreadsheet models of this sort become literally too big to handle, much less keep free of frightening, potentially catastrophic errors.

As for sharing these spreadsheet-only models: often they make the rounds via email—leading to multiple differing versions of the truth (a scary concept in itself). Or they are posted on a shared directory/site, which hardly solves the "overly burdened, frightening" spreadsheet issue.



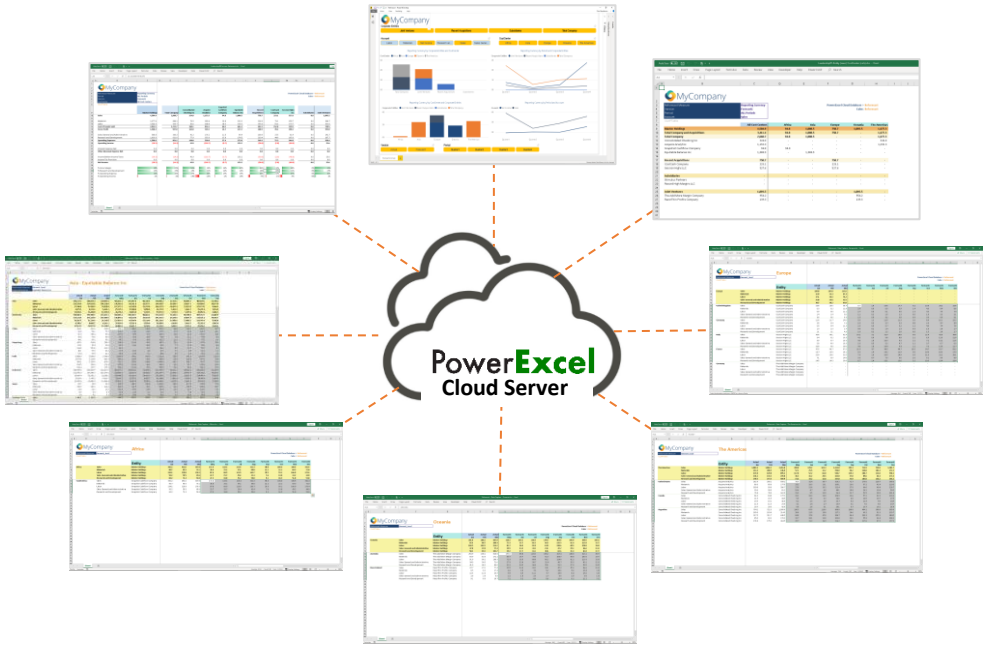
The *After* picture, at right, shows the PowerExcel Cloud Server in the middle. Business model(s) are accessible from the everyday spreadsheet…and, Yes, **Power BI** (and any other BI application) can be set up as another way to reach business data, in real time.

For leadership, PowerExcel provides the means to communicate a vision for the business and for staff to collaborate and act on that vision. In brief: leadership can see results dynamically, and—with responsive planning models in place—can control against objectives, in order to change business strategies as quickly as possible.

PowerExcel solves these issues, and confers upon users and firms other benefits, so that you can:

- Seamlessly and dynamically share your data through the cloud
- See your numbers tick and tie from the start
- Use a Financial Data Repository that keeps multiple versions of your numbers straight
- Collaborate in critical department- or organization-wide efforts that concern reporting, analytics and planning

The following illustration shows an example of users collaborating on a shared model, whether via report views, planning (e.g., budget/forecast) templates or even charts and graphs—all via a "disburdened" everyday instance of Excel.



PowerExcel Users at Work

About this Manual

This manual is intended to give you a view into the main capabilities that users can perform while using PowerExcel—creating Slices, entering data in shared models, using the Dimension Editor (to create new components of the model), and building more complex reports.

An important note: the data shown here is from a representative financial model. While the exercises proceed in a logical chronological fashion, some of the data may not be the same from exercise to exercise. That said, with basic understanding of Excel and an inquisitiveness about how PowerExcel can be useful to you, we hope that you are inspired to investigate further, for a potential PowerExcel solution at your own firm!

PLEASE NOTE ALSO before proceeding

If you see the "@" Symbol in the Microsoft Excel Formula Bar

Microsoft recently changed the syntax for some formulas in Excel, adding an "implicit intersection operator" or "@" symbol. This new syntax is added automatically by Excel to some formulas. Microsoft has made these changes in the core of Excel and you may or may not be aware that this has happened.

PARIS Technologies, developer of PowerExcel and other advanced planning/ analytics/reporting products that feature dynamic spreadsheet connectivity, has responded to these recent changes in Microsoft Excel and has developed enhancements, allowing PARIS products to work with the new Microsoft changes to Excel.

Indeed, many of the functions that you see in use within this PowerExcel manual will now contain the "@" symbol. Although the screen grabs and the text describing these functions may not presently show the "@" symbol, they will work as described.

2. Working with Slices – PowerExcel Perspective, DB Functions, Power Analyzer

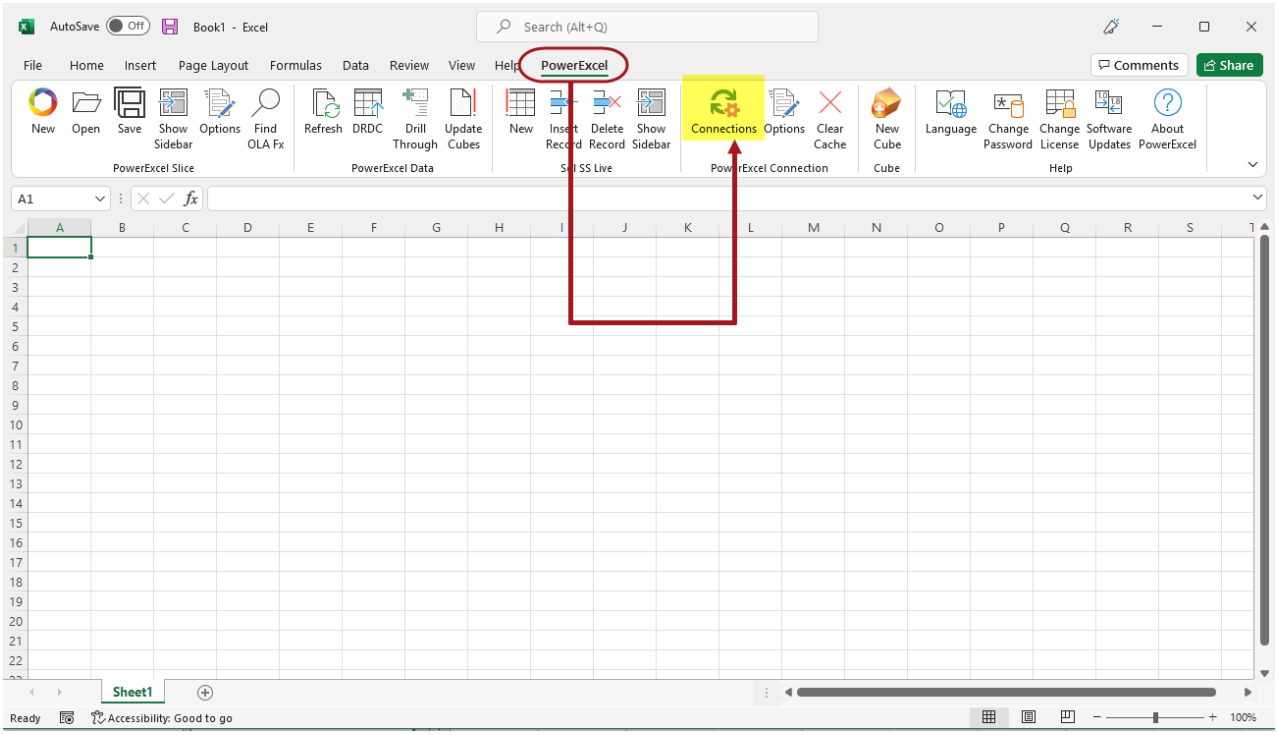
This section will describe the first step in using PowerExcel: how, through a standard spreadsheet, you can reach data that exists in a business model known as a Cube. The following describes how to establish a connection to a model, and the three methods used to create a Slice of business data, which will then allow a user to create a view of *any* desired data.

Important: This manual assumes that you have already installed and registered PowerExcel. If you have not done so, please review the **PowerExcel - Prerequisites. Installation, Registration** manual.

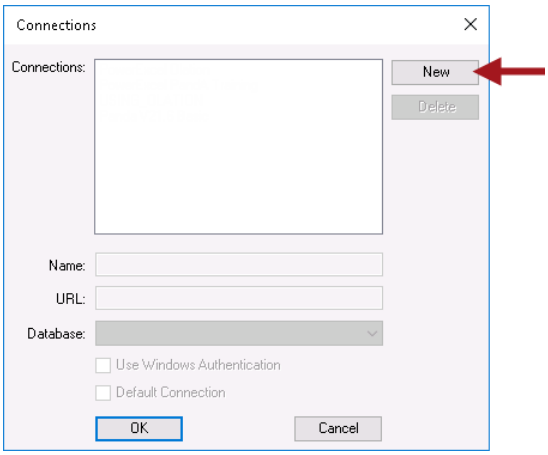
2.1 Establishing the PowerExcel Connection

Begin by creating a PowerExcel Connection in Excel.
To do this:

1. Launch the Excel application and go to the **PowerExcel Tab** along the Excel ribbon.



2. In the PowerExcel Connections control group, click the **Connections** icon (circled above).

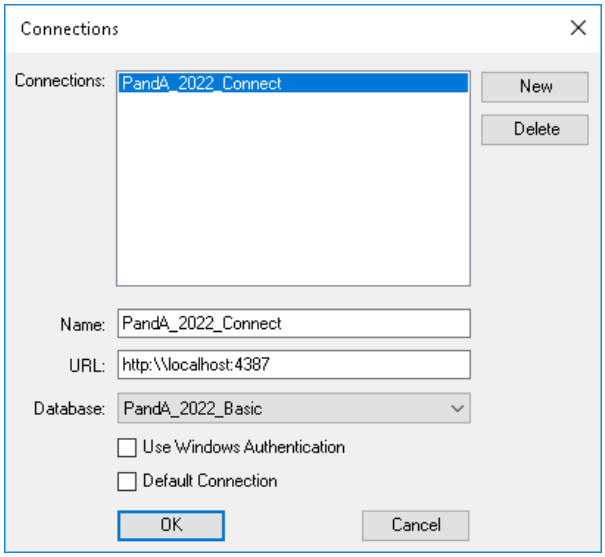


3. In the Connections dialog that appears, click **New** (red arrow in preceding image).
4. In the **Name** field, enter the <**name of the PowerExcel connection**>.
   Note: You can provide any name for the connection; for this exercise **PandA_2022_Connect** is the PowerExcel connection name.
5. In the **URL** field, enter the <**correct URL**>. This URL will be the URL of the Server where the source PowerExcel database (Panda in this example) is currently running/opened.

Important: Typically you will be entering an **http:\\IP Address** to reach a Cloud-based Server provided by PARIS Technologies. (Note that the URL in the image below—http:\\localhost:4387—is only an example.)

6. Click on the **Database drop-down** and select the correct source PowerExcel database. In this example, select **PandA_2022_Basic** as the source database.

Important: The source database must be opened on the specified Server in order for that database to be displayed when you click the Database drop-down button.



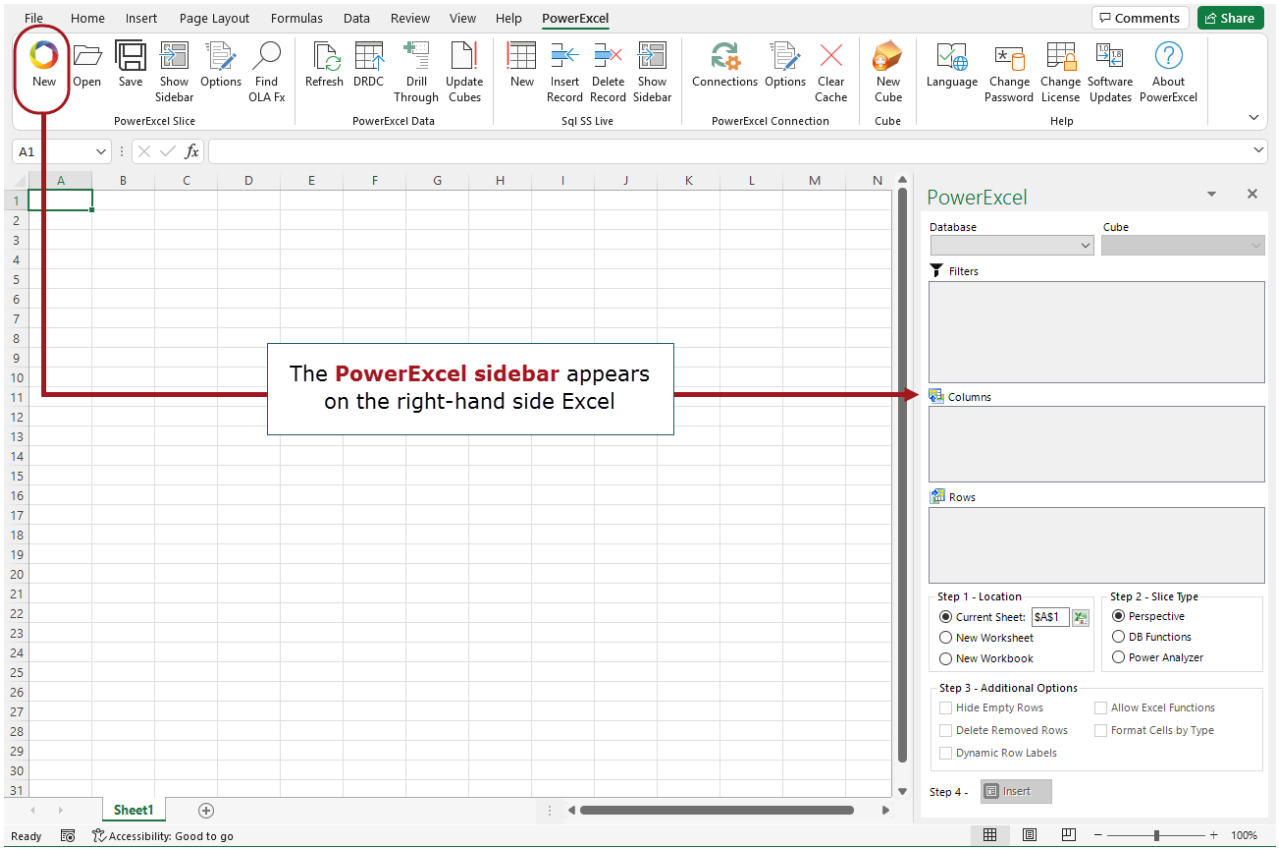
7. Click **OK**. The PowerExcel connection is now successfully created.

2.2 Creating a PowerExcel Slice

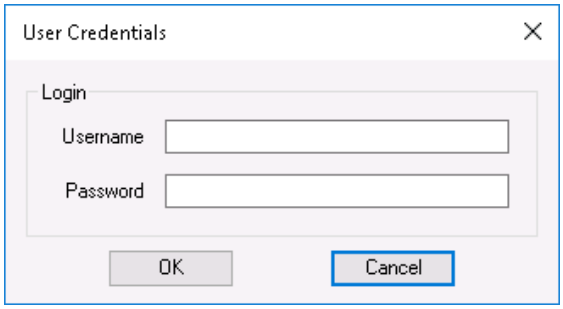
Important: Before we begin creating PowerExcel Slices, configure the PowerExcel Slice settings and enable the **Automatically display sidebar** option. This will help reduce the number of clicks needed to do to work with the PowerExcel sidebar.

TO DO THIS: Go to the **PowerExcel Addin Tab** of the Excel ribbon→click the **Options icon** in the PowerExcel Slice control group→check the **Automatically display sidebar** option in the Slice Options dialog→Click **Save**.

1. In the **PowerExcel Tab** of the Excel ribbon, go to the PowerExcel Slice control group and click the **New** (Slice) icon. The PowerExcel sidebar will appear in the right-hand area of Excel. (The New icon and the sidebar are shown in the following image.)

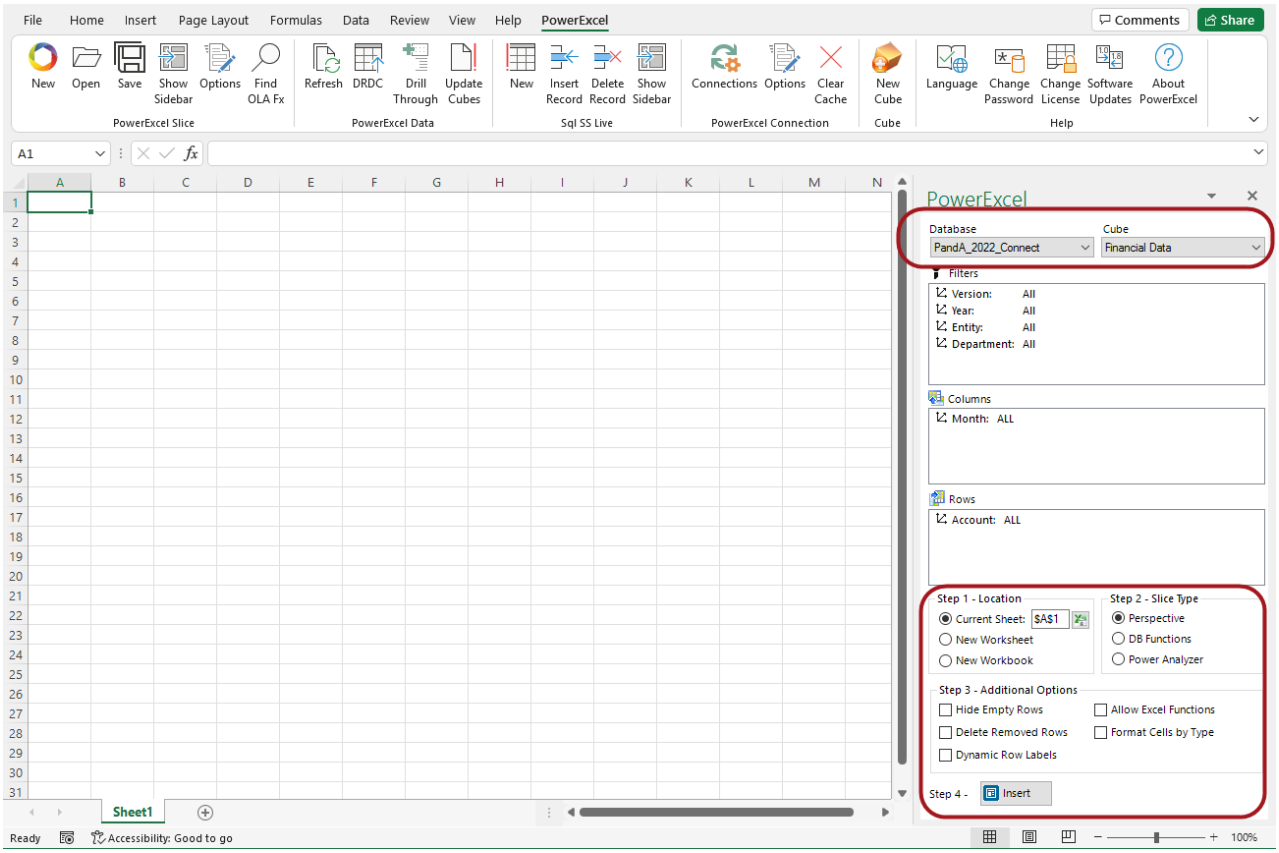


2. Go to the **PowerExcel sidebar**; click on the **Database drop-down** and select the appropriate PowerExcel connection, e.g., **PandA_2022_Connect**.
3. **Note:** If you are trying to connect to a secured PowerExcel database, you will next be prompted to enter valid user credentials to access the database.



If you are connecting to a non-secured database, you will not be prompted for User Credentials. Just proceed to selecting the Cube.

4. Still in the PowerExcel sidebar, click on the **Cube drop-down** and select the appropriate Cube, e.g., **Financial Data**.
   The PowerExcel sidebar will appear as follows, with the selected Database and Cube, circled in the following image:



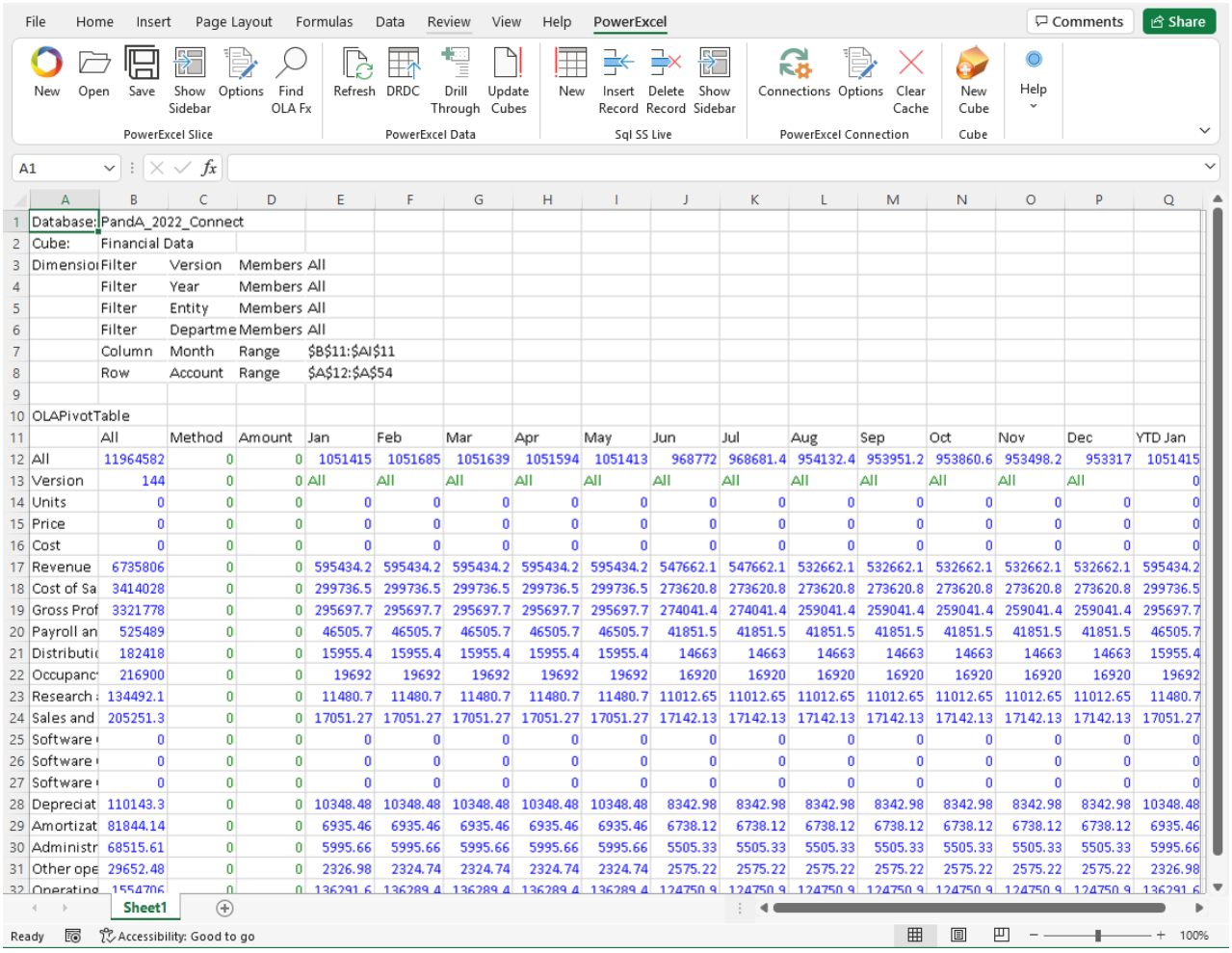
You may re-arrange the Dimensions by dragging and dropping them among the Filters, Columns and Rows sections, and you may also select specific Members to display. We will demonstrate this shortly; for now, we will create a Slice with the default Dimension and Member selections, and follow the Steps (1 through 4) shown at the bottom half of the PowerExcel sidebar (also circled in the image above).

Step 1: Select where you want to generate the PowerExcel report into the spreadsheet. In this example, choose to insert into the **Current Sheet** starting at cell **A1**. (See selection for Current Worksheet and Location circled in the preceding image.)

Step 2: Pick a PowerExcel Slice Type by enabling the correct radio button. You can select **Perspective, DB Functions, or Power Analyzer**. We will elaborate on these options in the succeeding topics.
For now, select **Perspective**.

Step 3: Enable any of the available selected **Additional Options**. In this case, keep only **Format Cells by Type**.

Step 4: Click the **Insert** button. The PowerExcel Slice will look as follows (after a moment, the sidebar disappears):



[NOTE: the data you see in the cells may differ, depending on the database that is used for these example steps.]

At this point you have demonstrated making a Connection to a PowerExcel database and testing how to create an example Slice.

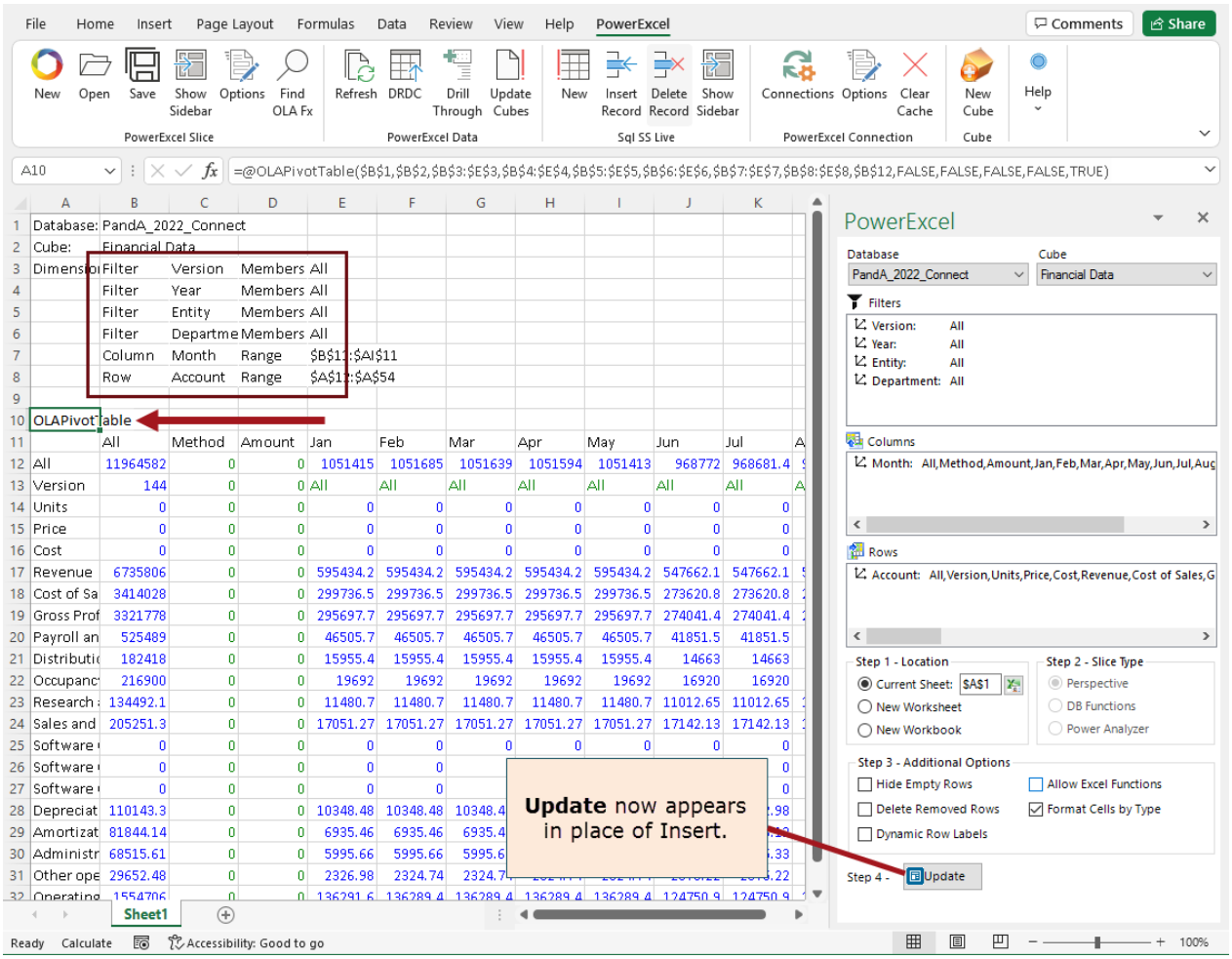
2.3 Using PowerExcel Perspective Slice Type and Reconfiguring a Slice

As mentioned previously, you can re-arrange a Slice by dragging and dropping Dimensions to the Filters, Columns and Rows boxes. You can also select the preferred 'Display Member' for those Dimensions within the Filters (Page Members). Likewise, you can select a specific set of Members to be displayed along the Columns and Rows.

Note: for the ensuing pages, **PowerExcel Perspective** is the Slice Type that is used to bring data into Excel. The **DB Functions** and **Analyzer** Slice Types will be explored in subsequent pages.

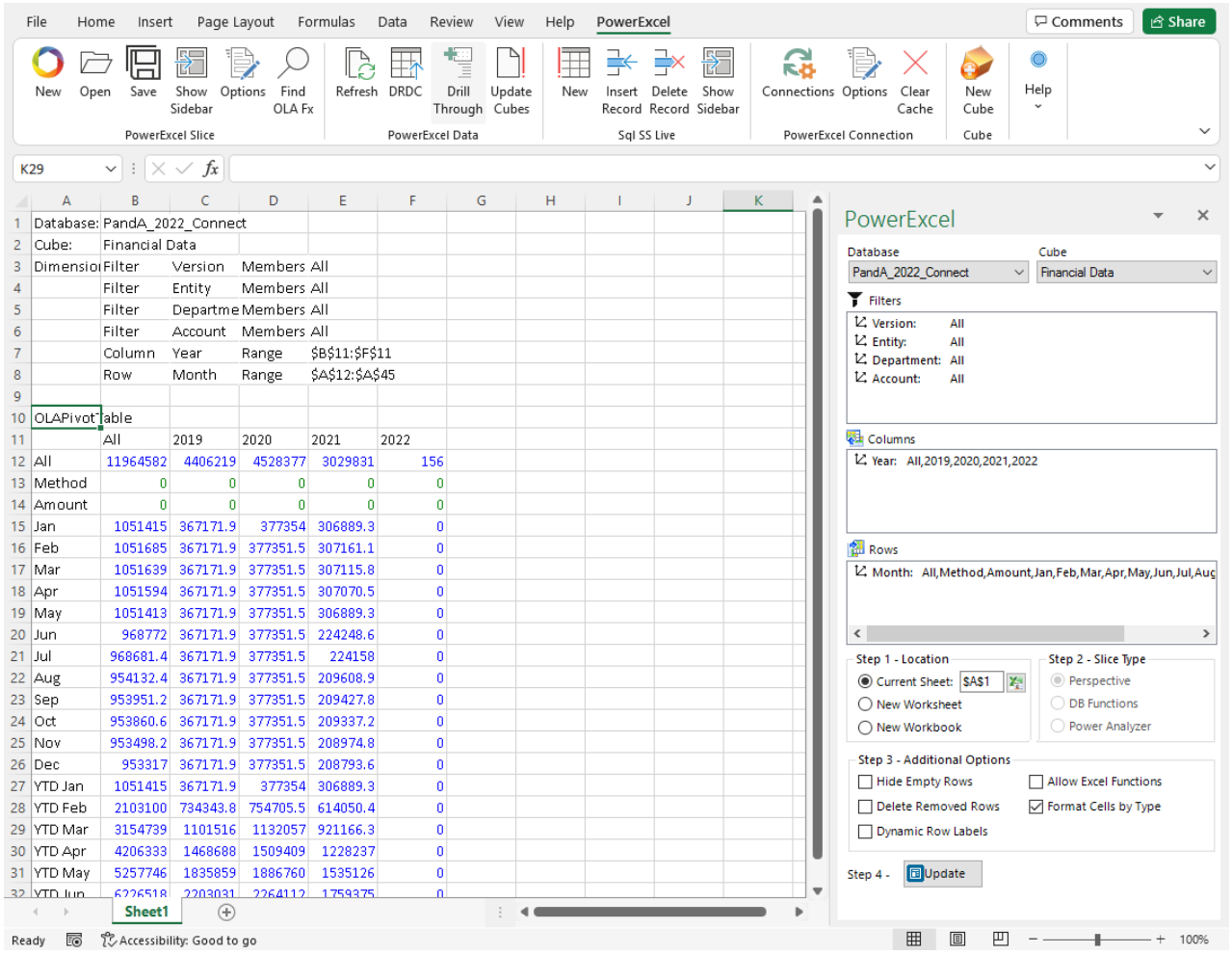
Important: Given that you set the option to **Automatically display sidebar**, it will appear when you click on a cell that contains either the OLAPivotTable (which is the operative function for the **Perspective** Slice Type) or the OLATableMember function, shown by the arrow and boxed, respectively, in the below image.

Also, note that the Insert button is replaced by an **UPDATE** button.

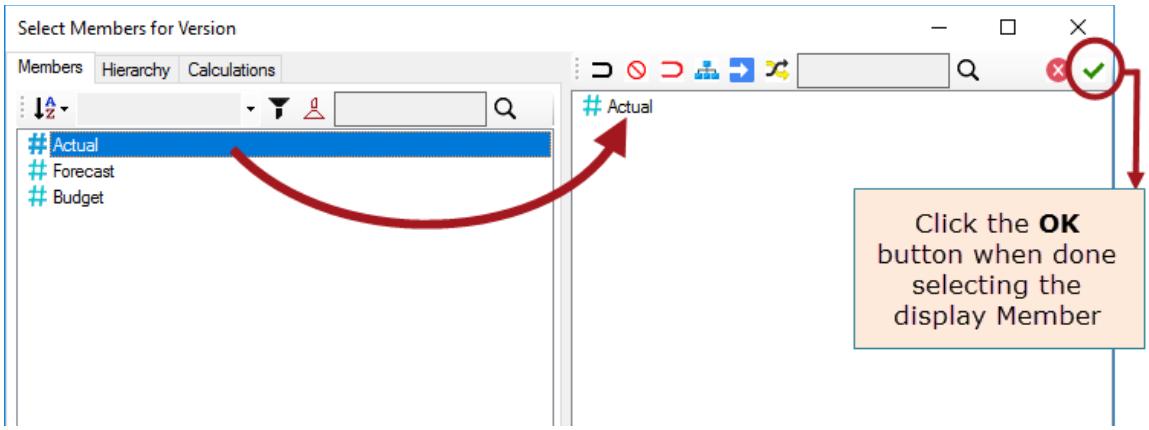


To reconfigure the PowerExcel Slice shown previously:

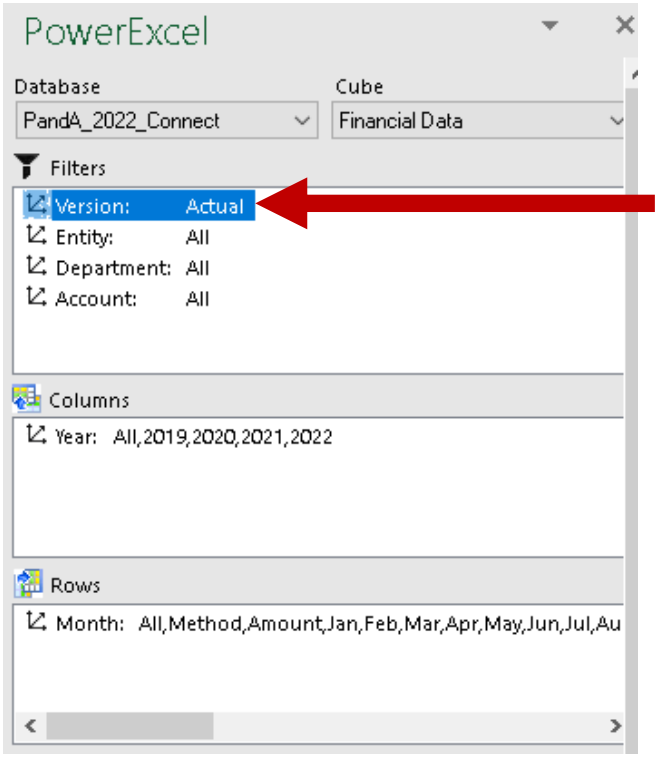
1. **Change the position of Dimensions within the Slice**.
   To do this:
   - In the PowerExcel sidebar, drag and drop the **Month** dimension from the Columns to the **Filters**.
   - Next, drag and drop the **Year** dimension from the Filters to the **Columns**.
   - Click the **Update button**. The Slice will look as follows:



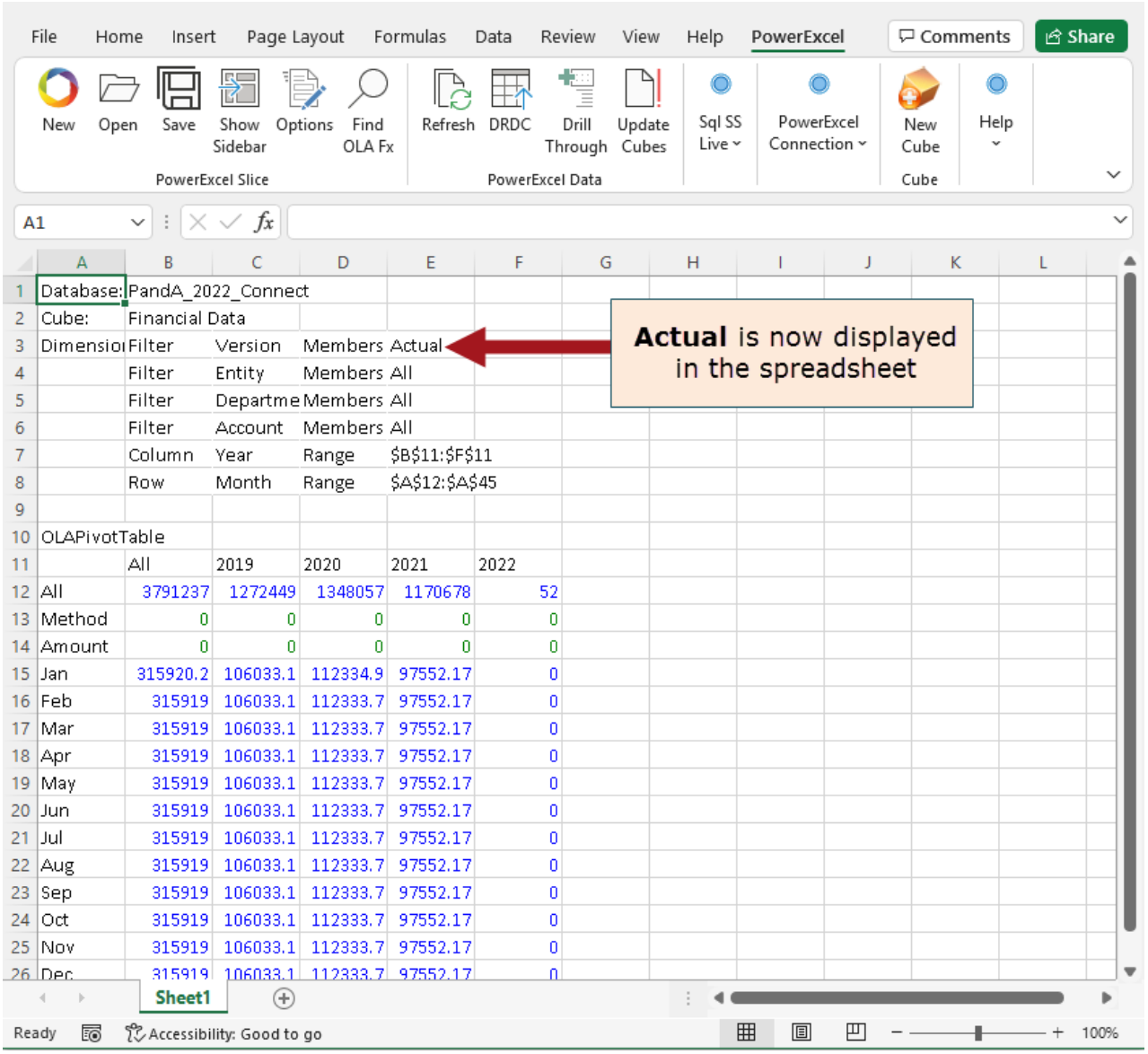
2. **Change the Display Member of Dimensions in Filters**.
   Next, we will change the display Member of one Dimension (*Version*) in the Filters section of the PowerExcel sidebar. For this we want to see only *Actual* data showing. To change the display Member in the Filters section:
   - Double-click on the **Version** dimension; in the Select Members dialog that appears, delete the **ALL** member displayed on the right-hand pane; then drag and drop the **Actual** member from the left-hand pane to the right-hand pane.
   - Click the **green checkmark icon** (OK button) located the top right-hand corner of the dialog. (See the following screen images.)



- Back in the PowerExcel sidebar, notice that the *Version* dimension now shows *Actual* as the display Member.



- In the PowerExcel sidebar, click the **Update** button. This updates the PowerExcel Slice values to show *Actual* data.



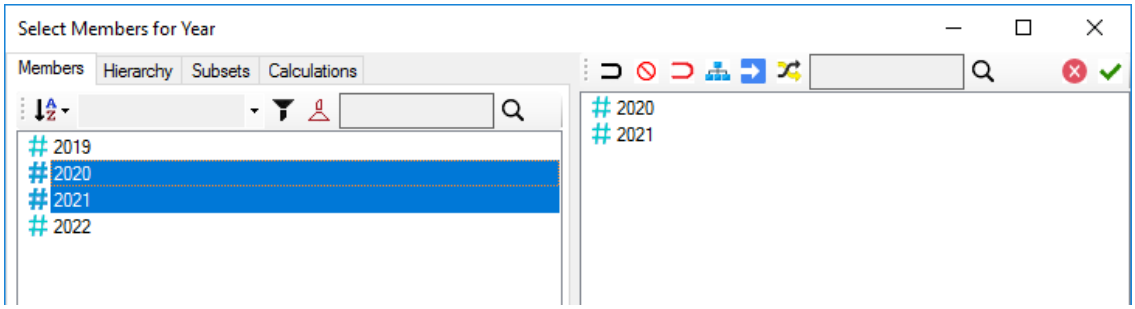
	A	B	C	D	E	F
1	Database:	PandA_2022_Connect				
2	Cube:	Financial Data				
3	Dimensio	Filter	Version	Members	Actual	
4		Filter	Entity	Members	All	
5		Filter	Departme	Members	All	
6		Filter	Account	Members	All	
7		Column	Year	Range	$B$11:$F$11	
8		Row	Month	Range	$A$12:$A$45	
9						
10	OLAPivotTable					
11		All	2019	2020	2021	2022
12	All	3791237	1272449	1348057	1170678	52
13	Method	0	0	0	0	0
14	Amount	0	0	0	0	0
15	Jan	315920.2	106033.1	112334.9	97552.17	0
16	Feb	315919	106033.1	112333.7	97552.17	0
17	Mar	315919	106033.1	112333.7	97552.17	0
18	Apr	315919	106033.1	112333.7	97552.17	0
19	May	315919	106033.1	112333.7	97552.17	0
20	Jun	315919	106033.1	112333.7	97552.17	0
21	Jul	315919	106033.1	112333.7	97552.17	0
22	Aug	315919	106033.1	112333.7	97552.17	0
23	Sep	315919	106033.1	112333.7	97552.17	0
24	Oct	315919	106033.1	112333.7	97552.17	0
25	Nov	315919	106033.1	112333.7	97552.17	0
26	Dec	315919	106033.1	112333.7	97552.17	0

3. **Change the Display Members of Dimensions in Rows or Columns**.
Next, we will change the display Members in both Rows and Columns.

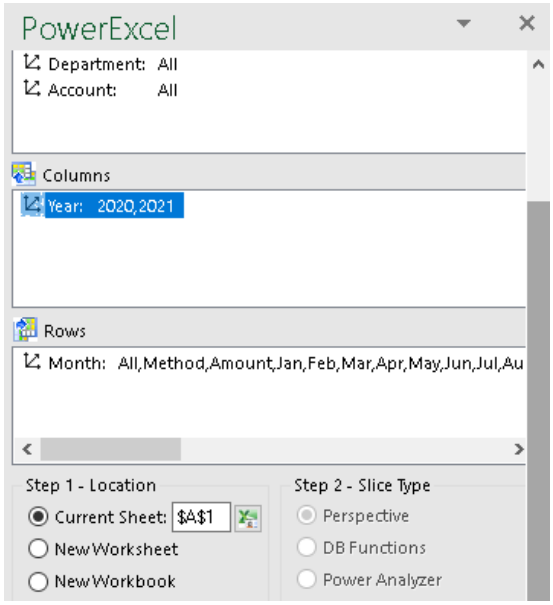
We will begin by changing Members along the Columns so that it only shows data for years 2020 and 2021.

To change the display Members in the Columns section:

- Go to the Columns section and double-click on the **Year** dimension; in the Select Members dialog that appears delete the Members displayed on the right-hand pane; then drag and drop the correct Members (**2020** and **2021**) from the left-hand pane to the right-hand pane, as shown in the next image.



- Click the **green checkmark icon** (OK button) located the top right-hand corner of the dialog.
  Back in the PowerExcel sidebar, notice that it now only display the years *2020* and *2021*.

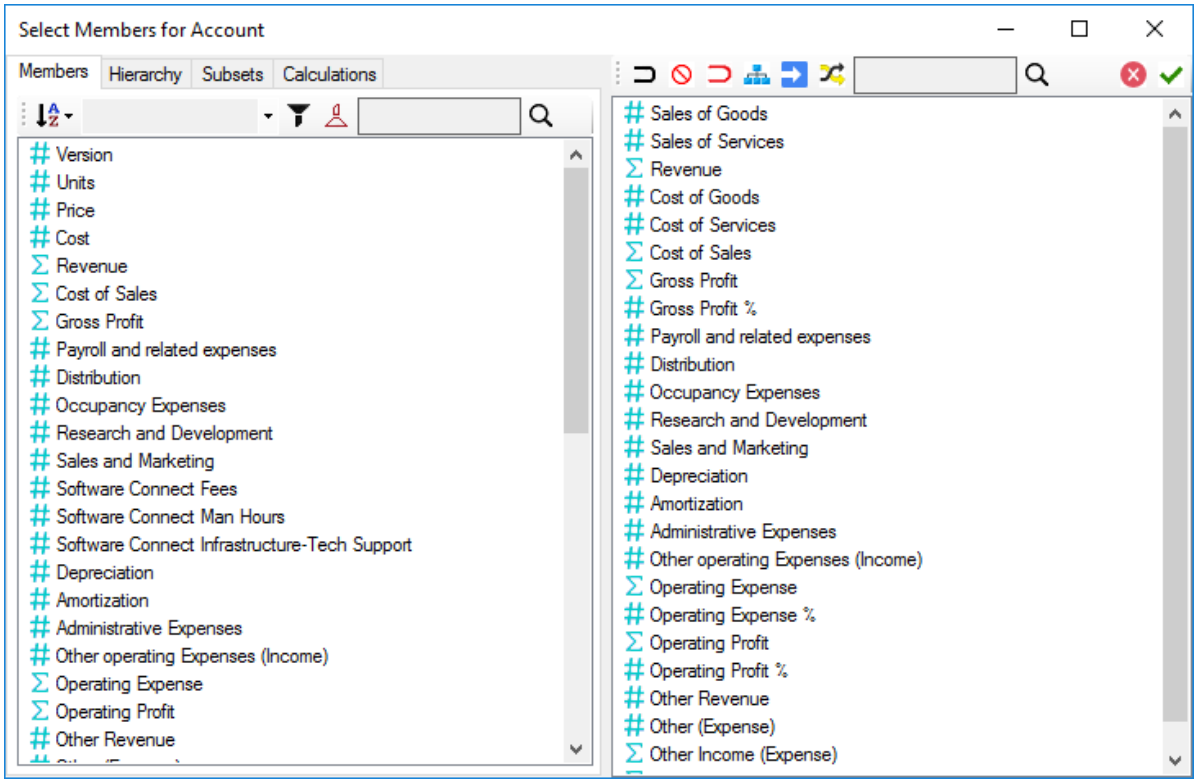


Next, let us move **Month** to the Filter box, and **Account** to Rows, and make selections so that only individual Income Statement accounts appear (those in the following chart).

