

Power Excel Session II

This Power Excel session will introduce you to PivotTables which are widely considered the most powerful feature in Excel, yet most accounting and financial professionals do not use them in their day-to-day activities. In this series of webinars, you will learn how to build PivotTables, how to group data inside PivotTables – including grouping options for fiscal periods – and how to create user-defined calculations in your PivotTables. You will also learn advanced PivotTable techniques, including how to build PivotTables that consolidate data from multiple data ranges and PivotTables dynamically connected to external databases and financial accounting systems.

If you have been leery of working with PivotTables or have struggled to realize their many benefits, this series of webinars is for you. With a little information, guidance, and coaching, you will be ready to use PivotTables to analyze and report on very large data sets in a fraction of the time you are spending presently to complete such tasks.

Table of Contents

Text Introducing PivotTables	2
What is a PivotTable?	2
Simple PivotTables	4
Grouping and Ungrouping Data	9
Custom Groups.....	11
Pivoting Columns and Rows.....	13
Using Field Settings	16
Updating the Underlying Data	18

Introducing PivotTables

PivotTables are the most powerful feature of Excel, yet few accountants use them in their day-to-day activities. For some, PivotTables are too intimidating; for others, PivotTables are unknown. PivotTables may be challenging at first, but with a little instruction and guidance, they will become part of your regular repertoire for analyzing and reporting financial and operational data. Our coverage will begin with basic PivotTables and progress to more advanced PivotTable topics. Topics covered in this chapter will include creating simple PivotTable reports, rearranging reports in the PivotTable task pane, grouping and custom grouping, ungrouping, drill down to underlying details, and custom data summaries.

What is a PivotTable?

A PivotTable report is an interactive table that automatically extracts, organizes, and summarizes data. A PivotTable report can be used to analyze data — for example, to make comparisons, to detect patterns and relationships, or to uncover trends. PivotTables are extremely useful for summarizing and analyzing large amounts of data efficiently and effectively. For example, an accountant might need to summarize an Excel-based check register into a summary of cash disbursements by month for the purposes of preparing a financial statement. Alternatively, a public practitioner evaluating audit risk may need to summarize all of a client's bill payment checks by vendor and by quarter. In both examples, users would like to be able to drill on the summarized totals in the report to see the detailed transactions that underlie the totals. PivotTables can provide all of this functionality and more, quickly and with computational accuracy.

Excel uses specific terms to identify the elements of a PivotTable report. The main elements, shown in **Figure 1**, are filters¹, values fields, column fields, items, row fields, and the data area.

¹ Filters were known as “page fields” in versions of Excel prior to Excel 2007.

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							
8							
9	Vendor	(All)					
10							
11	Sum of Amount		Quarter				
12	Account	Check Number	Qtr1	Qtr2	Qtr3	Qtr4	Grand Total
13	Beverages		14,620.76	14,630.86	16,476.61	14,706.65	60,434.88
14	Food		72,545.64	70,502.27	69,699.27	75,644.18	288,391.36
15	Insurance		1,281.99	1,281.99	1,521.07	1,640.61	5,725.66
16	Payroll Expense		75,715.47	83,907.75	90,288.01	97,520.26	347,431.49
17	Rent		7,200.00	7,200.00	7,200.00	7,200.00	28,800.00
18	Supplies		4,778.96	6,032.00	5,235.41	5,689.92	21,736.29
19	Utility Expense		5,130.76	7,217.52	7,949.89	5,207.34	25,505.51
20		2184	1,541.68				1,541.68
21		2220	2,156.87				2,156.87
22		2255	1,432.21				1,432.21
23		2285		2,794.58			2,794.58
24		2325		1,301.54			1,301.54
25		2360		3,121.40			3,121.40
26		2385			1,798.33		1,798.33
27		2426			3,297.45		3,297.45
28		2458			2,854.11		2,854.11
29		2504				1,257.14	1,257.14
30		2513				2,156.88	2,156.88
31		2571				1,793.32	1,793.32
32	Grand Total		181,273.58	190,772.39	198,370.26	207,608.96	778,025.19
33							
34							
35							
36							
37							
38							
39							
40							
41							

Figure 1 - Parts of a PivotTable

1. **Filters** are fields from the source data that act as filters in a PivotTable report. Vendor is a report field in **Figure 1**. The vendor field could be used to display data from a single vendor or multiple vendors as required.
2. **Values Fields** are fields from the source data that contain values to be summarized. Amount is a values field in **Figure 1**. For numeric data, users can choose how to summarize the data (sum, average, count). For text data, users can count the number of times a specific text entry, such as Yes or No, appears in a field.
3. **Column Fields** are fields from the source data that are assigned to a column layout. Quarter is a column field in **Figure 1**.
4. **Items** are the subcategories of a row, column, or report filter. In this example, the Account and Cheque Number fields contain these items: Beverages, Food, Insurance, Payroll Expense, Rent, Supplies, Utility Expense with the corresponding cheque number details.
5. **Row Fields** are fields from the source data that are assigned to a row layout in a PivotTable. Account and Cheque Number are row fields in **Figure 1**.
6. The **Data Area** is the range of cells in a PivotTable report that contains summarized data. For example, the value in cell C19 summarizes the total cheques written in Qtr1 for Utility Expense.

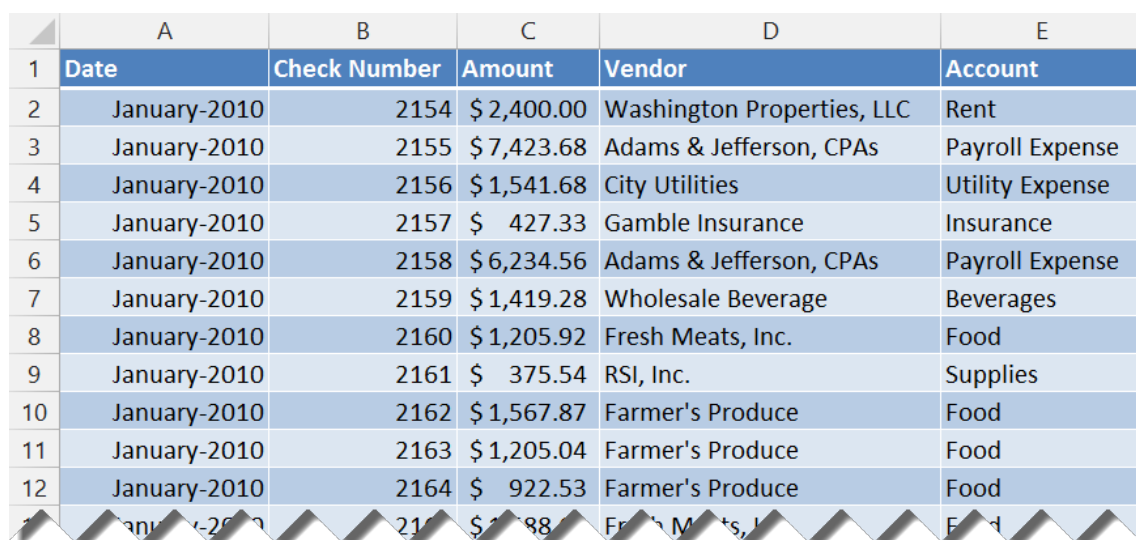
Now that we understand what a PivotTable is and are familiar with the terminology used by Microsoft to describe the various elements of a PivotTable, let's begin our coverage of PivotTables.

