ITS Training Class
PivotTables and Charts in Excel

When you have a large amount of data and you need to get summary information and graph it, the PivotTable and Chart tool in Microsoft Excel will be the answer. The data does not need to be in one workbook. You may analyze data from multiple workbooks without too much trouble.

Basics of PivotTable
PivotTable is a tool that will allow you to consolidate large amounts of data with similar fields and analyze the consolidated data or just summarize the consolidated data. Please note that the data must have at least 1 field in common otherwise, the consolidation will not work and spelling errors in the data will produce incorrect PivotTables.

Basics of Charts
Charts are used to graphically represent data. Remember your chart is only as good as your data or your summary table (PivotTable). If you try to cram too many fields into a chart, you will end up with a non-informative chart. You want to keep it simple and informative. See the examples below:

Informative chart

Non-informative chart
ITS Training Class
PivotTables and Charts in Excel

We will be using the data from the Microsoft sample company Northwind Traders. I exported the Orders that Northwind Traders fulfilled over three years. The data is in one Excel worksheet. We are going to use the PivotTable and Chart tool to see how Northwind Traders are doing.

Exercise 1: How is Business?

1. Open the Northwind Sample.xls workbook
2. You should see only 1 worksheet in this workbook. The worksheet’s name is Warehouse Orders.
3. Go to Data in the Excel menu
4. Look for PivotTable and PivotChart Report … in the drop down menu
5. You are now in the PivotTable and PivotChart wizard. In 3 steps, you will be able to create a PivotTable and PivotChart. The first thing is to tell Excel where the data is coming from. Since the data for this example is in a single worksheet, we will select Excel List or Database.

In the lower part of the window, tell Excel what you want it to do. You have the choice of running just the PivotTable report (does not include the Chart) or the PivotChart report (includes the PivotTable report). Please select PivotChart report (with PivotTable report).

6. Click on Next
7. Step 2 is to tell Excel where the data is. Excel might be smart enough to automatically select the current worksheet. If it does not, click on the little button on the right of the range box. Select the worksheet with the data and the range. Range defines the cells where the data is stored. In the example, we have data in cells A1 to F2156. This means that we have selected 6 columns (A through F) and 2156 rows.
8. Click on Next
9. Step 3 is where you would define the layout for the PivotTable and which fields to analyze. The first choice is where the PivotTable should be displayed. You will probably choose to place the PivotTable in a new worksheet. If you select Existing Worksheet, you will have to select a blank section of the current worksheet. Please select New Worksheet.

10. Click on the Layout button. This is where you will tell Excel what to analyze. There are a few things that you need to know before you set this up. There are 4 sections for the PivotTable. The first is the Page. The page is used when you have an overall field such as date or categories to include in the analysis. The Row and Column can be used to display the common fields that are directly tied to the field that you put in the DATA section. The DATA section is where you would calculate or count the items that correspond to the fields in Row and Column.

11. You will need to plan out what you want to analyze before continuing on. For the exercise, we want to see the total number of products sold by categories. To place the fields on the right into the PivotTable area, you would left click and hold the mouse button on the field name. Drag the name to the area that you want – Page, Row, Column, or Data. Click and drag Category to the Row area.
12. Click and drag Quantity to the Data area.

13. The marker for the Quantity will say Sum of Quantity. In this case, this is what we want done. If we wanted to use a different function, you would have to double click on the Sum of Quantity marker and make a selection from the list of functions. You may also select the formatting for the numbers. If you want to change the format for the numbers, click on the Number… button and make a selection from the list.

14. We have enough information to start our PivotTable. Click on Next. You should be back to the Step 3 of the wizard window.

15. Click on Finish. Excel will create the PivotTable and PivotChart.

We can see from the chart that Northwind Traders are not doing badly in sales.
ITS Training Class
PivotTables and Charts in Excel

Now, what if the chart is ugly and not in the format that you want, you can format the chart. We will do some simple formatting.

Exercise 2: Format the Chart
1. We want the number to have the comma to denote thousands. Double click on the vertical axis or line. You may choose to the pattern of the line, scale, font, number, and alignment. Select the number tab and select Number. Make sure the Use thousand separator (,) is checked. Also, be sure that the Decimal places value is “0”.
2. Since none of the totals are greater than 10,000, we want the highest number to be 10,000 and not 12,000. Click on the scale tab. The scale is set to automatic. Uncheck the box for automatic for maximum. In the box, type in 10000.
3. Click on OK.
4. You will see that the chart has changed.