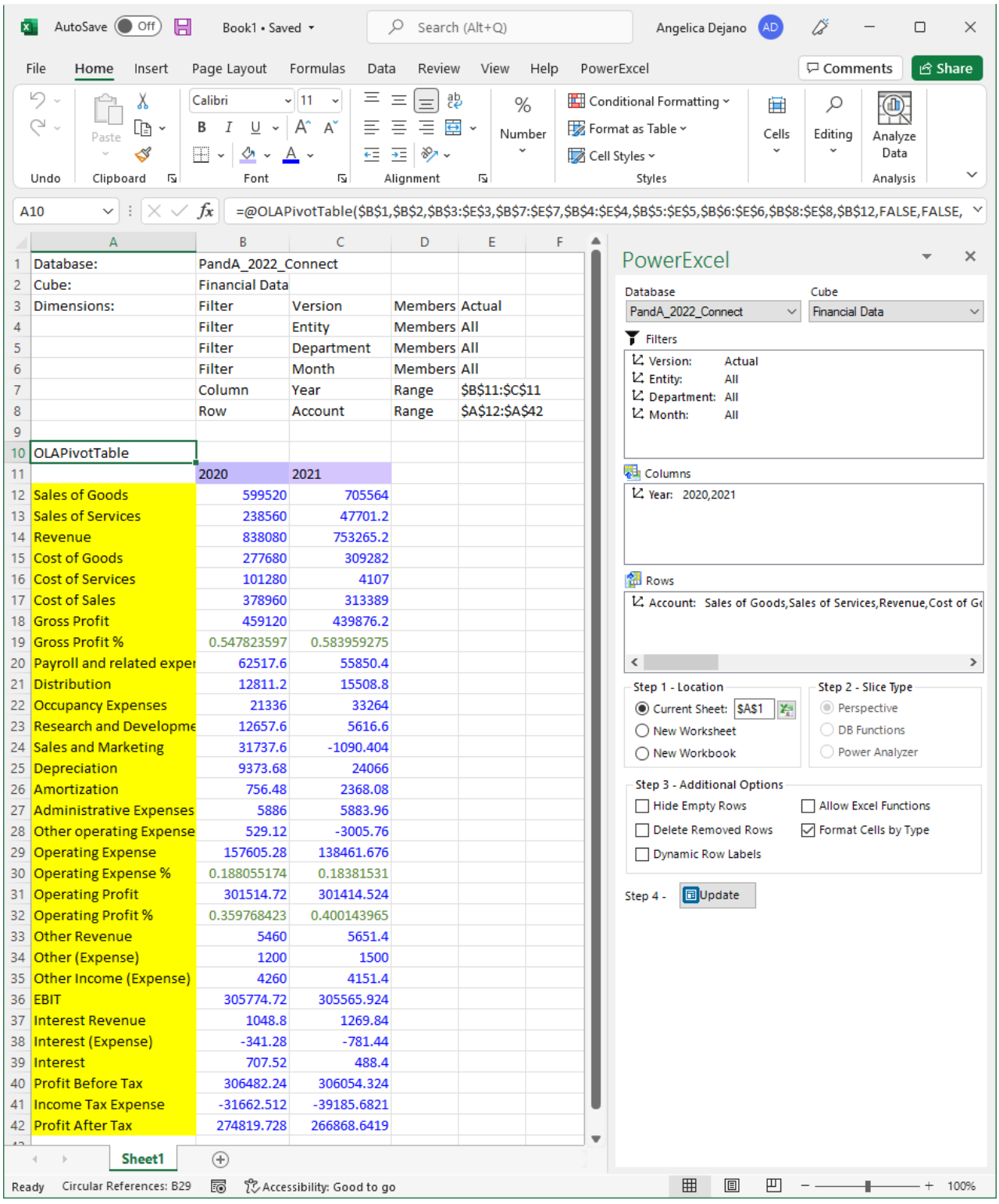
Sales of Goods Sales of Services Revenue Cost of Goods Cost of Services Cost of Sales Gross Profit Gross Profit % Payroll and related expenses Distribution Occupancy Expenses Research and Development Sales and Marketing Depreciation Amortization Administrative Expenses	Other operating Expenses (Income) Operating Expense Operating Expense % Operating Profit Operating Profit % Other Revenue Other (Expense) Other Income (Expense) EBIT Interest Revenue Interest (Expense) Interest Profit Before Tax Income Tax Expense Profit After Tax

To change the display Members in the Rows section:

- Go to the Rows section and double-click on the **Account** dimension; in the Select Members dialog that appears delete the Members displayed on the right-hand pane; then drag and drop the correct Members (see list above) from the left-hand pane to the right-hand pane.
- Click the **green checkmark icon** (OK button) located the top right-hand corner of the dialog.



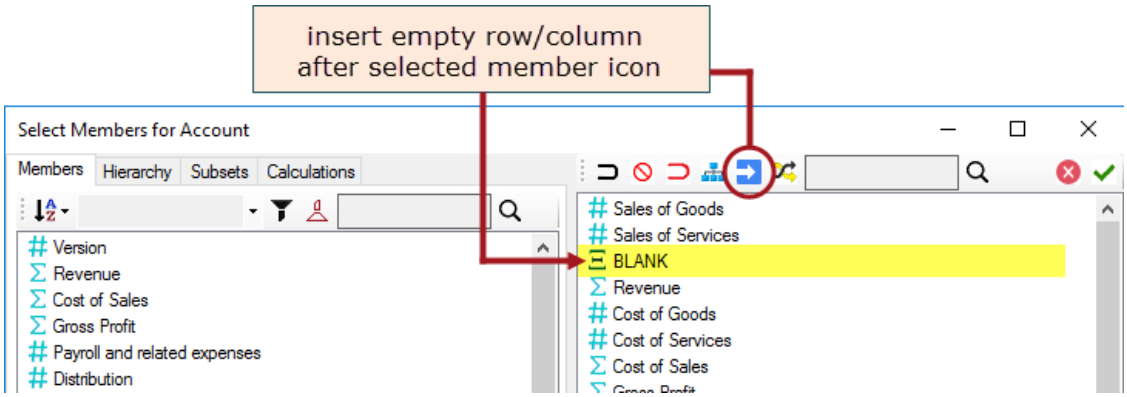
- In the PowerExcel sidebar, click the **Update** button. This updates the PowerExcel Slice.
  You now have a basic comparative Income Statement report as shown below:
  Note: Notice that now the PowerExcel Slice only shows the years 2020 and 2021 along the columns (highlighted in purple in columns B and C), while only the select Income Statement accounts appear along the rows (highlighted in yellow in rows 12 to 42).



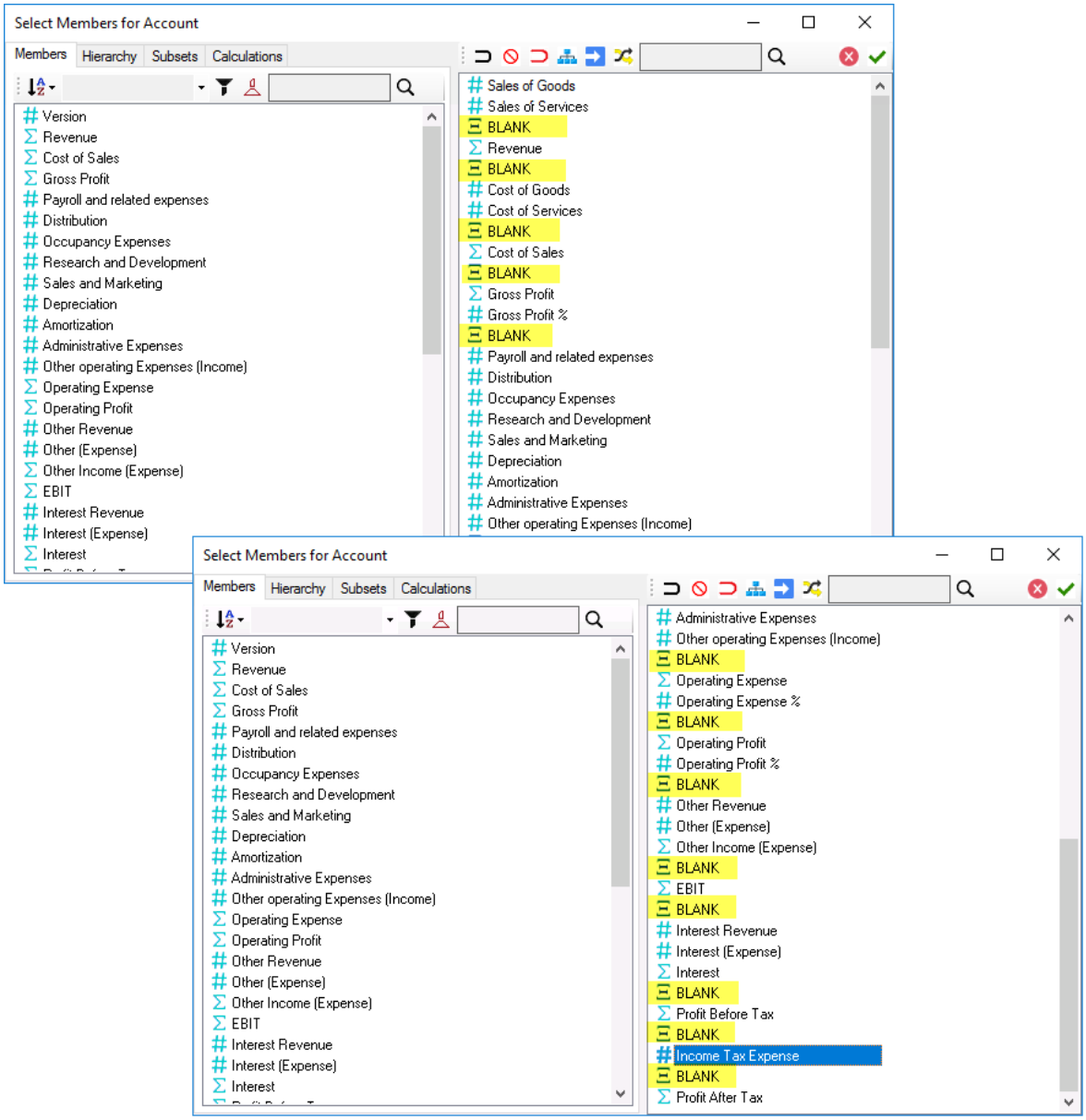
4. **Insert blank Rows or Columns.**
   You can also configure your PowerExcel Slice to include blank rows or columns, so that when you generate the PowerExcel Slice it automatically includes those blank rows or columns in the desired areas of the Slice.

For example, let us format this sample Comparative Income Statement report to include blank rows between specific accounts as follows:
To insert Empty Row:

- Go to the Rows section of the PowerExcel sidebar and double-click on the **Account** dimension.
  You can insert blank or empty rows/columns by using the **Insert empty row/column after selected member** button along the upper right-hand pane of the Select Members dialog. This will insert an empty row or column (see 'BLANK' highlighted in yellow in the succeeding image) right after the currently selected Member.
  You can also reposition the empty rows/column by dragging and dropping them before or after any Member.



- In the Select Members dialog, identify in what area you want to insert an empty row, select a Member directly above that area and click on the Insert empty row/column icon.
  As in the example above, to put a blank row between *Sales of Services* account and *Revenue*, select **Sales of Services** account then click the **Insert empty row/column icon**.
- Follow the same procedure and insert empty rows as shown in the screenshot below:

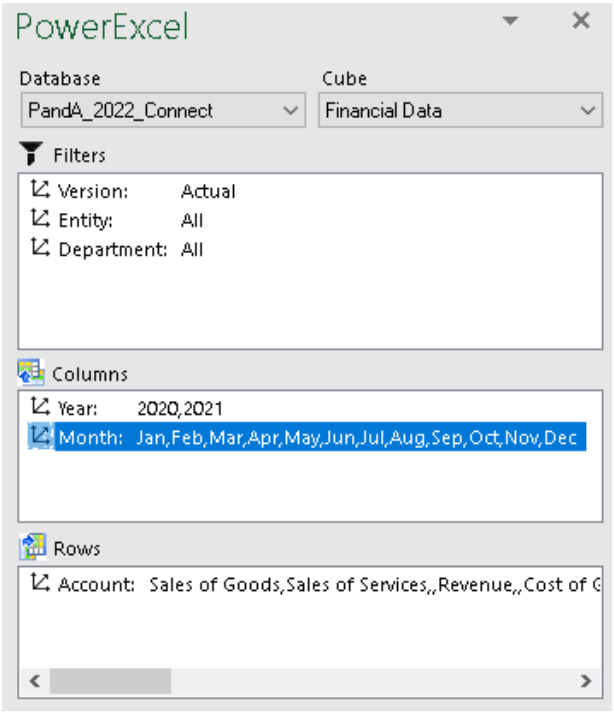


- Click the **green checkmark icon** (OK button) located the top right-hand corner of the dialog.
- In the PowerExcel sidebar, click the **Update** button. This updates the PowerExcel Slice.
  You now have a basic comparative Income Statement report as shown below:

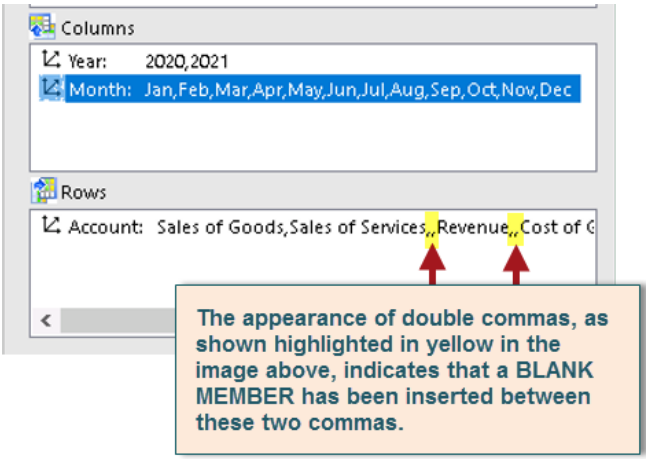
	A	B	C	D	E	F
1	Database:	PandA_2022_Connect				
2	Cube:	Financial Data				
3	Dimensions:	Filter	Version	Members	Actual	
4		Filter	Entity	Members	All	
5		Filter	Department	Members	All	
6		Filter	Month	Members	All	
7		Column	Year	Range	$B$11:$C$11	
8		Row	Account	Range	$A$12:$A$54	
9						
10	OLAPivotTable					
11		2020	2021			
12	Sales of Goods	599520	705564			
13	Sales of Services	238560	47701.2			
14						
15	Revenue	838080	753265.2			
16						
17	Cost of Goods	277680	309282			
18	Cost of Services	101280	4107			
19						
20	Cost of Sales	378960	313389			
21						
22	Gross Profit	459120	439876.2			
23	Gross Profit %	0.547823597	0.583959275			
24						
25	Payroll and related exper	62517.6	55850.4			
26	Distribution	12811.2	15508.8			
27	Occupancy Expenses	21336	33264			
28	Research and Developme	12657.6	5616.6			
29	Sales and Marketing	31737.6	-1090.404			
30	Depreciation	9373.68	24066			
31	Amortization	756.48	2368.08			
32	Administrative Expenses	5886	5883.96			
33	Other operating Expense	529.12	-3005.76			
34						
35	Operating Expense	157605.28	138461.676			
36	Operating Expense %	0.188055174	0.18381531			
37						
38	Operating Profit	301514.72	301414.524			
39	Operating Profit %	0.359768423	0.400143965			
40	Other Revenue	5460	5651.4			
41	Other (Expense)	1200	1500			
42	Other Income (Expense)	4260	4151.4			
43						
44	EBIT	305774.72	305565.924			
45						
46	Interest Revenue	1048.8	1269.84			
47	Interest (Expense)	-341.28	-781.44			
48	Interest	707.52	488.4			
49						
50	Profit Before Tax	306482.24	306054.324			
51						
52	Income Tax Expense	-31662.512	-39185.6821			
53						
54	Profit After Tax	274819.728	266868.6419			
55						
56						

5. **Nesting Dimensions**.
   Let us further customize our Income Statement report. This time, we will 'Nest' (aka 'Stack') Dimensions along the columns to display both **Year** and **Month** dimensions along the columns.

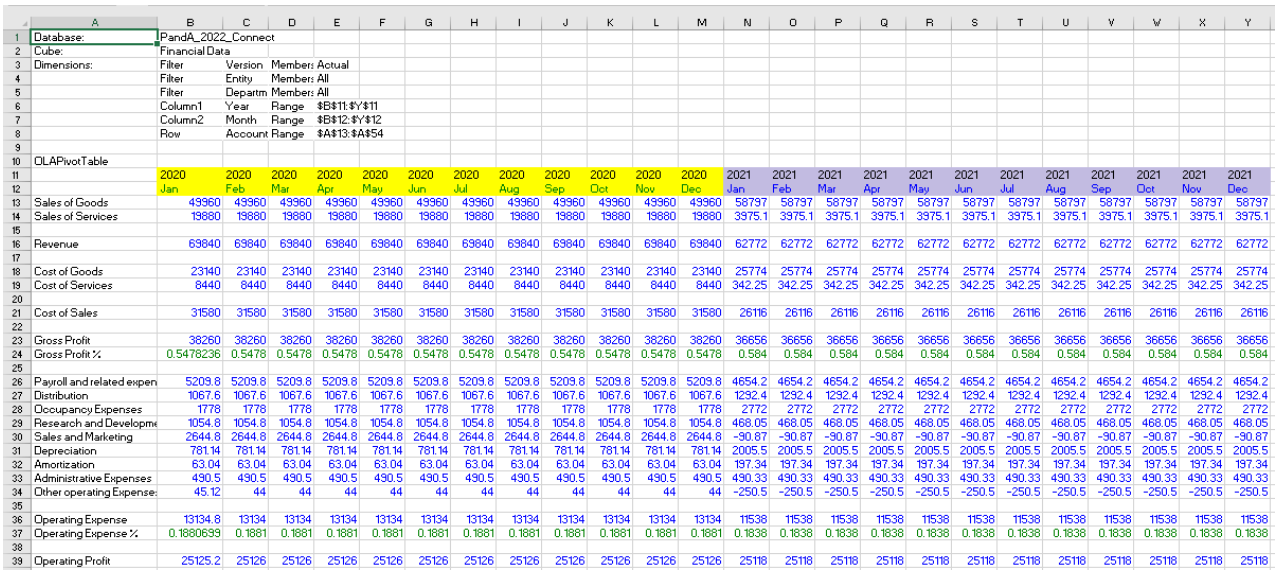
- Since we already have the *Year* dimension displayed along the columns (showing both years *2020* and *2021*) and, assuming we want to show the individual months below the years, we will need to drag and drop the **Month** dimension from the Filters section to the **Columns** section and place **Month** below **Year**.
- Change the display Members of *Month* to only show individual months *January* to *December*.



- Notice in the Rows section where blank Members were inserted, they appear as follows:



- Click the **Update** button.
  The PowerExcel Slice will look as follows, with *columns B to M* showing *Income Statement* data for the year *2020* (highlighted in yellow); while columns N to Y showing *Income Statement* data for the year *2021* (highlighted in purple).

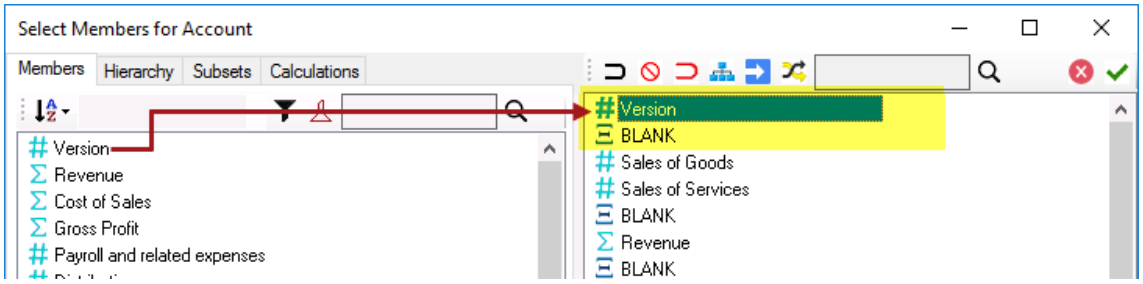


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	Database:	PandA_2022_Connect																							
2	Cube:	Financial Data																							
3	Dimensions:	Filter	Version	Members	Actual																				
4		Filter	Entity	Members	All																				
5		Filter	Departm	Members	All																				
6		Column1	Year	Range	$B$11:$Y$11																				
7		Column2	Month	Range	$B$12:$Y$12																				
8		Row	Account	Range	$A$13:$A$54																				
9																									
10	OLAPivotTable																								
11		2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
12		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
13	Sales of Goods	43960	43960	43960	43960	43960	43960	43960	43960	43960	43960	43960	43960	58797	58797	58797	58797	58797	58797	58797	58797	58797	58797	58797	58797
14	Sales of Services	19880	19880	19880	19880	19880	19880	19880	19880	19880	19880	19880	19880	3975.1	3975.1	3975.1	3975.1	3975.1	3975.1	3975.1	3975.1	3975.1	3975.1	3975.1	3975.1
15																									
16	Revenue	63840	63840	63840	63840	63840	63840	63840	63840	63840	63840	63840	63840	62772	62772	62772	62772	62772	62772	62772	62772	62772	62772	62772	62772
17																									
18	Cost of Goods	23140	23140	23140	23140	23140	23140	23140	23140	23140	23140	23140	23140	25774	25774	25774	25774	25774	25774	25774	25774	25774	25774	25774	25774
19	Cost of Services	8440	8440	8440	8440	8440	8440	8440	8440	8440	8440	8440	8440	342.25	342.25	342.25	342.25	342.25	342.25	342.25	342.25	342.25	342.25	342.25	342.25
20																									
21	Cost of Sales	31580	31580	31580	31580	31580	31580	31580	31580	31580	31580	31580	31580	26116	26116	26116	26116	26116	26116	26116	26116	26116	26116	26116	26116
22																									
23	Gross Profit	38260	38260	38260	38260	38260	38260	38260	38260	38260	38260	38260	38260	36656	36656	36656	36656	36656	36656	36656	36656	36656	36656	36656	36656
24	Gross Profit %	0.5478236	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478	0.584	0.584	0.584	0.584	0.584	0.584	0.584	0.584	0.584	0.584	0.584	0.584
25																									
26	Payroll and related expen	5209.8	5209.8	5209.8	5209.8	5209.8	5209.8	5209.8	5209.8	5209.8	5209.8	5209.8	5209.8	4654.2	4654.2	4654.2	4654.2	4654.2	4654.2	4654.2	4654.2	4654.2	4654.2	4654.2	4654.2
27	Distribution	1067.6	1067.6	1067.6	1067.6	1067.6	1067.6	1067.6	1067.6	1067.6	1067.6	1067.6	1067.6	1292.4	1292.4	1292.4	1292.4	1292.4	1292.4	1292.4	1292.4	1292.4	1292.4	1292.4	1292.4
28	Occupancy Expenses	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	2772	2772	2772	2772	2772	2772	2772	2772	2772	2772	2772	2772
29	Research and Developme	1054.8	1054.8	1054.8	1054.8	1054.8	1054.8	1054.8	1054.8	1054.8	1054.8	1054.8	1054.8	468.05	468.05	468.05	468.05	468.05	468.05	468.05	468.05	468.05	468.05	468.05	468.05
30	Sales and Marketing	2644.8	2644.8	2644.8	2644.8	2644.8	2644.8	2644.8	2644.8	2644.8	2644.8	2644.8	2644.8	-90.87	-90.87	-90.87	-90.87	-90.87	-90.87	-90.87	-90.87	-90.87	-90.87	-90.87	-90.87
31	Depreciation	781.14	781.14	781.14	781.14	781.14	781.14	781.14	781.14	781.14	781.14	781.14	781.14	2005.5	2005.5	2005.5	2005.5	2005.5	2005.5	2005.5	2005.5	2005.5	2005.5	2005.5	2005.5
32	Amortization	63.04	63.04	63.04	63.04	63.04	63.04	63.04	63.04	63.04	63.04	63.04	63.04	197.34	197.34	197.34	197.34	197.34	197.34	197.34	197.34	197.34	197.34	197.34	197.34
33	Administrative Expenses	490.5	490.5	490.5	490.5	490.5	490.5	490.5	490.5	490.5	490.5	490.5	490.5	490.33	490.33	490.33	490.33	490.33	490.33	490.33	490.33	490.33	490.33	490.33	490.33
34	Other operating Expense:	45.12	44	44	44	44	44	44	44	44	44	44	44	-250.5	-250.5	-250.5	-250.5	-250.5	-250.5	-250.5	-250.5	-250.5	-250.5	-250.5	-250.5
35																									
36	Operating Expense	13134.8	13134	13134	13134	13134	13134	13134	13134	13134	13134	13134	13134	11538	11538	11538	11538	11538	11538	11538	11538	11538	11538	11538	11538
37	Operating Expense %	0.1880699	0.1881	0.1881	0.1881	0.1881	0.1881	0.1881	0.1881	0.1881	0.1881	0.1881	0.1881	0.1838	0.1838	0.1838	0.1838	0.1838	0.1838	0.1838	0.1838	0.1838	0.1838	0.1838	0.1838
38																									
39	Operating Profit	25125.2	25126	25126	25126	25126	25126	25126	25126	25126	25126	25126	25126	25118	25118	25118	25118	25118	25118	25118	25118	25118	25118	25118	25118

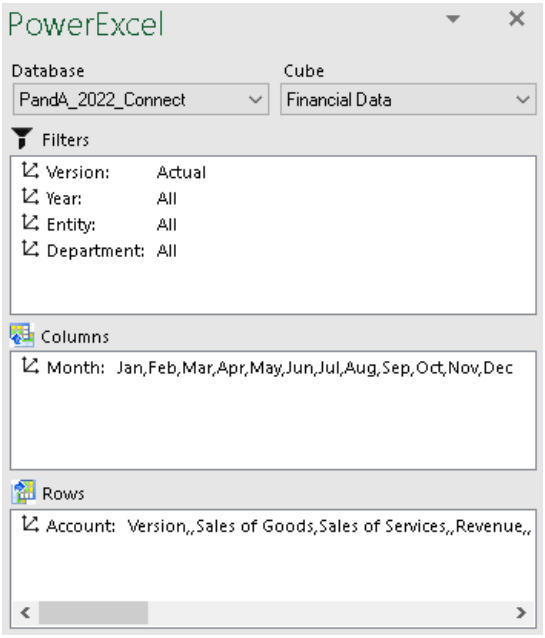
6. In preparation for our next topic, **re-arrange the Slice so that it shows the following**:

Filter	Version: *Actual*
	Year: *All*
	Entity: *All*
	Department: *All*
Columns	Month: individual months (*Jan* to *Dec*)
Rows	Account: *Version*, *Sales of Goods*, *Sales of Services*, *Revenue*, *Cost of Goods*, *Cost of Services*, *Cost of Sales*, *Gross Profit*, *Gross Profit %*, *Payroll and related expenses* *Distribution*, *Occupancy Expenses*, *Research and Development*, *Sales and Marketing*, *Depreciation*, *Amortization*, *Administrative Expenses*, *Other operating Expenses (Income)*, *Operating Expense* *Operating Expense %, Operating Profit, Operating Profit %, Other Revenue, Other (Expense), Other Income (Expense), EBIT, Interest Revenue, Interest (Expense), Interest, Profit Before Tax, Income Tax Expense, Profit After Tax* **Note:** Notice that we maintained the same set of Income Statement accounts as before but we have added the *Version* Member at the top of the list. Version isn't really part of the Income Statement account but it was included as a Member under the Account dimension for easier identification of what values are on display in the Slice. You will later see how that is used.

- Place the Dimensions **Version**, **Year**, **Entity** and **Department** along the **Filters** section. Set display Members for all Dimensions along the Filter to **ALL**, except for the **Version** where **Actual** should be the display Member.
  (If you have been following the exercise, all the Dimensions indicated are already placed along the Filter pane except for the Year dimension. Simply drag and drop the **Year** dimension to the **Filters** section, right under the *Version* dimension.)
- Leave the **Month** dimension at the **Columns** section. Specify the display Members to be **Jan** to **Dec**. (If you have been following the exercise, this is the current setup)
- Leave the **Account** dimension at the **Rows** section. Presently, the desired Members are already displayed except for the *Version* member. Double-click on the **Account** dimension and in the Select Members dialog that appears, click on the **Version** member from the Members list on the left-hand pane, then drag and drop the **Version** member to the right-hand pane at the very top of the Display Members list.
- Still in the Select Members for Account dimension dialog, select the Version member then click on the **insert empty row/column after selected member icon** to insert a BLANK member between *Version* and *Sales of Goods* members. Click the **green checkmark** button.



- Back in the PowerExcel Slice the PowerExcel sidebar appears as follows:

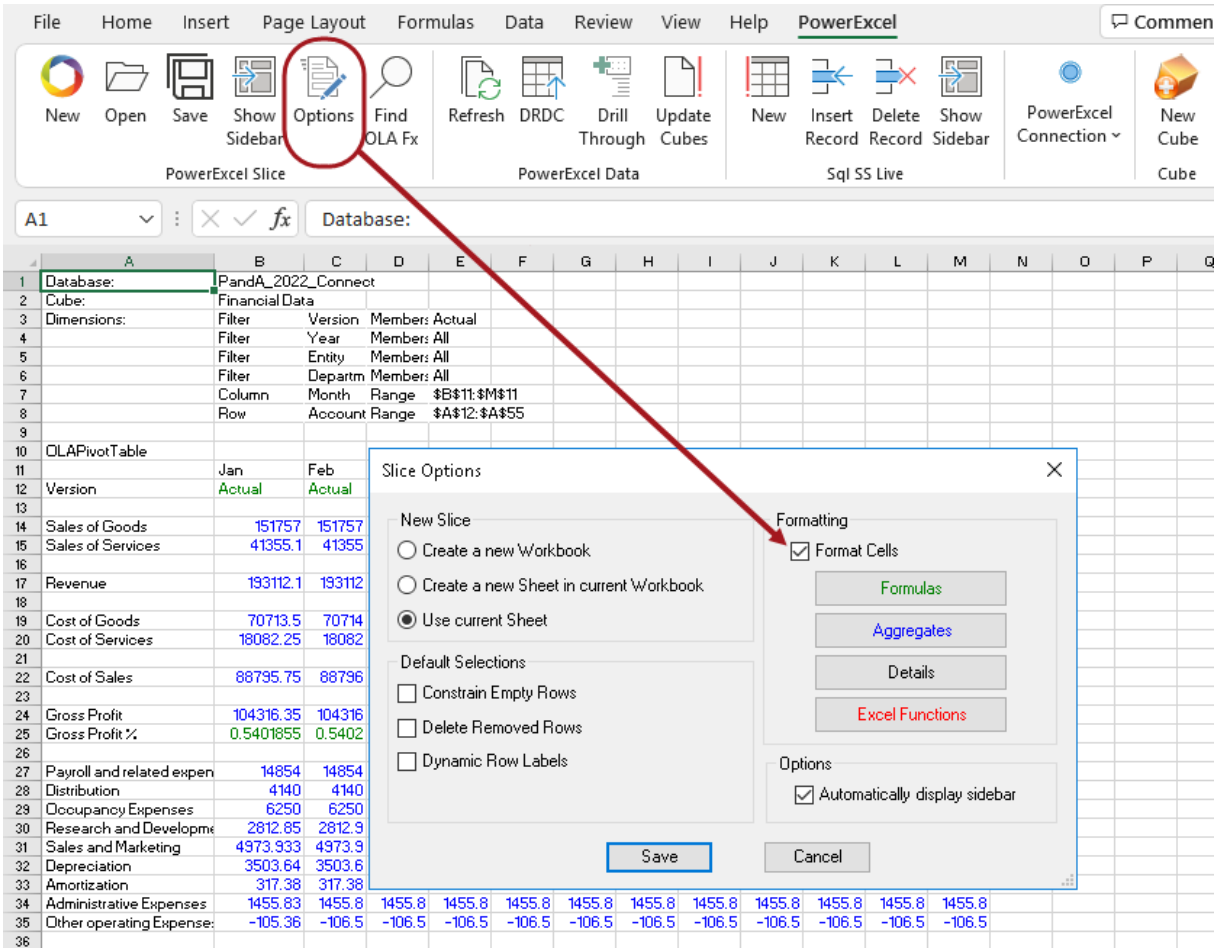


- Click the **Update** button.
  Note: You can adjust the column width as desired so that you can better see the data. (As well, in the following images, highlighting has been removed.)

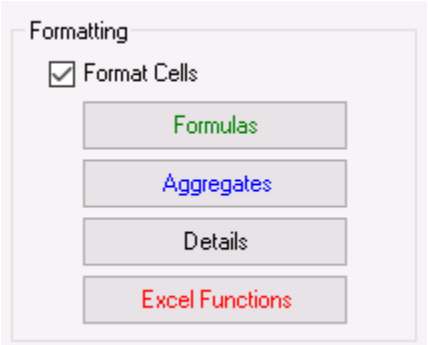
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA_2022_Connect											
2	Cube:	Financial Data											
3	Dimensions:	Filter	Version	Members	Actual								
4		Filter	Year	Members	All								
5		Filter	Entity	Members	All								
6		Filter	Departm	Members	All								
7		Column	Month	Range	$B$11:$M$11								
8		Row	Account	Range	$A$12:$A$55								
9													
10	OLAPivotTable												
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	Version	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual
13													
14	Sales of Goods	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757
15	Sales of Services	41355.1	41355	41355	41355	41355	41355	41355	41355	41355	41355	41355	41355
16													
17	Revenue	193112.1	193112	193112	193112	193112	193112	193112	193112	193112	193112	193112	193112
18													
19	Cost of Goods	70713.5	70714	70714	70714	70714	70714	70714	70714	70714	70714	70714	70714
20	Cost of Services	18082.25	18082	18082	18082	18082	18082	18082	18082	18082	18082	18082	18082
21													
22	Cost of Sales	88795.75	88796	88796	88796	88796	88796	88796	88796	88796	88796	88796	88796
23													
24	Gross Profit	104316.35	104316	104316	104316	104316	104316	104316	104316	104316	104316	104316	104316
25	Gross Profit %	0.5401855	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402
26													
27	Payroll and related expen	14854	14854	14854	14854	14854	14854	14854	14854	14854	14854	14854	14854
28	Distribution	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140
29	Occupancy Expenses	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250
30	Research and Developme	2812.85	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9
31	Sales and Marketing	4973.933	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9
32	Depreciation	3503.64	3503.6	3503.6	3503.6	3503.6	3503.6	3503.6	3503.6	3503.6	3503.6	3503.6	3503.6
33	Amortization	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38
34	Administrative Expenses	1455.83	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8
35	Other operating Expense:	-105.36	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5
36													
37	Operating Expense	38202.273	38201	38201	38201	38201	38201	38201	38201	38201	38201	38201	38201
38	Operating Expense %	0.1978243	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978
39													
40	Operating Profit	66114.077	66115	66115	66115	66115	66115	66115	66115	66115	66115	66115	66115
41	Operating Profit %	0.3423611	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424
42	Interest Revenue	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22
43	Interest (Expense)	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44
44													
45	EBIT	67890.027	67891	67891	67891	67891	67891	67891	67891	67891	67891	67891	67891
46													
47	Interest Revenue	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22
48	Interest (Expense)	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44
49	Interest	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66
50													
51	Profit Before Tax	68697.687	68699	68699	68699	68699	68699	68699	68699	68699	68699	68699	68699
52													
53	Income Tax Expense	-6786.614	-6787	-6787	-6787	-6787	-6787	-6787	-6787	-6787	-6787	-6787	-6787
54													
55	Profit After Tax	61911.073	61912	61912	61912	61912	61912	61912	61912	61912	61912	61912	61912
56													

7. By now, you may have noticed that fact values appear a certain color. This is a result of the following:
   - Go to the **PowerExcel Tab** in the Excel ribbon and click the PowerExcel Slice **Options** button.

- In the Slice Options dialog that appears, note that the **Format Cells** checkbox is ticked.



- The Slice fact data/values are formatted such that:
  - *Formulas* appear as GREEN text
  - *Aggregates* appear as BLUE text
  - *Details* appear as BLACK text
  - *Excel Functions* appear as RED text.



- Click the **Save** button. The Slice appears as follows:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA_2022_Connect											
2	Cube:	Financial Data											
3	Dimensions:	Filter	Version	Members	Actual								
4		Filter	Year	Members	All								
5		Filter	Entity	Members	All								
6		Filter	Departm	Members	All								
7		Column	Month	Range	$B$11:$M$11								
8		Row	Account	Range	$A$12:$A$55								
9													
10	OLAPivotTable												
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	Version	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual
13													
14	Sales of Goods	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757
15	Sales of Services	41355.1	41355	41355	41355	41355	41355	41355	41355	41355	41355	41355	41355
16													
17	Revenue	193112.1	193112	193112	193112	193112	193112	193112	193112	193112	193112	193112	193112
18													
19	Cost of Goods	70713.5	70714	70714	70714	70714	70714	70714	70714	70714	70714	70714	70714
20	Cost of Services	18082.25	18082	18082	18082	18082	18082	18082	18082	18082	18082	18082	18082
21													
22	Cost of Sales	88795.75	88796	88796	88796	88796	88796	88796	88796	88796	88796	88796	88796
23													
24	Gross Profit	104316.35	104316	104316	104316	104316	104316	104316	104316	104316	104316	104316	104316
25	Gross Profit %	0.5401855	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402	0.5402
26													
27	Payroll and related expen	14854	14854	14854	14854	14854	14854	14854	14854	14854	14854	14854	14854
28	Distribution	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140
29	Occupancy Expenses	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250
30	Research and Developme	2812.85	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9	2812.9
31	Sales and Marketing	4973.933	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9	4973.9
32	Distribution	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140
33	Amortization	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38
34	Administrative Expenses	1455.83	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8	1455.8
35	Other operating Expense:	-105.36	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5	-106.5
36													
37	Operating Expense	38202.273	38201	38201	38201	38201	38201	38201	38201	38201	38201	38201	38201
38	Operating Expense %	0.1978243	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978	0.1978
39													
40	Operating Profit	66114.077	66115	66115	66115	66115	66115	66115	66115	66115	66115	66115	66115
41	Operating Profit %	0.3423611	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424	0.3424
42	Interest Revenue	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22
43	Interest (Expense)	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44
44													
45	EBIT	67890.027	67891	67891	67891	67891	67891	67891	67891	67891	67891	67891	67891
46													
47	Interest Revenue	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22
48	Interest (Expense)	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44
49	Interest	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66
50													
51	Profit Before Tax	68697.687	68699	68699	68699	68699	68699	68699	68699	68699	68699	68699	68699
52													
53	Income Tax Expense	-6786.614	-6787	-6787	-6787	-6787	-6787	-6787	-6787	-6787	-6787	-6787	-6787
54													
55	Profit After Tax	61911.073	61912	61912	61912	61912	61912	61912	61912	61912	61912	61912	61912

We recommend at this point saving the Slice above by clicking on **Save As** and browsing to a preferred location, just as you save a normal spreadsheet.

Important: If you save a Slice, you can open it at any time and see the latest data from the Cloud-based model—simply hit F9 to re-establish the connection. The next section concerns **Saving a PowerExcel Slice to the Cloud** so that it can be viewed by other users who also have a PowerExcel connection to the same model.

2.4 Saving a PowerExcel Slice to the Cloud

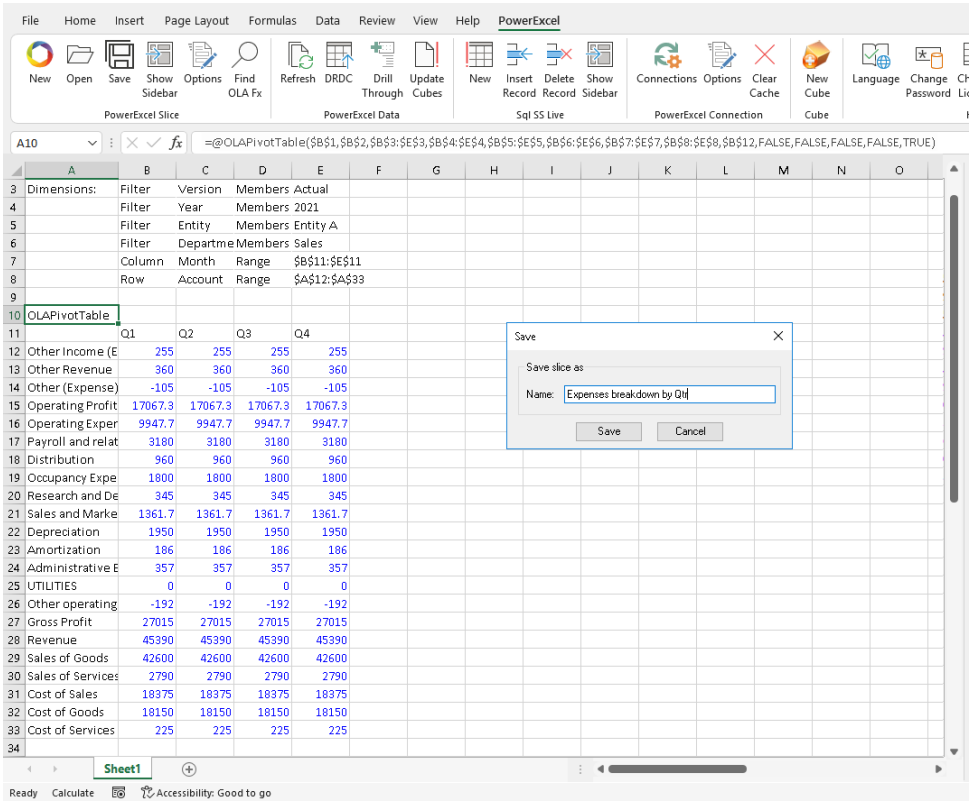
As mentioned above, a PowerExcel Slice can be saved just as you would a normal Excel spreadsheet; and it will maintain its connection to an underlying data model—wherever that model is located (locally, on a network drive, in the Cloud, etc.) simply by pressing F9.

You can also save a PowerExcel Slice so that it become accessible to other users who connect to the a PowerExcel model in the Cloud.

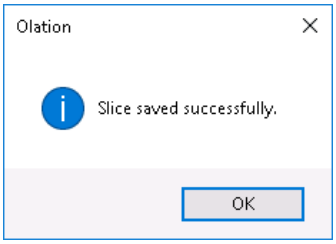
To save the PowerExcel Slice in the Cloud:

1. Create or open a **PowerExcel Slice**, as in the example shown below.
2. Click on a cell containing a PowerExcel reference—e.g., in the example image below, the cell containing the **OLAPivotTable** PowerExcel reference, which is **A10**.

   Note: You may click on cells containing other PowerExcel references such as OLADatabase, OLACube, OLATableMember, OLATableRange, OLATableSubset, OLAPowerQuery, etc…
3. In the Excel ribbon, go to the **PowerExcel Tab** and click the **Save icon**. The Save (Slice) as dialog appears, as below.



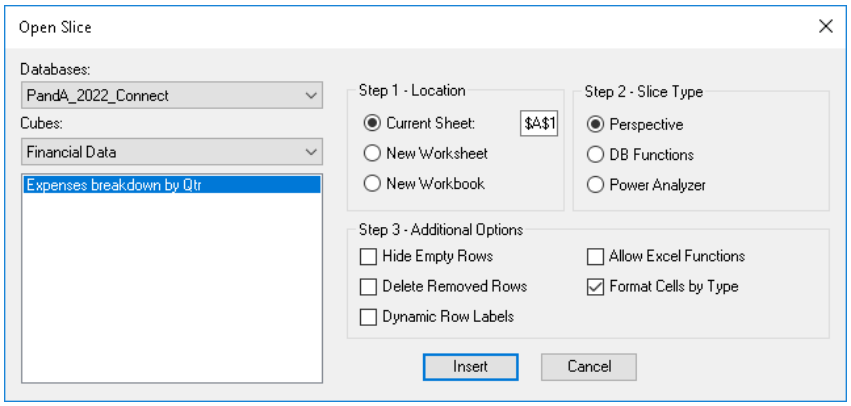
4. Type the <**name of the Slice**>, e.g., **Expenses breakdown by Qtr**.
5. Click **Save**. You will see a prompt that says ‘Slice saved successfully’.



6. Click **OK** to close the message prompt.

Next, another PowerExcel user—assuming he or she has a connection to the same PowerExcel model—can proceed as follows:

7. Launch **Excel**, create a **new workbook**.
8. From the **PowerExcel ribbon**, click on **Open**.
9. The Open Slice dialog appears, as below:



10. Once again: assuming the next user has a connection to the database (above, *PandA_2022_Connect* is also used as the Connection name, although using the same name is not required), the available Cubes will be shown (here, *Financial Data*). Directly below, the available Slices are listed: in the image, the Slice saved by the first user, *Expenses breakdown by Qtr* appears. By selecting this Slice, the user can create and insert it into a New Workbook, a New Worksheet or the Current Worksheet in the specified location (Step 1) with PowerExcel by using one of the Slice Types (Step 2: **Perspective**, **DB Functions**, and **Power Analyzer**). Other Slice options are also available (Step 3).

    The new Slice will be the same as the one saved by the original/last user—e.g., as shown in the previous page. This next user can now save it locally or to another drive for continuous use; he or she may change a Filter or reorder Dimensions, etc.—and will then may want to rename if it is important to keep the "original" Slice as is.

    In this manner, any person working on the collaborative model may see any Slice that has been saved and, therefore, be dynamically connected to the most updated data Furthermore—and this is a key point—the next (or any connected) user will also be able to contribute budget/forecast figures to a company-wide planning model, if that is the intended purpose for the Slice. (The ability to "write back" to a shared planning model is discussed in Section 4, Entering Data in a PowerExcel Slice.)

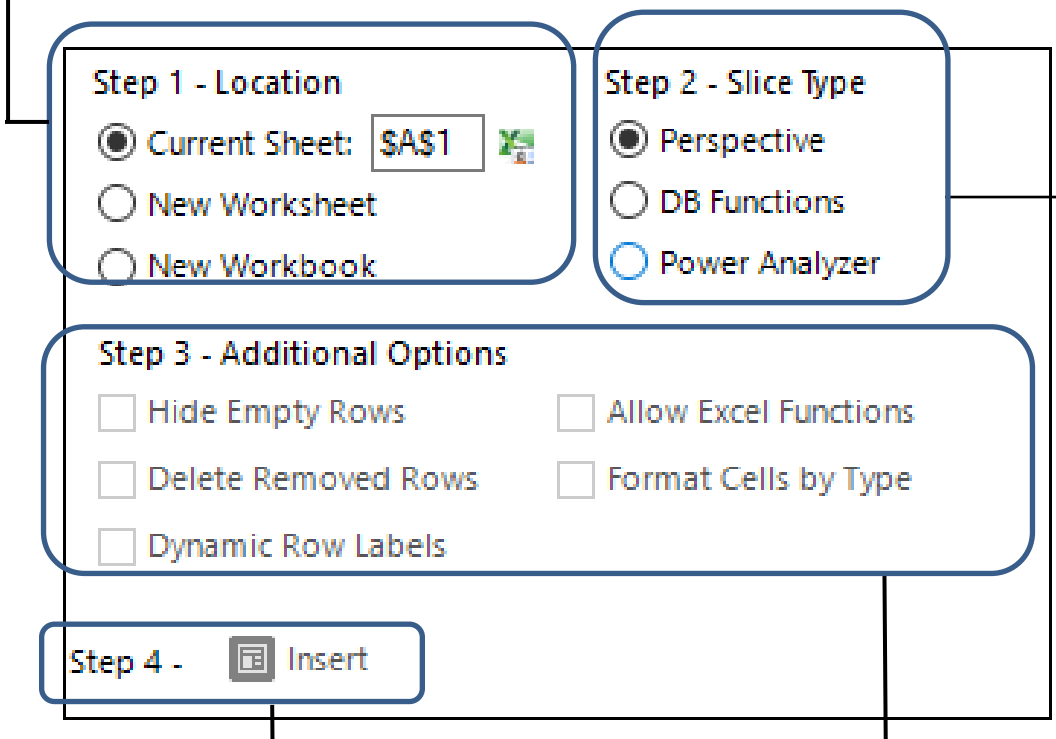
2.5 The PowerExcel Sidebar and Ribbon Commands

We are now in a position to explain some of the features that PowerExcel provides via the sidebar, which gives the user extensive capabilities in organizing data within the PowerExcel Slice (see next page); as well, we will explore the Commands on the PowerExcel Ribbon.