Simple PivotTables

A large portion of the productivity and information analysis benefits of using PivotTables is gained with the simplest of PivotTables. In other words, you need not be a PivotTable expert or know how to apply the advanced features of PivotTables in order to take advantage of their power and functionality. *The Law of Diminishing Returns applies!* As our PivotTables become more complex, the amount of learning required to take advantage of their more complex functionality increases. For most analyses, a simple PivotTable that auto-summarizes or auto-tabulates our data will be very effective and will provide all of the power that we need.

The table of data in **Figure 2** contains a check register that a restaurant owner maintained in Excel. Each row in the spreadsheet contains the details of a check written during the year. The spreadsheet contains five columns of data – Date, Check Number, Amount, Vendor, and Account. This data serves as the data source for our initial PivotTable examples.

Our sample data set includes the details of 430 cheques, although other data sets may have thousands, tens of thousands, hundreds of thousands, or even millions of rows, and the data that serves as the foundation of PivotTables need not even reside in Excel. There are no limits on the amount of data that can be used in a PivotTable, but the more data there is to summarize or analyze, the greater the power of PivotTables.



	A	B	C	D	E
1	Date	Check Number	Amount	Vendor	Account
2	January-2010	2154	\$ 2,400.00	Washington Properties, LLC	Rent
3	January-2010	2155	\$ 7,423.68	Adams & Jefferson, CPAs	Payroll Expense
4	January-2010	2156	\$ 1,541.68	City Utilities	Utility Expense
5	January-2010	2157	\$ 427.33	Gamble Insurance	Insurance
6	January-2010	2158	\$ 6,234.56	Adams & Jefferson, CPAs	Payroll Expense
7	January-2010	2159	\$ 1,419.28	Wholesale Beverage	Beverages
8	January-2010	2160	\$ 1,205.92	Fresh Meats, Inc.	Food
9	January-2010	2161	\$ 375.54	RSI, Inc.	Supplies
10	January-2010	2162	\$ 1,567.87	Farmer's Produce	Food
11	January-2010	2163	\$ 1,205.04	Farmer's Produce	Food
12	January-2010	2164	\$ 922.53	Farmer's Produce	Food

Figure 2 - Data for Simple PivotTable Examples

In our first example, we would like to tabulate cash disbursement figures by Account and by Date of expenditure to create a set of financial statements. Our completed PivotTable will have rows for the Account and Date for the columns.

To create a simple PivotTable from our data, do the following.

1. Place the cursor in the data and choose **PivotTable** from the **Insert** tab, as shown in **Figure 3**.

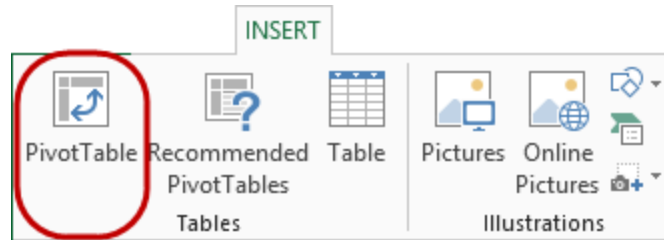


Figure 3 - Select PivotTable from the Insert Tab

2. In the resulting **Create PivotTable** dialog box, shown in **Figure 4**, the data range should already be defined. If not, click the **Collapse Dialog** button and highlight the data range. Make sure that your entire data range is selected, including the field names at the top of the data columns. Select **New Worksheet** and then click **OK**. Note that a Table can serve as a dynamic data range for a PivotTable in the 2007, 2010 and 2013 versions of Excel.

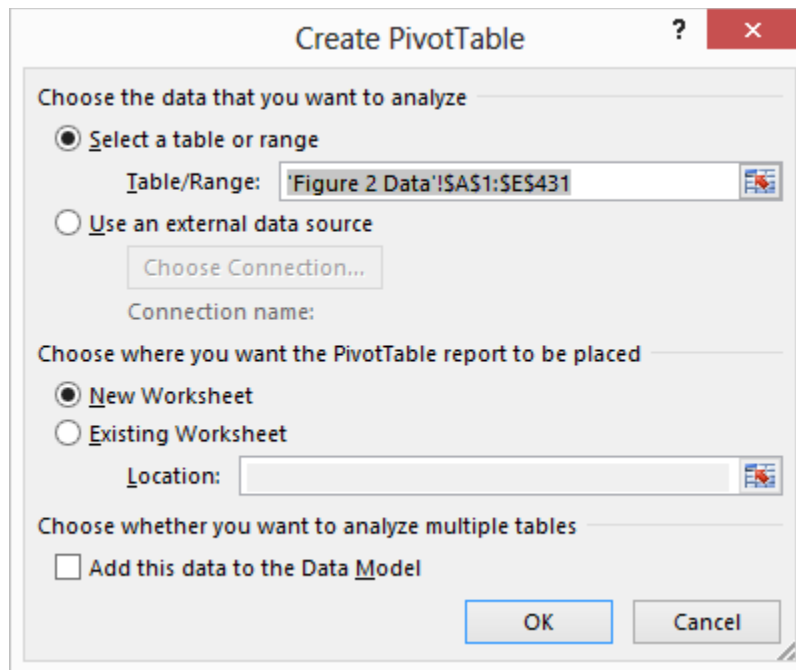


Figure 4 - Highlight the Data Range and Select New Worksheet

3. A new worksheet, like the one shown in **Figure 5**, will be inserted in the workbook. On the left side of the worksheet is a placeholder for the PivotTable report to be created. On the right side is the **PivotTable Task Pane**. The layout of the task pane can be customized to a user's needs by clicking the drop down button in the top right corner of the task pane just below the title bar.

