INTRODUCTION TO MS EXCEL

Part 4

Abstract

Part 4 of the training course covers Excel Pivot Tables.

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Introduction to Microsoft Excel – Part 4

Excel Pivot Tables

A pivot table in Excel is essentially another form of a database. You can question your data in various different ways without actually changing your source data.
Pivot tables are amazingly flexible and have lots of built in functions. They can suggest analysis in different ways and can immediately show you what your data looks like.
To start with, here is a table full of data that I have prepared earlier.
We could analyse this data using formulas and functions to solve a specific question, but that's actually quite time consuming.
Instead we can use Pivot Tables to analyse this data in seconds, and best of all, you don't need to know any formulas or functions, it's all just Drag and Drop.
So here we are in our Excel spreadsheet and this relates to data about biscuit sales.
I want to answer some basic questions, for example, How much Revenue did we earn from each of our customers, or how many orders did each one place with us.
On the right hand side, I have created a table to answer these questions.
So with customer #1 we made a little over half a million pounds of Revenue over the course of 92 different orders.
Initially to build this table I have used formulas and functions, so when I click into this cell you can see that I used the SUMIFS function and here for the number of orders, I used a Function. This works fine, but it's laborious.
Perhaps we might have some other questions such as, how much Revenue did we earn for each customer and for each product, or how many orders did we get in a specific month. Now of course you could build out the table to answer these questions, but that takes a long time.
Instead we can use Pivot Tables. Before we can insert a Pivot Table, we have to make our data into an Excel table. We have to prepare the data and ensure that there are no blank rows or columns.
Also, you need to have Headers at the top of each column. Make sure that the headers are descriptive of the data underneath.
For example, change Rev to Revenue, Our cost to just Cost.
It's easier if we turn all the data into an official Excel Table. The reason being that if we add data later, it can be added to the Pivot Table automatically later.
To turn the data into a table, go up to the Insert Tab at the top and here's the option to insert a Table. Alternatively, you can use the shortcut key is CTRL+T.
Here I'll press CTRL+T within the table and Excel automatically identifies all the data that should be in the table. It also asks if the table has headers, so check the Headers box, then Click OK.
On the Table Design Tab over on the left hand side you can give the table a name. Let's call it SalesData.

We are now ready to insert the Pivot Table. Up here under Table Design, I can Summarise with Pivot Table, or alternatively I can Click on Insert and here I can Click on Pivot Table.
When you Click on Insert, it asks you what data you want to include in the Pivot Table and whether you want it on a separate sheet or added to the existing sheet, then Click OK.
Excel then normally moves you to a new worksheet and here we have a new Pivot Table.
If I Click on the Pivot Table, over on the right hand side, a new pane appears Called Pivot Table Fields. Within that pane are all these different Field Names, so for example we have things like; Customer, Order ID, Product, Units sold, Date, etc.
You should recognise these from the Headers in the sales data table. Each Header title is referred to as a Field.
Flicking back to the sheet with the sales data, here on the right hand side we have the table of data that I pulled together using formulas and functions.
We want to recreate this same table using a Pivot Table just by dragging and dropping.
First I have the Customer ID and then I have the ID number and they are shown on successive Rows.
If we Click back into Sheet 1 (the new pivot table) let's see how we can start building the same table.
Here I see that I have the Customer. You can Click on this Field and Drag it down to the Rows and Drop it there. As soon as you do that, you see that the Pivot Table populates with your data.
Next, I want to display the Revenue data. If I Click back to the data sheet, on the right hand side, you can see the total Revenue per Customer. This is the sum of the Revenue by each Indi dual Customer.
Let's go back to the Pivot Table and over here I have a Field called Revenue. Click on that and Drag it down to Values.
You drag something down to Values if you want to calculate something, for example, if you want to Sum something or Count something, or if you want to calculate an Average.
When you release the Drag, it automatically gives you the Sum of the Revenue, so here for Customer #1 you have a little over half a million pounds of Revenue, and if I Click back to the SalesData, you see that the number is exactly the same. Of course, the formatting is a little different. You can Click on the Revenue cell, go down to the number format and you can set it to currency. Remove the decimal places, then Click OK.
Let's now Click back to the SalesData and the last column shows the number of orders.