The selections at the bottom of the PowerExcel sidebar become visible at right when you click on the PowerExcel function.

These selections enable you to specify whether you want to insert the PowerExcel Slice into a New Workbook, New Worksheet, or the Current Worksheet; use Location to choose the cell where the PowerExcel function will go.

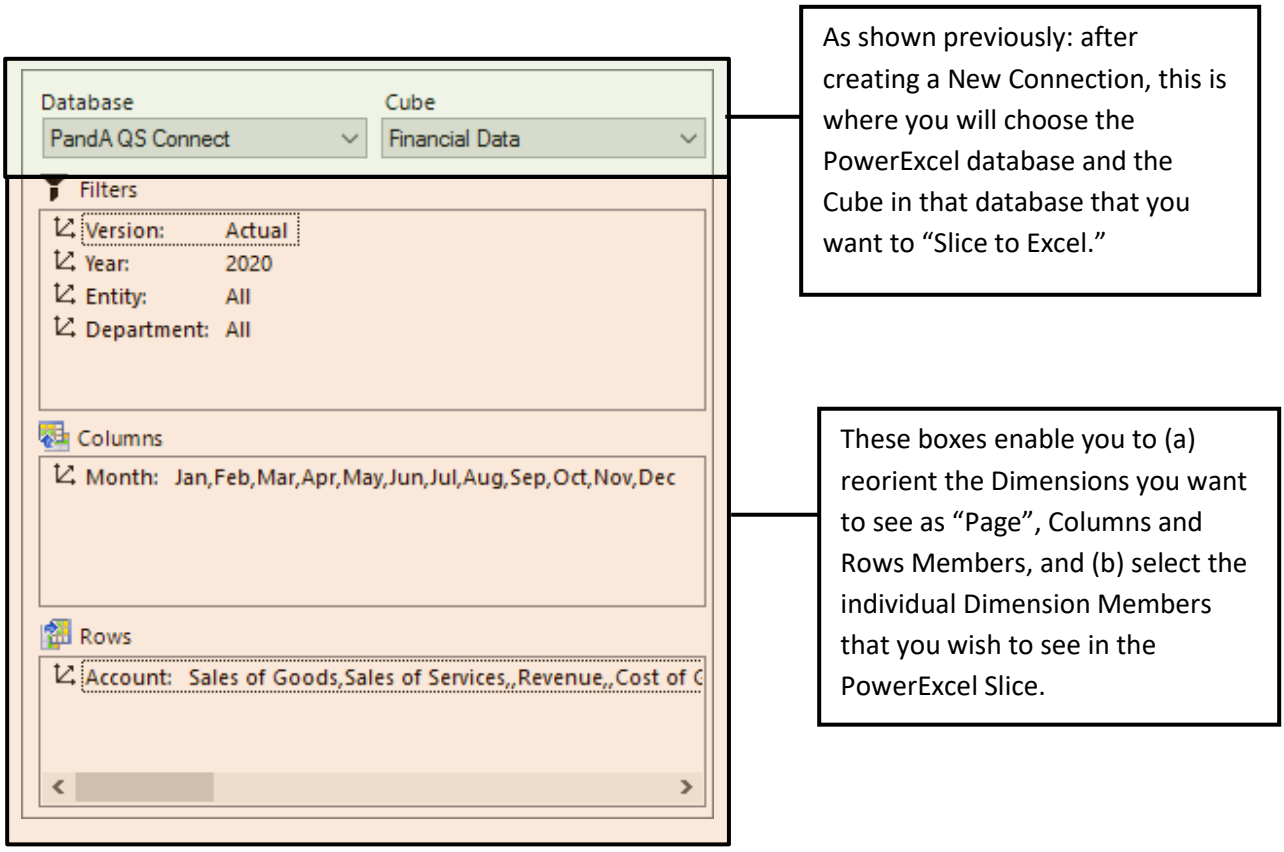
These selections determine the function that governs how data from the Cube will be shown in the Slice, whether Perspective, DB Functions and Power Analyzer.



Click on this button after you have made all other selections, to insert the PowerExcel Slice in a worksheet. As discussed above, the 'Insert' button changes to 'Update' after you have made further selections concerning Filters, Columns and Rows.

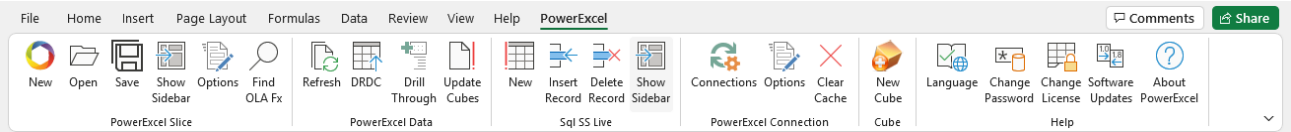
These selections will, top to bottom, constrain Rows with Zero values; maintain the relative position of successive Perspective Slices with constrained rows; ensure that dynamic Subsets will show in an updated PowerExcel Slice; allow Excel functions to be used at Detail intersections (with Perspective Slice type only), with recalc/write-back on F9; format cells based on whether values are determined by Formulas, Aggregates, Details, Excel Functions.

Note the selections at the top of the PowerExcel sidebar, which becomes visible when you click on a PowerExcel function.



[*see next page for PowerExcel Ribbon commands*]

The following are the icons on the PowerExcel ribbon, with a brief description.

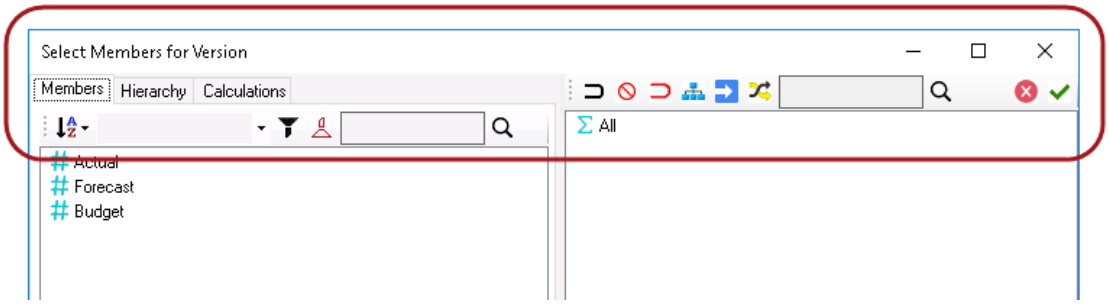


PowerExcel Slice	
New	Start here to create a Slice from a PowerExcel database (providing Connection exists).
Open	Opens a saved Slice, providing options about the Slice Type and where to insert the data
Save	Saves a PowerExcel Slice, which can be viewed by another user with a connection to the same model
Show Sidebar	Shows the PowerExcel Sidebar (pane) if you have unchecked the Option (see Option [PowerExcel Slice] below) to automatically display PowerExcel sidebar
Options	[PowerExcel Slice] Brings up a dialog concerning Workbooks (Create a new Workbook, Create a new Sheet in current Workbook) and to enable Defaults (Constrain Rows, Delete Removed Rows, Dynamic Row Labels). Also includes Formatting options and a checkbox to automatically Show/Hide PowerExcel sidebar
Find OLA Fx	Finds PowerExcel function in an open Slice governing the Slice [for current version: Perspective Slice]
PowerExcel Data	
Refresh	Refreshes Slice data after making Member selections
DRDC	[Licensed Feature] Saves a Slice as a View in a selected database (e.g., SQL Server) that is reachable by third-party products (Power BI, Tableau, Qlik, etc.)
Drill Through	[Licensed Feature] Access the multidimensional data or individual relational transactions that comprise a cell in a PowerExcel spreadsheet
Update Cubes	Allows an end-user with permissions to update Cube(s) in the relational source
SQL SS Live	
New	[Licensed Feature] Brings up a Forms pane on the right, for a user to access, update and delete data from the Fact table in SQL

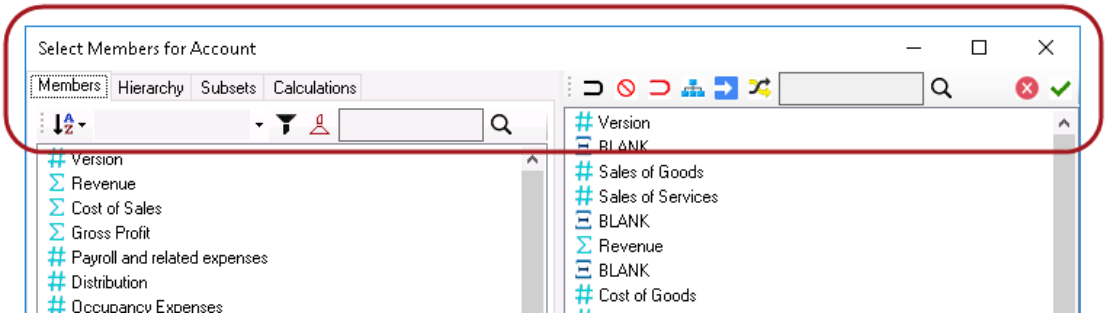
 Insert Record	[Licensed Feature] Enables user with access rights to add a new record to an underlying fact data table
 Delete Record	[Licensed Feature] Enables user with access rights to delete a record to an underlying fact data table
 Show Sidebar	Shows the PowerExcel Form Sidebar (pane)
PowerExcel Connection	
 Connections	Create a New connection (or Delete an existing one), or select an existing connection to an underlying database, and shows Name, URL, Database
 Options	Brings up a dialog concerning Caching Options, including Cache Expiration (Hours) and Disable All Caching
 Clear Cache	Clears Cache in the open Slice
Cube	
 New Cube	[Licensed Feature] Accesses the capability to create Cubes in Olation® from selected tabular data in an Excel spreadsheet
Help	
 Language	While PowerExcel detects the operating system's default language, a user can make another available language selection
 Change Password	Enables the user to change Password on the selected database
 Change License	Brings up the Register PowerExcel window
 Software Updates	Clicking on this will check for latest PowerExcel release (note that this is a licensed feature)
 About PowerExcel	This shows information as to Version/build and License number of the PowerExcel User Client application

There are additional features within PowerExcel to select Dimensions and Members you wish to display: Until now you changed Members in the Select Members dialog by deleting a Member on the right, and then moving a Member from the left to the right-hand pane to view it.

Notice at the top of the **Select Member** dialog that there are selections that can make what Member(s) appear easier.



Select Members dialog for Dimensions along the **Filter** section



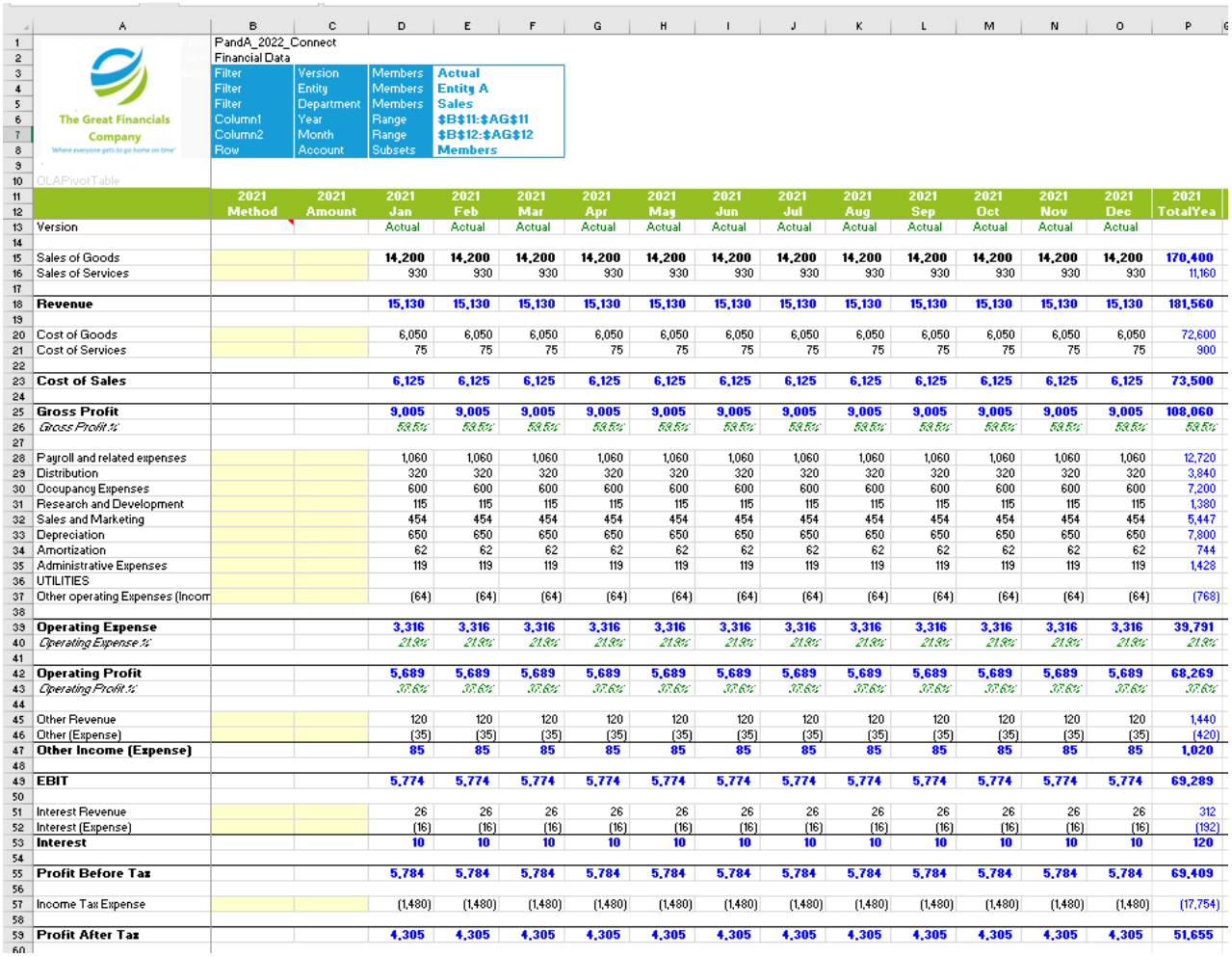
Select Members dialog for Dimensions along the **Rows/Columns** section

Important: Notice that the Select Members dialog for Dimensions placed within the Columns/Rows has an additional Tab called **Subsets** along the left-hand side of the dialog.

Function	Icon	Description
MEMBERS Tab (Left-hand pane)		
Sort or Sort Members		Sort the Member list in Natural, Ascending Alphabetical, or Descending Alphabetical order.
Filter box Apply Filter Cancel Filter	  	Type the filter parameter in the **Filter box** and click the **Apply Filter** button; Members that satisfy the filter parameter will appear. Click the **Cancel Filter** button to remove filter and see the full list of Members again.
Search		In the text box: type the starting string of letters for the Member you want to find; click the **magnifying glass** icon and the first Member with that string will appear. Click on the magnifying glass to see next Members.
HIERARCHY Tab (Left-hand Pane)		
Find Parent		Select-highlight a Member; clicking this will highlight its parent.
Search		In the **Find** text box: type the starting string of letters for the Member you want to find; click the **magnifying glass** icon and the first Member with that string will appear. Click on the magnifying glass to see next Members.
Expand (Hierarchy)		Expands the entire Dimension hierarchy.
Collapse (Hierarchy)		Collapses the entire Dimension hierarchy.
SUBSET Tab (Left-hand Pane) *This Tab is available only for Dimensions along Row/Column sections of the PowerExcel sidebar*		
Search		In the text box: type the starting string of letters for the Subset you want to find; click the **magnifying glass** icon and the first Subset with that string will appear. Click on the magnifying glass for next Members.
CALCULATIONS Tab (Left-hand Pane)		
Search		In the text box: type the starting string of letters for the Calculation you want to find; click the **magnifying glass** icon and the first

		Calculation with that string will appear. Click on the magnifying glass for next Calculations.
POWEREXCEL SLICE CONTENT LIST Toolbar icons (Right-hand Pane)		
Copy Selected Members		Copies selected Member(s) on the left-hand pane to the PowerExcel Slice Content list at right.
Clear		Clears the Member(s) listed on the Slice Content list.
Clear and Copy Selected Members		Clears the Member(s) listed on the Slice Content list on the right and copies the selected Member(s) from the left-hand pane to the Slice Content list.
Expand all child members		Expands the children of the currently selected Member.
Insert Empty Row/ Column after selected Member		Inserts an empty row after the currently selected Member in the resulting Slice.
Invert Selection		Select a Member(s) on the right side, click on the button; the "inverted Member(s)" will be selected. You can click on the Delete button to remove selected members. Clicking OK (green checkmark button) will show the remaining Members in the PowerExcel Slice.
Search		In the text box: type the starting string of letters for the Member you want to find; click the **magnifying glass** icon and the first Member with that string will appear. Click on the magnifying glass to see next Members.
Exit		Click to close the Select Members dialog.
OK		Click this to commit changes to the displayed Members and return to the PowerExcel Slice.

Finally, we can make note of one more important thing about PowerExcel—namely, the ability to continue to **improve a Slice by using standard Excel formatting**. In short, you can apply formatting (e.g., change the font, use highlighting, use conditional formatting etc.) to make a Slice like the one that follows—an Income Statement report that will be used in a demonstration later in this manual.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1		PandA_2022_Connect														
2		Financial Data														
3		Filter	Version	Members	Actual											
4		Filter	Entity	Members	Entity A											
5		Filter	Department	Members	Sales											
6		Column1	Year	Range	$B$11:$AG$11											
7		Column2	Month	Range	$B$12:$AG$12											
8		Row	Account	Subsets	Members											
9																
10	OLAPivotTable															
11		2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
12		Method	Amount	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TotalYea
13	Version			Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual		
14																
15	Sales of Goods			14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	170,400
16	Sales of Services			930	930	930	930	930	930	930	930	930	930	930	930	11,160
17																
18	**Revenue**			15,130	15,130	15,130	15,130	15,130	15,130	15,130	15,130	15,130	15,130	15,130	15,130	181,560
19																
20	Cost of Goods			6,050	6,050	6,050	6,050	6,050	6,050	6,050	6,050	6,050	6,050	6,050	6,050	72,600
21	Cost of Services			75	75	75	75	75	75	75	75	75	75	75	75	900
22																
23	**Cost of Sales**			6,125	6,125	6,125	6,125	6,125	6,125	6,125	6,125	6,125	6,125	6,125	6,125	73,500
24																
25	**Gross Profit**			9,005	9,005	9,005	9,005	9,005	9,005	9,005	9,005	9,005	9,005	9,005	9,005	108,060
26	*Gross Profit %*			*59.5%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*
27																
28	Payroll and related expenses			1,060	1,060	1,060	1,060	1,060	1,060	1,060	1,060	1,060	1,060	1,060	1,060	12,720
29	Distribution			320	320	320	320	320	320	320	320	320	320	320	320	3,840
30	Occupancy Expenses			600	600	600	600	600	600	600	600	600	600	600	600	7,200
31	Research and Development			115	115	115	115	115	115	115	115	115	115	115	115	1,380
32	Sales and Marketing			454	454	454	454	454	454	454	454	454	454	454	454	5,447
33	Depreciation			650	650	650	650	650	650	650	650	650	650	650	650	7,800
34	Amortization			62	62	62	62	62	62	62	62	62	62	62	62	744
35	Administrative Expenses			119	119	119	119	119	119	119	119	119	119	119	119	1,428
36	UTILITIES															
37	Other operating Expenses (Incom			(64)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(768)
38																
39	**Operating Expense**			3,316	3,316	3,316	3,316	3,316	3,316	3,316	3,316	3,316	3,316	3,316	3,316	39,791
40	*Operating Expense %*			*21.9%*	*21.9%*	*21.9%*	*21.9%*	*21.9%*	*21.9%*	*21.9%*	*21.9%*	*21.9%*	*21.9%*	*21.9%*	*21.9%*	*21.9%*
41																
42	**Operating Profit**			5,689	5,689	5,689	5,689	5,689	5,689	5,689	5,689	5,689	5,689	5,689	5,689	68,269
43	*Operating Profit %*			*37.6%*	*37.6%*	*37.6%*	*37.6%*	*37.6%*	*37.6%*	*37.6%*	*37.6%*	*37.6%*	*37.6%*	*37.6%*	*37.6%*	*37.6%*
44																
45	Other Revenue			120	120	120	120	120	120	120	120	120	120	120	120	1,440
46	Other (Expense)			(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(420)
47	**Other Income (Expense)**			85	85	85	85	85	85	85	85	85	85	85	85	1,020
48																
49	**EBIT**			5,774	5,774	5,774	5,774	5,774	5,774	5,774	5,774	5,774	5,774	5,774	5,774	69,289
50																
51	Interest Revenue			26	26	26	26	26	26	26	26	26	26	26	26	312
52	Interest (Expense)			(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(192)
53	**Interest**			10	10	10	10	10	10	10	10	10	10	10	10	120
54																
55	**Profit Before Tax**			5,784	5,784	5,784	5,784	5,784	5,784	5,784	5,784	5,784	5,784	5,784	5,784	69,409
56																
57	Income Tax Expense			(1,480)	(1,480)	(1,480)	(1,480)	(1,480)	(1,480)	(1,480)	(1,480)	(1,480)	(1,480)	(1,480)	(1,480)	(17,754)
58																
59	**Profit After Tax**			4,305	4,305	4,305	4,305	4,305	4,305	4,305	4,305	4,305	4,305	4,305	4,305	51,655
60																

2.6 Working with a PowerExcel DB Functions Slice Type

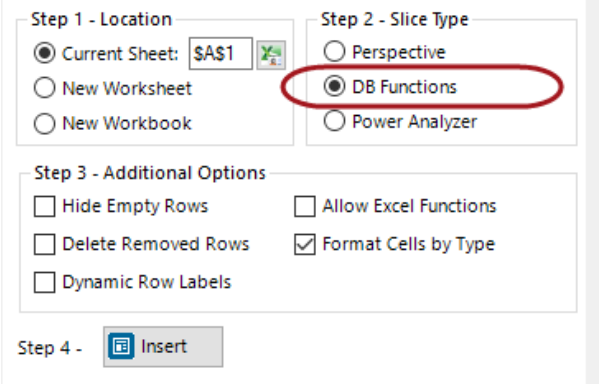
PowerExcel's **DB Functions** Slice Type, when used as the means to bring data into a Slice, has the key advantage of returning business-model data (according to Dimensions selected and filtered) via individual, discrete cell-by-cell functions. In other words, each cell's value is governed by its own function (an OLAReadWrite function), rather than as part of a swath of cells, which is the case when the Perspective or the Power Analyzer Slice Types are used (the Power Analyzer method is discussed in the section following this one).

The following exercise demonstrates how to use PowerExcel DB Functions to create a Slice and the advantages of using it. Assuming that you already have a Connection to a PowerExcel database (in the example, PandA_2022_Connect), proceed as follows.

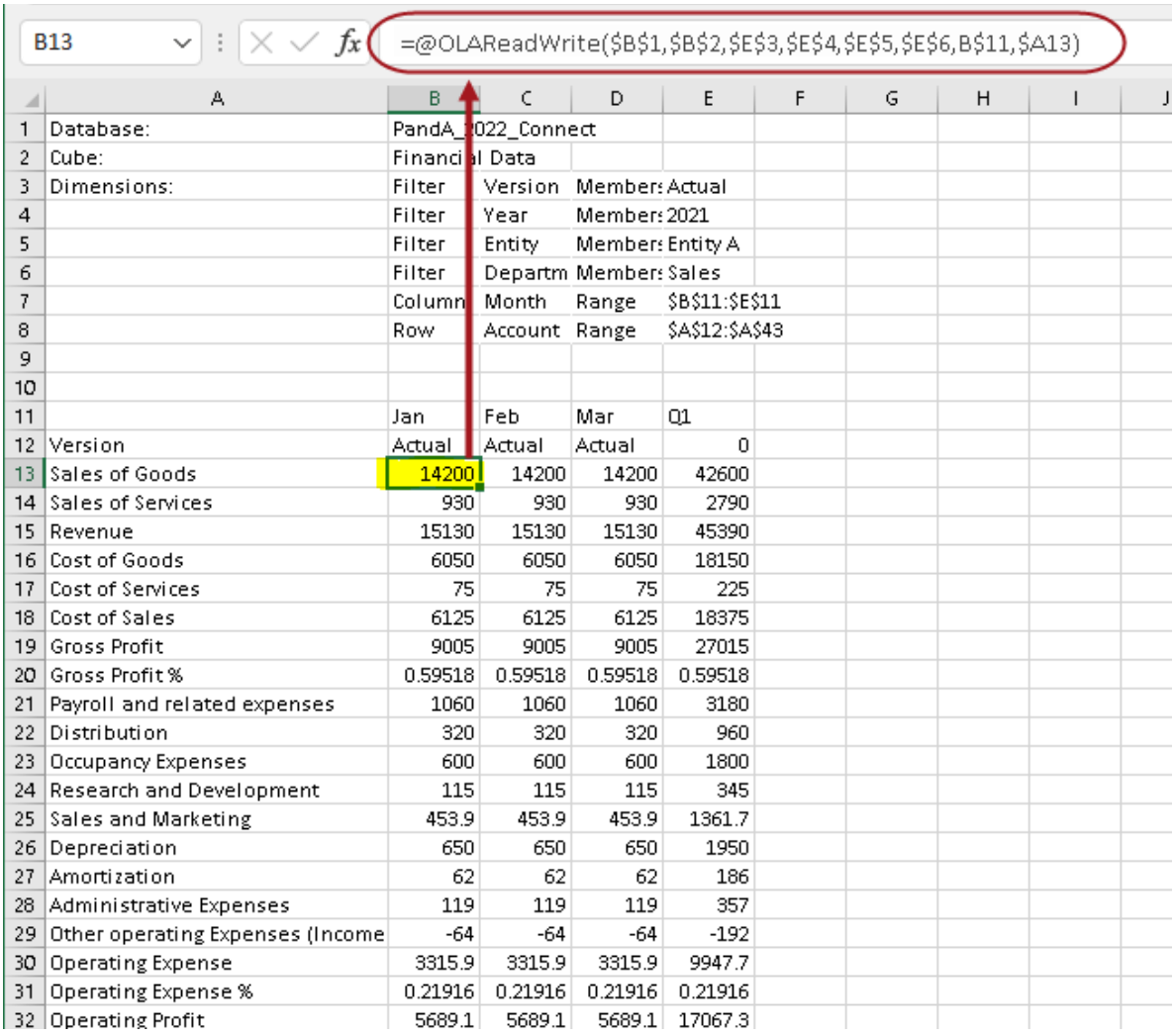
1. To create the example Slice for this exercise, go to the **PowerExcel Tab** and in the PowerExcel Slice control group, select the **New** icon
2. In the PowerExcel sidebar that appears, click on the **Database** drop-down list and select the preferred PowerExcel Database connection (e.g., **PandA_2022_Connect**) and Cube (**Financial Data**).
3. Re-arrange the Dimensions by dragging and dropping them along the Filter, Rows and Column areas; and by specifying the indicated display Members, as below.

Filter	Version: *Actual*
	Year: *2021*
	Entity: *Entity A*
	Department: *Sales*
Columns	Month: individual months *Jan* to *Mar* and aggregate month *Q1*
Rows	Account: *Version, Sales of Goods, Sales of Services, Revenue, Cost of Goods, Cost of Services, Cost of Sales, Gross Profit, Gross Profit %, Payroll and related expenses, Distribution, Occupancy Expenses, Research and Development, Sales and Marketing, Depreciation, Amortization, Administrative Expenses, Other operating Expenses (Income), Operating Expense Operating Expense %, Operating Profit, Operating Profit %, Other Revenue, Other (Expense), Other Income (Expense), EBIT, Interest Revenue, Interest (Expense), Interest, Profit Before Tax, Income Tax Expense, Profit After Tax* Note that there are no Blank Rows.

4. Click the **green checkmark icon** (OK button).
5. Back in the PowerExcel sidebar, keep the defaults for Steps 1 and 3, but now in Step 2 select Slice Type **DB Functions** by clicking on the appropriate radio button option (circled in the following image). **Note:** Notice that in Step 4 that the checkbox options along the left become grayed out/disabled) **Embed Excel Functions** and **Format Cells by Type** are still available for selection.



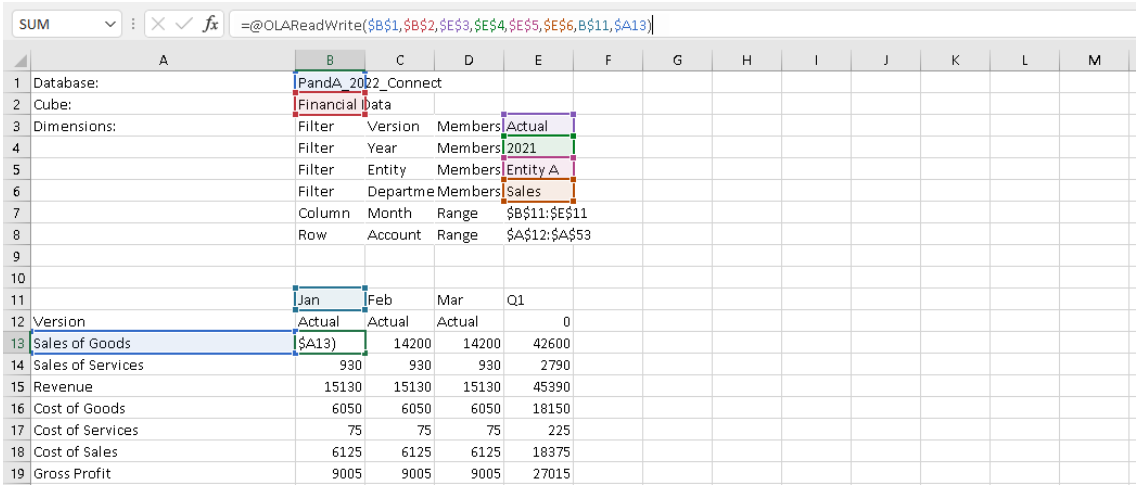
6. At Step 4, click on **Insert**. The Slice will appear as follows (detail):



	A	B	C	D	E
1	Database:	PandA_2022_Connect			
2	Cube:	Financial Data			
3	Dimensions:	Filter	Version	Member:	Actual
4		Filter	Year	Member:	2021
5		Filter	Entity	Member:	Entity A
6		Filter	Departm	Member:	Sales
7		Column	Month	Range	$B$11:$E$11
8		Row	Account	Range	$A$12:$A$43
9					
10					
11		Jan	Feb	Mar	Q1
12	Version	Actual	Actual	Actual	0
13	Sales of Goods	14200	14200	14200	42600
14	Sales of Services	930	930	930	2790
15	Revenue	15130	15130	15130	45390
16	Cost of Goods	6050	6050	6050	18150
17	Cost of Services	75	75	75	225
18	Cost of Sales	6125	6125	6125	18375
19	Gross Profit	9005	9005	9005	27015
20	Gross Profit %	0.59518	0.59518	0.59518	0.59518
21	Payroll and related expenses	1060	1060	1060	3180
22	Distribution	320	320	320	960
23	Occupancy Expenses	600	600	600	1800
24	Research and Development	115	115	115	345
25	Sales and Marketing	453.9	453.9	453.9	1361.7
26	Depreciation	650	650	650	1950
27	Amortization	62	62	62	186
28	Administrative Expenses	119	119	119	357
29	Other operating Expenses (Income	-64	-64	-64	-192
30	Operating Expense	3315.9	3315.9	3315.9	9947.7
31	Operating Expense %	0.21916	0.21916	0.21916	0.21916
32	Operating Profit	5689.1	5689.1	5689.1	17067.3

Notice the function (circled in the above image, on the formula bar) that returns data to yellow-highlighted cell **B13**: it is the **OLAReadWrite** function mentioned at the start of this section: it is the operative means of returning data when the **DB Functions** Slice Type is selected in the sidebar. What is characteristic of this function?—in sum, that each cell has its own unique argument, i.e., the referenced cells in parenthesis following the function itself.

7. Having clicked in cell B13 (or any other), next click in the function itself, which appears in the formula bar (as shown below).



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA_2022_Connect											
2	Cube:	Financial Data											
3	Dimensions:	Filter	Version	Members	Actual								
4		Filter	Year	Members	2021								
5		Filter	Entity	Members	Entity A								
6		Filter	Departme	Members	Sales								
7		Column	Month	Range	$B$11:$E$11								
8		Row	Account	Range	$A$12:$A$53								
9													
10													
11		Jan	Feb	Mar	Q1								
12	Version	Actual	Actual	Actual	0								
13	Sales of Goods	$A13)	14200	14200	42600								
14	Sales of Services	930	930	930	2790								
15	Revenue	15130	15130	15130	45390								
16	Cost of Goods	6050	6050	6050	18150								
17	Cost of Services	75	75	75	225								
18	Cost of Sales	6125	6125	6125	18375								
19	Gross Profit	9005	9005	9005	27015								

The function in this cell (reproduced below) has unique cell references; if you click in any other cell that returns values, you will see that the cell references are indeed different.

=OLAReadWrite($B$1,$B$2,$E$3,$E$4,$E$5,$E$6,B$11,$A13)

The OLAReadWrite function points to—and returns the value from—a precise multidimensional data point in the PowerExcel model: thus, the formula in Cell B13 is returning a value from the intersection of (in this example):

$B$1 – the Database where the model is located

$B$2 – the Cube in the Database

$E$3 – the *Actua*l member in the *Version* dimension

$E$4 – the *2021* member in the *Year* dimension

$E$5 – the *Entity A* member in the *Entity* dimension

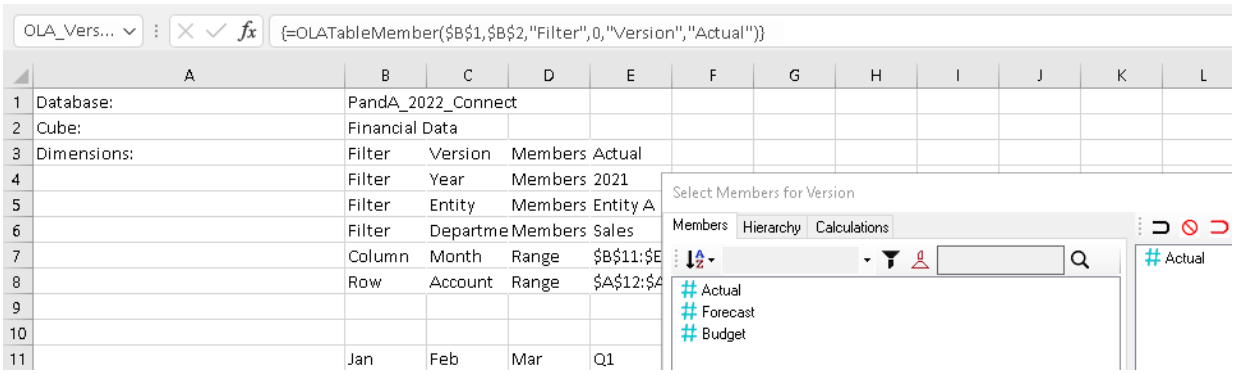
$E$6 – the *Sales* member in the *Department* dimension

B$12 – *Jan* from the *Month* dimension [Column reference]

$A13 – *Sales of Goods* from the *Account* dimension [Row reference]

The interesting—and very important—fact is that that these cells are themselves "selectable"—meaning that either by using the PowerExcel sidebar to the right or by double-clicking on those governed by an {OLATableMember…} function (for Filters), you can select a different Member that will change all results in the field of data in Columns and Rows.

As an example, you can double-click in Cell $E$4, and make a selection of a different *Version*: if you do so and pick "Budget" (from the resulting PowerExcel *Select Member for Version* window, as shown in the next image), then results for all the Members, including those in Columns and Rows, will show results for *Budget* rather than *Actual*.

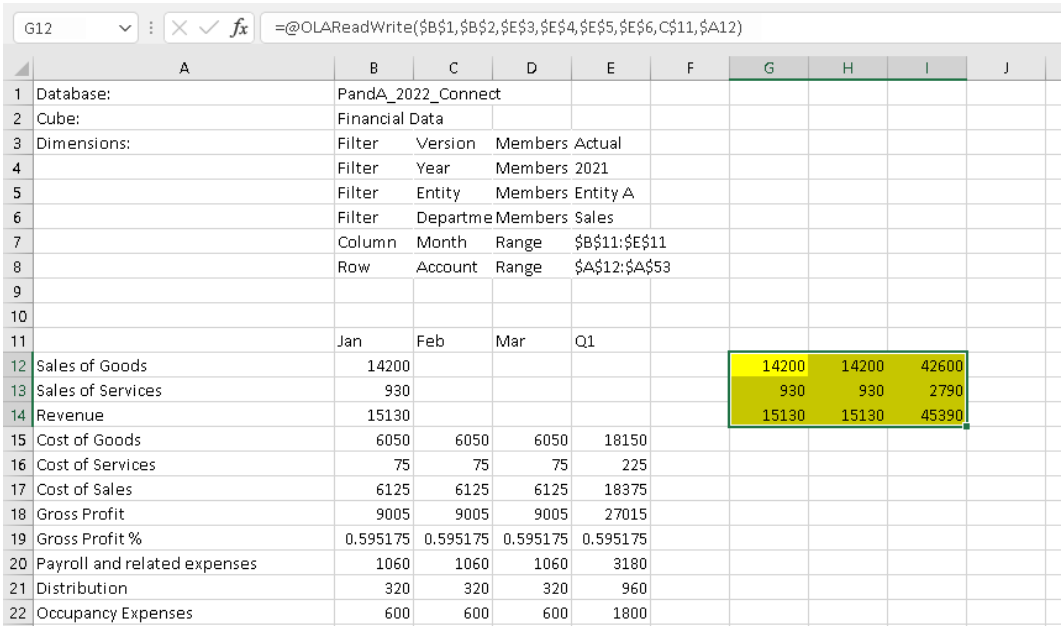


For present, go back to (or keep the selection at) *Actual*. We will proceed what discovering this "cell-by-cell return of values" enables us to do in the following steps.

8. First delete Row 12, which shows data for the Version Account Member—this is a formatting step, to show our data results more cleverly.

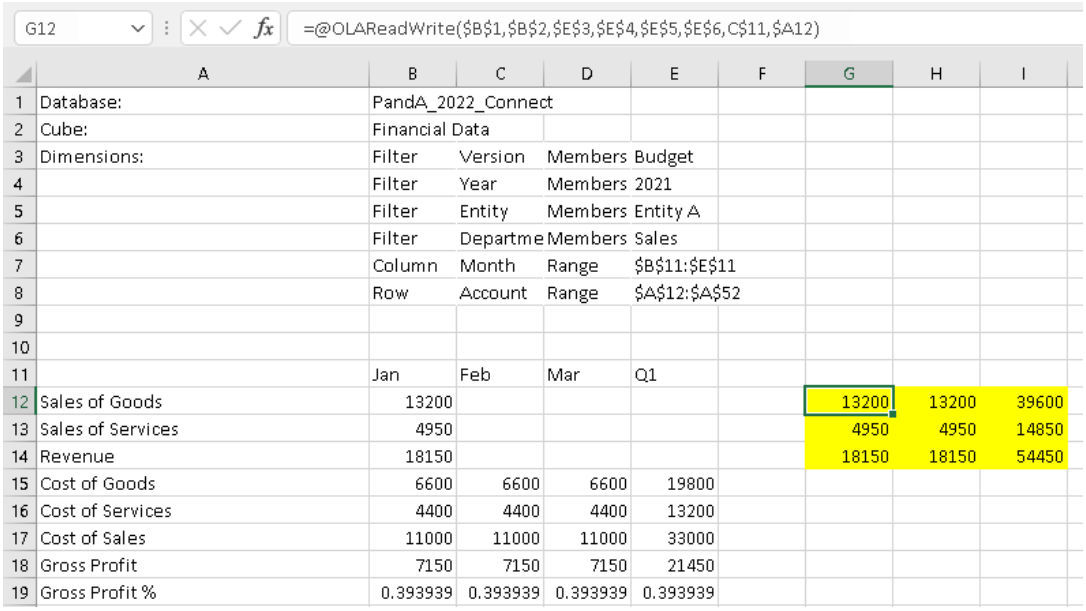
9. After the Rows have shifted upward one Row, click in Cell C12—*Feb, Sales of Goods*.

10. Highlight all cells across and down to E14 (*Q1*, *Revenue*); "grab" those cells and drop them starting in Cell G12—the result will show as in the following image: the cells where you dropped the 'grabbed values' are highlighted in yellow in the next image.



	A	B	C	D	E	F	G	H	I	J
1	Database:	PandA_2022_Connect								
2	Cube:	Financial Data								
3	Dimensions:	Filter	Version	Members	Actual					
4		Filter	Year	Members	2021					
5		Filter	Entity	Members	Entity A					
6		Filter	Departme	Members	Sales					
7		Column	Month	Range	$B$11:$E$11					
8		Row	Account	Range	$A$12:$A$53					
9										
10										
11		Jan	Feb	Mar	Q1					
12	Sales of Goods	14200					14200	14200	42600	
13	Sales of Services	930					930	930	2790	
14	Revenue	15130					15130	15130	45390	
15	Cost of Goods	6050	6050	6050	18150					
16	Cost of Services	75	75	75	225					
17	Cost of Sales	6125	6125	6125	18375					
18	Gross Profit	9005	9005	9005	27015					
19	Gross Profit %	0.595175	0.595175	0.595175	0.595175					
20	Payroll and related expenses	1060	1060	1060	3180					
21	Distribution	320	320	320	960					
22	Occupancy Expenses	600	600	600	1800					

11. If you now double-click on Cell E3 and select *Budget*, then **hit F9 to update**—note, those cells that you moved to the right refreshed to show Budget values (as in the next image)! That is because Excel maintained the references to the cells, and the selected Member in them, in their new position (G12 to I14—highlighted in yellow in the image below). In essence, you have proven that with PowerExcel, you can return values from a business model wherever you like, anywhere in a spreadsheet. This is enormously useful in creating precisely the report view you wish, from a multidimensional model of the sort PowerExcel features.

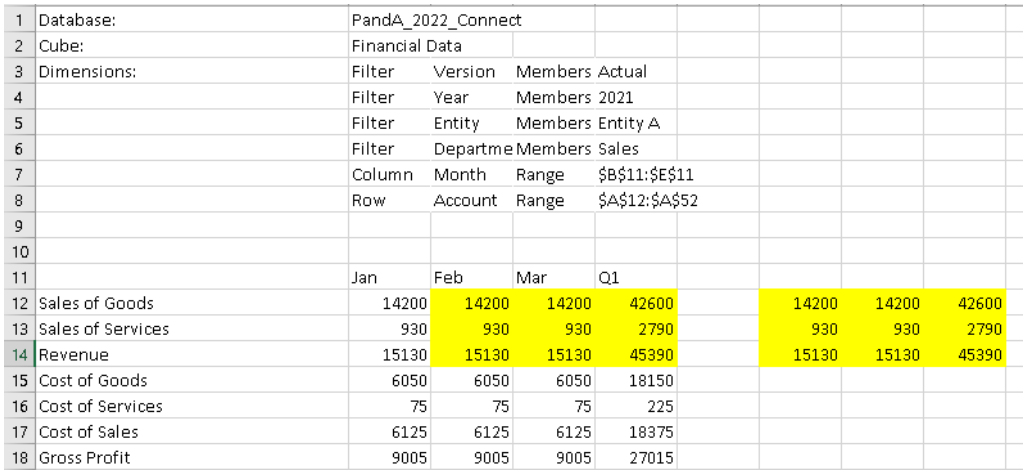


G12 =@OLAReadWrite($B$1,$B$2,$E$3,$E$4,$E$5,$E$6,C$11,$A12)

	A	B	C	D	E	F	G	H	I
1	Database:	PandA_2022_Connect							
2	Cube:	Financial Data							
3	Dimensions:	Filter	Version	Members	Budget				
4		Filter	Year	Members	2021				
5		Filter	Entity	Members	Entity A				
6		Filter	Departme	Members	Sales				
7		Column	Month	Range	$B$11:$E$11				
8		Row	Account	Range	$A$12:$A$52				
9									
10									
11		Jan	Feb	Mar	Q1				
12	Sales of Goods	13200					13200	13200	39600
13	Sales of Services	4950					4950	4950	14850
14	Revenue	18150					18150	18150	54450
15	Cost of Goods	6600	6600	6600	19800				
16	Cost of Services	4400	4400	4400	13200				
17	Cost of Sales	11000	11000	11000	33000				
18	Gross Profit	7150	7150	7150	21450				
19	Gross Profit %	0.393939	0.393939	0.393939	0.393939				

12. For present purposes, revert back to the *Actual* member (double-click on Cell E3, then select *Actual* as the display Member).
    Next, highlight Cells B12 to B14 (*Jan, Sales of Goods* to *Jan, Revenue*); click on the dot—Excel's "fill handle"—at the bottom right of Cell B14 and "drag" the highlight across to Column E.

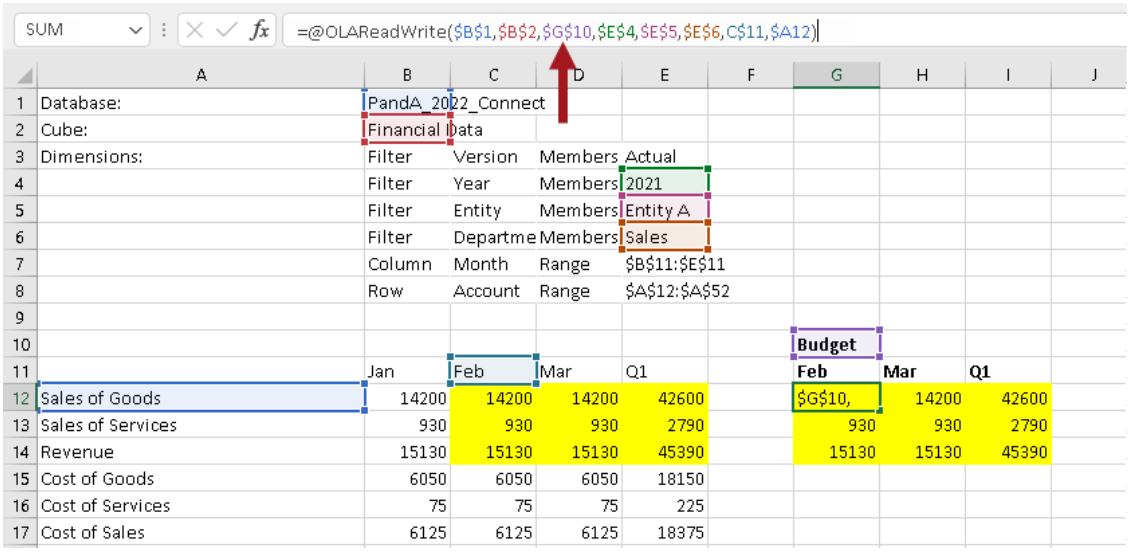
13. When you hit **F9 to update**—you will see the that the data is the same as the data to the right, which you moved a few steps ago. Here Excel, as is its custom, ensured that what shows in Columns is in the correct sequence. (This is a fine example of Excel working the way a user expected!)



1	Database:	PandA_2022_Connect						
2	Cube:	Financial Data						
3	Dimensions:	Filter	Version	Members	Actual			
4		Filter	Year	Members	2021			
5		Filter	Entity	Members	Entity A			
6		Filter	Departme	Members	Sales			
7		Column	Month	Range	$B$11:$E$11			
8		Row	Account	Range	$A$12:$A$52			
9								
10								
11		Jan	Feb	Mar	Q1			
12	Sales of Goods	14200	14200	14200	42600	14200	14200	42600
13	Sales of Services	930	930	930	2790	930	930	2790
14	Revenue	15130	15130	15130	45390	15130	15130	45390
15	Cost of Goods	6050	6050	6050	18150			
16	Cost of Services	75	75	75	225			
17	Cost of Sales	6125	6125	6125	18375			
18	Gross Profit	9005	9005	9005	27015			

14. This next step involves some housekeeping/formatting, which is always important in data presentation, and which here is necessary to arrive at our objective: to show *Budget* numbers to the right of the data showing *Actuals*:
    Copy the cells C11 to E11 (*Feb* to *Q1*) and paste them into cell G11, and make those month headers **bold**.
    Then, type the word **Budget** into Cell **G10**, making it **bold** as well.

