EXCEL DYNAMIC NAMED RANGES = NEVER MANUALLY UPDATING YOUR CHARTS

SEARCH BLOG

Originally written by Tim Wilson on August 17, 2010

[This post was written in 2010. I've made a new version of the post that takes advantage of Excel tables, which simplified the process a bit (it's still kinda' complicated). That post is available here (http://www.gilliganondata.com/index.php/2013/06/08/excel-dynamic-named-ranges-with-tables-never-manually-updating-your-charts/)*.]*

[This post is about dynamic named ranges in Excel 2007. I'm seeing a lot of referral traffic to this post searching for Excel 2010. If you're simply looking for where you define or modify named ranges in Excel 2010 (as one commenter indicated in response to an earlier version of this update), it's on the Formulas tab in the Defined Names area — Name Manager. If you are looking for other Excel 2010-specific information that this post doesn't cover, please leave a quick comment as to what the change/issue is that led you to the search. Thanks.]

I've had a pretty good run of theoretical posts about the nature of marketing measurement of late, so it seemed like I was due for a more down-in-the-weeds-Excel-efficiency-tactics write-up. This blog isn't really focussed on all of the myriad ways that Excel can be contorted to represent data effectively, but I'm a big believer in using tools as effectively as possible to remove as much rote report generation as possible. There are lots of blogs devoted entirely to Excel tips and tricks. My favorite on that front is Jon Peltier's (if you get intrigued by this post, hop over and peruse a slew of other ways to have charts dynamically update (http://peltiertech.com/Excel/Charts/Dynamics.html)).

This post describes (and includes a downloadable file of the example) a technique that we use extensively to make short work of updating recurring reports. Here are the criteria I was working against:

- User-selectable report date
- User-selectable range of data to include in the chart
- Single date/range selection to update multiple charts at once
- No need to touch the chart itself
- Reporting of the most recent value (think sparklines, where you want to show the last *x* data values in a small chart, and then report the last value explicitly as a number)
- No use of third-party plug-ins — one of these days, I'll get around to playing with the various Excel add-ons like those offered by <u>Tableau Software (http://www.tableausoftware.com)</u> and <u>XLCubed (http://www.xlcubed.com)</u> (or even the <u>Peltier Tech (http://peltiertech.com/Utility/)</u> add-ins, which are targeted but made by one of the top 3 most authoritative Excel resources on the 'net), but that adds just the slightest of barriers and, again, isn't needed for this exercise
- No macros used — I don't have anything against macros, but they introduce privacy concerns, version compatibility, odd little warnings, and, in this case, aren't needed

The example shown here is pretty basic, but the approach scales really well.

Sound like fun?

SETTING UP THE BASICS

One key here is to separate the *presentation layer* from the *data layer*. I like to just have the first worksheet as the presentation layer — let's name it Dashboard — and the second worksheets as the data layer — let's call that Data. (Note: I abhor many, many things about Excel's default settings, but, to keep the example as familiar as possible, I'm going to leave those alone. This basic approach is one of the core components in the dashboards I work on every day, and it can be applied to a much more robust visualization of data than is represen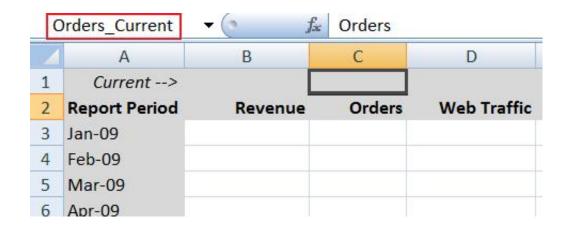ted here. See *<u>An Excel Dashboard Widget (http://www.gilliganondata.com/index.php/2009/11/16/an-excel-dashboard-widget/)</u>* for a look at my thoughts on dashboard visualization.)
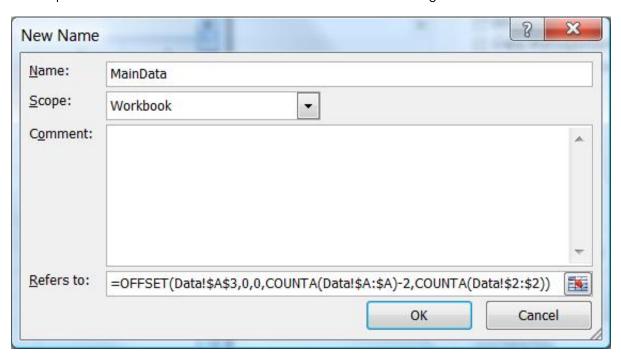
DATA TAB SETUP – PART 1

