

Intro to PivotTables

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Introduction

A **PivotTable** is an interactive table which allows the user to transpose, filter, sort, and aggregate large amounts of data into a single table format. ExcelWriter works with PivotTables in two ways: include a PivotTable in an `ExcelTemplate` template file or manipulate PivotTables programmatically with `ExcelApplication`. This article provides a brief overview on the functionality of PivotTables.



The ability to programmatically manipulate PivotTables was introduced in OfficeWriter 8.4.0.

Data

Data Source

A PivotTable uses a two-dimensional area of cells for a data source. The first row in the data source must contain names for each column of data and the data source must contain at least one row of data. The data can include regular values or formulas, but it must be a continuous area of cells.

Here is an example of a data source for a PivotTable:

	A	B	C	D	E
1	Region	Country	Area	Sales Rep	Sales YTD
2	North America	United States of America	Group A	Pat Feldman	\$ 123,456.78
3	North America	United States of America	Group A	Carly Ciscini	\$ 912,345.67
4	North America	United States of America	Group A	Sam O'Dell	\$ 891,234.56
5	North America	United States of America	Group A	Danielle Shalout	\$ 789,123.45
6	North America	United States of America	Group B	Bradley Minski	\$ 678,912.34
7	North America	United States of America	Group B	Charles Day	\$ 567,891.23
8	North America	United States of America	Group B	Tiffany Manning	\$ 456,789.12
9	North America	Canada	Group A	Casey Jarvis	\$ 345,678.91
10	North America	Canada	Group A	Tony Fontane	\$ 234,567.89
11	North America	Canada	Group B	Ashley Mark	\$ 123,456.78
12	Europe	France	Group A	Lucille Leblanc	\$ 912,345.67
13	Europe	United Kingdom	Group A	Paul Roberts	\$ 891,234.56
14	Europe	United Kingdom	Group A	Hugo Maes	\$ 789,123.45
15	Europe	United Kingdom	Group B	Roy Hawkes	\$ 678,912.34
16	Europe	United Kingdom	Group B	Jennifer Anderson	\$ 567,891.23
17	Europe	Germany	Group A	Edward Havic	\$ 456,789.12
18	Europe	Germany	Group A	Matthew Slade	\$ 345,678.91
19	Europe	Germany	Group B	Alphonse Rockbel	\$ 234,567.89
20	Asia	Japan	Group B	Sakura Watase	\$ 123,456.78
21	Asia	China	Group A	Yi Lok	\$ 912,345.67
22	Asia	China	Group B	Susan Chen	\$ 891,234.56