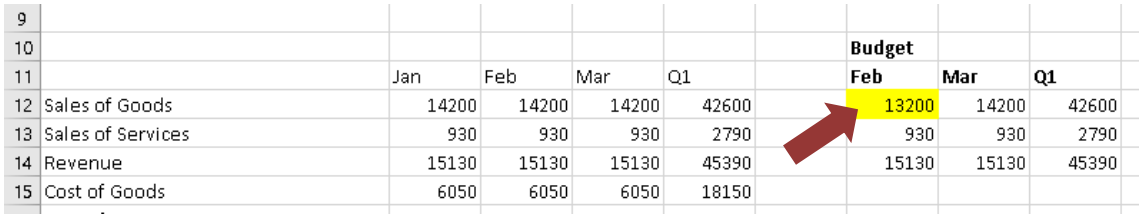
15. Next, to change the reference for the right "block" of cells, so they show *Budget* figures:
    Click in Cell **G12**, then click within the function in the formula bar.
    Change the reference to *Actual* ($E$3) to *Budget* by highlighting it and pointing to Cell **G10** (you can do this by pulling the rectangle surrounding E3 down to G10).
    Before you press F9 to recalculate, your spreadsheet will look as follows (note the arrow now referencing cell G10):



SUM =@OLAReadWrite($B$1,$B$2,$G$10,$E$4,$E$5,$E$6,C$11,$A12)

	A	B	C	D	E	F	G	H	I	J
1	Database:	PandA_2022_Connect								
2	Cube:	Financial Data								
3	Dimensions:	Filter	Version	Members	Actual					
4		Filter	Year	Members	2021					
5		Filter	Entity	Members	Entity A					
6		Filter	Departme	Members	Sales					
7		Column	Month	Range	$B$11:$E$11					
8		Row	Account	Range	$A$12:$A$52					
9										
10							Budget			
11		Jan	Feb	Mar	Q1		Feb	Mar	Q1	
12	Sales of Goods	14200	14200	14200	42600		$G$10,	14200	42600	
13	Sales of Services	930	930	930	2790		930	930	2790	
14	Revenue	15130	15130	15130	45390		15130	15130	45390	
15	Cost of Goods	6050	6050	6050	18150					
16	Cost of Services	75	75	75	225					
17	Cost of Sales	6125	6125	6125	18375					

16. Hit the **Enter** key and then press **F9**—note that the value changes to show *Budget* data (as per the arrow in the following image)! As we saw earlier, there is indeed a Budget value of **13200** for *Budget*, *Sales of Goods* for *Feb* (for *2021*, *Entity A*, *Sales*—i.e., the other referenced cells.)



9									
10						Budget			
11		Jan	Feb	Mar	Q1	Feb	Mar	Q1	
12	Sales of Goods	14200	14200	14200	42600	13200	14200	42600	
13	Sales of Services	930	930	930	2790	930	930	2790	
14	Revenue	15130	15130	15130	45390	15130	15130	45390	
15	Cost of Goods	6050	6050	6050	18150				

17. Once again put your cursor in Cell **G12**; use the fill handle at the bottom right and pull down to include G13 and G14; hit Enter and then F9 to update. Again, these cells update to show Budget values. Lastly, highlight G12 through G14 and, as above, use the fill handle to pull the highlighted area across, covering all of the data set through to Column I. Hit Enter and F9. The result set will show as in the following image.

	A	B	C	D	E	F	G	H	I
1	Database:	PandA_2022_Connect							
2	Cube:	Financial Data							
3	Dimensions:	Filter	Version	Members	Actual				
4		Filter	Year	Members	2021				
5		Filter	Entity	Members	Entity A				
6		Filter	Departme	Members	Sales				
7		Column	Month	Range	$B$11:$E$11				
8		Row	Account	Range	$A$12:$A$52				
9									
10							**Budget**		
11		Jan	Feb	Mar	Q1		**Feb**	**Mar**	**Q1**
12	Sales of Goods	14200	14200	14200	42600		13200	13200	39600
13	Sales of Services	930	930	930	2790		4950	Calculatin	14850
14	Revenue	15130	15130	15130	45390		18150	18150	54450
15	Cost of Goods	6050	6050	6050	18150				
16	Cost of Services	75	75	75	225				
17	Cost of Sales	6125	6125	6125	18375				

As a final part of this exercise, we will do something that is covered more in depth in a later section: entering data into a PowerExcel model—here will type a couple of numbers into this spreadsheet, which will further demonstrate (and validate) the use of creating data sets in a spreadsheet by using the DB functions Slice Type (i.e., the OLAReadWrite function).

18. Type example numbers—e.g., go to cell **G12** and type **9999** as the *Sales of Goods.* In this way we might be entering future budget numbers (in actuality, the entry template would be for a "plan" period, not the current months), with full, and nearby, knowledge of ongoing Actuals. (The Actual figures appear in Cells C12—highlighted in yellow to the left in the next image.)
    Hit Enter and F9.

	A	B	C	D	E	F	G	H	I	J
1	Database:	PandA_2022_Connect								
2	Cube:	Financial Data								
3	Dimensions:	Filter	Version	Members	Actual					
4		Filter	Year	Members	2021					
5		Filter	Entity	Members	Entity A					
6		Filter	Department	Members	Sales					
7		Column	Month	Range	$B$11:$E$11					
8		Row	Account	Range	$A$12:$A$42					
9										
10							**Budget**			
11		Jan	Feb	Mar	Q1		**Feb**	**Mar**	**Q1**	
12	Sales of Goods	14200	14200	14200	42600		9999	13200	36399	
13	Sales of Services	930	930	930	2790		4950	4950	14850	
14	Revenue	15130	15130	15130	45390		14949	18150	51249	
15	Cost of Goods	6050	6050	6050	18150					
16	Cost of Services	75	75	75	225					
17	Cost of Sales	6125	6125	6125	18375					

As shown above on the right, the *Budget* numbers appear and even calculate automatically (highlighted in pink), delivering the updated *Revenue* number for *Feb*. Additionally, the Q1 value also updates to reflect the changes (aggregate values). This calculation, defined once in the PowerExcel model—rather than in numerous cells individually, in numerous spreadsheets—demonstrates another advantage of using PowerExcel for business modeling.

2.7 Working with the PowerExcel Power Analyzer Slice Type

The PowerExcel Power Analyzer Slice Type dynamically creates a Slice in Excel in a powerful format that leverages Excel's own Power Query capabilities. In sum, it gives the user the ability to apply any queries to the table, apply numerous filters, easily reorder the table, and record/automate/undo changes, among other capabilities.

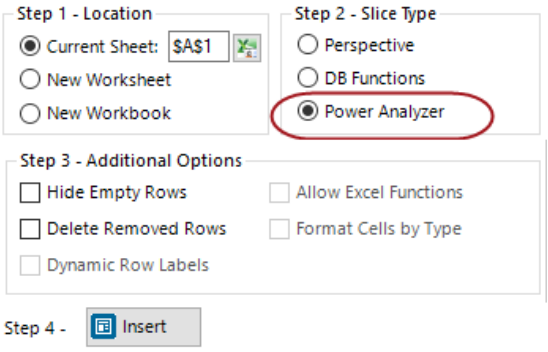
IMPORTANT: The important thing to take note of when using the PowerExcel Power Analyzer Slice Type (which uses the OLAPowerQuery function) is that **it is updated using the Refresh button found in the PowerExcel Tab** of the Excel ribbon. The F9 key WILL NOT refresh a PowerExcel Slice that has utilized the Power Analyzer as the Slice type.

The following exercise demonstrates the use of **PowerExcel's Power Analyzer** to create a Slice. Assuming that you already have a Connection to a PowerExcel database (in the example, **PandA_2022_Connect**), proceed as follows:

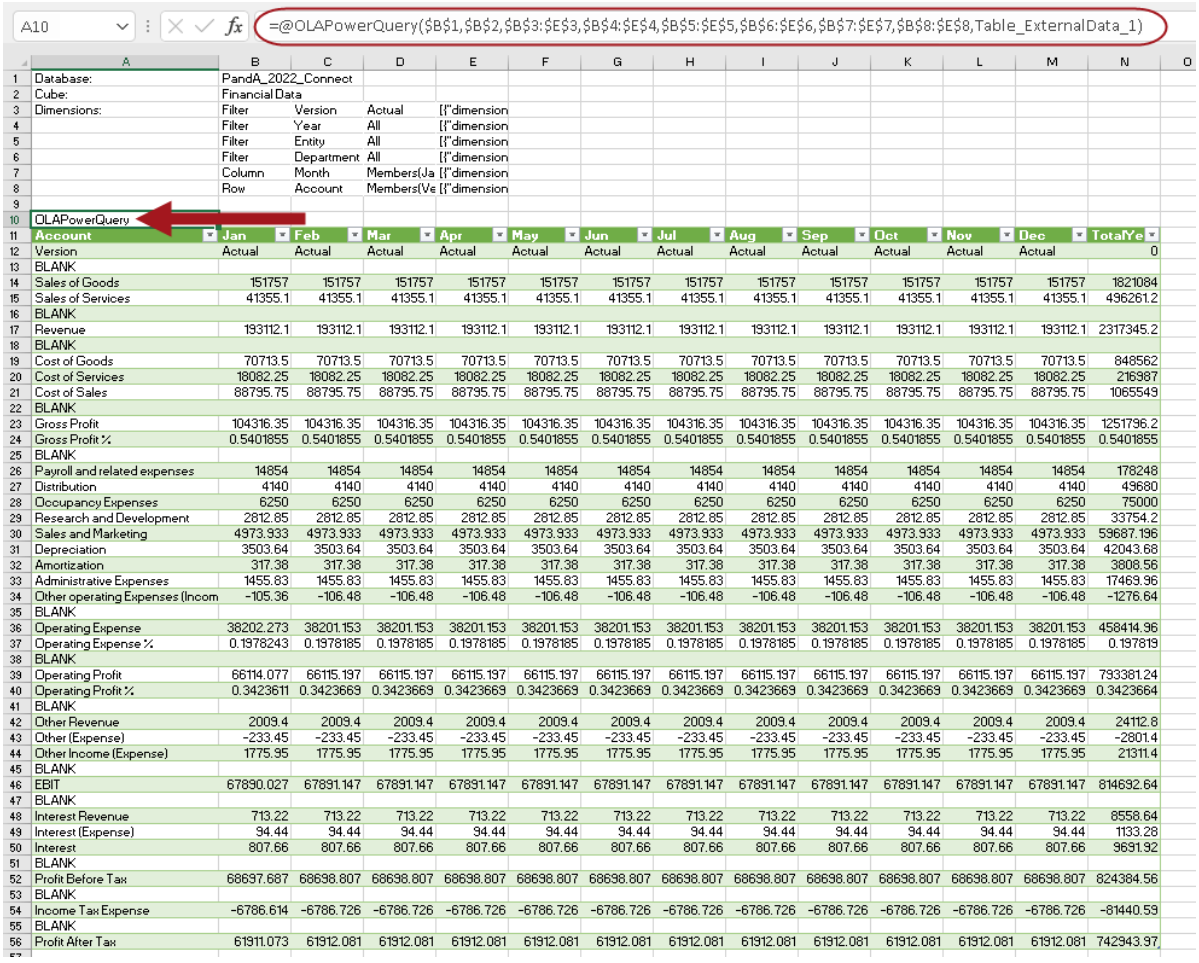
1. Open a new Excel workbook. Go to the **PowerExcel Tab** and in the PowerExcel Slice control group, select the **New** icon.
2. In the PowerExcel sidebar that appears, click on the **Database** drop-down list and select the preferred PowerExcel Database connection (e.g**., PandA_2022_Connect**) and Cube (i.e., **Financial Data**).
3. In the PowerExcel sidebar, make the following selections for Dimensions (in Filter, Rows and Columns) like so:

Filter	Version: *Actual*
	Year: *All*
	Entity: *All*
	Department: *All*
Columns	Month: individual months (*Jan* to *Dec*) and aggregate month *Total Year*
Rows	Account: *Version, BLANK, Sales of Goods, Sales of Services, BLANK, Revenue, BLANK, Cost of Goods, Cost of Services, Cost of Sales, BLANK, Gross Profit, Gross Profit %, BLANK, Payroll and related expenses, Distribution, Occupancy Expenses, Research and Development, Sales and Marketing, Depreciation, Amortization, Administrative Expenses, Other operating Expenses (Income), BLANK, Operating Expense Operating Expense %, BLANK, Operating Profit, Operating Profit %, BLANK, Other Revenue, Other (Expense), Other Income (Expense), BLANK, EBIT, BLANK, Interest Revenue, Interest (Expense), Interest, BLANK, Profit Before Tax, BLANK, Income Tax Expense, BLANK, Profit After Tax*

4. Once you have configured the PowerExcel Slice: back in the PowerExcel sidebar, select a Slice Type (Step 2): use **PowerExcel Power Analyzer** by clicking on the appropriate radio button option (circled in the following image).
   Note that all the checkbox options are grayed out except for **Hide Empty Rows** and **Delete Removed Rows**. The grayed-out options are not available in a Power Analyzer Slice Type.



5. Click the **Insert** button located at the bottom of the PowerExcel sidebar. Note the OLAPowerQuery function (see the next image, where arrow points, cell A10)—this is the PowerExcel function that governs how data appears in the spreadsheet. The function arguments appear in the formula bar, above, which is circled.



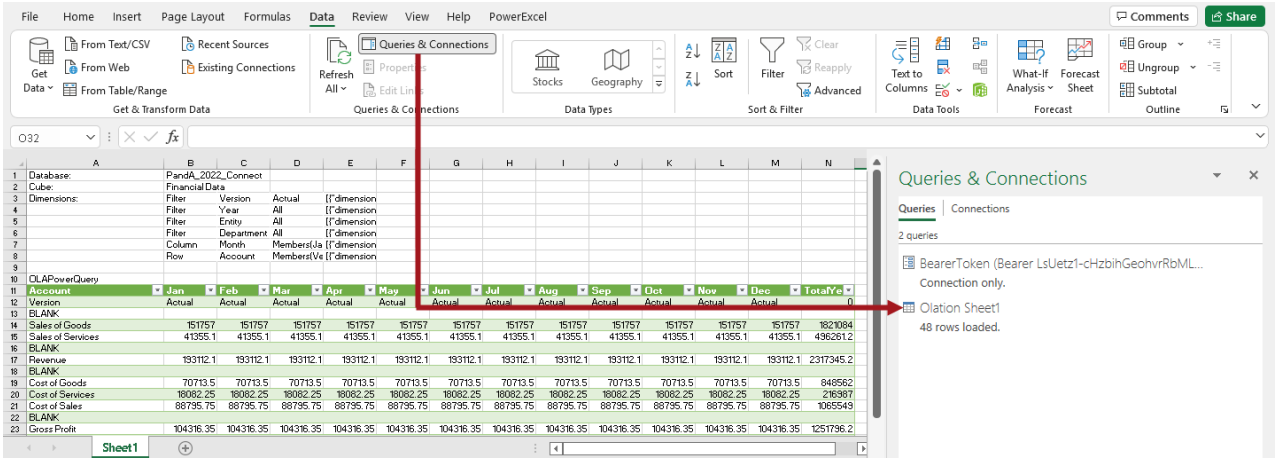
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Database:	PandA_2022_Connect													
2	Cube:	Financial Data													
3	Dimensions:	Filter	Version	Actual	[{"dimension										
4		Filter	Year	All	[{"dimension										
5		Filter	Entity	All	[{"dimension										
6		Filter	Department	All	[{"dimension										
7		Column	Month	Members(Ja	[{"dimension										
8		Row	Account	Members(Ve	[{"dimension										
9															
10	OLAPowerQuery														
11	Account	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TotalYe	
12	Version	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	0	
13	BLANK														
14	Sales of Goods	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757	1821084	
15	Sales of Services	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	496261.2	
16	BLANK														
17	Revenue	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	2317345.2	
18	BLANK														
19	Cost of Goods	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	848562	
20	Cost of Services	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	216987	
21	Cost of Sales	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	1065549	
22	BLANK														
23	Gross Profit	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	1251796.2	
24	Gross Profit %	0.5401855	0.5401855	0.5401855	0.5401855	0.5401855	0.5401855	0.5401855	0.5401855	0.5401855	0.5401855	0.5401855	0.5401855	0.5401855	
25	BLANK														
26	Payroll and related expenses	14854	14854	14854	14854	14854	14854	14854	14854	14854	14854	14854	14854	178248	
27	Distribution	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140	4140	49680	
28	Occupancy Expenses	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	75000	
29	Research and Development	2812.85	2812.85	2812.85	2812.85	2812.85	2812.85	2812.85	2812.85	2812.85	2812.85	2812.85	2812.85	33754.2	
30	Sales and Marketing	4973.933	4973.933	4973.933	4973.933	4973.933	4973.933	4973.933	4973.933	4973.933	4973.933	4973.933	4973.933	59687.196	
31	Depreciation	3503.64	3503.64	3503.64	3503.64	3503.64	3503.64	3503.64	3503.64	3503.64	3503.64	3503.64	3503.64	42043.68	
32	Amortization	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	317.38	3808.56	
33	Administrative Expenses	1455.83	1455.83	1455.83	1455.83	1455.83	1455.83	1455.83	1455.83	1455.83	1455.83	1455.83	1455.83	17463.96	
34	Other operating Expenses (Incom	-105.36	-106.48	-106.48	-106.48	-106.48	-106.48	-106.48	-106.48	-106.48	-106.48	-106.48	-106.48	-1276.64	
35	BLANK														
36	Operating Expense	38202.273	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	458414.96	
37	Operating Expense %	0.1978243	0.1978185	0.1978185	0.1978185	0.1978185	0.1978185	0.1978185	0.1978185	0.1978185	0.1978185	0.1978185	0.1978185	0.197819	
38	BLANK														
39	Operating Profit	66114.077	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	793381.24	
40	Operating Profit %	0.3423611	0.3423669	0.3423669	0.3423669	0.3423669	0.3423669	0.3423669	0.3423669	0.3423669	0.3423669	0.3423669	0.3423669	0.3423664	
41	BLANK														
42	Other Revenue	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	24112.8	
43	Other (Expense)	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-2801.4	
44	Other Income (Expense)	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	21311.4	
45	BLANK														
46	EBIT	67890.027	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	814692.64	
47	BLANK														
48	Interest Revenue	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	8558.64	
49	Interest (Expense)	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	1133.28	
50	Interest	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	9691.92	
51	BLANK														
52	Profit Before Tax	68697.687	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	824384.56	
53	BLANK														
54	Income Tax Expense	-6786.614	-6786.726	-6786.726	-6786.726	-6786.726	-6786.726	-6786.726	-6786.726	-6786.726	-6786.726	-6786.726	-6786.726	-81440.59	
55	BLANK														
56	Profit After Tax	61911.073	61912.081	61912.081	61912.081	61912.081	61912.081	61912.081	61912.081	61912.081	61912.081	61912.081	61912.081	742943.97	

Important: Most of the manipulations you made using Perspective and DB Functions Slice Types to arrange Columns and Rows, and to select Members to filter, are available in the Power Analyzer Slice. You can try these on your own, arranging a Slice according to your preferences, as explained below.

The great benefit of using PowerExcel's Power Analyzer capability is that—following the creation of a Slice—you can leverage all of Excel's own **Power Query** options. To show some examples of what can be done, proceed as follows:

6. With your cursor in the PowerExcel Slice, go to the **Data Tab of the Excel** ribbon, and select the **Queries & Connections** command icon.

   The **Queries and Connections sidebar** appears to the right of the PowerExcel Slice.

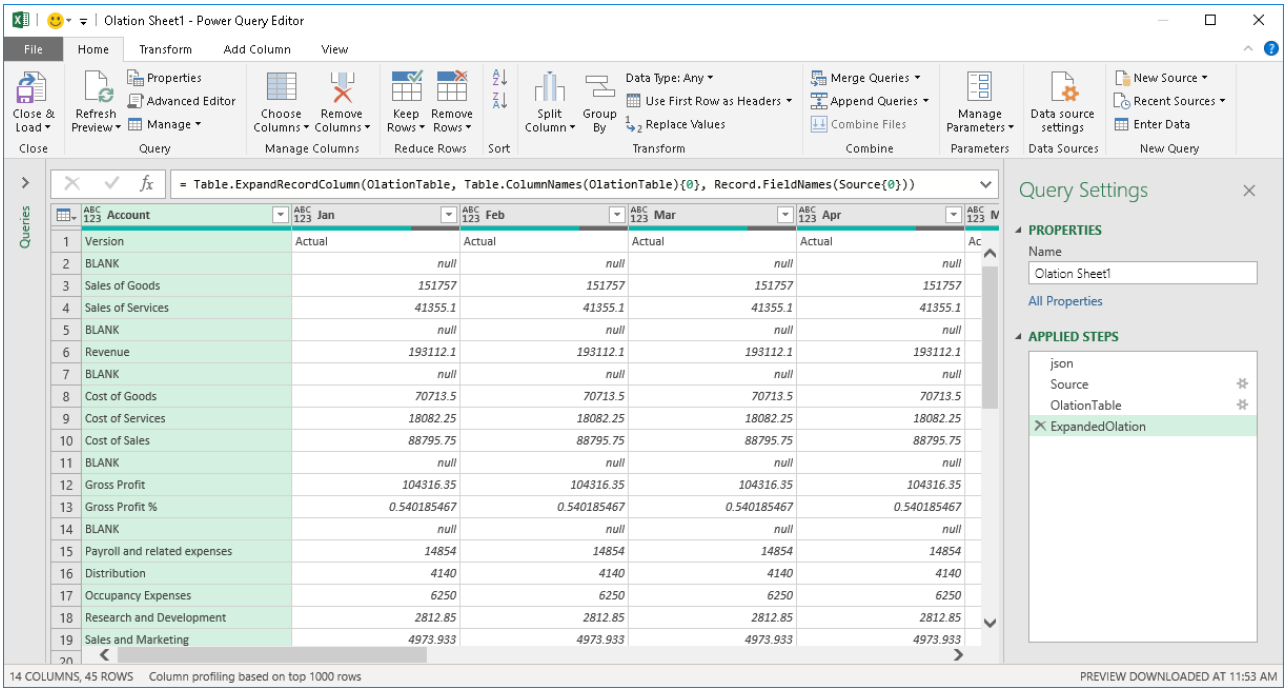


7. When you select a query and double-click on it (see where arrow points), the **Olation – Power Query Editor** appears. (This is shown in the next image.)

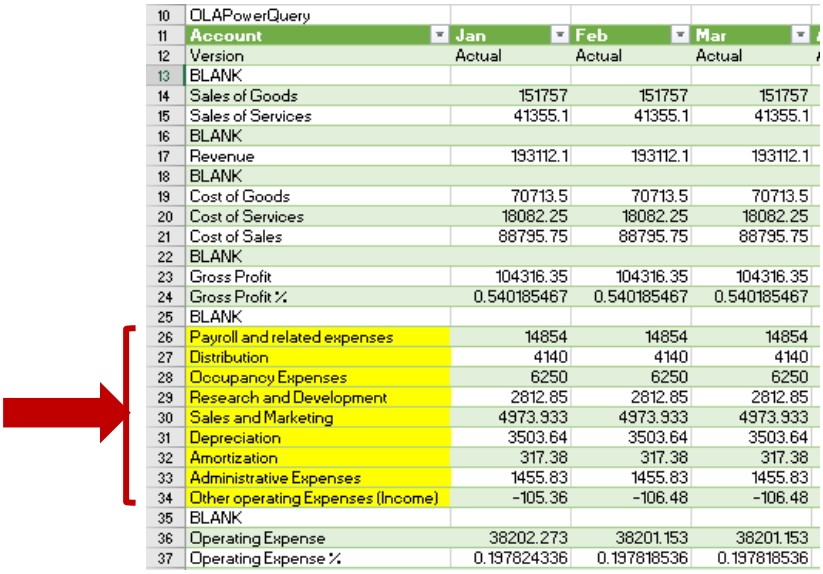
   Within the Query Editor, you can make all kinds of changes to the orientation of the data; as well, you can edit the query to show data as you like—there are truly limitless possibilities.

   These allow you to perform actions such as (but not limited to):

   - Re-order the Columns and Rows
   - Record and Delete some steps or actions performed
   - Remove, Add or Duplicate Columns
   - Unpivot Columns
   - Filter Data that appears in Columns



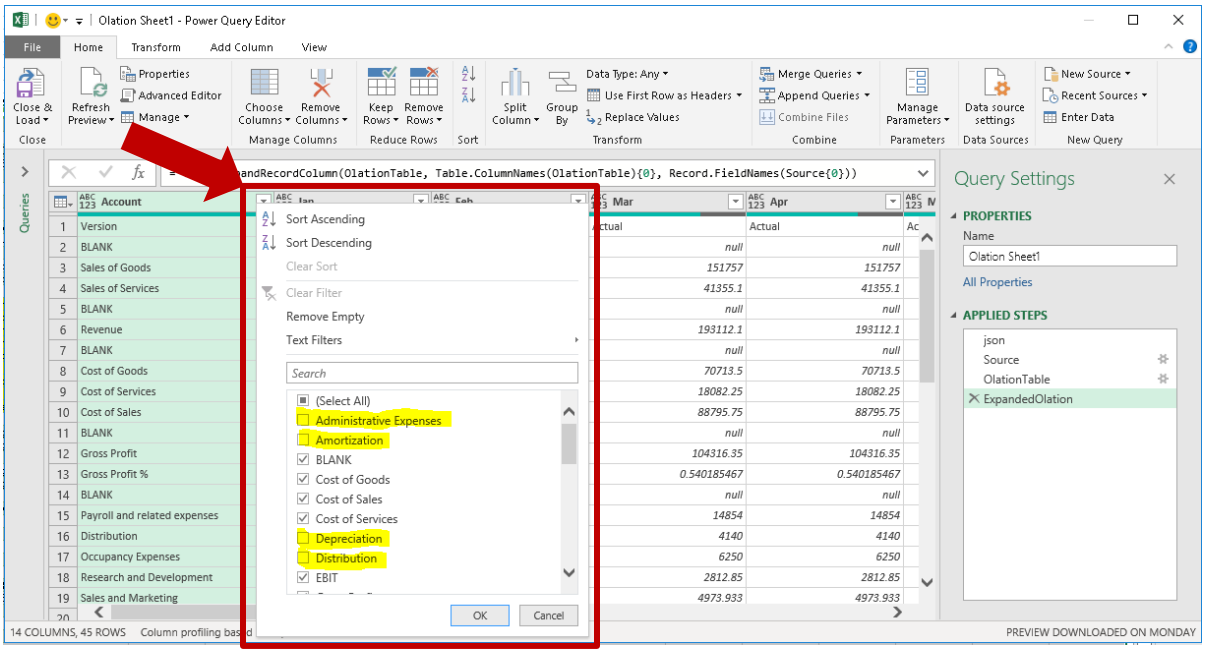
8. First, let us filter the Accounts to remove all sub accounts of *Operating Expense* from the Slice display.



	Account	Jan	Feb	Mar
10	OLAPowerQuery			
11	**Account**	**Jan**	**Feb**	**Mar**
12	Version	Actual	Actual	Actual
13	BLANK			
14	Sales of Goods	151757	151757	151757
15	Sales of Services	41355.1	41355.1	41355.1
16	BLANK			
17	Revenue	193112.1	193112.1	193112.1
18	BLANK			
19	Cost of Goods	70713.5	70713.5	70713.5
20	Cost of Services	18082.25	18082.25	18082.25
21	Cost of Sales	88795.75	88795.75	88795.75
22	BLANK			
23	Gross Profit	104316.35	104316.35	104316.35
24	Gross Profit %	0.540185467	0.540185467	0.540185467
25	BLANK			
26	Payroll and related expenses	14854	14854	14854
27	Distribution	4140	4140	4140
28	Occupancy Expenses	6250	6250	6250
29	Research and Development	2812.85	2812.85	2812.85
30	Sales and Marketing	4973.933	4973.933	4973.933
31	Depreciation	3503.64	3503.64	3503.64
32	Amortization	317.38	317.38	317.38
33	Administrative Expenses	1455.83	1455.83	1455.83
34	Other operating Expenses (Income)	-105.36	-106.48	-106.48
35	BLANK			
36	Operating Expense	38202.273	38201.153	38201.153
37	Operating Expense %	0.197824336	0.197818536	0.197818536

To do this:

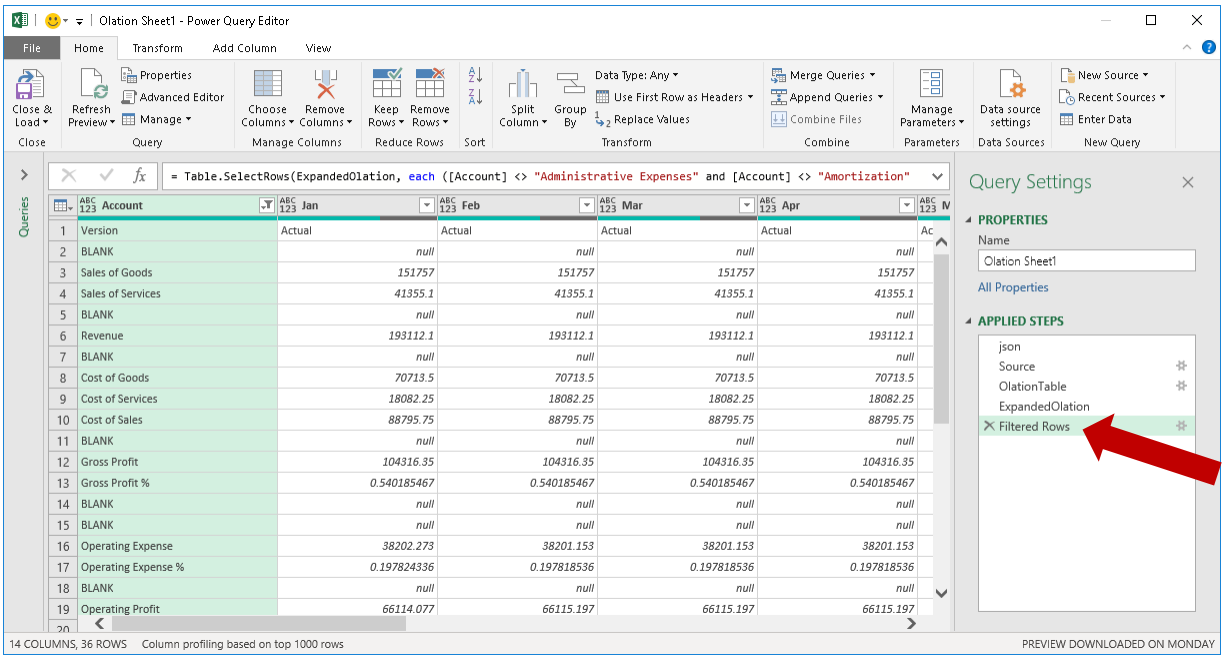
- In the **Olation – Power Query Editor**, click on the **Account drop-down** (see where arrow points in the image below).
- Uncheck all sub-accounts of **OPERATING EXPENSE**: *Payroll and related expenses*, *Distribution*, *Occupancy Expenses*, *Research and Development*, *Sales and Marketing*, *Depreciation*, *Amortization*, *Administrative Expenses*, *Other operating Expenses (Income)*—some of these are shown, unchecked and shaded in yellow, in the next image below.



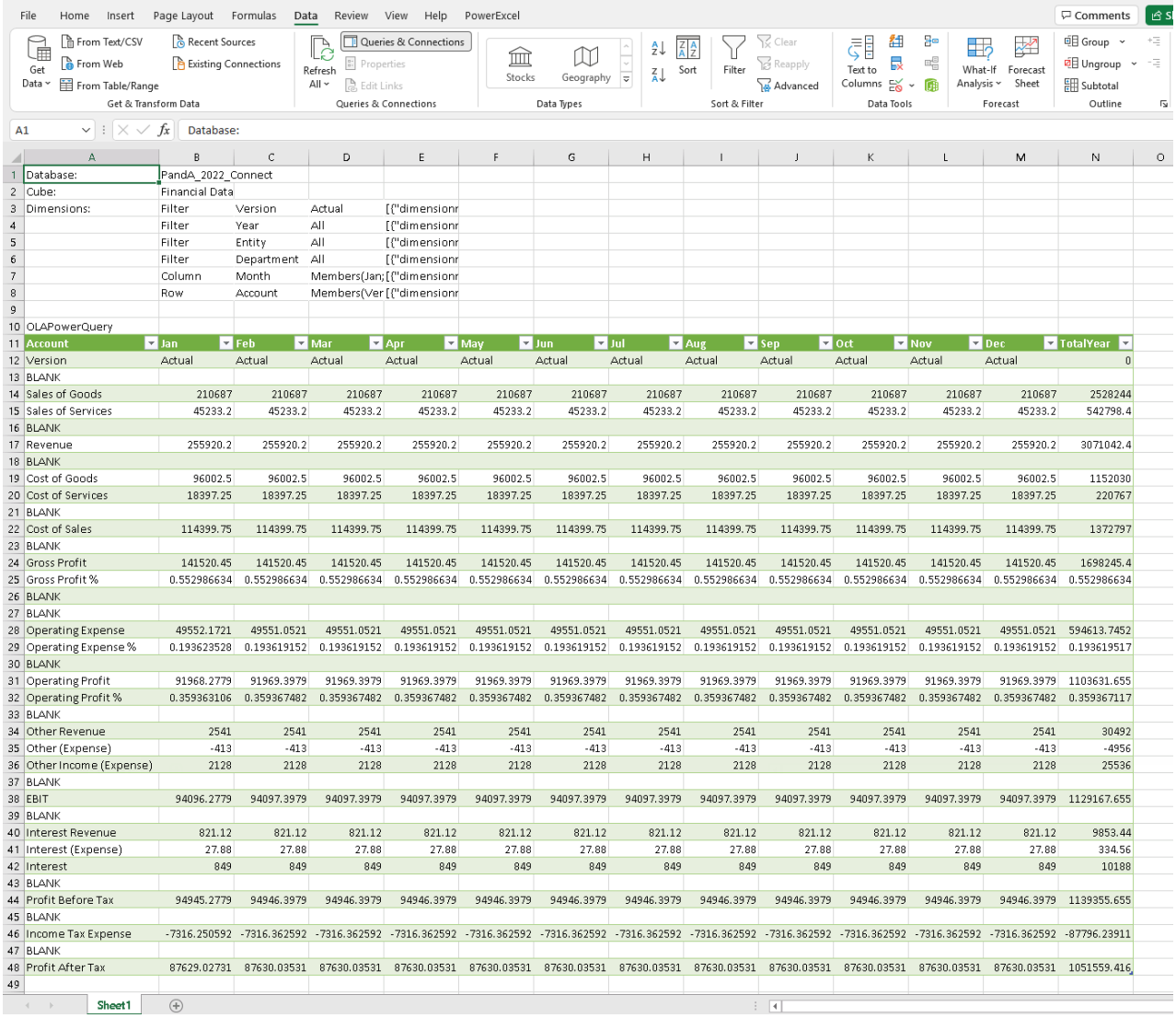
- Click **OK** to apply changes and exit the Filter box.
  Back in the Olation – Power Query Editor, notice that the table is updated.

  Note: You will see in the Olation – Power Query Editor a list of actions performed. Look at the applied steps section: notice the action we just performed, i.e., **Filtered Rows** (see where arrow points in the image below).

  Note: You can also rename the actions or steps.
  To do this: right-click on the step/action→ select **Rename** option→type the <**new name**>.



- Once you click on the **Close & Load** command icon, you will see that the changes have taken effect in the PowerExcel Slice (as shown below). Notice that the detail *Operating Expense accounts* (formerly in rows 26 to 34) no longer appear in the PowerExcel Slice.

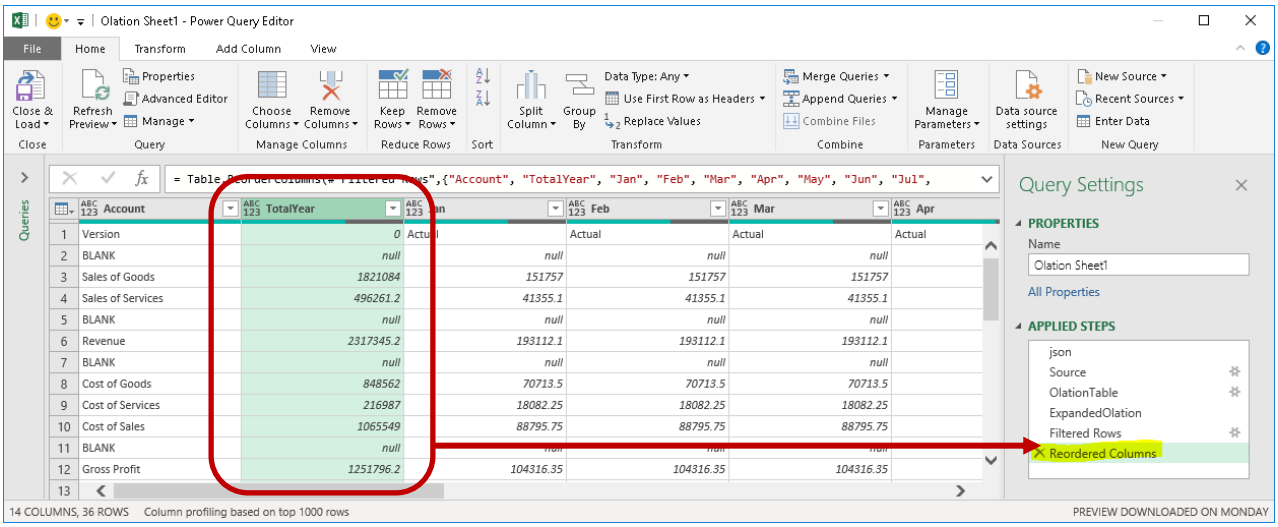


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Database:	PandA_2022_Connect													
2	Cube:	Financial Data													
3	Dimensions:	Filter	Version	Actual	[{"dimensionr										
4		Filter	Year	All	[{"dimensionr										
5		Filter	Entity	All	[{"dimensionr										
6		Filter	Department	All	[{"dimensionr										
7		Column	Month	Members(Jan;	[{"dimensionr										
8		Row	Account	Members(Ver	[{"dimensionr										
9															
10	OLAPowerQuery														
11	Account	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TotalYear	
12	Version	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	0	
13	BLANK														
14	Sales of Goods	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	2528244	
15	Sales of Services	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	542798.4	
16	BLANK														
17	Revenue	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	3071042.4	
18	BLANK														
19	Cost of Goods	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	1152030	
20	Cost of Services	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	220767	
21	BLANK														
22	Cost of Sales	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	1372797	
23	BLANK														
24	Gross Profit	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	1698245.4	
25	Gross Profit %	0.552986634	0.552986634	0.552986634	0.552986634	0.552986634	0.552986634	0.552986634	0.552986634	0.552986634	0.552986634	0.552986634	0.552986634	0.552986634	
26	BLANK														
27	BLANK														
28	Operating Expense	49552.1721	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	594613.7452	
29	Operating Expense %	0.193623528	0.193619152	0.193619152	0.193619152	0.193619152	0.193619152	0.193619152	0.193619152	0.193619152	0.193619152	0.193619152	0.193619152	0.193619517	
30	BLANK														
31	Operating Profit	91968.2779	91969.3979	91969.3979	91969.3979	91969.3979	91969.3979	91969.3979	91969.3979	91969.3979	91969.3979	91969.3979	91969.3979	1103631.655	
32	Operating Profit %	0.359363106	0.359367482	0.359367482	0.359367482	0.359367482	0.359367482	0.359367482	0.359367482	0.359367482	0.359367482	0.359367482	0.359367482	0.359367117	
33	BLANK														
34	Other Revenue	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	30492	
35	Other (Expense)	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	-4956	
36	Other Income (Expense)	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	25536	
37	BLANK														
38	EBIT	94096.2779	94097.3979	94097.3979	94097.3979	94097.3979	94097.3979	94097.3979	94097.3979	94097.3979	94097.3979	94097.3979	94097.3979	1129167.655	
39	BLANK														
40	Interest Revenue	821.12	821.12	821.12	821.12	821.12	821.12	821.12	821.12	821.12	821.12	821.12	821.12	9853.44	
41	Interest (Expense)	27.88	27.88	27.88	27.88	27.88	27.88	27.88	27.88	27.88	27.88	27.88	27.88	334.56	
42	Interest	849	849	849	849	849	849	849	849	849	849	849	849	10188	
43	BLANK														
44	Profit Before Tax	94945.2779	94946.3979	94946.3979	94946.3979	94946.3979	94946.3979	94946.3979	94946.3979	94946.3979	94946.3979	94946.3979	94946.3979	1139355.655	
45	BLANK														
46	Income Tax Expense	-7316.250592	-7316.362592	-7316.362592	-7316.362592	-7316.362592	-7316.362592	-7316.362592	-7316.362592	-7316.362592	-7316.362592	-7316.362592	-7316.362592	-87796.23911	
47	BLANK														
48	Profit After Tax	87629.02731	87630.03531	87630.03531	87630.03531	87630.03531	87630.03531	87630.03531	87630.03531	87630.03531	87630.03531	87630.03531	87630.03531	1051559.416	
49															

9. For our next modification, move the **Total Year** Aggregate Member for the *Month* dimension to the beginning of the Columns.

   To do this:

   - In the Queries & Connections sidebar, double-click on a query to access the **Olation – Power Query Editor**.
   - Drag and drop the **Total Year** column just before **Jan**.
   - Again, you will see the step listed (**Reordered Columns**)



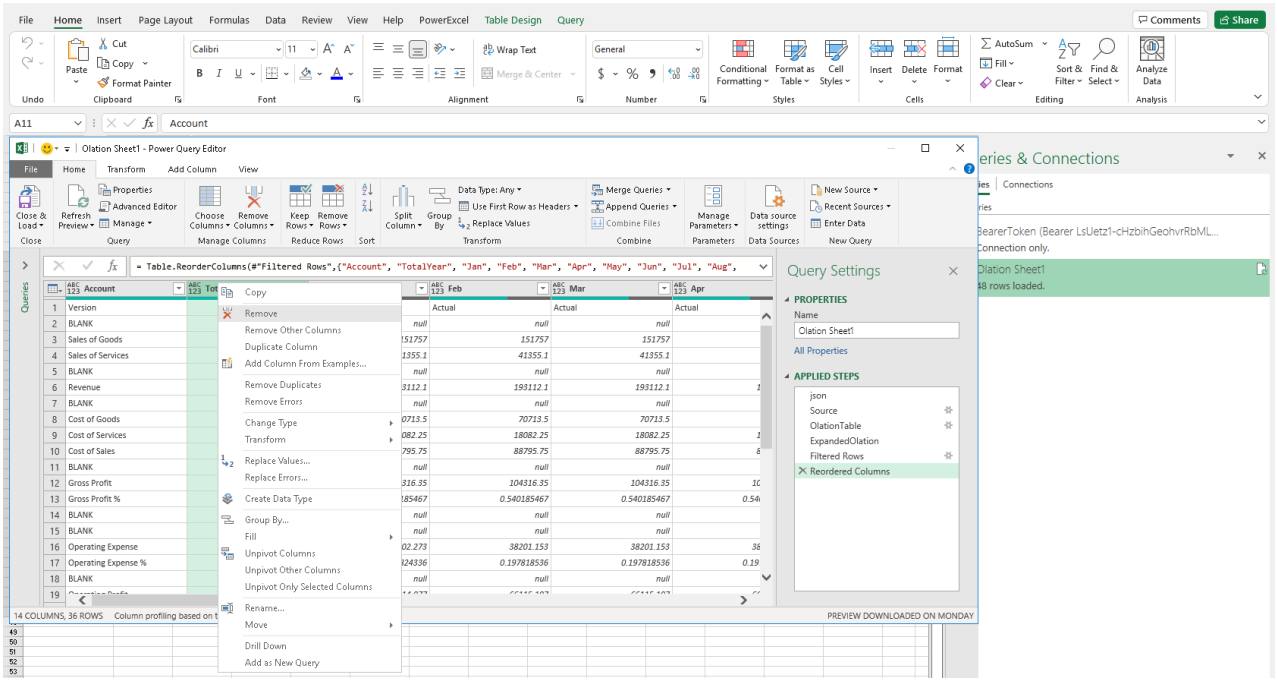
- Click **Close & Load** to update the PowerExcel Slice.
  Now the aggregate Member *Total Year*, which rolls up all individual months, appears in the first column of the Power Query Table.

	A	B	C	D	E	F	G	H
1	Database:	PandA_2022_Connect						
2	Cube:	Financial Data						
3	Dimensions:	Filter	Version	Actual	[{"dimensionnam			
4		Filter	Year	All	[{"dimensionnam			
5		Filter	Entity	All	[{"dimensionnam			
6		Filter	Department	All	[{"dimensionnam			
7		Column	Month	Members(Jan;Fe	[{"dimensionnam			
8		Row	Account	Members(Versio	[{"dimensionnam			
9								
10	OLAPowerQuery							
11	**Account**	**TotalYear**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**
12	Version	0	Actual	Actual	Actual	Actual	Actual	Actual
13	BLANK							
14	Sales of Goods	1821084	151757	151757	151757	151757	151757	151757
15	Sales of Services	496261.2	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1
16	BLANK							
17	Revenue	2317345.2	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1
18	BLANK							
19	Cost of Goods	848562	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5
20	Cost of Services	216987	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25
21	Cost of Sales	1065549	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75
22	BLANK							
23	Gross Profit	1251796.2	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35
24	Gross Profit %	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467
25	BLANK							
26	BLANK							
27	Operating Expense	458414.956	38202.273	38201.153	38201.153	38201.153	38201.153	38201.153
28	Operating Expense %	0.19781902	0.197824336	0.197818536	0.197818536	0.197818536	0.197818536	0.197818536
29	BLANK							
30	Operating Profit	793381.244	66114.077	66115.197	66115.197	66115.197	66115.197	66115.197
31	Operating Profit %	0.342366448	0.342361131	0.342366931	0.342366931	0.342366931	0.342366931	0.342366931
32	BLANK							
33	Other Revenue	24112.8	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4
34	Other (Expense)	-2801.4	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45
35	Other Income (Expense)	21311.4	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95
36	BLANK							
37	EBIT	814692.644	67890.027	67891.147	67891.147	67891.147	67891.147	67891.147
38	BLANK							
39	Interest Revenue	8558.64	713.22	713.22	713.22	713.22	713.22	713.22
40	Interest (Expense)	1133.28	94.44	94.44	94.44	94.44	94.44	94.44
41	Interest	9691.92	807.66	807.66	807.66	807.66	807.66	807.66
42	BLANK							
43	Profit Before Tax	824384.564	68697.687	68698.807	68698.807	68698.807	68698.807	68698.807
44	BLANK							
45	Income Tax Expense	-81440.59481	-6786.613567	-6786.725567	-6786.725567	-6786.725567	-6786.725567	-6786.725567
46	BLANK							
47	Profit After Tax	742943.9692	61911.07343	61912.08143	61912.08143	61912.08143	61912.08143	61912.08143

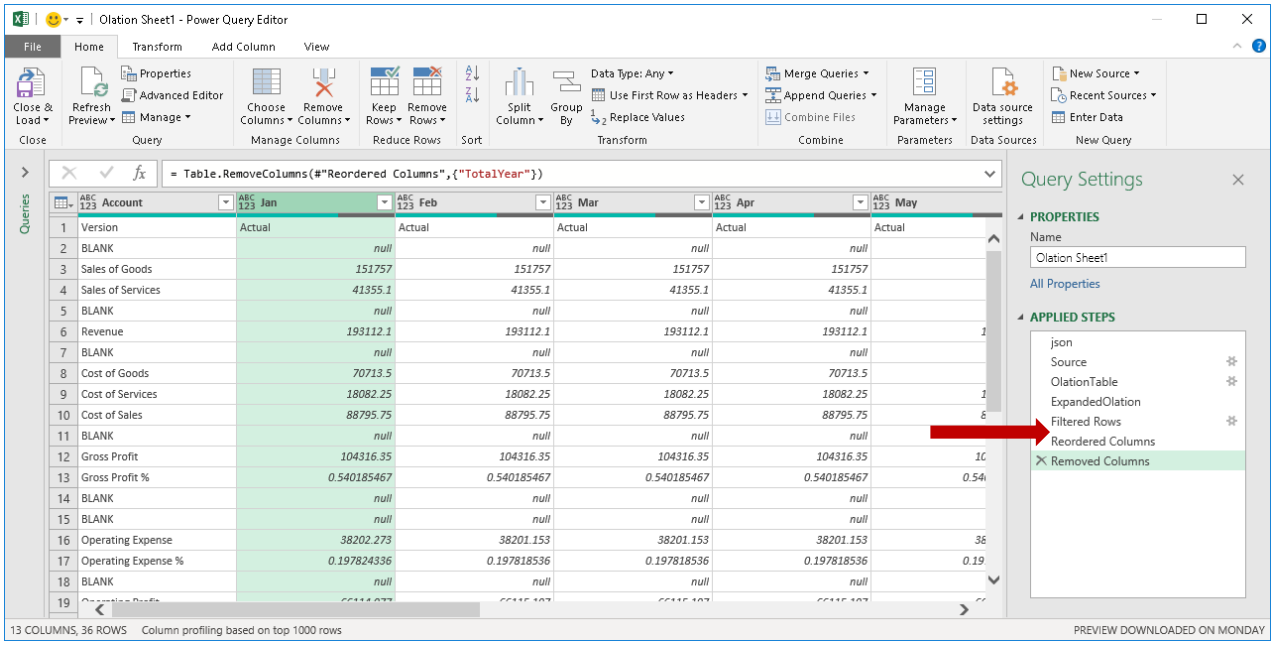
10. For the third modification, we will delete a column. For this example, let us delete the aggregate *Month* member **Total Year**.

