PowerExcel User Manual

PowerExcel

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POWEREXCEL

USER MANUAL

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- Introduction to PowerExcel
- Creating Slices – PowerExcel PivotTable, Read/Write Formulas, and Power Query
- Working with Subsets
- Entering Data in a PowerExcel Slice, Driver-based Planning and Bulk Copy-Paste into a PowerExcel Model
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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.

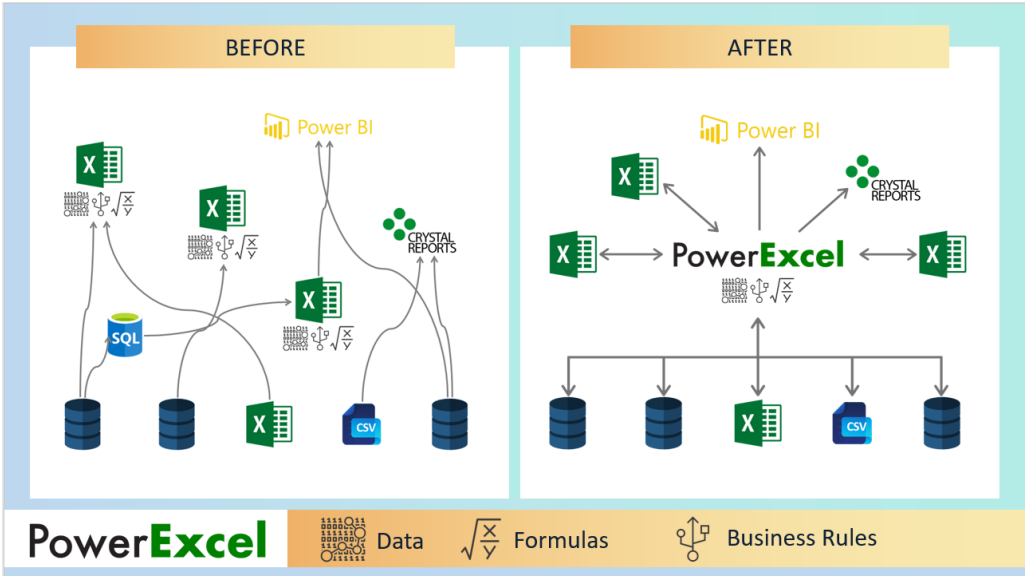
The only requirement is a **PowerExcel Add-In** to reach Cloud-based models. [Note that the following image shows a single user connecting to a PowerExcel Cloud Server through use of the PowerExcel Add-in; the PowerExcel Cloud Server is a multi-server configuration, as shown next page, at right, the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



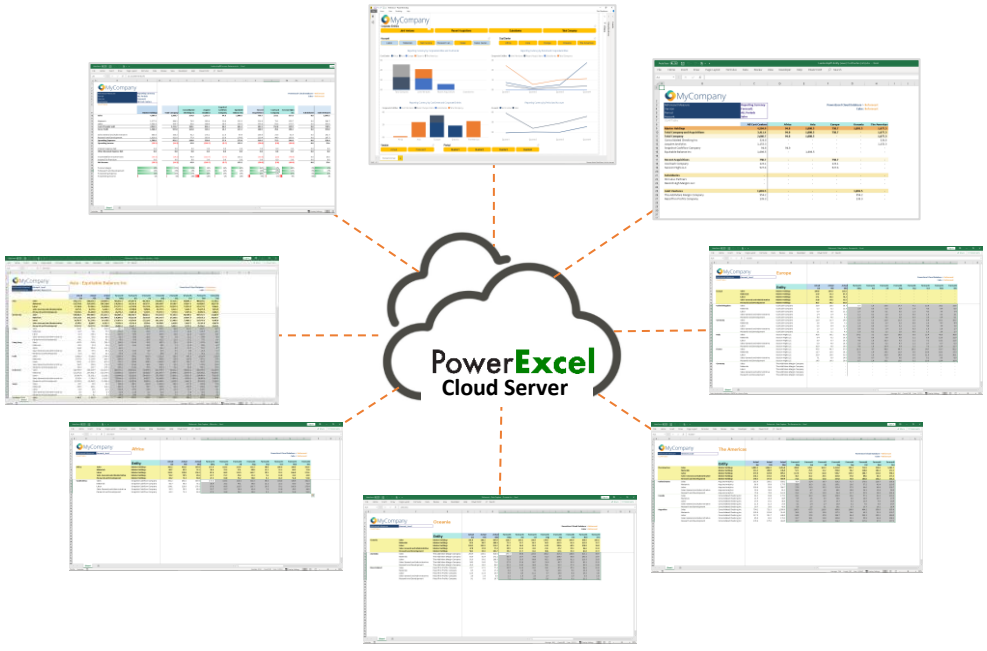
The *After* picture, at right, shows the PowerExcel Cloud Server in the middle. Business model(s) are accessible from the everyday spreadsheet…and, Yes, **Power BI** (and any other BI application) can be set up as another way to reach business data, in real time.

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 PivotTable, Read/Write Formulas and Power Query

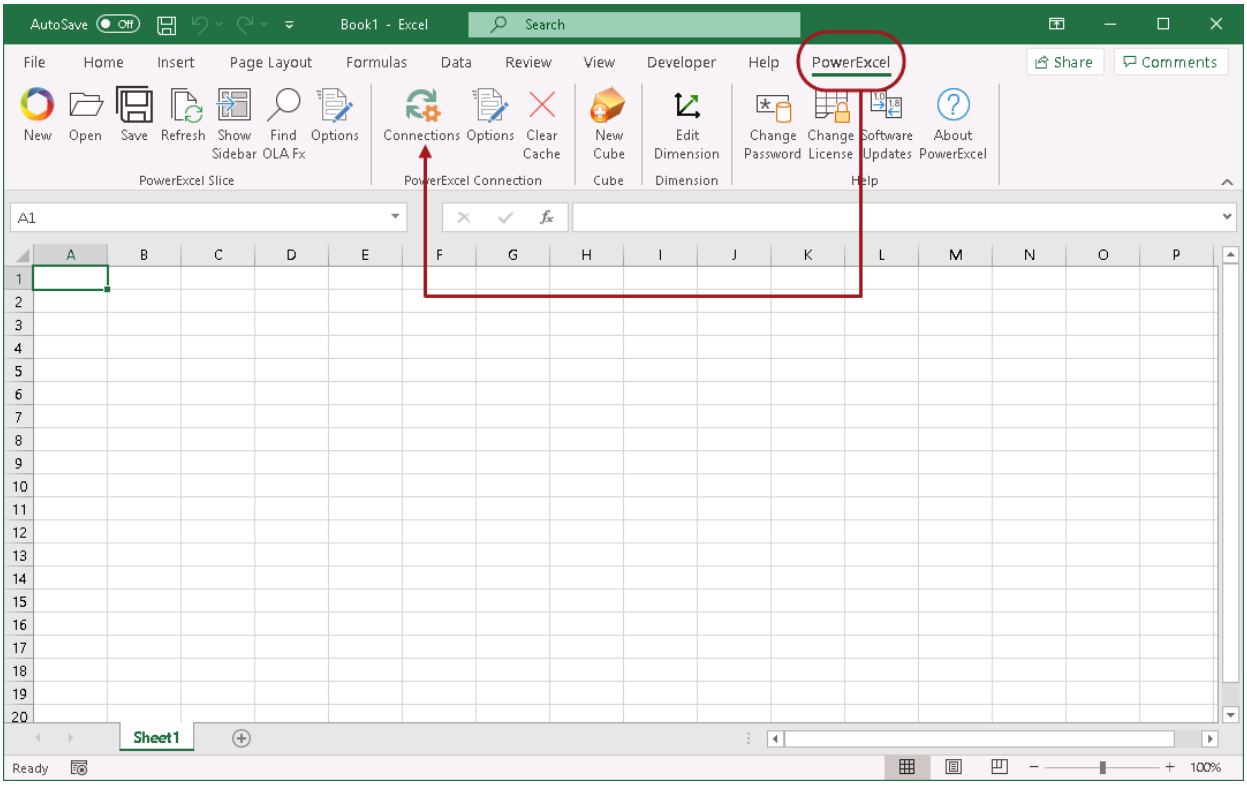
This section will describe the first step in using PowerExcel: how, through a standard spreadsheet, you can reach data that exists in a business model known as a Cube. The following describes how to establish a connection to a model, and the three methods used to create a Slice of business data, which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

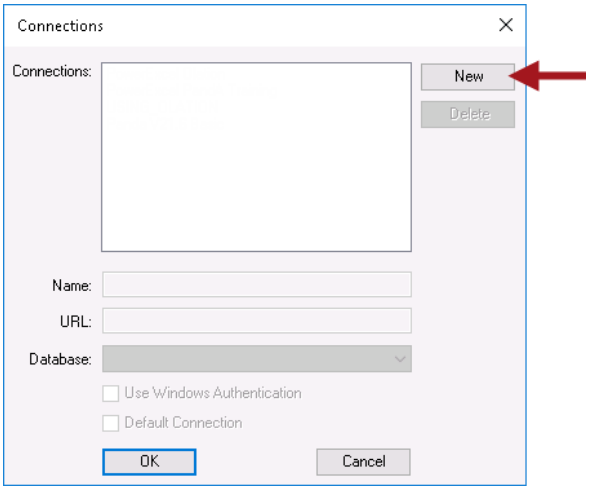
2.1 Establishing the PowerExcel Connection

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).

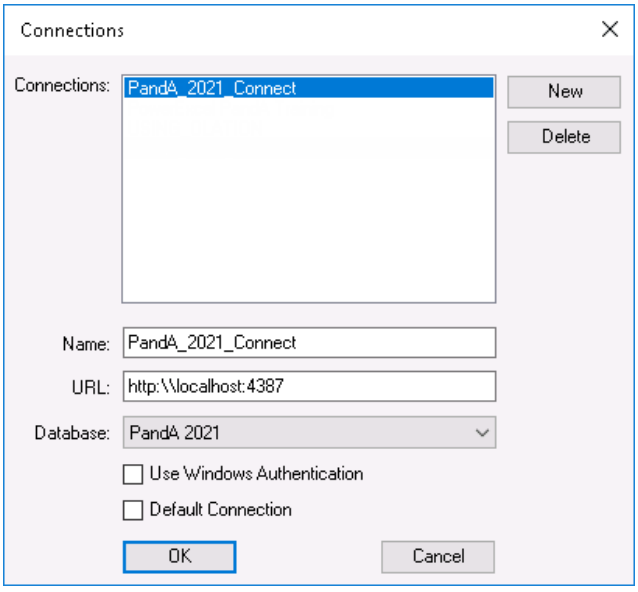


3. In the Connections dialog that appears, click **New** (red arrow in preceding image).
4. In the **Name** field, enter the <**name of the PowerExcel connection**>.
   Note: You can provide any name for the connection; for this exercise **PandA_2021_Connect** is the PowerExcel connection name.
5. In 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_2021_Connect** as the source PowerExcel database.

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



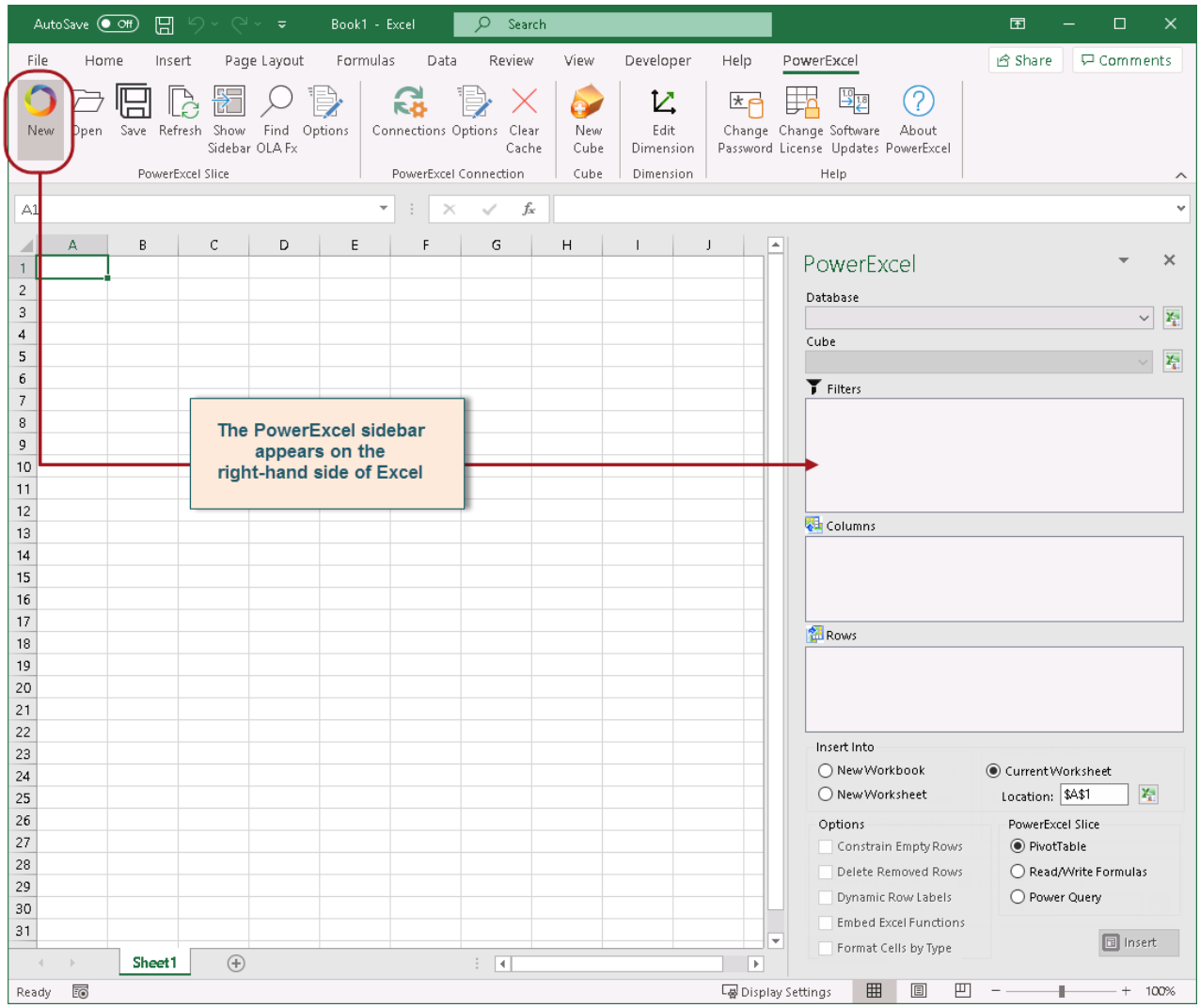
7. Click **OK**. The PowerExcel connection is now successfully created.

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.

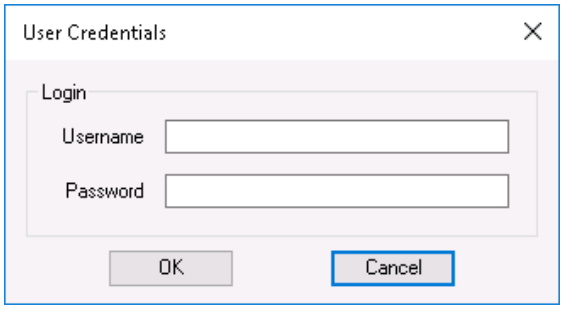
TO DO THIS: Go to the **PowerExcel Addin Tab** of the Excel ribbon→click the **Options icon** in the PowerExcel Slice control group→check the **Automatically display sidebar** option in the Slice Options dialog→Click **Save**.

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.)



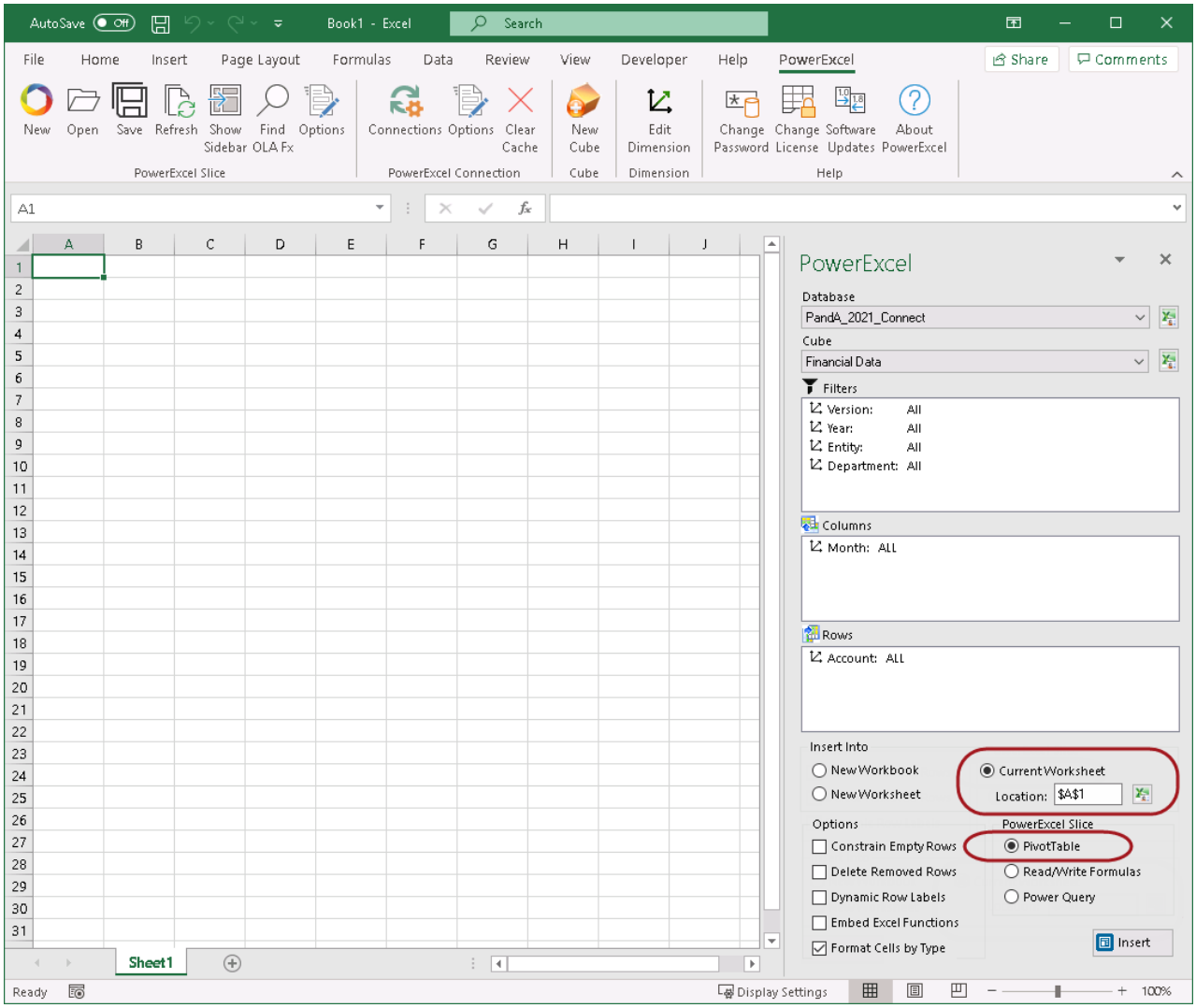
2. Go to the **PowerExcel sidebar**; click on the **Database drop-down** and select the appropriate PowerExcel connection, e.g., **PandA_2021_Connect**.

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.



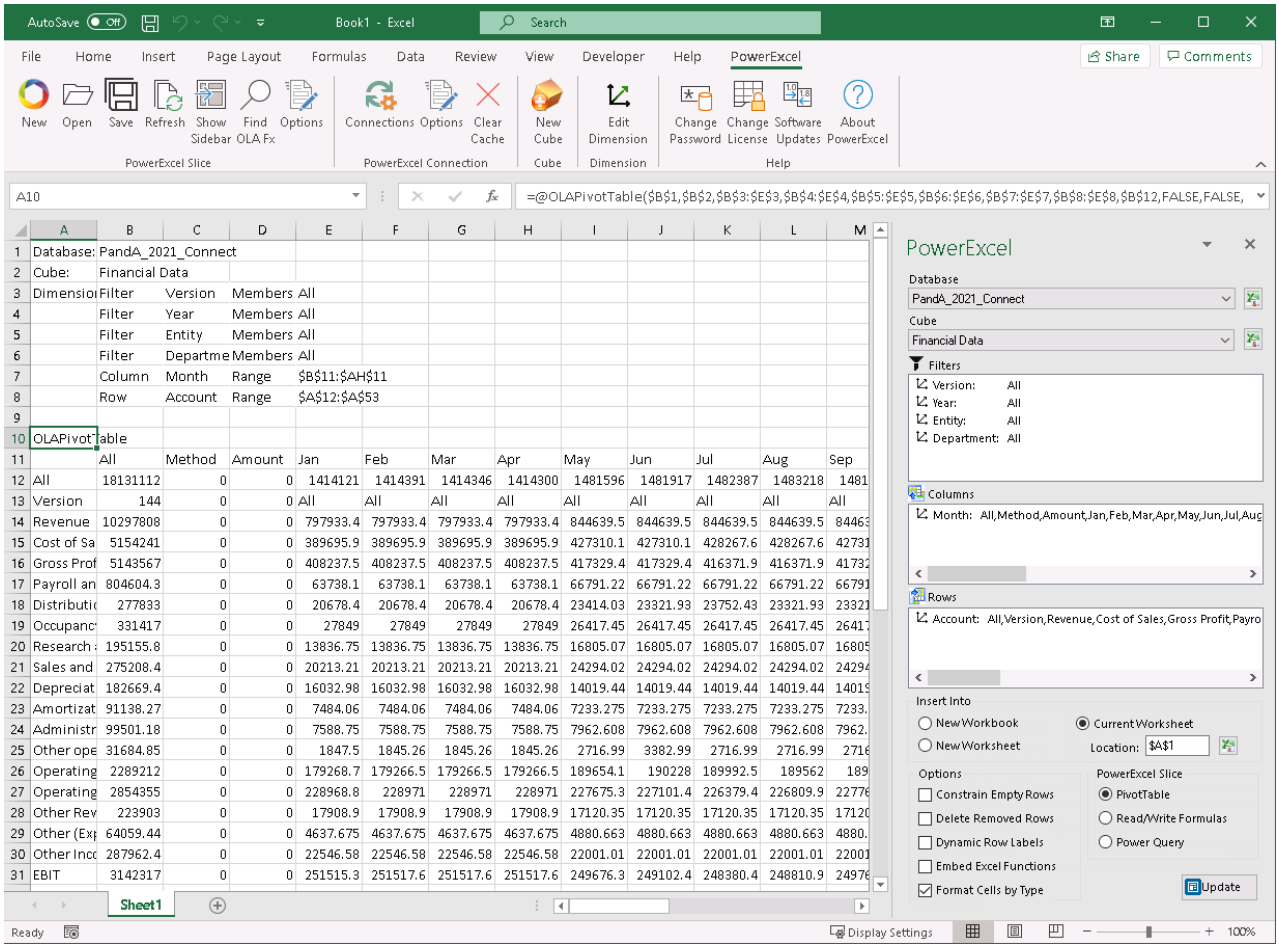
If you are connecting to a non-secured database you will not be prompted for User Credentials. Just proceed to selecting the Cube.

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:



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 selections.

5. Pick a PowerExcel Slice output by enabling the correct radio button. You can select **PivotTable**, **ReadWrite Formulas** or **Power Query**. We will elaborate on these options in the succeeding topics.
   For now select **PivotTable**.
6. Select where you want to generate the PowerExcel report into the spreadsheet. In this example, choose to insert into the **Current Worksheet** starting at cell **A1**. (See selection for Current Worksheet and Location circled in the preceding image.)
7. Click the **Insert** button.
   The PowerExcel Slice will look as follows:



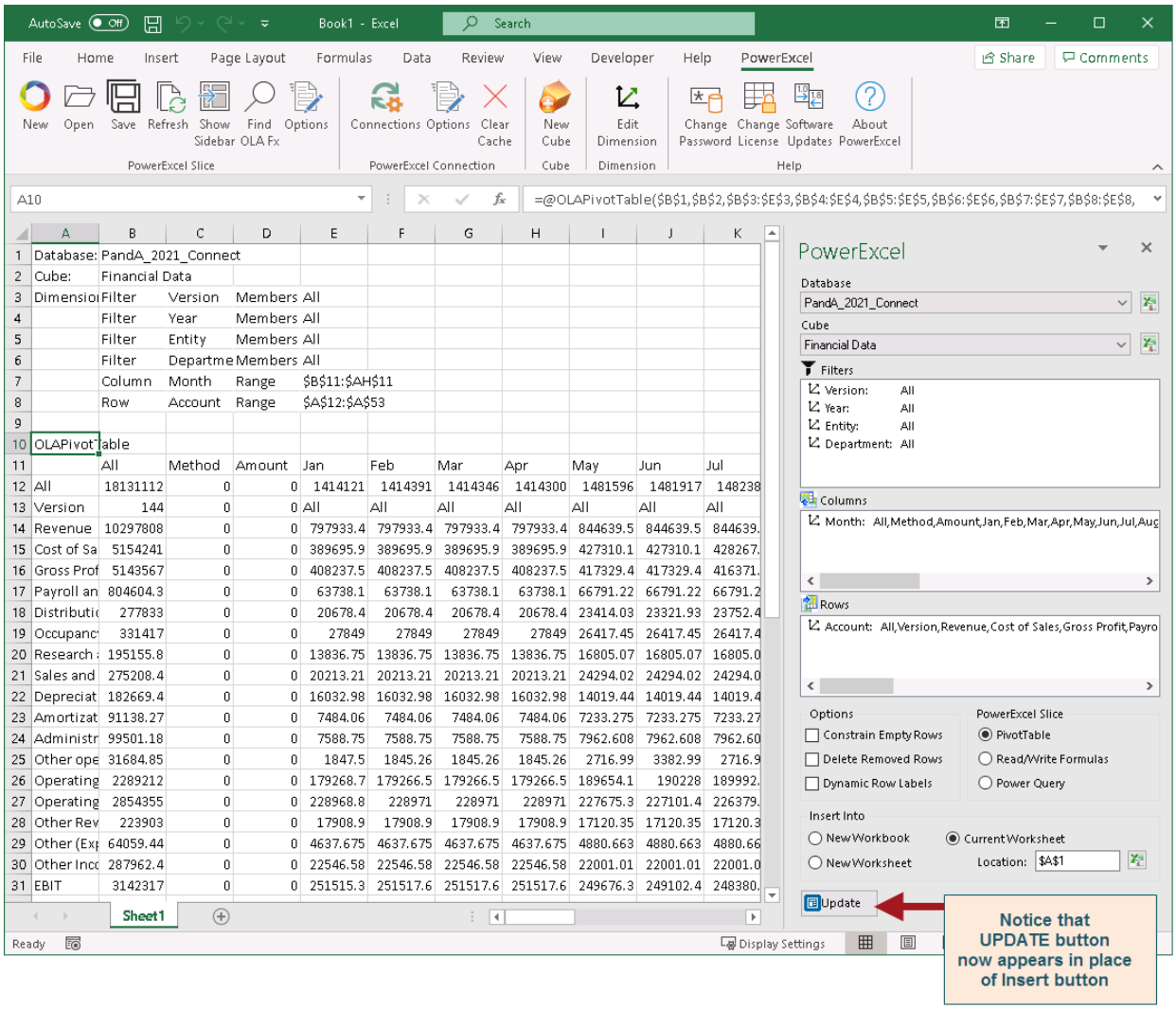
At this point you have demonstrated making a Connection to a PowerExcel database and testing how to create an example Slice.

2.3 Using PowerExcel PivotTable—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.

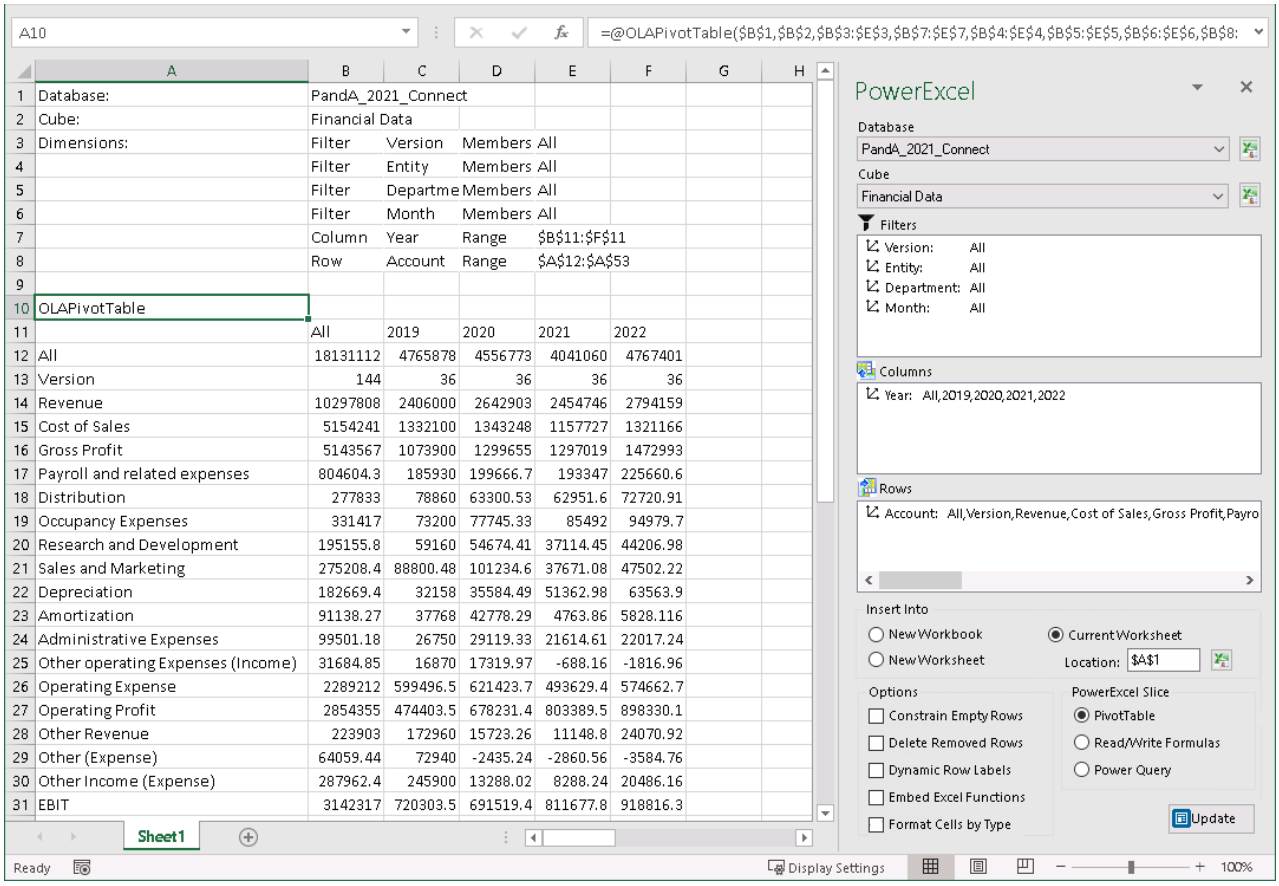
Note: for the ensuing pages, **PowerExcel PivotTable** is the function that is used to bring data into Excel. The **Read/Write Formulas** and **PowerExcel Power Query function** will be explored in subsequent pages.

Important: Before making any changes to the PowerExcel Slice for the FIRST TIME, you will need to click away from the PowerExcel sidebar and click on any cell that contains the PowerExcel connection references (e.g., OLAPivotTable, OLADatabase, OLACube, OLATableMember, etc.) so that the Insert button is replaced by an UPDATE button.

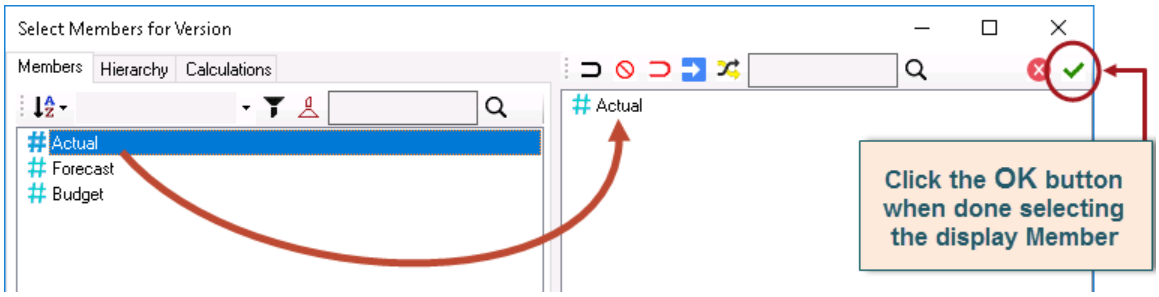


To reconfigure the PowerExcel Slice shown previously:

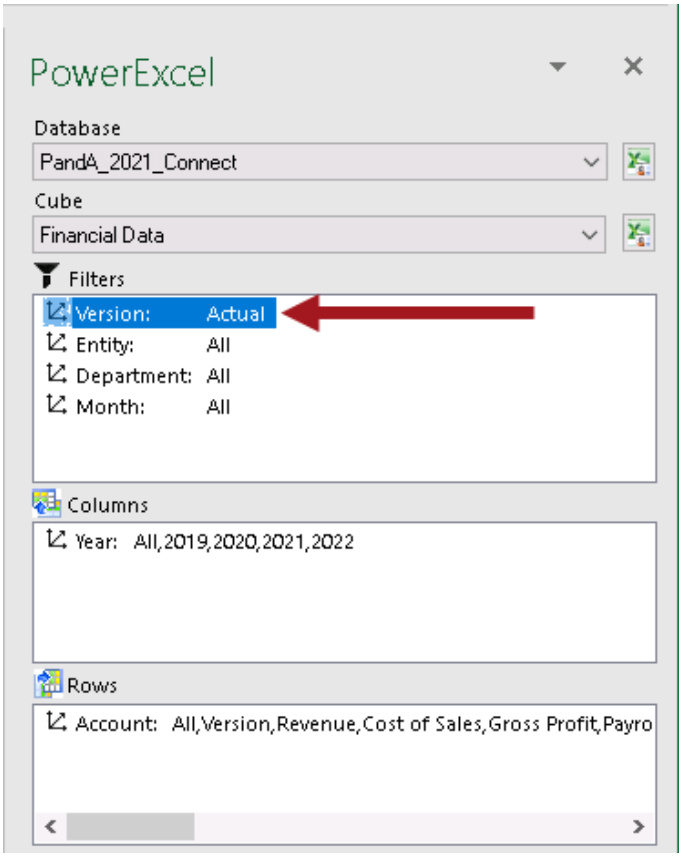
1. **Change the position of Dimensions within the Slice**.
   To do this:
   - In the PowerExcel sidebar, drag and drop the **Month** dimension from the Columns to the **Filters**.
   - Next, drag and drop the **Year** dimension from the Filters to the **Columns**.
   - Click the **Update button**. The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



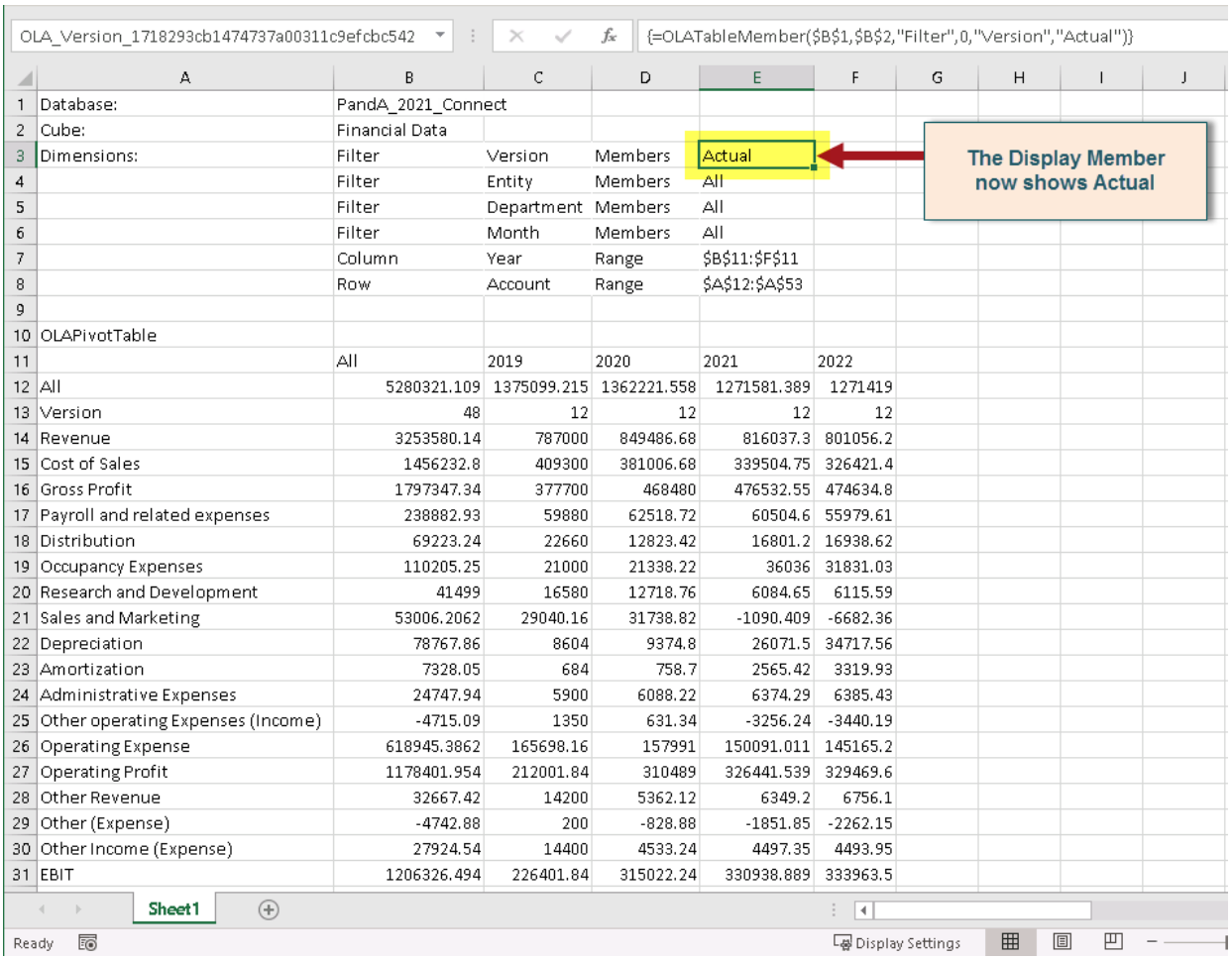
2. **Change the Display Member of Dimensions in Filters**.
   Next, we will change the display Member of one Dimension (*Version*) in the Filters section of the PowerExcel sidebar. For this we want to see only *Actual* data showing.
   To change the display Member in the Filters section:
   - Double-click 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.



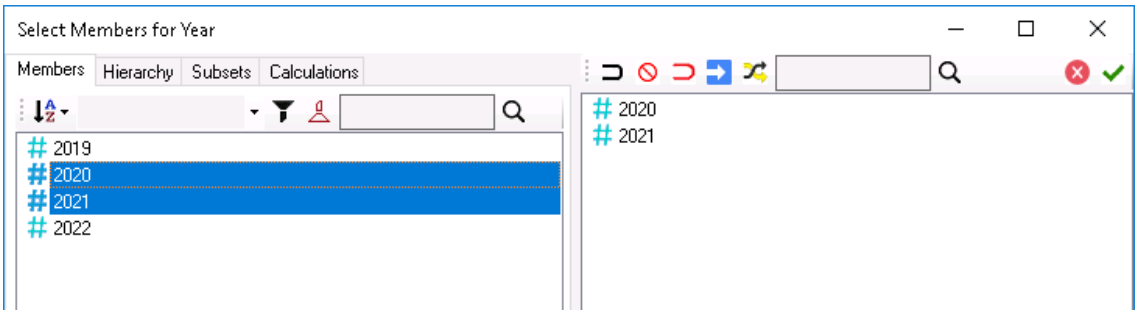
- In the PowerExcel sidebar, click the **Update** button. This updates the PowerExcel Slice values to show *Actual* data.