This is a slightly iterative process that starts with the setup of the Data tab. On that worksheet, we'll use the first column to list our dates — these could be days, weeks, months, whatever (they can be changed at any time and the whole approach still works). For the purposes of this example, we'll go with months. Let's leave the first row alone — this is where we will populate the "current value," which we'll get to later. I like to use a simple shading schema to clearly denote which cells will get updated with data and which ones never really need to be touched. And, in this example, let's say we've got three different metrics that we're updating: Revenue, Orders, and Web Visits. This approach can be scaled to include dozens of metrics, but three should illustrate the point. That leaves us with a Data tab that looks like this:

	B3		f_x	

	A	B	C	D
1	Current -->			
2	**Report Period**	**Revenue**	**Orders**	**Web Traffic**
3	Jan-09			
4	Feb-09			
5	Mar-09			
6	Apr-09			
7	May-09			
8	Jun-09			
9	Jul-09			
10	Aug-09			
11	Sep-09			
12	Oct-09			
13	Nov-09			
14	Dec-09			
15	Jan-10			
16	Feb-10			
17	Mar-10			
18	Apr-10			
19	May-10			
20	Jun-10			
21	Jul-10			

While we're on this tab, we should go ahead and defined some named cells and some named ranges. We'll name the cell in the first row of each metric column as the current value for that metric (the cells don't *have* to be named cells, but it makes for easier, safer updating of the dashboard as the complexity grows). Name each cell by clicking on the cell, then clicking in the cell address at the top left and typing in the cell name. It's important to have consistent naming conventions, so we'll go with *<metric>*_Current for this (it works out to have the metric identified first, with the qualifier/type after — just trust me!). The screen capture below shows this being done for the cell where the current value for Orders will go, but this needs to be done for Revenue and Web Traffic as well (I just remove the space for Web Traffic — WebTraffic_Current).

	A	B	C	D
	Orders_Current	▼	fx	Orders
1	Current -->			
2	**Report Period**	**Revenue**	**Orders**	**Web Traffic**
3	Jan-09			
4	Feb-09			
5	Mar-09			
6	Apr-09			

And, we're definitely going to want to have the whole range of data on the tab available to us. Let's call this MainData and define it by going to Formulas » Name Manager and clicking on New (this is Excel 2007 — it's somewhere else easier to find in Excel 2003). Define a new range with a Workbook scope that encompasses all the columns and all of the rows of data (starting at row 3):

New Name

Name: MainData

Scope: Workbook

Comment:

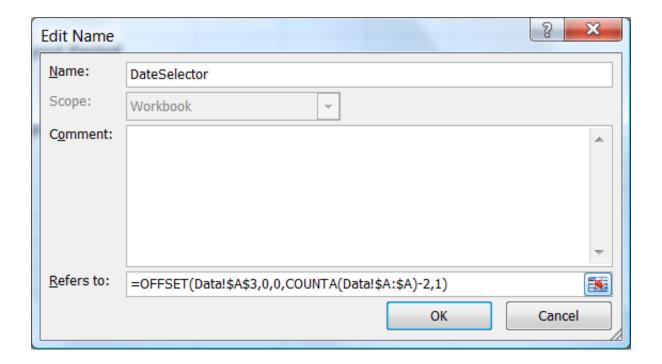Refers to: =OFFSET(Data!$A$3,0,0,COUNTA(Data!$A:$A)-2,COUNTA(Data!$2:$2))

OK   Cancel

There are lots of ways to dynamically define MainData. You can just drag a big area if you want, but this is a slightly more elegant approach. I'm not going to go into the nuts and bolts of why this formula works, but you can look up the OFFSET and COUNTA functions and figure it out if you're so inclined:

=OFFSET(Data!$A$3,0,0,COUNTA(Data!$A:$A)-2,COUNTA(Data!$2:$2))

We'll also want a named range that just includes the list of months — create that the same way as MainData, but call it DateSelector and use a slightly different formula:

=OFFSET(Data!$A$3,0,0,COUNTA(Data!$A:$A)-2,1)

Edit Name

Name: DateSelector

Scope: Workbook

Comment:

Refers to: =OFFSET(Data!$A$3,0,0,COUNTA(Data!$A:$A)-2,1)

[OK] [Cancel]

And, of course, we'll actually need data — this would come later, but I've gone ahead and dropped some fictitious stuff in there:

	B3			f_x	1435256	

	A	B	C	D
1	Current -->			
2	**Report Period**	**Revenue**	**Orders**	**Web Traffic**
3	Jan-09	$ 1,435,256	828	1,004,679
4	Feb-09	$ 1,402,532	749	981,772
5	Mar-09	$ 1,516,852	984	910,111
6	Apr-09	$ 1,539,400	816	923,640
7	May-09	$ 1,540,557	858	1,078,390
8	Jun-09	$ 1,443,958	773	1,010,771
9	Jul-09	$ 1,567,226	905	783,613
10	Aug-09	$ 1,517,176	867	910,306
11	Sep-09	$ 1,490,594	982	745,297
12	Oct-09	$ 1,629,494	928	1,140,646
13	Nov-09	$ 1,550,529	837	930,317
14	Dec-09	$ 1,620,330	945	972,198
15	Jan-10	$ 1,725,108	1,090	862,554
16	Feb-10	$ 1,868,801	987	1,308,161
17	Mar-10	$ 1,929,025	1,262	1,157,415
18	Apr-10	$ 1,906,975	1,023	1,144,185
19	May-10	$ 2,037,482	1,307	1,222,489
20	Jun-10	$ 2,162,494	1,224	1,513,746
21	Jul-10	$ 2,266,345	1,314	1,133,173
22	Aug-10	$ 2,299,991	1,291	1,379,995

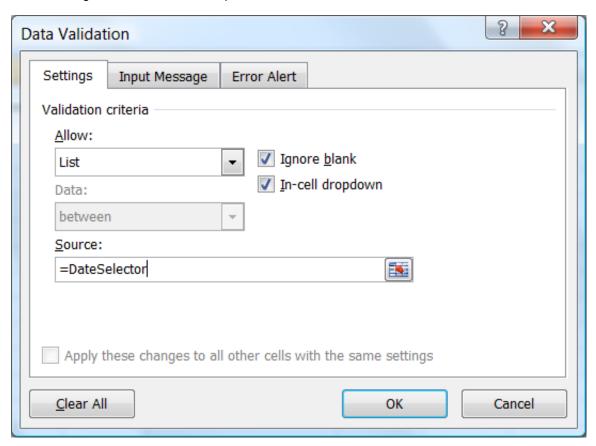That's it for the Data tab for now…but we'll be back!

DASHBOARD TAB SETUP – PART 1

Now we jump over to the Dashboard worksheet and set up a couple of dropdowns — one is the report period selector, and the other is the report range (how many months to include in the chart) selector. Start by setting up some labels with dropdowns (I normally put these off to the side and outside the print range… but that doesn't sit nice with the screen resolution I like to work with on this blog):
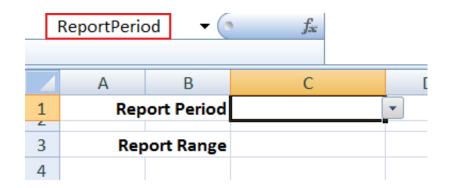
	A	B	C	D
1	**Report Period**			
2				
3	**Report Range**			
4				
5				
6				
7				
8				