![Chart Image]

What if the final results for the PivotTable and PivotChart are not what we expected to see, what should you do? First you should check the data and make sure that you are choosing the correct fields. Second, you can add or remove the fields that you see displayed in the PivotTable. The PivotChart is tied directly to the PivotTable so the changes that you make in the PivotTable will automatically be changed in the PivotChart.

Exercise 3: What if?
1. We see that the Category field values are not descriptive enough. We need to see the Description field and get rid of the Category field. Click and drag the Description marker in the PivotTable field list window to where the Category marker is on the PivotTable.
2. You should see the Description marker go in front of the Category marker. To remove a field, click and drag the Category marker to the PivotTable field list window.
3. You should see the PivotTable change because of the sort order.
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Now the PivotTable and the PivotChart is giving us the correct information. There is one thing missing. We do not know which product is the best seller for each category. If we use the Product name field in the PivotTable, we will end up with a very messy chart. How can we break up the displayed information without editing the worksheet with the data? This is a perfect time to use Page field.

**Exercise 4: How good are the products selling?**

1. We want to put the Description field in the Page field. Click and drag the Description marker to the 2 rows above top of the PivotTable.
2. Click and drag the Product Name marker from the PivotTable field list to the cell beneath the Sum of Total field (marker).
3. Now, look at the PivotChart
4. Yes, the chart is hard to read and very ugly.

5. Look at the chart and find the Description marker. You will see the word (All) in a box next to Description. Click on the down arrow.
6. You should see a list of the category descriptions. The word all means to display everything. Select Cheeses from the list.
7. Click on OK.
8. You will see that the ugly chart disappears and only the Cheese products are displayed.
9. Repeat Steps 5-6 but select Seaweed and fish instead of Cheeses.
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We have used the PivotTable and PivotChart on a single location for data. Now we will do a PivotTable from multiple workbooks and consolidate the information into a summary worksheet. We have 3 workbooks – Northwind Order 1996, Northwind Orders 1997, and Northwind Orders 1998. The 3 workbooks have the same fields but each workbook holds the order data for the specified year.

We do not need to copy the worksheets into a single workbook. We can tell the PivotTable tool to go to those workbooks and grab the data that we need to use. We do need to have the workbooks open.

**Exercise 5: How is Business?**

We are going to repeat Exercise 1 but with different choices. Please refer to the screen shots in Exercise 1 if you need to follow along.

1. Create a blank workbook.
3. Select the new workbook that you just created.
4. Click on Data in the Excel menu.
5. In the drop down menu, select PivotTable and PivotChart report….
   - Step 1 select the Multiple Consolidation ranges and select PivotChart report (with PivotTable report).
6. This is an extra window. In Step 2a, you are being asked to set up the Page field. If you are not sure what the Page field should be, let Excel Create one for you. Select Next.
7. In Step 2b, you will need to define the workbooks and the ranges to analyze. You may type in the workbook names and the ranges if you know what they are. OR you can use the button on the right of the Range box to select the workbooks and the ranges. I circled the button in the picture.
8. When the window shrinks, you may select the first workbook and the range.
9. Select Northwind 1998 workbook and select the Range A1 to J692. The workbook and range information will automatically appear in the range box. To add it to the PivotTable and
PivotChart Wizard, you need to click on the button again and then select Add. Your Step 2b window should look like this:

![PivotTable and PivotChart Wizard - Step 2b of 3](image)

Where are the worksheet ranges that you want to consolidate?

Range: 

Add  Delete  Browse...

All ranges:

10. Repeat steps 7 and 8 for the other 2 workbooks. Workbook Northwind 1997 has a range of A1 to J1060. Northwind 1996 has a range of A1 to J406.

11. After you are done, your Step 2b window should look like this:

![PivotTable and PivotChart Wizard - Step 2b of 3](image)

12. Click on Next
13. Select New worksheet
14. Select Finish

Excel will create PivotTable and a PivotChart but it is incomprehensible. We will need to narrow down our fields and re-arrange our data. We would need to make sure that the fields we want to analyze are together in the worksheet. It’s most convenient if the fields you want line up starting in Column A.
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PivotTables and Charts in Excel

In order for us to get the information that we want, we need to set up 3 PivotTables in the new workbook – one for each of the Northwind Orders workbooks. We will select the fields that we want to see in the bigger PivotTable and PivotChart report. The fields that we want to select are Quantity and CategoryName.