	A	B	C	D	E	F	G	H	I	J
1	Database:	PandA_2021_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$11:$F$11					
8		Row	Account	Range	$A$12:$A$53					
9										
10	OLAPivotTable									
11		All	2019	2020	2021	2022				
12	All	5280321.109	1375099.215	1362221.558	1271581.389	1271419				
13	Version	48	12	12	12	12				
14	Revenue	3253580.14	787000	849486.68	816037.3	801056.2				
15	Cost of Sales	1456232.8	409300	381006.68	339504.75	326421.4				
16	Gross Profit	1797347.34	377700	468480	476532.55	474634.8				
17	Payroll and related expenses	238882.93	59880	62518.72	60504.6	55979.61				
18	Distribution	69223.24	22660	12823.42	16801.2	16938.62				
19	Occupancy Expenses	110205.25	21000	21338.22	36036	31831.03				
20	Research and Development	41499	16580	12718.76	6084.65	6115.59				
21	Sales and Marketing	53006.2062	29040.16	31738.82	-1090.409	-6682.36				
22	Depreciation	78767.86	8604	9374.8	26071.5	34717.56				
23	Amortization	7328.05	684	758.7	2565.42	3319.93				
24	Administrative Expenses	24747.94	5900	6088.22	6374.29	6385.43				
25	Other operating Expenses (Income)	-4715.09	1350	631.34	-3256.24	-3440.19				
26	Operating Expense	618945.3862	165698.16	157991	150091.011	145165.2				
27	Operating Profit	1178401.954	212001.84	310489	326441.539	329469.6				
28	Other Revenue	32667.42	14200	5362.12	6349.2	6756.1				
29	Other (Expense)	-4742.88	200	-828.88	-1851.85	-2262.15				
30	Other Income (Expense)	27924.54	14400	4533.24	4497.35	4493.95				
31	EBIT	1206326.494	226401.84	315022.24	330938.889	333963.5				

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

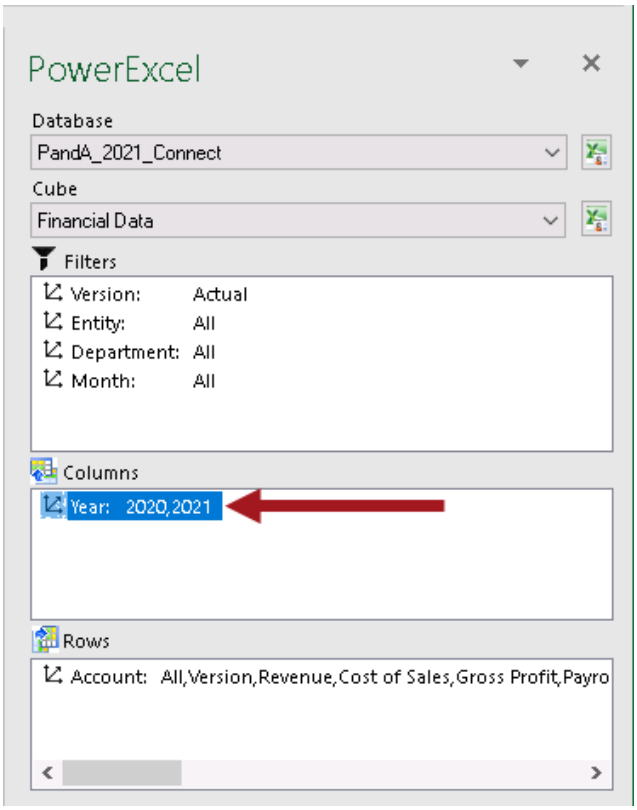
We will begin by changing Members along the Columns so that it only shows data for years 2020 and 2021.



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.

- 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*.

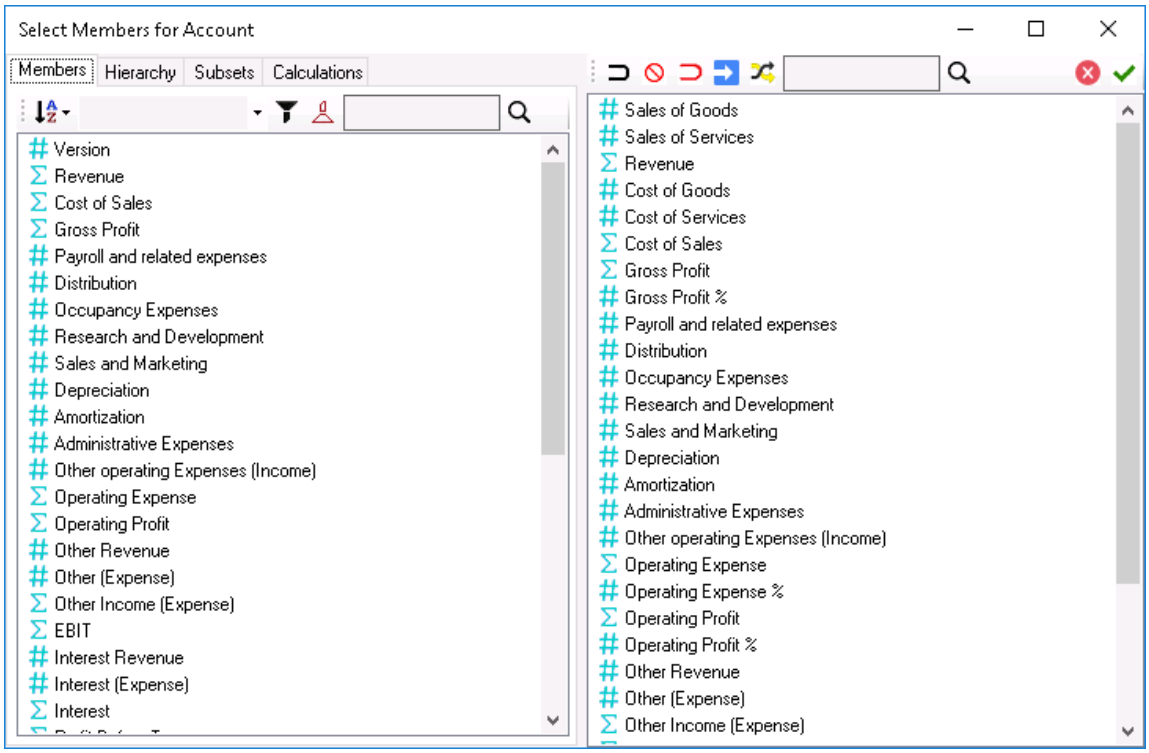


Next, let us change the Rows so that it only shows selected individual Income Statement *Accounts*.

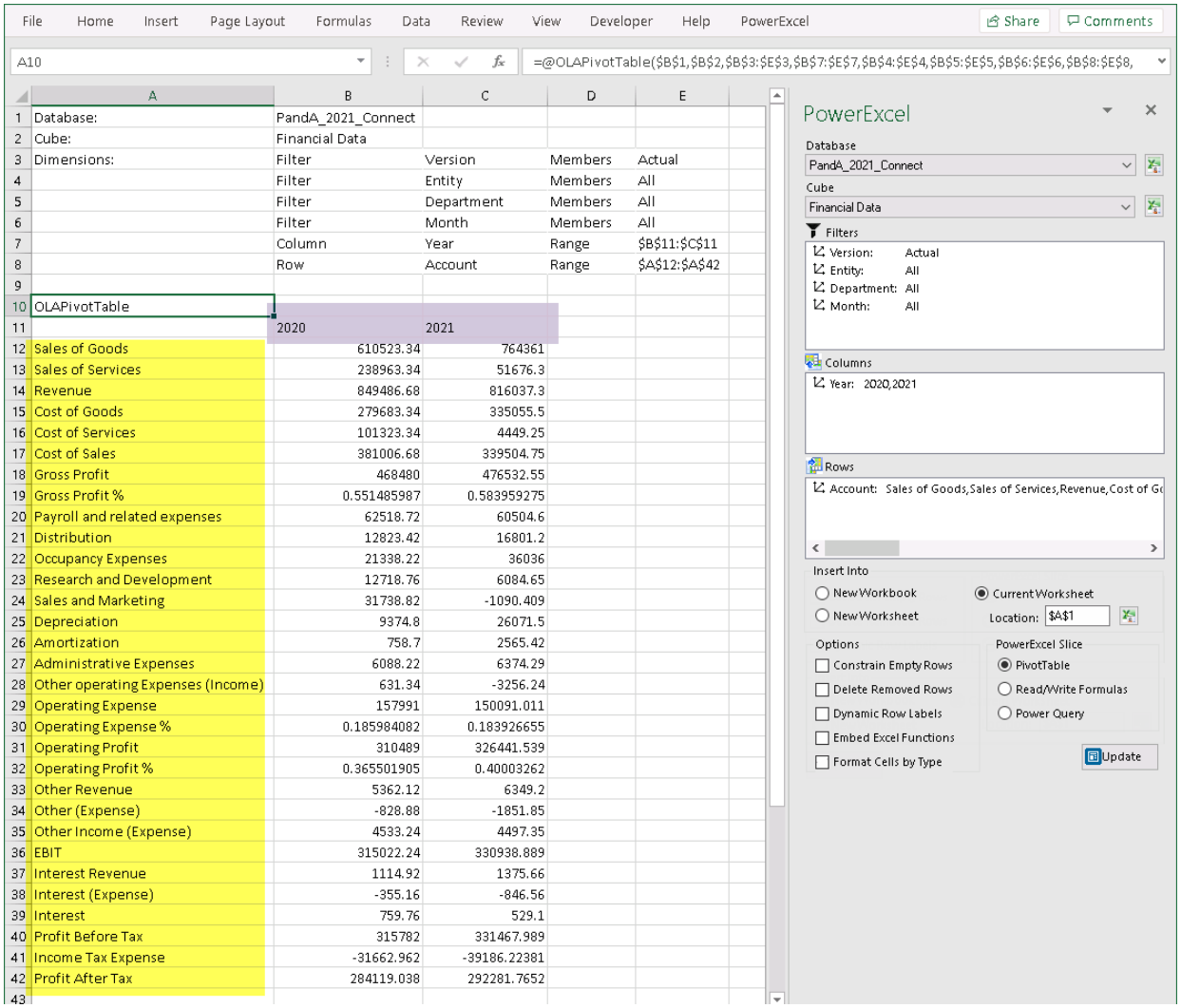
Sales of Goods Sales of Services Revenue Cost of Goods Cost of Services Cost of Sales Gross Profit Gross Profit % Payroll and related expenses Distribution Occupancy Expenses Research and Development Sales and Marketing Depreciation Amortization Administrative Expenses	Other operating Expenses (Income) 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 appears along the rows (highlighted in yellow in rows 12 to 42).

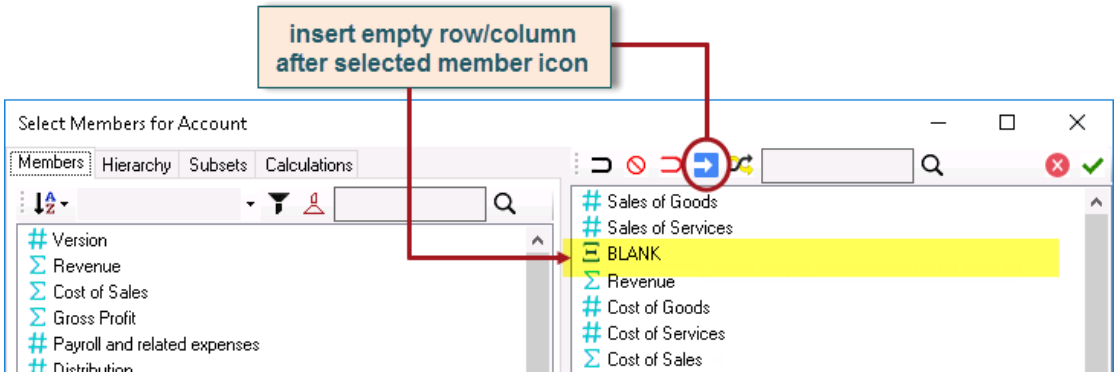


	A	B	C	D	E
1	Database:	PandA_2021_Connect			
2	Cube:	Financial Data			
3	Dimensions:	Filter	Version	Members	Actual
4		Filter	Entity	Members	All
5		Filter	Department	Members	All
6		Filter	Month	Members	All
7		Column	Year	Range	$B$11:$C$11
8		Row	Account	Range	$A$12:$A$42
9					
10	OLAPivotTable				
11		2020	2021		
12	Sales of Goods	610523.34	764361		
13	Sales of Services	238963.34	51676.3		
14	Revenue	849486.68	816037.3		
15	Cost of Goods	279683.34	335055.5		
16	Cost of Services	101323.34	4449.25		
17	Cost of Sales	381006.68	339504.75		
18	Gross Profit	468480	476532.55		
19	Gross Profit %	0.551485987	0.583959275		
20	Payroll and related expenses	62518.72	60504.6		
21	Distribution	12823.42	16801.2		
22	Occupancy Expenses	21338.22	36036		
23	Research and Development	12718.76	6084.65		
24	Sales and Marketing	31738.82	-1090.409		
25	Depreciation	9374.8	26071.5		
26	Amortization	758.7	2565.42		
27	Administrative Expenses	6088.22	6374.29		
28	Other operating Expenses (Income)	631.34	-3256.24		
29	Operating Expense	157991	150091.011		
30	Operating Expense %	0.185984082	0.183926655		
31	Operating Profit	310489	326441.539		
32	Operating Profit %	0.365501905	0.40003262		
33	Other Revenue	5362.12	6349.2		
34	Other (Expense)	-828.88	-1851.85		
35	Other Income (Expense)	4533.24	4497.35		
36	EBIT	315022.24	330938.889		
37	Interest Revenue	1114.92	1375.66		
38	Interest (Expense)	-355.16	-846.56		
39	Interest	759.76	529.1		
40	Profit Before Tax	315782	331467.989		
41	Income Tax Expense	-31662.962	-39186.22381		
42	Profit After Tax	284119.038	292281.7652		
43					

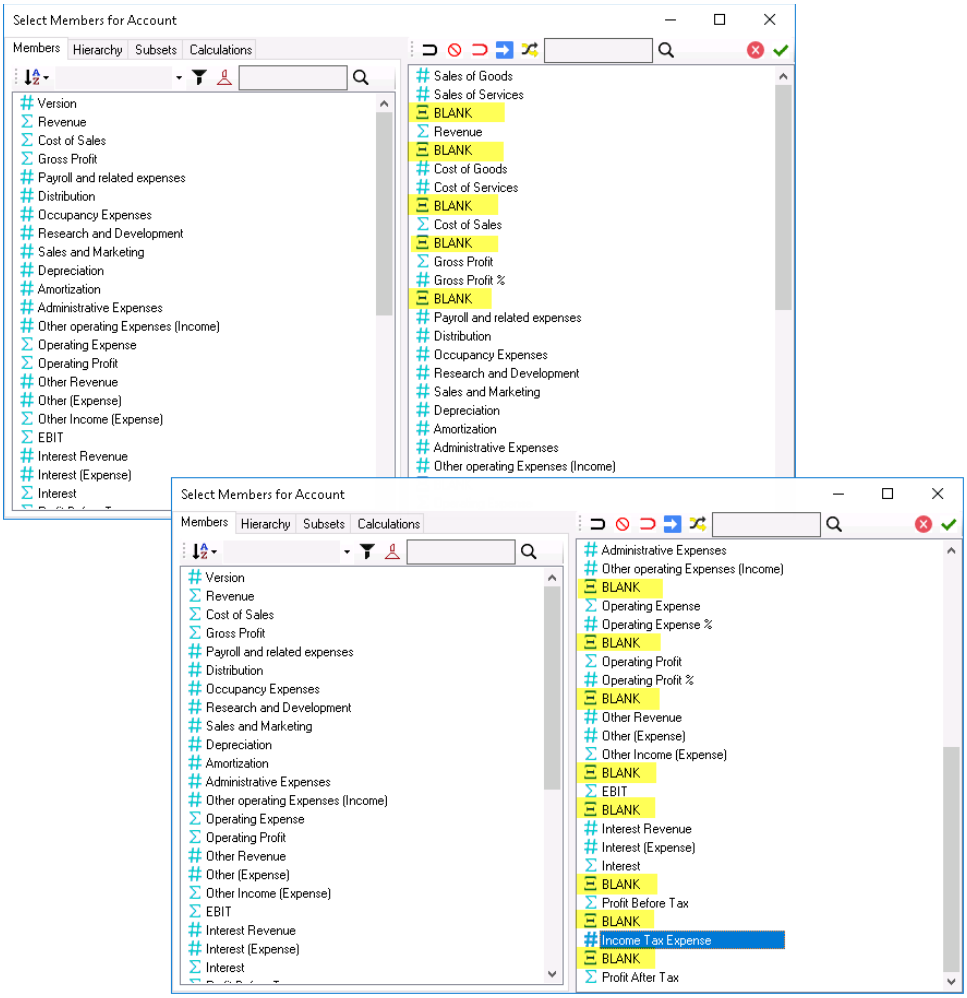
4. **Insert blank Rows or Columns.**
   You can also configure your PowerExcel Slice to include blank rows or columns, so that when you generate the PowerExcel Slice it automatically includes those blank rows or columns in the desired areas of the Slice.
   For example, let us format this sample Comparative Income Statement report to include blank rows between specific accounts as follows:

   To insert Empty Row:

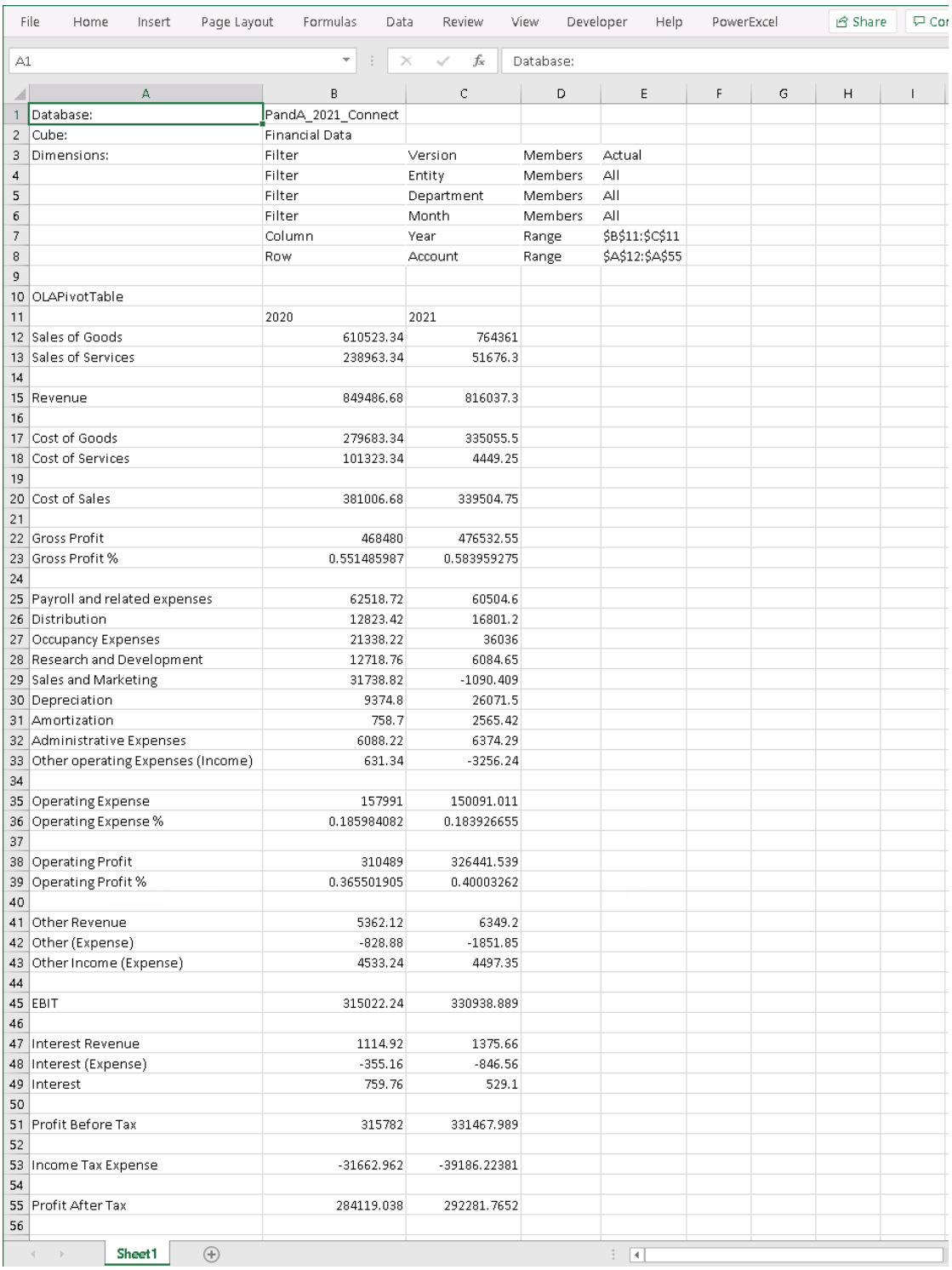
   - Go to the Rows section of the PowerExcel sidebar and double-click on the **Account** dimension.
     You can insert blank or empty rows/columns by using the **Insert empty row/column after selected member** button along the upper right-hand pane of the Select Members dialog. This will insert an empty 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:



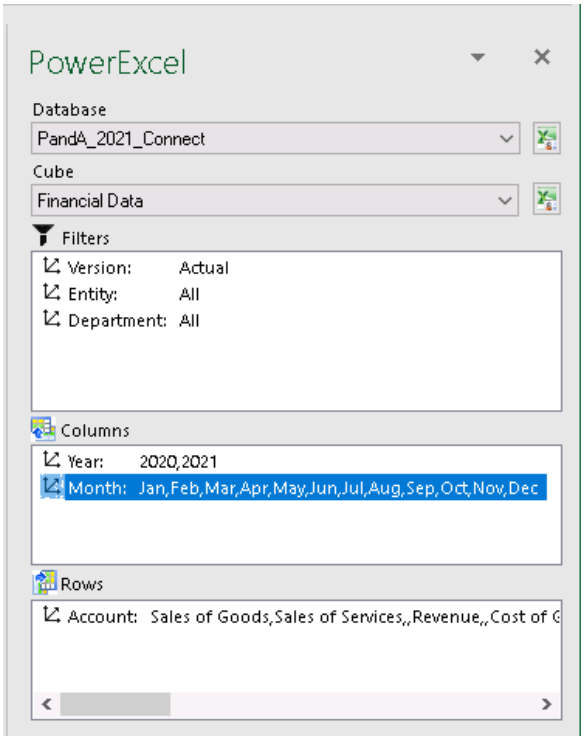
- Click the **green checkmark icon** (OK button) located the top right-hand corner of the dialog.
- In the PowerExcel sidebar, click the **Update** button. This updates the PowerExcel Slice.
  You now have a basic comparative Income Statement report as shown below:



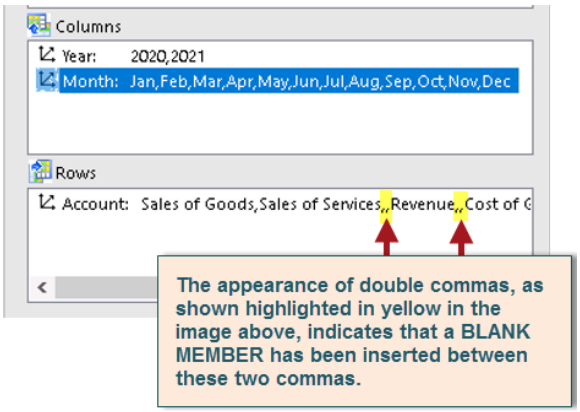
	A	B	C	D	E	F	G	H	I
1	Database:	PandA_2021_Connect							
2	Cube:	Financial Data							
3	Dimensions:	Filter	Version	Members	Actual				
4		Filter	Entity	Members	All				
5		Filter	Department	Members	All				
6		Filter	Month	Members	All				
7		Column	Year	Range	$B$11:$C$11				
8		Row	Account	Range	$A$12:$A$55				
9									
10	OLAPivotTable								
11		2020	2021						
12	Sales of Goods	610523.34	764361						
13	Sales of Services	238963.34	51676.3						
14									
15	Revenue	849486.68	816037.3						
16									
17	Cost of Goods	279683.34	335055.5						
18	Cost of Services	101323.34	4449.25						
19									
20	Cost of Sales	381006.68	339504.75						
21									
22	Gross Profit	468480	476532.55						
23	Gross Profit %	0.551485987	0.583959275						
24									
25	Payroll and related expenses	62518.72	60504.6						
26	Distribution	12823.42	16801.2						
27	Occupancy Expenses	21338.22	36036						
28	Research and Development	12718.76	6084.65						
29	Sales and Marketing	31738.82	-1090.409						
30	Depreciation	9374.8	26071.5						
31	Amortization	758.7	2565.42						
32	Administrative Expenses	6088.22	6374.29						
33	Other operating Expenses (Income)	631.34	-3256.24						
34									
35	Operating Expense	157991	150091.011						
36	Operating Expense %	0.185984082	0.183926655						
37									
38	Operating Profit	310489	326441.539						
39	Operating Profit %	0.365501905	0.40003262						
40									
41	Other Revenue	5362.12	6349.2						
42	Other (Expense)	-828.88	-1851.85						
43	Other Income (Expense)	4533.24	4497.35						
44									
45	EBIT	315022.24	330938.889						
46									
47	Interest Revenue	1114.92	1375.66						
48	Interest (Expense)	-355.16	-846.56						
49	Interest	759.76	529.1						
50									
51	Profit Before Tax	315782	331467.989						
52									
53	Income Tax Expense	-31662.962	-39186.22381						
54									
55	Profit After Tax	284119.038	292281.7652						
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*.

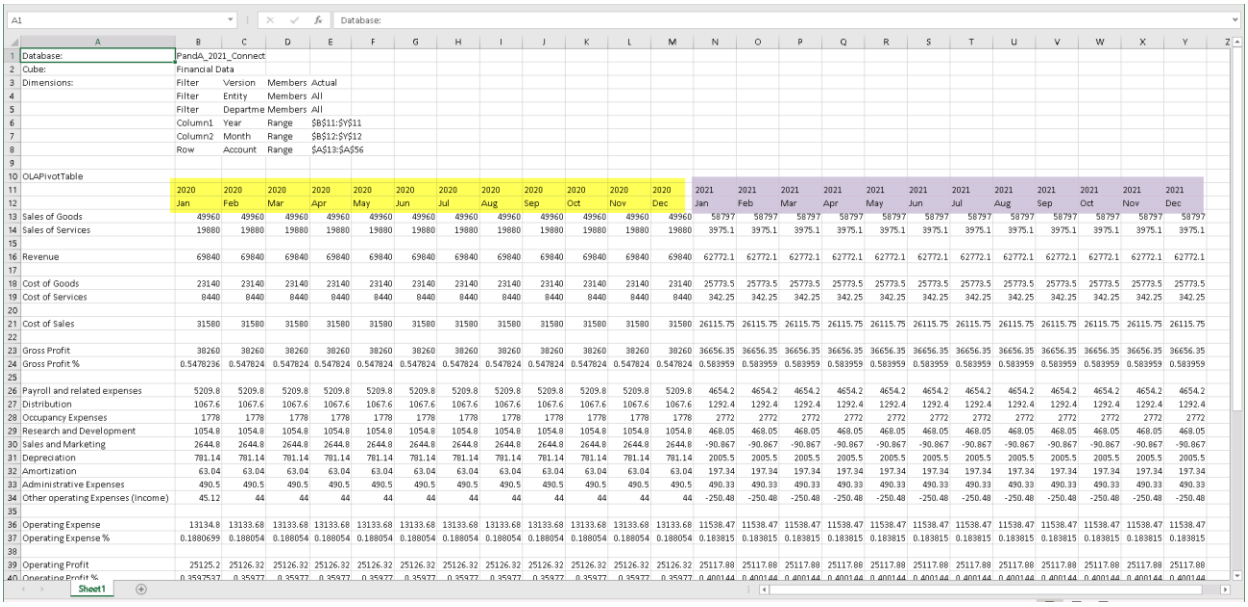


   - Notice in the Rows section where blank Members were inserted, they appear as follows:



   - 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).

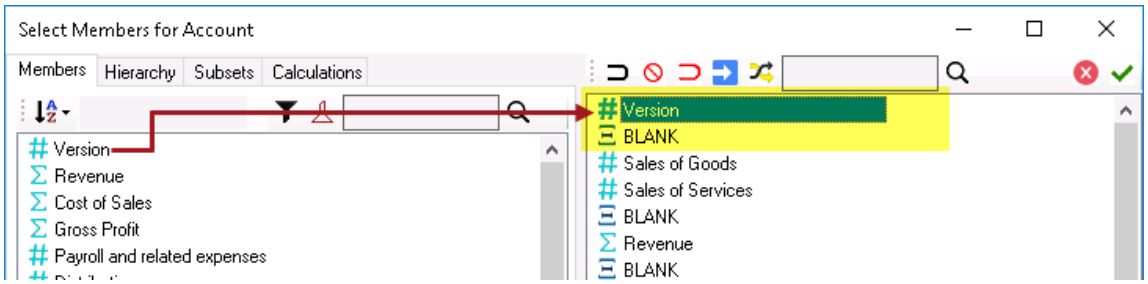


1	Database:	PandA_2021_Connect																							
2	Cube:	Financial Data																							
3	Dimensions:	Filter	Version	Members	Actual																				
4		Filter	Entity	Members	All																				
5		Filter	Departme	Members	All																				
6		Column1	Year	Range	$B$11:$Y$11																				
7		Column2	Month	Range	$B$12:$Y$12																				
8		Row	Account	Range	$A$13:$A$56																				
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	49960	49960	49960	49960	49960	49960	49960	49960	49960	49960	49960	49960	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	69840	69840	69840	69840	69840	69840	69840	69840	69840	69840	69840	69840	62772.1	62772.1	62772.1	62772.1	62772.1	62772.1	62772.1	62772.1	62772.1	62772.1	62772.1	62772.1
17																									
18	Cost of Goods	23140	23140	23140	23140	23140	23140	23140	23140	23140	23140	23140	23140	25773.5	25773.5	25773.5	25773.5	25773.5	25773.5	25773.5	25773.5	25773.5	25773.5	25773.5	25773.5
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	26115.75	26115.75	26115.75	26115.75	26115.75	26115.75	26115.75	26115.75	26115.75	26115.75	26115.75	26115.75
22																									
23	Gross Profit	38260	38260	38260	38260	38260	38260	38260	38260	38260	38260	38260	38260	36656.35	36656.35	36656.35	36656.35	36656.35	36656.35	36656.35	36656.35	36656.35	36656.35	36656.35	36656.35
24	Gross Profit %	0.5478236	0.547824	0.547824	0.547824	0.547824	0.547824	0.547824	0.547824	0.547824	0.547824	0.547824	0.547824	0.583959	0.583959	0.583959	0.583959	0.583959	0.583959	0.583959	0.583959	0.583959	0.583959	0.583959	0.583959
25																									
26	Payroll and related expenses	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 Development	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	-90.867	-90.867	-90.867	-90.867	-90.867	-90.867	-90.867	-90.867	-90.867	-90.867	-90.867	-90.867
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 Expenses (Income)	45.12	44	44	44	44	44	44	44	44	44	44	44	-250.48	-250.48	-250.48	-250.48	-250.48	-250.48	-250.48	-250.48	-250.48	-250.48	-250.48	-250.48
35																									
36	Operating Expense	13134.8	13133.68	13133.68	13133.68	13133.68	13133.68	13133.68	13133.68	13133.68	13133.68	13133.68	13133.68	11538.47	11538.47	11538.47	11538.47	11538.47	11538.47	11538.47	11538.47	11538.47	11538.47	11538.47	11538.47
37	Operating Expense %	0.1880699	0.188054	0.188054	0.188054	0.188054	0.188054	0.188054	0.188054	0.188054	0.188054	0.188054	0.188054	0.183815	0.183815	0.183815	0.183815	0.183815	0.183815	0.183815	0.183815	0.183815	0.183815	0.183815	0.183815
38																									
39	Operating Profit	25125.2	25126.32	25126.32	25126.32	25126.32	25126.32	25126.32	25126.32	25126.32	25126.32	25126.32	25126.32	25117.88	25117.88	25117.88	25117.88	25117.88	25117.88	25117.88	25117.88	25117.88	25117.88	25117.88	25117.88
40	Operating Profit %	0.3597537	0.35977	0.35977	0.35977	0.35977	0.35977	0.35977	0.35977	0.35977	0.35977	0.35977	0.35977	0.400144	0.400144	0.400144	0.400144	0.400144	0.400144	0.400144	0.400144	0.400144	0.400144	0.400144	0.400144

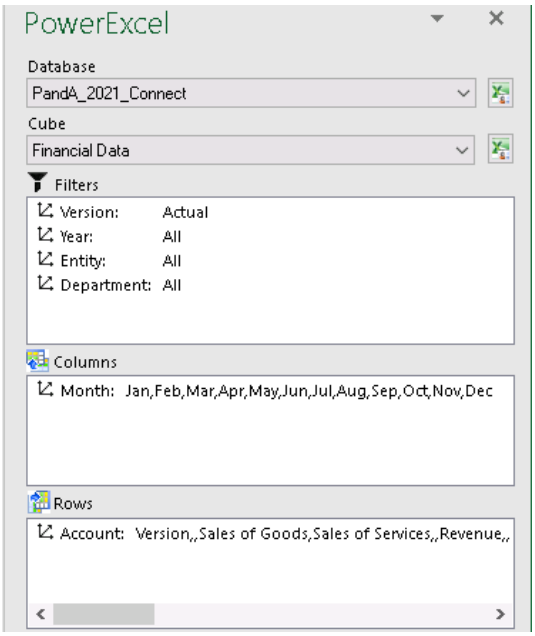
6. In preparation for our next topic, **re-arrange the Slice so that it shows the following**:

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.

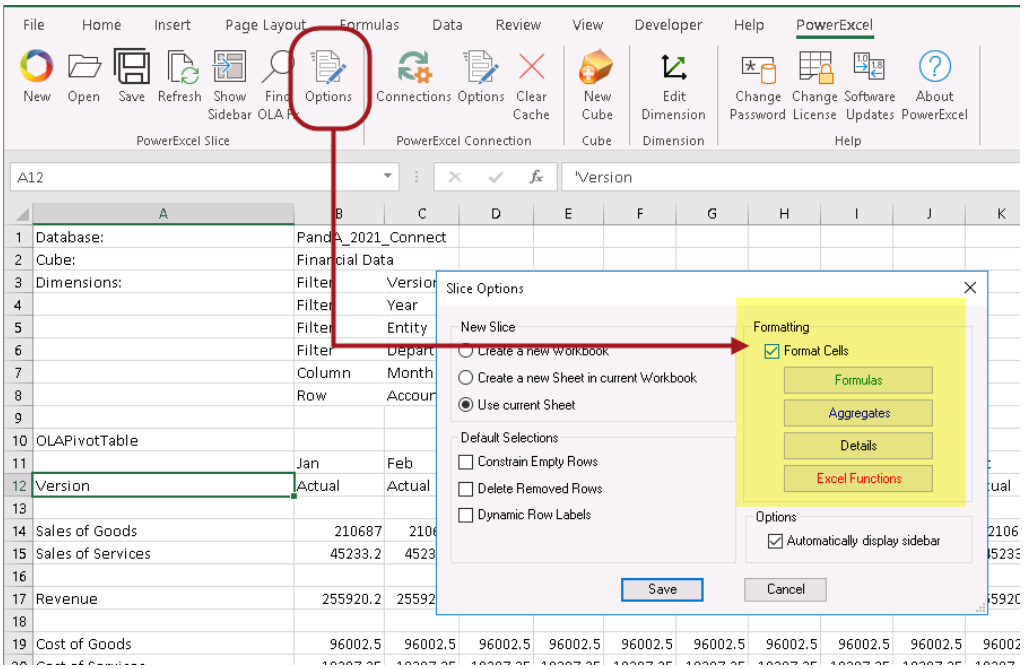


- Back in the PowerExcel Slice the PowerExcel sidebar appears as follows:

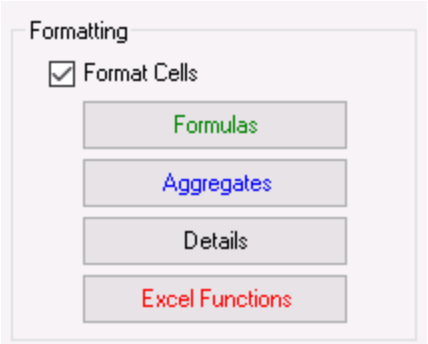


- With **Current Worksheet** selected and with **A1** as the starting cell selected, click the **Update** button.
  Note: You can adjust the column width as desired so that you can better see the data.

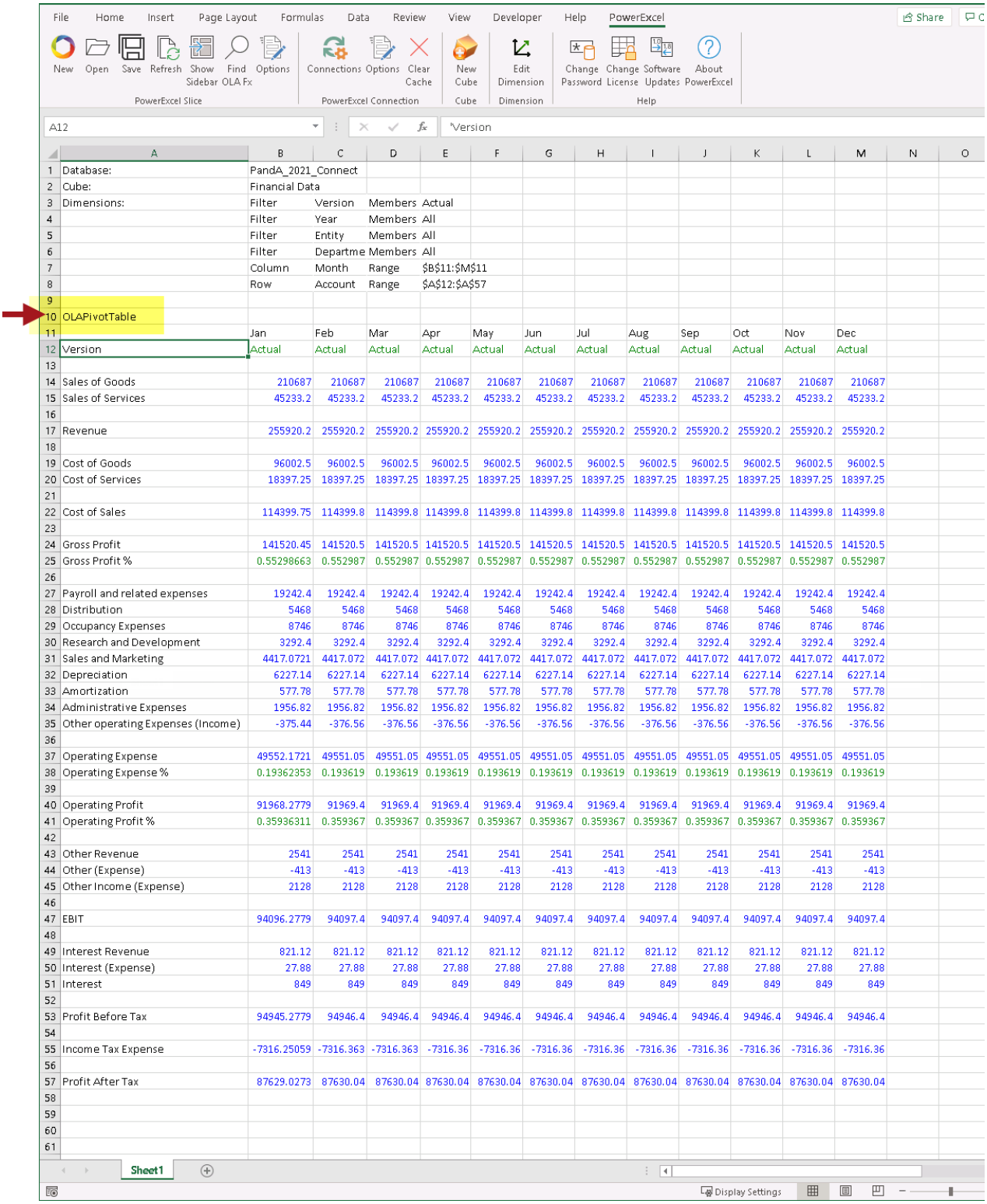
7. You can further customize the PowerExcel Slice so that fact values appear a certain color. To do this:
   - Go to the **PowerExcel Tab** in the Excel ribbon and click the PowerExcel Slice **Options** button.
   - In the Slice Options dialog that appears, tick to enable the **Format Cells** checkbox.