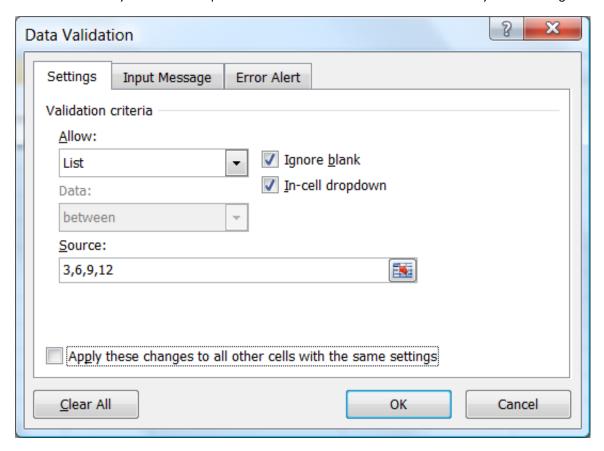Then, set up the dropdowns using Excel data validation:

First, the report period. Click in cell C1, select Data » Data Validation, choose List, and then reference the named range of months we set up earlier, DateSelector:

Data Validation

Settings Input Message Error Alert

Validation criteria

Allow:

List ▼ ✔ Ignore blank

Data: ✔ In-cell dropdown

between ▼

Source:

=DateSelector

☐ Apply these changes to all other cells with the same settings
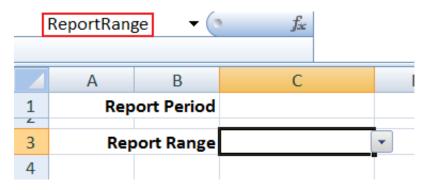
Clear All OK Cancel

When you click OK, you will have a dropdown in cell C1 that contains all of the available months. This is a critical cell — it's what we'll use to select the date we want to key off of for reporting, and it's what we'll use to look up the data. So, we need to make it a named cell — ReportPeriod:

	A	B	C	
ReportPeriod				

	A	B	C	D
1		Report Period		
2				
3		Report Range		
4				

Now, let's do a similar operation for the report range — this tells the spreadsheet how many months to include in each chart. Click in cell C3, select Data » Data Validation, choose List, and then enter the different values you want as options (I've used 3, 6, 9, and 12 here, but any list of integers will work):

Data Validation

Settings | Input Message | Error Alert

Validation criteria

Allow:

List

☑ Ignore blank

Data:

between

☑ In-cell dropdown

Source:

3,6,9,12

☐ Apply these changes to all other cells with the same settings

Clear All   OK   Cancel

And, let's name *that* cell ReportRange:

	A	B	C	
ReportRange				

	A	B	C	D
1		Report Period		
2				
3		Report Range		
4				

Does this seem like a lot of work? It can be a bit of a hassle on the initial setup, but it will pay huge dividends as the report gets updated each day, week, or month. Trust me!

Before we leave this tab, go ahead and select a value in each dropdown — this will make it easier to check the formulas in the next step.

A	B	C
Report Period		Jul-09
Report Range		6

DATA TAB SETUP – PART 2

Now is where the fun begins. We're going to go back over to the Data worksheet and start setting up some additional named ranges. We've got MainData, which is the full range of data. We want to look at the currently selected Report Period (a named range called ReportPeriod) and find the value for each metric that is in the same row as that report period. That will give us the "Current" value for each metric. All you need to do is put the *exact same formula* in each of the three "Current" cells:

```
=VLOOKUP(ReportPeriod,MainData,COLUMN())
```

In this example, these are the values for each of the three arguments:

- ReportPeriod — Jul-09, the value we selected on the Dashboard tab
- MainData — this is the full set of data, including the list of months in column A
- COLUMN() — this is 2, the column that the current metric is listed in (this function resolves to "3" for Orders and to "4" for Web Traffic)

So, the formula simply takes the currently selected month, finds the row with that value in the data array, and then moves over to the column that matches the current column of the formula:

	A	B	C	D
1	Current -->	$ 1,567,226	905	1,097,058
2	**Report Period**	**Revenue**	**Orders**	**Web Traffic**
3	Jan-09	$ 1,435,256	828	1,004,679
4	Feb-09	$ 1,402,532	749	701,266
5	Mar-09	$ 1,516,852	984	910,111
6	Apr-09	$ 1,539,400	816	769,700
7	May-09	$ 1,540,557	858	924,334
8	Jun-09	$ 1,443,958	773	1,010,771
9	Jul-09	$ 1,567,226	905	1,097,058
10	Aug-09	$ 1,517,176	867	910,306
11	Sep-09	$ 1,490,594	982	894,356
12	Oct-09	$ 1,629,494	928	1,140,646
13	Nov-09	$ 1,550,529	837	1,085,370
14	Dec-09	$ 1,620,330	945	1,134,231
15	Jan-10	$ 1,725,108	1090	452,554
16	Feb-10	$ 1,868,801	987	1,308,161
17				

Slick, huh? And, because the ReportPeriod data validation dropdown on the Dashboard worksheet is referencing the *first column of the data* on the Data tab, the VLOOKUP will always be able to find a matching value. (Read that last sentence again if it didn't sink in — it's a nifty little way of ensuring the robustness of the report)

This little bit of cleverness is really just a setup for the next step, which is setting up the data *ranges* that we're going to chart. Conceptually, it's very similar to what we did to find the current metric value, but we want to select the range of data that *ends* with that value and goes *backwards* by the number of months specified by ReportRange. So, in the values we selected above, Jul-09 and "6," we basically want to be able to chart the following range of data:

	A	B	C	D
1	*Current -->*	$ 1,567,226	905	1,097,058
2	**Report Period**	**Revenue**	**Orders**	**Web Traffic**
3	Jan-09	$ 1,435,256	828	1,004,679
4	Feb-09	$ 1,402,532	749	841,519
5	Mar-09	$ 1,516,852	984	910,111
6	Apr-09	$ 1,539,400	816	923,640
7	May-09	$ 1,540,557	858	1,078,390
8	Jun-09	$ 1,443,958	773	866,375
9	Jul-09	$ 1,567,226	905	1,097,058
10	Aug-09	$ 1,517,176	867	1,062,023
11	Sep-09	$ 1,490,594	982	745,297
12	Oct-09	$ 1,629,494	928	814,747
13	Nov-09	$ 1,550,529	837	1,085,370
14	Dec-09	$ 1,620,330	945	1,134,231

We'll do this by defining a named range called Revenue_Range (note how this has a similar naming convention to Revenue_Current, the name we gave the cell with the single value — this comes in handy for keeping track of things when setting up the dashboard). We can't use VLOOKUP, because that function doesn't really work with arrays and ranges of data. Instead, we'll use a combination of the MATCH function (which is sort of like VLOOKUP on steroids) and the INDEX function (which is a handy way to grab a range of cells). Pull your hat down and fasten your seatbelt, as this one gets a little scary. Ultimately, the formula looks like this:

```
=INDEX(MainData,MATCH(ReportPeriod,DateSelector)-ReportRange+1,
COLUMN(Revenue_Current)):INDEX(MainData, MATCH(ReportPeriod,DateSelector),
COLUMN(Revenue_Current))
```

It's really not that bad when you break it down. I promise!

Working from the outside in, you've got a couple of INDEX() functions. Think of those as being INDEX(First Cell) and INDEX(Last Cell).

	A	B	C	D
1	Current -->	$ 1,567,226	905	1,097,058
2	**Report Period**	**Revenue**	**Orders**	**Web Traffic**
3	Jan-09	$ 1,435,256	828	1,004,679
4	Feb-09	$ 1,402,532	INDEX(First Cell)	
5	Mar-09	$ 1,516,852		
6	Apr-09	$ 1,539,400	816	923,640
7	May-09	$ 1,540,557	858	1,078,390
8	Jun-09	$ 1,443,958	773	866,375
9	Jul-09	$ 1,567,226	INDEX(Last Cell)	3
10	Aug-09	$ 1,517,176		3
11	Sep-09	$ 1,490,594	982	745,297
12	Oct-09	$ 1,629,494	928	814,747
13	Nov-09	$ 1,550,529	837	1,085,370
14	Dec-09	$ 1,620,330	945	1,134,231

