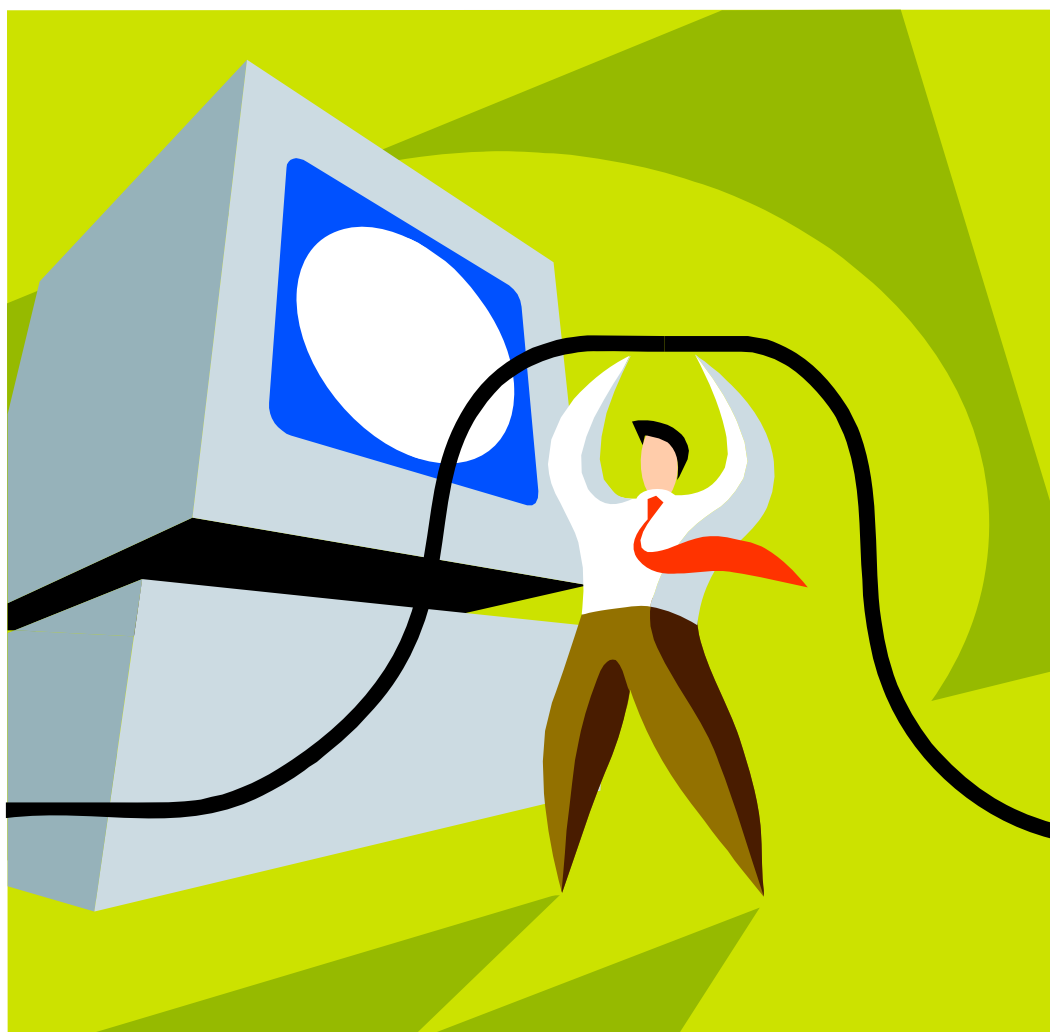


Office Productivity Series



Pivot Tables in Excel

PivotTable Reports 101 for Excel

Let's suppose you've compiled a large list of data — for example, sales figures for every product your company makes. But now you're ready to extract some meaningful information from the data. For example, you might want to answer the following questions:

- What are the total sales for each product by region?
- Which products are selling best over time?
- Who is your highest-performing salesperson?

For these and other questions, you can create a PivotTable[®] report — an interactive table that automatically extracts, organizes, and summarizes your data. You can then use the report to analyze the data — for example, make comparisons, detect patterns and relationships, and analyze trends.

For example, you can use this source data ...