Pivot Cache

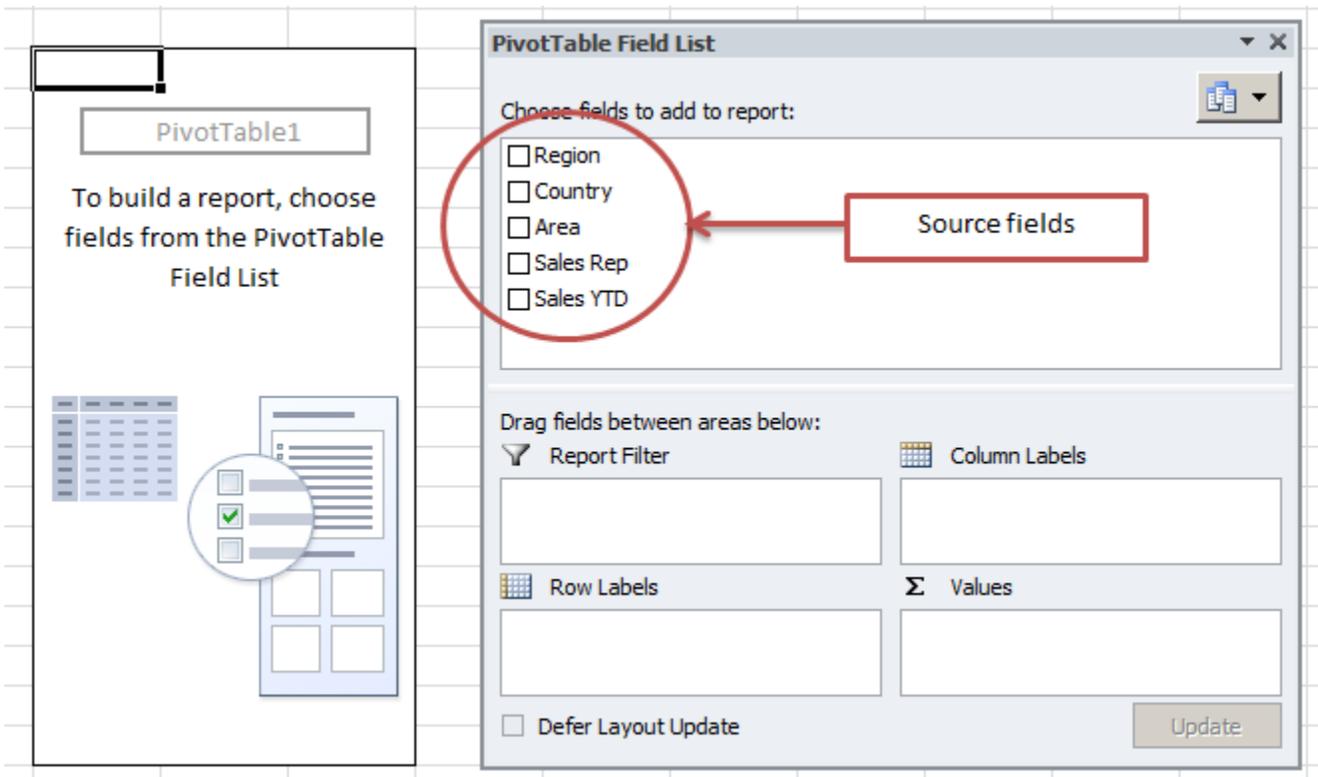
When a PivotTable is created using the data source, a copy of this data is stored in the **pivot cache** or **PivotTable cache**. Multiple PivotTables can use data from the same pivot cache.

PivotTable

After a PivotTable has been created, it is given a default area that is 3 columns wide and 18 rows tall until the **source fields** are used to create additional **PivotTable fields**.

Source Fields

A list of **source fields** is automatically generated based on the column names from the data source. These fields are used for building other types of PivotTable fields, such as report filters, column labels, row labels, or data fields.



PivotTable Options

There are numerous settings that can be applied to a PivotTable. These are available by right-clicking on the PivotTable and going to **PivotTable Options** in Excel. The settings are organized into groups, based on how they affect the PivotTable.

PivotTable Options [?] [X]

Name:

Layout & Format | Totals & Filters | Display | Printing | Data | Alt Text

Layout

Merge and center cells with labels

When in compact form indent row labels: character(s)

Display fields in report filter area:

Report filter fields per column:

Format

For error values show:

For empty cells show:

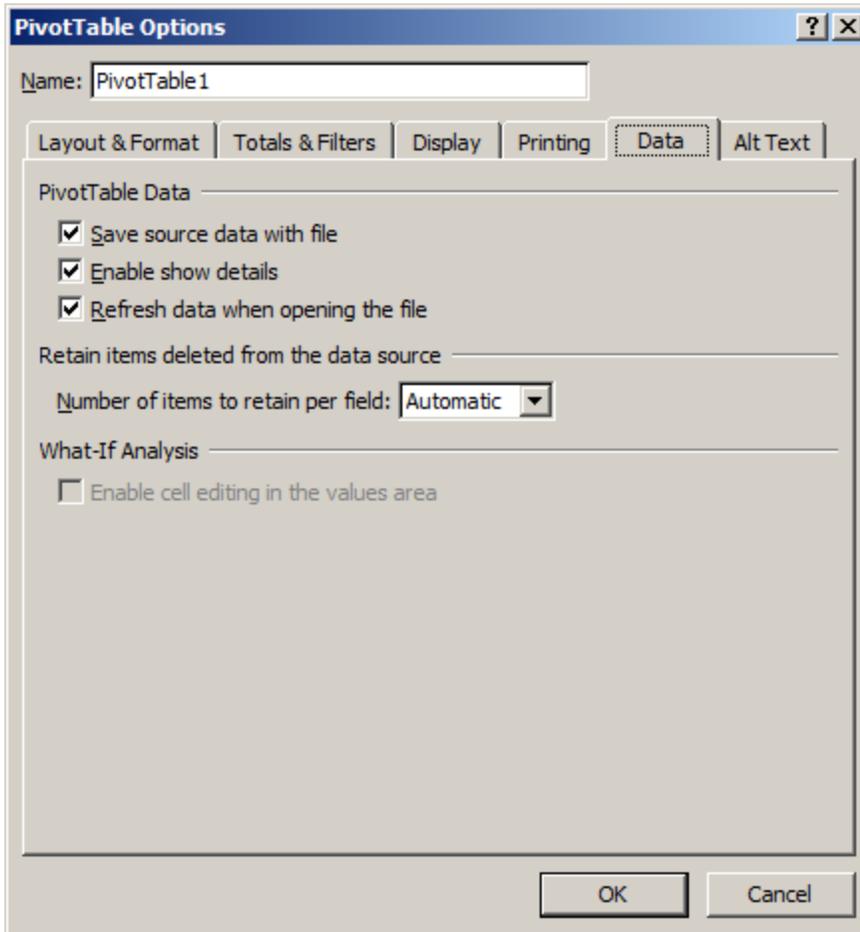
Autofit column widths on update

Preserve cell formatting on update

 In ExcelTemplate, just set these properties on the PivotTable in Excel. In ExcelApplication, these properties are available through `PivotTableSettings`.

 Take special note of the data options, particularly *Refresh data when opening the file* and *Number of items to retain per field*, as they are important for ensuring properly rendered PivotTables in ExcelWriter output.

More details are available in our ExcelTemplate [Templates and PivotTables](#) and ExcelApplication [Creating a Basic PivotTable](#) tutorials.



PivotTable Field

A PivotTable is made up of different **PivotTable fields**, which can perform different actions on data. PivotTable fields are created from source fields. In Excel this is done by dragging a source field into one of the pivot field areas.

Row and Column Label

Row labels and **Column Labels** group the same values together to nest data and display subtotals for different groups. You can use row and column labels to transpose data.

Country	Area	Count of Sales Rep	Sum of Sales YTD	Difference From Canada
Canada	Area A	2	\$580,246.80	
	Area B	1		
	Area C	1	\$123,456.78	
China	Area A	1		
	Area B	1		
	Area C	1	\$123,456.78	
France	Area A	1		
	Area B	1		
	Area C	1		
Germany	Area A	2		
	Area B	1		
	Area C	1		
Japan	Area A	1		
	Area B	1		
	Area C	1		
United Kingdom	Area A	1		
	Area B	1		
	Area C	1		
United States of America	Area A	4		
	Area B	1		
	Area C	1		

You will note that there is a **values label** listed under the column labels. This is a row or column label that is automatically generated whenever there are two or more data fields. These represent the labels for the data fields in the table. This label can be either a row label or a column label and cannot be modified.