The task pane contains the **PivotTable Field List** at the top and four quadrant boxes into which fields are dragged from the list to create the PivotTable. The quadrants correspond to the four areas of a PivotTable report: Filters, Columns (column fields), Rows (row fields), and Values (data area).



Experienced PivotTable users will recognize Filters as Report Filters or Page Fields in earlier versions of Excel. Filters serve the same function and work exactly as Report Filters or Page Fields.

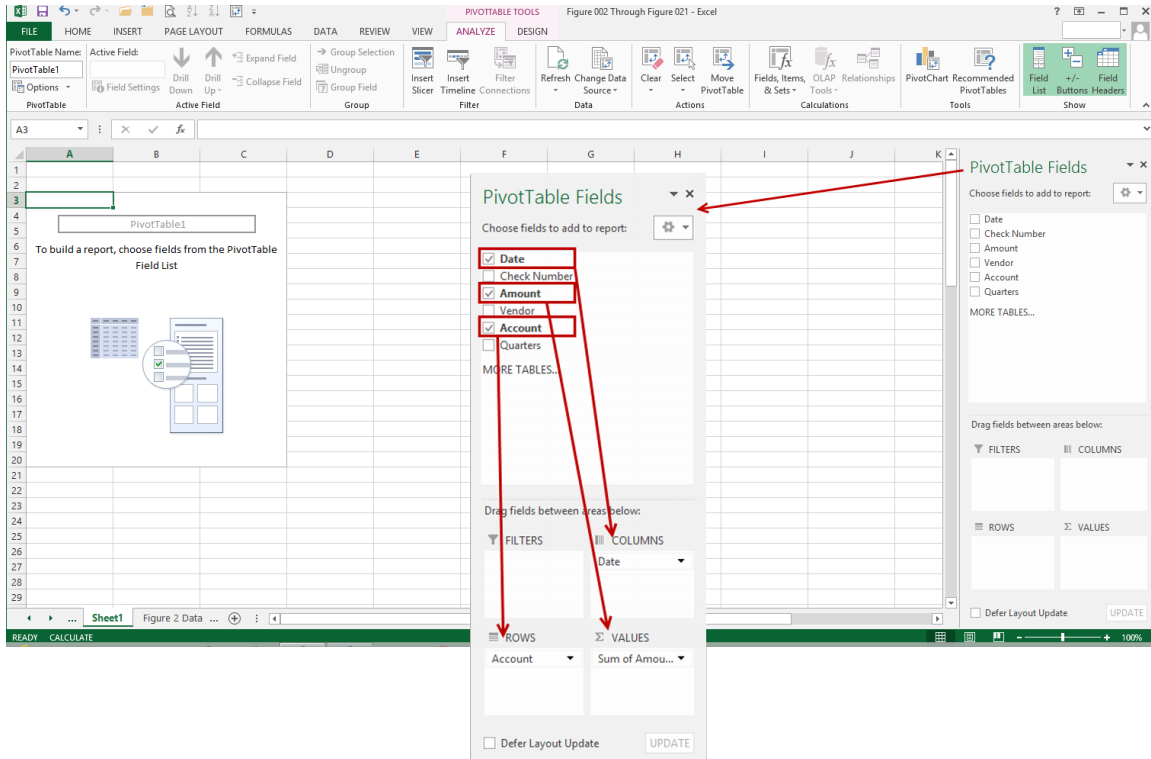


Figure 5 - Creating a PivotTable by Dragging Fields to the Quadrants

- Now, drag each of the fields, in turn, from the field list at the top of the **PivotTable Task Pane** to the report quadrants at the bottom, as shown in **Figure 5**.
- Click on the **Date** field, hold down your left mouse button, drag and point to the **Columns** quadrant, and then release your left mouse button.
- Click on the **Account** field, hold down your left mouse button, drag and point to the **Rows** quadrant, and again release your left mouse button.
- Click on the **Amount** field, hold down your left mouse button, drag and point to the **Values** quadrant, and then release your left mouse button.

We have just created our first PivotTable. **Figure 6** shows the results of our efforts. Note that some of the monthly columns have been removed from the PivotTable for presentation. The table summarizes the raw data into a two-dimensional table with Date across the top and Account down the left margin. Also, note how Excel totaled each row and column automatically.

	A	B	C	D	N
1					
2					
3	Sum of Amount	Column Labels			
4	Row Labels	Jan	Feb	Mar	Grand Total
5	Beverages	5098.91	4448.02	5073.83	60434.88
6	Food	25562.79	23221.12	23761.73	288391.36
7	Insurance	427.33	427.33	427.33	5725.66
8	Payroll Expense	13658.24	32601.41	23201.77	347431.49
9	Rent	2400	2400	2400	28800
10	Supplies	1510.8	1632	1636.16	21736.29
11	Utility Expense	1541.68	2156.87	1432.21	25505.51
12	Grand Total	50199.75	66886.75	57933.03	778025.19

Figure 6 - Simple PivotTable Report Created with a Few Clicks



Creating a PivotTable in the PivotTable Task Pane is only available in the 2007, 2010 and 2013 versions of Excel. In earlier versions, fields were dragged from the Field List to a PivotTable report template to create a report. For experienced users who prefer to use the former method, a setting can be changed in PivotTable Options to allow the method. Right-click on an existing PivotTable or PivotTable placeholder and select **PivotTable Options**. In the **PivotTable Options** dialog box, select **Classic PivotTable Layout** on the **Display** tab. This setting can also be modified from the **PivotTable Tools** contextual tab.

Since even the simplest PivotTable reports provide a significant proportion of the power of PivotTables, let's investigate a few report formatting techniques before we examine more powerful features.

First, turn off the field headers in the report for presentation. Click **Field Headers** on the **PivotTable Tools, Analyze** tab to turn off the headers, as shown in **Figure 7**. Next, rename the **Sum of Amount** label by typing the desired label into the cell. Simply click in the cell containing the label **Sum of Amount** and enter **Expenditures**.