The range is defined, in pseudocode, as simply:

```
=INDEX(First Cell):INDEX(Last Cell)
```

The Last Cell calculation is slightly simpler to understand. As a matter of fact, this is really just trying to identify the *cell location* (not the value *in* the cell) of the current value for revenue — very similar to what we did with the VLOOKUP function earlier. The INDEX function has three arguments: INDEX(array,row_num,column_num). Here's how those are getting populated:

- array — this is simply set to MainData, the full range of data
- row_num — this is the row number *within the array* that we want to use; we'll come back to that in just a minute
- column_num — we use a similar trick that we used on the Revenue_Current function, in that we use the COLUMN() formula; but, since we set up this range simply as a named range (as opposed to being a value in a cell), we can't leave the value of the function blank; so, we populate the function with the argument of Revenue_Current — we want to grab the column that is the same column as where the current revenue value is populated in the top row.

Now, back to how we determine the row_num value. We do this using the MATCH function, which we need to use on a 1-dimensional array rather than a 2-dimensional array (MainData is a 2-dimensional array). All we want this function to return is the number of the row in the MainData array for the currently selected report period, which, as it turns out, is the same row as the currently selected report period in the DataSelector range. The formula is pretty simple:

```
MATCH(ReportPeriod,DateSelector)
```

	A	B	C	D
1	Current -->	$ 1,567,226	905	1,097,058
2	Report Period	Revenue	Orders	Web Traffic
3	Jan-09	$ ——DateSelector	- - -	1,004,679
4	Feb-09	$		841,519
5	Mar-09	$ 1,516,852	984	910,111
6	Apr-09	$ 1,539,400	816	923,640
7	May-09	$ 1,540,557	858	1,078,390
8	Jun-09	$ 1,443,958	773	866,375
9	Jul-09	$ =MATCH()		1,097,058
10	Aug-09	$		1,062,023
11	Sep-09	$ 1,490,594	982	745,297
12	Oct-09	$ 1,629,494	928	814,747
13	Nov-09	$ 1,550,529	837	1,085,370
14	Dec-09	$ 1,620,330	945	1,134,231

The formula looks in the DateSelector range for the ReportPeriod value and finds it...in the seventh row of the array. So, row_num is set to 7.

INDEX(First Cell) is almost identical to INDEX(Last Cell), except the row_num value needs to be set to 2 instead of 7 — that will make the full range match the ReportRange value of 6. So, row_num is calculated as:

    MATCH(ReportPeriod,DateSelector)-ReportRange+1

(The "+1" is needed because we want the total number of cells included in the range to be ReportRange inclusive.)

Now, that's not all that scary, is it? We just need to drop the full formula into a named range called Revenue_Range by selecting Formulas » Name Manager » New, naming the range Revenue_Range, and inserting the formula:

    =INDEX(MainData,MATCH(ReportPeriod,DateSelector)-ReportRange+1,
    COLUMN(Revenue_Current)):INDEX(MainData, MATCH(ReportPeriod,DateSelector),
    COLUMN(Revenue_Current))

The whole formula is there, even if you can't see it!

Repeat this last step to create two more named ranges with slightly different formulas (the differences are in bold):

- Orders_Range: =INDEX(MainData,MATCH(ReportPeriod,DateSelector)-ReportRange+1,COLUMN(Orders_Current)):INDEX(MainData,MATCH(ReportPeriod,DateSelector),COLU
- WebTraffic_Range: =INDEX(MainData,MATCH(ReportPeriod,DateSelector)-ReportRange+1,COLUMN(WebTraffic_Current)):INDEX(MainData,MATCH(ReportPeriod,DateSelector),C

Tip: After creating one of these named ranges, while still in the Name Manager, you can select the range and click into the formula box, and the current range of cells defined by the formula will show up with a blinking dotted line around them.