    To do this:

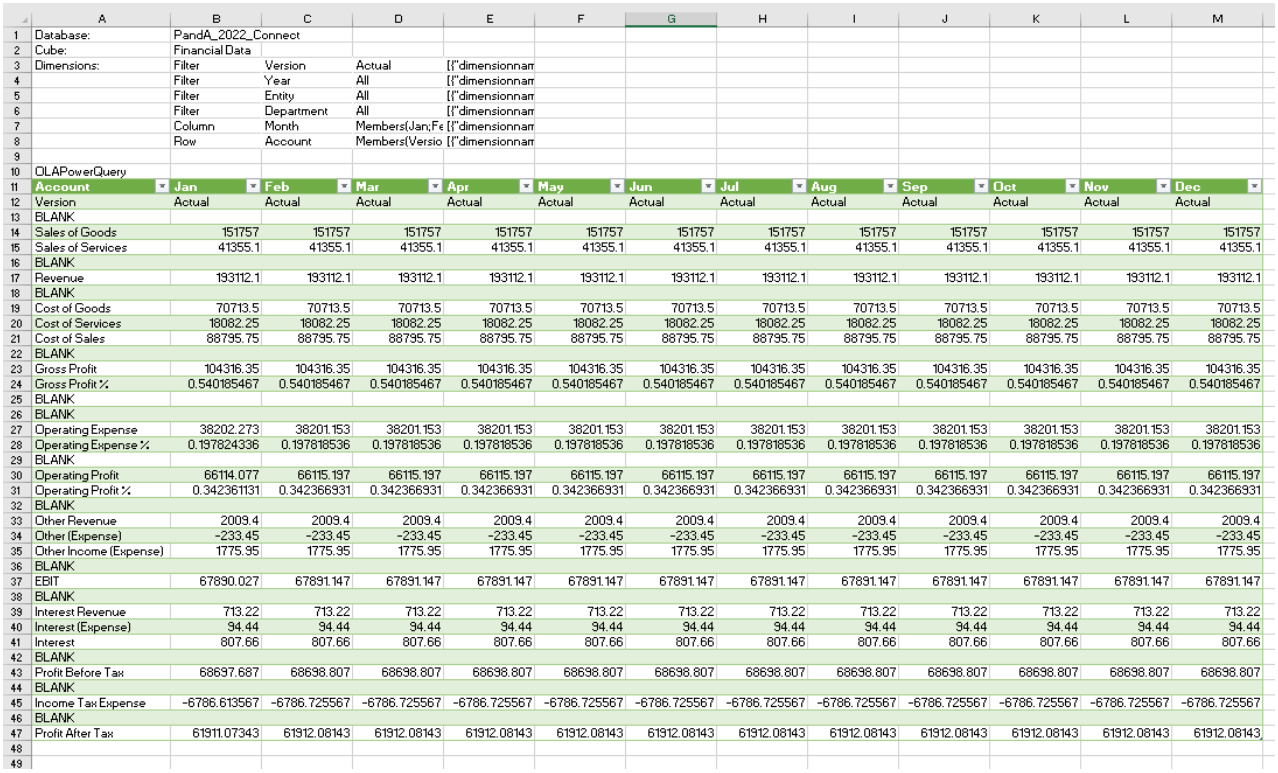
    - In the Queries & Connections sidebar, double-click on a query to access the **Olation – Power Query Editor**.
    - Right-click on the **Total Year** column then select **Remove**.



    - The table is once again updated and the action/step listed (**Removed Columns**).



- Click **Close & Load** to update the PowerExcel Slice.
  Now you have formatted your PowerExcel Slice to show only the individual months along the columns.



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA_2022_Connect											
2	Cube:	Financial Data											
3	Dimensions:	Filter	Version	Actual	[{"dimensionnam								
4		Filter	Year	All	[{"dimensionnam								
5		Filter	Entity	All	[{"dimensionnam								
6		Filter	Department	All	[{"dimensionnam								
7		Column	Month	Members(Jan:Fe	[{"dimensionnam								
8		Row	Account	Members(Versio	[{"dimensionnam								
9													
10	OLAPowerQuery												
11	Account	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	Version	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual
13	BLANK												
14	Sales of Goods	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757	151757
15	Sales of Services	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1	41355.1
16	BLANK												
17	Revenue	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1	193112.1
18	BLANK												
19	Cost of Goods	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5	70713.5
20	Cost of Services	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25	18082.25
21	Cost of Sales	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75	88795.75
22	BLANK												
23	Gross Profit	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35	104316.35
24	Gross Profit %	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467	0.540185467
25	BLANK												
26	BLANK												
27	Operating Expense	38202.273	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153	38201.153
28	Operating Expense %	0.197824336	0.197818536	0.197818536	0.197818536	0.197818536	0.197818536	0.197818536	0.197818536	0.197818536	0.197818536	0.197818536	0.197818536
29	BLANK												
30	Operating Profit	66114.077	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197	66115.197
31	Operating Profit %	0.342361131	0.342366931	0.342366931	0.342366931	0.342366931	0.342366931	0.342366931	0.342366931	0.342366931	0.342366931	0.342366931	0.342366931
32	BLANK												
33	Other Revenue	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4	2009.4
34	Other (Expense)	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45	-233.45
35	Other Income (Expense)	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95	1775.95
36	BLANK												
37	EBIT	67890.027	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147	67891.147
38	BLANK												
39	Interest Revenue	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22	713.22
40	Interest (Expense)	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44	94.44
41	Interest	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66	807.66
42	BLANK												
43	Profit Before Tax	68697.687	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807	68698.807
44	BLANK												
45	Income Tax Expense	-6786.613567	-6786.725567	-6786.725567	-6786.725567	-6786.725567	-6786.725567	-6786.725567	-6786.725567	-6786.725567	-6786.725567	-6786.725567	-6786.725567
46	BLANK												
47	Profit After Tax	61911.07343	61912.08143	61912.08143	61912.08143	61912.08143	61912.08143	61912.08143	61912.08143	61912.08143	61912.08143	61912.08143	61912.08143
48													
49													

3. The Subset Tab and the Calculations Tab

Subsets are a very important feature in PowerExcel, whether they are “Custom” Subsets, created by users in PowerExcel—as explained in this section—or created in Olation®, the modeling engine that PowerExcel reaches for users to plan, analyze and report on data.

What are Subsets and why are they important? in brief, a Subset is a saved list of Dimension members. The importance of Subsets is that they allow users to select saved lists with a click or two to create reports, templates, board books and the like in Excel. In other words, rather than navigate to select the list of Members with each report, etc., the Subset is at hand for immediate access, saving time and effort in PowerExcel.

3.1 Default Subsets

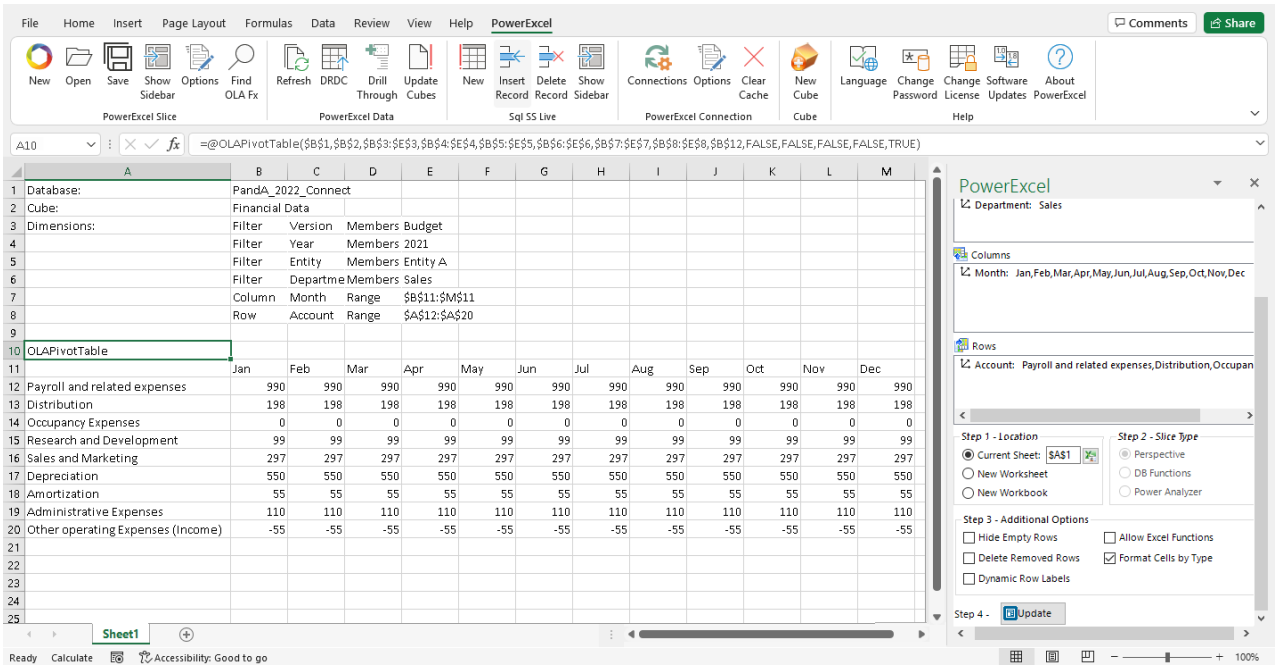
Before describing how a PowerExcel user can create Custom Subsets on his or her own, we note that every Dimension—or, more specifically, every Dimension that has at least one Hierarchy—includes Default Subsets: **ALL, AGGREGATES,** and **DETAILS**, which are described as follows.

(It is worth mentioning again here that the Subset tab becomes available in the Columns and Rows selection boxes in PowerExcel; the Subset tab does not show in the Filter selection box. Note as well that these Default Subset will appear, as below, in ALL CAPS in the Select Members for [Dimension name] dialog when Columns or Rows are double-clicked.

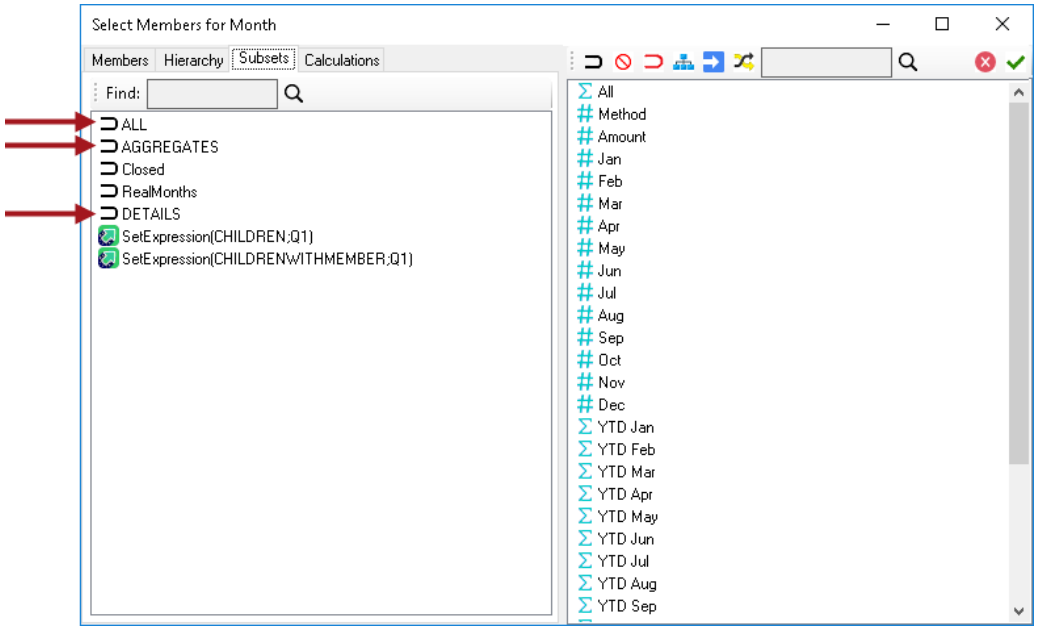
ALL	Returns **ALL Members** in Rows or Columns in the PowerExcel slice.
AGGREGATES	Returns **AGGREGATE Members** in Rows or Columns in the PowerExcel slice
DETAILS	Returns **DETAIL Members** in Rows or Columns in the PowerExcel slice

To show an example of these default Subsets and how choosing any of them will show in a Slice, you can proceed with the following example:

1. First, create an example PowerExcel Slice—the one shown in the next image, made with the Perspective Slice Type, shows selected Filters; *Month* along Columns, and; *Accounts* in the Rows.

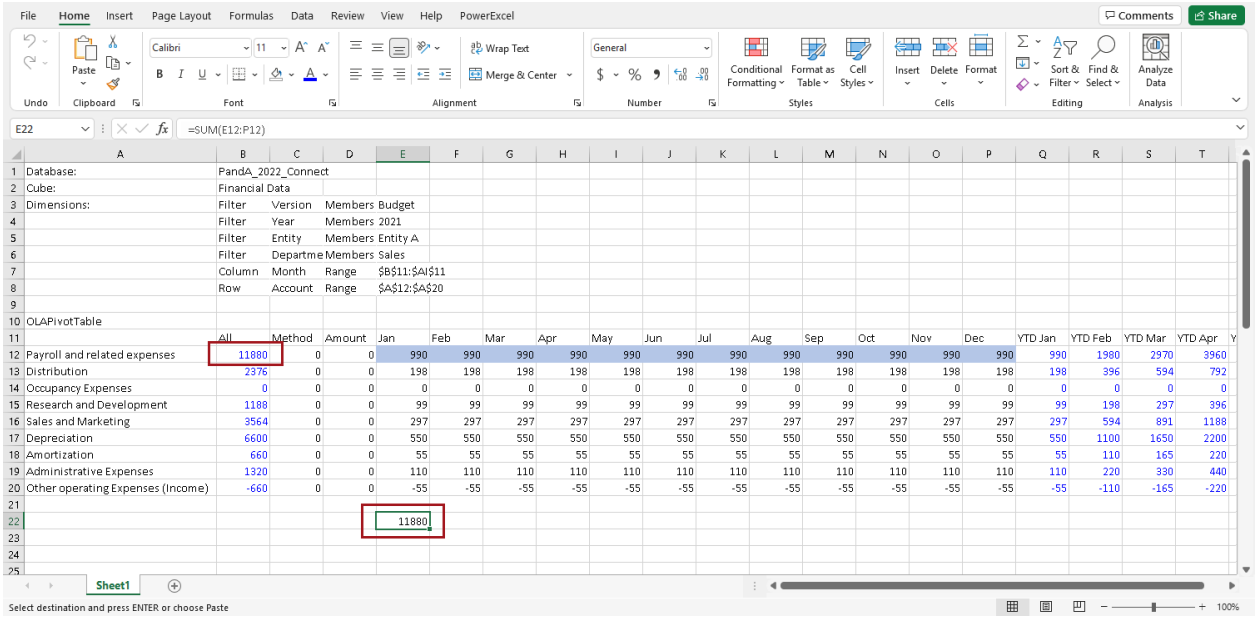


2. Double-clicking **Month** in the Columns box brings up the *Select Members for Month* dialog; click on the **Subsets tab**—note the default Subsets that appear, indicated by the red arrows in the following image.



Before examining what each of these default Subsets mean we will just make note at this point of the other Subset selections: *Closed* and *RealMonths*, which like the default Subsets have a horseshoe-shaped icon to the left, are Subsets that have been defined in the Olation model (for a description of how these Subsets are created, see the *Nexus Studio* manual); the other Subsets, beginning with "SetExpression", are the subject of the next section—*User-Defined Subsets in PowerExcel*.

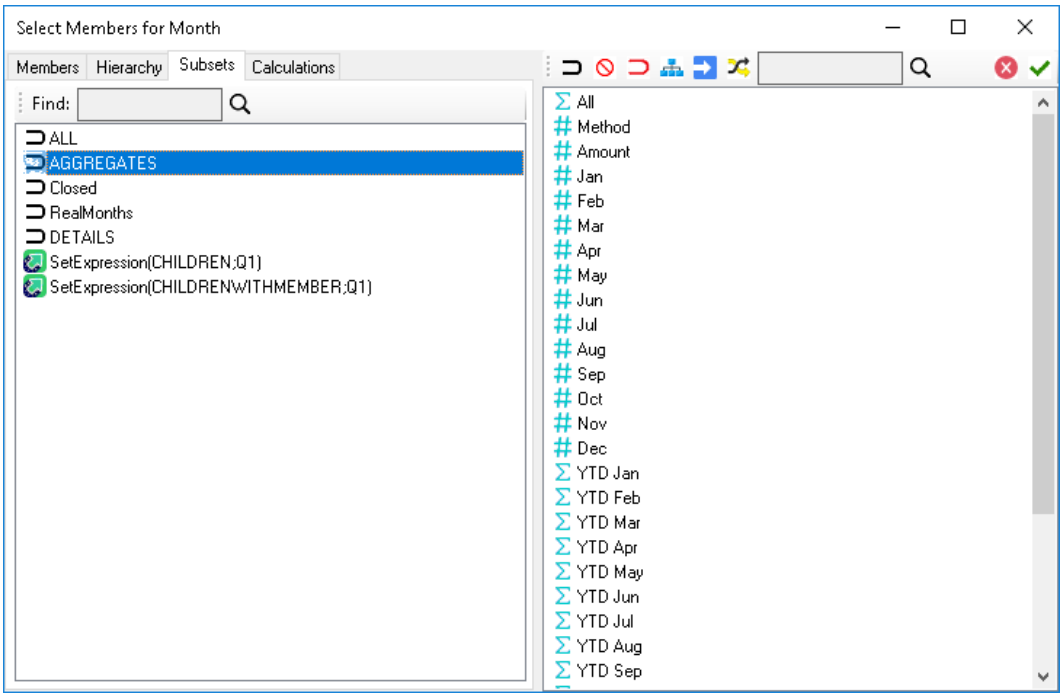
3. Select **ALL** on the left, and use the red horseshoe icon (*Clear and Copy Selected Members*), to place ALL on the right. Click the green checkmark, and then Update in the PowerExcel pane on the right. As shown in the next image, the Slice now shows in Columns every Member from the *Month* dimension. You would need to scroll right to see addition YTD figures, as well as *Q1*, *Q2*, *Q3*, *Q4*, and *Total Year*—i.e., the full set of **ALL** Members for this *Month* dimension.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Database:	PandA_2022_Connect																		
2	Cube:	Financial Data																		
3	Dimensions:	Filter	Version	Members	Budget															
4		Filter	Year	Members	2021															
5		Filter	Entity	Members	Entity A															
6		Filter	Departme	Members	Sales															
7		Column	Month	Range	$B$11:$AI$11															
8		Row	Account	Range	$A$12:$A$20															
9																				
10	OLAPivotTable																			
11		All	Method	Amount	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Jan	YTD Feb	YTD Mar	YTD Apr
12	Payroll and related expenses	11880	0	0	990	990	990	990	990	990	990	990	990	990	990	990	990	1980	2970	3960
13	Distribution	2376	0	0	198	198	198	198	198	198	198	198	198	198	198	198	198	396	594	792
14	Occupancy Expenses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Research and Development	1188	0	0	99	99	99	99	99	99	99	99	99	99	99	99	99	198	297	396
16	Sales and Marketing	3564	0	0	297	297	297	297	297	297	297	297	297	297	297	297	297	594	891	1188
17	Depreciation	6600	0	0	550	550	550	550	550	550	550	550	550	550	550	550	550	1100	1650	2200
18	Amortization	660	0	0	55	55	55	55	55	55	55	55	55	55	55	55	55	110	165	220
19	Administrative Expenses	1320	0	0	110	110	110	110	110	110	110	110	110	110	110	110	110	220	330	440
20	Other operating Expenses (Income)	-660	0	0	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-110	-165	-220
21																				
22					11880															
23																				
24																				
25																				

Before we consider the AGGREGATES Subset selection it makes sense to point out something in this spreadsheet—the fact that, in this model at least, there is not only a default ALL Subset, but also an *All* Member. This *All* Member is defined in the Olation model database; it is a sum of all the Detail MEMBERS, which in this case comprise the calendar months *Jan* through *Dec*. Note that in the image above the *All* Member for Row 12, in Cell B12, for *Payroll and other expenses*, is 11800 (boxed in red); Cell E22 (also boxed in red) validates this calculation, i.e., showing the SUM of Cells E12:P12 (blue highlighted).

4. Turning our attention to the AGGREGATES Subset:
   Again, **select Cell A10**, where the OLAPivotTable function is, governing what data appears in the Slice: in the PowerExcel pane on the right, double-click on *Month* in the Columns box. Select the **Subset tab**: note that literally ALL Members now appear on the right-hand side, as it is the current selection (see next image).



5. Now select **AGGREGATES** on the left, and replace (again, using the *Clear and Copy Selected Members*) the Members on the right with that Subset. Click the green checkmark and then click Update. The AGGREGATE Members now appear in Columns.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Database:	PandA_2022_Connect																		
2	Cube:	Financial Data																		
3	Dimensions:	Filter	Version	Members	Budget															
4		Filter	Year	Members	2021															
5		Filter	Entity	Members	Entity A															
6		Filter	Departme	Members	Sales															
7		Column	Month	Range	$B$11:$T$11															
8		Row	Account	Range	$A$12:$A$20															
9																				
10	OLAPivotTable																			
11		All	YTD Jan	YTD Feb	YTD Mar	YTD Apr	YTD May	YTD Jun	YTD Jul	YTD Aug	YTD Sep	YTD Oct	YTD Nov	YTD Dec	Q1	Q2	Q3	Q4	TotalYear	Closed
12	Payroll and related expenses	11880	990	1980	2970	3960	4950	5940	6930	7920	8910	9900	10890	11880	2970	2970	2970	2970	11880	4950
13	Distribution	2376	198	396	594	792	990	1188	1386	1584	1782	1980	2178	2376	594	594	594	594	2376	990
14	Occupancy Expenses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Research and Development	1188	99	198	297	396	495	594	693	792	891	990	1089	1188	297	297	297	297	1188	495
16	Sales and Marketing	3564	297	594	891	1188	1485	1782	2079	2376	2673	2970	3267	3564	891	891	891	891	3564	1485
17	Depreciation	6600	550	1100	1650	2200	2750	3300	3850	4400	4950	5500	6050	6600	1650	1650	1650	1650	6600	2750
18	Amortization	660	55	110	165	220	275	330	385	440	495	550	605	660	165	165	165	165	660	275
19	Administrative Expenses	1320	110	220	330	440	550	660	770	880	990	1100	1210	1320	330	330	330	330	1320	550
20	Other operating Expenses (Income)	-660	-55	-110	-165	-220	-275	-330	-385	-440	-495	-550	-605	-660	-165	-165	-165	-165	-660	-275

6. Finally, to show what occurs when we pick the **DETAILS Subset**:
Proceed in like manner as above, select the **DETAILS** Subset; bring that Subset to the right, and click the green checkmark, then Update. The DETAIL Members for the *Month* dimension appear in the Columns. Note that there are *Method* and *Amount* Members in Columns B and C and a Member called *Agg* in Column P—these are special Members incorporated into the model, which render as Detail Members.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Database:	PandA_2022_Connect														
2	Cube:	Financial Data														
3	Dimensions:	Filter	Version	Members	Budget											
4		Filter	Year	Members	2021											
5		Filter	Entity	Members	Entity A											
6		Filter	Departme	Members	Sales											
7		Column	Month	Range	$B$11:$P$11											
8		Row	Account	Range	$A$12:$A$20											
9																
10	OLAPivotTable															
11		Method	Amount	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Agg
12	Payroll and related expenses	0	0	990	990	990	990	990	990	990	990	990	990	990	990	0
13	Distribution	0	0	198	198	198	198	198	198	198	198	198	198	198	198	0
14	Occupancy Expenses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Research and Development	0	0	99	99	99	99	99	99	99	99	99	99	99	99	0
16	Sales and Marketing	0	0	297	297	297	297	297	297	297	297	297	297	297	297	0
17	Depreciation	0	0	550	550	550	550	550	550	550	550	550	550	550	550	0
18	Amortization	0	0	55	55	55	55	55	55	55	55	55	55	55	55	0
19	Administrative Expenses	0	0	110	110	110	110	110	110	110	110	110	110	110	110	0
20	Other operating Expenses (Income)	0	0	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	0

3.2 User-Created Subsets

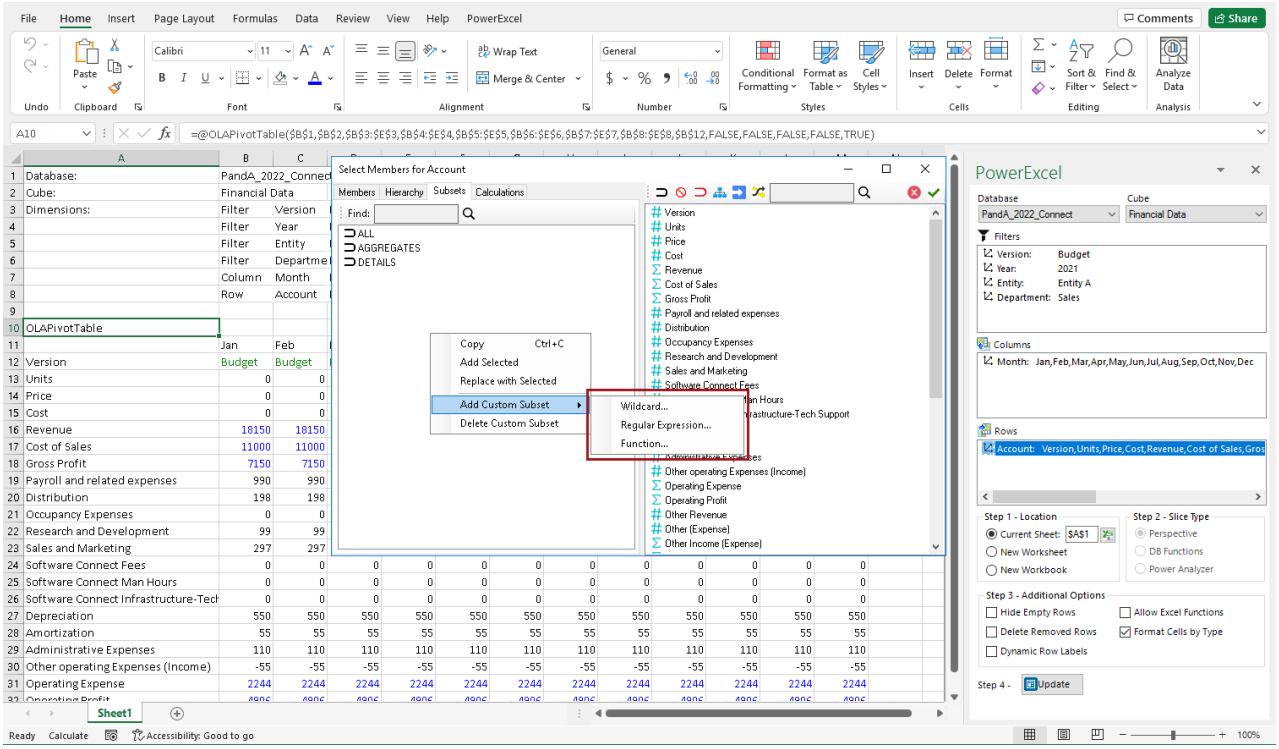
We are now in a position to discuss User-created Subsets. User-created Subsets are defined directly in PowerExcel, via the Subset tab, which is a great option if a subset is specific to a user's interest; he or she may need that subset frequently for setting up reports with the component Dimension members. Keep in mind that, as the Subset is defined locally, it is not shared with other users. (In order to share a Subset across users, it would be better to create/save the Subset in the data model, where all users can reach it.)

The three types of User-created Subsets are as follow:

Wildcard…	Returns a list of Members that satisfies the definition of the Wildcard expression.
Regular Expression…	Returns a list of Members that satisfies the definition of the Regular Expression.
Function…	Returns a list of Members that satisfies the selected Multidimensional Set Expression

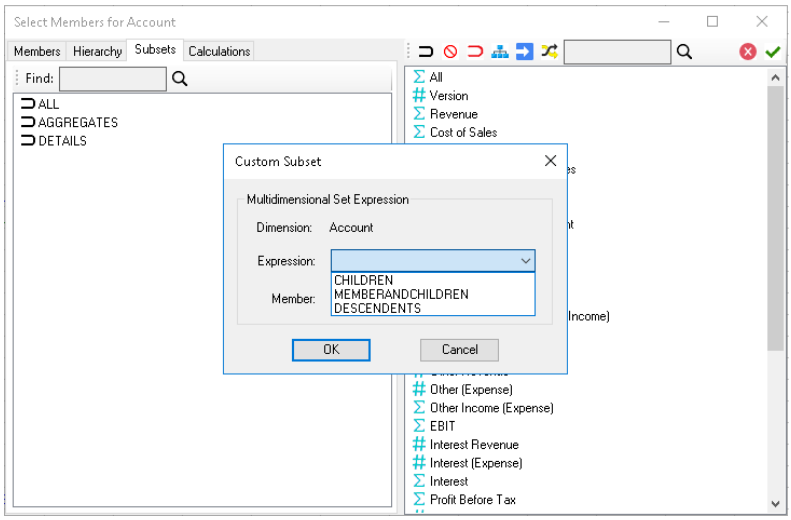
The procedure to create the Subset based on any of the above selections is the same. As shown in the following image:

1. First, create a **PowerExcel Slice**—the one below shows selected Filters; *Month* along Columns (*Jan* through *Dec* are selected), and; all *Accounts* in Rows.
2. **Double-click** on a Dimension in **Columns** or **Rows**. (Note: keep in mind that the Subset tab appears only for Dimensions placed in Columns or Rows.) In the example below, Accounts, in Rows, was chosen.
3. In the *Select Members for* Accounts (in this example), click on the **Subset tab**.
4. **Right-click in the blank area** below the Default Subsets (per previous section: ALL, AGGREGATES, DETAILS)—note that a pop-up window (boxed in red in the following image) appears, allowing you to select **Add Custom Subset**. (There is also a selection for Delete Custom Subset.) The selections for a Customer Subset appear: **Wildcard…**; **Regular Expression…**; **Function…**.



Function…

The **Function…** selection is the simplest to explain, and currently there are 3 selections from the drop-down menu: **CHILDREN**; **MEMBERANDCHILDREN**, and; **DESCENDENTS**, shown in the following image.

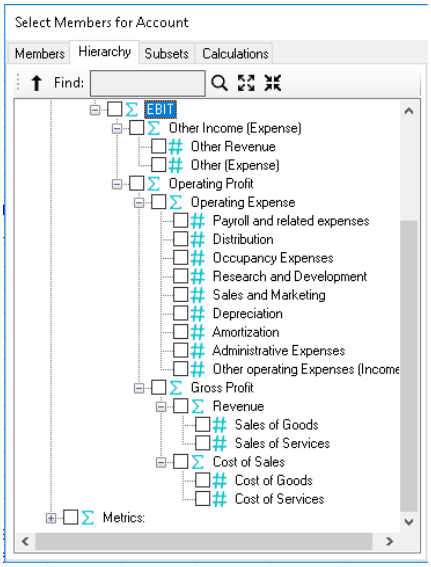


The selections will return Members as follows:

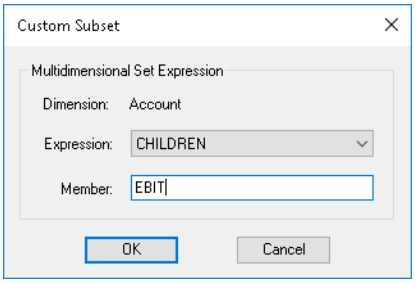
CHILDREN	Returns Child Members of the selected Member's immediate hierarchy
MEMBERAND CHILDREN	Returns the selected Member and Child Members of its immediate hierarchy
DESCENDENTS	Returns all Members—including sub-hierarchies and their Member—that aggregate into the selected Member

Example: CHILDREN

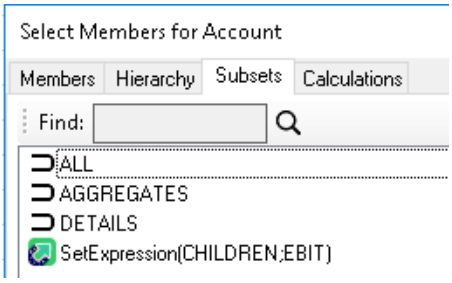
We can now take a look at an example of what each of the **Functions…** selections will return, in consideration of the *Accounts* dimension, and a portion of its hierarchy structure, which shows on the left-hand side of the Select Members for Account window, shown below:



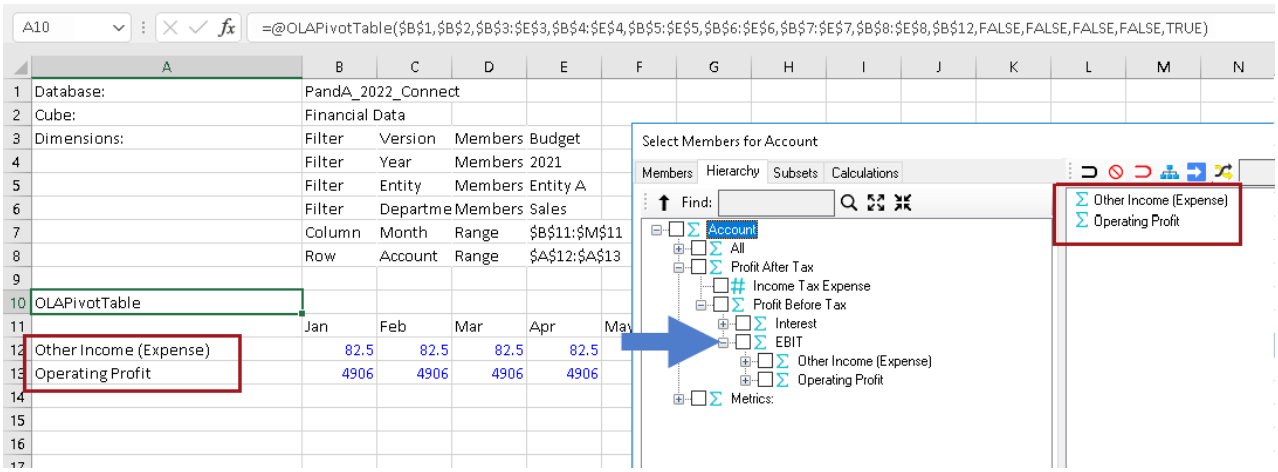
- In the Subset tab, right-click in the blank area and select **Add Custom Subset**; select **Function…**, then chose **CHILDREN** from the drop-down.
  Type **EBIT**. The window will look as follows:



- Click OK. Note that the Custom Subset is now listed in the Subset tab, as below: **SetExpression(CHILDREN;EBIT)**, with a Custom Subset icon to the left.



- By using this Custom Subset in Rows in an updated PowerExcel Slice, the result will be as follows (see boxed areas), showing *Other Income (Expenses)* and *Operating Profit*, which are the 2 Child Members of EBIT's immediate hierarchy (blue arrow).



Example: CHILDREN

- Follow the same steps as above to create a MEMBERANDCHILDREN Custom Subset for EBIT, the result of which will be a selection that looks as follows:

SetExpression(CHILDRENWITHMEMBER;EBIT)

- Upon making this Custom Subset the selection for Rows and Updating the PowerExcel Slice, the spreadsheet will look as follows\:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA_2022_Connect											
2	Cube:	Financial Data											
3	Dimensions:	Filter	Version	Members	Budget								
4		Filter	Year	Members	2021								
5		Filter	Entity	Members	Entity A								
6		Filter	Departme	Members	Sales								
7		Column	Month	Range	$B$11:$M$11								
8		Row	Account	Range	$A$12:$A$14								
9													
10	OLAPivotTable												
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	EBIT	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5
13	Other Income (Expense)	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5
14	Operating Profit	4906	4906	4906	4906	4906	4906	4906	4906	4906	4906	4906	4906
15													

Example: DESCENDENTS

- Again, follow the same steps to create a DESCENDENTS Custom Subset for EBIT, the result of which will be a selection that looks as follows.

SetExpression(DESCENDENTS;EBIT)

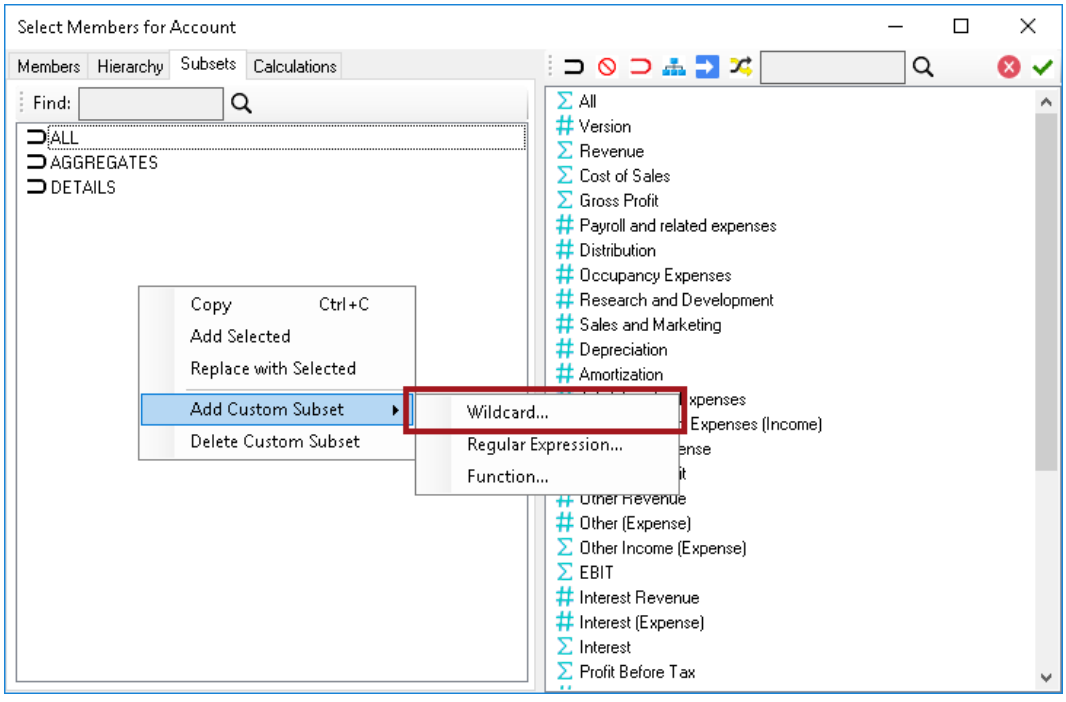
- Upon making this Custom Subset the selection for Rows and Updating the PowerExcel Slice, the spreadsheet will look as follows (reference the Account hierarchy a few pages back to validate all the DESCENDENT Members):

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA_2022_Connect											
2	Cube:	Financial Data											
3	Dimensions:	Filter	Version	Members	Budget								
4		Filter	Year	Members	2021								
5		Filter	Entity	Members	Entity A								
6		Filter	Departme	Members	Sales								
7		Column	Month	Range	$B$11:$M$11								
8		Row	Account	Range	$A$12:$A$32								
9													
10	OLAPivotTable												
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	Other Income (Expense)	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5
13	Other Revenue	110	110	110	110	110	110	110	110	110	110	110	110
14	Other (Expense)	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5
15	Operating Profit	4906	4906	4906	4906	4906	4906	4906	4906	4906	4906	4906	4906
16	Operating Expense	2244	2244	2244	2244	2244	2244	2244	2244	2244	2244	2244	2244
17	Payroll and related expenses	990	990	990	990	990	990	990	990	990	990	990	990
18	Distribution	198	198	198	198	198	198	198	198	198	198	198	198
19	Occupancy Expenses	0	0	0	0	0	0	0	0	0	0	0	0
20	Research and Development	99	99	99	99	99	99	99	99	99	99	99	99
21	Sales and Marketing	297	297	297	297	297	297	297	297	297	297	297	297
22	Depreciation	550	550	550	550	550	550	550	550	550	550	550	550
23	Amortization	55	55	55	55	55	55	55	55	55	55	55	55
24	Administrative Expenses	110	110	110	110	110	110	110	110	110	110	110	110
25	Other operating Expenses (Income)	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55
26	Gross Profit	7150	7150	7150	7150	7150	7150	7150	7150	7150	7150	7150	7150
27	Revenue	18150	18150	18150	18150	18150	18150	18150	18150	18150	18150	18150	18150
28	Sales of Goods	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200
29	Sales of Services	4950	4950	4950	4950	4950	4950	4950	4950	4950	4950	4950	4950
30	Cost of Sales	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
31	Cost of Goods	6600	6600	6600	6600	6600	6600	6600	6600	6600	6600	6600	6600
32	Cost of Services	4400	4400	4400	4400	4400	4400	4400	4400	4400	4400	4400	4400

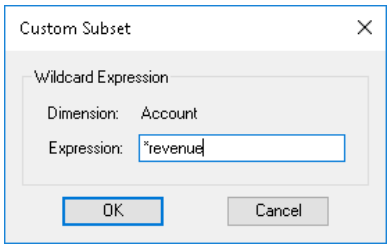
Wildcard…

The **Wildcard…** selection allow a PowerExcel user to type in one of several standard Wildcard characters—an asterisk (“*”), question mark (“?”), brackets (“[ ]”), etc.—to return a list of Members that satisfies the definition of the Wildcard expression.

- As with the Function… selection, in the *Select Members for [Dimension]* window (in our example, *Accounts*), on the left-hand side, right-click in the blank area; this time select **Add Custom Subset→Wildcard…** (shown in the following image)



- In the resulting Custom Subset dialog, the following example uses a leading asterisk to return Members that include *revenue*, i.e., the Wildcard expression: ***revenue**.



- After clicking OK, the Subset using that Wildcard expression will be listed on the left, as shown below:

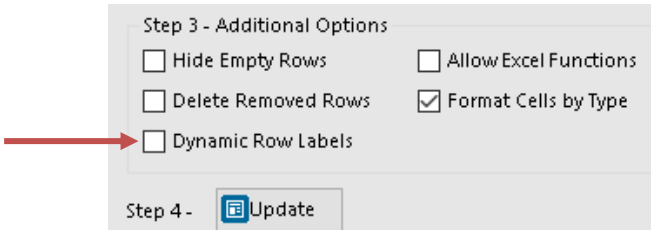
- Upon making this Wildcard Subset the selection for Rows and Updating the PowerExcel Slice, the spreadsheet will look as follows—note that Accounts with the expression "revenue" (capitalization is not required in the Wildcard search) are returned:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA_2022_Connect											
2	Cube:	Financial Data											
3	Dimensions:	Filter	Version	Members	Budget								
4		Filter	Year	Members	2021								
5		Filter	Entity	Members	Entity A								
6		Filter	Departme	Members	Sales								
7		Column	Month	Range	$B$11:$M$11								
8		Row	Account	Range	$A$12:$A$14								
9													
10	OLAPivotTable												
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	Revenue	18150	18150	18150	18150	18150	18150	18150	18150	18150	18150	18150	18150
13	Other Revenue	110	110	110	110	110	110	110	110	110	110	110	110
14	Interest Revenue	22	22	22	22	22	22	22	22	22	22	22	22
15													

Regular Expression… **Not Available for this version**

3.3 Dynamic Row (Labels)

It is appropriate to speak of the PowerExcel Slice option **Dynamic Row (Labels)** in this section concerning Subsets. Enabling Dynamic Row (Labels)—the checkbox shown in the next image, which is a detail of the bottom portion of the PowerExcel sidebar—ensures that if a new Member(s) is added to a Dimension, and if that Member(s) is part of a Subset (as will be shown), the Member(s) will appear when a workbook is refreshed or opened.



- Assume that a PowerExcel Slice was created with the SetExpression(DESCENDENTS;EBIT) selected as a Subset in Rows, as shown earlier. The Rows of the Slice looks as follows:

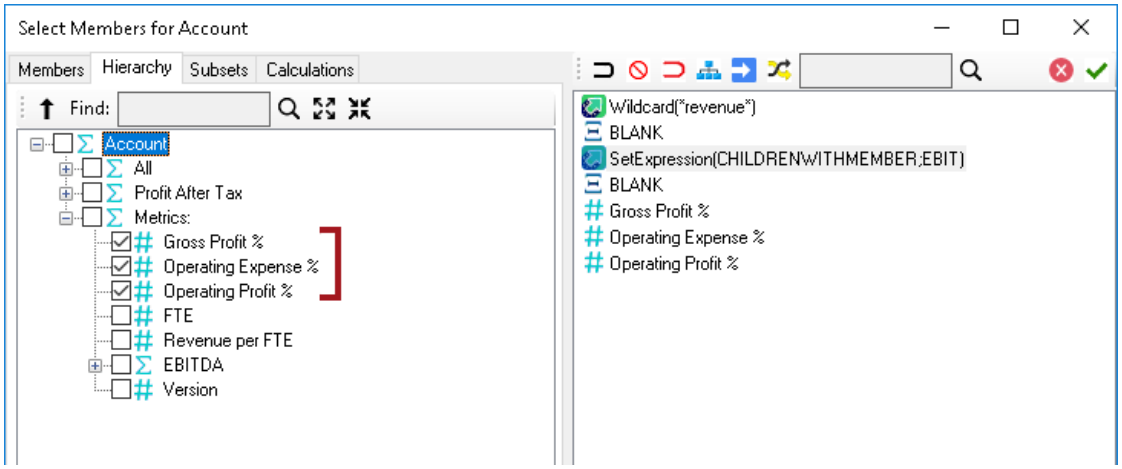
OLAPivotTable							
	Jan	Feb	Mar	Apr	May	Jun	Jul
Other Income (Expense)	82.5	82.5	82.5	82.5	82.5	82.5	82.5
Other Revenue	110	110	110	110	110	110	110
Other (Expense)	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5
Operating Profit	4906	4906	4906	4906	4906	4906	4906
Operating Expense	2244	2244	2244	2244	2244	2244	2244
Payroll and related expenses	990	990	990	990	990	990	990
Distribution	198	198	198	198	198	198	198
Occupancy Expenses	0	0	0	0	0	0	0
Research and Development	99	99	99	99	99	99	99
Sales and Marketing	297	297	297	297	297	297	297
Depreciation	550	550	550	550	550	550	550
Amortization	55	55	55	55	55	55	55
Administrative Expenses	110	110	110	110	110	110	110
Other operating Expenses (Income)	-55	-55	-55	-55	-55	-55	-55
Gross Profit	7150	7150	7150	7150	7150	7150	7150

- Assume next that a new Account was added—*Utilities*—which in the underlying model appears under *Administrative Expenses*. Upon refresh of the Slice (or reopening of a Slice), it will now look as follows (shading and bold font added):

21	Sales and Marketing	297	297	297	297	297	297	297
22	Depreciation	550	550	550	550	550	550	550
23	Amortization	55	55	55	55	55	55	55
24	Administrative Expenses	110	110	110	110	110	110	110
25	**UTILITIES**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
26	Other operating Expenses (Income)	-55	-55	-55	-55	-55	-55	-55
27	Gross Profit	7150	7150	7150	7150	7150	7150	7150
28	Revenue	18150	18150	18150	18150	18150	18150	18150

3.4 Combining Subset(s) and Selected Members in a Slice

PowerExcel allows users to combine Subsets and selected Members in the creation of a Slice, which provides great flexibility when building reports. The following image shows a *Select Members for Accounts* window with, on the right, two of the User-created Subsets from previous examples (a Wildcard and a SetExpression subset), with a BLANK row between them; then, following another BLANK row, three selected Members from the Metrics hierarchy (shown with bracket on the left).