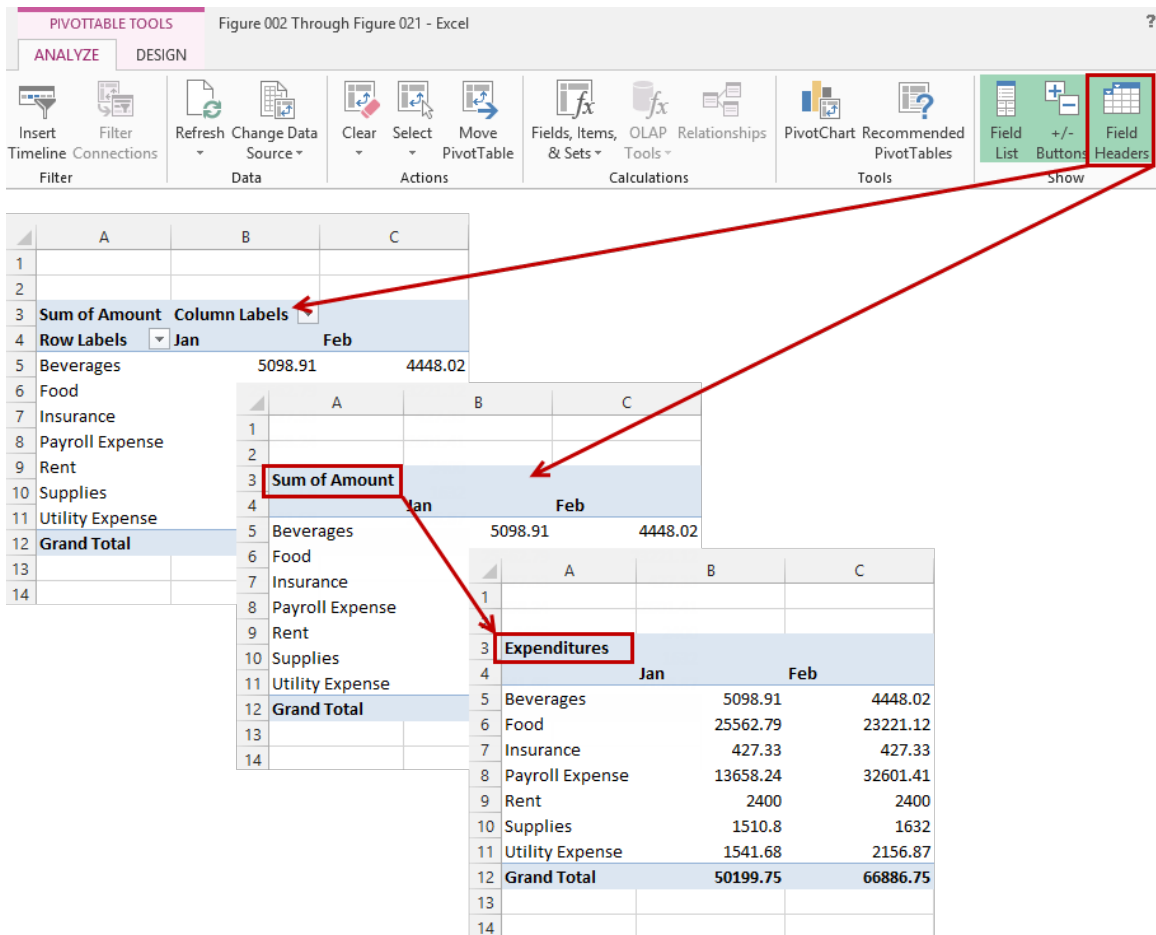


Figure 7 - Hiding the Field Headers and Entering a Descriptive Label for Presentation

Cells in a PivotTable can be formatted for printing and display just as with any other cell or range of cells. In our example PivotTable, the values in the report need to be formatted with the Accounting format with zero decimals and without dollar signs. The first and total rows of the values need to be formatted with dollar signs for presentation.

Excel also has a large number of built-in visual styles with which to format PivotTables automatically. These styles, available in the **PivotTables Styles** gallery on the **PivotTable Tools, Design** contextual tab, contain a wide variety of colors and formatting for the table, table headers, and total and subtotal rows. **Figure 8** shows our PivotTable report with the values formatted as dollars and one of the built-in styles applied.

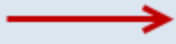
	A	B	C	N
1				
2				
3	Expenditures 			
4		Jan	Feb	Grand Total
5	Beverages	\$ 5,099	\$ 4,448	\$ 60,435
6	Food	25,563	23,221	288,391
7	Insurance	427	427	5,726
8	Payroll Expense	13,658	32,601	347,431
9	Rent	2,400	2,400	28,800
10	Supplies	1,511	1,632	21,736
11	Utility Expense	1,542	2,157	25,506
12	Grand Total	\$ 50,200	\$ 66,887	\$ 778,025

Figure 8 - PivotTable with Accounting Format and Style Applied

Subtotals and grand totals can be added or removed, as well as row and column banding (which use shading so that data points in rows or columns are easily identified), using buttons and check boxes accessible on the **PivotTable Tools, Design** contextual tab.

Excel also provides three built-in report layouts – **Compact**, **Outline**, and **Tabular** – that alter the way the report is displayed. The Compact form, which is the default, displays multiple row fields in a single expandable and collapsible column. Field names are hidden on the report. The Tabular form is the familiar PivotTable layout that experienced users have been utilizing for years. Multiple row fields are displayed in multiple columns, and the worksheet grid is visible. The Outline form is similar to the Tabular form, but the worksheet grid is not visible in the report. All of the layouts are available from the **PivotTable Tools, Design** contextual tab.

Grouping and Ungrouping Data

Now, let's examine some of the power of PivotTables. To calculate and display quarterly totals for each of the accounts, simply group the months into quarters. Position the cursor in a cell containing one of the monthly column headings, such as **January**. Right-click and choose **Group** to open the **Grouping** dialog box. In the **By** box, click **Quarters**, so that **Months** and **Quarters** are highlighted, as shown in **Figure 9**. Click **OK** to complete the task.