- 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	N	O
1	Database:	PandA_2021_Connect													
2	Cube:	Financial Data													
3	Dimensions:	Filter	Version	Members	Actual										
4		Filter	Year	Members	All										
5		Filter	Entity	Members	All										
6		Filter	Departme	Members	All										
7		Column	Month	Range	$B$11:$M$11										
8		Row	Account	Range	$A$12:$A$57										
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	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687		
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		
16															
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		
18															
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		
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		
21															
22	Cost of Sales	114399.75	114399.8	114399.8	114399.8	114399.8	114399.8	114399.8	114399.8	114399.8	114399.8	114399.8	114399.8		
23															
24	Gross Profit	141520.45	141520.5	141520.5	141520.5	141520.5	141520.5	141520.5	141520.5	141520.5	141520.5	141520.5	141520.5		
25	Gross Profit %	0.55298663	0.552987	0.552987	0.552987	0.552987	0.552987	0.552987	0.552987	0.552987	0.552987	0.552987	0.552987		
26															
27	Payroll and related expenses	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4		
28	Distribution	5468	5468	5468	5468	5468	5468	5468	5468	5468	5468	5468	5468		
29	Occupancy Expenses	8746	8746	8746	8746	8746	8746	8746	8746	8746	8746	8746	8746		
30	Research and Development	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4		
31	Sales and Marketing	4417.0721	4417.072	4417.072	4417.072	4417.072	4417.072	4417.072	4417.072	4417.072	4417.072	4417.072	4417.072		
32	Depreciation	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14		
33	Amortization	577.78	577.78	577.78	577.78	577.78	577.78	577.78	577.78	577.78	577.78	577.78	577.78		
34	Administrative Expenses	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82		
35	Other operating Expenses (Income)	-375.44	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56		
36															
37	Operating Expense	49552.1721	49551.05	49551.05	49551.05	49551.05	49551.05	49551.05	49551.05	49551.05	49551.05	49551.05	49551.05		
38	Operating Expense %	0.19362353	0.193619	0.193619	0.193619	0.193619	0.193619	0.193619	0.193619	0.193619	0.193619	0.193619	0.193619		
39															
40	Operating Profit	91968.2779	91969.4	91969.4	91969.4	91969.4	91969.4	91969.4	91969.4	91969.4	91969.4	91969.4	91969.4		
41	Operating Profit %	0.35936311	0.359367	0.359367	0.359367	0.359367	0.359367	0.359367	0.359367	0.359367	0.359367	0.359367	0.359367		
42															
43	Other Revenue	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541		
44	Other (Expense)	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413		
45	Other Income (Expense)	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128		
46															
47	EBIT	94096.2779	94097.4	94097.4	94097.4	94097.4	94097.4	94097.4	94097.4	94097.4	94097.4	94097.4	94097.4		
48															
49	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		
50	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		
51	Interest	849	849	849	849	849	849	849	849	849	849	849	849		
52															
53	Profit Before Tax	94945.2779	94946.4	94946.4	94946.4	94946.4	94946.4	94946.4	94946.4	94946.4	94946.4	94946.4	94946.4		
54															
55	Income Tax Expense	-7316.25059	-7316.363	-7316.363	-7316.36	-7316.36	-7316.36	-7316.36	-7316.36	-7316.36	-7316.36	-7316.36	-7316.36		
56															
57	Profit After Tax	87629.0273	87630.04	87630.04	87630.04	87630.04	87630.04	87630.04	87630.04	87630.04	87630.04	87630.04	87630.04		
58															
59															
60															
61															

Take note of the **OLAPivotTable** reference (see where arrow points highlighted in yellow in the above image, located in cell A10).

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.

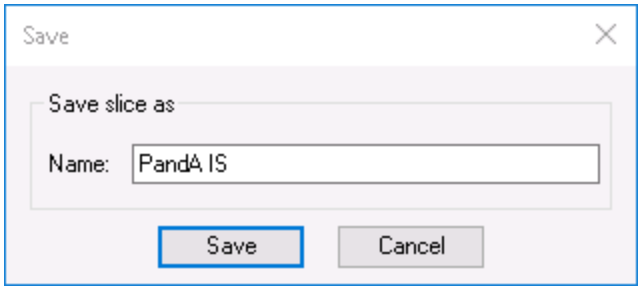
Important: If you save a Slice, you can open it at any time and see the latest data from the Cloud-based model—simply hit F9 to re-establish the connection.

The final section of this manual 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.

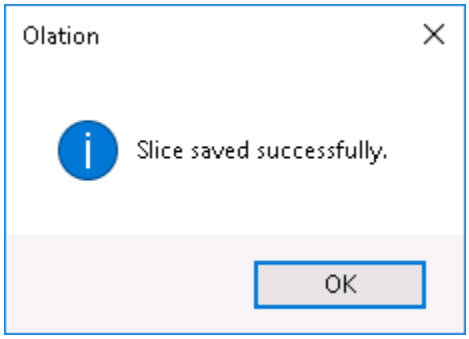
8. You can opt to **Save the PowerExcel Slice** back to the Olation Studio so that you can easily access/generate the same Slice configuration from scratch.

   To save the PowerExcel Slice

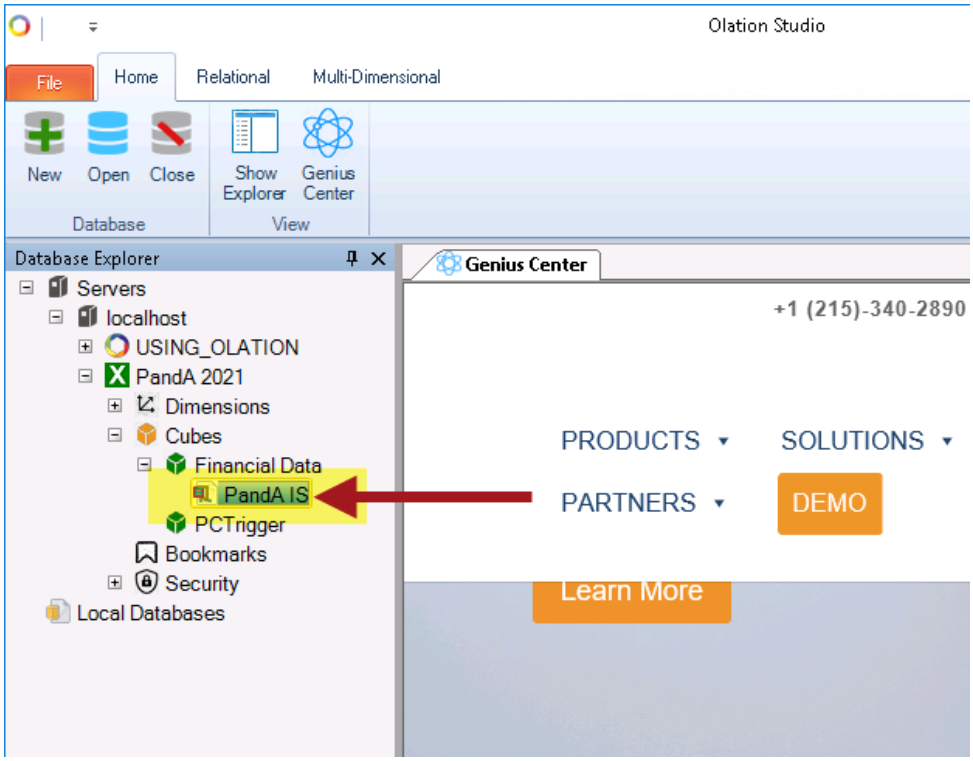
   - In the **PowerExcel Tab** of the Excel ribbon, click the **Save** PowerExcel Slice button.
   - In the Save Slice dialog, enter the <**PowerExcel Slice Name**>, e.g., **PandA IS**.



   - You will get a prompt that says '*Slice saved successfully*'.



   - Click **OK**. If you are to check the Olation Studio, you will see the saved Slice appear (highlighted in yellow in the screenshot below):



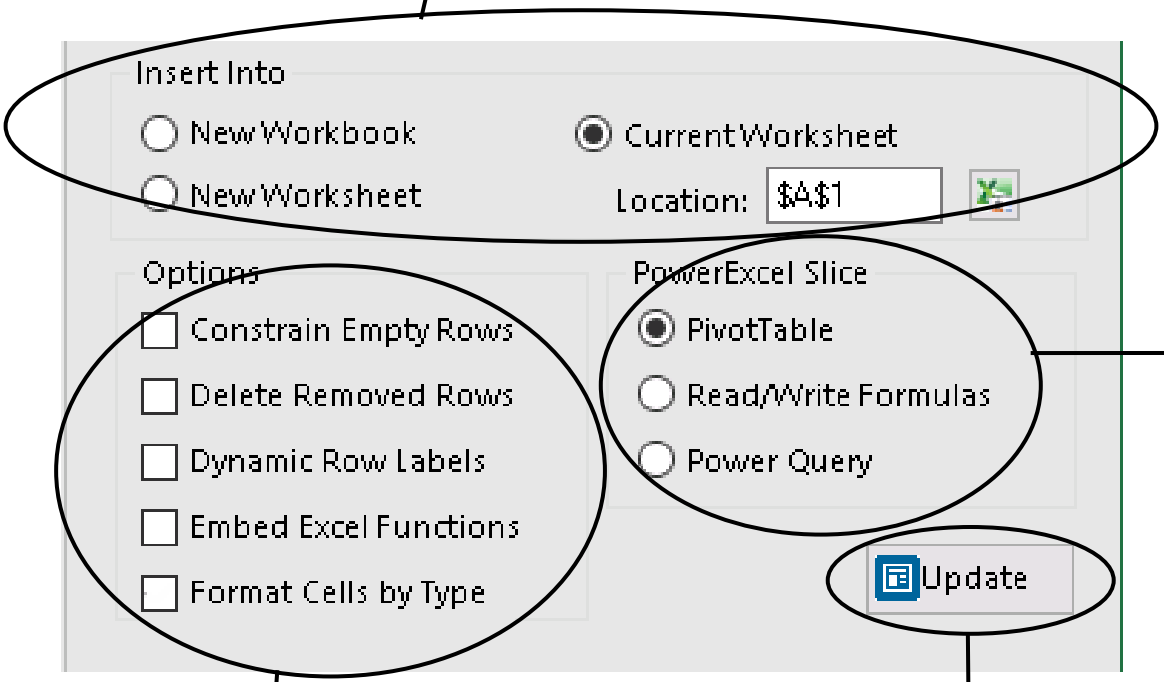
2.4 The PowerExcel Sidebar and Ribbon Commands

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.

Note the selections at the bottom of the PowerExcel sidebar, which become visible at right when you click on the OLAPivotTable function.

These selections will 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.

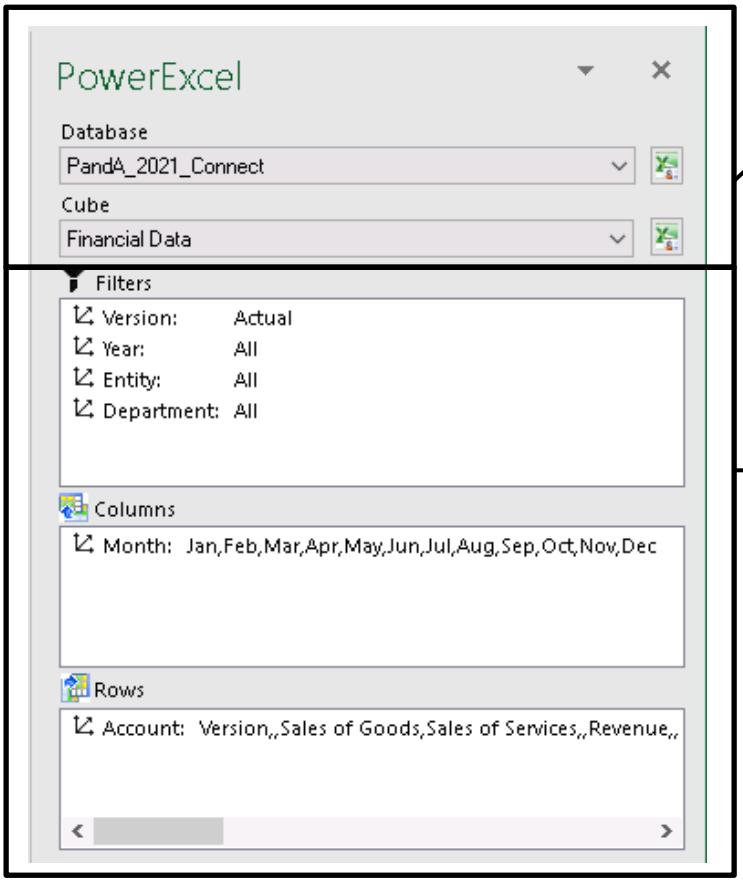
These selections determine the function that governs how data from the cube will be shown in the Slice. In the previous steps, OLAPivotTable was used. In the next few pages, you will use both Read/Write Formulas and Power Query.



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

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.

Note the selections at the top of the PowerExcel window, which becomes visible when you click on the OLAPivotTable function located in cell A8, as shown in the previous image.

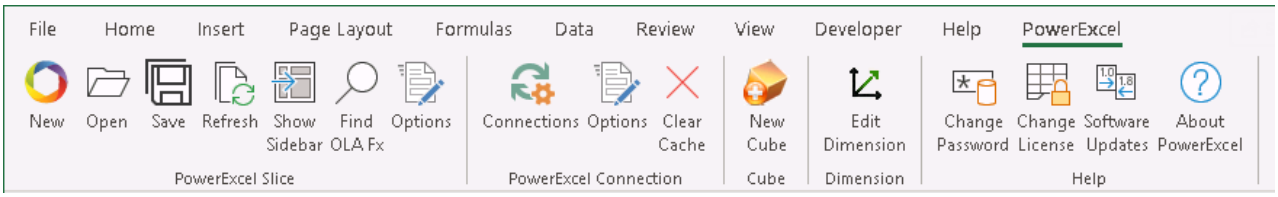


As shown previously: after creating a New Connection, this is where you will choose the PowerExcel database and the Cube in that database that you want to "Slice to Excel."

These Filter boxes enable you to (a) reorient the Dimensions you want to see as "Page", Columns and Rows Members, and (b) select the individual Dimension Members that you wish to see in the PowerExcel Slice.

[*see next page for PowerExcel Ribbon commands*]

The following are the icons on the PowerExcel ribbon, shown below (with a brief description).

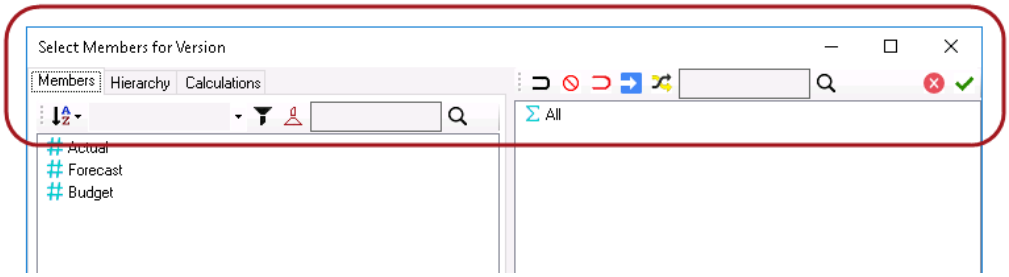


New	Start here to create a Slice from a PowerExcel database (providing Connection exists).
Open	Opens a Saved Slice. Note that you will have further options about the Slice Type and where to insert the data [see the final section of this manual for further information]
Save	Saves a PowerExcel Slice, which can be viewed by another user with a connection to the same model [see the final section of this manual for further information]
Refresh	Refreshes the Slice data after making Member selections
Show Sidebar	Shows the PowerExcel Sidebar (pane) if you have unchecked the Option (see Option [PowerExcel Slice] below) to automatically display PowerExcel sidebar.
Find OLA Fx	Finds PowerExcel function in an open Slice governing the Slice [for current version: OLAPivotTable]
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.
Connections	Create a New connection (or Delete an existing one), or select 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.
New Cube	[Licensed Feature] Accesses the capability to create Cubes in Olation® from selected tabular data in an Excel spreadsheet – see Section 4.1.

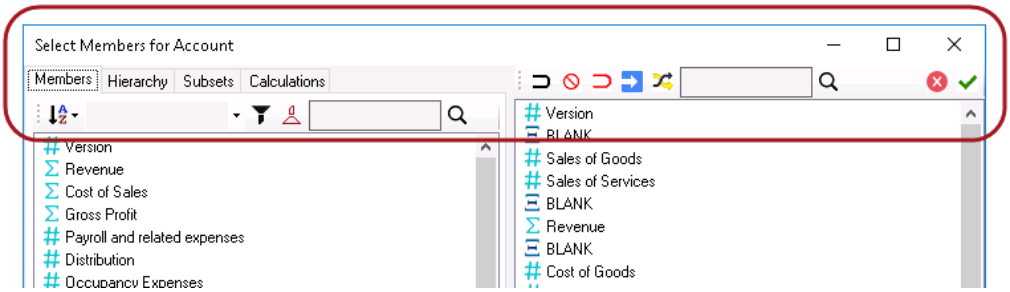
Edit Dimension	[Licensed Feature] The Dimension Editor enables you to Add new Members (as a Sibling or Child to existing Members) and to reorganize existing Hierarchies – see Section 4.2.
Change Password	Enables the user to change Password on the selected PowerExcel database.
Change License	Brings up 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.

Concerning 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



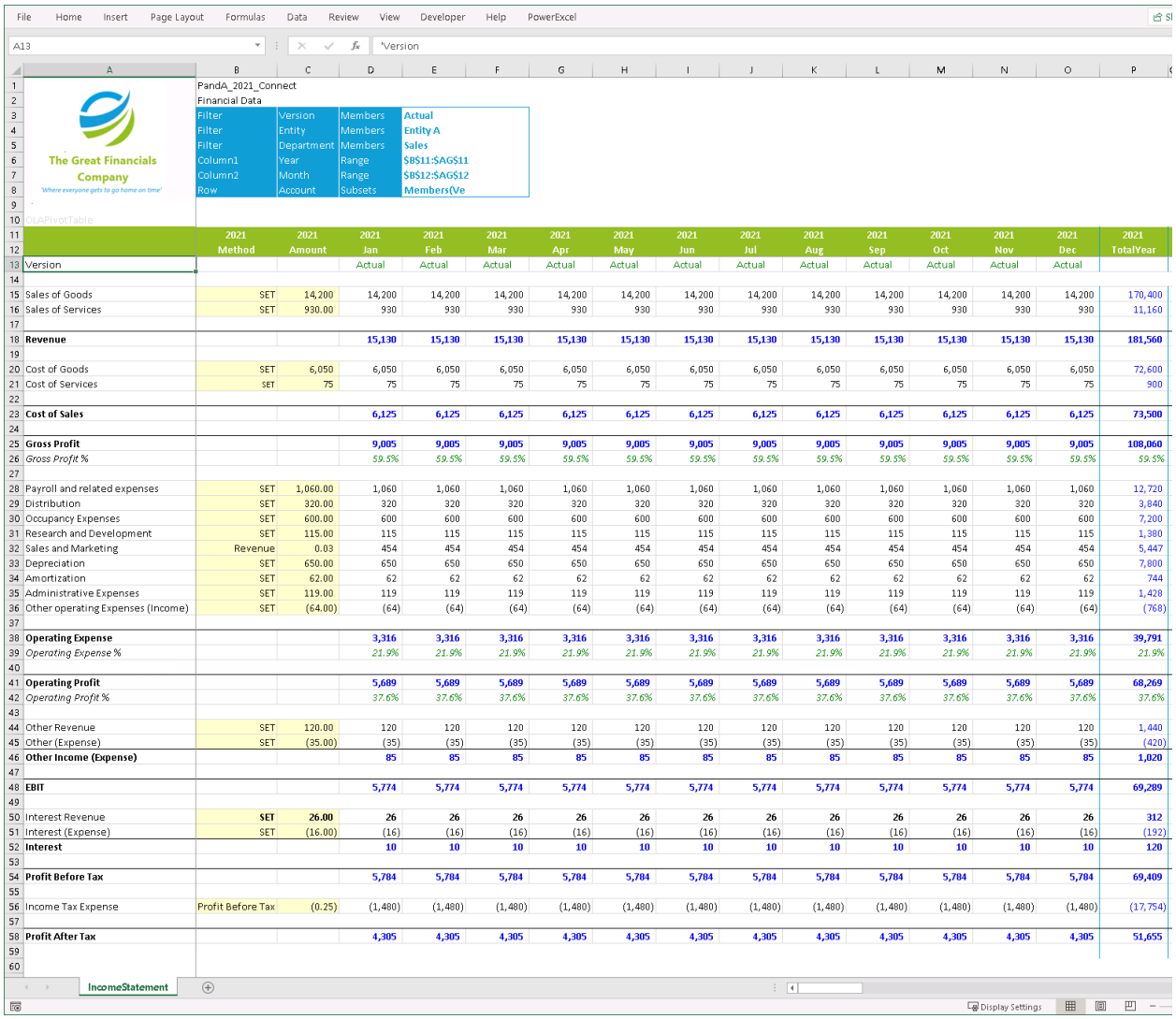
Select Members dialog for Dimensions along the **Rows/Columns** section

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.
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.



File Home Insert Page Layout Formulas Data Review View Developer Help PowerExcel

A13 'Version

The Great Financials Company
'Where everyone gets to go home on time'

PandA_2021_Connect
Financial Data

Filter	Version	Members	Actual
Filter	Entity	Members	Entity A
Filter	Department	Members	Sales
Column1	Year	Range	$B$11:$AG$11
Column2	Month	Range	$B$12:$AG$12
Row	Account	Subsets	Members(Ve

OLAPPivotTable

	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
Version			Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	
Sales of Goods	SET	14,200	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
Sales of Services	SET	930.00	930	930	930	930	930	930	930	930	930	930	930	930	11,160
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**
Cost of Goods	SET	6,050	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
Cost of Services	SET	75	75	75	75	75	75	75	75	75	75	75	75	75	900
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**
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**
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%*
Payroll and related expenses	SET	1,060.00	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
Distribution	SET	320.00	320	320	320	320	320	320	320	320	320	320	320	320	3,840
Occupancy Expenses	SET	600.00	600	600	600	600	600	600	600	600	600	600	600	600	7,200
Research and Development	SET	115.00	115	115	115	115	115	115	115	115	115	115	115	115	1,380
Sales and Marketing	Revenue	0.03	454	454	454	454	454	454	454	454	454	454	454	454	5,447
Depreciation	SET	650.00	650	650	650	650	650	650	650	650	650	650	650	650	7,800
Amortization	SET	62.00	62	62	62	62	62	62	62	62	62	62	62	62	744
Administrative Expenses	SET	119.00	119	119	119	119	119	119	119	119	119	119	119	119	1,428
Other operating Expenses (Income)	SET	(64.00)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(64)	(768)
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**
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%*
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**
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%*
Other Revenue	SET	120.00	120	120	120	120	120	120	120	120	120	120	120	120	1,440
Other (Expense)	SET	(35.00)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(420)
Other Income (Expense)			**85**	**85**	**85**	**85**	**85**	**85**	**85**	**85**	**85**	**85**	**85**	**85**	**1,020**
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**
Interest Revenue	SET	26.00	26	26	26	26	26	26	26	26	26	26	26	26	312
Interest (Expense)	SET	(16.00)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(192)
Interest			**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**120**
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**
Income Tax Expense	Profit Before Tax	(0.25)	(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)
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**

IncomeStatement

Display Settings

2.5 Working with a PowerExcel Read/Write Formulas

PowerExcel's Read/Write Formulas, 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 OLAP Pivot Table or the PowerQuery functions are used (the PowerQuery method is discussed in the section following this one).

The following exercise demonstrates how to use PowerExcel Read/Write Formulas 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_2021_Connect), proceed as follows.

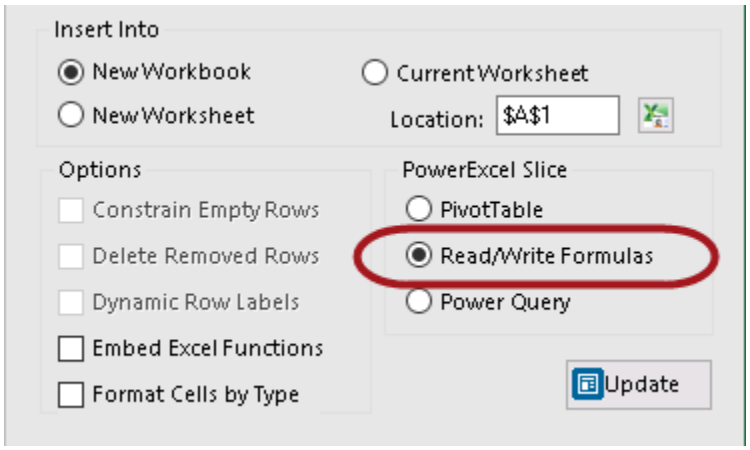
1. To create the example Slice for this exercise, go to the **PowerExcel Tab** and in the PowerExcel Slice control group, select the **New** icon
2. In the PowerExcel sidebar that appears, click on the **Database** drop-down list and select the preferred PowerExcel Database connection (e.g., **PandA_2021_Connect**) 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.*

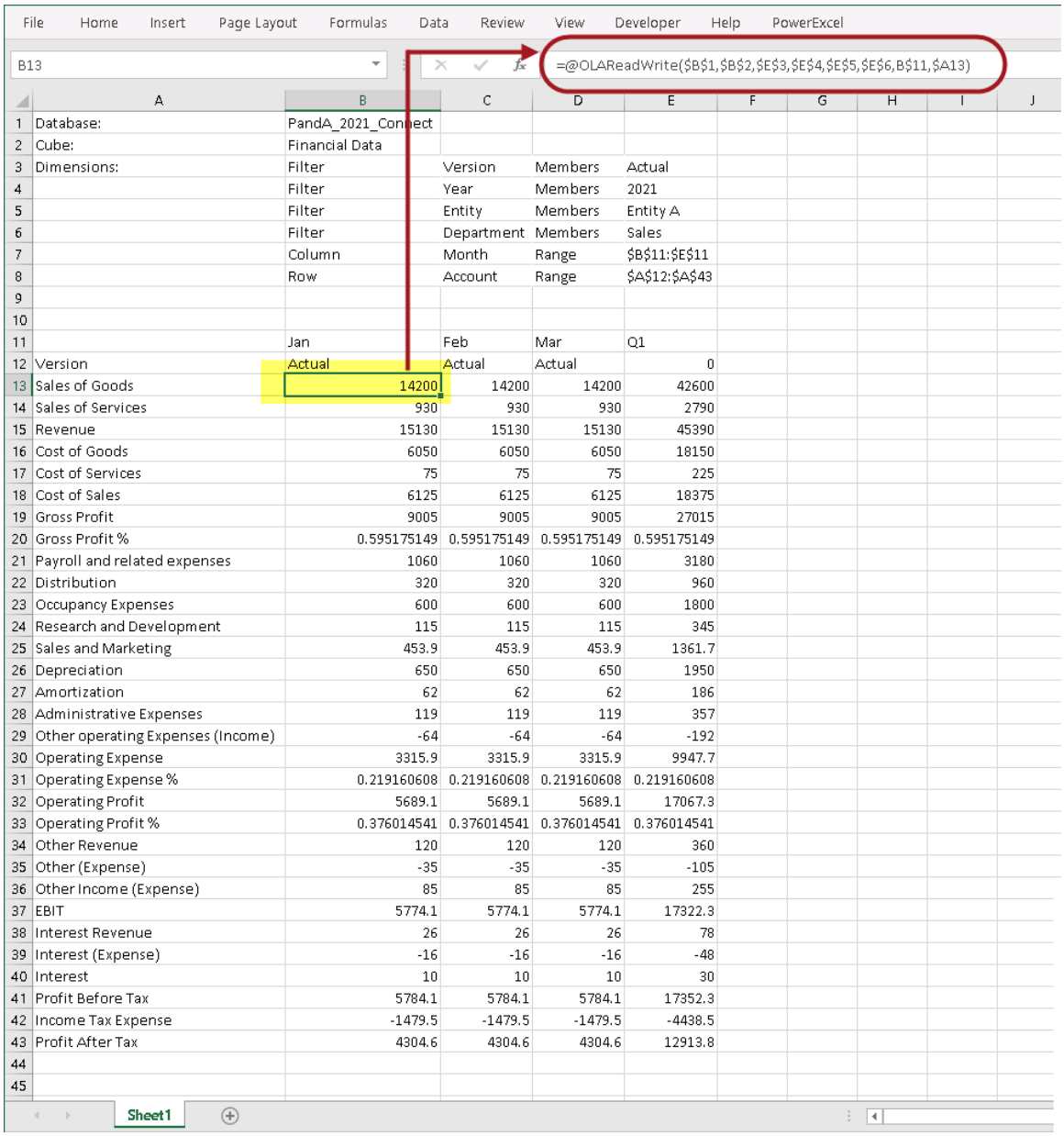
TIP: Another much way to create your PowerExcel Slice, if you had been following the flow of this exercise, is to go back to the PivotTable report you created earlier: click on the **OLAPivotTable** connection reference to bring up the PowerExcel sidebar→*but this time* select **Read/Write Formulas** as the PowerExcel Slice Type→select **New Workbook**→specify starting cell Location as cell **A1** and→click the **Update button**. This will generate the desired ReadWrite Slice in a new Excel workbook.

NOTE: If there are any 'Blank Rows' inserted in the new OLAReadWrite Slice, remove them, as they will return an error (#ERROR)--or you can delete the #ERROR text in the rows where they appear manually after generating the Slice.

4. Click the **green checkmark icon** (OK button).
5. Back in the PowerExcel sidebar, select a Slice Type: use **Read/Write Formulas** by clicking on the appropriate radio button option (circled in the following image).
   Note: Notice that at this point that the checkbox options along the left become grayed out/disabled except for a) **Embed Excel Functions** and b) **Format Cells by Type**. The grayed out options are not available for the Read/Write Formula Slice



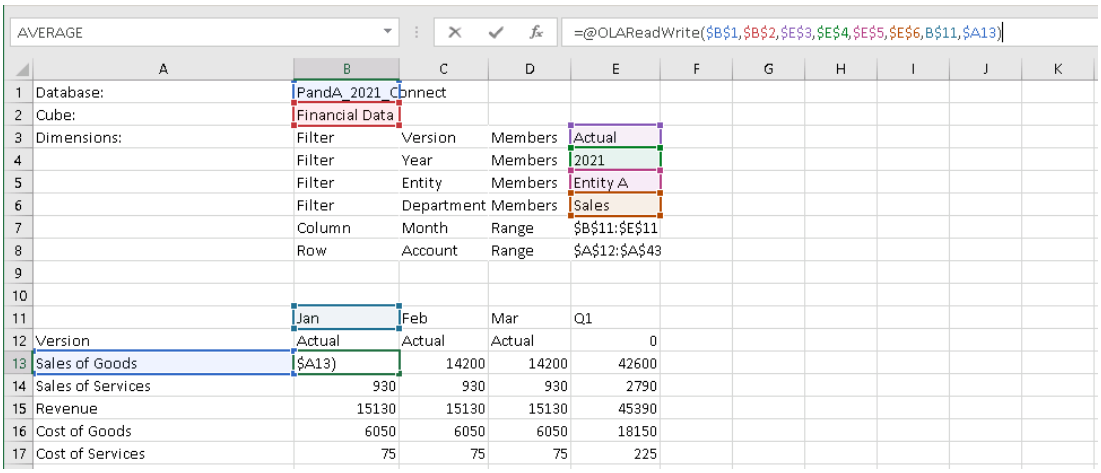
6. Select the **New Workbook** radio button, and indicate the **Location** (cell) to insert the start of the Slice: in this example, $**A$1**.
   The Slice will appear as follows (detail):



	A	B	C	D	E
1	Database:	PandA_2021_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$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 %	0.595175149	0.595175149	0.595175149	0.595175149
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 %	0.219160608	0.219160608	0.219160608	0.219160608
32	Operating Profit	5689.1	5689.1	5689.1	17067.3
33	Operating Profit %	0.376014541	0.376014541	0.376014541	0.376014541
34	Other Revenue	120	120	120	360
35	Other (Expense)	-35	-35	-35	-105
36	Other Income (Expense)	85	85	85	255
37	EBIT	5774.1	5774.1	5774.1	17322.3
38	Interest Revenue	26	26	26	78
39	Interest (Expense)	-16	-16	-16	-48
40	Interest	10	10	10	30
41	Profit Before Tax	5784.1	5784.1	5784.1	17352.3
42	Income Tax Expense	-1479.5	-1479.5	-1479.5	-4438.5
43	Profit After Tax	4304.6	4304.6	4304.6	12913.8
44					
45					

Notice the function in cell B13 (circled in the above image): it is the **OLAReadWrite** function mentioned at the start of this section: it is the operative means of returning data when Read/Write Formulas is selected in the sidebar. What is characteristic of this function?—in sum, that each cell has its own unique argument, which is to say 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
1	Database:	PandA_2021_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$43						
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						

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 Read/Write Formula 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

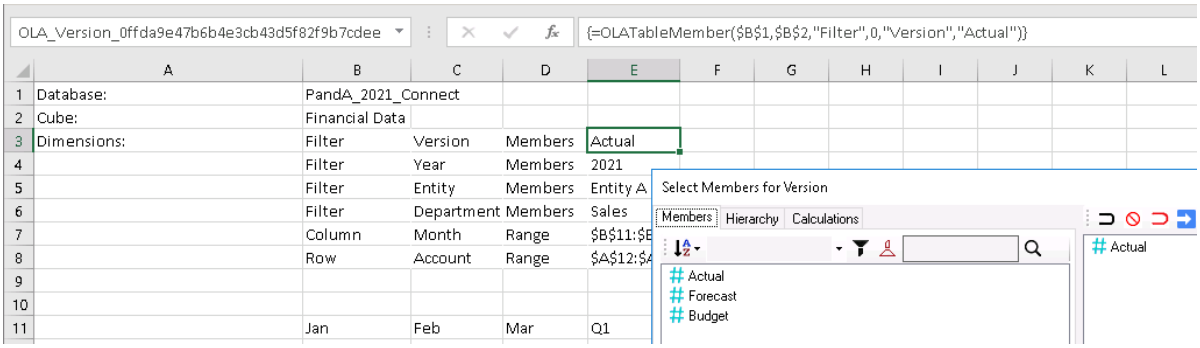
$E$6 – the *Sales* member in the *Department* dimension

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, 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 below image), then results for all the Members, including those in Columns and Rows, will show results for *Budget* rather than *Actual*.

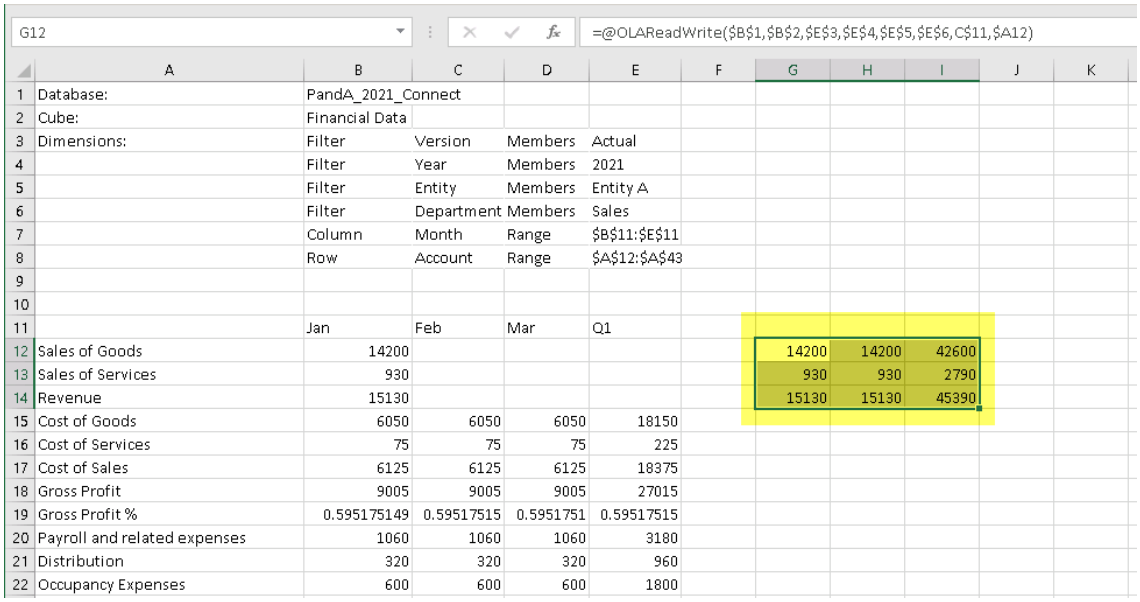


For present, go back to (or keep the selection at) *Actual*. We will proceed what this "cell-by-cell return of values" enables us to do in the following steps.

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.

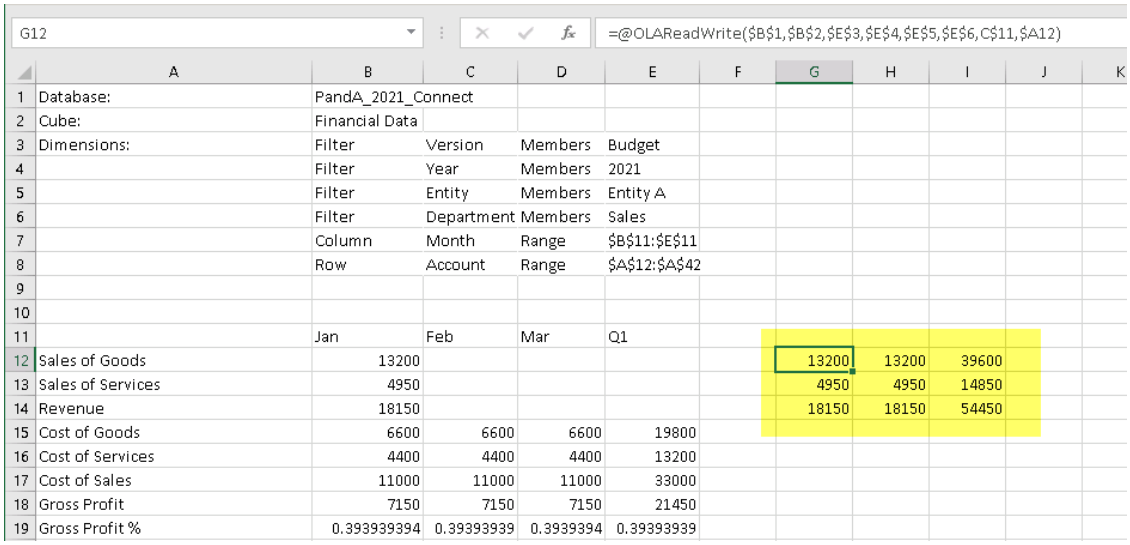
9. After the Rows have shifted upward one Row, click in Cell C12—*Feb, Sales of Goods*.

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:
See the cells where you dropped the 'grabbed values' highlighted in yellow in the succeeding image.