Let's go back to the Pivot Table. On the right hand pane we have a Field called Order ID. Once again, Drag this down to Values. The Pivot Table updates, but it doesn't match what is shown in SalesData. For customer #1 we have 92 orders, but the Pivot Table has a massive number. So what happened? If we look down at Values, this gave us the Sum of all the Order IDs. What we want is a Count of all the Order IDs. If you right Click on the Pivot Table cell showing the sum of Order IDs, you can change it to Summarise Values by. It is currently set to Sum, but you can change it to Count, you could also do Average, Max, Min or Product and there are more options down below. I'll select the Count and now we have a Count of all the orders.
If you click back to SalesData, it matches exactly now.
So you see that you can build exactly the same view just by Dragging and Dropping with the mouse. There was no need to write a Formula or use a Function.
Now we have our Pivot Table, it's easy to use it to analyse our data and take different views of our data.
Let's say that we don't want the Count of Orders any more. You simply Drag it out of Values and the Pivot Table updates automatically. Now you just see the Revenues.
Maybe I just want to see the total Revenue. Go over to the right hand pane, under Rows, hover over Customer, see the X appear, when you release, you just see the sum of the total Revenue.
Now pull the Customer in again. Click on the Customer Field and Drag it back to Rows and the Revenue is broken down by Customer again. It's so easy.
Looking at the table, on the left hand side, currently it is sorted by Customer number and not the Revenue. If you want to see which customer spent the most money, Click onto the Revenue column, then Right Click. Here is the option to Sort, select from largest to smallest. Notice that Customer #3 spent the most.
If you want to change the order back to CustomerId, just Right Click in the Customer column and select Sort lowest to highest which then brings back the original view.
You can play about as much as you like with the Pivot Table, you can't do any damage!
You can also Custom Sort the Customer list. Let's say that I want to move Customer #4 to the top of the list. Just Right Click on Customer #4 and all the way down at the bottom is an option to Move. Here I can Customer #4 to the beginning, or change the order as you wish.
Another way to do this is to Click on Customer #4, Type CTRL+X, then select the position in the table that you want the data to appear and Type CTRL+V and the data moves.
You can also Filter the list. Say that you just want to customers 1, 2 and 3 and see how much Revenue they generated. You can Click on the dropdown in the Header title showing customer numbers, you can then deselect All and just select the records that you want to display, eg 1, 2 and 3.

If you Click on the dropdown again, you can clear out the Filter to get back to the original view.
Let's say we want to see the Revenue for just Chocolate Chip Cookies. Over on the right hand side, there's a Field called Product. If you Click back into SalesData, the column Product includes the type of biscuit.
If you go back to the Pivot Table, select and Drag it down to Filters. When you Release, notice that there is a new section of the Pivot Table called Product with a dropdown selector. If you Click on it, you can select Chocolate Chip Cookie. You can also select multiple items if you want to, but I just want to select Chocolate Chip Cookies, so Click OK. The table will update and just show the Chocolate Chip Cookie Revenue. To remove the Filter, Just select Product on the right hand side and Drag that off the pane. The table then reverts to showing all the products again.
If we look at the Revenue that the customer generated, we would also like to know the Percentage of the total Revenue each customer contributed,
On the right hand side, Click Revenue and Drag it down to Values again. This creates a second display of Revenues in the Pivot Table. If you Right Click on the column, you get the option to show the Values as a Percentage of the column total.
Now we see that Customer #3 drove 1.4 million pounds of Revenue or 30% of the total Revenue.
To tidy up the Pivot Table we can change the Headers to make better sense. We can Click in a Header and type in a custom header name, eg % of Revenue. This makes more sense. Change the Sum of Revenue to Total Revenue.
Perhaps you might want to see Revenue by Product. Over on the right hand side there's the list of Fields. Select the Product and Drag it down to the Rows and place it under Customer. This causes the Pivot Table to update to show all the products under each customer. Against each customer number you can collapse or expand the Product list.
You can also change the sort order. For example, put the Product above the Customer. This shows which Customer bought which Products.
At the bottom of the right hand corner, remove the % of Revenue by dragging that Filed off the right hand pane.
You can also take the Product and move it from Rows to Columns. Now we see the Customer as the Row and the Product as the columns and the value we see is the total Revenue.
Notice that the layout in the right hand pane maps to the layout in the Pivot Table.
You can also change the design of the Pivot Table. With your mouse within the Pivot Table, let's Click on the Design Tab.
Here we have a whole bunch of different things we can do to change the look of the Pivot Table. We can change the Pivot Table Style here. We could go for Red, or Yellow or go back to our Blue colour. You can also decide whether you want banded Rows or banded columns.