Column Labels ▼

Group A			Group B		
Count of Sales Rep	Sum of Sales YTD	Difference From Canada	Count of Sales Rep	Sum of Sales YTD	Difference
2	\$580,215.80		1	\$123,456.78	

Values label as a column label

Column Labels task pane:

- Area: [Dropdown]
- Σ Values** (circled in red)
- Σ Values
- Count of Sales Rep [Dropdown]
- Sum of Sales YTD [Dropdown]
- Difference From Canada [Dropdown]
- Update

Values label as a row label

Row Labels task pane:

- Country [Dropdown]
- Sales Rep [Dropdown]
- Σ Values** (circled in red)
- Defer Layout Update
- Update

	Country	Sales Rep	Σ Values
China	Susan Chen	Count of Sales Rep	
		Sum of Sales YTD	
		Difference From Canada	
	Yi Lok	Count of Sales Rep	
		Sum of Sales YTD	
		Difference From Canada	
China	Count of Sales Rep		\$912,343.67
China	Sum of Sales YTD		\$891,233.56
China	Difference From Canada		\$1,803,577.23

Report Filters (Page Fields)

Report Filters, or **page fields**, provide filtering across the entire PivotTable.

Region (All) ▼

Search

- (All)
- Asia
- Europe
- North America

Region filter values (circled in red)

Drag fields between areas below:

- Report Filter
- Region** (circled in red)
- Row Labels

Data fields

Data fields, or value fields, are used to summarize and aggregate data values with formulas. The values computed from the data fields make up the majority of the PivotTable.

	Group A	Group B
Count of Sale: Sum of Sales	2 \$580,246.00	1 \$123,456.78
rk	1 \$345,678.91	1 \$123,456.78
is	1 \$234,567.89	1 \$123,456.78
ane	1 \$912,345.67	1 \$891,234.56
	\$332,098.87	\$332,098.87
n	1 \$912,345.67	1 \$891,234.56
	\$332,098.87	\$332,098.87
lanc	2 \$802,468.03	1 \$234,567.89
	\$222,221.23	\$222,221.23
Rockbell	1 \$456,789.12	1 \$234,567.89
vic	1 \$345,678.91	1 \$234,567.89
lade	1 \$456,789.12	1 \$234,567.89
	-\$580,246.80	1 \$123,456.78
tase	1 \$789,123.45	1 \$123,456.78
gdon	2 \$1,100,111.21	2 \$1,100,111.21
s	1 \$567,891.23	1 \$567,891.23
nderson	1 \$891,234.56	1 \$678,912.34
rts	1 \$678,912.34	1 \$678,912.34
es	1 \$678,912.34	1 \$678,912.34
ites of A	4 \$2,135,913.66	3 \$2,135,913.66
nski	1 \$567,891.23	1 \$567,891.23
ni	1 \$789,123.45	1 \$789,123.45
yg	1 \$123,456.78	1 \$123,456.78
valout	1 \$891,234.56	1 \$456,789.12
an	1 \$456,789.12	1 \$456,789.12
l	1 \$456,789.12	1 \$456,789.12
nning	1 \$456,789.12	1 \$456,789.12
	12	9

Data fields have different settings for how to aggregate and compute the data. The first of these is **Summarize Values By**, which determines the function used to aggregate the data, for example, Sum, Count, Average, Min, Max etc. The second is **Show Values As**, which allows you to change how the aggregation is display. For example, you can specify that you want to do a sum, but show the values as a percentage of the column total.

Value Field Settings

Source Name: Sales Rep

Custom Name: Count of Sales Rep

Summarize Values By | Show Values As

Summarize value field by

Choose the type of calculation that you want to use to summarize data from the selected field

- Sum
- Count
- Average
- Max
- Min
- Product

Number Format | OK | Cancel

Value Field Settings

Source Name: Sales YTD

Custom Name: Difference From Canada

Summarize Values By | Show Values As

Show values as

Difference From

Base field: Country

Base item: Canada

Number Format | OK | Cancel

Next Steps

Those are the basics of PivotTables. To learn how to use PivotTables with ExcelTemplate, see [Templates and PivotTables](#). To learn how to create or manipulate PivotTables with ExcelTemplate, see [Creating a Basic PivotTable](#) or our [PivotTable API reference](#).