	A	B	C	D	E	F	G	H	I	J	K
1	Database:	PandA_2021_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$43						
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 %	0.595175149	0.59517515	0.5951751	0.59517515						
20	Payroll and related expenses	1060	1060	1060	3180						
21	Distribution	320	320	320	960						
22	Occupancy Expenses	600	600	600	1800						

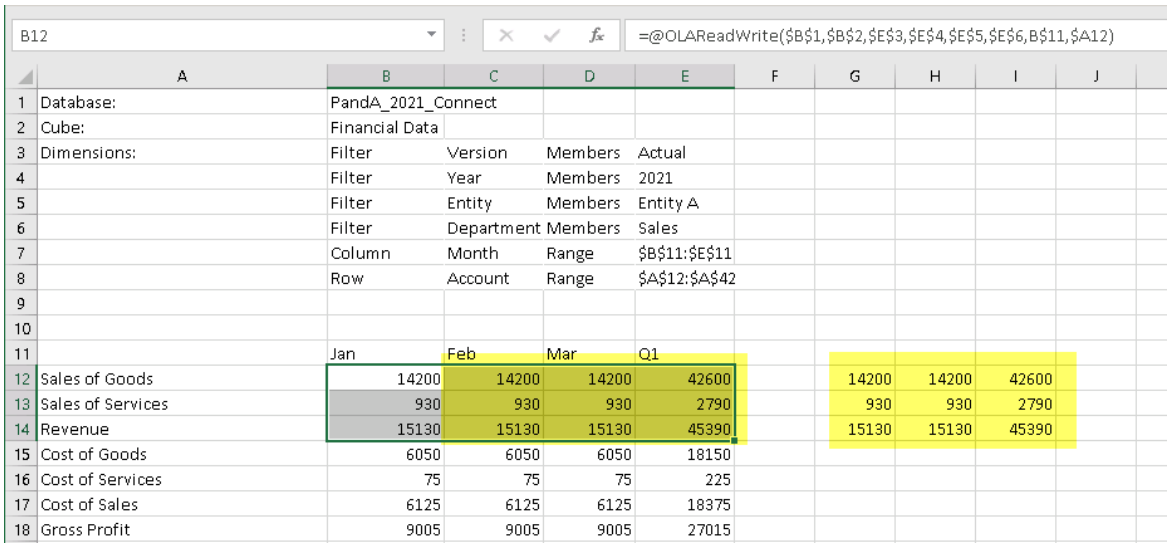
11. If you now double-click on Cell E3 and select *Budget*, then **hit F9 to update**—note, those cells that you moved to the right refreshed to show Budget values (as in the next image)! That is because Excel maintained the references to the cells, and the selected Member in them, in their new position (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	J
1	Database:	PandA_2021_Connect								
2	Cube:	Financial Data								
3	Dimensions:	Filter	Version	Members	Budget					
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										
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 %	0.393939394	0.39393939	0.3939394	0.39393939					

12. For present purposes, revert back to the *Actual* member (double-click on Cell E4, 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.

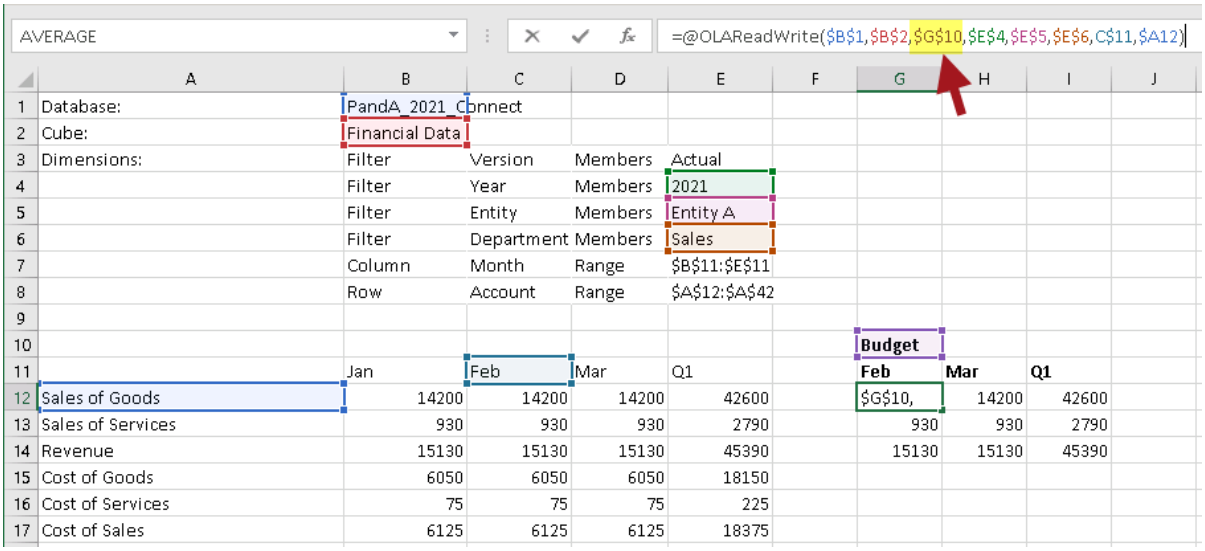
13. When you hit **F9 to update**—you will see the that the data is the same as the data to the right, which you moved a few steps ago. Here Excel, as is its custom, ensured that what shows in Columns is the sequence. (This is a fine example of Excel working the way a user expected!)



B12	=@OLAReadWrite($B$1,$B$2,$E$3,$E$4,$E$5,$E$6,B$11,$A12)									
	A	B	C	D	E	F	G	H	I	J
1	Database:	PandA_2021_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										
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					

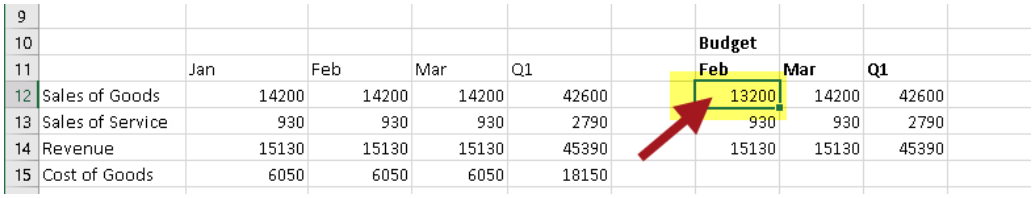
14. This next step involves some housekeeping/formatting, which is always important in data presentation, and which here is necessary to arrive are our objective: to show *Budget* numbers to the right of the data showing *Actuals*:
    Copy the cells C11 to E11 (*Feb* to *Q1*) and paste them into cell 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 from the reference to *Actual* ($E$3) to *Budget* by highlighting it and pointing to Cell **G10** (you can do this by pull the rectangle surrounding E3 down to G10).
    Before you press F9 to recalculate, your spreadsheet will look as follows:



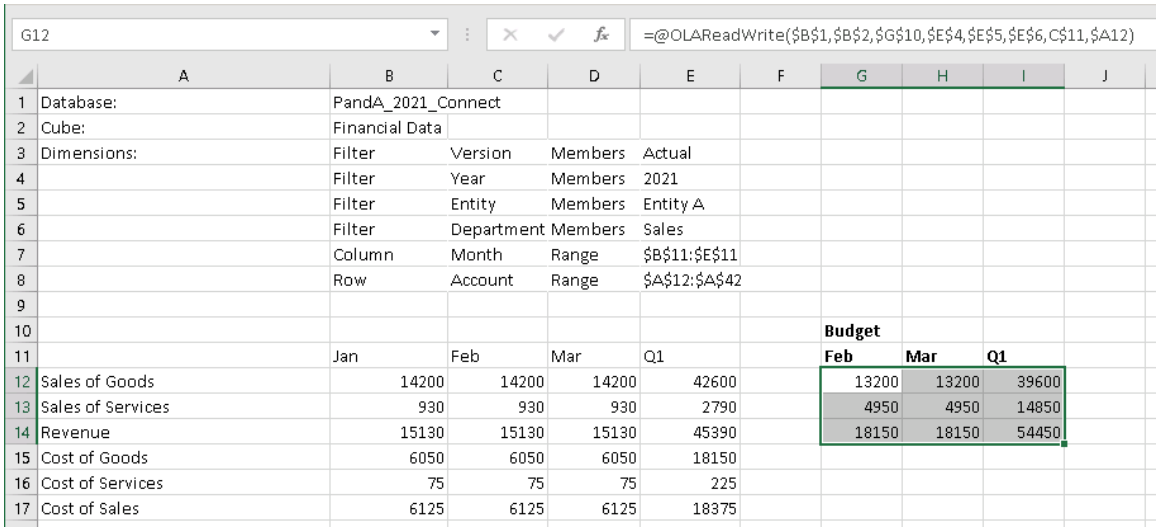
	A	B	C	D	E	F	G	H	I	J
1	Database:	PandA_2021_Connect								
2	Cube:	Financial Data								
3	Dimensions:	Filter	Version	Members	Actual					
4		Filter	Year	Members	2021					
5		Filter	Entity	Members	Entity A					
6		Filter	Department	Members	Sales					
7		Column	Month	Range	$B$11:$E$11					
8		Row	Account	Range	$A$12:$A$42					
9										
10							Budget			
11		Jan	Feb	Mar	Q1		Feb	Mar	Q1	
12	Sales of Goods	14200	14200	14200	42600		$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 Service	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.

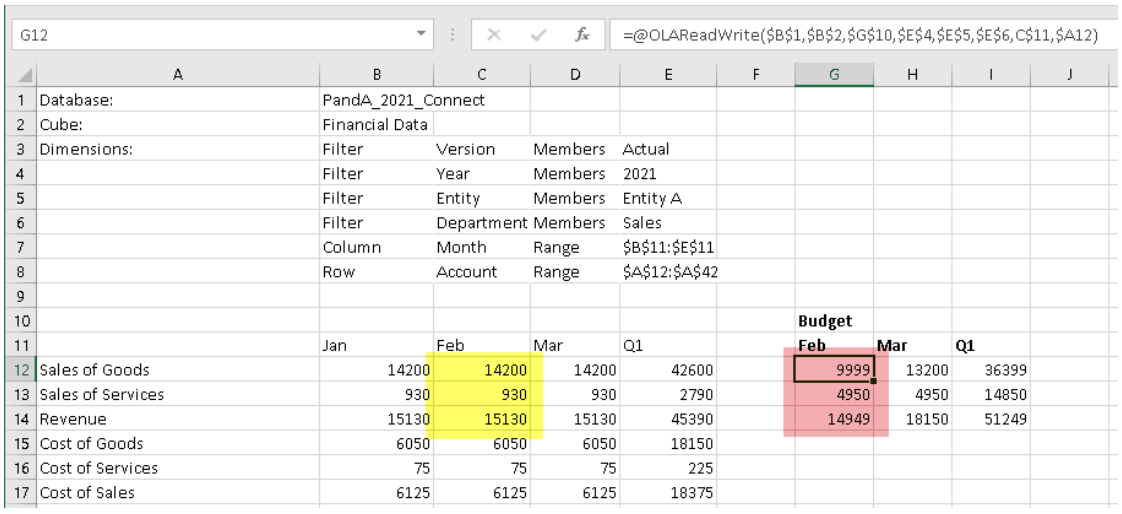


G12 =@OLAReadWrite($B$1,$B$2,$G$10,$E$4,$E$5,$E$6,C$11,$A12)

	A	B	C	D	E	F	G	H	I	J
1	Database:	PandA_2021_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		13200	13200	39600	
13	Sales of Services	930	930	930	2790		4950	4950	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 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.



G12 =@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_2021_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.

2.6 Working with a PowerExcel Power Query Table

The PowerExcel Power Query Table 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.

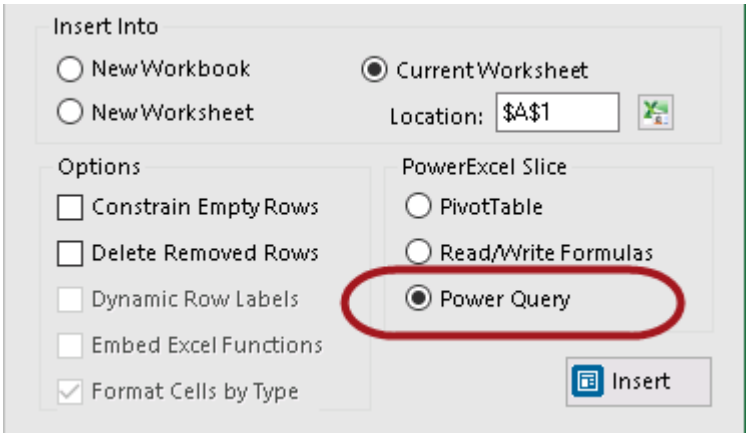
IMPORTANT: The important thing to take note of when using the PowerExcel Power Query Table is that **it is updated using the Refresh button found in the PowerExcel Tab** of the Excel ribbon. The F9 key WILL NOT refresh a PowerExcel Slice that has the Power Query Table as the Slice type.

The following exercise demonstrates the use of the **PowerExcel Power Query** to create a Slice. Assuming that you already have a Connection to a PowerExcel database (in the example, **PandA_2021_Connect**), proceed as follows:

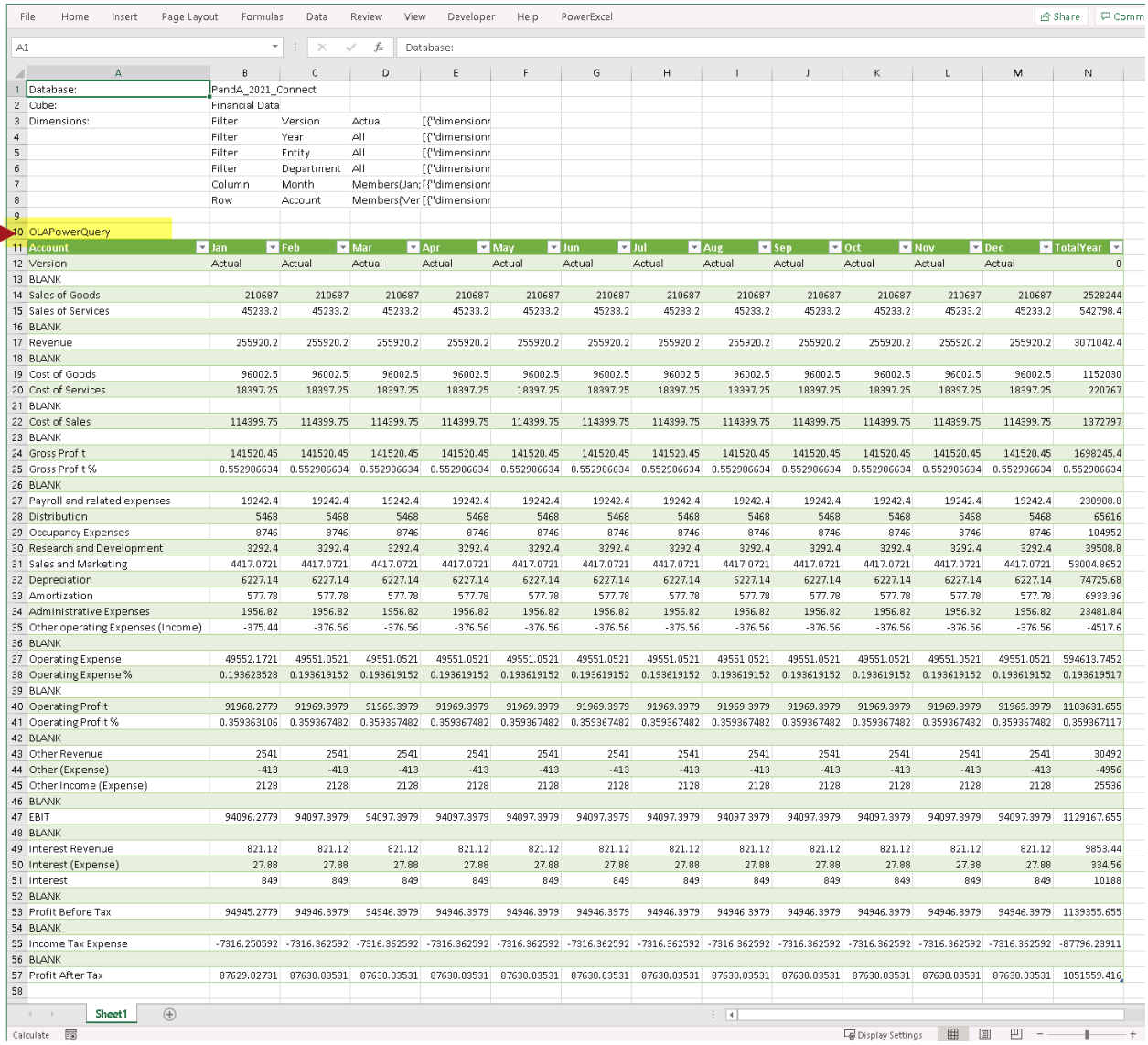
1. First, create an example PowerExcel Slice.
2. Open a new Excel workbook. Go to the **PowerExcel Tab** and in the PowerExcel Slice control group, select the **New** icon.
3. In the PowerExcel sidebar that appears, click on the **Database** drop-down list and select the preferred PowerExcel Database connection (e.g**., PandA_2021_Connect**) and Cube (i.e., **Financial Data**).
4. You can keep the same Slice arrangement and display Members, similar to the PivotTable Slice the Dimensions (the following concerns a 6-dimensional business model, or Cube) by dragging and dropping them along the Filter, Rows and Column areas; and by specifying the indicated display Members:

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*

5. Once you have configured the PowerExcel Slice: back in the PowerExcel sidebar, select a Slice Type: use **PowerExcel Power Query Table** by clicking on the appropriate radio button option (circled in the following image).
   Notice how all the checkbox options are grayed out except for a) **Constrain Empty Rows** and b) **Delete Removed Rows**. The gray-out options are not available in a Power Query Slice.



6. Select the **Current Workbook** radio button, and indicate the **Location** (cell) to insert the Power Query table: in this example, **$A$1**.
7. Click the **Insert** button located at the bottom-left area of the PowerExcel sidebar. Note THE OLAPowerQuery function (see the next image, where arrow points highlighted in yello, located in cell A10)—this is the PowerExcel function that governs how data appears in the spreadsheet.



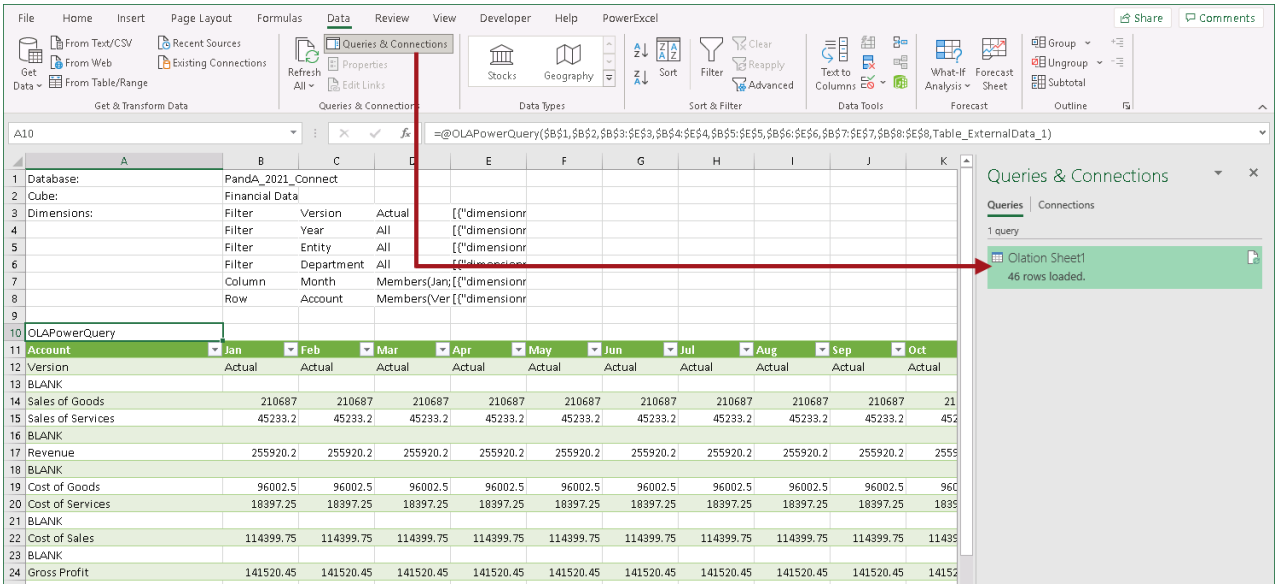
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Database:	PandA_2021_Connect												
2	Cube:	Financial Data												
3	Dimensions:	Filter	Version	Actual	[{"dimensionr									
4		Filter	Year	All	[{"dimensionr									
5		Filter	Entity	All	[{"dimensionr									
6		Filter	Department	All	[{"dimensionr									
7		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	Payroll and related expenses	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	19242.4	230908.8
28	Distribution	5468	5468	5468	5468	5468	5468	5468	5468	5468	5468	5468	5468	65616
29	Occupancy Expenses	8746	8746	8746	8746	8746	8746	8746	8746	8746	8746	8746	8746	104952
30	Research and Development	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	3292.4	39508.8
31	Sales and Marketing	4417.0721	4417.0721	4417.0721	4417.0721	4417.0721	4417.0721	4417.0721	4417.0721	4417.0721	4417.0721	4417.0721	4417.0721	53004.8652
32	Depreciation	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	6227.14	74725.68
33	Amortization	577.78	577.78	577.78	577.78	577.78	577.78	577.78	577.78	577.78	577.78	577.78	577.78	6933.36
34	Administrative Expenses	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	1956.82	23481.84
35	Other operating Expenses (Income)	-375.44	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-376.56	-4517.6
36	BLANK													
37	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
38	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
39	BLANK													
40	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
41	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
42	BLANK													
43	Other Revenue	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	30492
44	Other (Expense)	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	-4956
45	Other Income (Expense)	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	25536
46	BLANK													
47	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
48	BLANK													
49	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
50	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
51	Interest	849	849	849	849	849	849	849	849	849	849	849	849	10188
52	BLANK													
53	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
54	BLANK													
55	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
56	BLANK													
57	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
58														

Important: Most of the manipulations you made using the OLAPivotTable to arrange Columns and Rows, and to select Members to filter, are available in the PowerExcel Power Query 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 Query 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:

8. 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.

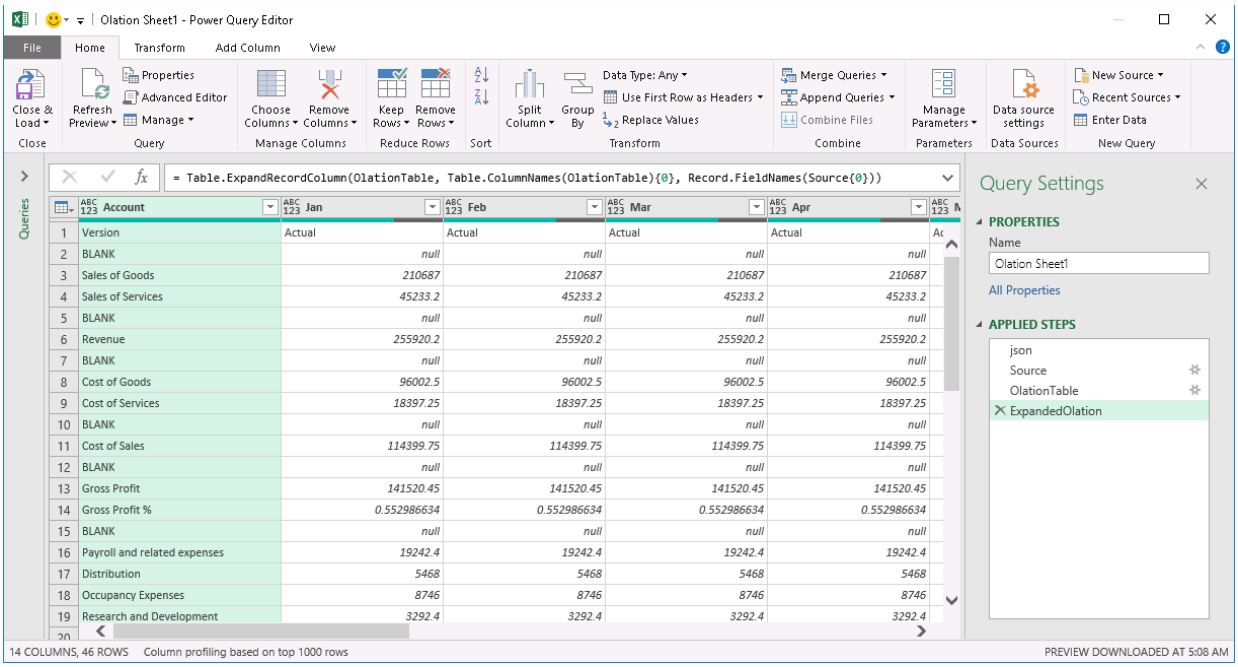


9. When you select a query and double-click on it (see where arrow points), the **Olation – Power Query Editor** appears. (This is shown in the next image.)

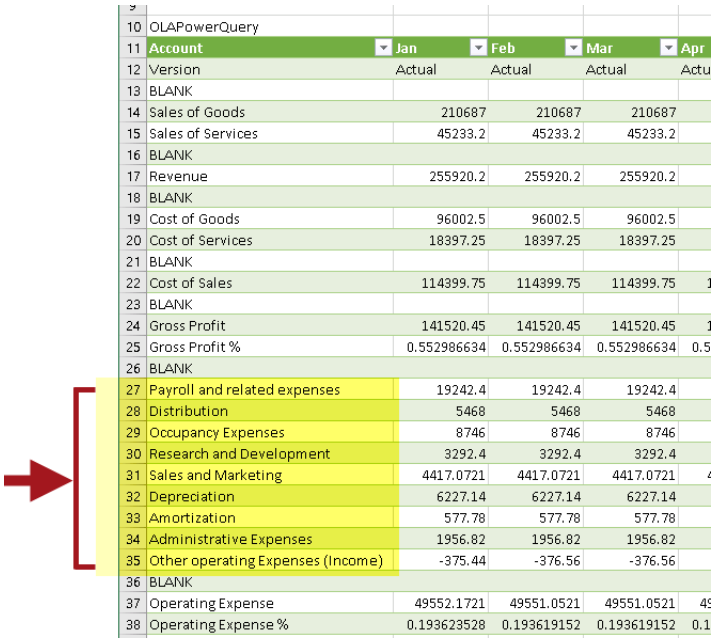
   Within the Query Editor, you can make all kinds of changes to the orientation of the data; as well, you can edit the query to show data as you like—there are truly limitless possibilities.

   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



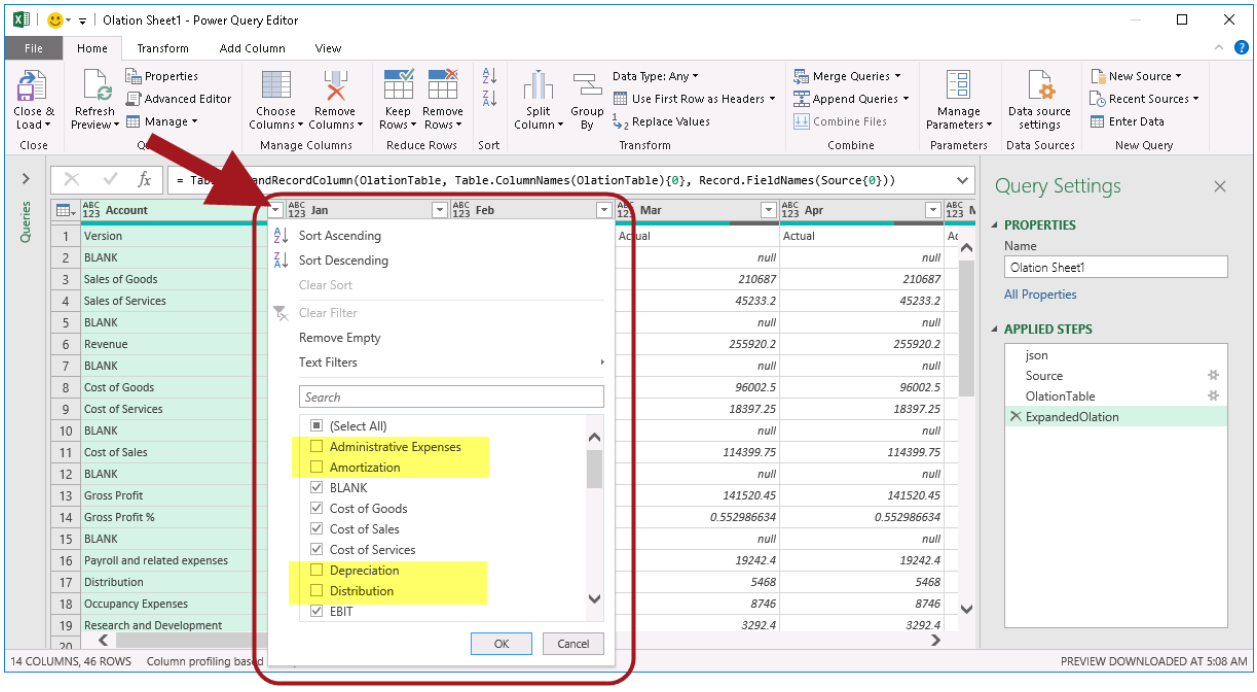
10. First, let us filter the Accounts to remove all sub accounts of *Operating Expense* from the Slice display.



	Account	Jan	Feb	Mar	Apr
10	OLAPowerQuery				
11	Account	Jan	Feb	Mar	Apr
12	Version	Actual	Actual	Actual	Actu
13	BLANK				
14	Sales of Goods	210687	210687	210687	
15	Sales of Services	45233.2	45233.2	45233.2	
16	BLANK				
17	Revenue	255920.2	255920.2	255920.2	
18	BLANK				
19	Cost of Goods	96002.5	96002.5	96002.5	
20	Cost of Services	18397.25	18397.25	18397.25	
21	BLANK				
22	Cost of Sales	114399.75	114399.75	114399.75	
23	BLANK				
24	Gross Profit	141520.45	141520.45	141520.45	
25	Gross Profit %	0.552986634	0.552986634	0.552986634	0.5
26	BLANK				
27	Payroll and related expenses	19242.4	19242.4	19242.4	
28	Distribution	5468	5468	5468	
29	Occupancy Expenses	8746	8746	8746	
30	Research and Development	3292.4	3292.4	3292.4	
31	Sales and Marketing	4417.0721	4417.0721	4417.0721	
32	Depreciation	6227.14	6227.14	6227.14	
33	Amortization	577.78	577.78	577.78	
34	Administrative Expenses	1956.82	1956.82	1956.82	
35	Other operating Expenses (Income)	-375.44	-376.56	-376.56	
36	BLANK				
37	Operating Expense	49552.1721	49551.0521	49551.0521	4
38	Operating Expense %	0.193623528	0.193619152	0.193619152	0.1

To do this:

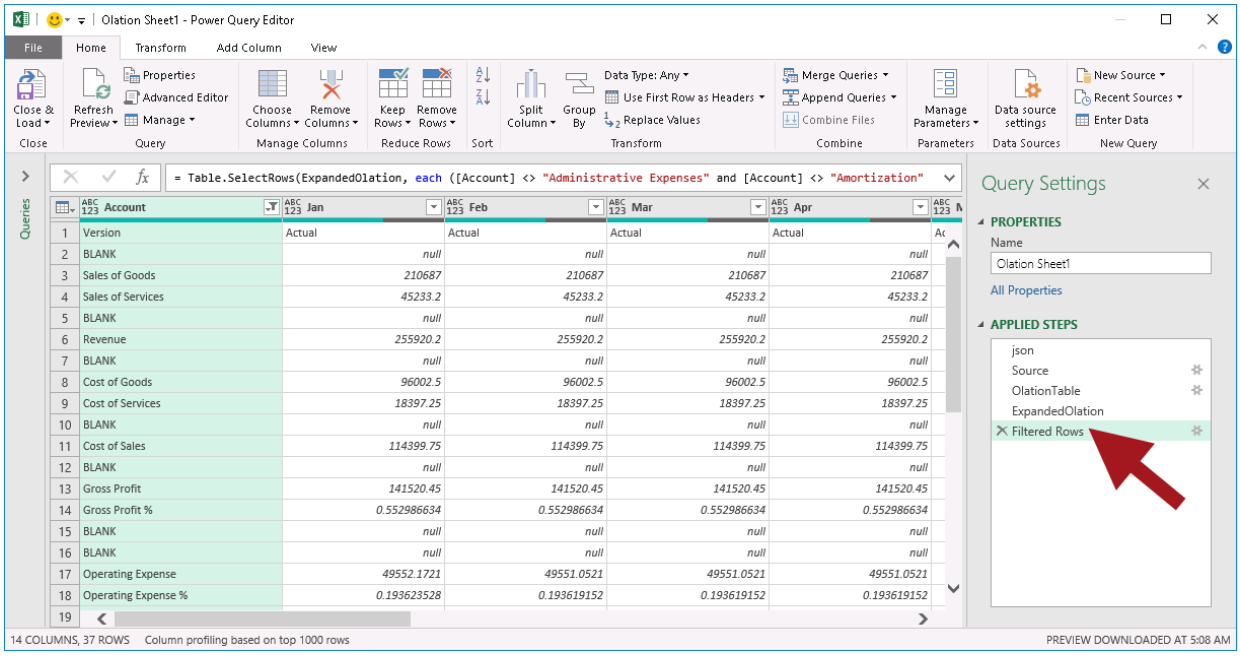
- In the Olation – Power Query Editor, click on the **Account drop-down** (see where arrow points in the image below).
- Uncheck all sub-accounts of **OPERATING EXPENSE**: *Payroll and related expenses*, *Distribution*, *Occupancy Expenses*, *Research and Development*, *Sales and Marketing*, *Depreciation*,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



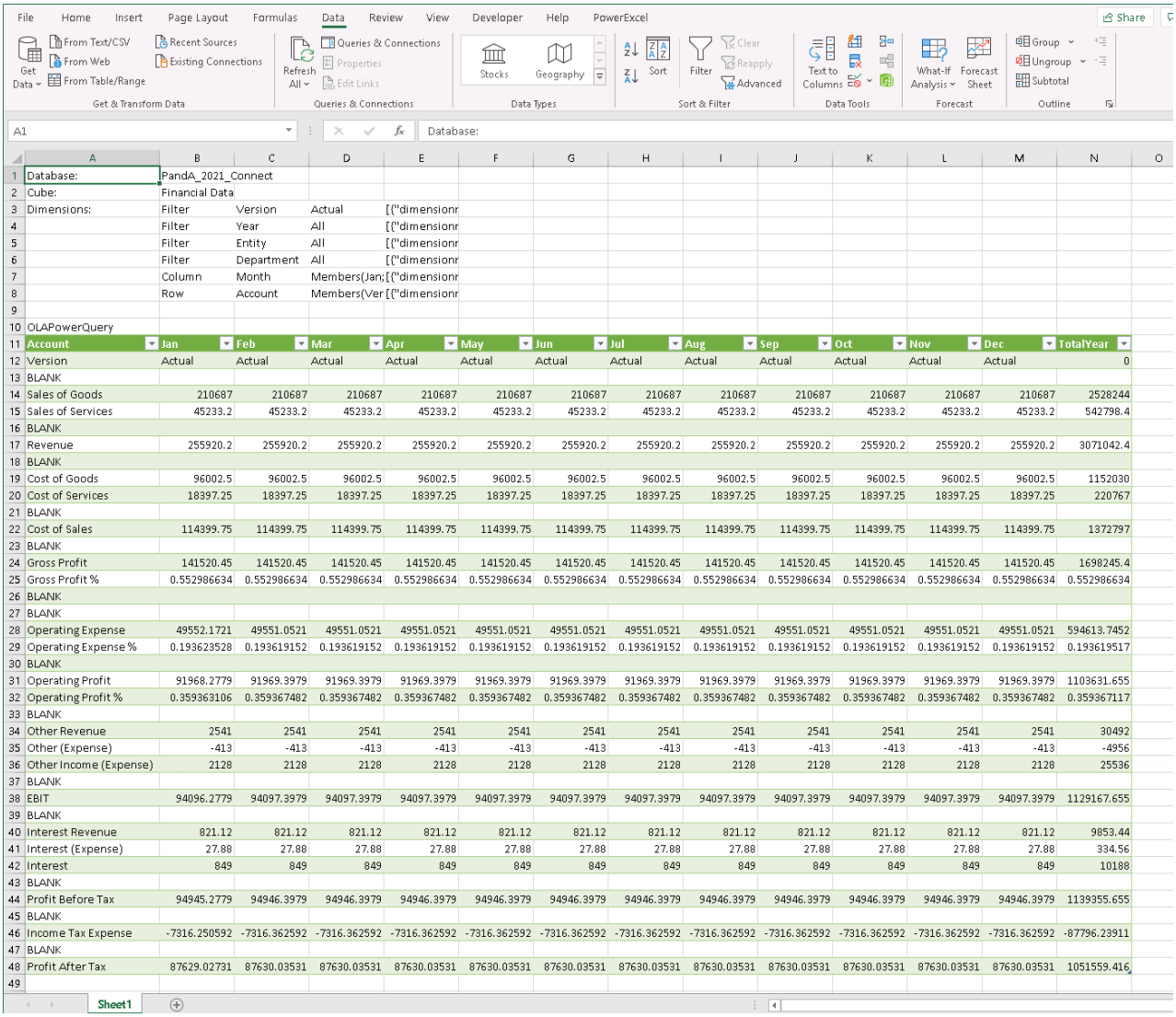
- Click **OK** to apply changes and exit the Filter box.
  Back in the Olation – Power Query Editor, notice that the table is updated.

  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* in rows 27 to 35 no longer appear in the PowerExcel Slice.

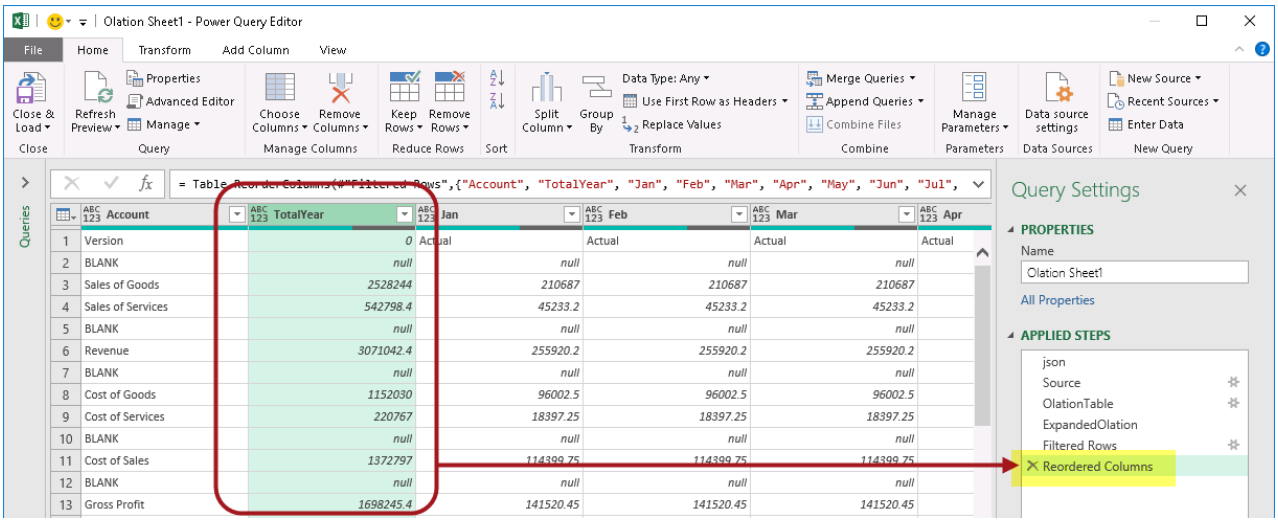


	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Database:	PandA_2021_Connect												
2	Cube:	Financial Data												
3	Dimensions:	Filter	Version	Actual	[{"dimensionr									
4		Filter	Year	All	[{"dimensionr									
5		Filter	Entity	All	[{"dimensionr									
6		Filter	Department	All	[{"dimensionr									
7		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														

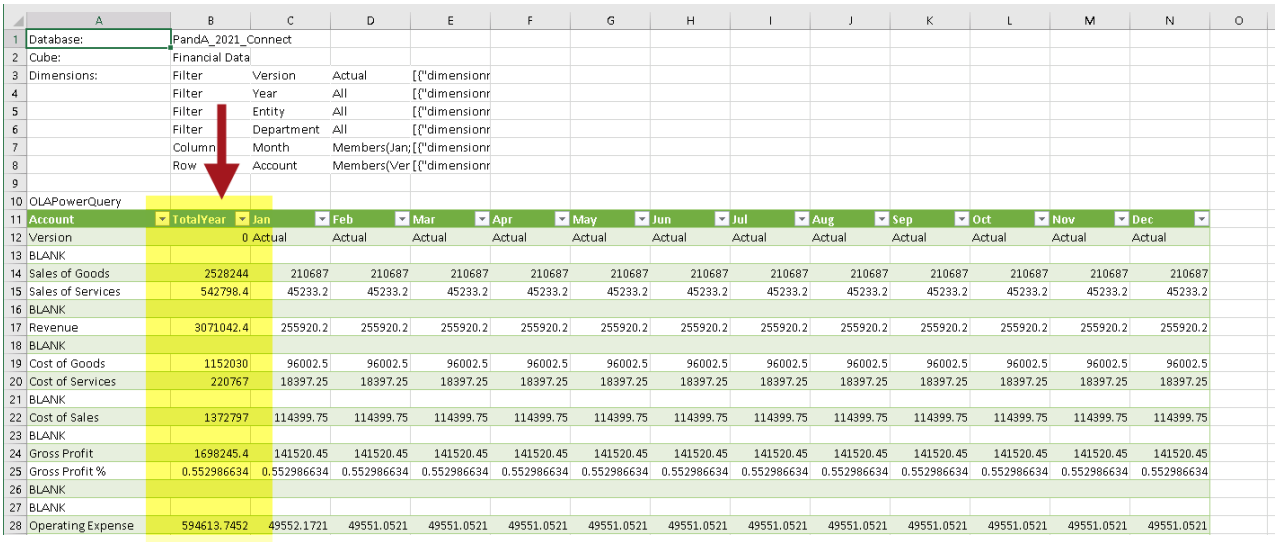
11. For our next modification, move the **Total Year** aggregate Member for the *Month* dimension to the beginning of the Columns.