	A	B	C	D	E	F	G
1	Month	Year	Type	Salesperson	Sales	Units	Region
2	Jan	2003	Dairy	Dodsworth	2686	5611	West
3	Jan	2003	Beverages	Davolio	8725	6890	North
4	Jan	2003	Produce	Buchanan	6715	2652	South
5	Jan	2003	Dairy	Suyama	4356	5636	East
6	Jan	2003	Meat	Suyama	9662	3400	North
7	Jan	2003	Produce	Davolio	1328	2861	West
8	Feb	2003	Beverages	Buchanan	3571	5178	South
9	Feb	2003	Dairy	Dodsworth	6758	7817	South
10	Feb	2003	Beverages	Buchanan	4953	5889	West
11	Feb	2003	Meat	Davolio	4923	124	South
12	Feb	2003	Meat	Suyama	2666	744	West
13	Feb	2003	Produce	Buchanan	1450	234	West

... to create a PivotTable report that shows how each product is selling in each sales region.

	A	B	C	D	E	F
1	Sum of Sales	Type				
2	Region	Beverages	Dairy	Meat	Produce	Grand Total
3	East	35,233	39,444	33,406	28,675	136,758
4	North	51,832	63,418	17,062	26,799	159,111
5	South	30,172	27,889	58,025	39,074	155,160
6	West	40,392	44,110	8,435	36,466	129,403
7	Grand Total	157,629	174,861	116,928	131,014	580,432

Read on to discover what you can do with a PivotTable report.

Summarize and analyze your data

To see the "big picture" of your data you can use a PivotTable report to summarize and analyze the data. You can control how Microsoft Excel 2002 summarizes the data — for example, by sum, average, or count — without entering a single formula.

Add or remove data

Not quite enough information in your PivotTable report? For example, maybe you want to include sales figures broken down by salesperson. You can easily add or remove categories of data.

For example, add the Salesperson field:

	A	B	C	D	E
1	Sum of Sales	Type	Salesperson		
2		Beverages			
3	Region	Buchanan	Davolio	Dodsworth	Suyama
4	East	1,132	13,781	4,097	16,223
5	North	9,116	14,186	6,481	22,049
6	South	3,571	6,711	13,850	6,040
7	West	12,066	16,977	7,782	3,567
8	Grand Total	25,885	51,655	32,210	47,879

Quickly Rearrange the Layout

Not satisfied with the layout of your PivotTable report? For example, maybe you'd prefer to display the salesperson information in rows instead of in columns. The interactive nature of your PivotTable report lets you literally turn the table: you can easily move (or "pivot") the rows and columns to view different summaries of the data.

For example, you can move the Salesperson field so it appears down the rows instead of across the columns.

	A	B	C	D	E	F
1	Sum of Sales		Type			
2	Region	Salesperson	Beverages	Dairy	Meat	Produce
3	East	Buchanan	1,132	9,136	16,191	
4		Davolio	13,781	22,953	1,441	12,599
5		Dodsworth	4,097		8,118	9,996
6		Suyama	16,223	7,355	7,656	6,080
7	East Total		35,233	39,444	33,406	28,675

View a subset of the data

Want to filter the data so you can view a manageable chunk at a time? To do this, you can use a page field to break the PivotTable report into separate "pages." Each page contains a subset of the data that's summarized in the PivotTable report.

For example, you can add a page field for the Year category. That way, you can view sales data for an individual year (such as 2003), or for all years combined.

	A	B	C	D	E
1	Year	2003			
2					
3	Sum of Sales		Type		
4	Region	Salesperson	Beverages	Dairy	Meat
5	East	Buchanan	1,132		16,191
6		Davolio	8,334	14,474	1,441
7		Dodsworth	1,898		
8		Suyama	7,538	4,356	265
9	East Total		18,902	18,830	17,897
10	North	Buchanan	3,522	4,562	
11		Davolio	8,725	9,291	

Are there other reasons to use page fields? If your PivotTable report contains many fields, you can use page fields to keep your report compact and readable. Or, if you're retrieving data from some types of large external databases, you can add and then set up page fields so that they limit the amount of data retrieved at a time. That way, you can avoid long waits and memory problems.

Show just the details you want

Want to zero in on specific details in a PivotTable report? You can display or hide items in a row or column field — for example, specific products or salespeople. You can also display or hide details about items in row or column fields.