When the Slice is updated to show these Accounts in rows, the worksheet will look as follows:

10	OLAPivotTable										
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	C
12	Revenue	18150	18150	18150	18150	18150	18150	18150	18150	18150	
13	Other Revenue	110	110	110	110	110	110	110	110	110	
14	Interest Revenue	22	22	22	22	22	22	22	22	22	
15											
16	EBIT	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5	4988.5	
17	Other Income (Expense)	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	
18	Operating Profit	4906	4906	4906	4906	4906	4906	4906	4906	4906	
19											
20	Gross Profit %	39%	39%	39%	39%	39%	39%	39%	39%	39%	
21	Operating Expense %	12%	12%	12%	12%	12%	12%	12%	12%	12%	
22	Operating Profit %	27%	27%	27%	27%	27%	27%	27%	27%	27%	

As with all PowerExcel Slices, this worksheet can be saved locally, or using the Save function, so that other users connected to the Cloud-based model can see it.

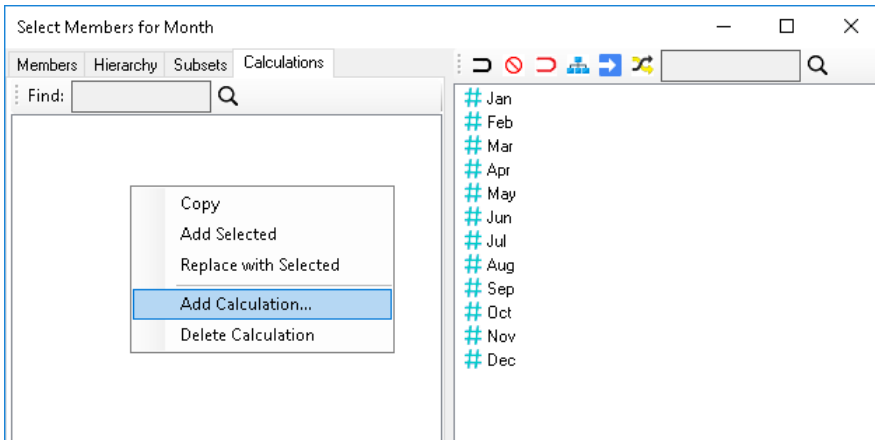
3.5 Calculations Tab

PowerExcel can perform on-the-fly aggregations on any axis (filter, row, column), which can then be used (and saved) in any report. Because these are aggregations, the specific calculations concern addition, subtraction and weighted addition.

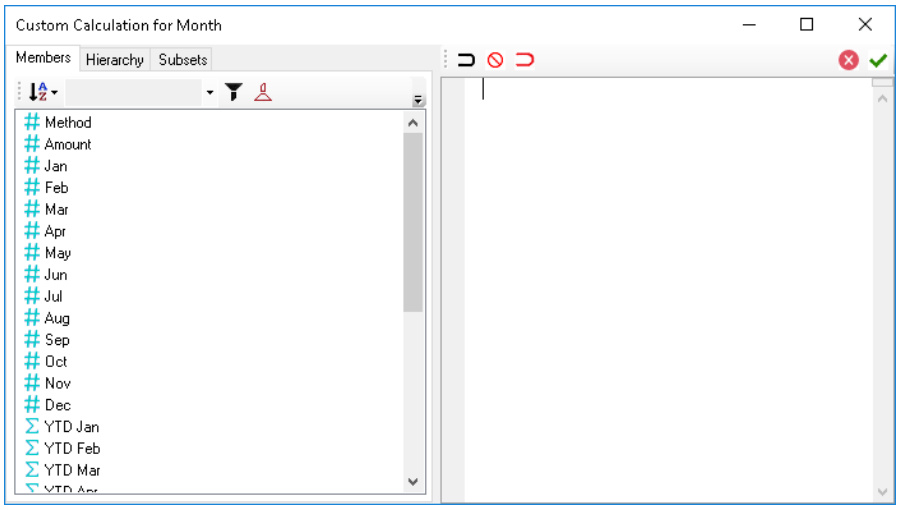
We will consider the following example, assuming that the sum of Jun + Jul + Aug is relevant to an understanding of the business—these months are highlighted in the image below.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA_2022_Connect											
2	Cube:	Financial Data											
3	Dimensions:	Filter	Version	Members	Budget								
4		Filter	Year	Members	2021								
5		Filter	Entity	Members	Entity A								
6		Filter	Departme	Members	Sales								
7		Column	Month	Range	$B$11:$M$11								
8		Row	Account	Members	Other Inco	Other Income (Expense), Other Revenue, Other (Expense), Operating Profit, Operatir							
9													
10	OLAPivotTable												
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	Other Income (Expense)	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5
13	Other Revenue	110	110	110	110	110	110	110	110	110	110	110	110
14	Other (Expense)	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5
15	Operating Profit	4906	4906	4906	4906	4906	4906	4906	4906	4906	4906	4906	4906
16	Operating Expense	2244	2244	2244	2244	2244	2244	2244	2244	2244	2244	2244	2244
17	Payroll and related expenses	990	990	990	990	990	990	990	990	990	990	990	990
18	Distribution	198	198	198	198	198	198	198	198	198	198	198	198
19	Occupancy Expenses	0	0	0	0	0	0	0	0	0	0	0	0
20	Research and Development	99	99	99	99	99	99	99	99	99	99	99	99
21	Sales and Marketing	297	297	297	297	297	297	297	297	297	297	297	297
22	Depreciation	550	550	550	550	550	550	550	550	550	550	550	550
23	Amortization	55	55	55	55	55	55	55	55	55	55	55	55
24	Administrative Expenses	110	110	110	110	110	110	110	110	110	110	110	110
25	Other operating Expenses (Income)	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55
26	Gross Profit	7150	7150	7150	7150	7150	7150	7150	7150	7150	7150	7150	7150
27	Revenue	18150	18150	18150	18150	18150	18150	18150	18150	18150	18150	18150	18150
28	Sales of Goods	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200
29	Sales of Services	4950	4950	4950	4950	4950	4950	4950	4950	4950	4950	4950	4950
30	Cost of Sales	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
31	Cost of Goods	6600	6600	6600	6600	6600	6600	6600	6600	6600	6600	6600	6600
32	Cost of Services	4400	4400	4400	4400	4400	4400	4400	4400	4400	4400	4400	4400

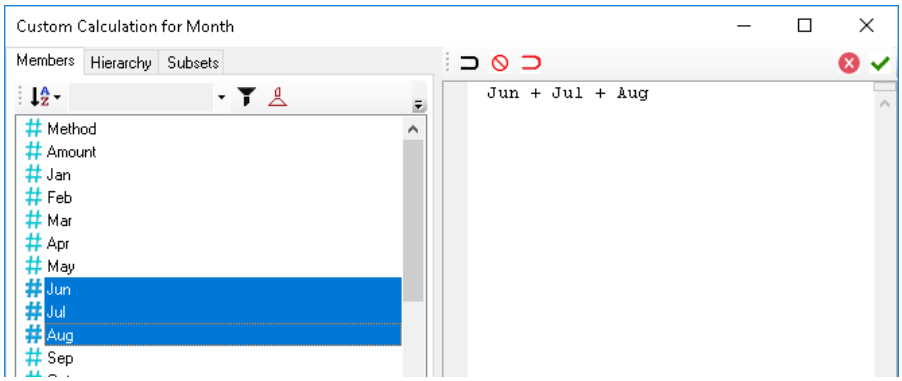
- To add a calculation, double-click on a Dimension in the Filter, Column or Row box of the sidebar—here, below, the *Select Members for Month* window appears for *Month*.
- Click on the **Calculations tab**, then right-click in the empty space; in the pop-up window, the selection **Add Calculation** appears, as highlighted below.



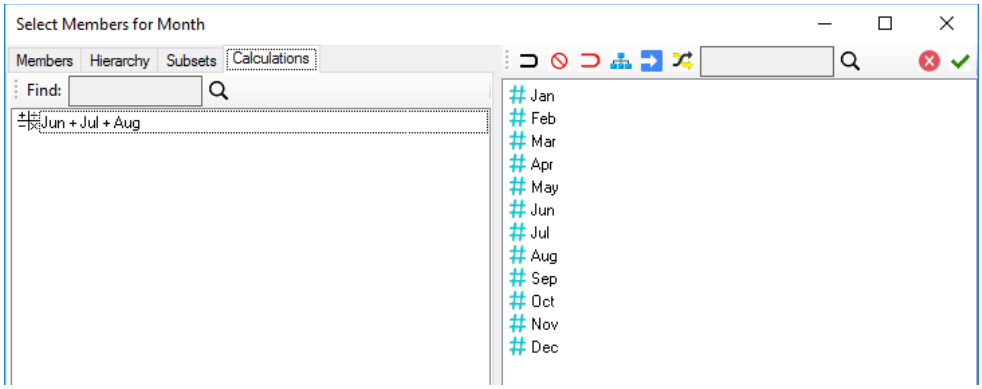
- The *Custom Calculation for [Dimension]* window appears, as shown below, for the *Month* dimension.



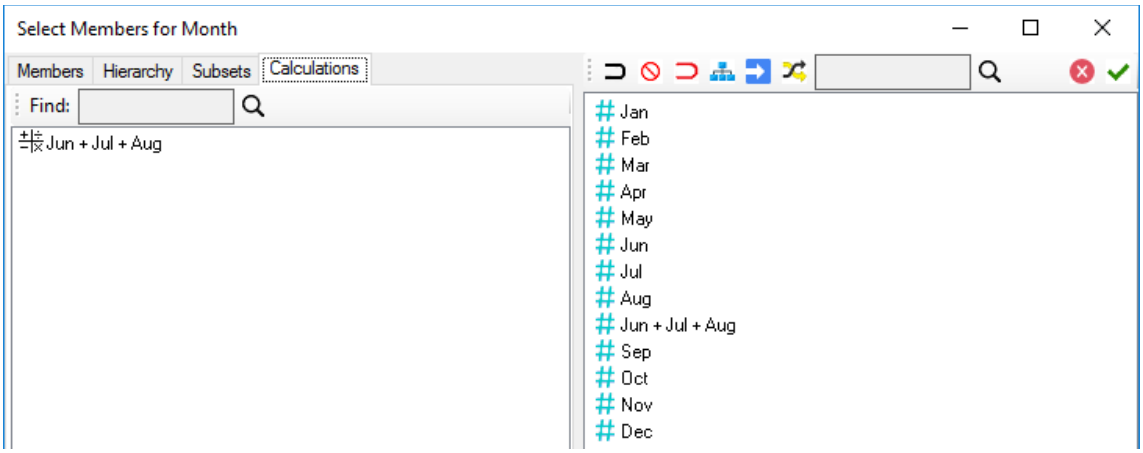
- When you highlight Jun, Jul and Aug, then drag them to the right, you will see an expression of the 3 Members added: **Jun + Jul + Aug**, as shown below. NOTE: to do a Subtraction, replace the plus sign ("+") with a minus sign; to make a weighted calculation of a Member, use a fraction (e.g., *.05*) within square brackets immediately following the Member name (e.g., *[.05]*).



- Click the green checkmark to **Save Custom Calculation**. The calculation will now appear in the Calculations tab, as shown in the following image. (The Members displayed in the current Slice appear on the right.)



- You can now drag the Custom Calculation to its logical place on the right in the Select Members for Month window (as shown below); then, when you click the green checkmark, and **Update** the Slice, the worksheet will show the new calculated Member following *Aug* in the workbook (highlighted and boxed in the last image).



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Database:	PandA_2022_Connect												
2	Cube:	Financial Data												
3	Dimensions:	Filter	Version	Members	Budget									
4		Filter	Year	Members	2021									
5		Filter	Entity	Members	Entity A									
6		Filter	Departme	Members	Sales									
7		Column	Month	Range	$B$11:$N$11									
8		Row	Account	Members	Other Inc	Other Income (Expense),Other Revenue,Other (Expense),Operating Profit,Operating Expense,Payr								
9														
10	OLAPivotTable													
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Jun + Jul + Aug	Sep	Oct	Nov	Dec
12	Other Income (Expense)	82.5	82.5	82.5	82.5	82.5	82.5	82.5	82.5	247.5	82.5	82.5	82.5	82.5
13	Other Revenue	110	110	110	110	110	110	110	110	330	110	110	110	110
14	Other (Expense)	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5	-82.5	-27.5	-27.5	-27.5	-27.5
15	Operating Profit	4906	4906	4906	4906	4906	4906	4906	4906	14718	4906	4906	4906	4906
16	Operating Expense	2244	2244	2244	2244	2244	2244	2244	2244	6732	2244	2244	2244	2244
17	Payroll and related expenses	990	990	990	990	990	990	990	990	2970	990	990	990	990
18	Distribution	198	198	198	198	198	198	198	198	594	198	198	198	198
19	Occupancy Expenses	0	0	0	0	0	0	0	0	0	0	0	0	0
20	Research and Development	99	99	99	99	99	99	99	99	297	99	99	99	99
21	Sales and Marketing	297	297	297	297	297	297	297	297	891	297	297	297	297
22	Depreciation	550	550	550	550	550	550	550	550	1650	550	550	550	550
23	Amortization	55	55	55	55	55	55	55	55	165	55	55	55	55
24	Administrative Expenses	110	110	110	110	110	110	110	110	330	110	110	110	110
25	Other operating Expenses (Income)	-55	-55	-55	-55	-55	-55	-55	-55	-165	-55	-55	-55	-55
26	Gross Profit	7150	7150	7150	7150	7150	7150	7150	7150	21450	7150	7150	7150	7150
27	Revenue	18150	18150	18150	18150	18150	18150	18150	18150	54450	18150	18150	18150	18150
28	Sales of Goods	13200	13200	13200	13200	13200	13200	13200	13200	39600	13200	13200	13200	13200
29	Sales of Services	4950	4950	4950	4950	4950	4950	4950	4950	14850	4950	4950	4950	4950
30	Cost of Sales	11000	11000	11000	11000	11000	11000	11000	11000	33000	11000	11000	11000	11000
31	Cost of Goods	6600	6600	6600	6600	6600	6600	6600	6600	19800	6600	6600	6600	6600
32	Cost of Services	4400	4400	4400	4400	4400	4400	4400	4400	13200	4400	4400	4400	4400

4. Entering Data in a PowerExcel Slice

This section concerns the important topic of entering data into PowerExcel—essentially, populating a data model by entering numbers in a Slice. Most often this kind of activity is done as part of a planning (budgeting, forecasting, etc.) exercise, and it includes multiple users working collaboratively on a shared Cloud-based model. With that in mind, the section immediately below demonstrates how to enter Budget data simply by typing in numbers.

The second section—also relevant to a planning exercise—shows how to work with a driver-based template to arrive at forecast numbers.

4.1 "Write Back" into a PowerExcel Slice – Typing in Numbers

For this exercise, we will enter Forecast data for two Operating Expense accounts: *Administrative Expenses* and *UTILITIES* (referenced in an earlier exercise). We will begin by creating a simple PowerExcel Slice with key accounts along with all Operating Expense accounts—these will appear in Rows. In Columns, we will show *Jan*, *Feb*, *Mar*, *Q1*, *Apr*, *May*, *Jun*, *Q2*, and *YTD Jun*. As you will see, entering numbers for Detail Members will result in calculations for relevant Aggregates.

Important: Remember that you can enter data only for Detail Member "intersections", meaning, ALL the selections (whether in Filters, Column or Row) must have detail Members at the intersection (cell) where you want to enter data.

1. We will begin by creating the data entry Slice described above.
   The Slice will look as shown below.
   Note: In this Slice, cells shaded in yellow are Detail intersections; unshaded cells are Aggregate intersections and will show calculations resulting from entries made in their 'Child Members'.

	A	B	C	D	E	F	G	H	I	J
1	Database:	PandA_2022_Connect								
2	Cube:	Financial Data								
3	Dimensions:	Filter	Version	Members	Forecast					
4		Filter	Year	Members	2022					
5		Filter	Entity	Members	Entity B					
6		Filter	Departme	Members	Sales					
7		Column	Month	Range	$B$11:$J$11					
8		Row	Account	Range	$A$12:$A$33					
9										
10	OLAPivotTable									
11		Jan	Feb	Mar	Q1	Apr	May	Jun	Q2	YTD Jun
12	Profit After Tax	0	0	0	0	0	0	0	0	0
13	Income Tax Expense	0	0	0	0	0	0	0	0	0
14	Interest	0	0	0	0	0	0	0	0	0
15	EBIT	0	0	0	0	0	0	0	0	0
16	Other Income (Expense)	0	0	0	0	0	0	0	0	0
17	Operating Profit	0	0	0	0	0	0	0	0	0
18	Operating Expense	0	0	0	0	0	0	0	0	0
19										
20	Payroll and related expenses	0	0	0	0	0	0	0	0	0
21	Distribution	0	0	0	0	0	0	0	0	0
22	Occupancy Expenses	0	0	0	0	0	0	0	0	0
23	Research and Development	0	0	0	0	0	0	0	0	0
24	Sales and Marketing	0	0	0	0	0	0	0	0	0
25	Depreciation	0	0	0	0	0	0	0	0	0
26	Amortization	0	0	0	0	0	0	0	0	0
27	Administrative Expenses	0	0	0	0	0	0	0	0	0
28	UTILITIES	0	0	0	0	0	0	0	0	0
29	Other operating Expenses (Income)	0	0	0	0	0	0	0	0	0
30										
31	Gross Profit	0	0	0	0	0	0	0	0	0
32	Revenue	0	0	0	0	0	0	0	0	0
33	Cost of Sales	0	0	0	0	0	0	0	0	0

2. We will begin entering forecast data for the *Administrative Expenses* and *UTILITIES* sub-accounts: Type figures for these accounts for the individual *Month* members **Jan**, **Feb**, **Mar**, and **Apr**. Example figures are shown in the next image (red circled), which is a detail of Operating Expenses. Note all the zero figures for the Aggregate Member *Operating Expenses*, at the top, and for *Q1*, *Q2*, and *YTDJun* (all blue circled).

18	Operating Expense	0	0	0	0	0	0	0	0	0
19										
20	Payroll and related expenses	0	0	0	0	0	0	0	0	0
21	Distribution	0	0	0	0	0	0	0	0	0
22	Occupancy Expenses	0	0	0	0	0	0	0	0	0
23	Research and Development	0	0	0	0	0	0	0	0	0
24	Sales and Marketing	0	0	0	0	0	0	0	0	0
25	Depreciation	0	0	0	0	0	0	0	0	0
26	Amortization	0	0	0	0	0	0	0	0	0
27	Administrative Expenses	55	55	55	0	44	0	0	0	0
28	UTILITIES	99	88	77	0	66	0	0	0	0
29	Other operating Expenses (Income)	0	0	0	0	0	0	0	0	0

3. Press **F9** to refresh the PowerExcel Slice. Notice that the columns and rows for Aggregates are now also populated with data. These columns and rows show the results of the hierarchies in the *Account* and *Month* dimensions.

	Jan	Feb	Mar	Q1	Apr	May	Jun	Q2	YTD Jun
Operating Expense	154	143	132	429	110	0	0	110	539
Payroll and related expenses	0	0	0	0	0	0	0	0	0
Distribution	0	0	0	0	0	0	0	0	0
Occupancy Expenses	0	0	0	0	0	0	0	0	0
Research and Development	0	0	0	0	0	0	0	0	0
Sales and Marketing	0	0	0	0	0	0	0	0	0
Depreciation	0	0	0	0	0	0	0	0	0
Amortization	0	0	0	0	0	0	0	0	0
Administrative Expenses	55	55	55	165	44	0	0	44	209
UTILITIES	99	88	77	264	66	0	0	66	330
Other operating Expenses (Income)	0	0	0	0	0	0	0	0	0

4. Also, we can observe that the entry of figures for *Administrative Expenses* and *UTILITIES* has had an impact throughout the model, up to *Operating Profit*, *EBIT and Profit After Tax*.

	Jan	Feb	Mar	Q1	Apr	May	Jun	Q2	YTD Jun
Profit After Tax	-154	-143	-132	-429	-110	0	0	-110	-539
Income Tax Expense	0	0	0	0	0	0	0	0	0
Interest	0	0	0	0	0	0	0	0	0
EBIT	-154	-143	-132	-429	-110	0	0	-110	-539
Other Income (Expense)	0	0	0	0	0	0	0	0	0
Operating Profit	-154	-143	-132	-429	-110	0	0	-110	-539

5. Now that you have entered figures, this data is saved back to the PowerExcel Cloud-based model. Therefore, any new Slice that you create will show the data correctly populated within the model.

4.2 Driver-Based Data Entry

This final example of data entry in PowerExcel concerns the use a "driver-based" system for generating planning (e.g., budget and forecast, etc.) numbers. As we will show, not only are there numerous methods of projecting/spreading numbers, but individual data entry into cells is also possible in combination with these methods.

Let's examine first an **Income Statement** report, shown below, for **The Great Financials Company**. This spreadsheet not only reflects the past few months' figures, but also includes numbers related to Forecast: this is indicated by the fact that the *Version* dimension indicates *Forecast* (circled) and even shows in Row 13 the *Version* for each *Year* and *Month* (also circled). Cleverly, the model detects the current month, and reflects the correct Version as a result: thus, at the time this spreadsheet was being used, *2021 April* shows *Actual*, while *May 2021* and the following months show Forecast (all zeros).

Important: The spreadsheet shown following is for example purposes—it will not match exercises you have done up to this point. In this spreadsheet, almost all of the Forecast *May* through *Dec* has been filled in. This will allow us to demonstrate an account with existing numbers (*Revenue*, in this example) as the basis for figures in another forecast account (*Sales and Marketing*).

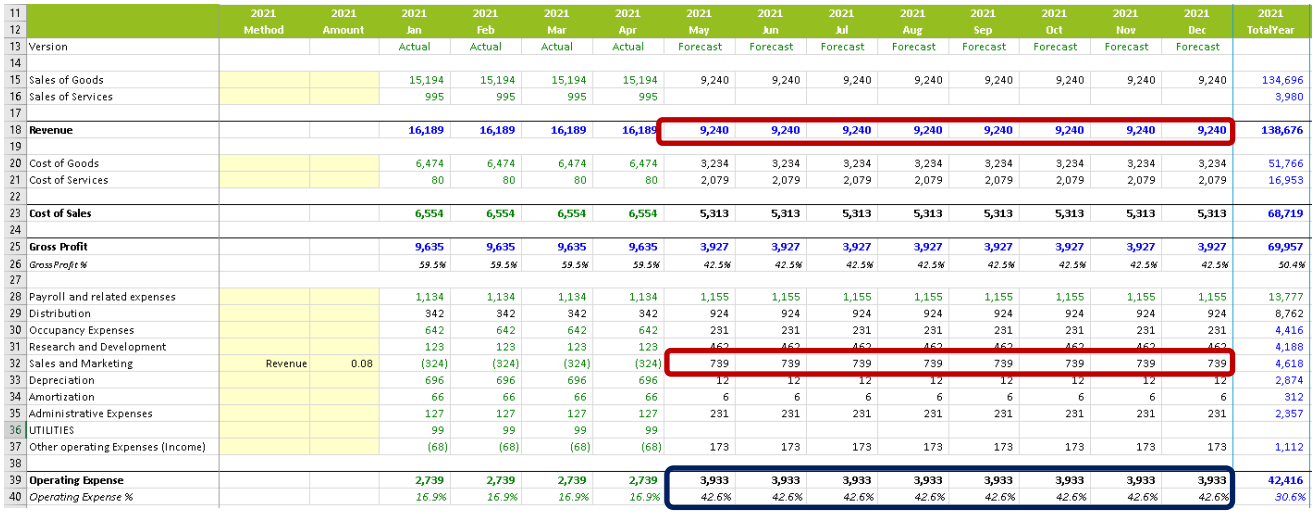
1		PandA_2021_Connect														
2		Financial Data														
3		Filter	Version	Members	Forecast											
4		Filter	Entity	Members	Entity A											
5		Filter	Department	Members	Administration											
6		Column1	Year	Range	SBS11:SAGS11											
7		Column2	Month	Range	SBS12:SAGS12											
8		Row	Account	Subsets	Members(Ver											
9																
10	OLAPivotTable															
11		2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
12		Method	Amount	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TotalYear
13	Version			Actual	Actual	Actual	Actual	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	
14																
15	Sales of Goods			15,194	15,194	15,194	15,194	9,240	9,240	9,240	9,240	9,240	9,240	9,240	9,240	134,696
16	Sales of Services			995	995	995	995									3,980
17																
18	**Revenue**			**16,189**	**16,189**	**16,189**	**16,189**	**9,240**	**9,240**	**9,240**	**9,240**	**9,240**	**9,240**	**9,240**	**9,240**	**138,676**
19																
20	Cost of Goods			6,474	6,474	6,474	6,474	3,234	3,234	3,234	3,234	3,234	3,234	3,234	3,234	51,766
21	Cost of Services			80	80	80	80	2,079	2,079	2,079	2,079	2,079	2,079	2,079	2,079	16,953
22																
23	**Cost of Sales**			**6,554**	**6,554**	**6,554**	**6,554**	**5,313**	**5,313**	**5,313**	**5,313**	**5,313**	**5,313**	**5,313**	**5,313**	**68,719**
24																
25	**Gross Profit**			**9,635**	**9,635**	**9,635**	**9,635**	**3,927**	**3,927**	**3,927**	**3,927**	**3,927**	**3,927**	**3,927**	**3,927**	**69,957**
26	*Gross Profit %*			*59.5%*	*59.5%*	*59.5%*	*59.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*50.4%*
27																
28	Payroll and related expenses			1,134	1,134	1,134	1,134	1,155	1,155	1,155	1,155	1,155	1,155	1,155	1,155	13,777
29	Distribution			342	342	342	342	924	924	924	924	924	924	924	924	8,762
30	Occupancy Expenses			642	642	642	642	231	231	231	231	231	231	231	231	4,416
31	Research and Development			123	123	123	123	462	462	462	462	462	462	462	462	4,188
32	Sales and Marketing			(324)	(324)	(324)	(324)									(1,295)
33	Depreciation			696	696	696	696	12	12	12	12	12	12	12	12	2,874
34	Amortization			66	66	66	66	6	6	6	6	6	6	6	6	312
35	Administrative Expenses			127	127	127	127	231	231	231	231	231	231	231	231	2,357
36	UTILITIES			99	99	99	99									
37	Other operating Expenses (Income)			(68)	(68)	(68)	(68)	173	173	173	173	173	173	173	173	1,112
38																
39	**Operating Expense**			**2,739**	**2,739**	**2,739**	**2,739**	**3,194**	**3,194**	**3,194**	**3,194**	**3,194**	**3,194**	**3,194**	**3,194**	**36,503**
40	*Operating Expense %*			*16.9%*	*16.9%*	*16.9%*	*16.9%*	*34.6%*	*34.6%*	*34.6%*	*34.6%*	*34.6%*	*34.6%*	*34.6%*	*34.6%*	*26.3%*

We will now utilize the pre-built plan modeling methods, evident in the shaded, left-most columns, to enter both a *Method* and an *Amount* to define and calculate driver-based figures for Forecast *Sales and Marketing* and *UTILITIES* for the months *May* forward:

1. Type **Revenue** into the cell to the right of *Sales and Marketing*, Row 32, in the Method column (indicated by the red arrow). This will calculate an amount for each of the Forecast months on the basis of a **percentage of Revenue**, which figure you will indicate next. (Note at this point that monthly Revenue is indicated in Row 18).

2. Next, type **.08** (thus, 8 percent) in the cell to the right, which is in the Amount column (indicated by a blue arrow). Hit **Enter**.

3. Press **F9**. Note that *Sales and Marketing* Forecast figures, based on an 8 percent calculation of Revenue, now show in the months *May* forward (see circled, next image, both *Revenue* and the calculated results for *Sales and Marketing*).

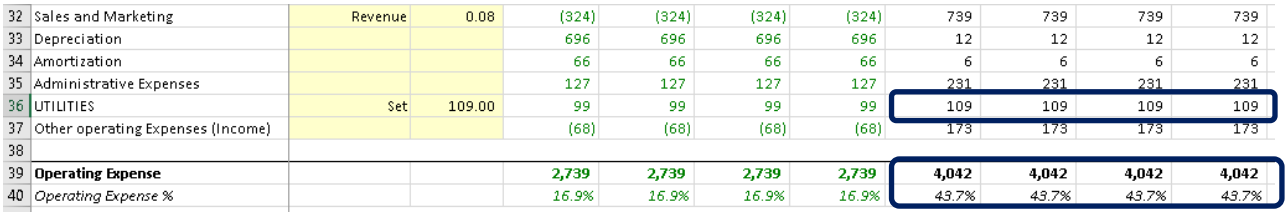


		2021 Method	2021 Amount	2021 Jan	2021 Feb	2021 Mar	2021 Apr	2021 May	2021 Jun	2021 Jul	2021 Aug	2021 Sep	2021 Oct	2021 Nov	2021 Dec	2021 TotalYear
13	Version			Actual	Actual	Actual	Actual	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	
14																
15	Sales of Goods			15,194	15,194	15,194	15,194	9,240	9,240	9,240	9,240	9,240	9,240	9,240	9,240	134,696
16	Sales of Services			995	995	995	995									3,980
17																
18	**Revenue**			**16,189**	**16,189**	**16,189**	**16,189**	**9,240**	**9,240**	**9,240**	**9,240**	**9,240**	**9,240**	**9,240**	**9,240**	**138,676**
19																
20	Cost of Goods			6,474	6,474	6,474	6,474	3,234	3,234	3,234	3,234	3,234	3,234	3,234	3,234	51,766
21	Cost of Services			80	80	80	80	2,079	2,079	2,079	2,079	2,079	2,079	2,079	2,079	16,953
22																
23	**Cost of Sales**			**6,554**	**6,554**	**6,554**	**6,554**	**5,313**	**5,313**	**5,313**	**5,313**	**5,313**	**5,313**	**5,313**	**5,313**	**68,719**
24																
25	**Gross Profit**			**9,635**	**9,635**	**9,635**	**9,635**	**3,927**	**3,927**	**3,927**	**3,927**	**3,927**	**3,927**	**3,927**	**3,927**	**69,957**
26	*Gross Profit %*			*59.5%*	*59.5%*	*59.5%*	*59.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*50.4%*
27																
28	Payroll and related expenses			1,134	1,134	1,134	1,134	1,155	1,155	1,155	1,155	1,155	1,155	1,155	1,155	13,777
29	Distribution			342	342	342	342	924	924	924	924	924	924	924	924	8,762
30	Occupancy Expenses			642	642	642	642	231	231	231	231	231	231	231	231	4,416
31	Research and Development			123	123	123	123	462	462	462	462	462	462	462	462	4,188
32	Sales and Marketing	Revenue	0.08	(324)	(324)	(324)	(324)	739	739	739	739	739	739	739	739	4,618
33	Depreciation			696	696	696	696	12	12	12	12	12	12	12	12	2,874
34	Amortization			66	66	66	66	6	6	6	6	6	6	6	6	312
35	Administrative Expenses			127	127	127	127	231	231	231	231	231	231	231	231	2,357
36	UTILITIES			99	99	99	99									
37	Other operating Expenses (Income)			(68)	(68)	(68)	(68)	173	173	173	173	173	173	173	173	1,112
38																
39	**Operating Expense**			**2,739**	**2,739**	**2,739**	**2,739**	**3,933**	**3,933**	**3,933**	**3,933**	**3,933**	**3,933**	**3,933**	**3,933**	**42,416**
40	*Operating Expense %*			*16.9%*	*16.9%*	*16.9%*	*16.9%*	*42.6%*	*42.6%*	*42.6%*	*42.6%*	*42.6%*	*42.6%*	*42.6%*	*42.6%*	*30.6%*

There is another key thing to point out in this report: the consequent effect that the entry of these driver-based numbers have had on *Operating Expense* and *Operating Expense %*, which are shown above in Rows 39 and 40 (circled in blue). Contrast these figures with those from the previous image and you will understand how being able to create "what if" scenarios so quickly, with new figures, will significantly impact the forecast—and the ability to plan and react to changing market conditions.

4. We will forecast Utilities costs next (Row 36), using a different method, *Set*, which will "write back" the figure you enter in the Amount column:
   Type **Set** in the Method column, and **109** in the Amount column.

5. Then press **F9**.
   Now note that 109 appears in the forecast months; as well, on Operating Expenses and Operating Expenses % (as well as all consequent figures in the model) are recalculated on that basis, as shown in the following image.



32	Sales and Marketing	Revenue	0.08	(324)	(324)	(324)	(324)	739	739	739	739
33	Depreciation			696	696	696	696	12	12	12	12
34	Amortization			66	66	66	66	6	6	6	6
35	Administrative Expenses			127	127	127	127	231	231	231	231
36	UTILITIES	Set	109.00	99	99	99	99	109	109	109	109
37	Other operating Expenses (Income)			(68)	(68)	(68)	(68)	173	173	173	173
38											
39	**Operating Expense**			**2,739**	**2,739**	**2,739**	**2,739**	**4,042**	**4,042**	**4,042**	**4,042**
40	*Operating Expense %*			*16.9%*	*16.9%*	*16.9%*	*16.9%*	*43.7%*	*43.7%*	*43.7%*	*43.7%*

Lastly, we want to demonstrate another PowerExcel feature available with the driver-based planning we have shown so far: *users can enter numbers that override the driver Method*, which points up the limitless flexibility of using PowerExcel as a budget and forecasting—indeed, any kind of planning—solution.

6. To demonstrate that a user can enter an individual number(s), let's entertain the hypothesis that in *June* The Great Financials Company will initiate a Sales and Marketing campaign that will be far larger than the percentage of Revenue provided

previously: therefore, type **7777** in **June** for **Sales and Marketing**.
As well—and perhaps more far-fetched than hypothetical—the company expects a huge increase in UTILITIES in the summer months: type **999** in **June** for **UTILITIES**.

7. Press **F9**.
New figures, based on those numbers entered in the specific cells, "override" those determined by the **Revenue** (percentage) and **Set** amounts previously demonstrated. All dependent numbers throughout the model (*Operating Expense*, *Operating Expense %*, etc.) also recalculate, as shown below, yellow-highlighted.

	A	B	C	D	E	F	G	H	I
1		PandA_2021_Connect							
2		Financial Data							
3		Filter	Version	Members	Forecast				
4		Filter	Entity	Members	Entity A				
5		Filter	Department	Members	Administration				
6		Column1	Year	Range	$B$11:$AG$11				
7		Column2	Month	Range	$B$12:$AG$12				
8		Row	Account	Subsets	Members(Ver				
9									
10	OLAPivotTable								
11		2021	2021	2021	2021	2021	2021	2021	2021
12		Method	Amount	Jan	Feb	Mar	Apr	May	Jun
13	Version			Actual	Actual	Actual	Actual	Forecast	Forecast
14									
15	Sales of Goods			15,194	15,194	15,194	15,194	9,240	9,240
16	Sales of Services			995	995	995	995		
17									
18	**Revenue**			**16,189**	**16,189**	**16,189**	**16,189**	**9,240**	**9,240**
19									
20	Cost of Goods			6,474	6,474	6,474	6,474	3,234	3,234
21	Cost of Services			80	80	80	80	2,079	2,079
22									
23	**Cost of Sales**			**6,554**	**6,554**	**6,554**	**6,554**	**5,313**	**5,313**
24									
25	**Gross Profit**			**9,635**	**9,635**	**9,635**	**9,635**	**3,927**	**3,927**
26	*Gross Profit %*			*59.5%*	*59.5%*	*59.5%*	*59.5%*	*42.5%*	*42.5%*
27									
28	Payroll and related expenses			1,134	1,134	1,134	1,134	1,155	1,155
29	Distribution			342	342	342	342	924	924
30	Occupancy Expenses			642	642	642	642	231	231
31	Research and Development			123	123	123	123	462	462
32	Sales and Marketing	Revenue	0.08	(324)	(324)	(324)	(324)	739	7,777
33	Depreciation			696	696	696	696	12	12
34	Amortization			66	66	66	66	6	6
35	Administrative Expenses			127	127	127	127	231	231
36	UTILITIES	Set	109.00					109	999
37	Other operating Expenses (Income)			(68)	(68)	(68)	(68)	173	173
38									
39	**Operating Expense**			**2,739**	**2,739**	**2,739**	**2,739**	**4,042**	**11,970**
40	*Operating Expense %*			*16.9%*	*16.9%*	*16.9%*	*16.9%*	*43.7%*	*129.5%*

5. Using Range References and Other Functions in a PowerExcel Slice

PowerExcel features very powerful capabilities through the functions it adds to Excel, from the OLAConnection function, which enables the Slice to reach a Cloud-based multi-user model, to the many others that govern what shows in a Slice. There are numerous additional other functions that can obtain data/model logic from, and "write"/edit to, the Cloud-based model (where the analytic database resides).

Note that a full list of the 20+ PowerExcel Add-in Functions, and a detailed description of each, along with examples, can be found in the online PowerExcel Functions manual, as well as in the Olation® Help file.

This section will demonstration use of the OLATableRange function: the first step will be to set up a second PowerExcel Slice into the same workbook where an initial Slice exists; and then, use the OLATableRange function to display different Members from the first, as a means of making an "eyeball comparison" between, for example, different Entities or Departments.

5.1 Setting up Two Slices in a Single Worksheet

Until now we have worked with only 1 Slice in a worksheet; now we will add a second.

First arrange an example Slice using the Perspective Slice Type—the one on the image below shows Filters for *Actual*, 2021, *Entity A*, *Sales*, with the *Q1*, *Q2*, *Q3*, *Q4* for *Month* in Columns, and select Members from the *Account* dimension. (These Members comprise a Subset that was demonstrated earlier, i.e., DESCENDENTS;EBIT). The image shows the selected Members in yellow highlight.

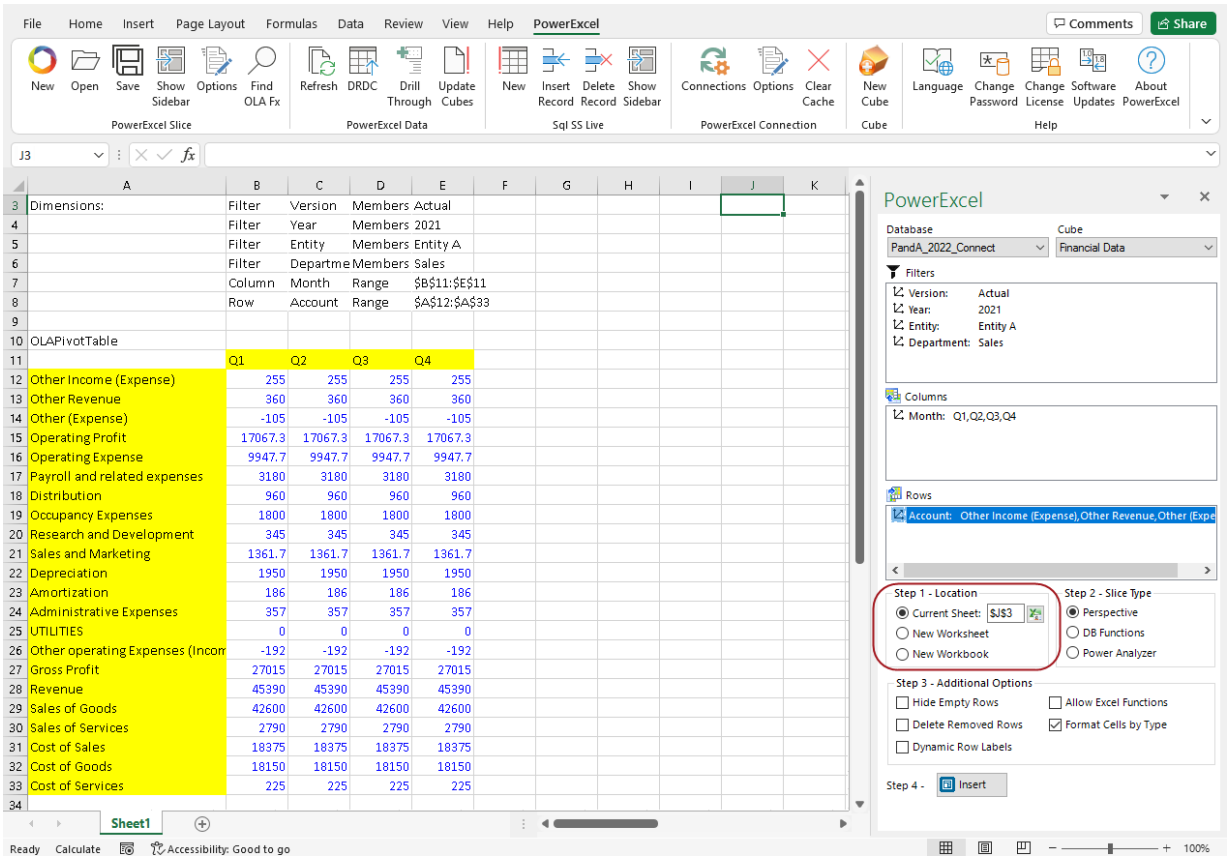
	A	B	C	D	E	F
3	Dimensions:	Filter	Version	Members	Actual	
4		Filter	Year	Members	2021	
5		Filter	Entity	Members	Entity A	
6		Filter	Departme	Members	Sales	
7		Column	Month	Range	$B$11:$E$11	
8		Row	Account	Range	$A$12:$A$33	
9						
10	OLAPivotTable					
11		Q1	Q2	Q3	Q4	
12	Other Income (Expense)	255	255	255	255	
13	Other Revenue	360	360	360	360	
14	Other (Expense)	-105	-105	-105	-105	
15	Operating Profit	17067.3	17067.3	17067.3	17067.3	
16	Operating Expense	9947.7	9947.7	9947.7	9947.7	
17	Payroll and related expenses	3180	3180	3180	3180	
18	Distribution	960	960	960	960	
19	Occupancy Expenses	1800	1800	1800	1800	
20	Research and Development	345	345	345	345	
21	Sales and Marketing	1361.7	1361.7	1361.7	1361.7	
22	Depreciation	1950	1950	1950	1950	
23	Amortization	186	186	186	186	
24	Administrative Expenses	357	357	357	357	
25	UTILITIES	0	0	0	0	
26	Other operating Expenses (Incom	-192	-192	-192	-192	
27	Gross Profit	27015	27015	27015	27015	
28	Revenue	45390	45390	45390	45390	
29	Sales of Goods	42600	42600	42600	42600	
30	Sales of Services	2790	2790	2790	2790	
31	Cost of Sales	18375	18375	18375	18375	
32	Cost of Goods	18150	18150	18150	18150	
33	Cost of Services	225	225	225	225	
34						

The operative functions/Cells and their respective Cells is as follows their use, and

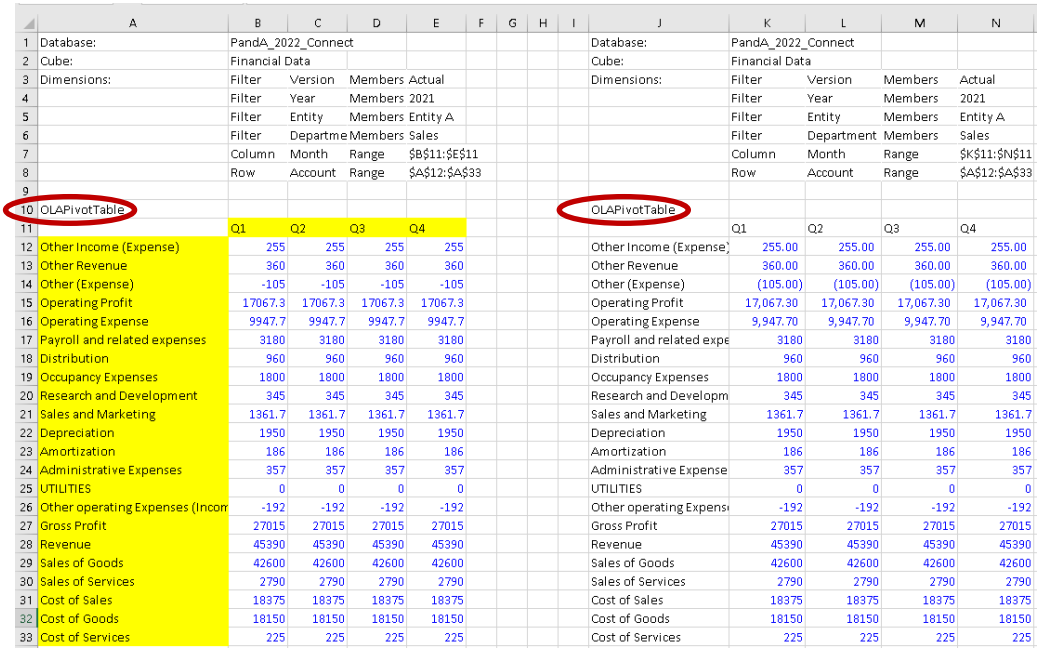
OLAConnection	B1	Establishes connection to Olation analytical database
OLACube	B2	Allows selection of Cube in the database.
OLATableMember	B3 – B6	Allows selection (Filter) of Member in a Dimension
OLATableRange	B7, B8	Allows a range of Members in a Dimension to be shown
OLAPivotTable	A10	The function used to create the Slice (this is the operative function for the Perspective Slice Type).

Returning the task of creating a second PowerExcel Slice (or “Slice area”) in the same worksheet: you can simply do the following:

1. Click on the **PowerExcel Tab**—or, if the PowerExcel sidebar is open, then:
2. Click **New** on the PowerExcel ribbon (if the PowerExcel sidebar was open, note that the button at bottom right says Insert).
3. Indicate in the **Location** (Step 1) text box the Cell where you want to position the insert of the Slice (e.g., Cell $J$1, as in the following image).