    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.

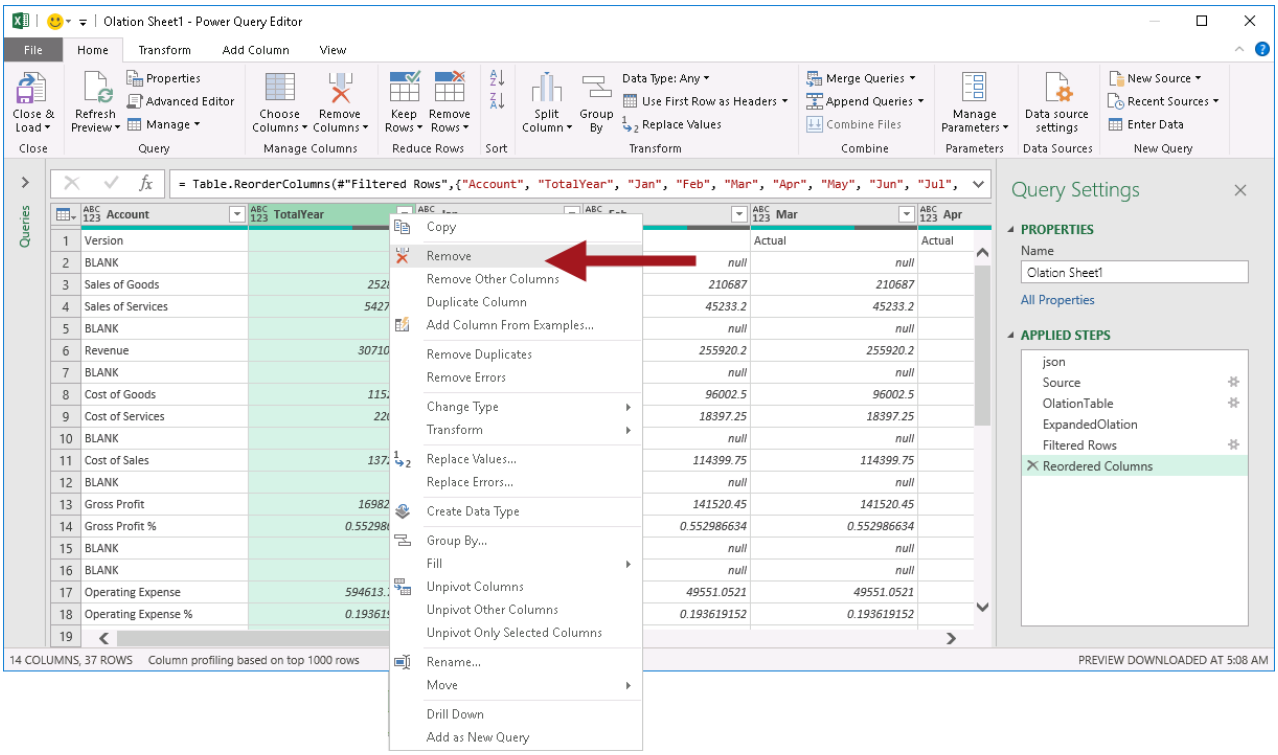


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Database:	PandA_2021_Connect													
2	Cube:	Financial Data													
3	Dimensions:	Filter	Version	Actual	[{"dimensionr										
4		Filter	Year	All	[{"dimensionr										
5		Filter	Entity	All	[{"dimensionr										
6		Filter	Department	All	[{"dimensionr										
7		Column	Month	Members(Jan;[{"dimensionr											
8		Row	Account	Members(Ver	[{"dimensionr										
9															
10	OLAPowerQuery														
11	Account	TotalYear	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
12	Version	0	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	
13	BLANK														
14	Sales of Goods	2528244	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	
15	Sales of Services	542798.4	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	45233.2	
16	BLANK														
17	Revenue	3071042.4	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	255920.2	
18	BLANK														
19	Cost of Goods	1152030	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	96002.5	
20	Cost of Services	220767	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	18397.25	
21	BLANK														
22	Cost of Sales	1372797	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	114399.75	
23	BLANK														
24	Gross Profit	1698245.4	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	141520.45	
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	594613.7452	49552.1721	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	49551.0521	

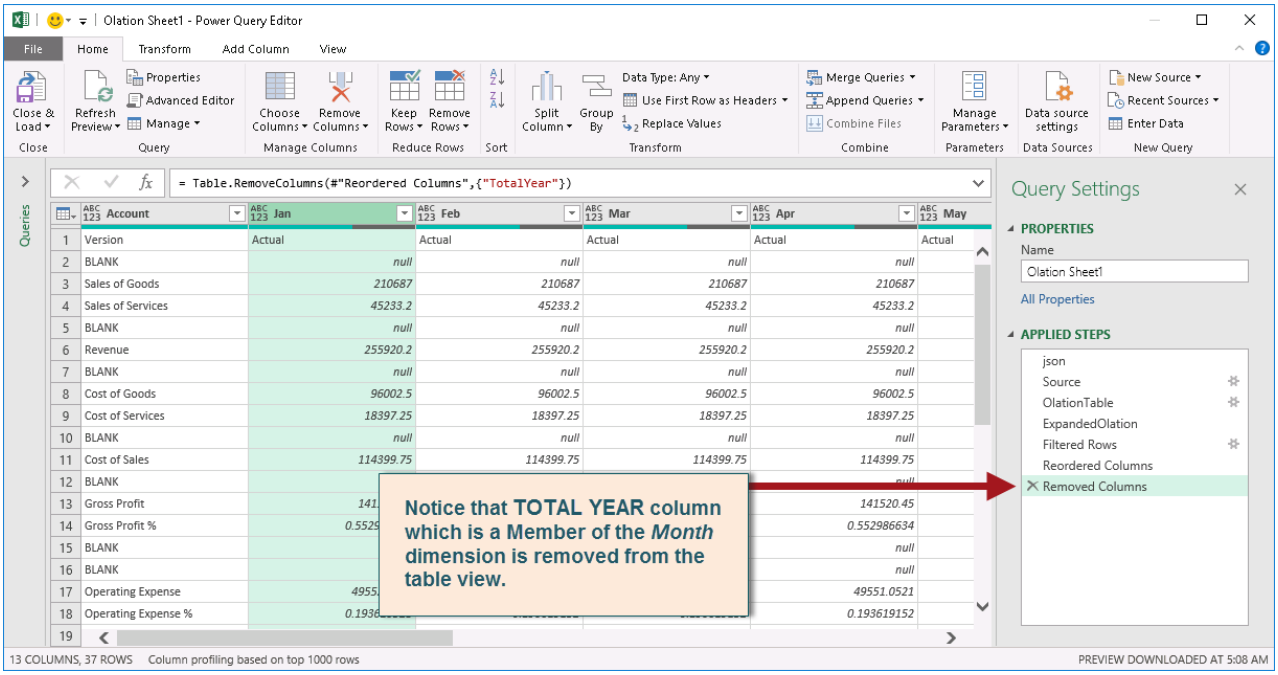
12. For the third modification, we will delete a column. For this example, let us delete the aggregate *Month* member **Total Year**.

    To do this:

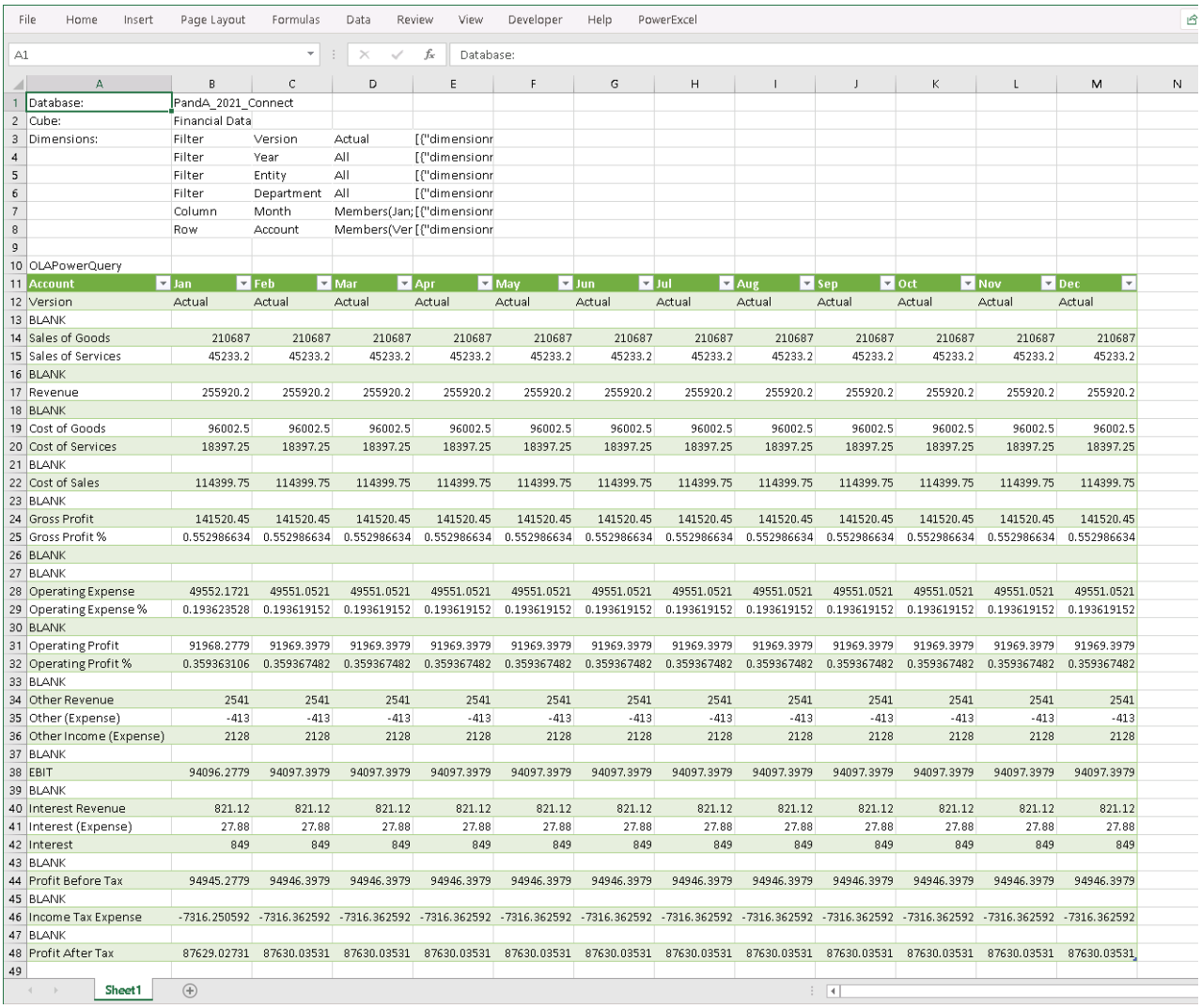
    - In the Queries & Connections sidebar, double-click on a query to access the **Olation – Power Query Editor**.
    - Right-click on the **Total Year** column then select **Remove**.



- 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.



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A1 | Database:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Database:	PandA_2021_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	
12	Version	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	
13	BLANK													
14	Sales of Goods	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	210687	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
33	BLANK													
34	Other Revenue	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	2541	
35	Other (Expense)	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	-413	
36	Other Income (Expense)	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	
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	
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	
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	
42	Interest	849	849	849	849	849	849	849	849	849	849	849	849	
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	
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	
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	
49														

Sheet1

3. Topics: The Subset Tab and the Calculations Tab

Subsets are a very important feature in PowerExcel, whether they (a) "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

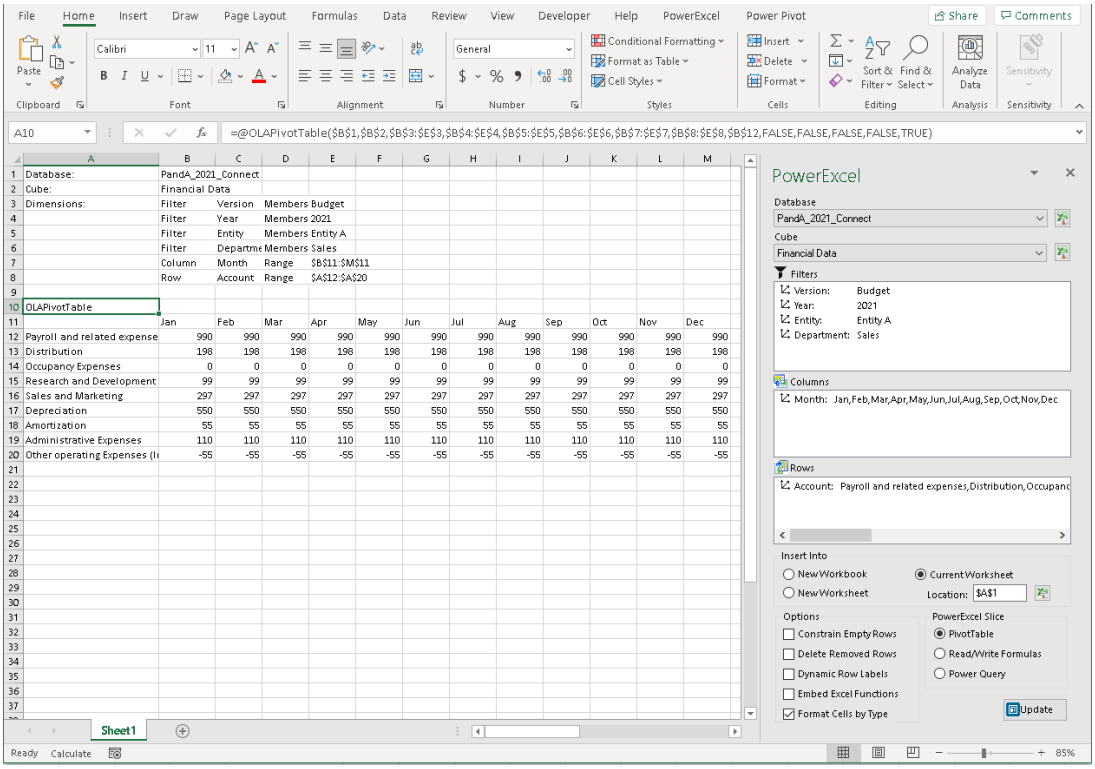
Before describing how a PowerExcel user can create Custom Subsets on his or her own, we note that every Dimension—or, more specifically, every Dimension that has at least one Hierarchy—includes Default Subsets: **ALL, AGGREGATES,** and **DETAILS**, which are described as follows.

(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.

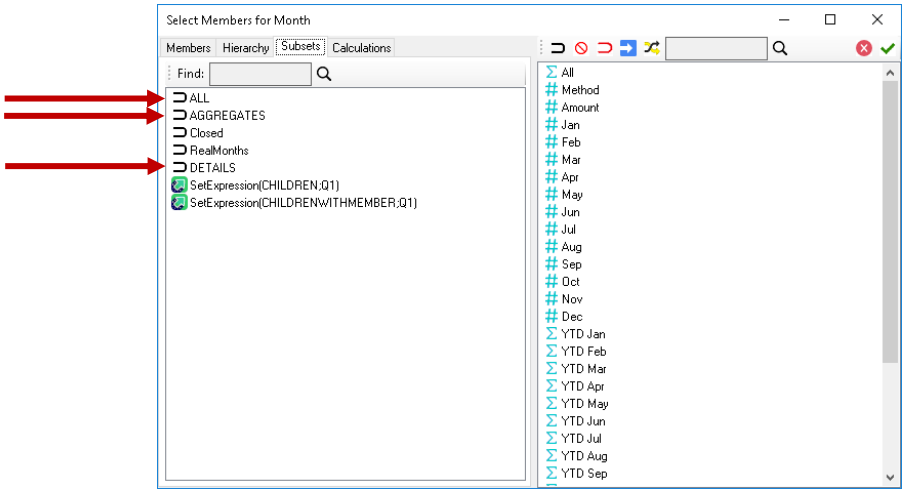
ALL	Returns **ALL Members** in Rows or Columns in the PowerExcel slice.
AGGREGATES	Returns **AGGREGATE Members** in Rows or Columns in the PowerExcel slice
DETAILS	Returns **DETAIL Members** in Rows or Columns in the PowerExcel slice

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 below shows selected Filters; *Month* along Columns, and; *Accounts* in the Rows.



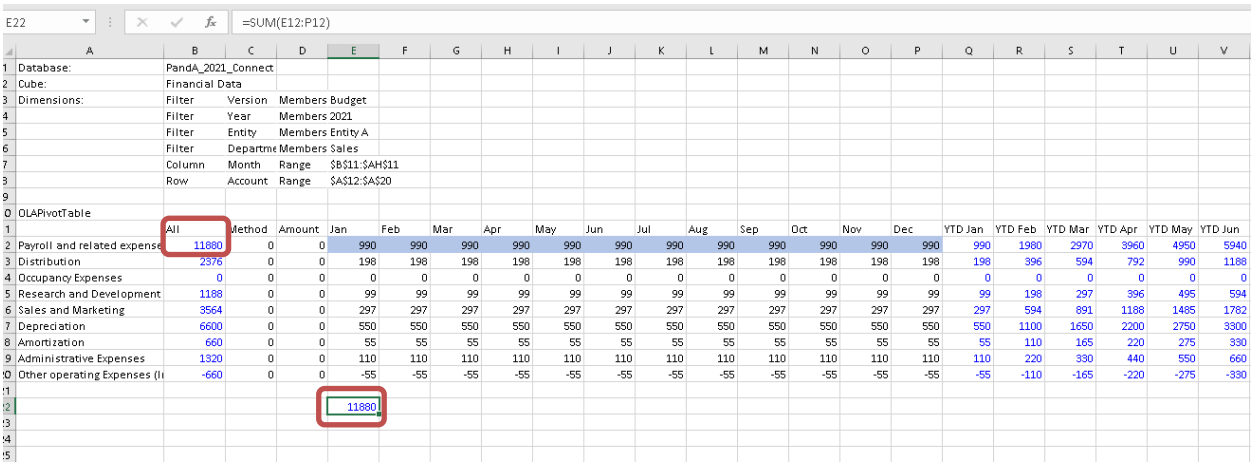
2. Double-clicking **Month** in the Columns box brings up the *Select Members for Month* dialog; click on the Subsets tab—note the default Subsets that appear, indicated by the red arrows in the following image.



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 *PowerExcel 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

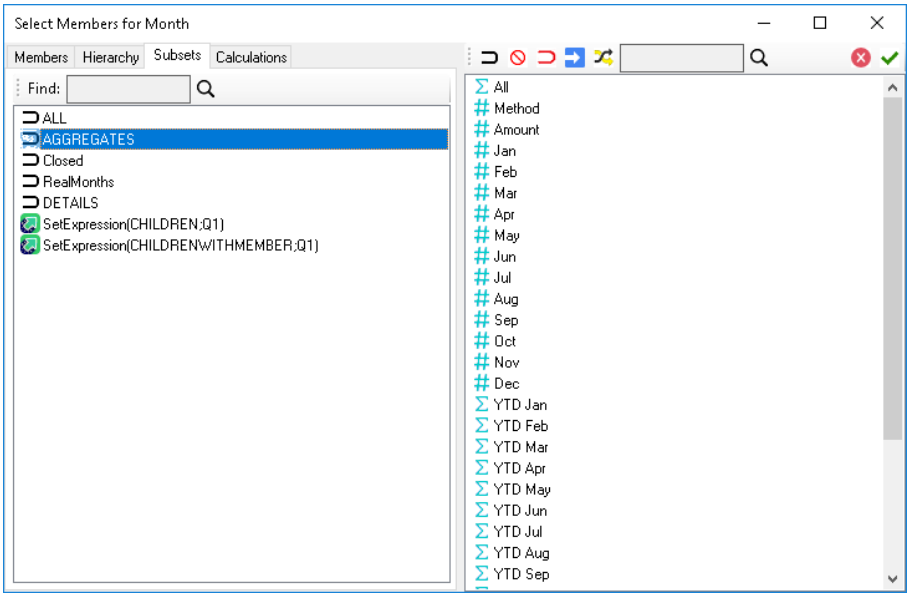
PowerExcel pane on the right. As shown, the Slice now shows in Columns ALL the members from the *Month* dimension. You would need to scroll right to see addition YTD figures, as well as *Q1*, *Q2*, *Q3*, *Q4*, and *Total Year*—i.e., the full set of **ALL** Members for this *Month* dimension.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	Database:	PandA_2021_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$11:$AH$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	YTD May	YTD Jun
12	Payroll and related expense	11880	0	0	990	990	990	990	990	990	990	990	990	990	990	990	990	1980	2970	3960	4950	5940
13	Distribution	2376	0	0	198	198	198	198	198	198	198	198	198	198	198	198	198	396	594	792	990	1188
14	Occupancy Expenses	0	0	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	495	594
16	Sales and Marketing	3564	0	0	297	297	297	297	297	297	297	297	297	297	297	297	297	594	891	1188	1485	1782
17	Depreciation	6600	0	0	550	550	550	550	550	550	550	550	550	550	550	550	550	1100	1650	2200	2750	3300
18	Amortization	660	0	0	55	55	55	55	55	55	55	55	55	55	55	55	55	110	165	220	275	330
19	Administrative Expenses	1320	0	0	110	110	110	110	110	110	110	110	110	110	110	110	110	220	330	440	550	660
20	Other operating Expenses (I	-660	0	0	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-110	-165	-220	-275	-330
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 2, in Cell B2, for *Payroll and other expenses*, is 11800 (boxed in red); Cell E22 (also boxed in red) validates this calculation, i.e., showing a 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_2021_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$11:$S$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	
12	Payroll and related expense	11880	990	1980	2970	3960	4950	5940	6930	7920	8910	9900	10890	11880	2970	2970	2970	2970	11880	
13	Distribution	2376	198	396	594	792	990	1188	1386	1584	1782	1980	2178	2376	594	594	594	594	2376	
14	Occupancy Expenses	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	
16	Sales and Marketing	3564	297	594	891	1188	1485	1782	2079	2376	2673	2970	3267	3564	891	891	891	891	3564	
17	Depreciation	6600	550	1100	1650	2200	2750	3300	3850	4400	4950	5500	6050	6600	1650	1650	1650	1650	6600	
18	Amortization	660	55	110	165	220	275	330	385	440	495	550	605	660	165	165	165	165	660	
19	Administrative Expenses	1320	110	220	330	440	550	660	770	880	990	1100	1210	1320	330	330	330	330	1320	
20	Other operating Expenses (I	-660	-55	-110	-165	-220	-275	-330	-385	-440	-495	-550	-605	-660	-165	-165	-165	-165	-660	
21																				

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. 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_2021_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 expense	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 (I	0	0	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	0
21																

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.)

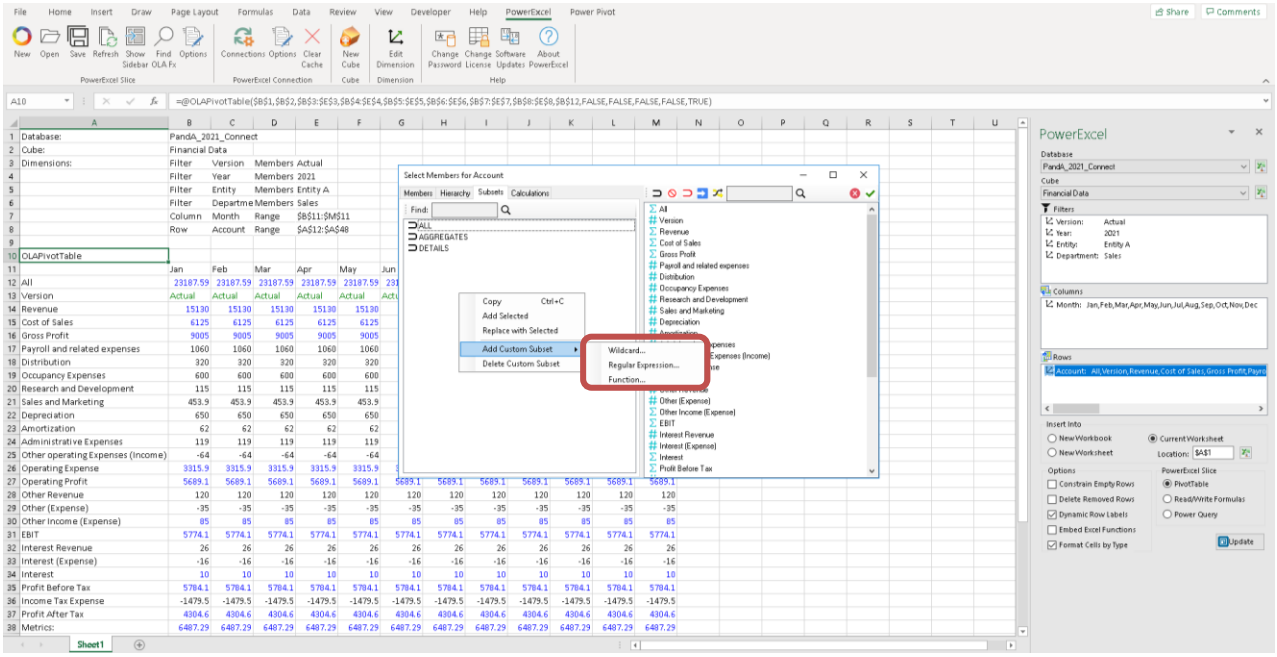
The three types of User-created Subsets are as follow.

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

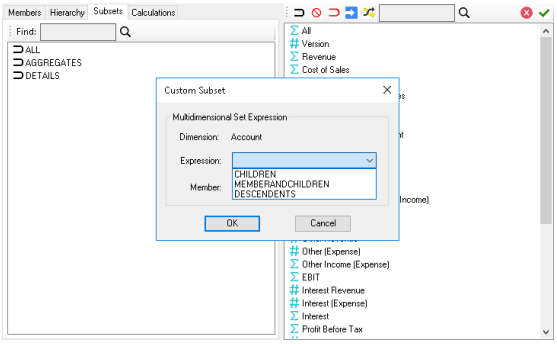
The procedure to create the Subset based on any of the above selections is the same. As shown in the following image:

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.

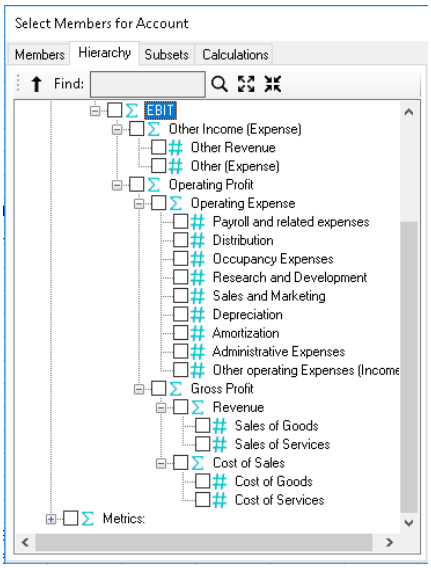


The selections will return Members as follows:

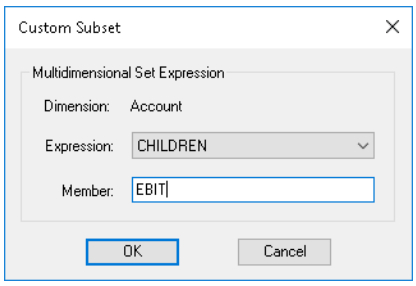
CHILDREN	Returns Child Members of the selected Member's immediate hierarchy
MEMBERAND CHILDREN	Returns the selected Member and Child Members of its immediate hierarchy
DESCENDENTS	Returns all Members—including sub-hierarchies and their Member—that aggregate into the selected Member

Example: CHILDREN

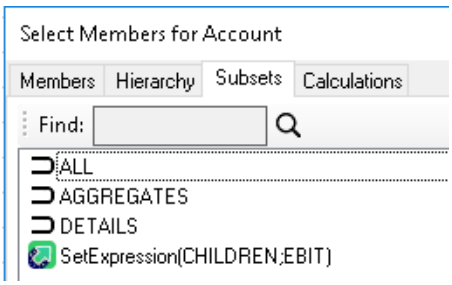
We can now take a look at an example of what each of the **Functions…** selections will return, in consideration of the Accounts dimension, and a portion of its hierarchy structure, which shows on the left-hand side of the Select Members for Account window, shown below:



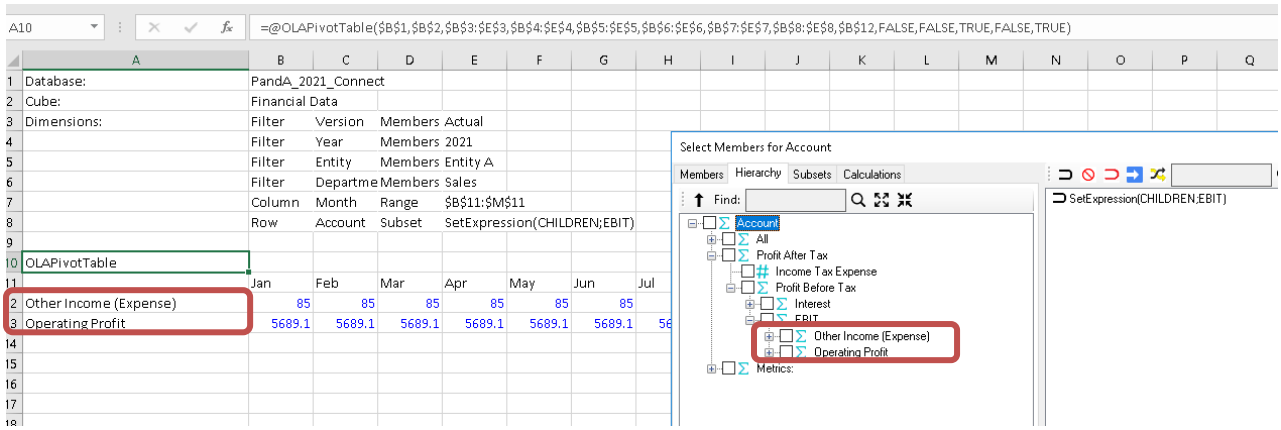
- In the Subset tab, right-click in the blank area and select **Add Custom Subset**; select **Function…**, then chose **CHILDREN** from the drop-down.
  Type EBIT. The window will look as follows:



- 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.

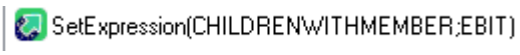


- By using this Custom Subset in Rows in an updated PowerExcel Slice, the result will be as follows (see boxed areas), showing *Other Income (Expenses)* and *Operating Profit*, which are the 2 Child Members of EBIT's immediate hierarchy.



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

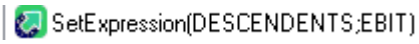


- Upon making this Custom Subset the selection for Rows and Updating the PowerExcel Slice, the spreadsheet will look as follows:

	A	B	C	D	E	F	G	H	I
1	Database:	PandA_2021_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$11:$M$11				
8		Row	Account	Subset	SetExpression(CHILDRENWITHMEMBER;EBIT)				
9									
10	OLAPivotTable								
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
12	EBIT	5774.1	5774.1	5774.1	5774.1	5774.1	5774.1	5774.1	5774.1
13	Other Income (Expense)	85	85	85	85	85	85	85	85
14	Operating Profit	5689.1	5689.1	5689.1	5689.1	5689.1	5689.1	5689.1	5689.1
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.



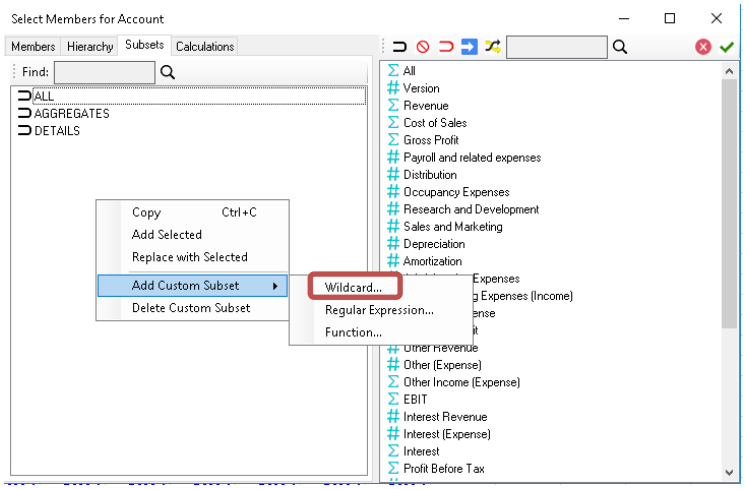
- Upon making this Custom Subset the selection for Rows and Updating the PowerExcel Slice, the spreadsheet will look as follows (reference the Account hierarchy a few pages back to validate all the DESCENDENT Members):

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA_2021_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$11:$M$11								
8		Row	Account	Subset	SetExpression(DESCENDENTS;EBIT)								
9													
10	OLAPivotTable												
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	Other Income (Expense)	85	85	85	85	85	85	85	85	85	85	85	85
13	Other Revenue	120	120	120	120	120	120	120	120	120	120	120	120
14	Other (Expense)	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35
15	Operating Profit	5689.1	5689.1	5689.1	5689.1	5689.1	5689.1	5689.1	5689.1	5689.1	5689.1	5689.1	5689.1
16	Operating Expense	3315.9	3315.9	3315.9	3315.9	3315.9	3315.9	3315.9	3315.9	3315.9	3315.9	3315.9	3315.9
17	Payroll and related expenses	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060
18	Distribution	320	320	320	320	320	320	320	320	320	320	320	320
19	Occupancy Expenses	600	600	600	600	600	600	600	600	600	600	600	600
20	Research and Development	115	115	115	115	115	115	115	115	115	115	115	115
21	Sales and Marketing	453.9	453.9	453.9	453.9	453.9	453.9	453.9	453.9	453.9	453.9	453.9	453.9
22	Depreciation	650	650	650	650	650	650	650	650	650	650	650	650
23	Amortization	62	62	62	62	62	62	62	62	62	62	62	62
24	Administrative Expenses	119	119	119	119	119	119	119	119	119	119	119	119
25	Other operating Expenses (Income)	-64	-64	-64	-64	-64	-64	-64	-64	-64	-64	-64	-64
26	Gross Profit	9005	9005	9005	9005	9005	9005	9005	9005	9005	9005	9005	9005
27	Revenue	15130	15130	15130	15130	15130	15130	15130	15130	15130	15130	15130	15130
28	Sales of Goods	14200	14200	14200	14200	14200	14200	14200	14200	14200	14200	14200	14200
29	Sales of Services	930	930	930	930	930	930	930	930	930	930	930	930
30	Cost of Sales	6125	6125	6125	6125	6125	6125	6125	6125	6125	6125	6125	6125
31	Cost of Goods	6050	6050	6050	6050	6050	6050	6050	6050	6050	6050	6050	6050
32	Cost of Services	75	75	75	75	75	75	75	75	75	75	75	75
33													

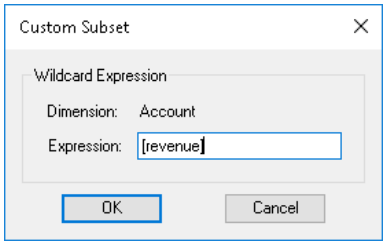
Wildcard…

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 brackets 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:

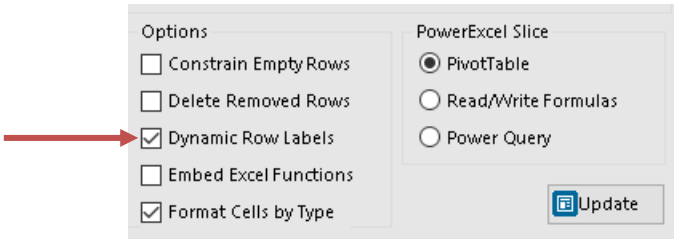
- Upon making this Wildcard Subset the selection for Rows and Updating the PowerExcel Slice, the spreadsheet will look as follows—note that Accounts with the expression "revenue" (capitalization is not required in the Wildcard search) are returned:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA 2021 Basic											
2	Cube:	Financial Data											
3	Dimensions:	Filter	Version	Members	All								
4		Filter	Year	Members	All								
5		Filter	Entity	Members	All								
6		Filter	Departme	Members	All								
7		Column	Month	Range	$B$11:$M$11								
8		Row	Account	Range	$A$12:$A$15								
9													
10	OLAPivotTable												
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	Revenue	797933.4	797933.4	797933.4	797933.4	844639.5	844639.5	844639.5	844639.5	844639.5	844639.5	844639.5	844639.5
13	Other Revenue	17908.9	17908.9	17908.9	17908.9	17120.35	17120.35	17120.35	17120.35	17120.35	17120.35	17120.35	17120.35
14	Interest Revenue	12895.44	12895.44	12895.44	12895.44	12719.39	12719.39	12719.39	12719.39	12719.39	12719.39	12719.39	12719.39
15	Revenue per FTE	0	0	0	0	0	0	0	0	0	0	0	0
16													

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(CHILDREN;EBIT) selected as a Subset in Rows, as shown earlier. The Rows of the Slice looks as follows:

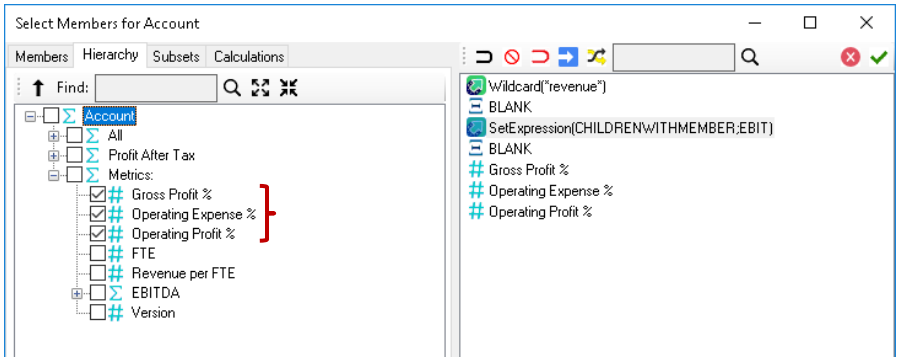
OLAPivotTable							
	Jan	Feb	Mar	Apr	May	Jun	Jul
Other Income (Expense)	22546.58	22546.58	22546.58	22546.58	22001.01	22001.01	22001.01
Other Revenue	17908.9	17908.9	17908.9	17908.9	17120.35	17120.35	17120.35
Other (Expense)	4637.675	4637.675	4637.675	4637.675	4880.663	4880.663	4880.663
Operating Profit	228968.8	228971	228971	228971	227675.3	227101.4	226379.4
Operating Expense	179268.7	179266.5	179266.5	179266.5	189654.1	190228	189992.5
Payroll and related expenses	63738.1	63738.1	63738.1	63738.1	66791.22	66791.22	66791.22
Distribution	20678.4	20678.4	20678.4	20678.4	23414.03	23321.93	23752.43
Occupancy Expenses	27849	27849	27849	27849	26417.45	26417.45	26417.45
Research and Development	13836.75	13836.75	13836.75	13836.75	16805.07	16805.07	16805.07
Sales and Marketing	20213.21	20213.21	20213.21	20213.21	24294.02	24294.02	24294.02
Depreciation	16032.98	16032.98	16032.98	16032.98	14019.44	14019.44	14019.44
Amortization	7484.06	7484.06	7484.06	7484.06	7233.275	7233.275	7233.275
Administrative Expenses	7588.75	7588.75	7588.75	7588.75	7962.608	7962.608	7962.608
Other operating Expenses (Income)	1847.5	1845.26	1845.26	1845.26	2716.99	3382.99	2716.99
Gross Profit	408237.5	408237.5	408237.5	408237.5	417329.4	417329.4	416371.9
Revenue	797933.4	797933.4	797933.4	797933.4	844639.5	844639.5	844639.5
Sales of Goods	620499.1	620499.1	620499.1	620499.1	621672.5	621672.5	621672.5
Sales of Services	177434.3	177434.3	177434.3	177434.3	222967	222967	222967
Cost of Sales	389695.9	389695.9	389695.9	389695.9	427310.1	427310.1	428267.6
Cost of Goods	296506	296506	296506	296506	305905.8	305905.8	305905.8
Cost of Services	93189.9	93189.9	93189.9	93189.9	121404.3	121404.3	122361.8

- 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 follow (shading and bold font added):

21	Sales and Marketing	20213.21	20213.21	20213.21	20213.21	24294.02	24294.02	24294.02
22	Depreciation	16032.98	16032.98	16032.98	16032.98	14019.44	14019.44	14019.44
23	Amortization	7484.06	7484.06	7484.06	7484.06	7233.275	7233.275	7233.275
24	Administrative Expenses	7588.75	7588.75	7588.75	7588.75	7962.608	7962.608	7962.608
25	**UTILITIES**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
26	Other operating Expenses (Income)	1847.5	1845.26	1845.26	1845.26	2716.99	3382.99	2716.99
27	Gross Profit	408237.5	408237.5	408237.5	408237.5	417329.4	417329.4	416371.9
28	Revenue	797933.4	797933.4	797933.4	797933.4	844639.5	844639.5	844639.5

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
12	**Revenue**	797933	797933	797933	797933	844639	844639	844639	844639	844639
13	**Other Revenue**	17909	17909	17909	17909	17120	17120	17120	17120	17120
14	**Interest Revenue**	12895	12895	12895	12895	12719	12719	12719	12719	12719
15	**Revenue per FTE**	0	0	0	0	0	0	0	0	0
16										
17	**EBIT**	251515	251518	251518	251518	249676	249102	248380	248811	249768
18	**Other Income (Expense)**	22547	22547	22547	22547	22001	22001	22001	22001	22001
19	**Operating Profit**	228969	228971	228971	228971	227675	227101	226379	226810	227767
20										
21	**Gross Profit %**	51%	51%	51%	51%	49%	49%	49%	49%	49%
22	**Operating Expense %**	22%	22%	22%	22%	22%	23%	22%	22%	22%
23	**Operating Profit %**	29%	29%	29%	29%	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.