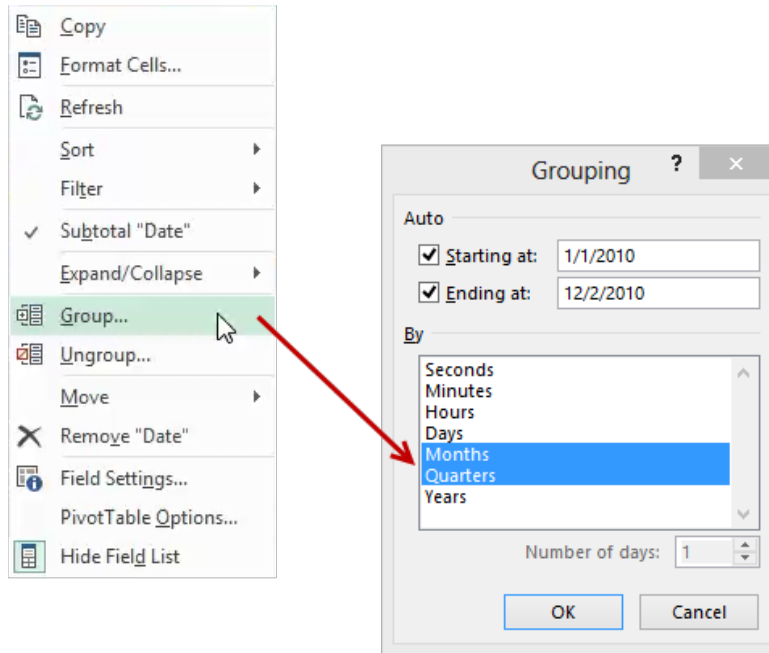


Figure 9 - Grouping Months into Quarters

Turn off the field headers for presentation. On the **PivotTable Tools, Analyze** contextual tab, click on **Field Headers**. Next, position the cursor in a cell containing one of the quarterly column headings, such as **Qtr1**. Right-click on the cell and from the context-sensitive menu, select **Subtotal "Quarters"** to add a quarterly subtotal following each calendar year quarter. The initial results are shown in **Figure 10**. For presentation purposes, only the first two quarters are shown.

	A	B	C	D	E	F	G	H	I
1									
2									
3	Expenditures								
4		Qtr1			Qtr1 Total	Qtr2			Qtr2 Total
5		Jan	Feb	Mar		Apr	May	Jun	
6	Beverages	\$ 5,099	\$ 4,448	\$ 5,074	\$ 14,621	\$ 4,967	\$ 4,903	\$ 4,761	\$ 14,631
7	Food	25,563	23,221	23,762	72,546	24,076	22,817	23,609	70,502
8	Insurance	427	427	427	1,282	427	427	427	1,282
9	Payroll Expense	13,658	32,601	23,202	69,461	33,903	27,834	28,425	90,162
10	Rent	2,400	2,400	2,400	7,200	2,400	2,400	2,400	7,200
11	Supplies	1,511	1,632	1,636	4,779	2,076	2,219	1,737	6,032
12	Utility Expense	1,542	2,157	1,432	5,131	2,795	1,302	3,121	7,218
13	Grand Total	\$ 50,200	\$ 66,887	\$ 57,933	\$ 175,020	\$ 70,644	\$ 61,901	\$ 64,481	\$ 197,026

Figure 10 - Results of Grouping Months into Quarters

Again, position the cursor in a cell containing one of the quarterly column headings, such as **Qtr1**. Right-click on the cell and from the context-sensitive menu, select **Expand/Collapse, Collapse Entire Field**. Months are collapsed into Quarters, and all of the totals now reflect quarterly totals as shown in **Figure 11**. Detail can be shown or hidden for a single group or an entire field from the context-sensitive menu.

	A	B	C	D	E	F
1						
2						
3	Expenditures					
4		± Qtr1	± Qtr2	± Qtr3	± Qtr4	Grand Total
5						
6	Beverages	\$ 14,621	\$ 14,631	\$ 16,477	\$ 14,707	\$ 60,435
7	Food	72,546	70,502	69,699	75,644	288,391
8	Insurance	1,282	1,282	1,521	1,641	5,726
9	Payroll Expense	69,461	90,162	90,288	97,520	347,431
10	Rent	7,200	7,200	7,200	7,200	28,800
11	Supplies	4,779	6,032	5,235	5,690	21,736
12	Utility Expense	5,131	7,218	7,950	5,207	25,506
13	Grand Total	\$ 175,020	\$ 197,026	\$ 198,370	\$ 207,609	\$ 778,025

Figure 11 - Monthly Data Grouped into Quarters

To see the detail records that underlie any of the cells, just double-click on the cell of interest. Excel will insert a new sheet containing the detail observations that created the cell contents. For example, if a user clicked on cell D8, which contains an Insurance expense total of \$1,521.07 in our sample PivotTable, Excel would display the underlying detail as shown in **Figure 12**. Note that the data is presented in *Table* form and format, which makes it easy to filter and analyze.

	A	B	C	D	E
1	Date ▾	Check Number ▾	Amount ▾	Vendor ▾	Account ▾
2	7/1/2010	2363	427.33	Gamble Insurance	Insurance
3	8/1/2010	2405	546.87	Gamble Insurance	Insurance
4	9/1/2010	2435	546.87	Gamble Insurance	Insurance

Figure 12 - Drilling to Detail from a PivotTable

Custom Groups

In the example PivotTable, data items were summarized using built-in groups, such as when months were grouped into quarters. However, Excel allows data to be grouped using user-defined groups. To accomplish this task, first highlight the items to be grouped together. Then, right-click and select **Group** from the context-sensitive menu.

In the example PivotTable, we would like to group the accounts into two classifications for financial statement presentation – *Cost of Goods Sold* and *Operating Expenses*. Food and Beverages make up the Cost of Goods Sold group, while all other items make up the Operating Expenses group. To create the groups, click on **Beverages**, hold down the **CTRL** key, and then click **Food**. Next, right-click and choose **Group** from the context-sensitive menu. This combines the first two accounts into a single group entitled **Group1**. Rename the **Group1** label to **Cost of Goods Sold** to complete the first group, as shown in **Figure 13**; to rename the label, simply type over it with the desired text.

	A	B	C	D	E	F
1						
2						
3	Expenditures	Calibri	11	A	\$	%
4		B	I			
5						
6	Beverages	\$ 14,621	\$ 14,631	\$ 16,477	\$ 14,707	\$ 60,435
7	Food					
8	Insurance					
9	Payroll Expense					
10	Rent					
11	Supplies					
12	Utility Expense					
13	Grand Total					
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

	A	B	C	D	E	F
1						
2						
3	Expenditures					
4		Qtr1	Qtr2	Qtr3	Qtr4	Grand Total
5						
6	Group1					
7	Beverages	\$ 14,621	\$ 14,631	\$ 16,477	\$ 14,707	\$ 60,435
8	Food	72,546	70,502	69,699	75,644	288,391
9	Insurance					
10	Insurance					
11	Payroll Expense					
12	Payroll Expense					
13	Rent					
14	Rent					
15	Supplies					
16	Supplies					
17	Utility Expense					
18	Utility Expense					
19	Grand Total					