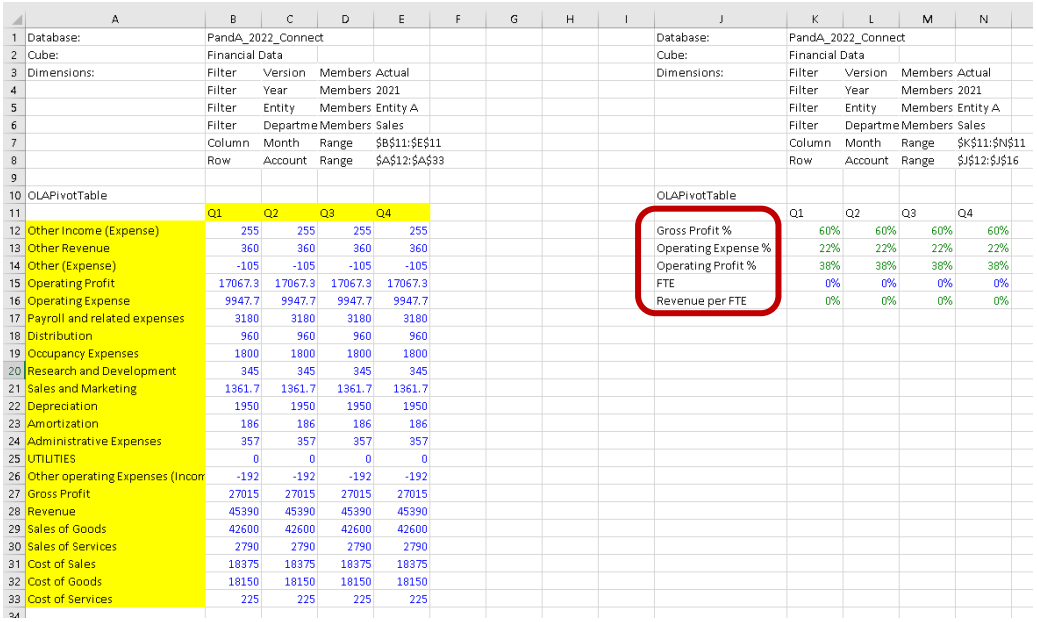


4. For present purposes, keep all other defaults—i.e., if recreating the Slice shown previously, maintain the same Filters, Column and Row Members, and use the **Perspective Slice Type** to create the Slice.
5. Click **Insert**. The second Slice in the worksheet, essentially a replication of the first, will appear as follows:



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Database:	PandA_2022_Connect								Database:	PandA_2022_Connect			
2	Cube:	Financial Data								Cube:	Financial Data			
3	Dimensions:	Filter	Version	Members	Actual					Dimensions:	Filter	Version	Members	Actual
4		Filter	Year	Members	2021						Filter	Year	Members	2021
5		Filter	Entity	Members	Entity A						Filter	Entity	Members	Entity A
6		Filter	Departme	Members	Sales						Filter	Department	Members	Sales
7		Column	Month	Range	$B$11:$E$11						Column	Month	Range	$K$11:$N$11
8		Row	Account	Range	$A$12:$A$33						Row	Account	Range	$A$12:$A$33
9														
10	OLAPivotTable									OLAPivotTable				
11		Q1	Q2	Q3	Q4						Q1	Q2	Q3	Q4
12	Other Income (Expense)	255	255	255	255					Other Income (Expense)	255.00	255.00	255.00	255.00
13	Other Revenue	360	360	360	360					Other Revenue	360.00	360.00	360.00	360.00
14	Other (Expense)	-105	-105	-105	-105					Other (Expense)	(105.00)	(105.00)	(105.00)	(105.00)
15	Operating Profit	17067.3	17067.3	17067.3	17067.3					Operating Profit	17,067.30	17,067.30	17,067.30	17,067.30
16	Operating Expense	9947.7	9947.7	9947.7	9947.7					Operating Expense	9,947.70	9,947.70	9,947.70	9,947.70
17	Payroll and related expenses	3180	3180	3180	3180					Payroll and related expe	3180	3180	3180	3180
18	Distribution	960	960	960	960					Distribution	960	960	960	960
19	Occupancy Expenses	1800	1800	1800	1800					Occupancy Expenses	1800	1800	1800	1800
20	Research and Development	345	345	345	345					Research and Developm	345	345	345	345
21	Sales and Marketing	1361.7	1361.7	1361.7	1361.7					Sales and Marketing	1361.7	1361.7	1361.7	1361.7
22	Depreciation	1950	1950	1950	1950					Depreciation	1950	1950	1950	1950
23	Amortization	186	186	186	186					Amortization	186	186	186	186
24	Administrative Expenses	357	357	357	357					Administrative Expense	357	357	357	357
25	UTILITIES	0	0	0	0					UTILITIES	0	0	0	0
26	Other operating Expenses (Incom	-192	-192	-192	-192					Other operating Expens	-192	-192	-192	-192
27	Gross Profit	27015	27015	27015	27015					Gross Profit	27015	27015	27015	27015
28	Revenue	45390	45390	45390	45390					Revenue	45390	45390	45390	45390
29	Sales of Goods	42600	42600	42600	42600					Sales of Goods	42600	42600	42600	42600
30	Sales of Services	2790	2790	2790	2790					Sales of Services	2790	2790	2790	2790
31	Cost of Sales	18375	18375	18375	18375					Cost of Sales	18375	18375	18375	18375
32	Cost of Goods	18150	18150	18150	18150					Cost of Goods	18150	18150	18150	18150
33	Cost of Services	225	225	225	225					Cost of Services	225	225	225	225

Now, in order to change the Filters on either of those 2 PowerExcel Slices, one could simply click on the OLAPivotTable cell (A10 for the first Slice, J10 for the second—both circled in the preceding image. The PowerExcel sidebar will appear, and it would simply be a matter of changing selections in either Columns or Rows. The next image shows that very thing: with selected Metrics *Account* members (circled) showing in the Rows of the second Slice.



	A	B	C	D	E	J	K	L	M	N
1	Database:	PandA_2022_Connect				Database:	PandA_2022_Connect			
2	Cube:	Financial Data				Cube:	Financial Data			
3	Dimensions:	Filter	Version	Members	Actual	Dimensions:	Filter	Version	Members	Actual
4		Filter	Year	Members	2021		Filter	Year	Members	2021
5		Filter	Entity	Members	Entity A		Filter	Entity	Members	Entity A
6		Filter	Departme	Members	Sales		Filter	Departme	Members	Sales
7		Column	Month	Range	$B$11:$E$11		Column	Month	Range	$K$11:$N$11
8		Row	Account	Range	$A$12:$A$33		Row	Account	Range	$J$12:$J$16
9										
10	OLAPivotTable					OLAPivotTable				
11		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4
12	Other Income (Expense)	255	255	255	255	Gross Profit %	60%	60%	60%	60%
13	Other Revenue	360	360	360	360	Operating Expense %	22%	22%	22%	22%
14	Other (Expense)	-105	-105	-105	-105	Operating Profit %	38%	38%	38%	38%
15	Operating Profit	17067.3	17067.3	17067.3	17067.3	FTE	0%	0%	0%	0%
16	Operating Expense	9947.7	9947.7	9947.7	9947.7	Revenue per FTE	0%	0%	0%	0%
17	Payroll and related expenses	3180	3180	3180	3180					
18	Distribution	960	960	960	960					
19	Occupancy Expenses	1800	1800	1800	1800					
20	Research and Development	345	345	345	345					
21	Sales and Marketing	1361.7	1361.7	1361.7	1361.7					
22	Depreciation	1950	1950	1950	1950					
23	Amortization	186	186	186	186					
24	Administrative Expenses	357	357	357	357					
25	UTILITIES	0	0	0	0					
26	Other operating Expenses (Incom	-192	-192	-192	-192					
27	Gross Profit	27015	27015	27015	27015					
28	Revenue	45390	45390	45390	45390					
29	Sales of Goods	42600	42600	42600	42600					
30	Sales of Services	2790	2790	2790	2790					
31	Cost of Sales	18375	18375	18375	18375					
32	Cost of Goods	18150	18150	18150	18150					
33	Cost of Services	225	225	225	225					

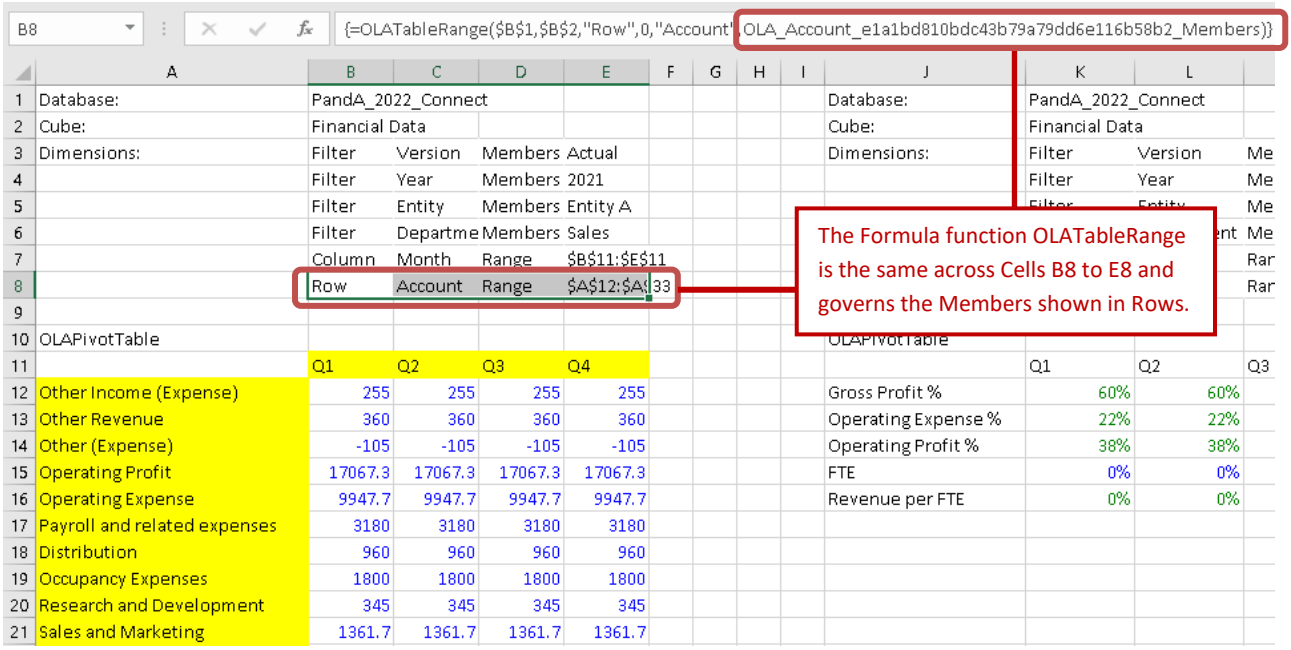
5.2 Changing the Range Reference in a PowerExcel Slice

This section will discuss how to correctly change a Range Function reference within a PowerExcel Slice.

IMPORTANT: The following step-by-step procedure must be observed and followed when changing Range References or when changing the range parameter of the OLATableRange formula to ensure that the newly specified range will be committed to the formula.

A 'Range' or a 'Range Reference' concerns a group of cells rather than just one cell. For this topic, we will show how to modify/update the **OLATableRange** function, which enables a user to specify a range of Members to be displayed along Rows or Columns.

Note below the OLATableRange function that governs what appears in Rows. (This is from the first PowerExcel Slice, created previously.)



	A	B	C	D	E	J	K	L
1	Database:	PandA_2022_Connect				Database:	PandA_2022_Connect	
2	Cube:	Financial Data				Cube:	Financial Data	
3	Dimensions:	Filter	Version	Members	Actual	Dimensions:	Filter	Version
4		Filter	Year	Members	2021		Filter	Year
5		Filter	Entity	Members	Entity A			
6		Filter	Departme	Members	Sales			
7		Column	Month	Range	$B$11:$E$11			
8		Row	Account	Range	$A$12:$A$33			
9								
10	OLAPivotTable					OLAPivotTable		
11		Q1	Q2	Q3	Q4		Q1	Q2
12	Other Income (Expense)	255	255	255	255	Gross Profit %	60%	60%
13	Other Revenue	360	360	360	360	Operating Expense %	22%	22%
14	Other (Expense)	-105	-105	-105	-105	Operating Profit %	38%	38%
15	Operating Profit	17067.3	17067.3	17067.3	17067.3	FTE	0%	0%
16	Operating Expense	9947.7	9947.7	9947.7	9947.7	Revenue per FTE	0%	0%
17	Payroll and related expenses	3180	3180	3180	3180			
18	Distribution	960	960	960	960			
19	Occupancy Expenses	1800	1800	1800	1800			
20	Research and Development	345	345	345	345			
21	Sales and Marketing	1361.7	1361.7	1361.7	1361.7			

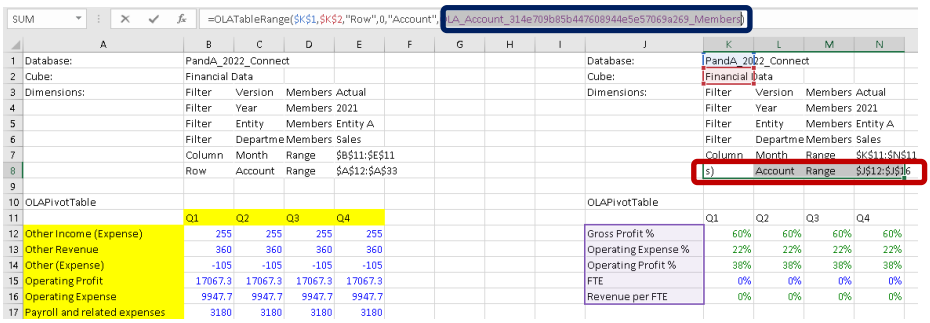
As above, the circled function governs which Members are shown in Rows—in this spreadsheet, Row 12 through Row 33—and you will see the same formula in each of the 4 cells (B8 to E8).

The correct way to modify the range reference is to simultaneously update the range within the group of cells referenced in the Range Function.

IMPORTANT: To correctly update the range, one must: (1) select the group of cells governed by the Range function and update them *simultaneously*; keeping in mind that (2) the Members covered within the new range must be valid Members (i.e., they exist within the source database).

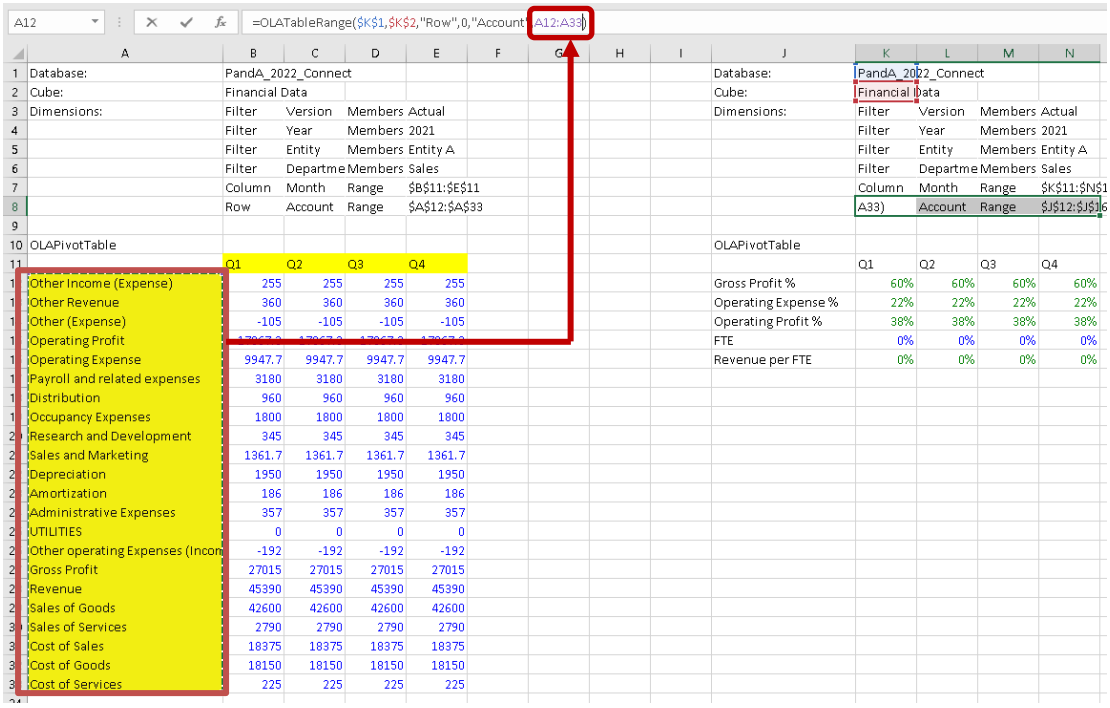
Now suppose we wish to change the range reference of the *second* PivotTable so that it once again shows the same Members along Rows that are displayed in the first PivotTable, the method will be to do as follows:

1. Go to the PivotTable that you wish to update and locate the OLATableRange Function for Row; highlight the group of cells referenced by that function. (As this is the second inserted Slice, those Cells will be **K8** through **N8**—see the image below, red circled).
2. Go to the formula bar; **double-click on the last function argument** (blue circled in the below image). Notice that the related Rows are now highlighted in Excel (*Gross Profit %* through *Revenue per FTE*, i.e., **Row 12** through **Row 16**).



	A	B	C	D	E	J	K	L	M	N
1	Database:	PandA_2022_Connect				Database:	PandA_2022_Connect			
2	Cube:	Financial Data				Cube:	Financial Data			
3	Dimensions:	Filter	Version	Members	Actual	Dimensions:	Filter	Version	Members	Actual
4		Filter	Year	Members	2021		Filter	Year	Members	2021
5		Filter	Entity	Members	Entity A		Filter	Entity	Members	Entity A
6		Filter	Departme	Members	Sales		Filter	Departme	Members	Sales
7		Column	Month	Range	$B$11:$E$11		Column	Month	Range	$K$11:$N$11
8		Row	Account	Range	$A$12:$A$33		s)	Account	Range	$J$12:$J$16
9										
10	OLAPivotTable					OLAPivotTable				
11		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4
12	Other Income (Expense)	255	255	255	255	Gross Profit %	60%	60%	60%	60%
13	Other Revenue	360	360	360	360	Operating Expense %	22%	22%	22%	22%
14	Other (Expense)	-105	-105	-105	-105	Operating Profit %	38%	38%	38%	38%
15	Operating Profit	17067.3	17067.3	17067.3	17067.3	FTE	0%	0%	0%	0%
16	Operating Expense	9947.7	9947.7	9947.7	9947.7	Revenue per FTE	0%	0%	0%	0%
17	Payroll and related expenses	3180	3180	3180	3180					

3. Select the new range that you want to show in Rows. In this case, put your cursor on **A12 and highlight cells to A33**, which will be the new target range (boxed in the image below). Note that the function argument changes to this range of cells (arrow).



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Database:	PandA_2022_Connect								Database:	PandA_2022_Connect			
2	Cube:	Financial Data								Cube:	Financial Data			
3	Dimensions:	Filter	Version	Members	Actual					Dimensions:	Filter	Version	Members	Actual
4		Filter	Year	Members	2021						Filter	Year	Members	2021
5		Filter	Entity	Members	Entity A						Filter	Entity	Members	Entity A
6		Filter	Departme	Members	Sales						Filter	Departme	Members	Sales
7		Column	Month	Range	$B$11:$E$11						Column	Month	Range	$K$11:$N$1
8		Row	Account	Range	$A$12:$A$33						A33)	Account	Range	$J$12:$J$16
9														
10	OLAPivotTable									OLAPivotTable				
11		Q1	Q2	Q3	Q4						Q1	Q2	Q3	Q4
12	Other Income (Expense)	255	255	255	255					Gross Profit %	60%	60%	60%	60%
13	Other Revenue	360	360	360	360					Operating Expense %	22%	22%	22%	22%
14	Other (Expense)	-105	-105	-105	-105					Operating Profit %	38%	38%	38%	38%
15	Operating Profit									FTE	0%	0%	0%	0%
16	Operating Expense	9947.7	9947.7	9947.7	9947.7					Revenue per FTE	0%	0%	0%	0%
17	Payroll and related expenses	3180	3180	3180	3180									
18	Distribution	960	960	960	960									
19	Occupancy Expenses	1800	1800	1800	1800									
20	Research and Development	345	345	345	345									
21	Sales and Marketing	1361.7	1361.7	1361.7	1361.7									
22	Depreciation	1950	1950	1950	1950									
23	Amortization	186	186	186	186									
24	Administrative Expenses	357	357	357	357									
25	UTILITIES	0	0	0	0									
26	Other operating Expenses (Incon	-192	-192	-192	-192									
27	Gross Profit	27015	27015	27015	27015									
28	Revenue	45390	45390	45390	45390									
29	Sales of Goods	42600	42600	42600	42600									
30	Sales of Services	2790	2790	2790	2790									
31	Cost of Sales	18375	18375	18375	18375									
32	Cost of Goods	18150	18150	18150	18150									
33	Cost of Services	225	225	225	225									

4. To commit the change, press **Ctrl** + **Shift** + **Enter** keys.

IMPORTANT: Bear in mind that when changing range references, in order to successfully commit the changes to the formula, you MUST always press the **Ctrl + Shift + Enter** keys. Otherwise, the new range will not be updated.

5. Press the **F9** key to refresh the PowerExcel Slice. Notice that the range reference for the rows of the second PivotTable has updated and now displays the same *Account* members as in the first PivotTable.

K8 {=OLATableRange($K$1,$K$2,"Row",0,"Account",A12:A33)}

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Database:	PandA_2022_Connect								Database:	PandA_2022_Connect			
2	Cube:	Financial Data								Cube:	Financial Data			
3	Dimensions:	Filter	Version	Members	Actual					Dimensions:	Filter	Version	Members	Actual
4		Filter	Year	Members	2021						Filter	Year	Members	2021
5		Filter	Entity	Members	Entity A						Filter	Entity	Members	Entity A
6		Filter	Departme	Members	Sales						Filter	Department	Members	Sales
7		Column	Month	Range	$B$11:$E$11						Column	Month	Range	$K$11:$N$11
8		Row	Account	Range	$A12:$A$33						Row	Account	Range	$A12:$A$33
9														
10	OLAPivotTable									OLAPivotTable				
11		Q1	Q2	Q3	Q4						Q1	Q2	Q3	Q4
12	Other Income (Expense)	255	255	255	255					Other Income (Expense)	255.00	255.00	255.00	255.00
13	Other Revenue	360	360	360	360					Other Revenue	360.00	360.00	360.00	360.00
14	Other (Expense)	-105	-105	-105	-105					Other (Expense)	(105.00)	(105.00)	(105.00)	(105.00)
15	Operating Profit	17067.3	17067.3	17067.3	17067.3					Operating Profit	17,067.30	17,067.30	17,067.30	17,067.30
16	Operating Expense	9947.7	9947.7	9947.7	9947.7					Operating Expense	9,947.70	9,947.70	9,947.70	9,947.70
17	Payroll and related expenses	3180	3180	3180	3180					Payroll and related expe	3180	3180	3180	3180
18	Distribution	960	960	960	960					Distribution	960	960	960	960
19	Occupancy Expenses	1800	1800	1800	1800					Occupancy Expenses	1800	1800	1800	1800
20	Research and Development	345	345	345	345					Research and Developm	345	345	345	345
21	Sales and Marketing	1361.7	1361.7	1361.7	1361.7					Sales and Marketing	1361.7	1361.7	1361.7	1361.7
22	Depreciation	1950	1950	1950	1950					Depreciation	1950	1950	1950	1950
23	Amortization	186	186	186	186					Amortization	186	186	186	186
24	Administrative Expenses	357	357	357	357					Administrative Expense	357	357	357	357
25	UTILITIES	0	0	0	0					UTILITIES	0	0	0	0
26	Other operating Expenses (Incom	-192	-192	-192	-192					Other operating Expens	-192	-192	-192	-192
27	Gross Profit	27015	27015	27015	27015					Gross Profit	27015	27015	27015	27015
28	Revenue	45390	45390	45390	45390					Revenue	45390	45390	45390	45390
29	Sales of Goods	42600	42600	42600	42600					Sales of Goods	42600	42600	42600	42600
30	Sales of Services	2790	2790	2790	2790					Sales of Services	2790	2790	2790	2790
31	Cost of Sales	18375	18375	18375	18375					Cost of Sales	18375	18375	18375	18375
32	Cost of Goods	18150	18150	18150	18150					Cost of Goods	18150	18150	18150	18150
33	Cost of Services	225	225	225	225					Cost of Services	225	225	225	225

6. PowerExcel Licensed Capabilities: New Cube / Drill-Through / SQL SS Live / DRDC (Dynamic Relational Database Connectivity)

By now we have documented the full complement of capabilities that PowerExcel has, to reach, from Excel, data in a collaborative business model—in order to report on or analyze any model data and to contribute to planning applications. The following capabilities—all of which require licensing—are of a different order. The first, New Cube, makes use of data in Excel to create a model "from scratch." In other words, PowerExcel can transform formatted Excel data, no matter the volume of it (we should note here how large some Excel data sets can be) into a significantly more efficient, sharable "cube" structure(s) for collaborative business applications.

The other capabilities go in the other direction—they concern reaching data in transactional (i.e., table-based) systems and applications. With PowerExcel, a user can "drill through" to the transactional details of any table that contributes to a business model; can bring up summary table-based data and make pretty well limitless "multidimensional" reports from it; can "write back" data points into transactional tables, and; save Views that will be dynamic to other third-party products, including end-user tools like Power BI.

The following sections detail these capabilities and point out the PowerExcel benefits from using them.

6.1 New Cube

PowerExcel users can create Cubes in Olation® from selected data in an Excel spreadsheet. This feature determines the Dimension and Cube structures by looking at the selected data range. Dimensions, dimension types and measure values are determined by looking at the data in each of the selected columns. Once the Dimensions and Cubes are created in Olation, modifications can be made through the Olation or Nexus Studio. [Note that this presupposes that a user/company has an accessible installation of the Olation or Nexus Studio.]

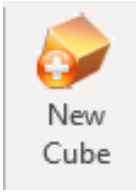
Note: The PowerExcel **New Cube** capability is enabled on the basis of customer licensing. If your PowerExcel installation does not include New Cube capabilities, reach PARIS Technologies for further information.

Creating a new Cube begins with a worksheet of tabular data in Excel. This data can come from any source but needs to follow a basic structure, beginning with the fact that has a Header row (as circled in the following image, from an example file, *Northwind Sample Data.xlsx*). This row is used to name the specific Dimensions and Measures for the new Cube.

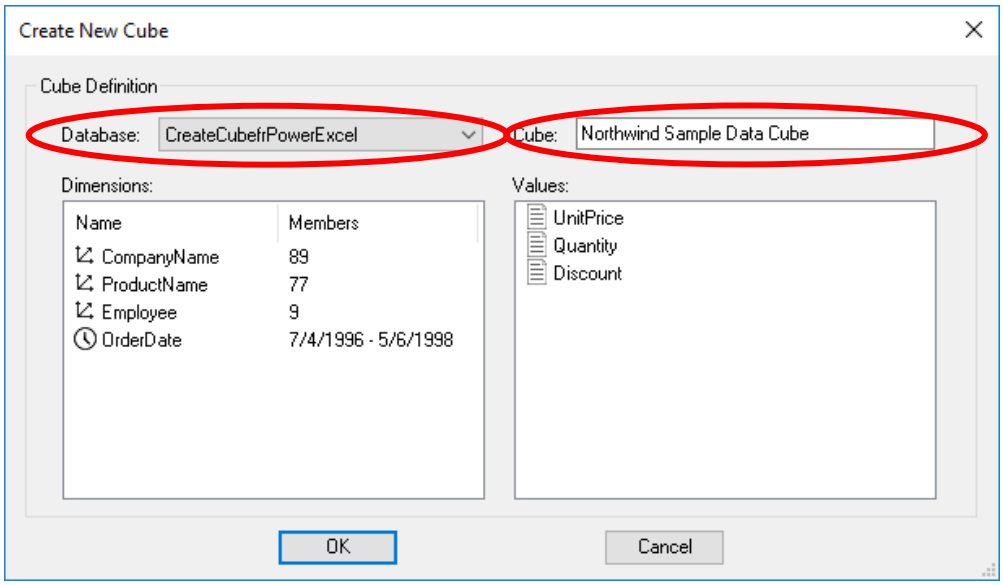
	A	B	C	D	E	F	G	H
1	CompanyName	ProductName	Employee	OrderDate	UnitPrice	Quantity	Discount	
2	Vins et alcools Chevalier	Queso Cabrales	Steven Buchanan	7/4/1996	14	12	0	
3	Vins et alcools Chevalier	Singaporean Hokkien Fried Mee	Steven Buchanan	7/4/1996	9.8	10	0	
4	Vins et alcools Chevalier	Mozzarella di Giovanni	Steven Buchanan	7/4/1996	34.8	5	0	
5	Toms Spezialitäten	Tofu	Michael Suyama	7/5/1996	18.6	9	0	
6	Toms Spezialitäten	Manjimup Dried Apples	Michael Suyama	7/5/1996	42.4	40	0	
7	Hanari Carnes	Jack's New England Clam Chowder	Margaret Peacock	7/8/1996	7.7	10	0	
8	Hanari Carnes	Manjimup Dried Apples	Margaret Peacock	7/8/1996	42.4	35	0.15	
9	Hanari Carnes	Louisiana Fiery Hot Pepper Sauce	Margaret Peacock	7/8/1996	16.8	15	0.15	
10	Victuailles en stock	Gustaf's Knäckebröd	Janet Leverling	7/8/1996	16.8	6	0.05	
11	Victuailles en stock	Ravioli Angelo	Janet Leverling	7/8/1996	15.6	15	0.05	
12	Victuailles en stock	Louisiana Fiery Hot Pepper Sauce	Janet Leverling	7/8/1996	16.8	20	0	
13	Suprêmes délices	Sir Rodney's Marmalade	Margaret Peacock	7/9/1996	64.8	40	0.05	
14	Suprêmes délices	Geitost	Margaret Peacock	7/9/1996	2	25	0.05	
15	Suprêmes délices	Camembert Pierrot	Margaret Peacock	7/9/1996	27.2	40	0	

1. To define the new Cube, first select the columns (and rows) that contain the data. You can select full columns and the logic will stop once it hits a blank row.

2. Next, select the **New Cube** option in the **PowerExcel Tab**.



PowerExcel uses the header columns along with the first 4 rows of data to determine what to do with each column of data. If the column contains 4 text values, then the column is treated as a standard dimension. If the column contains 4 date values, the column is treated as a data dimension. If the column contains 4 numerical values, it is treated as a measure. The user will receive a preview dialog with the parsed Dimension and Cube values, as shown in the following image.



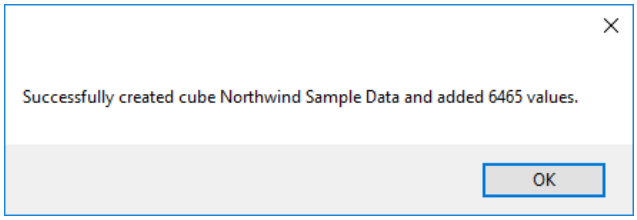
Before clicking OK, there are 2 conditions that must be met in advance for successful Cube creation:

- An **Olation database** (whether a SQL, Nexus or other database type) must exist; this may be an existing or a newly created database.
- There must be an established **PowerExcel Connection** to this database.

In the above diagram the Database circled top left (a drop-down selection) is in fact the PowerExcel Connection name; a connection has already been established to a Nexus database also so-named (CreateCubefrPowerExcel).

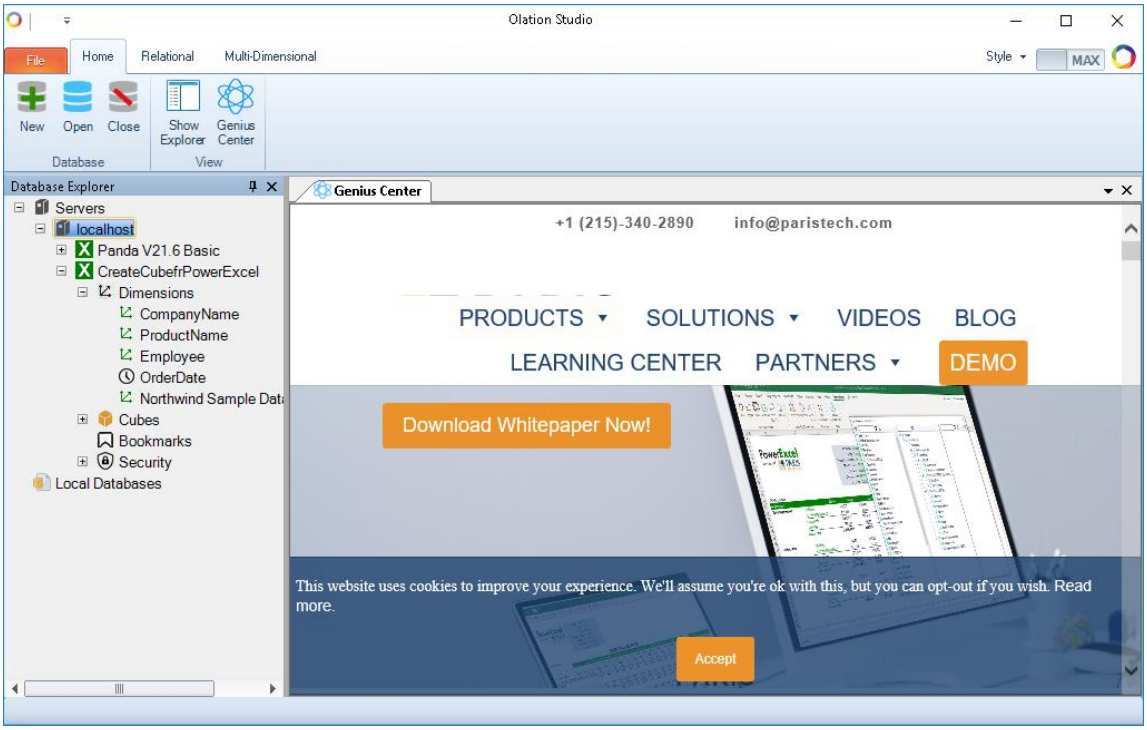
The default Cube name is the name of the saved Excel document; you may name the new Cube—circled top right in the preceding image—anything you wish (in this example, *Northwind Sample Data Cube*). For each column that represents a Dimension, the dialog will display the column header as the dimension name, an icon indicating the type, and a count or date range indicating the number of unique Members for each Dimension. The columns that contain numeric values will appear as Values columns and will become Measure members in the Measure dimension.

3. Click **OK**.
   A message will appear indicating successful Cube creation and added Values.



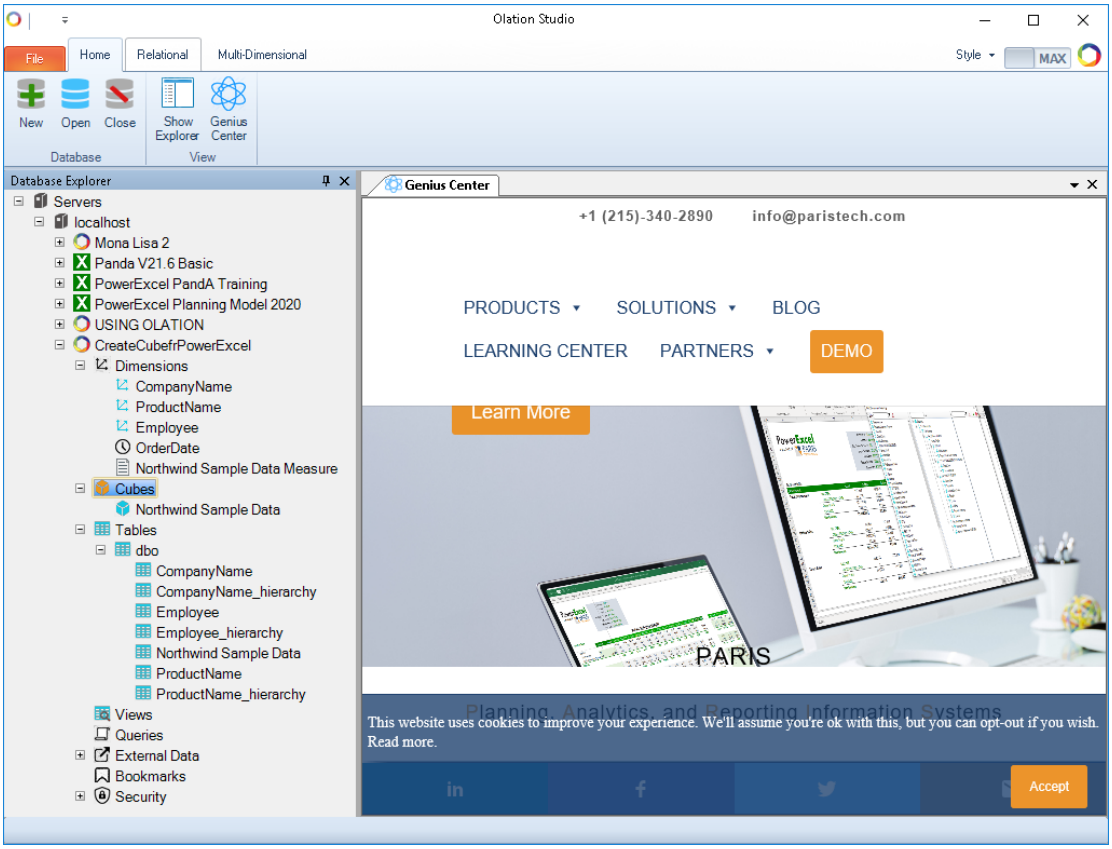
If you want to change the name of any of the Dimensions or Measures, cancel the previous dialog above, edit the column header and start the new Cube again. Clicking OK will pass this structure along with all the rows of data to Olation and create all the new Dimensions and the Cube and will populate the data. If the database is a Nexus database, then it will be saved multidimensionally. If the target database source is relational (e.g., SQL Server) then all data will be pushed to relational tables. Both instances are shown below.

Note that Cube and Dimension names must be unique. In SQL, Dimensions are created as custom dimension types so users can easily edit them using Olation Studio. If created as multidimensional dimensions in Nexus, they can be edited in Nexus Studio. Note that, depending on the amount of data, this process can take some time. A progress dialog will come up until all values are written to Olation.

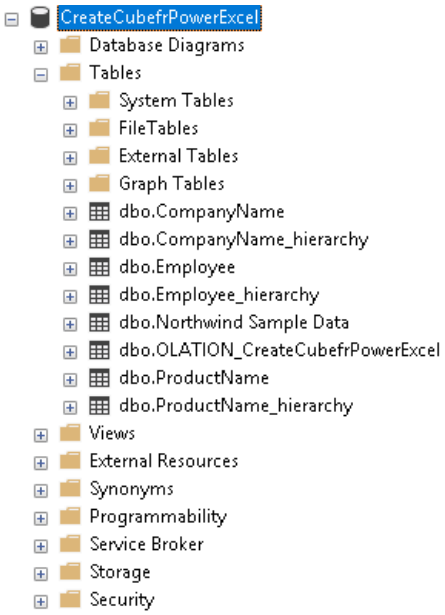


Cube created as a database in Nexus Studio

In the following images dialogs, note that the Dimensions and Tables are shown in Olation Studio. As this is a SQL-based Olation database, the Tables are also shown in SQL Server (second image).

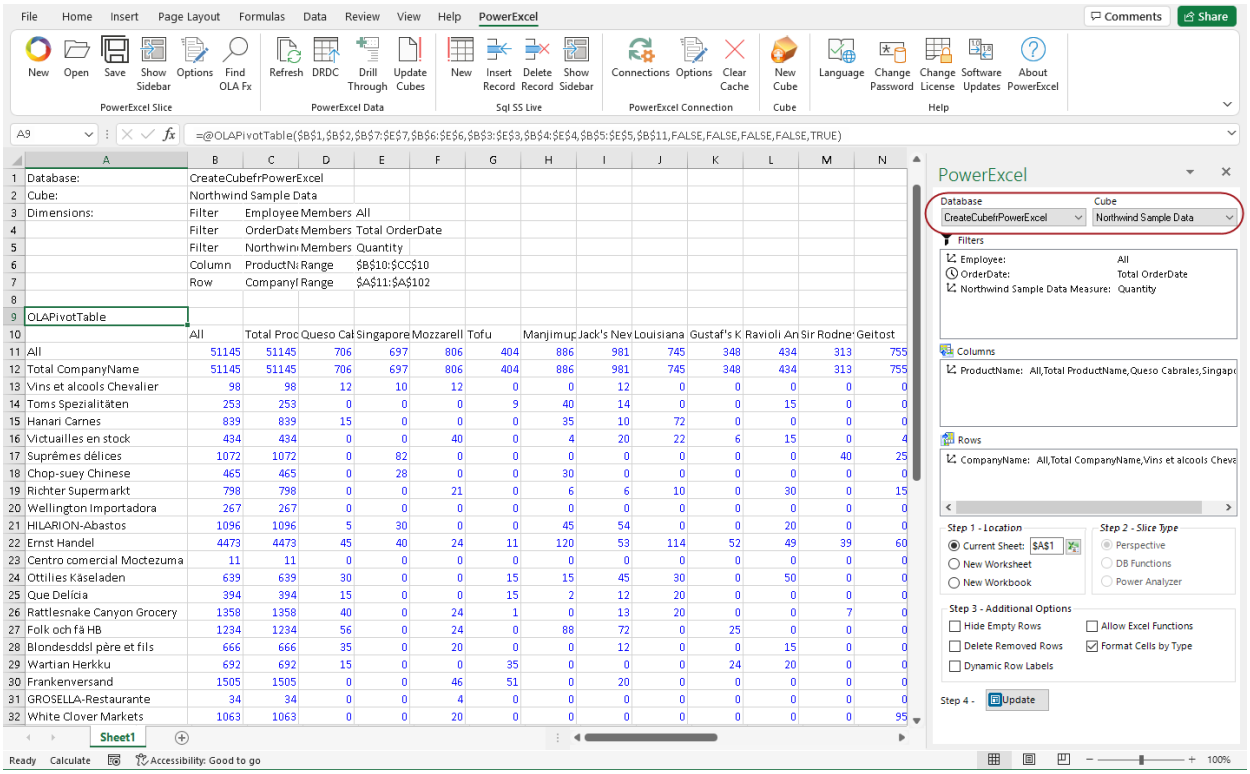


Above, the Dimensions, the new Cube, and relational (SQL) tables shown in Olation Studio



At left, the tables created in the New Cube process shown in SQL Server

You can now create a PowerExcel Slice of the newly created Cube: the spreadsheet below shows the Connection used to reach the Cube and the Cube itself (boxed area in the image below). Filters and Columns and Rows selections have been made to show the following Slice.



6.2 Drill Through

PowerExcel has a Drill Through feature, which allows users to see the relational database reference values that create a point(s) in a multidimensional data model. The Drill Through feature can be applied to any data point, but it is particularly useful when used on an aggregated number, showing its “source” values.

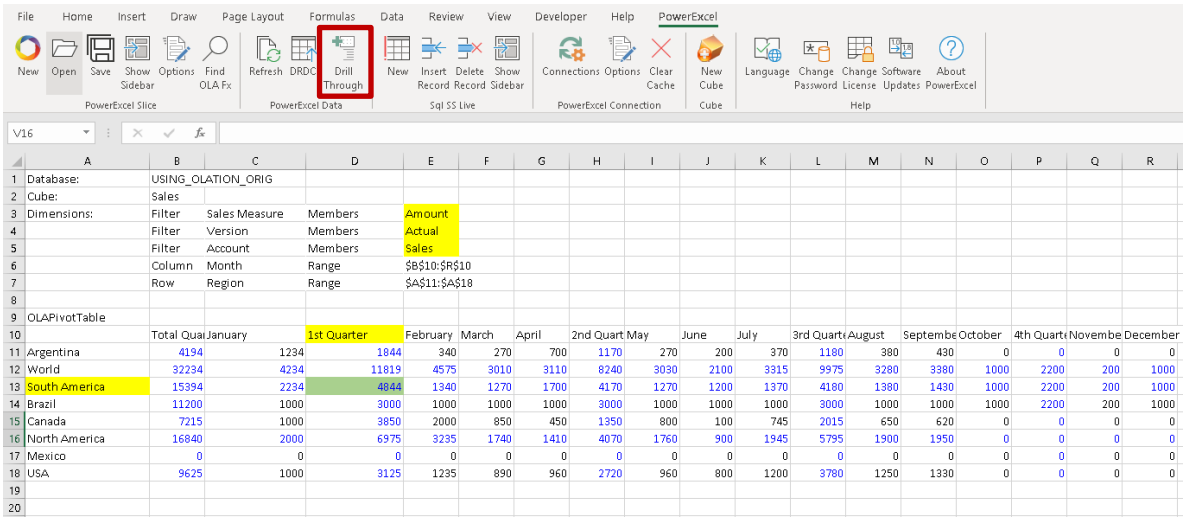
Once Drill-Through values of composite relational records are shown in PowerExcel, a user can investigate further—essentially, “multidimensionally”—to show records across different Dimension/Member selections.

Using another feather, SQL SS Live, a user can as well Insert or Delete records from a relational database source, provide s/he has requisite privileges.

NOTE: The PowerExcel **Dill Through** capability is enabled on the basis of customer licensing. If your PowerExcel installation does not include this capability, reach PARIS Technologies for further information In addition to being a licensed feature, DRDC requires that the Olation Server be installed and licensed.

Also important: To perform a drill though, the PowerExcel must have rights to access the referenced underlying relational database.

This example uses an Olation® model/cube called *Sales* that is based on a SQL Server relational database called *USING_OLATION_ORIG*; the Olation model has the same name and is referenced in Cell B1 in the spreadsheet below, which is an example PowerExcel Slice.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Database:	USING_OLATION_ORIG																
2	Cube:	Sales																
3	Dimensions:	Filter	Sales Measure	Members	Amount													
4		Filter	Version	Members	Actual													
5		Filter	Account	Members	Sales													
6		Column	Month	Range	$B$10:$R$10													
7		Row	Region	Range	$A$11:$A$18													
8																		
9	OLAPivotTable																	
10		Total Qua	January	1st Quarter	February	March	April	2nd Quart	May	June	July	3rd Quarte	August	Septembe	October	4th Quarte	Novembe	December
11	Argentina	4194	1234	1844	340	270	700	1170	270	200	370	1180	380	430	0	0	0	0
12	World	32234	4234	11819	4575	3010	3110	8240	3030	2100	3315	9975	3280	3380	1000	2200	200	1000
13	South America	15394	2234	4844	1340	1270	1700	4170	1270	1200	1370	4180	1380	1430	1000	2200	200	1000
14	Brazil	11200	1000	3000	1000	1000	1000	3000	1000	1000	1000	3000	1000	1000	1000	2200	200	1000
15	Canada	7215	1000	3850	2000	850	450	1350	800	100	745	2015	650	620	0	0	0	0
16	North America	16840	2000	6975	3235	1740	1410	4070	1760	900	1945	5795	1900	1950	0	0	0	0
17	Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	USA	9625	1000	3125	1235	890	960	2720	960	800	1200	3780	1250	1330	0	0	0	0
19																		
20																		

Our aim will be to do a drill through on the green-highlighted cell in the image above, Cell D13, whose value is **4844**. Note that it comes at the intersection of *South America*, *1st Quarter* (the Row and Column Dimension Members) for *Amount*, *Actual*, *Sales* (the Filter Members), all of which are yellow-highlighted.

1. To perform the Drill Through, select a cell in a PowerExcel Slice—e.g., Cell D13, as above, then click on the Drill Through icon on the PowerExcel ribbon (boxed in the image above, and shown below).

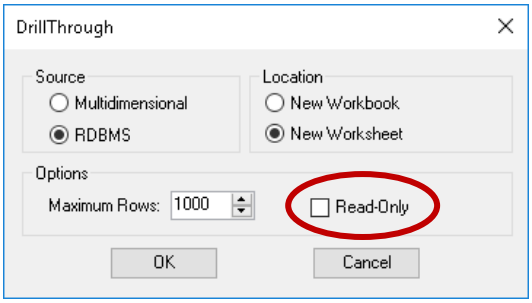
The DrillThrough dialog appears, as shown in the image below.

Note that you can select, for Source, either Multidimensional or Relational. When Multidimensional is selected, the composite data points from the multidimensional model (only) will appear. When Relational is selected (as shown selected), the composite points that make up the selected cell will be the *relational database points*—in sum, "reaching back" to the table(s) for the most granular level transactions.

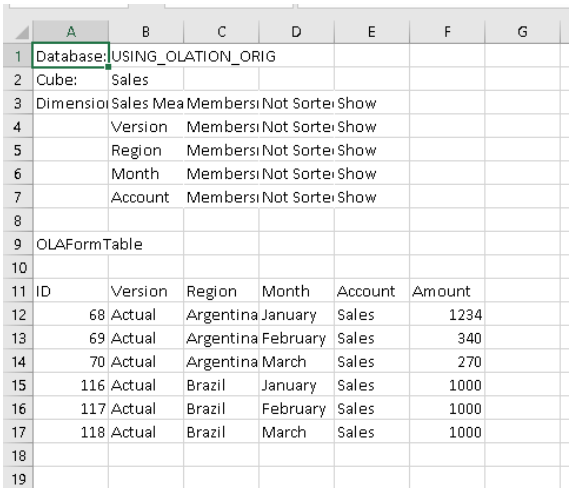
As well you can direct PowerExcel to show the drill through results in either a New Workbook or New Worksheet (as shown selected);

The Maximum Number of Rows can be indicated.

Lastly—and this will be important when discussing the next feature, SQL SS Live, there is a Read-Only box (circled in the image). When checked, the user will not be able to "write back" to the Source database. The box is unchecked in the image, which is necessary for an upcoming exercise, i.e., we will want to demonstrate the "write back" capability.