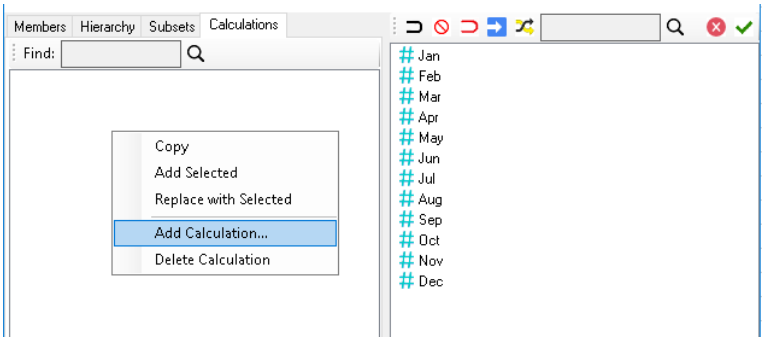
3.5 Calculations Tab

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

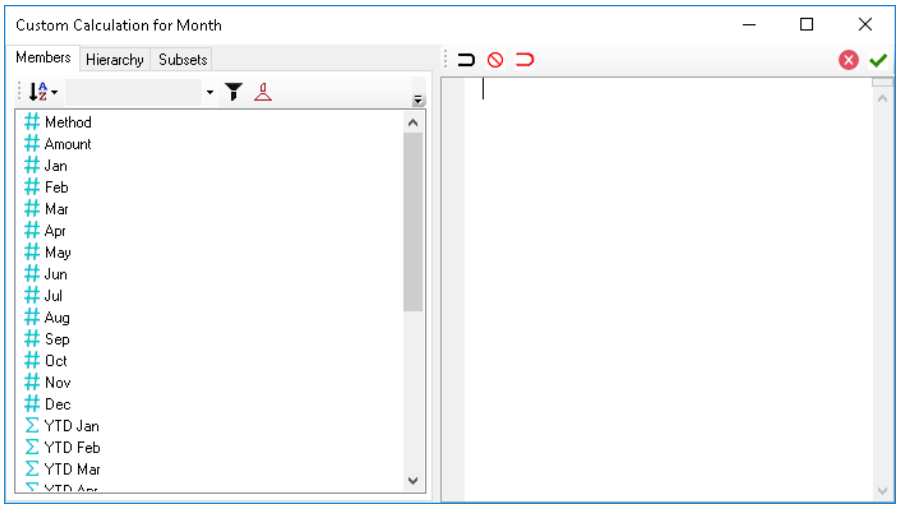
We will consider the following example, assuming that the sum of Jun + Jul + Aug is relevant to an understanding of the business—these months are highlighted in the image below.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Database:	PandA 2021 Basic											
2	Cube:	Financial Data											
3	Dimensions:	Filter	Version	Members	Forecast								
4		Filter	Year	Members	2022								
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)	75	75	75	75	75	75	75	75	75	75	75	75
13	Other Revenue	100	100	100	100	100	100	100	100	100	100	100	100
14	Other (Expense)	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
15	Operating Profit	4070	4070	4070	4070	4070	4070	4070	4070	4070	4070	4070	4070
16	Operating Expense	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430
17	Payroll and related expen	900	900	900	900	900	900	900	900	900	900	900	900
18	Distribution	180	180	180	180	180	180	180	180	180	180	180	180
19	Occupancy Expenses	0	0	0	0	0	0	0	0	0	0	0	0
20	Research and Developmer	90	90	90	90	90	90	90	90	90	90	90	90
21	Sales and Marketing	660	660	660	660	660	660	660	660	660	660	660	660
22	Depreciation	500	500	500	500	500	500	500	500	500	500	500	500
23	Amortization	50	50	50	50	50	50	50	50	50	50	50	50
24	Administrative Expenses	100	100	100	100	100	100	100	100	100	100	100	100
25	Other operating Expenses	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50
26	Gross Profit	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500
27	Revenue	16500	16500	16500	16500	16500	16500	16500	16500	16500	16500	16500	16500
28	Sales of Goods	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
29	Sales of Services	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
30	Cost of Sales	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
31	Cost of Goods	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
32	Cost of Services	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000

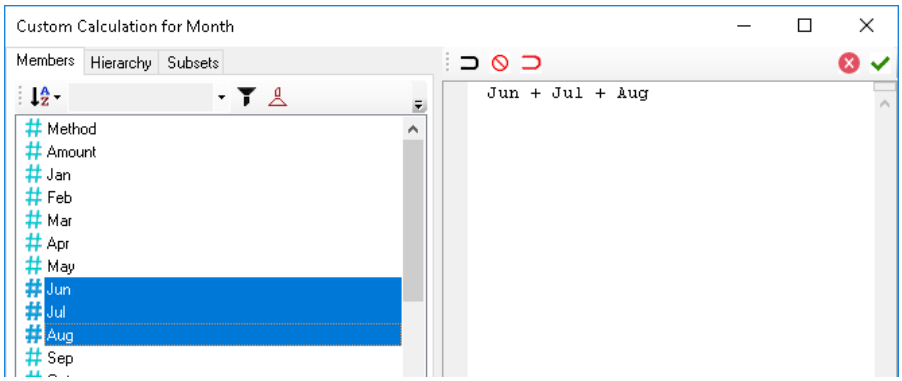
- To add a calculation, double-click on a Dimension in the Filter, Column or Row box of the PowerExcel sidebar—here, below, the *Select Members for Month* window appears
- Click on the **Calculations tab**, then right-click in the empty space; in the pop-up window, the selection **Add Calculation** appears,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



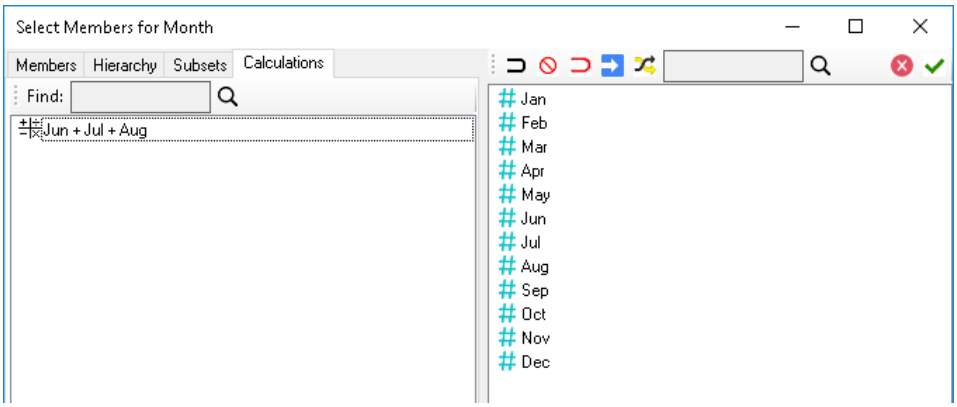
- The *Custom Calculation for [Dimension]* window appears, as shown below, for the *Month* dimension.



- 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]*).

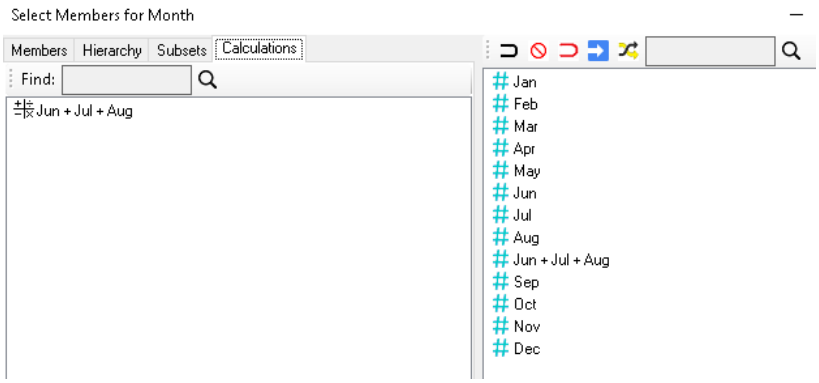


- Click the green checkmark to **Save Custom Calculation**. The calculation will now appear in the Calculations tab, as shown in the following image. (The Members displayed in the current Slice appear on the right.)



-

- 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 2021 Basic												
2	Cube:	Financial Data												
3	Dimensions:	Filter	Version	Members	Forecast									
4		Filter	Year	Members	2022									
5		Filter	Entity	Members	Entity A									
6		Filter	Departme	Members	Sales									
7		Column	Month	Range	$B$11:$N$11									
8		Row	Account	Range	$A$12:$A$32									
9														
10	OLAPivotTable													
11		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	**Jun + Jul + Aug**	Sep	Oct	Nov	Dec
12	Other Income (Expense)	75	75	75	75	75	75	75	75	**225**	75	75	75	75
13	Other Revenue	100	100	100	100	100	100	100	100	**300**	100	100	100	100
14	Other (Expense)	-25	-25	-25	-25	-25	-25	-25	-25	**-75**	-25	-25	-25	-25
15	Operating Profit	4070	4070	4070	4070	4070	4070	4070	4070	**12210**	4070	4070	4070	4070
16	Operating Expense	2430	2430	2430	2430	2430	2430	2430	2430	**7290**	2430	2430	2430	2430
17	Payroll and related expen:	900	900	900	900	900	900	900	900	**2700**	900	900	900	900
18	Distribution	180	180	180	180	180	180	180	180	**540**	180	180	180	180
19	Occupancy Expenses	0	0	0	0	0	0	0	0	**0**	0	0	0	0
20	Research and Developmer	90	90	90	90	90	90	90	90	**270**	90	90	90	90
21	Sales and Marketing	660	660	660	660	660	660	660	660	**1980**	660	660	660	660
22	Depreciation	500	500	500	500	500	500	500	500	**1500**	500	500	500	500
23	Amortization	50	50	50	50	50	50	50	50	**150**	50	50	50	50
24	Administrative Expenses	100	100	100	100	100	100	100	100	**300**	100	100	100	100
25	Other operating Expenses	-50	-50	-50	-50	-50	-50	-50	-50	**-150**	-50	-50	-50	-50
26	Gross Profit	6500	6500	6500	6500	6500	6500	6500	6500	**19500**	6500	6500	6500	6500
27	Revenue	16500	16500	16500	16500	16500	16500	16500	16500	**49500**	16500	16500	16500	16500
28	Sales of Goods	12000	12000	12000	12000	12000	12000	12000	12000	**36000**	12000	12000	12000	12000
29	Sales of Services	4500	4500	4500	4500	4500	4500	4500	4500	**13500**	4500	4500	4500	4500
30	Cost of Sales	10000	10000	10000	10000	10000	10000	10000	10000	**30000**	10000	10000	10000	10000
31	Cost of Goods	6000	6000	6000	6000	6000	6000	6000	6000	**18000**	6000	6000	6000	6000
32	Cost of Services	4000	4000	4000	4000	4000	4000	4000	4000	**12000**	4000	4000	4000	4000

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 you will see 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.

The final section concerns a bulk copy-paste of numbers into a PowerExcel Slice to load an entire model , as will often be done with transaction records from an underlying data set.

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_2021_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	Administration					
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**	6070.5	6070.5	6070.5	18211.5	6070.5	6070.5	6070.5	18211.5	36423
13	**Income Tax Expense**	-319.5	-319.5	-319.5	-958.5	-319.5	-319.5	-319.5	-958.5	-1917
14	**Interest**	0	0	0	0	0	0	0	0	0
15	**EBIT**	6390	6390	6390	19170	6390	6390	6390	19170	38340
16	**Other Income (Expense)**	0	0	0	0	0	0	0	0	0
17	**Operating Profit**	6390	6390	6390	19170	6390	6390	6390	19170	38340
18										
19	**Operating Expense**	4610	4610	4610	13830	4610	4610	4610	13830	27660
20	**Payroll and related expenses**	1890	1890	1890	5670	1890	1890	1890	5670	11340
21	**Distribution**	500	500	500	1500	500	500	500	1500	3000
22	**Occupancy Expenses**	600	600	600	1800	600	600	600	1800	3600
23	**Research and Development**	700	700	700	2100	700	700	700	2100	4200
24	**Sales and Marketing**	720	720	720	2160	720	720	720	2160	4320
25	**Depreciation**	200	200	200	600	200	200	200	600	1200
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**	11000	11000	11000	33000	11000	11000	11000	33000	66000
32	**Revenue**	18000	18000	18000	54000	18000	18000	18000	54000	108000
33	**Cost of Sales**	7000	7000	7000	21000	7000	7000	7000	21000	42000

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 all Operating Expenses. Note also the figures for *Operating Expenses*, at the top, and for *Q1*, *Q2*, and *YTDJun* (blue circled.

	Jan	Feb	Mar	Q1	Apr	May	Jun	Q2	YTD Jun
Operating Expense	4610	4610	4610	13830	4610	4610	4610	13830	27660
Payroll and related expenses	1890	1890	1890	5670	1890	1890	1890	5670	11340
Distribution	500	500	500	1500	500	500	500	1500	3000
Occupancy Expenses	600	600	600	1800	600	600	600	1800	3600
Research and Development	700	700	700	2100	700	700	700	2100	4200
Sales and Marketing	720	720	720	2160	720	720	720	2160	4320
Depreciation	200	200	200	600	200	200	200	600	1200
Amortization	0	0	0	0	0	0	0	0	0
Administrative Expenses	55	55	55	0	44	0	0	0	0
UTILITIES	99	88	77	0	66	0	0	0	0
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	4764	4753	4742	14259	4720	4610	4610	13940	28199
Payroll and related expenses	1890	1890	1890	5670	1890	1890	1890	5670	11340
Distribution	500	500	500	1500	500	500	500	1500	3000
Occupancy Expenses	600	600	600	1800	600	600	600	1800	3600
Research and Development	700	700	700	2100	700	700	700	2100	4200
Sales and Marketing	720	720	720	2160	720	720	720	2160	4320
Depreciation	200	200	200	600	200	200	200	600	1200
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*: the below detail (of an image shown previously) shows that *before* the changes were made, *January, Profit After Tax* was 6070.5, whereas…

11		Jan	Feb	Mar	Q1	Apr	May	Jun	Q2	YTD Jun
12	Profit After Tax	6070.5	6070.5	6070.5	18211.5	6070.5	6070.5	6070.5	18211.5	36423
13	Income Tax Expense	-319.5	-319.5	-319.5	-958.5	-319.5	-319.5	-319.5	-958.5	-1917
14	Interest	0	0	0	0	0	0	0	0	0
15	EBIT	6390	6390	6390	19170	6390	6390	6390	19170	38340
16	Other Income (Expense)	0	0	0	0	0	0	0	0	0
17	Operating Profit	6390	6390	6390	19170	6390	6390	6390	19170	38340

…on the next page, the impact of the entries shows that the same intersection point (along with all others) is now 5916.5. reflecting the 55 entered for *Administrative Expenses* and 99 for *UTILITIES*.

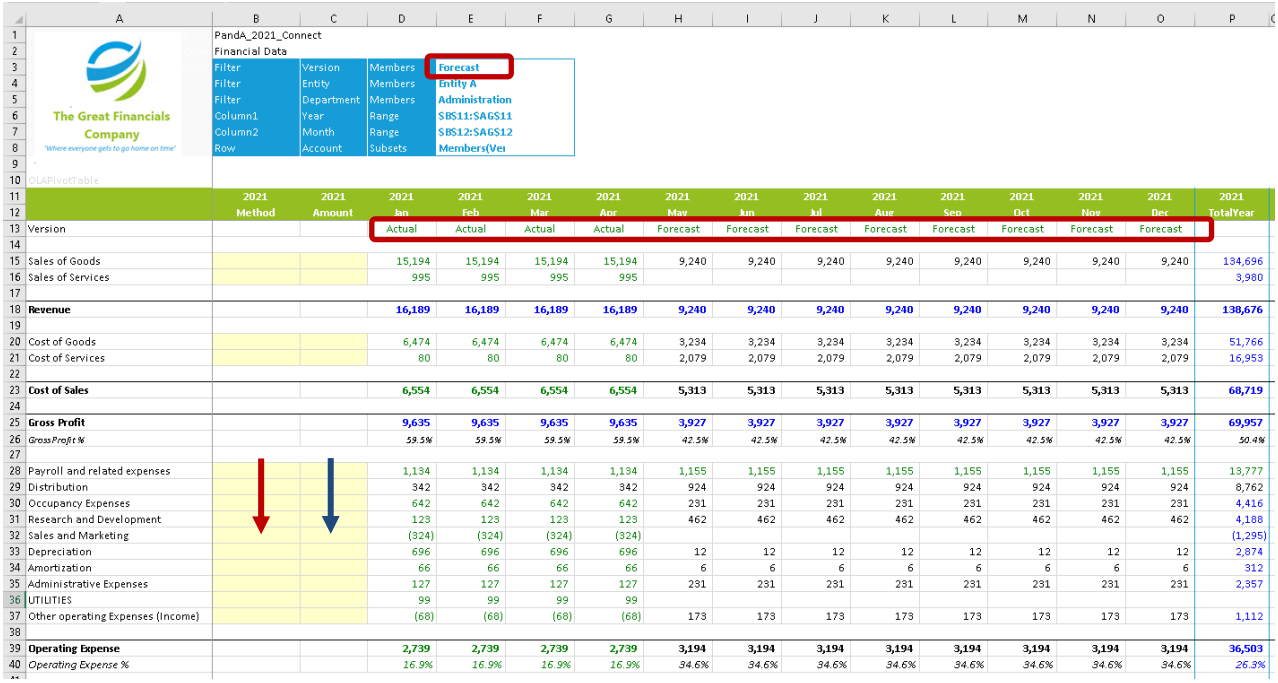
	Jan	Feb	Mar	Q1	Apr	May	Jun	Q2	YTD Jun
Profit After Tax	5916.5	5927.5	5938.5	17782.5	5960.5	6070.5	6070.5	18101.5	35884
Income Tax Expense	-319.5	-319.5	-319.5	-958.5	-319.5	-319.5	-319.5	-958.5	-1917
Interest	0	0	0	0	0	0	0	0	0
EBIT	6236	6247	6258	18741	6280	6390	6390	19060	37801
Other Income (Expense)	0	0	0	0	0	0	0	0	0
Operating Profit	6236	6247	6258	18741	6280	6390	6390	19060	37801
Operating Expense	4764	4753	4742	14259	4720	4610	4610	13940	28199
Payroll and related expenses	1890	1890	1890	5670	1890	1890	1890	5670	11340
Distribution	500	500	500	1500	500	500	500	1500	3000
Occupancy Expenses	600	600	600	1800	600	600	600	1800	3600
Research and Development	700	700	700	2100	700	700	700	2100	4200
Sales and Marketing	720	720	720	2160	720	720	720	2160	4320
Depreciation	200	200	200	600	200	200	200	600	1200
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
Gross Profit	11000	11000	11000	33000	11000	11000	11000	33000	66000
Revenue	18000	18000	18000	54000	18000	18000	18000	54000	108000
Cost of Sales	7000	7000	7000	21000	7000	7000	7000	21000	42000

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.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
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 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).

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*).

11		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	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.

5. 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.

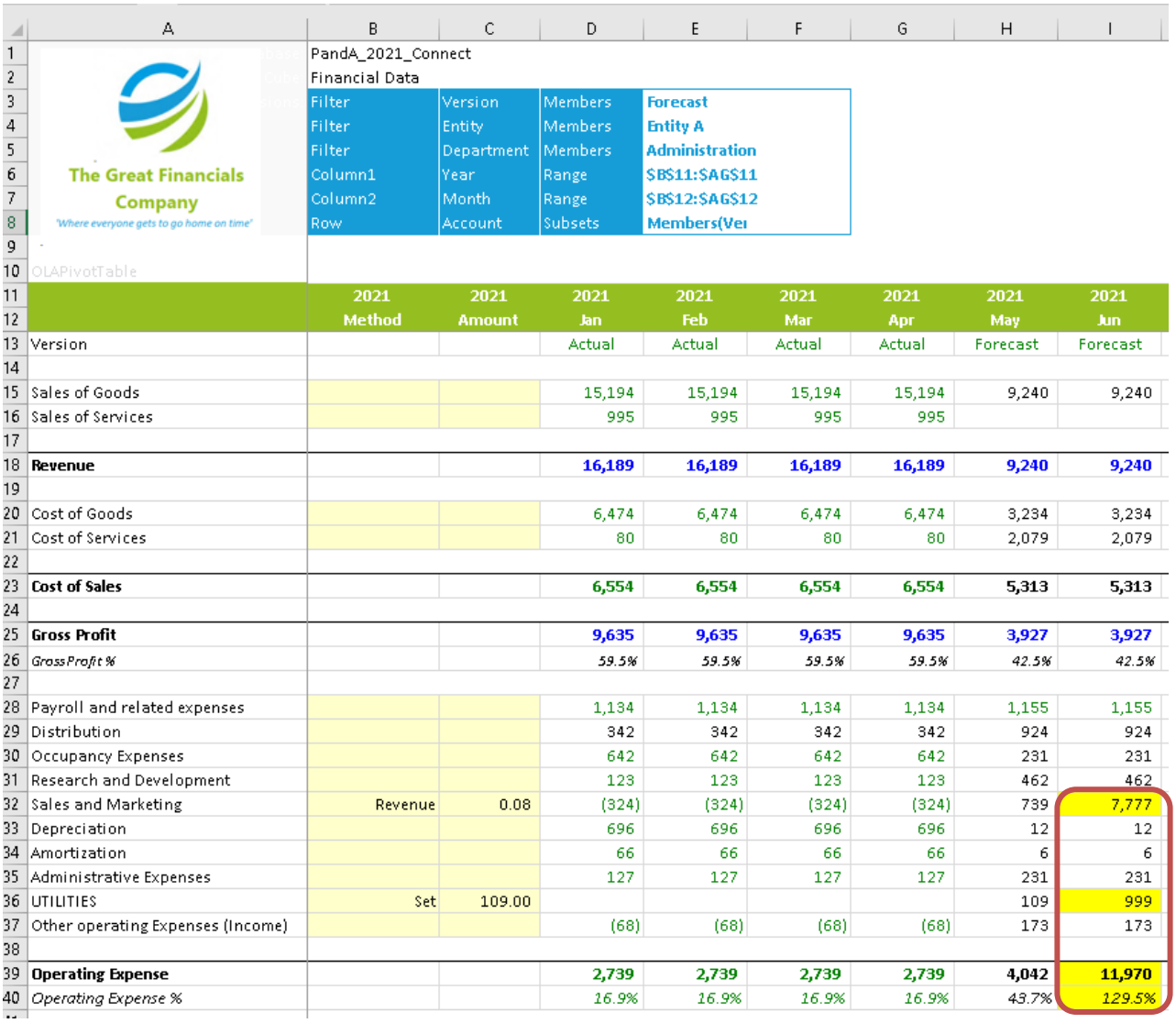
6. Then press **F9**.
   Now note that 109 appears in the forecast months; as well, on Operating Expenses and Operating Expenses % (as well as all consequent figures in the model) are recalculated on that basis, as shown in the following image.

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.

7. 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**.

8. 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.



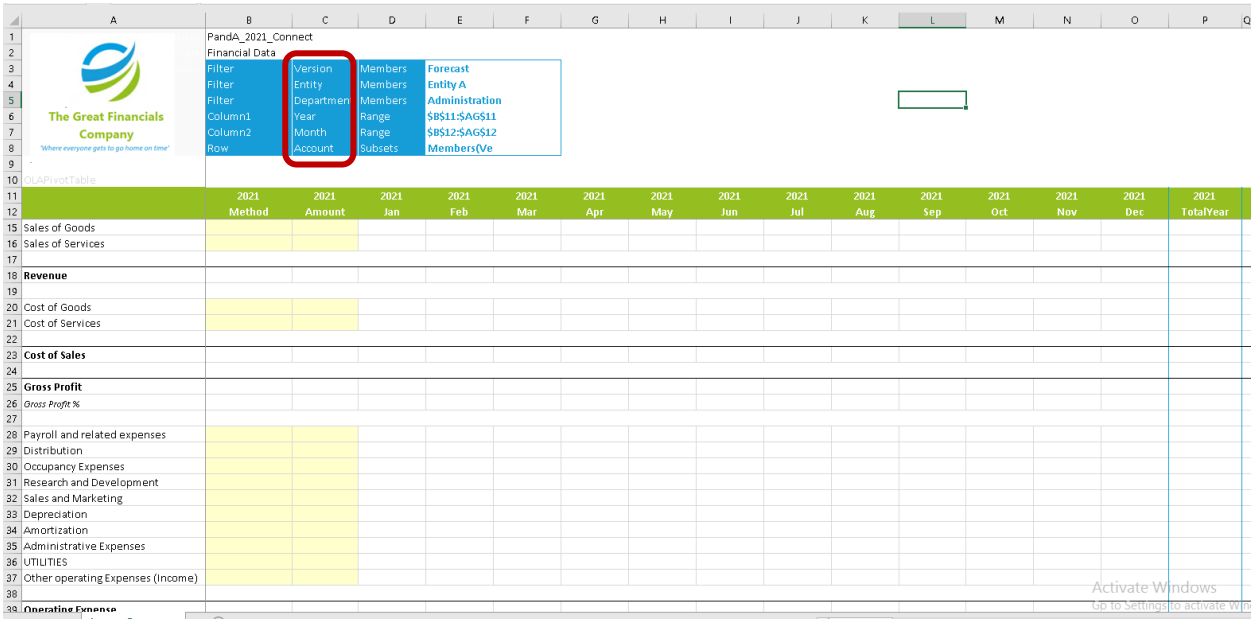
1		PandA_2021_Connect							
2		Financial Data							
3		Filter	Version	Members	Forecast				
4		Filter	Entity	Members	Entity A				
5		Filter	Department	Members	Administration				
6		Column1	Year	Range	$B$11:$AG$11				
7		Column2	Month	Range	$B$12:$AG$12				
8		Row	Account	Subsets	Members(Ver				
9									
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%*

4.3 Performing a Bulk Copy/Paste of Data to a PowerExcel Slice

This section concerns the wholesale data entry/import into a PowerExcel model via a bulk copy-paste of data into a PowerExcel Slice—a Slice that will be used as a "Load" template for potential ongoing use.

We begin by positing, How can we get data into a business model most quickly with the tools at hand?—essentially, using a PowerExcel Slice, which is a "supercharged" instance of an Excel spreadsheet. In sum, we will the Slice's connectivity to a business model (as amply demonstrated up to this point); as well, we will make good and clever use of several of Excel's native capabilities, which, arguably, give us greater power combined with the use of PowerExcel.

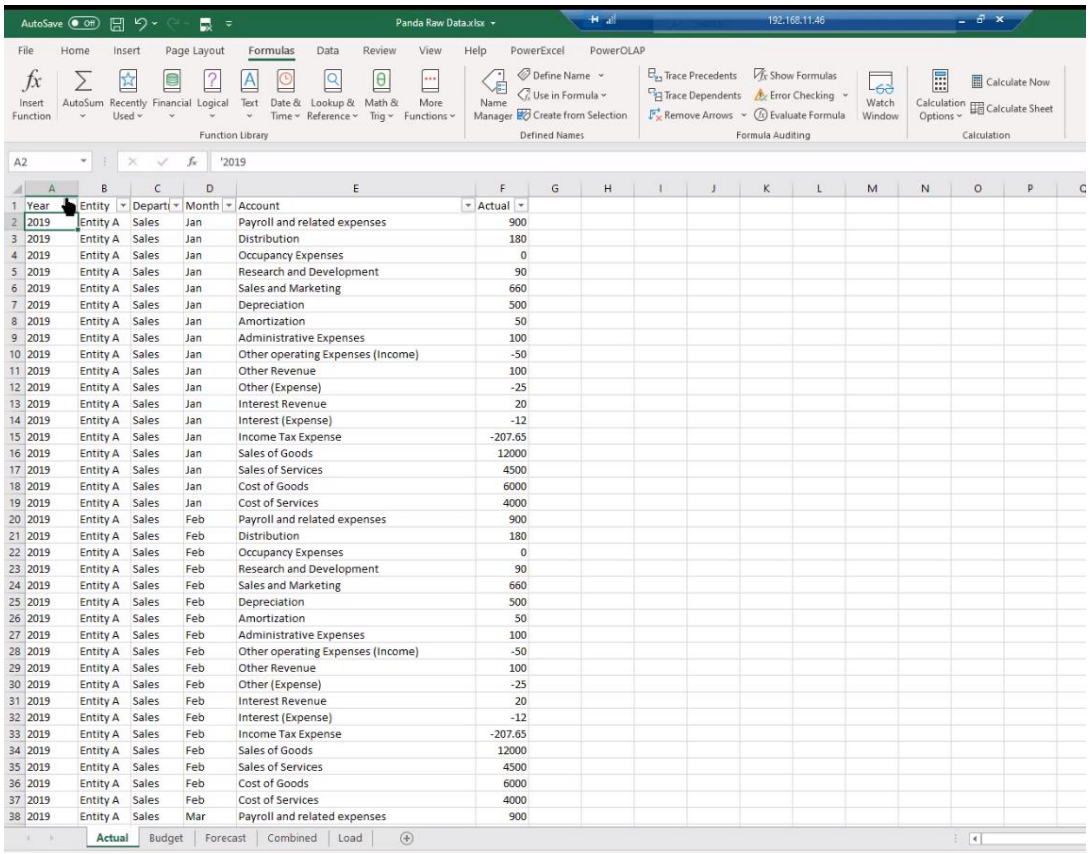
Positing further: we have a business model with Dimensions like Version, Entity, Department, Year, Month and Account (as circled, below) and a mocked up Slice in the form of an Income Statement (for this hypothetical firm, The Great Financials Company). As indicated: at this point, there is no data in it!



Now, let us assume as well that we have a data set at hand, which we can use to populate this multidimensional PowerExcel model: this data set features Row after Row of transactions in an Excel spreadsheet. The transactions record specific particulars—which match our Dimensions—as well as a Value for each event. For example, as below, this Row tells us that in the Year 2019, for Entity A, in the Sales Department, in Jan, for Payroll and related expenses, there is a Forecast a value of 900. It may not be the way we would explain the record in plain English, but the point comes across!

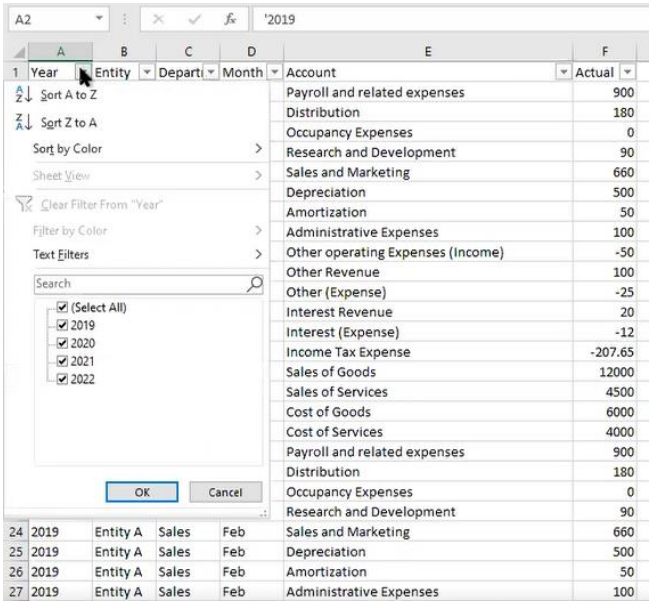
	Year	Entity	Departme	Month	Account	Forecast
2	2019	Entity A	Sales	Jan	Payroll and related expenses	900

Keeping in mind that there are Rows and Rows of such transactions—essentially a data table that is a record of every transaction relevant to the PowerExcel business model—a representation of this data would look as follows:

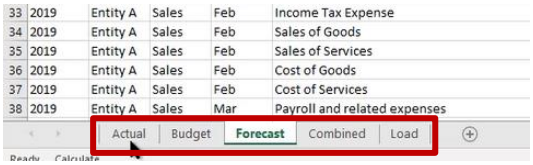


Year	Entity	Depart	Month	Account	Actual
2019	Entity A	Sales	Jan	Payroll and related expenses	900
2019	Entity A	Sales	Jan	Distribution	180
2019	Entity A	Sales	Jan	Occupancy Expenses	0
2019	Entity A	Sales	Jan	Research and Development	90
2019	Entity A	Sales	Jan	Sales and Marketing	660
2019	Entity A	Sales	Jan	Depreciation	500
2019	Entity A	Sales	Jan	Amortization	50
2019	Entity A	Sales	Jan	Administrative Expenses	100
2019	Entity A	Sales	Jan	Other operating Expenses (Income)	-50
2019	Entity A	Sales	Jan	Other Revenue	100
2019	Entity A	Sales	Jan	Other (Expense)	-25
2019	Entity A	Sales	Jan	Interest Revenue	20
2019	Entity A	Sales	Jan	Interest (Expense)	-12
2019	Entity A	Sales	Jan	Income Tax Expense	-207.65
2019	Entity A	Sales	Jan	Sales of Goods	12000
2019	Entity A	Sales	Jan	Sales of Services	4500
2019	Entity A	Sales	Jan	Cost of Goods	6000
2019	Entity A	Sales	Jan	Cost of Services	4000
2019	Entity A	Sales	Feb	Payroll and related expenses	900
2019	Entity A	Sales	Feb	Distribution	180
2019	Entity A	Sales	Feb	Occupancy Expenses	0
2019	Entity A	Sales	Feb	Research and Development	90
2019	Entity A	Sales	Feb	Sales and Marketing	660
2019	Entity A	Sales	Feb	Depreciation	500
2019	Entity A	Sales	Feb	Amortization	50
2019	Entity A	Sales	Feb	Administrative Expenses	100
2019	Entity A	Sales	Feb	Other operating Expenses (Income)	-50
2019	Entity A	Sales	Feb	Other Revenue	100
2019	Entity A	Sales	Feb	Other (Expense)	-25
2019	Entity A	Sales	Feb	Interest Revenue	20
2019	Entity A	Sales	Feb	Interest (Expense)	-12
2019	Entity A	Sales	Feb	Income Tax Expense	-207.65
2019	Entity A	Sales	Feb	Sales of Goods	12000
2019	Entity A	Sales	Feb	Sales of Services	4500
2019	Entity A	Sales	Feb	Cost of Goods	6000
2019	Entity A	Sales	Feb	Cost of Services	4000
2019	Entity A	Sales	Mar	Payroll and related expenses	900

Each Column can have multiple elements—which are precisely analogous to the Members in a Dimension (and will match those in the PowerExcel model): e.g., *Year* in this example goes back to *2019* (as shown in the drop-down). Likewise, there may be 1 to many elements for *Entity*; 1 to many for *Department*; *Month* will show any/all of the 12 months of the Year; there will likely be many *Accounts*, and; 1 to many Versions, including—as in this example—*Actual*, *Budget* and *Forecast*.



Note here the different Versions across tabs (boxed)—Actual, Budget and Forecast. The next tab, Combined, will come in to play momentarily; and Load, as will be shown, will be our template for the bulk copy-paste exercise.

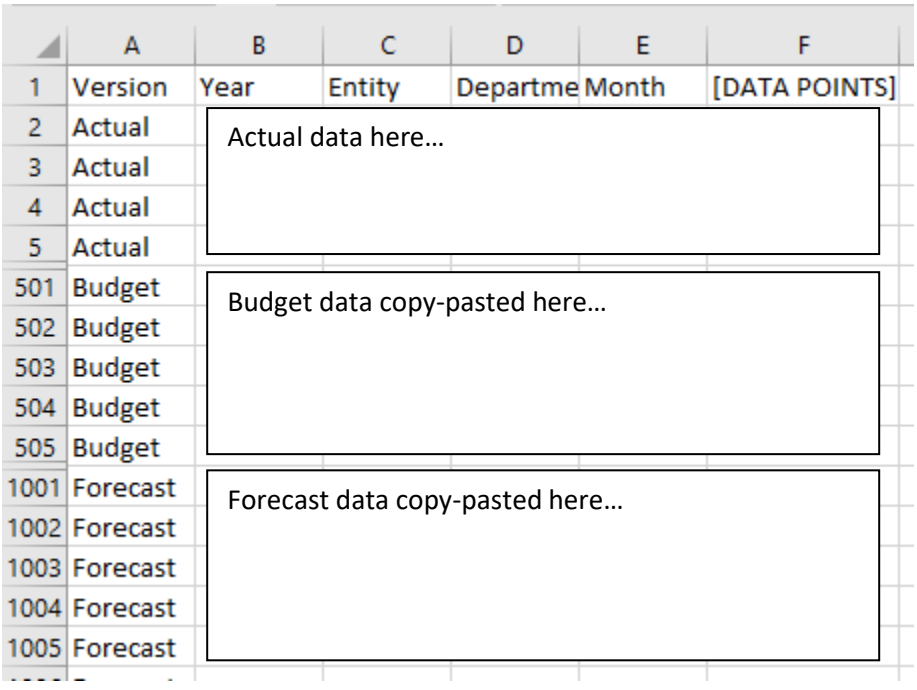


It is straightforward to make the Combined tab contain all the Version data: first, by copy-pasting the data from the Actual tab to this tab. You can insert a column to the left, the area of data that appertains to each Version.

	A	B	C	D	E	F
1	Version	Year	Entity	Departme	Month	Account
2		2019	Entity A	Sales	Jan	Payroll and related expenses
3		2019	Entity A	Sales	Jan	Distribution
4		2019	Entity A	Sales	Jan	Occupancy Expenses

Next, copy paste all the data on the Budget tab directly below the Actual data, making sure that the columns line up correctly; in column A (Version), indicate where the Budget data begins and carry it down to the end of the data set. Do the same for the Forecast data, i.e., directly below Budget data.

Essentially, you will have one worksheet of data with all the Versions (as below, assuming each Version has approx. 500 Rows of data—of course, this may amount to much more or less for each).