For example, in the Type field, you can hide all product items except beverages:

	A	B	C	D
1	Sum of Sales		Type ▼	
2	Region ▼	Salesperson ▼	Beverages	Grand Total
3	East	Buchanan	1,132	1,132
4		Davolio	13,781	13,781
5		Dodsworth	4,097	4,097
6		Suyama	16,223	16,223
7	East Total		35,233	35,233

Step 1: Prepare the source data

You're probably anxious to get started on your first PivotTable report. But before you begin, it's a good idea to make sure your data is well organized and ready to go.

In this section, you'll learn what kinds of data you can use to create a PivotTable report, and what you need to do to prepare it. Once you've prepared the data you can create the PivotTable report by using the PivotTable and PivotChart Wizard. In the wizard, you'll actually choose the source data. (You can choose data already entered in Excel, or data from a database, called an "external data source.") If you've chosen an external source, the wizard lets you use a separate program called Microsoft Query to connect to the source and select just the data you want.

Types of data you can use

- **Excel list or database**
- **External data** For example, you can use a database file, text file, or a source on the Internet.
- **Multiple consolidation ranges** You can combine and summarize data from several different Excel lists.
- **Another PivotTable report** Do you plan to use the same data to create multiple PivotTable reports? If so, you can save memory and disk space by reusing an existing PivotTable report to create a new PivotTable report. This action links both the original and new PivotTable reports. (For example, if you refresh the data in the original PivotTable report, the data in the new report is also refreshed, and vice versa.)

What you need to do to prepare the data

To prepare the data for a PivotTable report, just read the section below that corresponds to the type of data you're using.

Prepare data from an Excel list or database

There are a few things to consider in preparing your Excel data:

- **Make sure the list is well organized** Neatness counts! For example, make sure the first row of the list contains column labels, since Excel will use this data for the field names in the report. Also, make sure each column contains similar items — for example, include text in one column and numeric values in a separate column.
- **Remove any automatic subtotals** Don't worry — the PivotTable report will calculate the subtotals and grand totals for you.
- **If you plan to add more data later, name the range** Then, when you create the PivotTable report, make sure to specify the name when you enter the source data range. That way, whenever you add more data to the range, you can update the PivotTable report to include the new data.
- **If you want to use filtered data use the Advanced Filter command** On the **Data** menu, point to **Filter**, click **Advanced Filter**, and then click **Copy to another location**. This extracts the filtered data

to another worksheet location, so you can use it in your PivotTable report. Don't filter the data in place or use the **AutoFilter** command. This hides some of the data but the PivotTable report will include all the data from the list.

Prepare data from an external source

There are a few things to consider in preparing your external data:

- **Install the necessary tools and drivers** You're probably all ready to go — just make sure you've installed Microsoft Query and the appropriate open database connectivity (ODBC) drivers or data source drivers you need. Then, when you create a PivotTable report with the PivotTable and PivotChart Wizard, you'll use Microsoft Query to actually retrieve the external data.
- **In the following cases, retrieve the data before starting the wizard** Check the following list — if it contains your data retrieval method, you won't be able to use Query from within the PivotTable and PivotChart Wizard to retrieve the data. Instead, use the following instructions to insert the data in an Excel workbook. You can then use the wizard to select the worksheet range that contains the external data just as you would any other Excel list.

Office Data Connections Office Data Connection, or .odc, files are the recommended method of retrieving external data for your reports. You can use them whenever you're simply retrieving data from a single database table or from an OLAP database, so that you don't need to combine data from more than one table in the external database or filter the data to select specific records before creating the report.

Query files and report templates To use a query file (.dqy, .oqy, or .rqy extension) to retrieve the data open the query file in Excel. To use a report template (.xlt) that doesn't already include a PivotTable report, open the template.

Parameter queries To use a parameter query to retrieve the data you must first create the parameter query in Microsoft Query so that it returns the data to Excel. Note that you can't create a parameter query to retrieve source data from OLAP databases. For information about creating parameter queries, see Help in Microsoft Query.

Web queries To use a Web query to retrieve data over the Internet, you must first create a Web query and retrieve the data into Excel. To create a Web query, point to **Import External Data** on the **Data** menu, and then click **New Web Query**.

Prepare data in multiple ranges for consolidation

There are a few things to consider in preparing data from multiple Excel lists:

- **Make sure the lists are well organized** Neatness counts! For example, make sure the lists have matching row and column names for items you want to summarize together.
- **Remove any automatic subtotals** Don't worry — the PivotTable report will calculate the subtotals and grand totals for you.
- **If you plan to add more data later, name the ranges** Then, when you create the PivotTable report, make sure to specify the names when you enter the source data ranges. That way, whenever you add more data to a range, you can update the PivotTable report to include the new data.