Exercise 6: Revision of Exercise 5: How is Business?

1. Create a new workbook.
3. Go to Sheet1 of the new workbook.
4. Select Data from the Excel menu.
5. In the drop-down menu select PivotTable and PivotChart reports…
6. Select Microsoft Excel List or Database and PivotTable report in wizard.
7. Select Next.
8. Select the range. Click on the button next to the range box.
10. Select cells A1 to B692.
11. Select the range box again. You should be back in the wizard.
12. Select Next.
13. Select New Worksheet.
15. Click and drag CategoryName to Row.
16. Click and drag Quantity to Data.
17. Select OK and then Finish.
18. Repeat steps 3-17 for the other 2 workbooks. The range for 1997 is A1 to B1060. The range for 1996 is A1 to B406.
19. Now you have 3 PivotTables worksheets in the new workbook that you created earlier.
20. Rename each worksheet to the year that is assigned to the workbook. You should have 3 worksheets - 1996, 1997, and 1998.
21. We want to analyze the 3 PivotTables. Insert a new worksheet or use one of the blank worksheets in the workbook.
22. Select Data from the Excel menu.
23. In the drop-down menu, select PivotTable and PivotChart reports…
24. Select Multiple Consolidation Ranges and select PivotChart with PivotTable report.
25. Select Create a Single Page field for me and select next.
26. Select the Ranges that you want to summarize. In this case, we want to look at the 3 PivotTables in worksheets 1996, 1997, and 1998. Select the first range and click on Add. Repeat this step for the other 2 worksheets.
27. Select Next.
28. Select New worksheet and select Layout.
29. The layout should be selected already. The Page fields are each worksheet, the Column is the PivotTable total, and the Row is the CategoryName.
30. Select Ok and then Finish. This is how the PivotTable should look and the PivotChart.
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**PivotTables and Charts in Excel**

#### Table:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Drop Page Fields Here</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Sum of Value</td>
<td>Column ▼</td>
</tr>
<tr>
<td>4</td>
<td>Row ▼</td>
<td>Total</td>
</tr>
<tr>
<td>5</td>
<td>Beverages</td>
<td>9532</td>
</tr>
<tr>
<td>6</td>
<td>Condiments</td>
<td>5298</td>
</tr>
<tr>
<td>7</td>
<td>Confections</td>
<td>7906</td>
</tr>
<tr>
<td>8</td>
<td>Dairy Products</td>
<td>9149</td>
</tr>
<tr>
<td>9</td>
<td>Grains/Cereals</td>
<td>4562</td>
</tr>
<tr>
<td>10</td>
<td>Meat/Poultry</td>
<td>4199</td>
</tr>
<tr>
<td>11</td>
<td>Produce</td>
<td>2990</td>
</tr>
<tr>
<td>12</td>
<td>Seafood</td>
<td>7681</td>
</tr>
<tr>
<td>13</td>
<td>Grand Total</td>
<td>51317</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Chart:

![Chart](chart.png)

- **Title:** Total
- **Legend:** Column ▼, Total
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PivotTables and Charts in Excel

TIPS on Charts

- Charts should be simple and represent the data. It is very easy to manipulate a chart so that it “embellishes” on the truth. Please be careful.

- There are many different kinds of charts and Excel gives you a wide variety.

![Chart Type](image)

- However, some charts just cannot represent the data. For example, if you are comparing the number of apples you sold versus the monthly cost of running the farm, a pie chart is not a good chart to use because you are graphing 2 items across a third factor (time). The line chart would be a better choice.

You can change the PivotChart reports to any of the chart types offered by Excel. Just Right click on the chart and select Chart Type from the pop-up menu. You should see the list of charts and different styles.

Here is an example of a Pie chart for Exercise 6.

![Pie Chart](image)

- You may customize the way the data is represented on a chart. For example, I want Excel to display the totals on the chart.
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PivotTables and Charts in Excel

Exercise 7: Customize the series
1. Right click on the first bar in the chart
2. A pop-up menu should appear. Select Format Data Series.
3. You may customize the series from this window.
4. We want to select the Data Labels tab.
5. Select Value and select OK
6. The chart will have the values that we see in the PivotTable on the Chart.