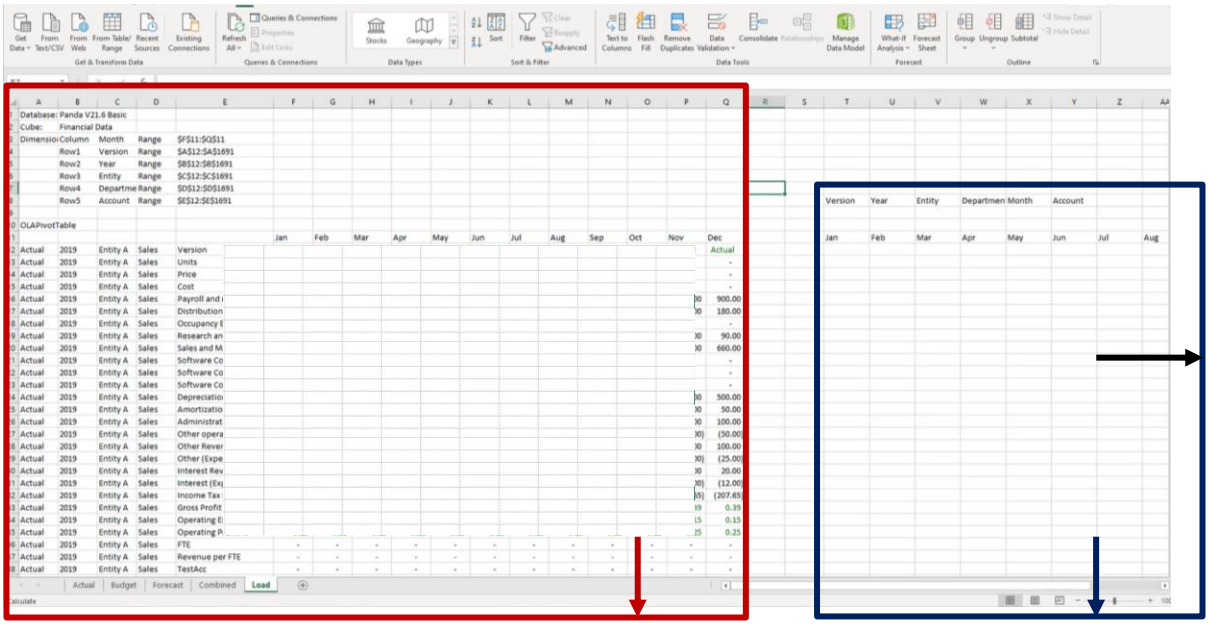
Next, create an identifier for each of the intersections—so named in Column H. We can do this using the Excel concatenation formula function, as in the following image.

You will next extend logic of the contatenation to the end of the data set, so that each transaction Row is identifiable. Note that the Intersections are not necessarily unique, as there may be multiple transactions in the same Month, for example, for the other parameters. (In short time you will Sum the intersections with the same concatenated identifier, to bring that data into the PowerExcel model.)

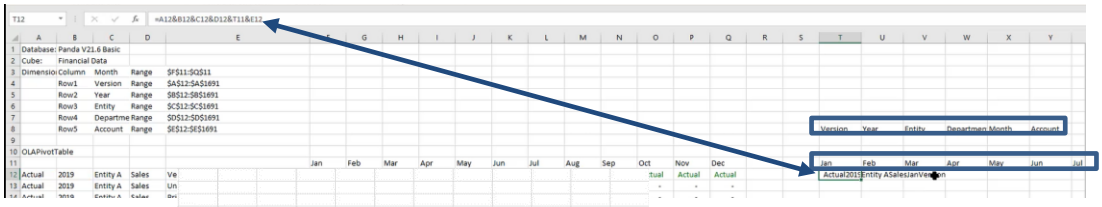
H26 =CONCAT(A26,B26,C26,D26,E26,F26)

	A	B	C	D	E	F	G	H
1	Version	Year	Entity	Departme	Month	Account	Actual	Intersection
2	Actual	2019	Entity A	Sales	Jan	Payroll and related expenses	900.00	Actual2019Entity ASalesJanPayroll and related expenses
3	Actual	2019	Entity A	Sales	Jan	Distribution	180.00	Actual2019Entity ASalesJanDistribution
4	Actual	2019	Entity A	Sales	Jan	Occupancy Expenses	-	Actual2019Entity ASalesJanOccupancy Expenses
5	Actual	2019	Entity A	Sales	Jan	Research and Development	90.00	Actual2019Entity ASalesJanResearch and Development
6	Actual	2019	Entity A	Sales	Jan	Sales and Marketing	660.00	Actual2019Entity ASalesJanSales and Marketing
7	Actual	2019	Entity A	Sales	Jan	Depreciation	500.00	Actual2019Entity ASalesJanDepreciation
8	Actual	2019	Entity A	Sales	Jan	Amortization	50.00	Actual2019Entity ASalesJanAmortization
9	Actual	2019	Entity A	Sales	Jan	Administrative Expenses	100.00	Actual2019Entity ASalesJanAdministrative Expenses
10	Actual	2019	Entity A	Sales	Jan	Other operating Expenses (Income)	(50.00)	Actual2019Entity ASalesJanOther operating Expenses (Income)
11	Actual	2019	Entity A	Sales	Jan	Other Revenue	100.00	Actual2019Entity ASalesJanOther Revenue
12	Actual	2019	Entity A	Sales	Jan	Other (Expense)	(25.00)	Actual2019Entity ASalesJanOther (Expense)
13	Actual	2019	Entity A	Sales	Jan	Interest Revenue	20.00	Actual2019Entity ASalesJanInterest Revenue
14	Actual	2019	Entity A	Sales	Jan	Interest (Expense)	(12.00)	Actual2019Entity ASalesJanInterest (Expense)
15	Actual	2019	Entity A	Sales	Jan	Income Tax Expense	(207.65)	Actual2019Entity ASalesJanIncome Tax Expense
16	Actual	2019	Entity A	Sales	Jan	Sales of Goods	12,000.00	Actual2019Entity ASalesJanSales of Goods
17	Actual	2019	Entity A	Sales	Jan	Sales of Services	4,500.00	Actual2019Entity ASalesJanSales of Services
18	Actual	2019	Entity A	Sales	Jan	Cost of Goods	6,000.00	Actual2019Entity ASalesJanCost of Goods
19	Actual	2019	Entity A	Sales	Jan	Cost of Services	4,000.00	Actual2019Entity ASalesJanCost of Services
20	Actual	2019	Entity A	Sales	Feb	Payroll and related expenses	900.00	Actual2019Entity ASalesFebPayroll and related expenses
21	Actual	2019	Entity A	Sales	Feb	Distribution	180.00	Actual2019Entity ASalesFebDistribution
22	Actual	2019	Entity A	Sales	Feb	Occupancy Expenses	-	Actual2019Entity ASalesFebOccupancy Expenses
23	Actual	2019	Entity A	Sales	Feb	Research and Development	90.00	Actual2019Entity ASalesFebResearch and Development
24	Actual	2019	Entity A	Sales	Feb	Sales and Marketing	660.00	Actual2019Entity ASalesFebSales and Marketing

Next, the we will make use of a “Load template” (the Load tab): this is a PowerExcel Slice, with all Dimensions, save one, stacked on the left; and the one remaining Dimension (in this example, Months) in Columns (see the boxed area of the spreadsheet in the next image, which will extend for many more Rows, as suggested by the arrow).



The area to the right (blue, boxed) will be used to Sum all the data from the individual transactions from the Combined tab (extended to the right and downward, per the blue arrows): it will be necessary here, also, to create a concatenation that will be used as the Criteria for the summation (boxed in blue in the following image). You will want to make certain the relative referencing to the Dimensions (Row 8), and the Month indicator (Row 11) is correct. In this case, the ampersand is used for the concatenation formula. (Respective sections for the Dimensions, Month and the formula itself are noted in blue in the image below.)

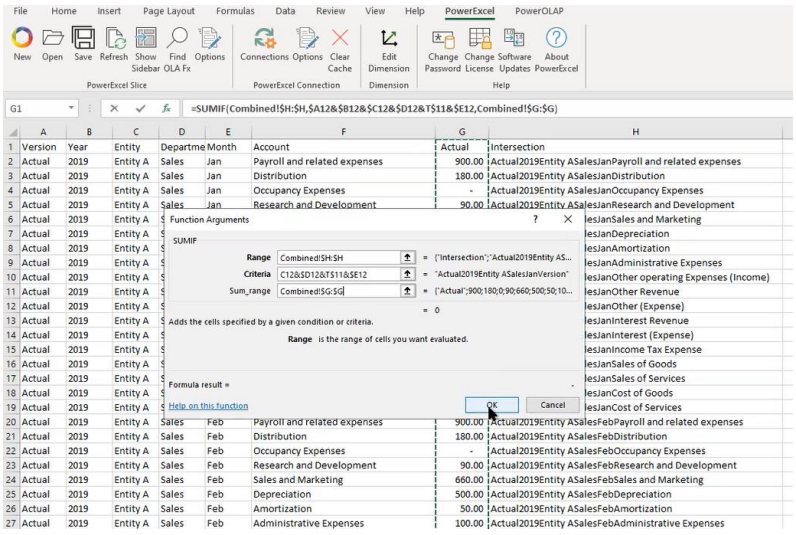


[In this case, the ampersand is used for the concatenation formula. (Respective sections for the Dimensions, Month and the formula itself are noted in blue in the image above; a detail of the concatenation formula is below.)

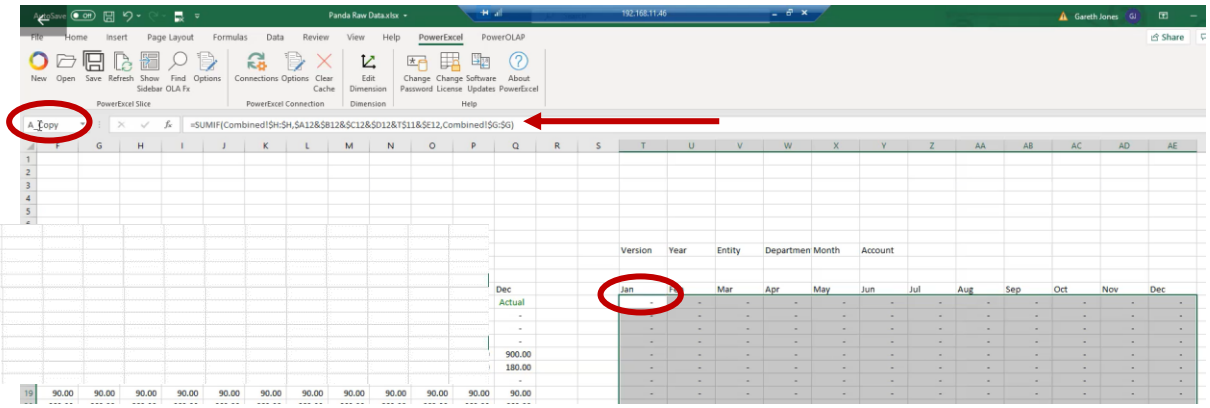
This SUMIF formula will be written to:

- Evaluate the Range of intersection points in Column H from the large block of data on the Combined tab;
- And IF the Criteria is met (by “equaling” the result of the concatenation formula), then
- SUM the correct values from Column G on the Combined tab appertaining to the Criteria (and make a Zero if the Criteria is not met).

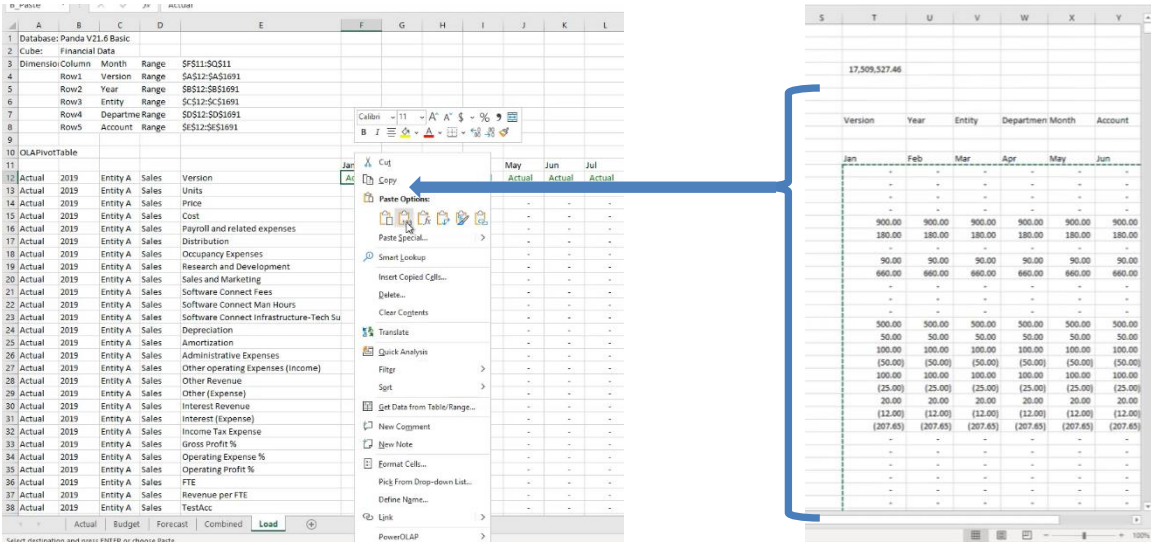
The full SUMIF function is shown next, with the Combined tab showing in the background.



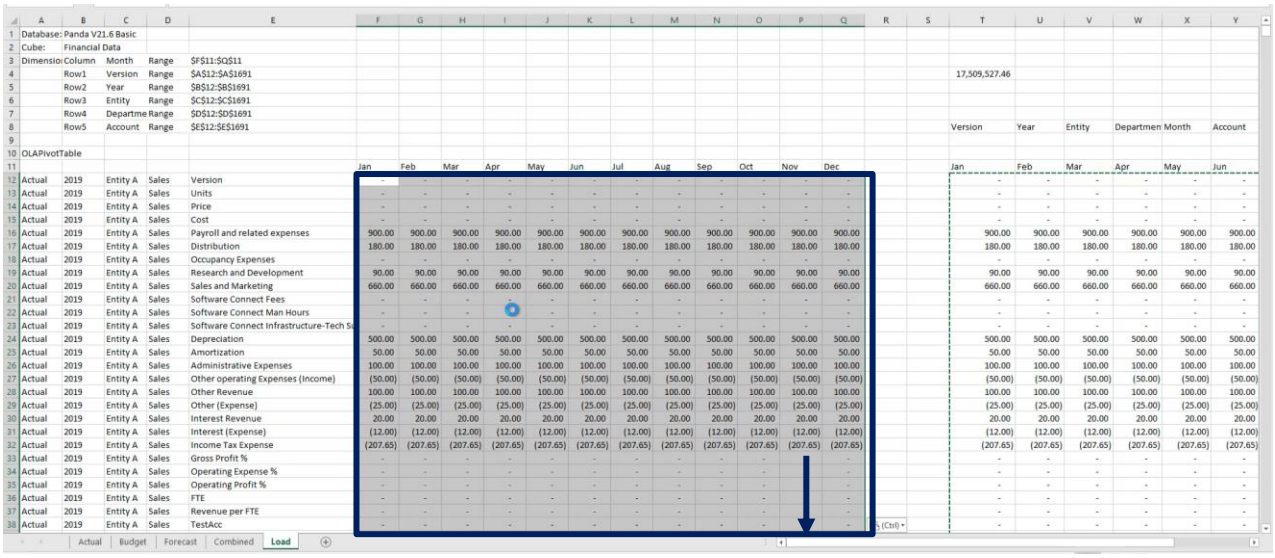
Before refreshing to execute the SUMIF formula (see red arrow below), you can indicate the full area (the “beginning” cell is red circled, on the right) where results will appear by indicating it as a Range, e.g., A_Copy (red circled, top left).



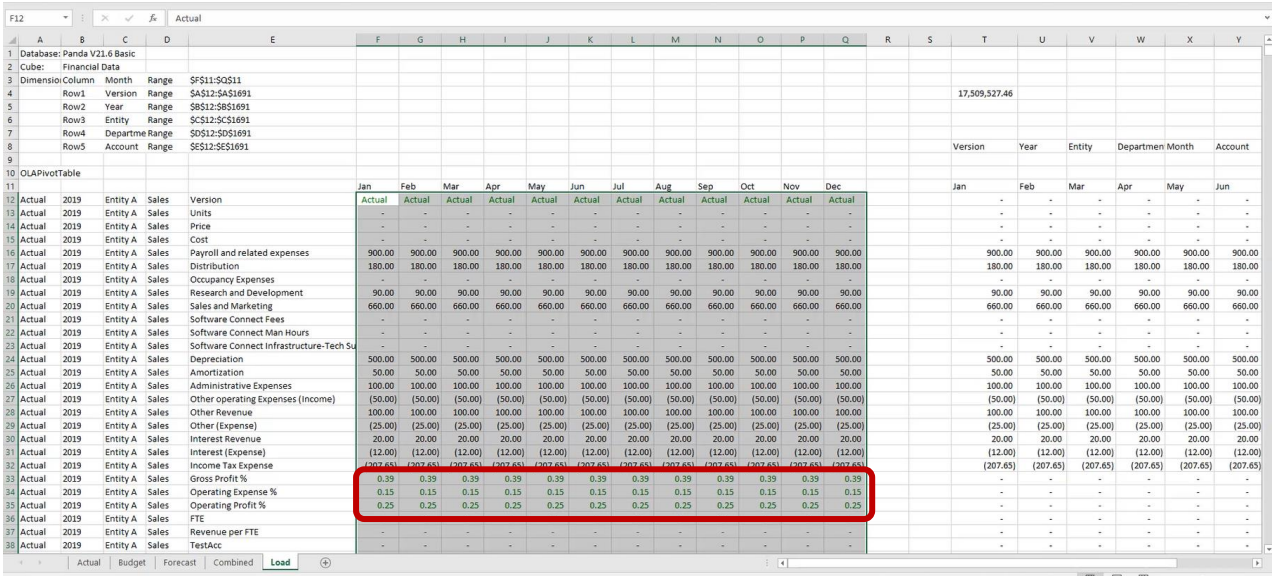
Execute the formula, and results will appear on the right, as below; then, finally, perform the bulk copy-paste those cells into the PowerExcel Slice area on the left, per the blue arrow.



The effect of this bulk copy-paste into the PowerExcel Slice area of the spreadsheet is that all that data now “writes back” to the model—next image (blue outline). Upon refresh, note that the calculations—the results of aggregations and formulas within the PowerExcel model—now appear (red circled area, see next page, second image).

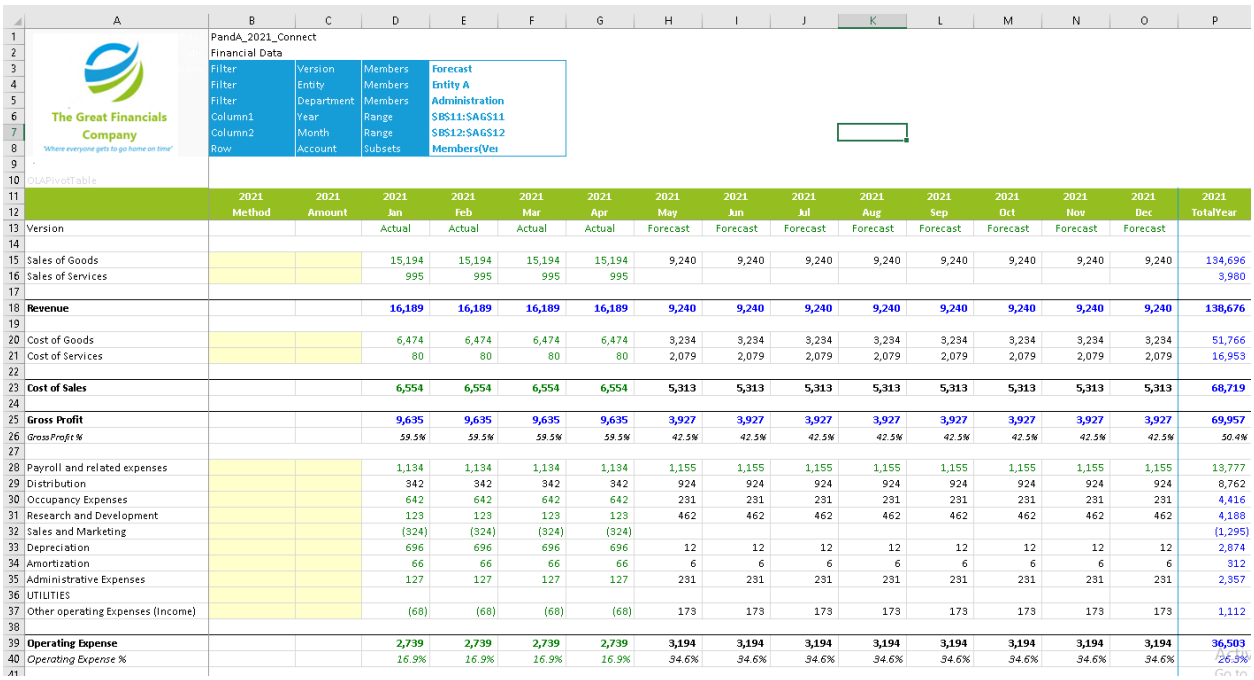


Numbers from the right-hand side—results of the SUMIF formula—bulk copy-pasted into the PowerExcel Slice



Member values driven by formulas in the model—like *Operating Expense %*, etc.—calculate upon Refresh

We are now in a position to take another look at the PowerExcel Slice with which we began this section. As shown in the next image, the Income Statement Slice for The Great Financials Company now has data in it! That data can be shown according to all the selections in the Filters section—by *Version*, *Department*, *Entity*, *Year*, with *Month* in Columns and *Account* is Rows [see next page].



	PandA_2021_Connect															
	Financial Data															
	Filter	Version	Members	Forecast												
	Filter	Entity	Members	Entity A												
	Filter	Department	Members	Administration												
	Column1	Year	Range	SBS11:SAGS11												
	Column2	Month	Range	SBS12:SAGS12												
	Row	Account	Subsets	Members(Ver												
	OLAPivotTable															
	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	
	Method	Amount	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TotalYear	
Version			Actual	Actual	Actual	Actual	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast		
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	
Sales of Services			995	995	995	995									3,980	
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**	
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	
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	
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**	
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**	
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%*	
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	
Distribution			342	342	342	342	924	924	924	924	924	924	924	924	8,762	
Occupancy Expenses			642	642	642	642	231	231	231	231	231	231	231	231	4,416	
Research and Development			123	123	123	123	462	462	462	462	462	462	462	462	4,188	
Sales and Marketing			(324)	(324)	(324)	(324)									(1,295)	
Depreciation			696	696	696	696	12	12	12	12	12	12	12	12	2,874	
Amortization			66	66	66	66	6	6	6	6	6	6	6	6	312	
Administrative Expenses			127	127	127	127	231	231	231	231	231	231	231	231	2,357	
UTILITIES																
Other operating Expenses (Income)			(68)	(68)	(68)	(68)	173	173	173	173	173	173	173	173	1,112	
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**	
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%*	

The Great Financials Company: an Income Statement that can be viewed by *Version*, *Department*, *Entity*, *Year*

5. New Cube and Dimension Editor (Licensed Features)

5.1 New Cube—Creating a Cube in Olation from an Excel Spreadsheet

Introduction

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 either the Excel Dimension Editor (see next section) or in Olation Studio. [Note that this presupposes that a user/company has an accessible installation of the Olation Studio.]

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

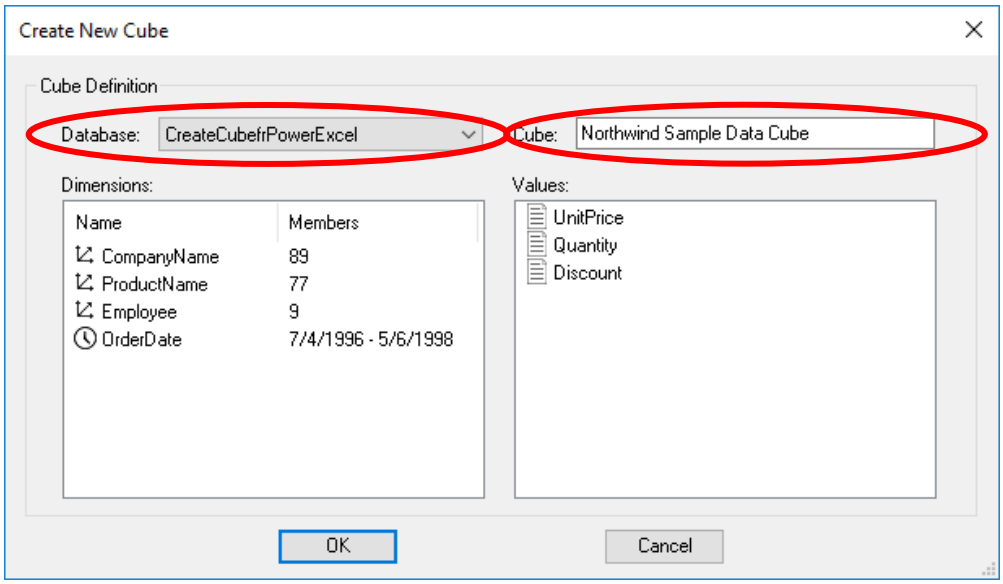
Creating a new Cube begins with a worksheet of tabular data in Excel. This data can come from any source but needs to follow a basic structure, beginning with the fact that the data requires a Header row (as circled in the following image, from an example file, *Northwind Sample Data.xlsx*). This row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



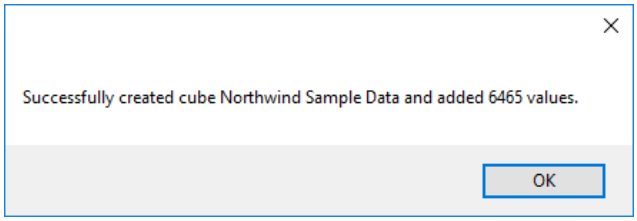
Before clicking OK, there are 2 conditions that must be met in advance for successful cube creation:

- An **Olation database** (whether a SQL, PowerExcel 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 SQL 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.

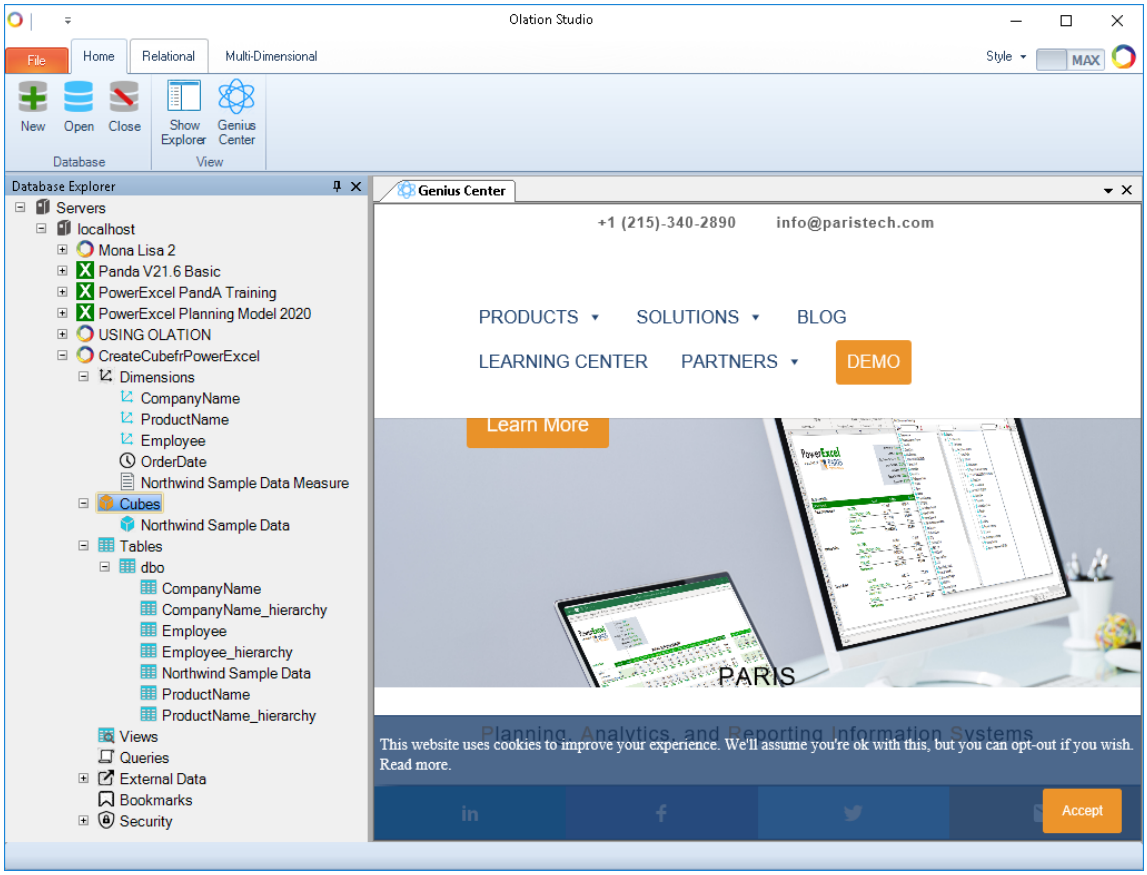
3. Click **OK**.
   A message will appear indicating successful Cube creation and added Values.



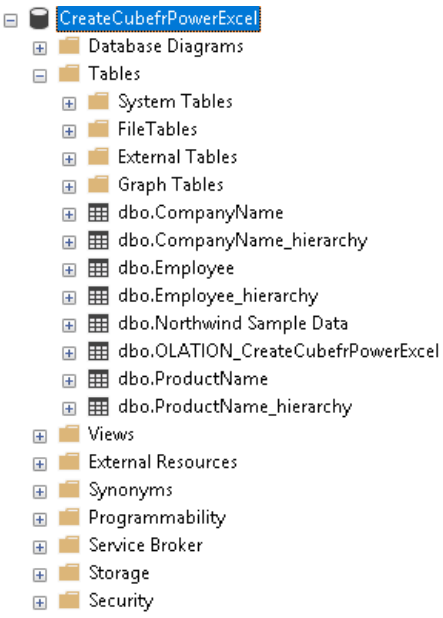
If you want to change the name of any of the Dimensions or Measures, cancel the previous dialog above, edit the column header and start the new Cube again. Clicking OK will pass this structure along with all the rows of data to Olation and create all the new Dimensions and the Cube and will populate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

Note that Cube and Dimension names must be unique. Dimensions are created as custom dimension types so users can easily edit them using either Dimension Editor (see next section). Also 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.

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

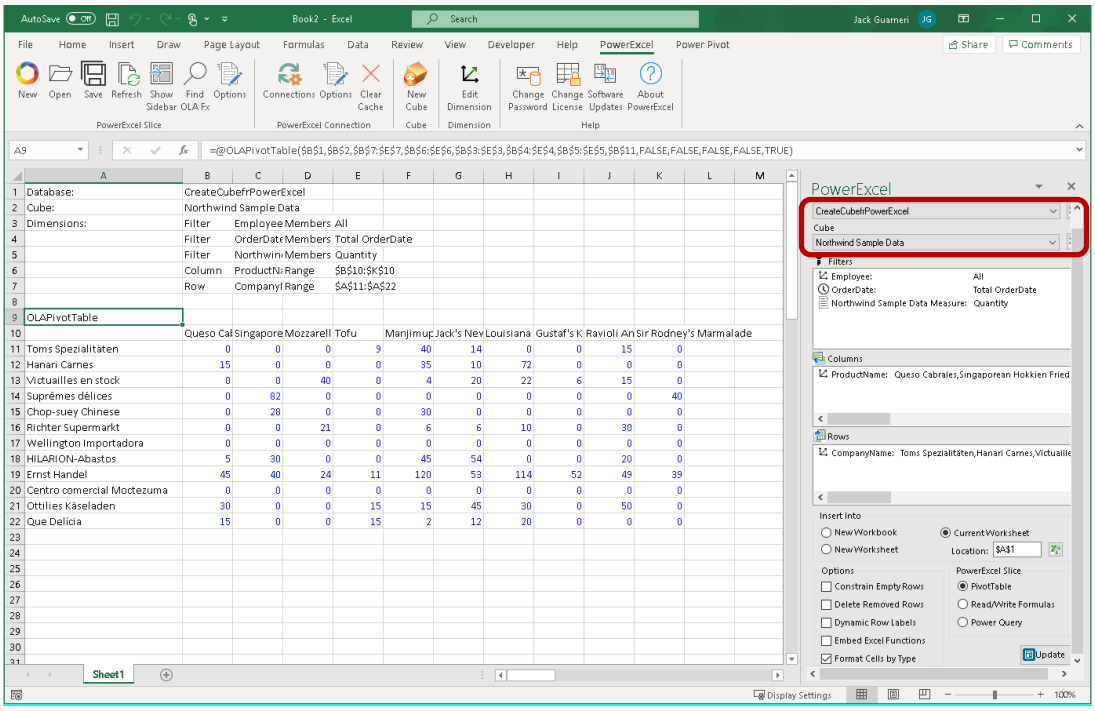


Above, the Dimensions, the new Cube, and relational tables shown in Olation Studio.



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.



5.2 Dimension Editor

The **Dimension Editor** or the **Edit Dimension command** is found on the PowerExcel ribbon.

The Dimension Editor allows you to create new or rename existing Members; change the Hierarchy structure or create a new Hierarchy; edit Hierarchy Weights, and; sort and filter the Member list directly from Excel. However, you will be restricted from deleting Members that exist within the Dimension.

Note: The PowerExcel Dimension Editor capability is enabled on the basis of customer licensing. If your PowerExcel installation does not allow Edit Dimension capabilities, reach PARIS Technologies for further information.

For this exercise, you will demonstrate how to use the Dimension Editor to create a new Member(s) within the PowerExcel model—this is a significant capability, allowing the creation new metrics/KPIs/analytics of business performance based on existing data in the model.

In the following example we posit a business that is a children's retail store: its biggest months are Aug (just before school starts), and Nov and Dec (holiday sales). We will create a new Hierarchy in the *Month* dimension, called *Key Performance Months*, to track the aggregated sales for those three (3) months.

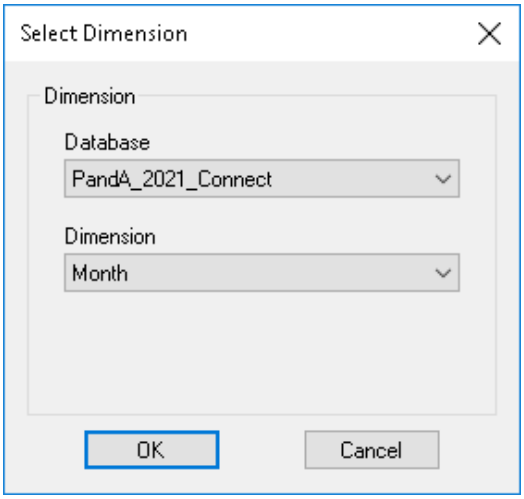
Important: Please note that specific figures or the order of the Dimensions may be different from the data set you are working on. This exercise is meant to serve as a guide to the steps to be followed to use the feature.

To proceed with the exercise:

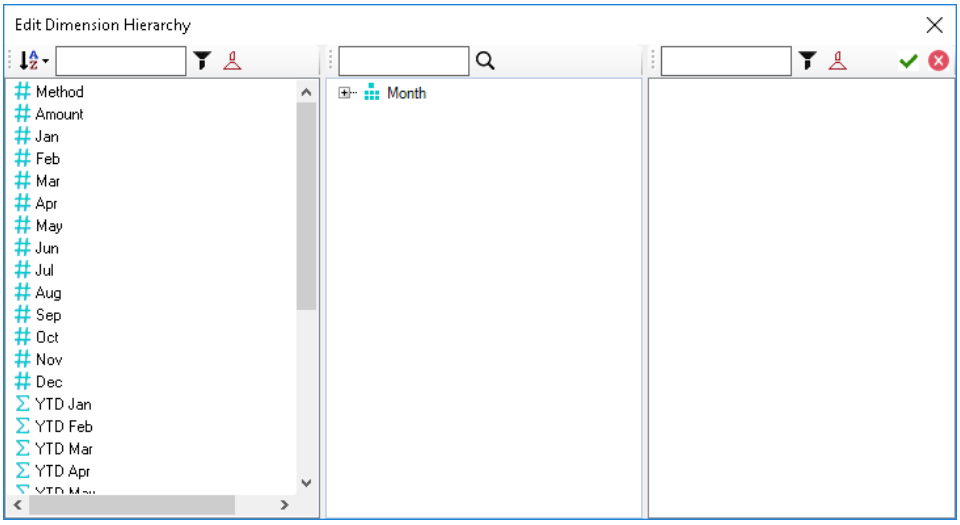
Begin by accessing the Dimension Editor window:

1. Click on the **PowerExcel Tab**.
2. Click on the **Edit Dimension icon** and the following Dimension Editor window appears.

3. Click the **Edit Dimension** button (circled in the previous image).
   The Select Dimension window appears; next, select the Database Connection and Dimension you wish to edit (as below, the example **PandA_2021_Connect** database and the **Month** dimension).



4. Click **OK**; the Edit Dimension Hierarchy window appears (see image below).

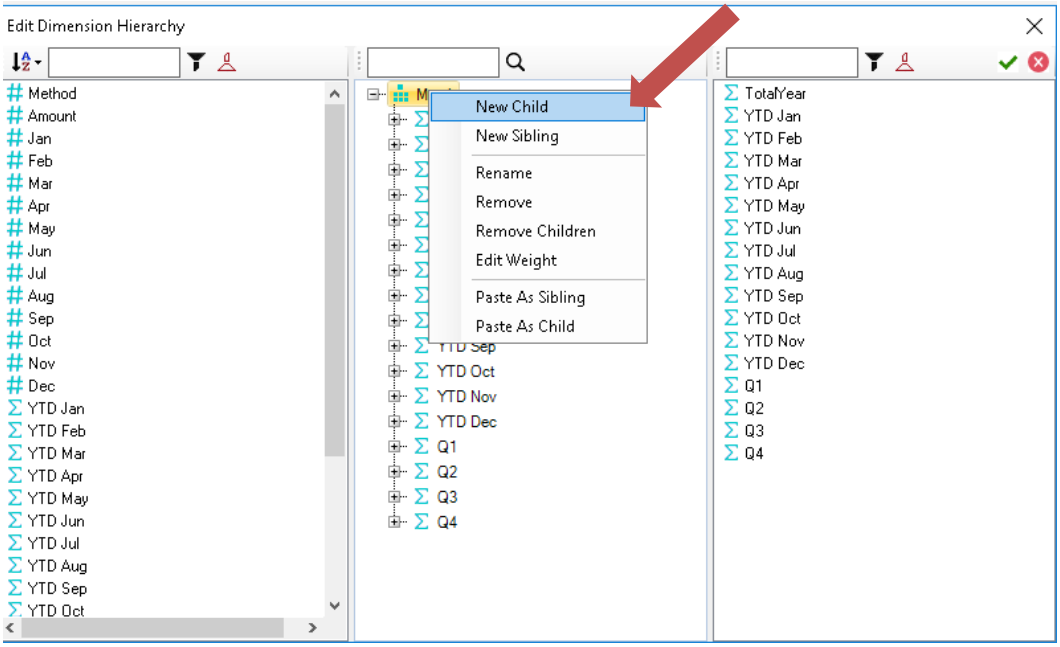


Commands and functions available in the Dimension Editor window:
(These can be found along the top portion of the window)

Function	Icon	Description
Left-hand Pane		
Sort list of members		This option allows you to define the sort order of the Member list. The Member list can be sorted in Natural, Ascending Alphabetical, and Descending Alphabetical orders.
Filter box		This is where you type in the filter parameter.
Filter list of members		This executes the filter parameter specified in the Filter box.
Remove filter from list of members		This removes the filter applied to the Member list.
Middle Pane		
Find member in hierarchy		This allows you to perform a find and search.
Right-hand Pane		
This pane shows the “child” Members when you click on a Hierarchy in the Middle Pane. It features the same options as the Left-hand Pane, except for Sort Member list.		
Other command buttons		
Save Hierarchy		Saves the changes you made in the Hierarchy.
Close without saving		Cancels all the changes and reverts to the original Hierarchy structure.