Prepare data from another PivotTable report

There are a few things to consider in preparing data from another PivotTable report:

- **Make sure both PivotTable reports are in the same workbook** If the original PivotTable report is in a different workbook, copy the original report to the workbook where you want the new report to appear.
- **Check the page field settings** In the original PivotTable report, you may have changed the page field settings so they retrieve external data for each page individually. In this case, you need to reset the page fields so they retrieve external data for all items at once. To check the settings, double-click each page field and then click **Advanced**. (If you aren't sure which fields are the page fields, see the illustration in section "Anatomy of a PivotTable report" in part 2 of this article.)

Step 2: Create a PivotTable report

To create a PivotTable report, you first use the PivotTable and PivotChart Wizard to specify the data you want to use and to create the report framework. You can then use the **PivotTable** toolbar to arrange the data within that framework.

For example, you can choose the categories of data to include (shaded in blue) and the corresponding data values to summarize (shaded in yellow):

	A	B	C	D	E	F	G
1	Month	Year	Type	Salesperson	Sales	Units	Region
2	Jan	2003	Dairy	Dodsworth	2686	5611	West
3	Jan	2003	Beverages	Davolio	8725	6890	North
4	Jan	2003	Produce	Buchanan	6715	2652	South
5	Jan	2003	Dairy	Suyama	4356	5636	East
6	Jan	2003	Meat	Suyama	9662	3400	North
7	Jan	2003	Produce	Davolio	1328	2861	West
8	Feb	2003	Beverages	Buchanan	3571	5178	South
9	Feb	2003	Dairy	Dodsworth	6758	7817	South
10	Feb	2003	Beverages	Buchanan	4953	5889	West
11	Feb	2003	Meat	Davolio	4923	124	South
12	Feb	2003	Meat	Suyama	2666	744	West
13	Feb	2003	Produce	Buchanan	1450	234	West

Then, tell Excel how to arrange the data categories in the rows and columns of the PivotTable report. When Excel creates the finished report, it automatically summarizes and totals the data values.

	A	B	C	D	E	F
1	Sum of Sales	Type				
2	Region	Beverages	Dairy	Meat	Produce	Grand Total
3	East	35,233	39,444	33,406	28,675	136,758
4	North	51,832	63,418	17,062	26,799	159,111
5	South	30,172	27,889	58,025	39,074	155,160
6	West	40,392	44,110	8,435	36,466	129,403
7	Grand Total	157,629	174,861	116,928	131,014	580,432

Start by using the PivotTable and PivotChart wizard

1. Open the workbook where you want to create the PivotTable report. If you're basing the report on an Excel list or database, click a cell in the list or database.
2. On the **Data** menu, click **PivotTable and PivotChart Report**.
3. In step 1 of the PivotTable and PivotChart Wizard, follow the instructions, and click **PivotTable** under **What kind of report do you want to create?**
4. Follow the instructions in step 2 of the wizard. If you're retrieving external data for the PivotTable report, you can get more information about using Microsoft Query or the Query Wizard from either Excel or Query Help.
5. In step 3 of the wizard, click **Finish**.

Lay out the PivotTable report

1. From the **PivotTable Field List** window, drag field buttons to the labeled areas on the PivotTable diagram.
2. If you want to rearrange the fields, drag them from one area to another. To remove a field, drag it outside the PivotTable report.

In some cases, you might not want to lay out the PivotTable report directly on a worksheet. For example, if your source data is from a large external database, worksheet layout may be too time-consuming. In this case, you can click **LAYOUT** in step 3 of the PivotTable and PivotChart Wizard to lay out the PivotTable report.

Anatomy of a PivotTable Report

You may have noticed that Microsoft Excel uses specific terms to identify the parts of a PivotTable® report. If you're not familiar with these terms, read this section for a quick primer.