	A	B	C	D	E	F
1						
2						
3	Expenditures					
4		Qtr1	Qtr2	Qtr3	Qtr4	Grand Total
5						
6	Cost of Goods Sold					
7	Beverages	\$ 14,621	\$ 14,631	\$ 16,477	\$ 14,707	\$ 60,435
8	Food	72,546	70,502	69,699	75,644	288,391
9	Insurance					
10	Insurance	1,282	1,282	1,521	1,641	5,726
11	Payroll Expense					
12	Payroll Expense	69,461	90,162	90,288	97,520	347,431
13	Rent					
14	Rent	7,200	7,200	7,200	7,200	28,800
15	Supplies					
16	Supplies	4,779	6,032	5,235	5,690	21,736
17	Utility Expense					
18	Utility Expense	5,131	7,218	7,950	5,207	25,506
19	Grand Total	\$175,020	\$197,026	\$198,370	\$207,609	\$778,025

Highlight Beverages and Food.
 Right-click and choose Group to create
 the Custom Group.
 Rename the Custom Group from "Group
 1" to "Cost of Goods Sold"

Figure 13 - Grouping Accounts into Account Groups

Repeat the steps for the remaining group, Operating Expenses. To complete the PivotTable, add subtotals for both of the groups. Position the cursor in a cell containing one of the group row headings, such as **Cost of Goods Sold**. Right-click on the cell and from the context-sensitive menu, select **Subtotal "Account2"** to add a subtotal for the group. The completed report should resemble the one shown in **Figure 14**.

	A	B	C	D	E	F
1						
2						
3	Expenditures					
4		⊕ Qtr1	⊕ Qtr2	⊕ Qtr3	⊕ Qtr4	Grand Total
5						
6	⊖ Cost of Goods Sold	\$ 87,166	\$ 85,133	\$ 86,176	\$ 90,351	\$ 348,826
7	Beverages	14,621	14,631	16,477	14,707	60,435
8	Food	72,546	70,502	69,699	75,644	288,391
9	⊖ Operating Expenses	\$ 87,853	\$ 111,893	\$ 112,194	\$ 117,258	\$ 429,199
10	Insurance	1,282	1,282	1,521	1,641	5,726
11	Payroll Expense	69,461	90,162	90,288	97,520	347,431
12	Rent	7,200	7,200	7,200	7,200	28,800
13	Supplies	4,779	6,032	5,235	5,690	21,736
14	Utility Expense	5,131	7,218	7,950	5,207	25,506
15	Grand Total	\$ 175,020	\$ 197,026	\$ 198,370	\$ 207,609	\$ 778,025

Figure 14 - PivotTable with Account Groups and Subtotals



Note that the default field name, **Account2**, given by Excel to the account group can be renamed in **Field Settings**. Right-click on any one of the group labels and select **Field Settings** from the context-sensitive menu. In the **Field Settings** dialog box, type the desired field name, such as Account Group, in the **Custom Name** box and click **OK**.

Also, note that the default Compact layout puts group subtotals at the top of the group on the same line with the group name. If subtotals are desired at the bottom of each group, select **Subtotals, Show All Subtotals at Bottom of Group** on the **PivotTable Tools, Design** contextual tab. Alternatively, right-click on any one of the group labels and select **Field Settings**. In the **Field Settings** dialog box on the **Layout & Print** tab, uncheck **Display subtotals at the top of each group** and click **OK**.

Any items within a field may be custom grouped to form another field. Custom grouping may also be necessary when built-in groups are not consistent with a company's practices. For example, when grouping months into quarters, the built-in groups use a calendar year to define the quarters. If a company uses a fiscal year other than a calendar year, custom grouping of months into quarters will be necessary.

Pivoting Columns and Rows

The summarized table can be rearranged, or pivoted, to show the data from any perspective. Along with the ability to group or ungroup data, being able to immediately rearrange the table is among the most powerful features of PivotTables. For example, if users wanted to display Accounts as the columns and Quarterly Totals as the rows, they would simply rearrange the rows and columns by dragging and dropping the fields in the quadrant boxes.

1. Position the cursor in the PivotTable report to display the **PivotTable Task Pane**. In the field list at the top of the task pane, uncheck **Date** and **Account Group** to remove them from the report. Click on **Quarters** and drag it into the **Rows** quadrant and drop it below **Account**. This has the effect of reporting Quarters within Accounts, as shown in **Figure 15**.