Next, proceed to add the new Member (*Key Performance Months*):

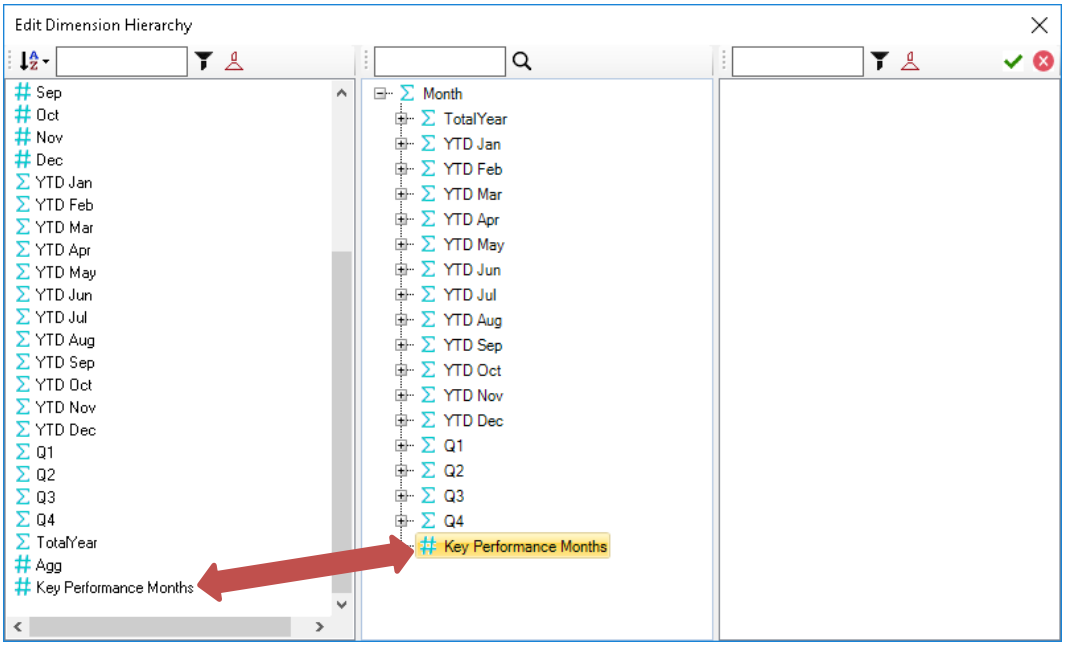
5. Go to the Hierarchy Definition Box (middle pane) and expand **Month**.
   Right-click on **Month** and select **New Child**.
   This will create a new textbox at the bottom of the Hierarchy where you can enter the name of the newly added Member (see below).



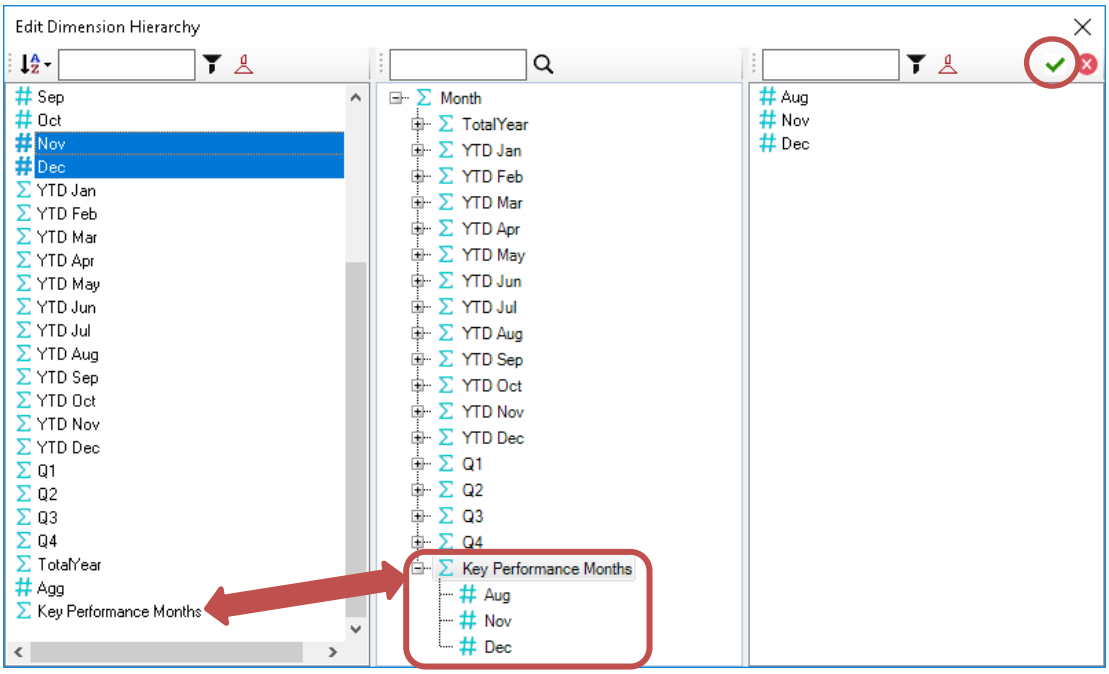
   Alternatively, you can expand **Month**, and select a Member that is at the same hierarchy level where you want the new Member to be; then right-click and select **New Sibling**. Doing this will insert the new Member at the same hierarchy level but directly below the **M**ember.

6. In the textbox that appears, type **Key Performance Months**.

   Notice that the newly added member (*Key Performance Months*) is now displayed under the Member List pane (left-hand pane).



7. Press **Ctrl,** then select the *Month* members **Aug**, **Nov**, and **Dec** on the left, and drag them below *Key Performance Months* in the middle pane to create the Hierarchy, as shown circled below:



Note that the Member Key Performance Months now has a Sigma sign next to it (Σ).

8. Click the **Save Hierarchy** button (**green checkmark**) at the top right (circled above) to save Hierarchy changes.

At this point we want to see results in a report—for this, open a new PowerExcel spreadsheet:

9. In the newly opened Excel worksheet, click on the **PowerExcel Tab** and use the selection box on the right to create an Excel Slice like the following, with those months shown; you can use Excel formatting capabilities as well.
   (Be sure that the Dimension members have been filtered to the Detail level—as below, circled, *Actual* has been selected from the *Version* dimension, *2020* has been selected for from the *Year* dimension, and so on.)

	A	B	C	D	E	F	G	H	I	J
1	Database:	PandA_2021_Connect								
2	Cube:	Financial Data								
3	Dimensio	Filter	Version	Members	Actual					
4		Filter	Year	Members	2020					
5		Filter	Entity	Members	Entity A					
6		Filter	Departme	Members	Sales					
7		Column	Month	Range	$B$11:$J$11					
8		Row	Account	Range	$A$12:$A$24					
9										
10	OLAPivotTable									
11		Q1	Q2	Q3	Q4		Aug	Nov	Dec	Key Performance Months
12	Sales of G	40320	40320	40320	40320		13440	13440	13440	40320
13	Cost of Gc	20160	20160	20160	20160		6720	6720	6720	20160
14	Gross Prof	21840	21840	21840	21840		7280	7280	7280	21840
15	Profit Bef	13400	13400	13400	13400		4467	4467	4467	13400
16	Income Ta	-3816	-3816	-3816	-3816		-1272	-1272	-1272	-3816
17										
18	Profit Bef	13400	13400	13400	13400		4467	4467	4467	13400
19	Income Ta	-3816	-3816	-3816	-3816		-1272	-1272	-1272	-3816
20	Profit Afte	9584	9584	9584	9584		3195	3195	3195	9584
21										
22	Gross Prof	39%	39%	39%	39%		39%	39%	39%	39%
23	Operating	16%	16%	16%	16%		16%	16%	16%	16%
24	Operating	24%	24%	24%	24%		24%	24%	24%	24%
25										

6. 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.

6.1 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 PivotTable function—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.

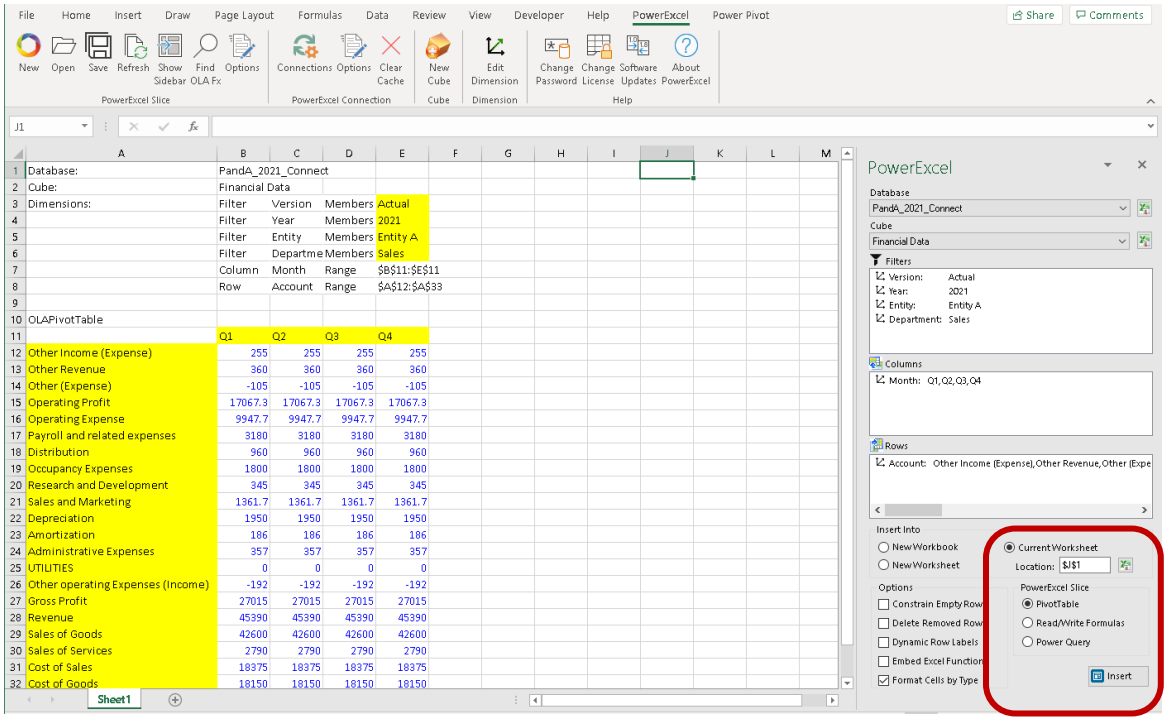
	A	B	C	D	E
1	Database:	PandA_2021_Connect			
2	Cube:	Financial Data			
3	Dimensions:	Filter	Version	Members	Actual
4		Filter	Year	Members	2021
5		Filter	Entity	Members	Entity A
6		Filter	Departme	Members	Sales
7		Column	Month	Range	$B$11:$E$11
8		Row	Account	Range	$A$12:$A$3
9					
10	OLAPivotTable				
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 (Income)	-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

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

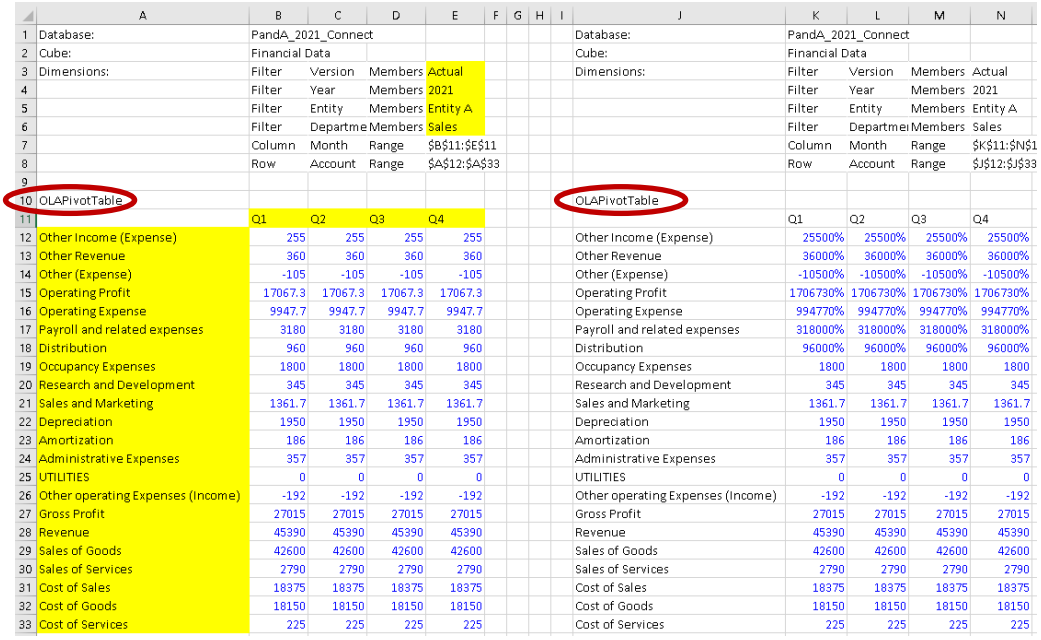
OLAConnection	B1	Establishes connection to Olation analytical database
OLACube	B2	Allows selection of Cube in the database.
OLATableMember	B3 – B6	Allows selection (Filter) of Member in a Dimension
OLATableRange	B7, B8	Allows a range of Members in a Dimension to be shown
OLAPivotTable	A11	One of several (along with OLAQuery and OLAReadWrite) selectable means to create the Slice.

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** text box the Cell where you want to position the insert of the Slice (e.g., Cell J!, as in the following image).

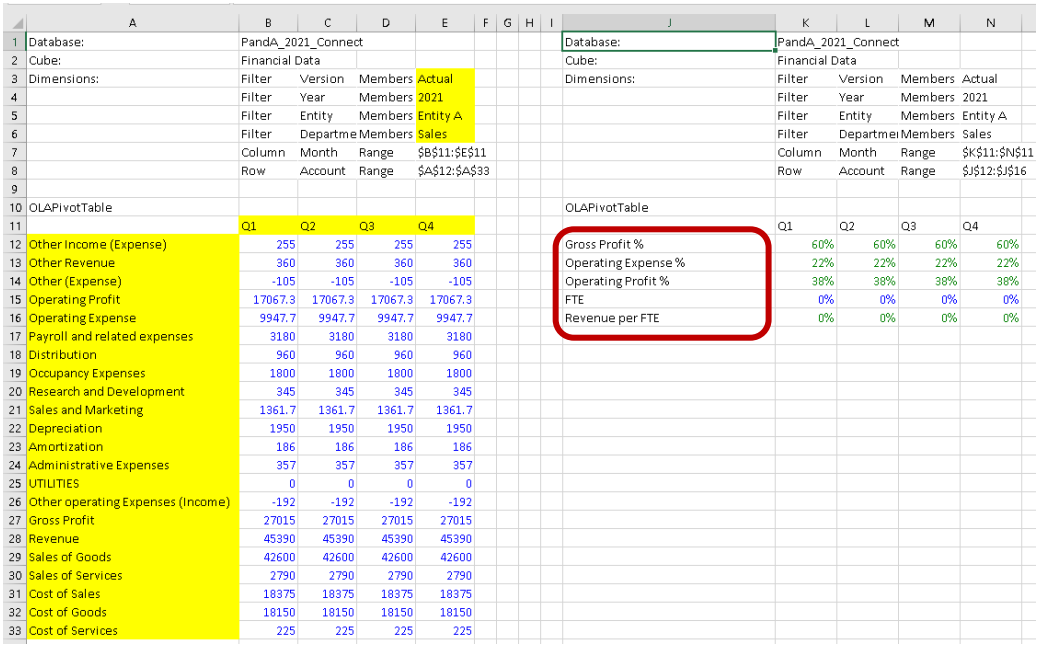


4. For present purposes, keep all other defaults—i.e., if recreating the Slice shown previously, maintain the same Filters, Column and Row Members, and use the OLAPivotTable to create the Slice.
5. Click **Insert**. The second Slice in the worksheet, essentially a replication of the first, will appear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



	A	B	C	D	E	J	K	L	M	N
1	Database:	PandA_2021_Connect				Database:	PandA_2021_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	Departmei	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		Row	Account	Range	$J$12:$J$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)	25500%	25500%	25500%	25500%
13	Other Revenue	360	360	360	360	Other Revenue	36000%	36000%	36000%	36000%
14	Other (Expense)	-105	-105	-105	-105	Other (Expense)	-10500%	-10500%	-10500%	-10500%
15	Operating Profit	17067.3	17067.3	17067.3	17067.3	Operating Profit	1706730%	1706730%	1706730%	1706730%
16	Operating Expense	9947.7	9947.7	9947.7	9947.7	Operating Expense	994770%	994770%	994770%	994770%
17	Payroll and related expenses	3180	3180	3180	3180	Payroll and related expenses	318000%	318000%	318000%	318000%
18	Distribution	960	960	960	960	Distribution	96000%	96000%	96000%	96000%
19	Occupancy Expenses	1800	1800	1800	1800	Occupancy Expenses	1800	1800	1800	1800
20	Research and Development	345	345	345	345	Research and Development	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 Expenses	357	357	357	357
25	UTILITIES	0	0	0	0	UTILITIES	0	0	0	0
26	Other operating Expenses (Income)	-192	-192	-192	-192	Other operating Expenses (Income)	-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 (A11 for the first Slice, J11 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_2021_Connect				Database:	PandA_2021_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	Departmei	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 (Income)	-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					

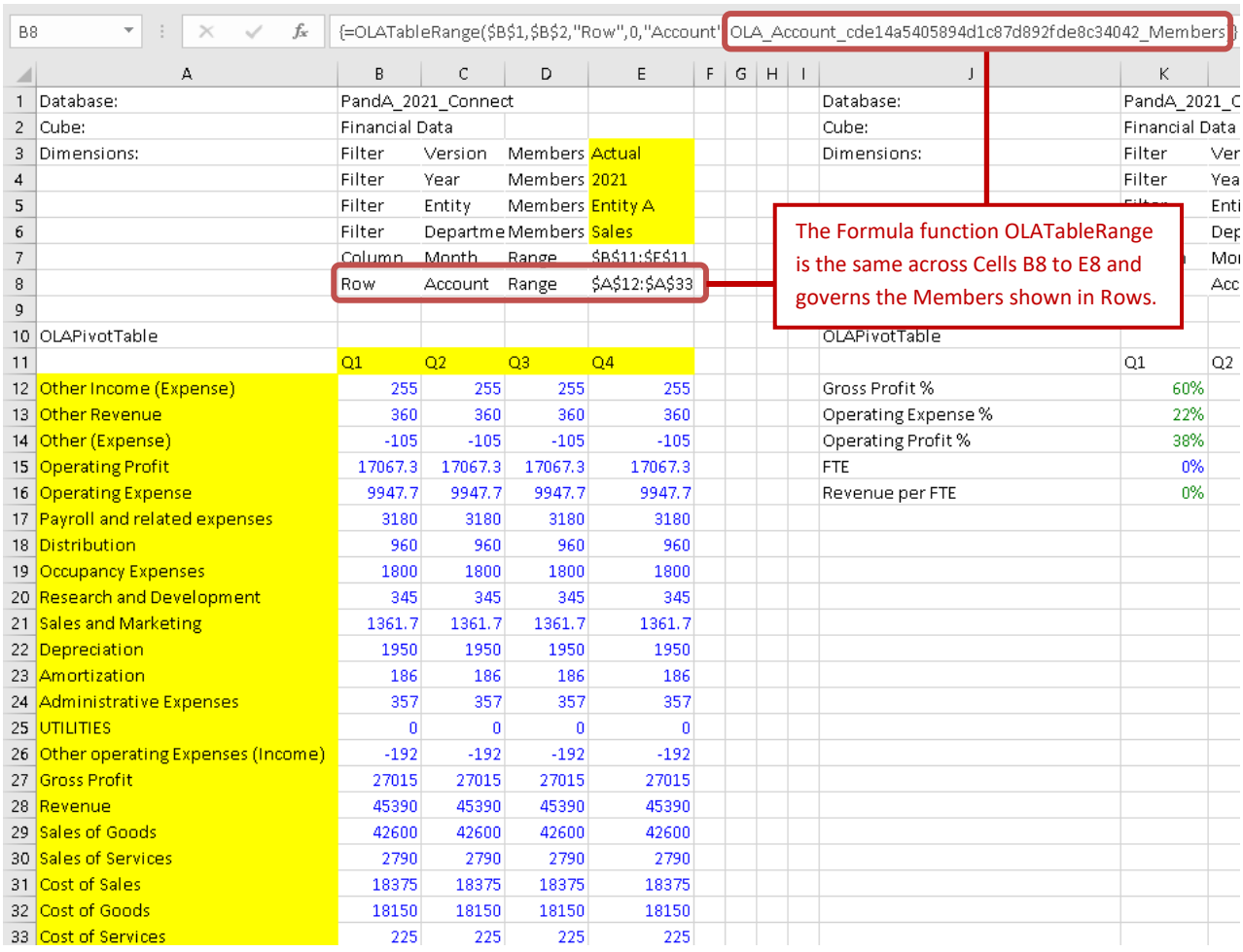
6.2 Changing the Range Reference in a PowerExcel Slice

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
1	Database:	PandA_2021_Connect				Database:	PandA_2021_C
2	Cube:	Financial Data				Cube:	Financial Data
3	Dimensions:	Filter	Version	Members	Actual	Dimensions:	Filter Ver
4		Filter	Year	Members	2021		Filter Yea
5		Filter	Entity	Members	Entity A		Enti
6		Filter	Departme	Members	Sales		Dep
7		Column	Month	Range	$B$11:$E$11		Mo
8		Row	Account	Range	$A$12:$A$33		Acc
9							
10	OLAPivotTable					OLAPivotTable	
11		Q1	Q2	Q3	Q4		Q1 Q2
12	Other Income (Expense)	255	255	255	255	Gross Profit %	60%
13	Other Revenue	360	360	360	360	Operating Expense %	22%
14	Other (Expense)	-105	-105	-105	-105	Operating Profit %	38%
15	Operating Profit	17067.3	17067.3	17067.3	17067.3	FTE	0%
16	Operating Expense	9947.7	9947.7	9947.7	9947.7	Revenue per FTE	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 (Income)	-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		

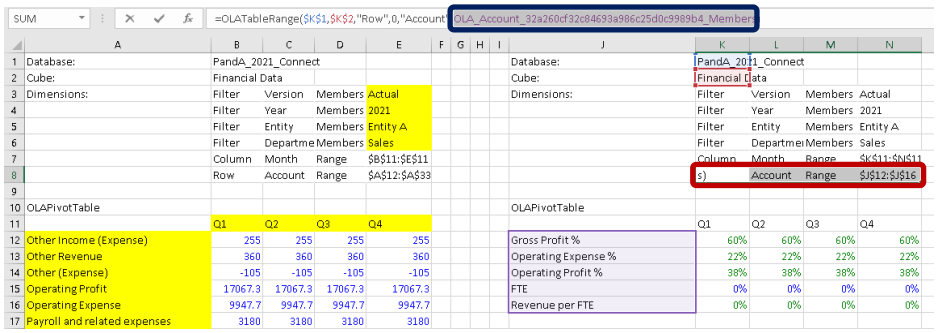
As above, the circled function governs which Members are shown in Rows—in this spreadsheet, Row12 through Row 33—you will see the same formula.

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).

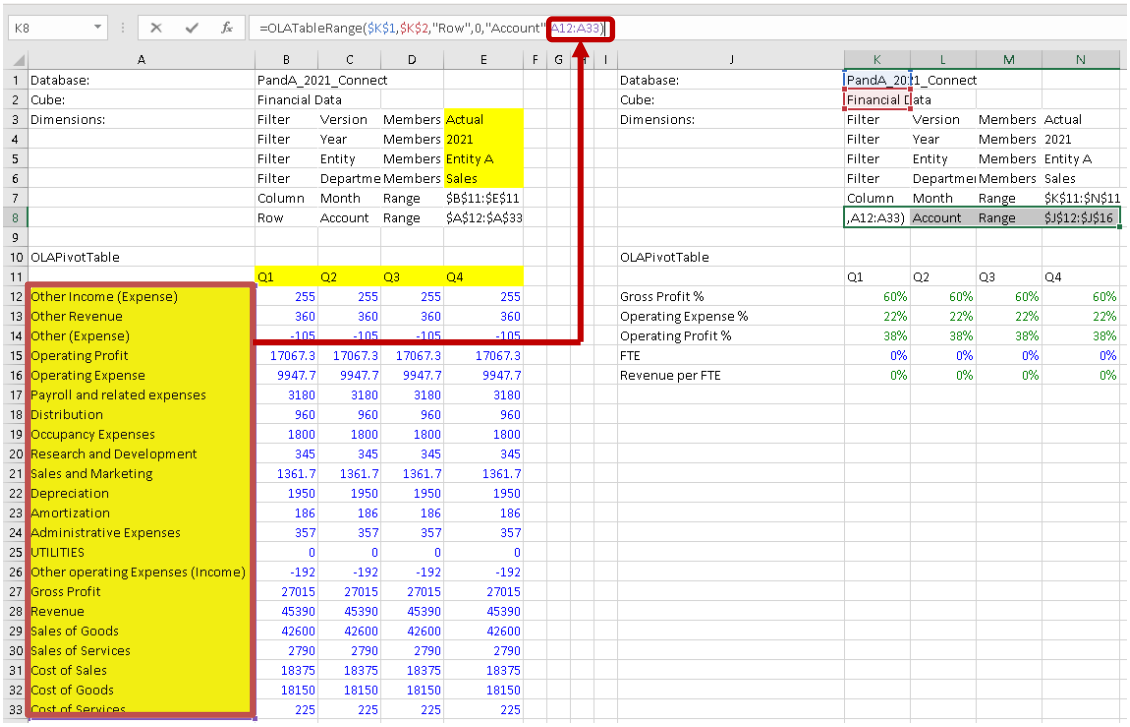
Now suppose we wish to change the range reference of the *second* PivotTable so that it once again shows the same Members along Rows that are displayed in the first PivotTable, the method will be to do as follows:

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_2021_Connect				Database:	PandA_2021_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	Departmer	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) .

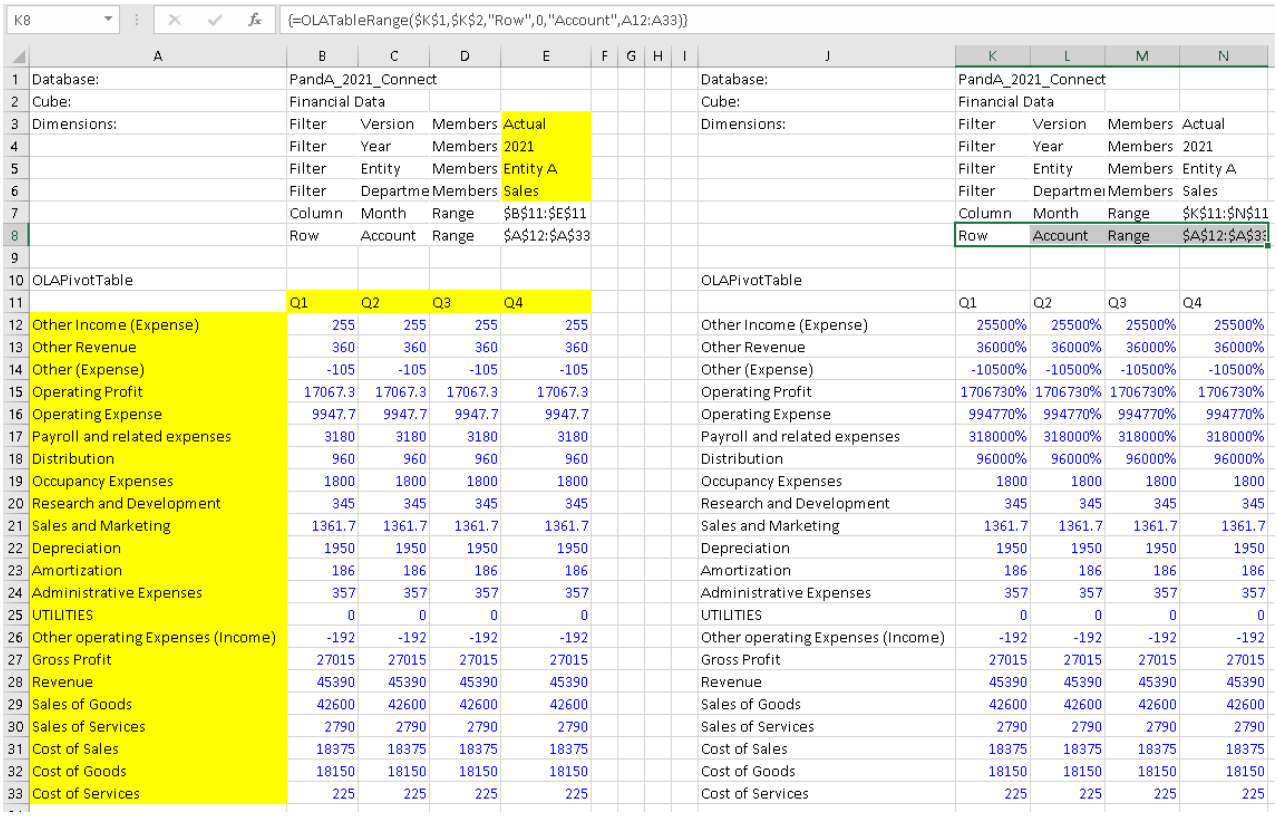


	A	B	C	D	E	J	K	L	M	N
1	Database:	PandA_2021_Connect				Database:	PandA_2021_Connect			
2	Cube:	Financial Data				Cube:	Financial Data			
3	Dimensions:	Filter	Version	Members	Actual	Dimensions:	Filter	Version	Members	Actual
4		Filter	Year	Members	2021		Filter	Year	Members	2021
5		Filter	Entity	Members	Entity A		Filter	Entity	Members	Entity A
6		Filter	Departme	Members	Sales		Filter	Departmer	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		,A12: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	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 (Income)	-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)}

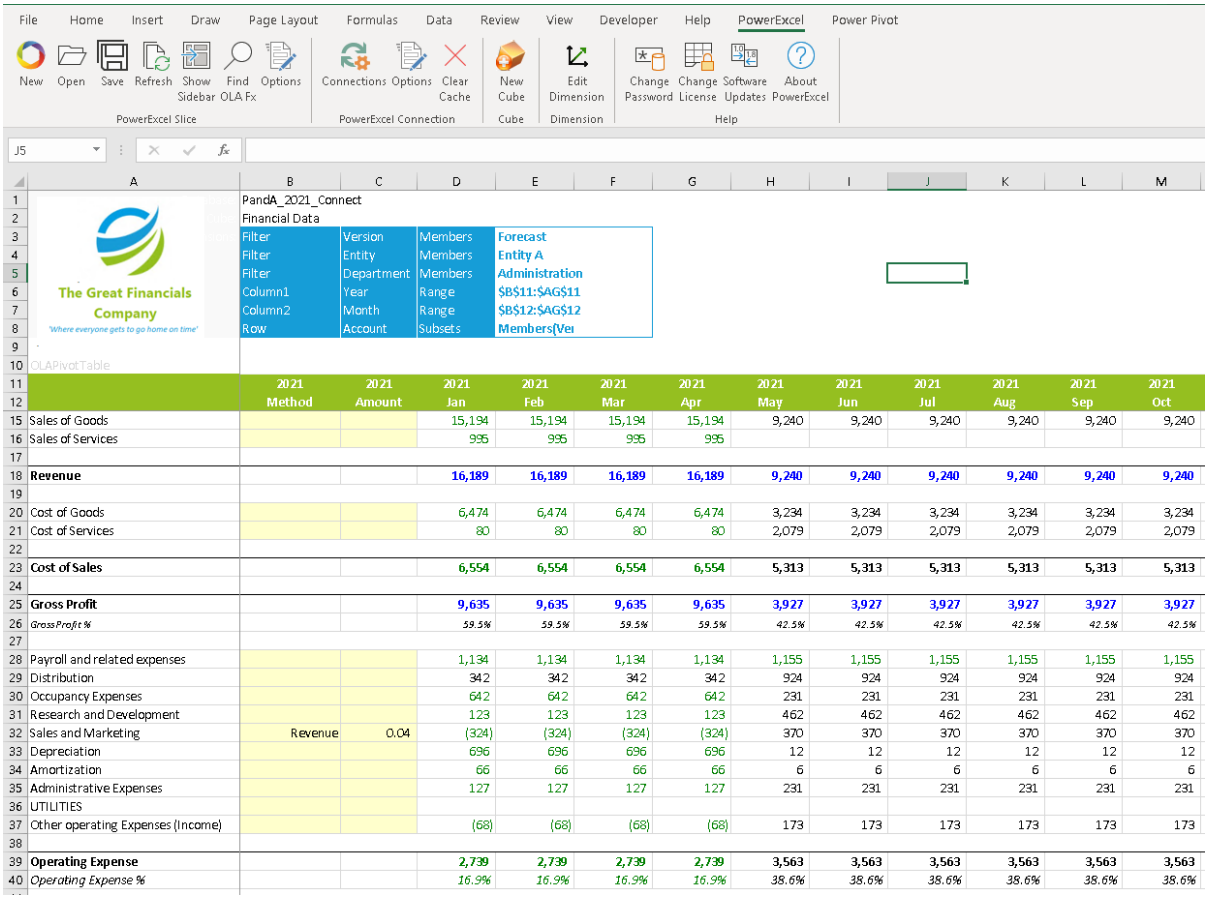
	A	B	C	D	E	J	K	L	M	N
1	Database:	PandA_2021_Connect				Database:	PandA_2021_Connect			
2	Cube:	Financial Data				Cube:	Financial Data			
3	Dimensions:	Filter	Version	Members	Actual	Dimensions:	Filter	Version	Members	Actual
4		Filter	Year	Members	2021		Filter	Year	Members	2021
5		Filter	Entity	Members	Entity A		Filter	Entity	Members	Entity A
6		Filter	Departme	Members	Sales		Filter	Departmei	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$3
9										
10	OLAPivotTable					OLAPivotTable				
11		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4
12	Other Income (Expense)	255	255	255	255	Other Income (Expense)	25500%	25500%	25500%	25500%
13	Other Revenue	360	360	360	360	Other Revenue	36000%	36000%	36000%	36000%
14	Other (Expense)	-105	-105	-105	-105	Other (Expense)	-10500%	-10500%	-10500%	-10500%
15	Operating Profit	17067.3	17067.3	17067.3	17067.3	Operating Profit	1706730%	1706730%	1706730%	1706730%
16	Operating Expense	9947.7	9947.7	9947.7	9947.7	Operating Expense	994770%	994770%	994770%	994770%
17	Payroll and related expenses	3180	3180	3180	3180	Payroll and related expenses	318000%	318000%	318000%	318000%
18	Distribution	960	960	960	960	Distribution	96000%	96000%	96000%	96000%
19	Occupancy Expenses	1800	1800	1800	1800	Occupancy Expenses	1800	1800	1800	1800
20	Research and Development	345	345	345	345	Research and Development	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 Expenses	357	357	357	357
25	UTILITIES	0	0	0	0	UTILITIES	0	0	0	0
26	Other operating Expenses (Income)	-192	-192	-192	-192	Other operating Expenses (Income)	-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

7. Saving a PowerExcel Slice to the Cloud

You can save PowerExcel Slices so that it becomes accessible to other users who connect to the same PowerExcel model in the Cloud.

To save the PowerExcel Slice:

1. Create or Open a **PowerExcel Slice,** as in the example.

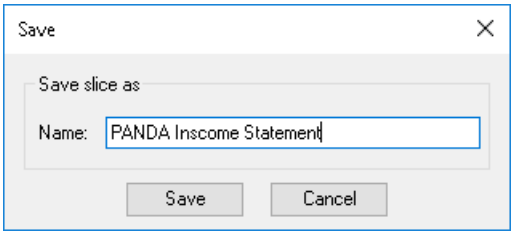


		2021 Method	2021 Amount	2021 Jan	2021 Feb	2021 Mar	2021 Apr	2021 May	2021 Jun	2021 Jul	2021 Aug	2021 Sep	2021 Oct
15	Sales of Goods			15,194	15,194	15,194	15,194	9,240	9,240	9,240	9,240	9,240	9,240
16	Sales of Services			995	995	995	995						
17													
18	**Revenue**			**16,189**	**16,189**	**16,189**	**16,189**	**9,240**	**9,240**	**9,240**	**9,240**	**9,240**	**9,240**
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
21	Cost of Services			80	80	80	80	2,079	2,079	2,079	2,079	2,079	2,079
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**
24													
25	**Gross Profit**			**9,635**	**9,635**	**9,635**	**9,635**	**3,927**	**3,927**	**3,927**	**3,927**	**3,927**	**3,927**
26	*Gross Profit %*			*59.5%*	*59.5%*	*59.5%*	*59.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*	*42.5%*
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
29	Distribution			342	342	342	342	924	924	924	924	924	924
30	Occupancy Expenses			642	642	642	642	231	231	231	231	231	231
31	Research and Development			123	123	123	123	462	462	462	462	462	462
32	Sales and Marketing	Revenue	0.04	(324)	(324)	(324)	(324)	370	370	370	370	370	370
33	Depreciation			696	696	696	696	12	12	12	12	12	12
34	Amortization			66	66	66	66	6	6	6	6	6	6
35	Administrative Expenses			127	127	127	127	231	231	231	231	231	231
36	UTILITIES												
37	Other operating Expenses (Income)			(68)	(68)	(68)	(68)	173	173	173	173	173	173
38													
39	**Operating Expense**			**2,739**	**2,739**	**2,739**	**2,739**	**3,563**	**3,563**	**3,563**	**3,563**	**3,563**	**3,563**
40	*Operating Expense %*			*16.9%*	*16.9%*	*16.9%*	*16.9%*	*38.6%*	*38.6%*	*38.6%*	*38.6%*	*38.6%*	*38.6%*

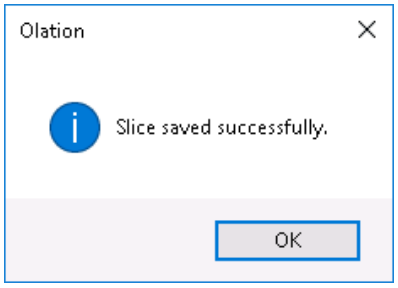
2. Click on a cell containing a PowerExcel reference—e.g., in the example above, the cell containing the **OLAPivotTable** PowerExcel reference.

   Note: You may click on cells containing other PowerExcel references such as OLADatabase, OLACube, OLATableMember, OLATableRange and OLATableSubset or OLAPowerQuery)

3. In the Excel ribbon, go to the **PowerExcel Tab** and click the **Save icon**. The Save (Slice) as dialog appears.



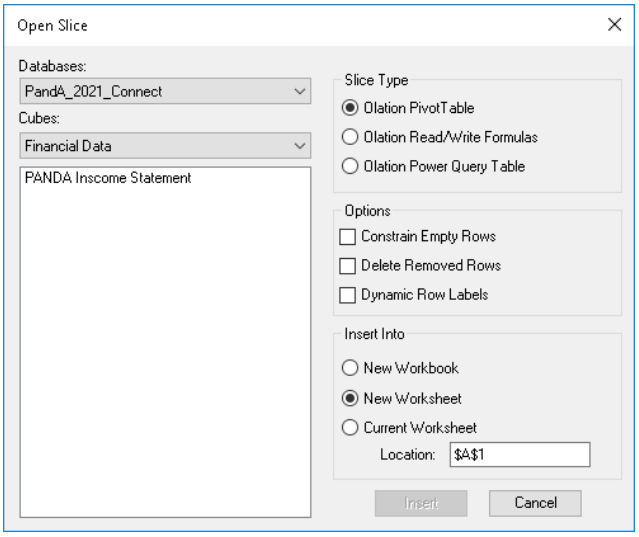
4. Type the <**name of the Slice**>, e.g., **PANDA Income Statement**.
5. Click **Save**. You will see a prompt that says 'Slice saved successfully'.



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, he or she will see it (assuming the same Connection name—in this case, *PandA_2021_Connect*) among the Databases that may be selected from the drop-down, top left. As well, the available Cubes will be shown (here, *Financial Data* is selected). Directly below, the available Slices are listed. By selecting the Slice shown on the previous page, the user can create the PowerExcel Slice by using one of the Slice Types, and insert it into a New Workbook, a New Worksheet or the Current Worksheet in the specified location. (Naturally, the Slice will be the same as the one saved by the last user—as shown in the previous page.)

As such, the next user—indeed, any person working on the collaborative PowerExcel model—may see any Slice that has been saved and in that way be dynamically connected to the most updated data, or contribute budget/forecast figures to a company-wide planning model.

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