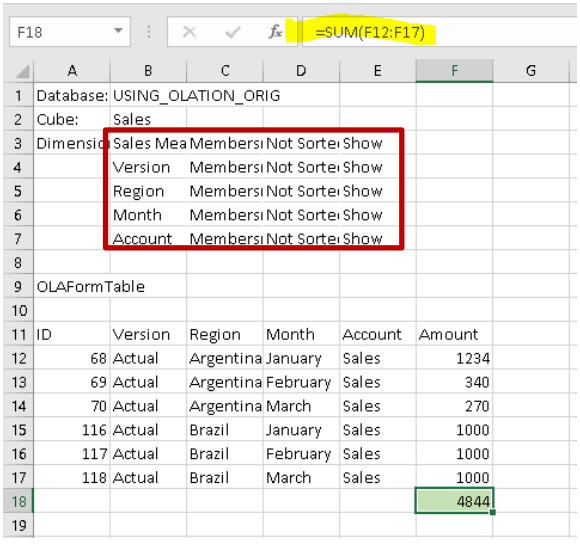
2. Click **OK**.
   The result of the drill through will appear in a New Worksheet:



	A	B	C	D	E	F	G
1	Database:	USING_OLATION_ORIG					
2	Cube:	Sales					
3	Dimensio	Sales Mea	Members	Not Sorte	Show		
4		Version	Members	Not Sorte	Show		
5		Region	Members	Not Sorte	Show		
6		Month	Members	Not Sorte	Show		
7		Account	Members	Not Sorte	Show		
8							
9	OLAFormTable						
10							
11	ID	Version	Region	Month	Account	Amount	
12	68	Actual	Argentina	January	Sales	1234	
13	69	Actual	Argentina	February	Sales	340	
14	70	Actual	Argentina	March	Sales	270	
15	116	Actual	Brazil	January	Sales	1000	
16	117	Actual	Brazil	February	Sales	1000	
17	118	Actual	Brazil	March	Sales	1000	
18							
19							

In summary, these six transactional records from the USING_OLATION_ORIG relational database in the SQL Server—concerning Actual Sales in South America—comprise the (multidimensional data point) value shown in Cell D13.

Although it is not necessary, you can confirm the value (4844) by creating a SUM on the drill-through sheet:

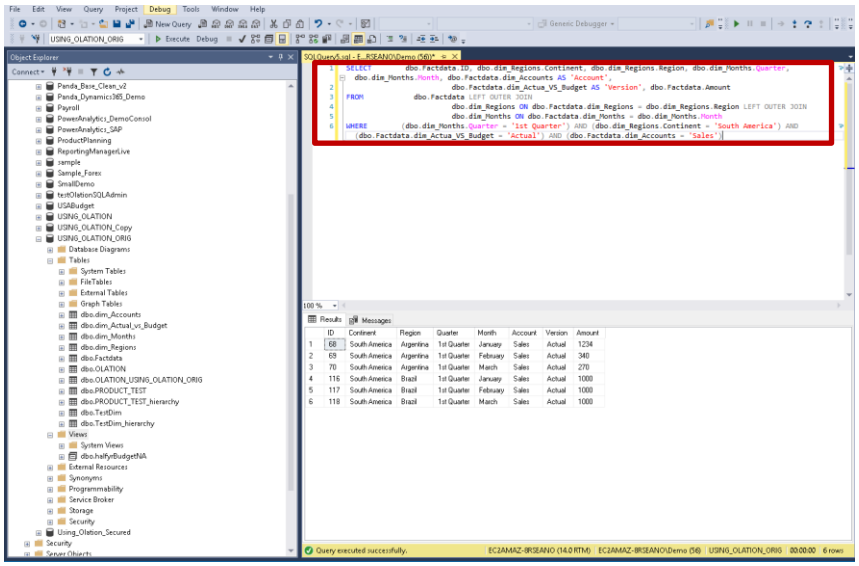


F18 =SUM(F12:F17)

	A	B	C	D	E	F	G
1	Database:	USING_OLATION_ORIG					
2	Cube:	Sales					
3	Dimensio	Sales Mea	Members	Not Sorte	Show		
4		Version	Members	Not Sorte	Show		
5		Region	Members	Not Sorte	Show		
6		Month	Members	Not Sorte	Show		
7		Account	Members	Not Sorte	Show		
8							
9	OLAFormTable						
10							
11	ID	Version	Region	Month	Account	Amount	
12	68	Actual	Argentina	January	Sales	1234	
13	69	Actual	Argentina	February	Sales	340	
14	70	Actual	Argentina	March	Sales	270	
15	116	Actual	Brazil	January	Sales	1000	
16	117	Actual	Brazil	February	Sales	1000	
17	118	Actual	Brazil	March	Sales	1000	
18						4844	
19							

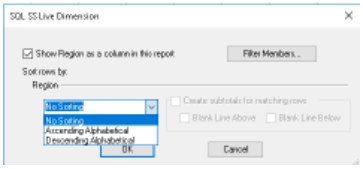
Two things are worth noting at this point:

1. The spreadsheet of this drill through can be saved locally (or, if the original Slice still exists, it can be saved to the Cloud for other users to open).
2. The quick access to transactional records via the PowerExcel Drill Through stands in contrast to what might otherwise be requred by other programs to reach this data. As an example, it would likely require advanced query-writing skills to create the SQL Query to run through all tables (as it is highly unlikely that this data would be available in one table) and return the values. A sample query, quite complex, is shown below as an example (red boxed)—indeed, it s the SQL query that would need to be written to return the values obtained in the exercise above.

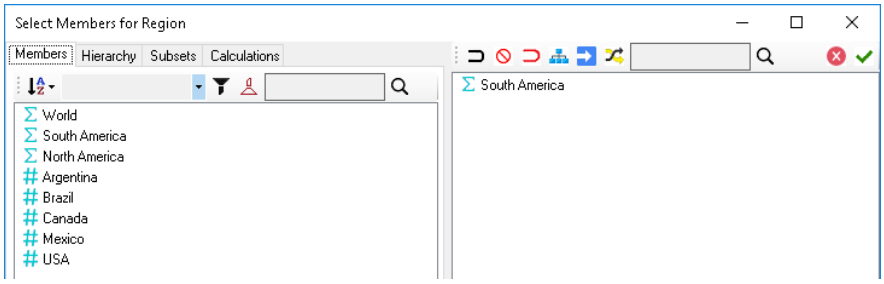


We are now in a position to show how this drill-through report can be used to find more information about the transaction data in a model that PowerExcel has reached: in short, from this worksheet a user can double-click on any of the filter Dimensions at the top of the page (red-boxed in the preceding image) and find the relevant data records.

3. As an example, to find the transactional records for *North America*, *Total Quarter*, double-click on Cell C5 (referencing the Region dimension). A SQL SS Live Dimension window appears:

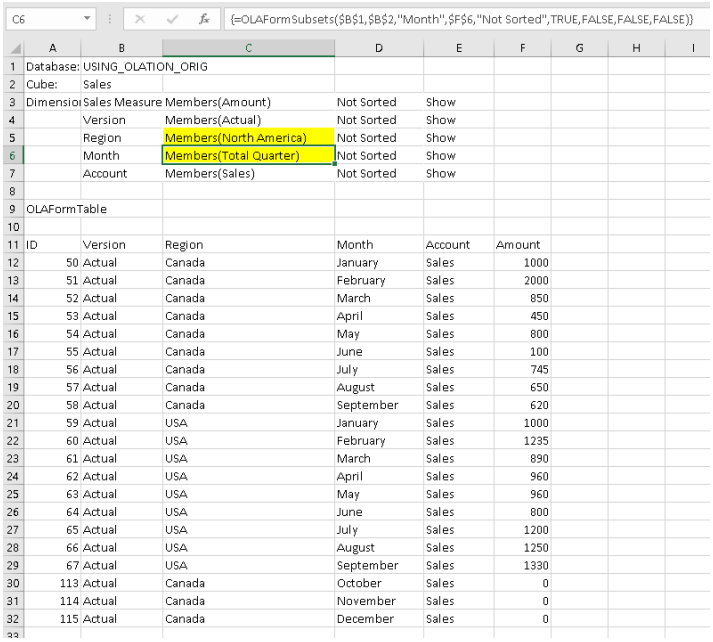


4. Click on the Filter Members button and the Select Members for Region dialog appears:



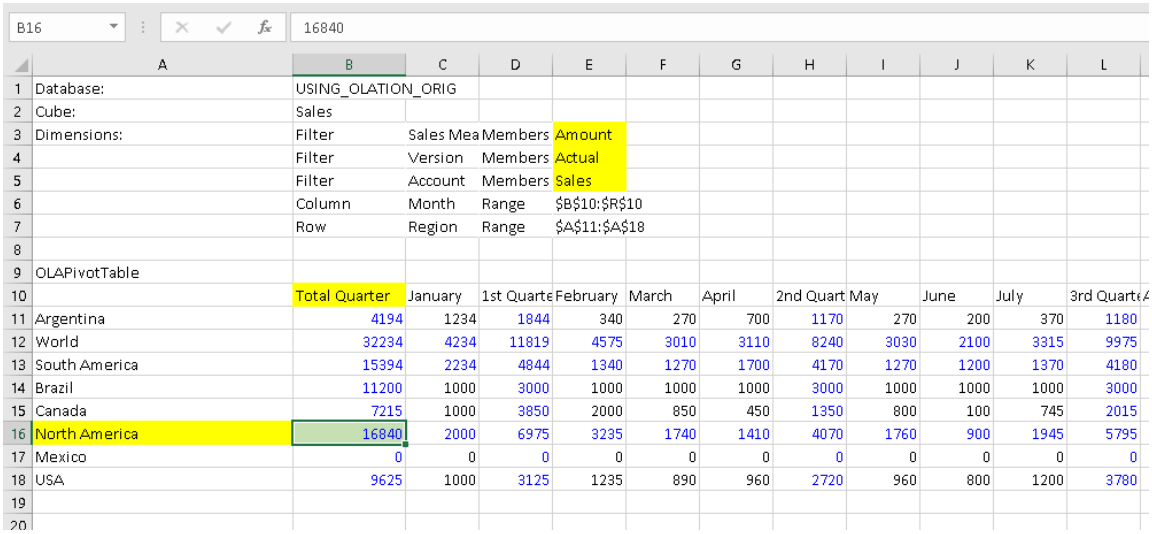
5. Delete South America in the display pane on the right and drag **North America** from the Members pane to there. Then click on the green checkmark, top right. Back in the SQL SS Live dialog, note that there are sorting options for the Region dimension data in the new drill-through report you will create (see drop-down in previous SQL SS Live image).

6. Click **OK**.
   Similarly, select **Total Quarters** from among the Month dimension Members.
   The resulting Drill Through will appear, showing transactional records for *Actual*, *Sales Amount*, for *North America*, *Total Quarters*.



	A	B	C	D	E	F	G	H	I
1	Database:	USING_OLATION_ORIG							
2	Cube:	Sales							
3	Dimensio	Sales Measure	Members(Amount)	Not Sorted	Show				
4		Version	Members(Actual)	Not Sorted	Show				
5		Region	Members(North America)	Not Sorted	Show				
6		Month	Members(Total Quarter)	Not Sorted	Show				
7		Account	Members(Sales)	Not Sorted	Show				
8									
9	OLAFormTable								
10									
11	ID	Version	Region	Month	Account	Amount			
12	50	Actual	Canada	January	Sales	1000			
13	51	Actual	Canada	February	Sales	2000			
14	52	Actual	Canada	March	Sales	850			
15	53	Actual	Canada	April	Sales	450			
16	54	Actual	Canada	May	Sales	800			
17	55	Actual	Canada	June	Sales	100			
18	56	Actual	Canada	July	Sales	745			
19	57	Actual	Canada	August	Sales	650			
20	58	Actual	Canada	September	Sales	620			
21	59	Actual	USA	January	Sales	1000			
22	60	Actual	USA	February	Sales	1235			
23	61	Actual	USA	March	Sales	890			
24	62	Actual	USA	April	Sales	960			
25	63	Actual	USA	May	Sales	960			
26	64	Actual	USA	June	Sales	800			
27	65	Actual	USA	July	Sales	1200			
28	66	Actual	USA	August	Sales	1250			
29	67	Actual	USA	September	Sales	1330			
30	113	Actual	Canada	October	Sales	0			
31	114	Actual	Canada	November	Sales	0			
32	115	Actual	Canada	December	Sales	0			

If you create a SUM of values for this report (which will yield *16840*) it will match the value in a PowerExcel Slice with the same parameters (yellow-highlighted below) that shows the same data point (green-highlighted):

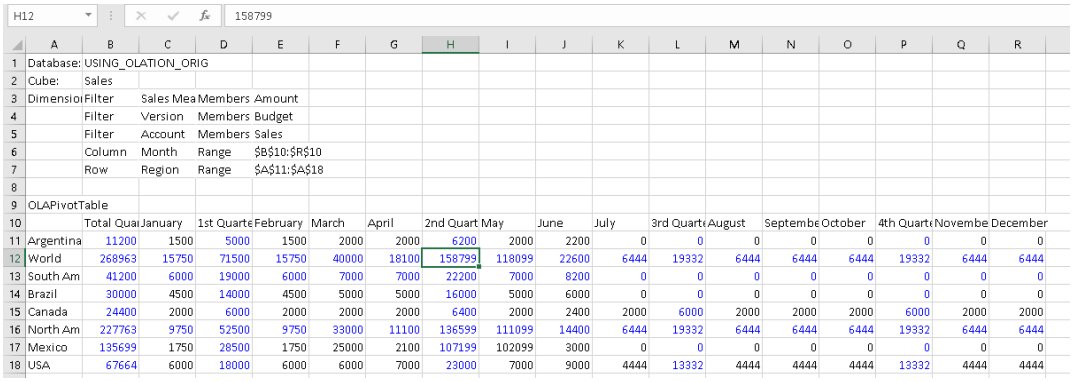


	A	B	C	D	E	F	G	H	I	J	K	L
1	Database:	USING_OLATION_ORIG										
2	Cube:	Sales										
3	Dimensions:	Filter	Sales Mea	Members	Amount							
4		Filter	Version	Members	Actual							
5		Filter	Account	Members	Sales							
6		Column	Month	Range	$B$10:$R$10							
7		Row	Region	Range	$A$11:$A$18							
8												
9	OLAPivotTable											
10		Total Quarter	January	1st Quarte	February	March	April	2nd Quart	May	June	July	3rd Quarte
11	Argentina	4194	1234	1844	340	270	700	1170	270	200	370	1180
12	World	32234	4234	11819	4575	3010	3110	8240	3030	2100	3315	9975
13	South America	15394	2234	4844	1340	1270	1700	4170	1270	1200	1370	4180
14	Brazil	11200	1000	3000	1000	1000	1000	3000	1000	1000	1000	3000
15	Canada	7215	1000	3850	2000	850	450	1350	800	100	745	2015
16	North America	16840	2000	6975	3235	1740	1410	4070	1760	900	1945	5795
17	Mexico	0	0	0	0	0	0	0	0	0	0	0
18	USA	9625	1000	3125	1235	890	960	2720	960	800	1200	3780
19												
20												

6.3 SQL SS Live

We will now consider another licensed feature, **SQL SS Live**, which works in a way similar to a Drill Through (both use the OLAFormTable PowerExcel function to return values) and with which we will show the Insert/Delete capability in coordination with a drill through sheet.

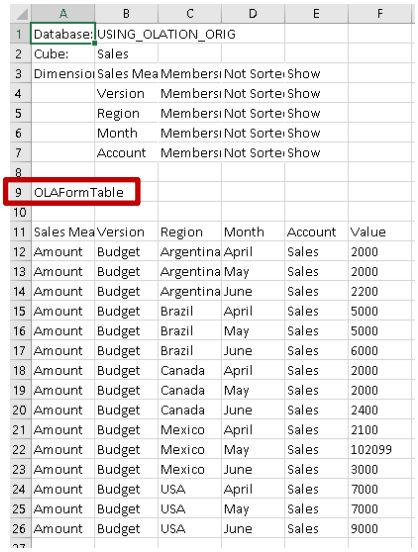
1. Start with a PowerExcel Slice like the following, which shows *Budget* numbers for *Sales*, *Amount* (Filters), with the *Month* dimension on Columns and *Region* on Rows.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Database:	USING_OLATION_ORIG																
2	Cube:	Sales																
3	Dimensio	Filter	Sales Mea	Members	Amount													
4		Filter	Version	Members	Budget													
5		Filter	Account	Members	Sales													
6		Column	Month	Range	$B$10:$R$10													
7		Row	Region	Range	$A$11:$A$18													
8																		
9	OLAPivotTable																	
10		Total Quai	January	1st Quarte	February	March	April	2nd Quart	May	June	July	3rd Quart	August	Septembe	October	4th Quart	Novembe	December
11	Argentina	11200	1500	5000	1500	2000	2000	6200	2000	2200	0	0	0	0	0	0	0	0
12	World	268963	15750	71500	15750	40000	18100	158799	118099	22600	6444	19332	6444	6444	6444	19332	6444	6444
13	South Am	41200	6000	19000	6000	7000	7000	22200	7000	8200	0	0	0	0	0	0	0	0
14	Brazil	30000	4500	14000	4500	5000	5000	16000	5000	6000	0	0	0	0	0	0	0	0
15	Canada	24400	2000	6000	2000	2000	2000	6400	2000	2400	2000	6000	2000	2000	2000	6000	2000	2000
16	North Am	227763	9750	52500	9750	33000	11100	136599	111099	14400	6444	19332	6444	6444	6444	19332	6444	6444
17	Mexico	135699	1750	28500	1750	25000	2100	107199	102099	3000	0	0	0	0	0	0	0	0
18	USA	67664	6000	18000	6000	6000	7000	23000	7000	9000	4444	13332	4444	4444	4444	13332	4444	4444

2. Note that the cursor is placed on **Cell H12**, at the intersection of *World*, *2nd Quarter*.

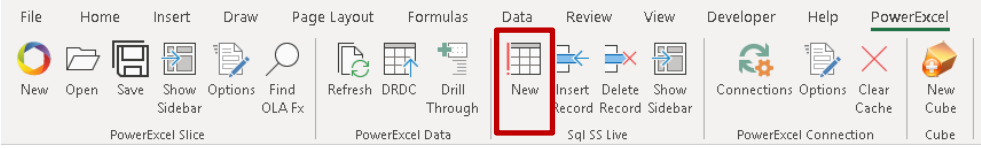
3. Perform a **Drill Through**, making sure to uncheck Read Only and proceeding to create it on a new workbook.
   The result will be as follows:



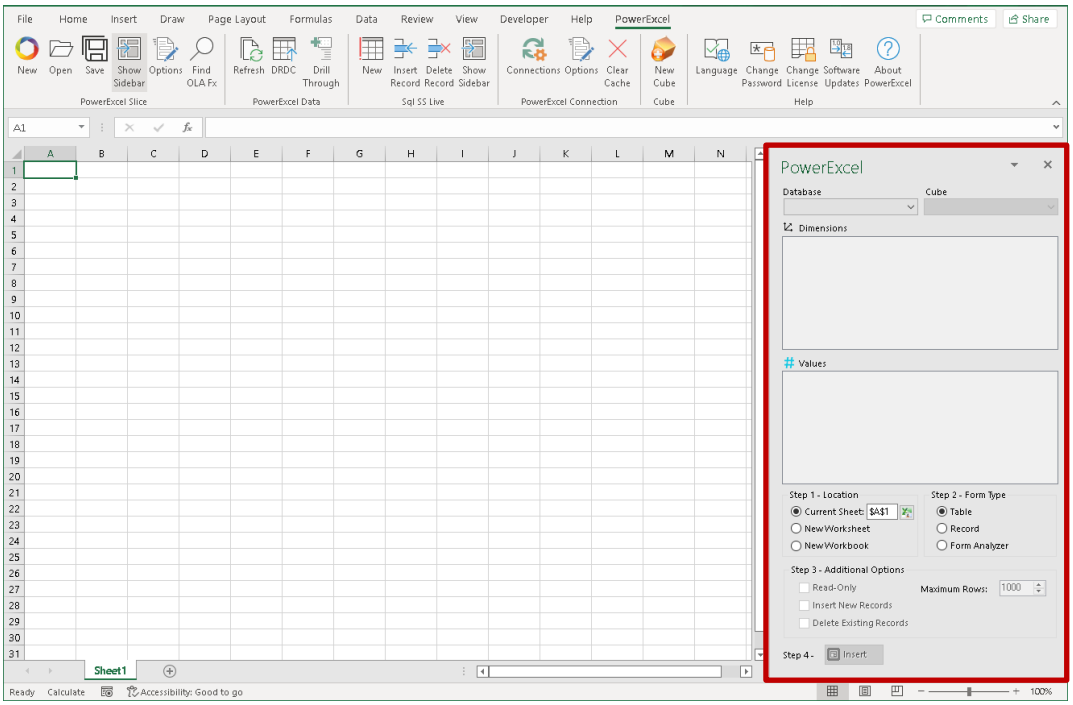
	A	B	C	D	E	F
1	Database:	USING_OLATION_ORIG				
2	Cube:	Sales				
3	Dimensio	Sales Mea	Members	Not Sorte	Show	
4		Version	Members	Not Sorte	Show	
5		Region	Members	Not Sorte	Show	
6		Month	Members	Not Sorte	Show	
7		Account	Members	Not Sorte	Show	
8						
9	OLAFormTable					
10						
11	Sales Mea	Version	Region	Month	Account	Value
12	Amount	Budget	Argentina	April	Sales	2000
13	Amount	Budget	Argentina	May	Sales	2000
14	Amount	Budget	Argentina	June	Sales	2200
15	Amount	Budget	Brazil	April	Sales	5000
16	Amount	Budget	Brazil	May	Sales	5000
17	Amount	Budget	Brazil	June	Sales	6000
18	Amount	Budget	Canada	April	Sales	2000
19	Amount	Budget	Canada	May	Sales	2000
20	Amount	Budget	Canada	June	Sales	2400
21	Amount	Budget	Mexico	April	Sales	2100
22	Amount	Budget	Mexico	May	Sales	102099
23	Amount	Budget	Mexico	June	Sales	3000
24	Amount	Budget	USA	April	Sales	7000
25	Amount	Budget	USA	May	Sales	7000
26	Amount	Budget	USA	June	Sales	9000

Note in the above image the OLAFormTable function, boxed in red.

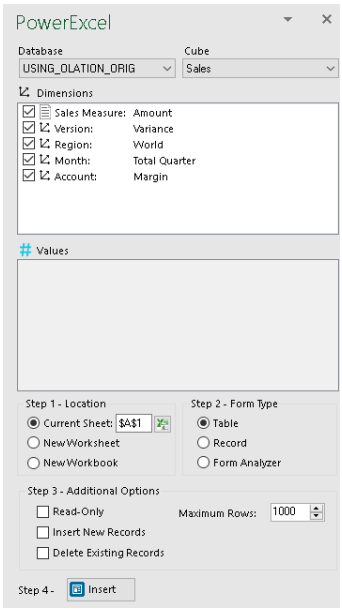
4. Next, open a new spreadsheet (or create a new tab in the current workbook). Rather than create a New Slice, click on the **New** icon in the SQL SS Live group (see boxed, in the next image).



The right-hand pane (boxed in the next image) is one that we have not seen before—it is for use specifically with the SQL SS Live capability:



This pane works, at the top, in the same way as the PowerExcel Slice pane we have been working with: the first step is to select a Database and a Cube in that database. Here, below, the USING_OLATION_ORIG database and the Sales cube are selected.



Note that in the top box that fields from the Fact table in the underlying relational database are shown—specifically, the fields that have been used to create Dimensions in the Olation cube. These are *Sales Measure*, *Version*, *Region*, *Month*, and *Account*. Any additional fields—those that are *not* used in the cube creation, but which appear in the Fact table anyway—will appear in the second box, titled # Vaues. (As there are no such fields/dimensions, this box is empty. It is worth noting that if there were any fields/dimensions, then data from them could be selected to appear in the following steps.)

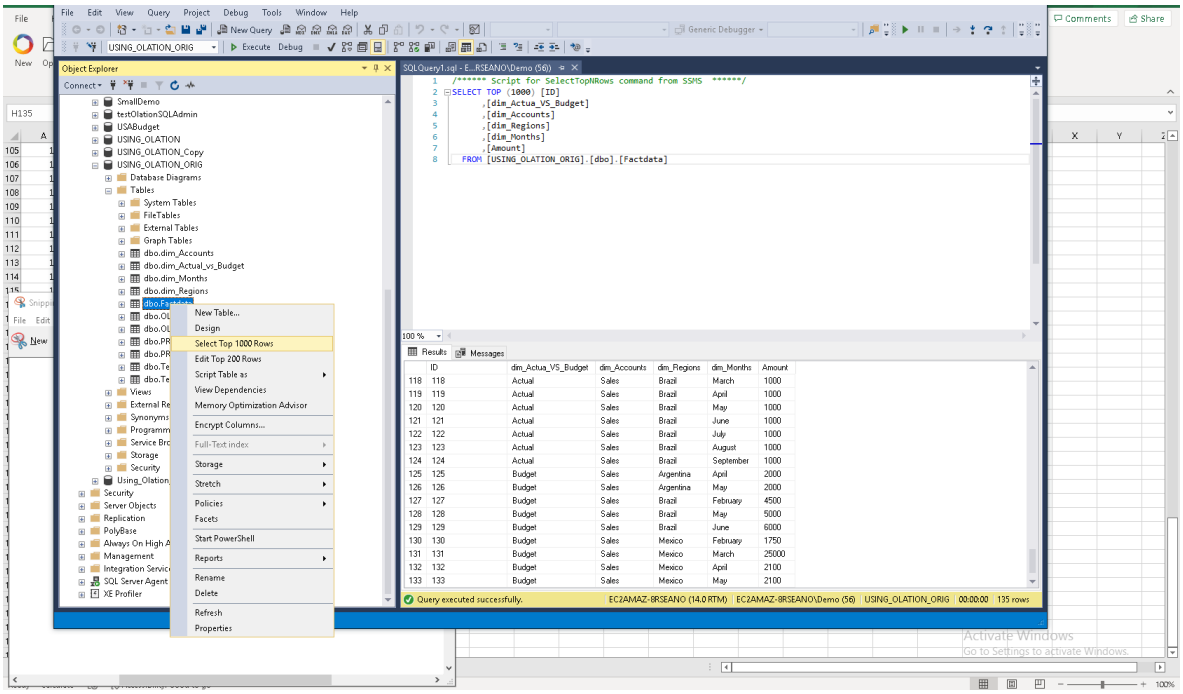
5. For Step 1, select where you would like the Form (which is what SQL SS Live creates) to be created—here, Current Sheet is selected.
   [Note, in the current version Steps 2 and 3 are not operable.]
   Click Insert: depending on the number of Maximum Rows selected, the entire Fact data table from the underlying relational database will appear, with the ID column show at the right (Column A):

	A	B	C	D	E	F
1	Database:	USING_OLATION_ORIG				
2	Cube:	Sales				
3	Dimensio	Sales Mea	Members	Not Sorte	Show	
4		Version	Members	Not Sorte	Show	
5		Region	Members	Not Sorte	Show	
6		Month	Members	Not Sorte	Show	
7		Account	Members	Not Sorte	Show	
8						
9	OLAFormTable					
10						
11	ID	Version	Region	Month	Account	Amount
12	1	Budget	Canada	January	Sales	2000
13	2	Budget	USA	January	Sales	6000
14	3	Actual	Brazil	October	Sales	1000
15	4	Actual	Brazil	Novembe	Sales	200
16	5	Actual	Brazil	Decembe	Sales	1000
17	6	Actual	Brazil	January	Cost of Sa	500
18	7	Actual	Brazil	February	Cost of Sa	500
19	8	Actual	Brazil	March	Cost of Sa	500
20	9	Actual	Brazil	April	Cost of Sa	500
21	10	Actual	Brazil	May	Cost of Sa	500
22	11	Actual	Brazil	June	Cost of Sa	500
23	12	Actual	Brazil	July	Cost of Sa	500
24	13	Actual	Brazil	August	Cost of Sa	500
25	14	Actual	Brazil	Septembe	Cost of Sa	500
26	15	Actual	Brazil	October	Cost of Sa	500

[the intervening Rows 27 – 124 would appear here]

125	123	Actual	Brazil	August	Sales	1000
126	124	Actual	Brazil	Septembe	Sales	1000
127	125	Budget	Argentina	April	Sales	2000
128	126	Budget	Argentina	May	Sales	2000
129	127	Budget	Brazil	February	Sales	4500
130	128	Budget	Brazil	May	Sales	5000
131	129	Budget	Brazil	June	Sales	6000
132	130	Budget	Mexico	February	Sales	1750
133	131	Budget	Mexico	March	Sales	25000
134	132	Budget	Mexico	April	Sales	2100
135	133	Budget	Mexico	May	Sales	2100
136	134	Budget	Mexico	June	Sales	3000
137	140	Budget	Mexico	May	Sales	99999

IMPORTANT: The PowerExcel **SQL SS Live form** returns values from the entire Fact data table of the underlying relational database. The below image shows the last few rows from the example database that we are using when Select Top 1000 Rows is selected, as shown. The transactions shown from this table match those in the form shown in the preceding image. (Below shows 20 or so rows of these transactions.)



A few observations are worth making here, as we look again at the Form generated by the SQL SS Live form:

a. The spreadsheet has been created by the OLAFormTable PowerExcel function (boxed in blue in the last image of the form), just as is the Drill Through.

b. One might make the observation that the Drill Through returns values for the data point selected—a composite of a single point—while the SQL SS Live form brings back the whole megillah, i.e., the entire Fact data table of the underlying database.

c. Like the Drill Through spreadsheet, we can change Dimension members, near the top of the spreadsheet, is indicated among the PowerExcel functions:

	A	B	C	D	E	F
1	Database:	USING_OLATION_ORIG				
2	Cube:	Sales				
3	Dimension	Sales Meas	Members(Amount)	Not Sorted	Show	
4		Version	Members(Variance)	Not Sorted	Show	
5		Region	Members(World)	Not Sorted	Show	
6		Month	Members(Total Quarter)	Not Sorted	Show	
7		Account	Members(Margin)	Not Sorted	Show	
8						
9	OLAFormTable					
10						
11	ID	Version	Region	Month	Account	Amount
12	1	Budget	Canada	January	Sales	2000
13	2	Budget	USA	January	Sales	6000
14	3	Actual	Brazil	October	Sales	1000

6. Returning to the SQL SS Live form first created, we will now change this report (effectively, "multidimensionally") by making Member selections *Budget*; *North America*, and: *2nd Quarter*) and *Sales*. Each time you double-click to make selections, you will sequence through 2 windows: the first to make particularized selections regarding format, and: the second, after clicking the **Filter Members** button, which takes you to the *Select Members for Dimension* dialog.
   The resulting new form will look as follows:

	A	B	C	D	E	F
1	Database:	USING_OLATION_ORIG				
2	Cube:	Sales				
3	Dimensior	Sales Meas	Members(Amount)	Not Sorted	Show	
4		Version	Members(Budget)	Not Sorted	Show	
5		Region	Members(North America	Not Sorted	Show	
6		Month	Members(2nd Quarter)	Not Sorted	Show	
7		Account	Members(Sales)	Not Sorted	Show	
8						
9	OLAFormTable					
10						
11	ID	Version	Region	Month	Account	Amount
12	20	Budget	Canada	April	Sales	2000
13	21	Budget	Canada	May	Sales	2000
14	22	Budget	Canada	June	Sales	2400
15	31	Budget	USA	April	Sales	7000
16	32	Budget	USA	May	Sales	7000
17	33	Budget	USA	June	Sales	9000
18	132	Budget	Mexico	April	Sales	2100
19	133	Budget	Mexico	May	Sales	2100
20	134	Budget	Mexico	June	Sales	3000
21	140	Budget	Mexico	May	Sales	99999
22						

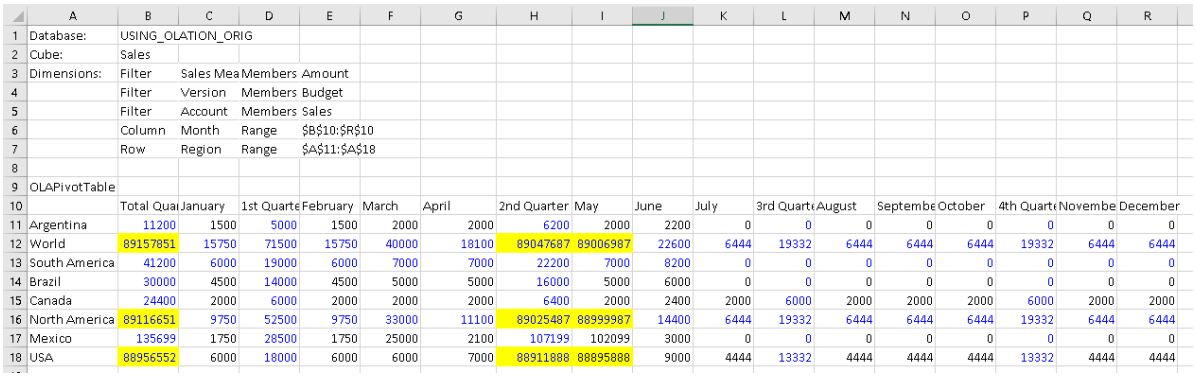
7. To show how to **Insert** a record:
   Click on a cell from the OLAFormTable results—e.g., Cell C17, which concerns *Budget*, *USA*, *June*. Click on the Insert Record icon on the PowerExcel toolbar.
   Note that a Row is inserted above it.

11	ID	Version	Region	Month	Account	Amount
12	20	Budget	Canada	April	Sales	2000
13	21	Budget	Canada	May	Sales	2000
14	22	Budget	Canada	June	Sales	2400
15	31	Budget	USA	April	Sales	7000
16	32	Budget	USA	May	Sales	7000
17	0					
18	33	Budget	USA	June	Sales	9000

8. Abiding by the form's Dimensional logic in or copy a Row with the information you wish to insert: here, below *Budget*, *USA*, *May*, *Sales* has been giving a value (in the Amount column) of **88888888**—we will use an especially large number to make it stand out.
   Note: do not enter anything for ID; indeed, after typing in the Amount value, an ID is automatically generated (141, as below.)

16	32	Budget	USA	May	Sales	7000
17	142	Budget	USA	May	Sales	88888888
18	33	Budget	USA	June	Sales	9000
19	132	Budget	Mexico	April	Sales	2100

9. If we return to the drill-through spreadsheet created at the beginning of this section, and click F9 to refresh the data, we will see this new value and how it affected all intersections (yellow-highlighted in the image below) that concern *May*, *2nd Quarter*, *Total Quarter*, *USA*, *North America*, and *World*.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Database:	USING_OLATION_ORIG																
2	Cube:	Sales																
3	Dimensions:	Filter	Sales Mea	Members	Amount													
4		Filter	Version	Members	Budget													
5		Filter	Account	Members	Sales													
6		Column	Month	Range	$B$10:$R$10													
7		Row	Region	Range	$A$11:$A$18													
8																		
9	OLAPivotTable																	
10		Total Qua	January	1st Quarte	February	March	April	2nd Quarter	May	June	July	3rd Quarte	August	Septembe	October	4th Quarte	Novembe	December
11	Argentina	11200	1500	5000	1500	2000	2000	6200	2000	2200	0	0	0	0	0	0	0	0
12	World	89157851	15750	71500	15750	40000	18100	89047687	89006987	22600	6444	19332	6444	6444	6444	19332	6444	6444
13	South America	41200	6000	19000	6000	7000	7000	22200	7000	8200	0	0	0	0	0	0	0	0
14	Brazil	30000	4500	14000	4500	5000	5000	16000	5000	6000	0	0	0	0	0	0	0	0
15	Canada	24400	2000	6000	2000	2000	2000	6400	2000	2400	2000	6000	2000	2000	2000	6000	2000	2000
16	North America	89116651	9750	52500	9750	33000	11100	89025487	88999987	14400	6444	19332	6444	6444	6444	19332	6444	6444
17	Mexico	135699	1750	28500	1750	25000	2100	107199	102099	3000	0	0	0	0	0	0	0	0
18	USA	88956552	6000	18000	6000	6000	7000	88911888	88895888	9000	4444	13332	4444	4444	4444	13332	4444	4444

10. You can likewise use the **Delete Record** icon in the SQL SS Live toolbar group to delete a record in a form

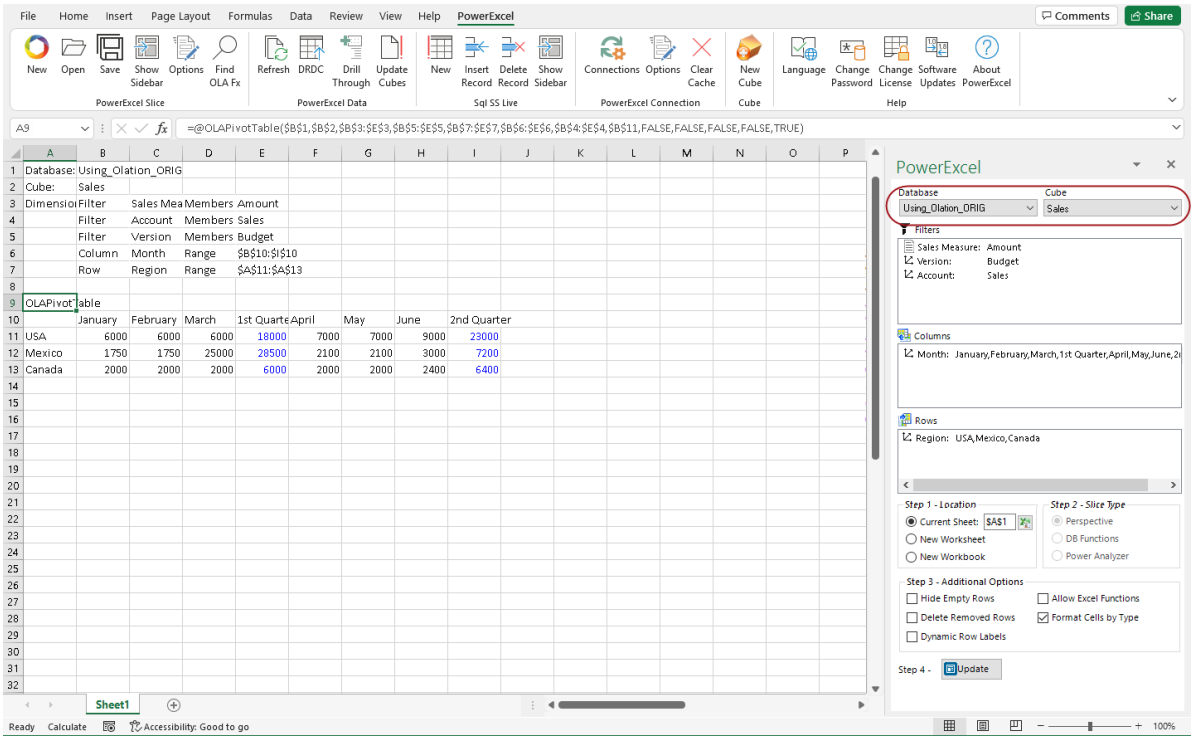
6.4 DRDC - Dynamic Relational Database Connectivity

DRDC stands for Dynamic Relational Database Connectivity, meant to convey the fact that data represented in a PowerExcel Slice can be dynamically available from a relational database (e.g., SQL Server) to other end-user products, including Business Intelligence tools like Power BI and Tableau. As shown below, with a single click, a Slice can create a View in an underlying database; as the data in the View changes, other products will reflect those changes dynamically. In this respect, DRDC is a new and innovative way to connect and unite different data and systems.

IMPORTANT: In addition to being a licensed feature, DRDC requires that the Olation Server be installed and licensed. Also, the PowerExcel using DRDC must have rights to create the View in the underlying relational database.

The procedure for using DRDC—essentially saving the relational View—is quick and straightforward:

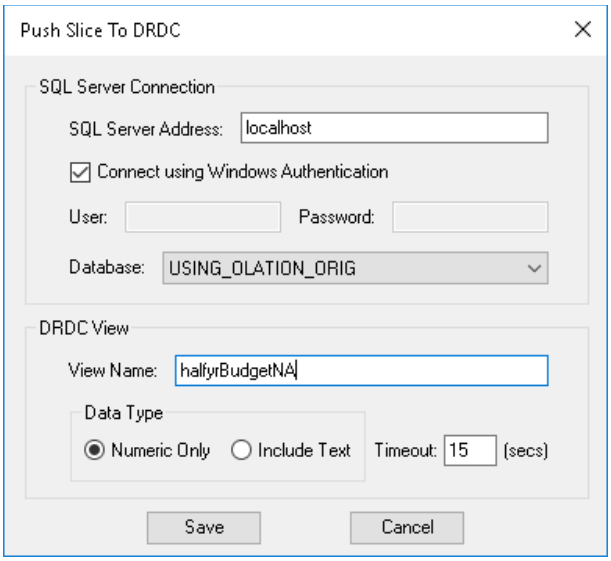
1. **Create a PowerExcel Slice**, like the one shown below. [Note: as above, the Olation Server is running, and the database we use in this example concerns a model in SQL Server, named USING_OLATION_ORIG; the Cube is *Sales*—circled in the following image.]



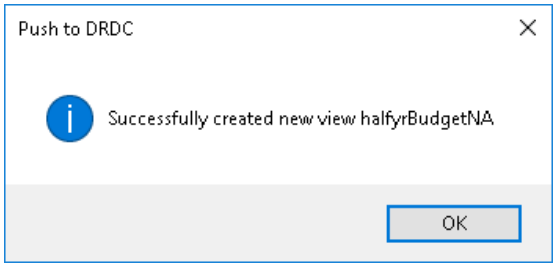
2. Click the **Save** icon on the PowerExcel ribbon and proceed to save the Slice as detailed in the previous section. Here, the example saved Slice is given the name *halfyrBudgetNA*. [Note: strictly speaking, saving the Slice is not an absolute requirement for the creation of the View.]

3. At this point you can create the View via DRDC by, first, clicking on the DRDC icon on the PowerExcel ribbon:

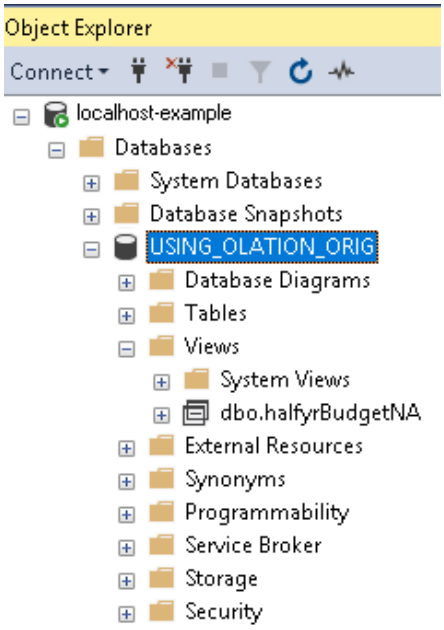
4. In the ensuing Push Slice to DRDC dialog, enter the **SQL Server Address**; specify the **privileges** you will use to connect to SQL Server (here, Windows Authentication); **specify the database** where you wish to create the View (here, *USING_OLATON_ORIG*). Also, provide a **View Name** (e.g., as with the Slice, *halfyrBudgetNA*) and select the **Data Type** for the View.



5. Click **Save**. A message will appear that indicates that the View has been created.



6. Click **OK**.
   Next, to check the View in SQL Server, open SQL Server Management Studio. Locate the database into which you created the View and expand on Views: the View created by DRDC from the PowerExcel Slice will appear (in this example, *halfyrBudgetNA*, as shown circled in the following image).

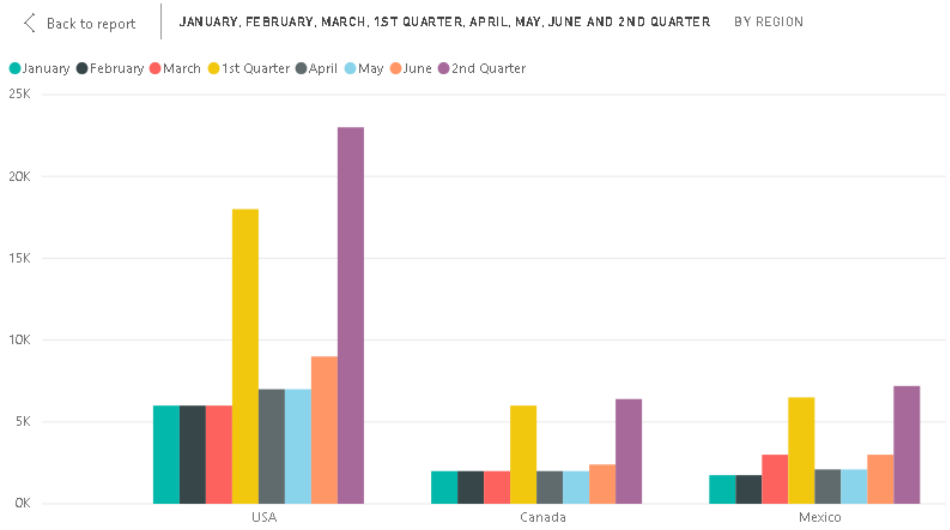


7. Next, right-click on the View and choose **Select Top 1000 Rows**.
   The View results will appear as follows—matching the saved PowerExcel Slice.

Results | Messages

	Region	January	February	March	1st Quarter	April	May	June	2nd Quarter
1	USA	6000	6000	6000	18000	7000	7000	9000	23000
2	Mexico	1750	1750	3000	6500	2100	2100	2100	6300
3	Canada	2000	2000	2000	6000	2000	2000	2400	6400

This data can quickly be transformed into an impressive visualization, as done below with this **Power BI** dashboard:

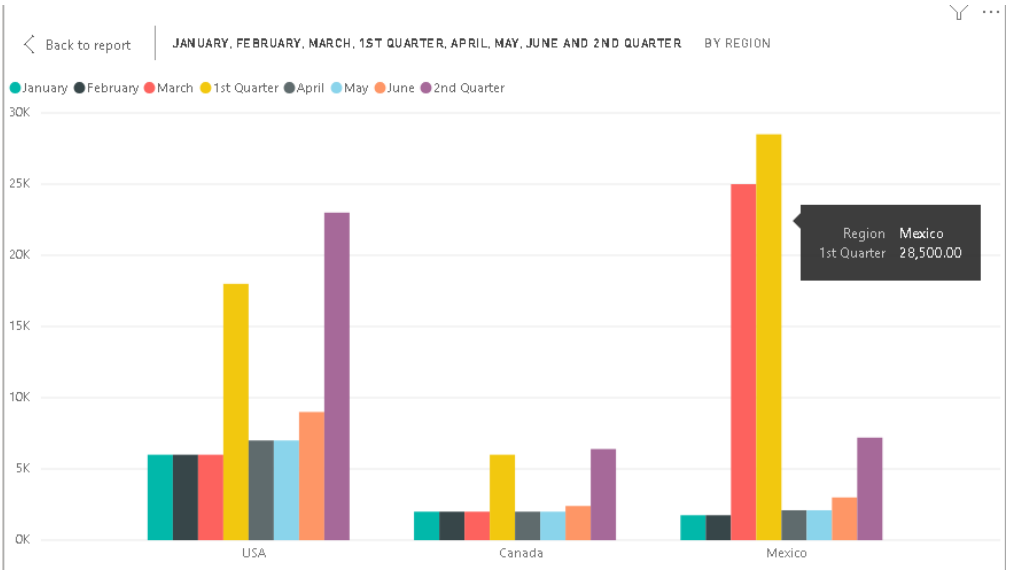


And this dashboard will reflect changes made to the underlying model to which PowerExcel is dynamically connected. If a user makes an entry—let's say an unusually large *Budget* number in *March*, for *Sales* in *Mexico*, as below (see the rose-highlighted cell, ***25000***)--

	A	B	C	D	E	F	G	H	I
1	Database:	Using_Olation_ORIG							
2	Cube:	Sales							
3	Dimensior	Filter	Sales Mea	Members	Amount				
4		Filter	Account	Members	Sales				
5		Filter	Version	Members	Budget				
6		Column	Month	Range	$B$10:$I$10				
7		Row	Region	Range	$A$11:$A$13				
8									
9	OLAPivotTable								
10		January	February	March	1st Quarte	April	May	June	2nd Quarter
11	USA	6000	6000	6000	18000	7000	7000	9000	23000
12	Mexico	1750	1750	**25000**	**28500**	2100	2100	3000	7200
13	Canada	2000	2000	2000	6000	2000	2000	2400	6400

Then the model will recalculate, increasing the *1st Quarter* results (orange-highlighted in the image above, *13500*). It is worth noting that this *1st Quarter* figure, **28500**, is calculated in the underlying model (not in Excel itself).

As a consequence, the Power BI or other dashboard—or indeed any third-party tool that sources data from the DRDC Slice View—will also update dynamically.



All tools, all front ends—indeed, all applications and even databases—can be brought together…all through the use of **PowerExcel**!

And that, in sum, is the power of PowerExcel!

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