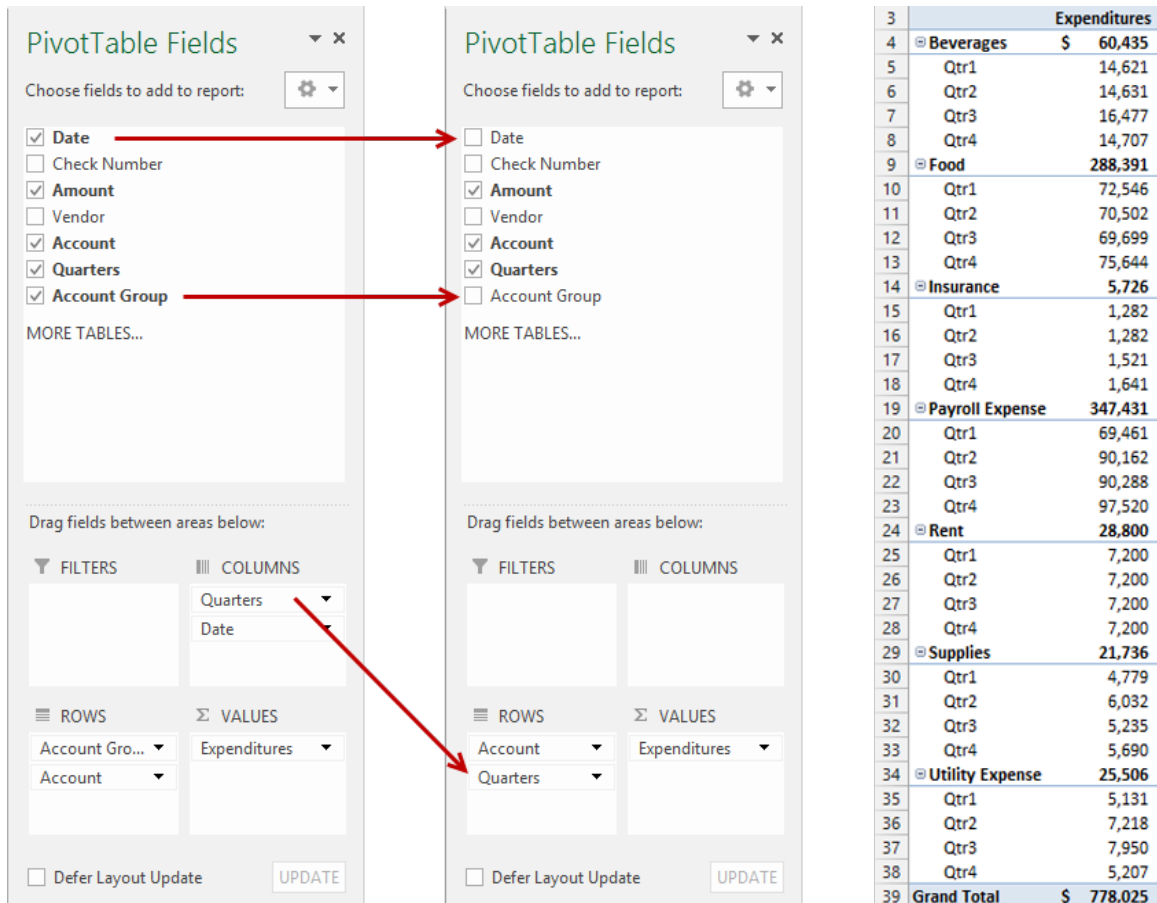
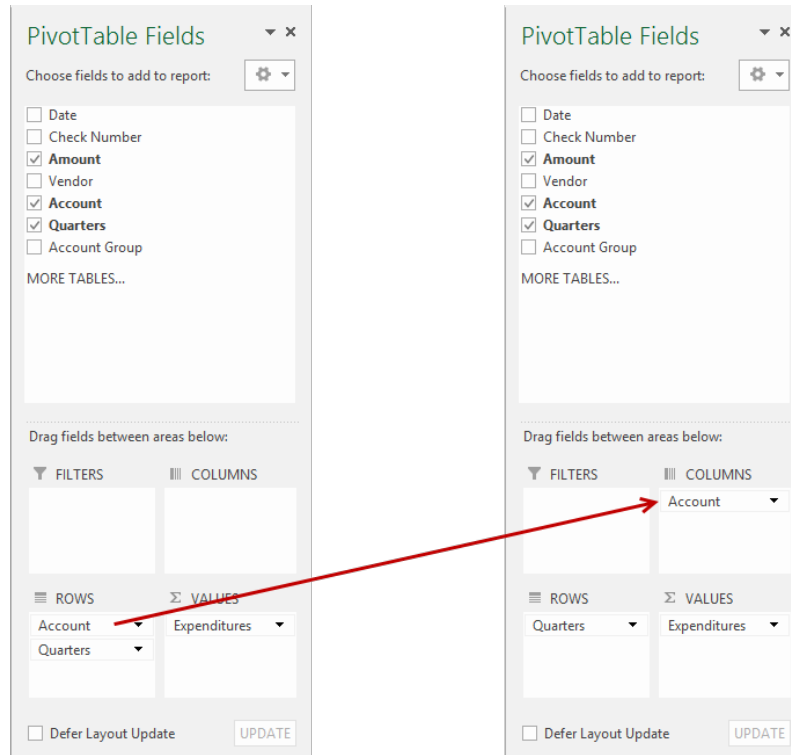


Figure 15 - Dragging Fields in the PivotTable Task Pane to Rearrange a Report

2. Now, click on **Account** and drag-and-drop it into the **Columns** quadrant. This rearranges the report so that Accounts are the columns, and Quarters are the rows, as shown in **Figure 16**.



	A	B	C	D	E	F	G	H	I
1									
2									
3	Expenditures								
4		Beverages	Food	Insurance	Payroll Expense	Rent	Supplies	Utility Expense	Grand Total
5	Qtr1	\$ 14,621	\$ 72,546	\$ 1,282	\$ 69,461	\$ 7,200	\$ 4,779	\$ 5,131	\$ 175,020
6	Qtr2	14,631	70,502	1,282	90,162	7,200	6,032	7,218	197,026
7	Qtr3	16,477	69,699	1,521	90,288	7,200	5,235	7,950	198,370
8	Qtr4	14,707	75,644	1,641	97,520	7,200	5,690	5,207	207,609
9	Grand Total	\$ 60,435	\$ 288,391	\$ 5,726	\$ 347,431	\$ 28,800	\$ 21,736	\$ 25,506	\$ 778,025

Figure 16 - Completing the Drag-and-Drop Rearrangement of a Report

To review, we are simply dragging the field buttons to different quadrants in the PivotTable Task Pane in order to rearrange the report. We can view a report with Month and/or Quarters across the columns and Accounts as the rows, or Accounts as the columns and Months and/or Quarters as the rows, Months within Accounts, or Accounts within Months, etc. The number of ways that we can view a PivotTable is limited only by the number of fields that we have to display and our imagination.

At first glance, the power of PivotTables to reduce the time and tedium of preparing routine reports is significant. However, the real power of PivotTables is not clerical; it is the added ability they provide to view data from different perspectives. By viewing data from different perspectives, PivotTables increase the probability of uncovering relationships in the data that were previously unknown and of exploiting these relationships on behalf of our company or our clients. Now, that's analytical power!

Using Field Settings

In our PivotTable examples above, the individual data elements were summed to produce the report. By changing field settings, we can display the average amount in each cell, the minimum or maximum amounts, or the variance or standard deviation of the amount distribution, etc. Field Settings are accessible in any of three ways:

- 1) Right-click on a field label and select **Field Settings** or **Value Field Settings** from the context-sensitive menu;
- 2) Position the cursor in a cell containing a field label or value and select **Field Settings** from the **PivotTable Tools, Analyze** contextual tab; or
- 3) Click the drop-down arrow of any field button in a quadrant box on the PivotTable Task Pane and select **Field Settings** or **Value Field Settings** from the menu.

To change the summary function for any value field, open the **Value Field Settings** dialog box using any of the described methods. In the **Summarize Values By** box, select the function to use in summarizing the field's values. To summarize the selected field by calculating averages, select **Average**, as shown in **Figure 17**.