	A	B	C	D	E
1	Year	2003			
2					
3	Sum of Sales		Type		
4	Region	Salesperson	Beverages	Dairy	Meat
5	East	Buchanan	1,132		16,191
6		Davolio	8,334	14,474	1,441
7		Dodsworth	1,898		
8		Suyama	7,538	4,356	265
9	East Total		18,902	18,830	17,897
10	North	Buchanan	3,522	4,562	
11		Davolio	8,725	9,291	

- 1 Page field
- 2 Data field
- 3 Column field
- 4 Item
- 5 Row fields
- 6 Data area

- **Row field** A field from the source data that you assign to a row orientation in a PivotTable report. For example, Region and Salesperson are row fields.
- **Column field** A field from the source data that you assign to a column orientation in a PivotTable report. For example, Type is a column field.
- **Page field** A field from the source data that you assign to a page (or filter) orientation in a PivotTable report. For example, Year is a page field. You can use the Year field to display summarized data for only 2003, 2004, and so on.
- **Item** A subcategory of a row, column, or page field. For example, the Type field contains the following items: Beverages, Dairy, and Meat; the Salesperson field contains the following items: Buchanan, Davolio, Dodsworth, and Suyama.
- **Data field** A field from the source data that contains values to be summarized. For example, Sum of Sales is a data field.

For most types of source data you can choose how to summarize data (for example, by sum, average, or count). A data field usually summarizes numbers, but it can also summarize text. For example, you can count the number of times a specific text entry (such as Yes or No) appears in a field.

- **Data area** The cells in a PivotTable report that contain summarized data. For example, the value in cell C5 summarizes Buchanan's beverage sales for the East region in 2003. In other words, it's a summary of the sales figures for every row in the source data that contains the items Buchanan, Beverage, East, and 2003.

Step 3: Customize a PivotTable report

You've now created a PivotTable report, but that's only the first step. Remember all the questions you had about your data? A PivotTable report is more than just a static summary; you can use it to interactively explore the data's significance. Zero in on the details or pull back for an overview. View sales by region or over time. You decide the type of customizations you want:

- Add or remove data.
- Quickly rearrange the layout.

- View a subset of the data with page fields.
- Show just the details you want.

Add or remove data

Do you want to view more or fewer categories of data in your PivotTable report? You can easily add or remove a field — including a row, column, or page field.

To add a field, drag a field from the **PivotTable Field List** window to the appropriate area on the PivotTable report. To remove a field, drag a field outside the PivotTable report.

Note You can't directly edit the data in a PivotTable report. Instead, you need to edit the source data and then refresh the PivotTable report.

Quickly rearrange the layout

Do you want to reorganize the PivotTable report to get a different perspective on the data? You can quickly "pivot" the report by moving a field or reordering the items within a field.

To move a field, drag the field to the appropriate area on the PivotTable report. To reorder items within a field, drag an item to a new location in the field.

Use page fields to view a subset of the data

Did you include a page field in your PivotTable report? If so, you now have a three-dimensional report that consists of multiple "pages." Each page contains a subset of the data that's summarized in the report.

To view a different page, click the arrow next to the page field item, and then click an item in the list.

	A	B	C	D	E
1	Year	2004			
2					
3	Sum of Sales				
4	Region	Salesp			Meat
5	East	Buchan			
6		Davoli			
7		Dodsw			8,118
8		Suyam			7,391
9	East Total				15,509
10	North	Buchanan	5,594	15,971	1,361

Show just the details you want

In a PivotTable report, you can drill down on the details or hide information for a "big picture" view.

Show or hide items in a row or column Click the arrow in a field, and then select or clear the check boxes you want. For example, in the Type field, you can hide all product items except Beverages.

		C	D
	Type		
	Beverages	Grand Total	
1		1,132	1,132
2		13,781	13,781
3		4,097	4,097
4	Suyama	16,223	16,223
5	East Total	35,233	35,233

Show or hide specific details for an item Click an item in a field, and then click the **Show Detail** or **Hide Detail** button on the **PivotTable** toolbar. If prompted, click the field with the detail you want to show.

For example, for the Beverages item in the Type field, you can include more detail by displaying the sales per year.

		C	D	E
	Type	Year		
	Beverages		Beverages Total	
		2003	2004	
1		1,132		1,132
2		8,334	5,447	13,781
3	Dodsworth	1,898	2,199	4,097
4	Suyama	7,538	8,685	16,223
5	East Total	18,902	16,331	35,233

Display the underlying source data for a specific data cell Just double-click a cell to see its details. For example, double-click the subtotal for Beverages in the East region to see the source data records used to calculate the cell.