On the left hand side you can decide whether to show subtotals or not.
There are options for showing Grand Totals or not. Turn it off for Grand Totals to disappear, or Click on Grand Totals for them to appear.
You can also insert a chart to visually represent the Pivot Table. On the top Tabs, Click on Insert, then choose one of the recommended charts available.
Another way is to Type ALT+F1 and this should insert a chart depending on your keyboard mappings. This may not work if your manufacturer has changed mappings.
Here's the chart representing my Pivot Table. Let's say that I no longer want to see Product. Here I can Drag that out and you will see that the chart updates as well as the Pivot Table. The chart and the Pivot Table are tied together.
To make it easy to analyse data you can Click on the Pivot Table Analyse Tab at the top. There is an option to insert a Slicer, I'll select that. A new pane pops up and maybe I want to very quickly evaluate how much different types of product earnt, just check that box and Click OK.
Here I see all my different products. Let's say I want to see the Revenue for Chocolate Chip Cookies. Click on Chocolate Chip Cookies and it updates the chart and the table to show just the Revenue from Chocolate Chip Cookies. I can press the CTRL key if I want to select multiple products, so maybe I want to see Oatmeal Raison as well. Both the table and the chart update automatically.
Click back into the Pivot Table, then go to Pivot Table Analyse. Here we have the option to insert a Timeline, then Check Date and this inserts a Timeline. You can select a time period and it will update the chart.
You can Click on this Icon in the Timeline and this Icon on the Slicer and that will return it back to its original state.
Say that you want to do further analysis on the Pivot Table but without losing the original Pivot Table. You can select the Pivot Table, Copy it and Paste it further down the page.
Using the new Pivot Table, I want to see the Profit Margin. Over on the right hand side, I already have the Revenue and here I can Drag in the Cost. This gives me the Sum of the Cost which I don't want. What I want is a Field for Profit Margin.
Here I'll remove the Cost. To create a profit margin we need a formula. To add this we go up to the analyse Pivot Table Tab, there we have Fields, options and sets, within this we select Calculated field. This opens up the calculated field dialogue. So we add the name Profit Margin. We need to insert the formula Margin=Revenue-Cost, this gives me the Profit Margin. Click on Add, then Click OK. Note that in the Fields pane, a new Field called Profit Margin has appeared. Profit Margin has been automatically added to the Pivot Table.
Here I could remove the Revenue and now I can see my Profit Margin by Customer.
I am now happy with my Pivot Tables, but I want to make sure if I add more data that all the views will update.

I we Click back to SalesData. I'll go to the very bottom of the table and here I'll add a new sale to a new Customer who will be Customer #6.
Type in the new data – Order id = 456851, Chocolate Chip Cookie, 150 12/15/2022, £800, £100.
Now go back to Sheet 1 where our Pivot Table is, but it doesn't show the new sale data for Customer #6. With the Pivot Table selected, go up to Pivot Table Analyse, and see that there's an option to Refresh. Click on that and magically the Pivot Table updates.
One of the benefits of using Pivot Tables is that it doesn't change your source data.
So far, we have created Pivot Tables from scratch, but there is a cunning way to get Excel to create your Pivot Tables for you. If we go up to the top tabs, let's Click on Insert and here's the option for recommended Pivot Tables. You can Click that and it opens up a pane over on the right hand side, and here we see all these different items of data and how they could be displayed.
If you like one of the Pivot Tables you could add it as a new sheet, or put it on the existing sheet.
Back on the Home Tab, all the way over on the right hand side there is the option for Analyse Data. If you Click that, it will look through all your data and on the right hand side it will show you lots of different insights and here it generates a new Pivot Table for you.
As you scroll down, you see that you can automatically generate a Pivot Table.
Another neat feature is right up at the top, you can even ask questions about your data.
As an example, How many different Products are there? It says that we sell six different types of biscuits. If you like that view, you can Click on Insert and it's done.
You don't even need to know how to create a Pivot Table from scratch.
If you know what it is that you want to find out then Excel will do all the heavy lifting for you.

THE END