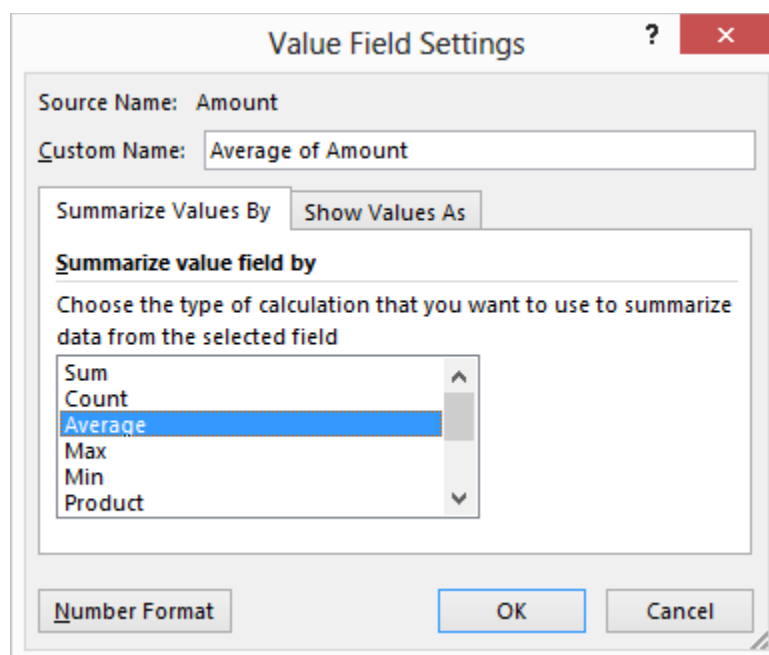


Figure 17 - Changing the Summary Function for a Value Field

In the next example, a PivotTable report that displays four columns, one each for the total annual expenditures by account, the average expenditure by account, and the minimum and maximum expenditure by account, will be created. Since the statistics are calculated on expenditure data, the amount field must be dragged to the **Values** quadrant four times, once for each summary column to be displayed.

The Value Field Settings (field name and summary function) for each field are then modified, in turn, to reflect the appropriate calculation. **Figure 18** illustrates this process and the finished report.

The figure illustrates the process of creating a multicolumn PivotTable. It shows the PivotTable Fields task pane, the Value Field Settings dialog box, and the resulting PivotTable report.

PivotTable Fields Task Pane:

- Choose fields to add to report:
 - ☐ Date
 - ☐ Check Number
 - ☒ Amount
 - ☐ Vendor
 - ☒ Account
 - ☐ Quarters
 - ☐ Account Group
- MORE TABLES...
- Drag fields between areas:
 - FILTERS:**
 - ROWS:** Account
 - VALUES:** Sum of Amount3
- Context menu for 'Sum of Amount3':
 - Move Up
 - Move Down
 - Move to Beginning
 - Move to End
 - Move to Report Filter
 - Move to Row Labels
 - Move to Column Labels
 - Move to Values
 - Remove Field
 - Value Field Settings...

Value Field Settings Dialog Box:

- Source Name: Amount
- Custom Name: Max
- Summarize Values By: Show Values As
- Summarize value field by:
 - Sum
 - Count
 - Average
 - Max
 - Min
 - Product
- Buttons: Number Format, OK, Cancel

PivotTable Report:

	A	B	C	D	E
1					
2					
3		Expenditures	Mean	Min	Max
4	Beverages	\$ 60,435	\$ 1,233	\$ 814	\$ 1,586
5	Food	288,391	1,182	802	1,596
6	Insurance	5,726	477	427	547
7	Payroll Expense	347,431	6,681	5,448	8,702
8	Rent	28,800	2,400	2,400	2,400
9	Supplies	21,736	444	307	600
10	Utility Expense	25,506	2,125	1,257	3,297
11	Grand Total	\$ 778,025	\$ 1,809	\$ 307	\$ 8,702

Figure 18 - Creating a Multicolumn PivotTable to Display Expenditure Statistics

Let's add another column to our report. In this final example, the CFO would like to have a column that displays the total expenditures by account as a percentage of total expenditures. Since the column is to summarize account data, the **Amount** field must be dragged to the **Values** quadrant area once again, a fifth time. Right-click on its column heading and select **Value Field Settings**. Click on the **Show Values As** tab, and, in the **Show Values As** drop-down list, select **% of Column Total** and click **OK**. Type in **Percent** as the new column heading and then adjust the column widths to complete the PivotTable report, as shown in **Figure 19**.

PivotTable Fields

Choose fields to add to report:

- ☐ Date
- ☐ Check Number
- ☒ Amount
- ☐ Vendor
- ☒ Account
- ☐ Quarters
- ☐ Account Group

MORE TABLES...

Drag fields between areas below:

FILTERS

COLUMNS

VALUES

Account

Expenditures

Sum of Amount

Mean

Min

Max

☐ Defer Layout Update

Value Field Settings

Source Name: Amount

Custom Name: **Percent**

Summarize Values By: Show Values As

Show values as

% of Column Total

Base field:

Base item:

Number Format

OK

Cancel

	A	B	C	D	E	F
1						
2						
3		Expenditures	Percent	Mean	Min	Max
4	Beverages	\$ 60,435	7.77%	\$ 1,233	\$ 814	\$ 1,586
5	Food	288,391	37.07%	1,182	802	1,596
6	Insurance	5,726	0.74%	477	427	547
7	Payroll Expense	347,431	44.66%	6,681	5,448	8,702
8	Rent	28,800	3.70%	2,400	2,400	2,400
9	Supplies	21,736	2.79%	444	307	600
10	Utility Expense	25,506	3.28%	2,125	1,257	3,297
11	Grand Total	\$ 778,025	100.00%	\$ 1,809	\$ 307	\$ 8,702

Figure 19 - Using Percentage of Column to Display Amounts for Each Account as a Percentage of Total Expenditures

Updating the Underlying Data

Whenever data is changed, updated, or added to the underlying data table, a user must refresh the PivotTable to see the changes reflected in the report. Position the cursor anywhere in the table, right-click, and choose **Refresh** from the context-sensitive menu. Alternatively, click the **Refresh** button on the **PivotTable Tools, Analyze** contextual tab. Note that it is best practice to always refresh a PivotTable after rearranging a complex report.

If data is added or removed from the data range and the size of the range changes, then users may have to modify the data range. If the data range is an Excel table, no action is necessary. A table is a dynamic range that readjusts its dimensions automatically as data is added or removed. Similarly, if the data range is a named dynamic range, no action is necessary. (Tables and named dynamic ranges are discussed in chapter two.) However, if the data range is an ordinary range specified using cell references, the data range must be adjusted. To adjust the data range, position the cursor in the PivotTable report. On the **PivotTable Tools, Analyze** contextual tab, click **Change Data Source**. In the **Change PivotTable Data Source** dialog box, specify the new data range and click **OK**. The existing PivotTable will be updated to reflect the new data.