	A	B	C	D
1	Year	(All)		
2				
3	Sum of Sales		Type	
4	Region	Salesperson	Beverages	Dairy
5	East	Buchanan	1,132	9,136
6		Davolio	13,781	22,953
7		Dodsworth	4,097	
8		Suyama	16,223	7,355
9	East Total		35,233	39,444
10	North			

	A	B	C	D	E	F	G
1	Month	Year	Type	Salesperson	Sales	Units	Region
2	Jul	2003	Beverages	Buchanan	1132	3326	East
3	Mar	2003	Beverages	Davolio	8334	2933	East
4	Jul	2004	Beverages	Davolio	5447	9069	East
5	Jun	2004	Beverages	Dodsworth	2199	8496	East
6	Apr	2003	Beverages	Dodsworth	1898	817	East
7	Oct	2004	Beverages	Suyama	5122	3299	East
8	Oct	2003	Beverages	Suyama	7538	2898	East
9	Jan	2004	Beverages	Suyama	3563	4183	East

Step 4: Print a PivotTable report

Do you plan to print your PivotTable report? If it's a multipage report, you can set print options to control the report's printed appearance:

- To make it easier to follow the PivotTable report from one page to the next, you can automatically reprint labels at the top of each page.
- To ensure that a logical chunk of the PivotTable report is printed on each page, you can insert automatic page breaks.

For example, a page break might fall between items in the Month field:

	A	B	C	D	E	
1	Sum of Sales			Type		
2	Month	Region	Salesperson	Beverages	Dairy	
3	Jan	East	Suyama	3,563	4,356	
4		East Total		3,563	4,356	
5		North	Buchanan	5,594		
6			Davolio	8,725		
7			Dodsworth		4,231	
38		Mar Total			25,475	2,242
39		Apr	East	Buchanan		9,136
40			Dodsworth	1,898		
41	East Total		1,898	9,136		
42	North		Davolio		9,291	
43			Suyama	2,768		
44	North Total		2,768	9,291		
45	South		Davolio			
46		Dodsworth	2,478			
47	South Total		2,478			

On the printed page, you can repeat the labels from rows 1 and 2, and also repeat the outer row field item Apr.

Sales Summary - Page 2

Sum of Sales			Type				
Month	Region	Salesperson	Beverages	Dairy	Meat	Produce	Grand Total
Apr	North	Davolio		9,291		1,500	10,791
		Suyama	2,768				2,768
	North Total		2,768	9,291		1,500	13,559
	South	Davolio			450		450
		Dodsworth	2,478				2,478
	South Total		2,478		450		2,928
							1,861
							7,782

The following procedures describe how to set print options for your PivotTable report. After you set the options, you can click **Print Preview** on the **File** menu to preview the printed report. When you're ready to print the report, click **Print**.

Repeat row labels on each printed page

1. Make sure the PivotTable report is the only report in the print area. (To do this, click the PivotTable report, click **PivotTable** on the **PivotTable** toolbar, point to **Select**, and then click **Entire Table**. On the **File** menu, point to **Print Area**, and then click **Set Print Area**.)

2. On the **File** menu, click **Page Setup**, click the **Sheet** tab, and then make sure the **Rows to repeat at top** and **Columns to repeat at left** boxes are blank. Click **OK**.
3. Click the PivotTable report.
4. On the **PivotTable** toolbar, click **PivotTable**, and then click **Table Options**.
5. Under **Format options**, select the **Set print titles** check box.

Repeat outer row field items on each printed page

1. Click the PivotTable report.
2. On the **PivotTable** toolbar, click **PivotTable**, and then click **Table Options**.
3. Under **Format options**, select the **Repeat item labels on each printed page** check box.

Print sections of a PivotTable report on separate pages

1. Double-click the outer row field that has the items you want to print on separate pages. For example, if you want to automatically insert a page break between each type of product, double-click the Type row field.
2. Click **Layout**.
3. Under **Print Option**, select the **Insert page break after each item** check box, and then click **OK** twice.
4. On the **View** menu, click **Page Break Preview**, and make any adjustments you want to the automatic page breaks. You can move a page break by dragging it, or delete a page break by pressing the DELETE key.

More information

Want to make your printed PivotTable report easier to scan? You use the **Format Report** button on the **PivotTable** toolbar can quickly switch to an indented format, in which the data for each row field is indented (similar to a text outline). Also, all the summary figures for a data field are displayed in a single column.