You're getting sooooooo close, so hang in there! In order for the chart labels to show up correctly, we need to make *one more* named range. We'll call it Date_Range and define it with the following formula (this is just like the earlier _Range formulas, but we know we want to pull the dates from the first column, so, rather than using the COLUMN() formula, we simply use a constant, "1":

=INDEX(MainData,MATCH(ReportPeriod,DateSelector)-ReportRange+1,1):INDEX(MainData, MATCH(ReportPeriod,DateSelector),1)
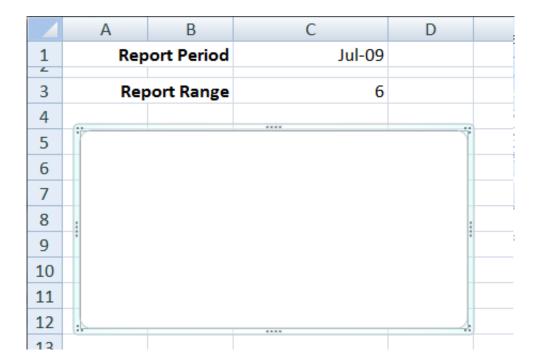
If you want, you can fiddle around with the different settings on the Dashboard tab and watch how both the "Current" values and (if you get into Name Manager) the _Range areas change.

OR...you can move on to the final step, where it all comes together!

DASHBOARD TAB SETUP – PART 2 (THE FINAL STEP)

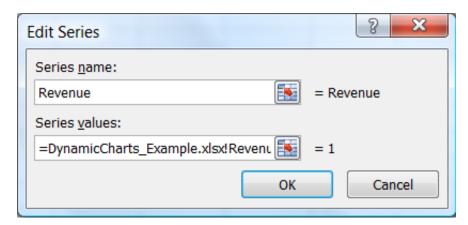It's back over to the Dashboard worksheet to wrap things up.

Insert a 2-D Line chart and resize it to be less than totally obnoxious. It will just be a blank box initially:

	A	B	C	D
1	**Report Period**		Jul-09	
3	**Report Range**		6	
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Right-click on the chart and select Select Data. Click to Add a new series and enter "Revenue" (without the quotes — Excel will add those for you) as the series name and the following formula for the series values:

=DynamicCharts_Example.xlsx!Revenue_Range

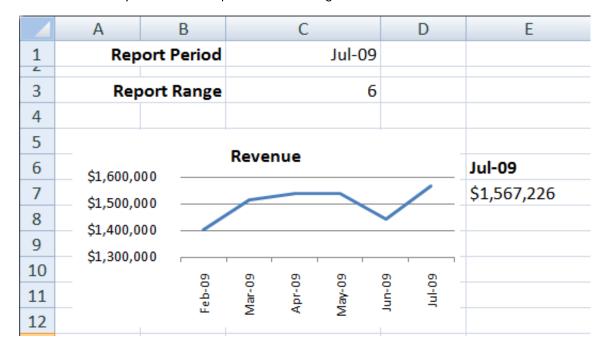(Change the name of the workbook if that's not what your workbook is named)

Edit Series

Series name:

Revenue   = Revenue

Series values:

=DynamicCharts_Example.xlsx!Revenu   = 1

OK   Cancel

Click to edit the axis labels and enter a similar formula:

=DynamicCharts_Example.xlsx!Date_Range

You will now have an absolutely *horrid* looking chart (thank you, Excel!):

	A	B	C	D
1	**Report Period**		Jul-09	
3	**Report Range**		6	
4				
5				
6				
7		$1,600,000		
8		$1,400,000		
9		$1,200,000		
10				
11				
12				
13				

Tighten it up with some level of formatting (if you just can't stand to wait, you can go ahead and start flipping the dropdowns to different settings), drop "=ReportPeriod" into cell E6 and "=Revenue_Current" into cell E7, and you will wind up with something that looks like this:

	A	B	C	D	E
1	**Report Period**		Jul-09		
3	**Report Range**		6		
4					
5					
6		$1,600,000			**Jul-09**
7		$1,500,000			$1,567,226
8		$1,400,000			
9		$1,300,000			
10					
11					
12					

Okay, so that still looks pretty horrid…but this isn't a post about data visualization, and I'm trying to make the example as illustrative as possible. In practice, we use this technique to populate a slew of sparklines (no x-axis labels) and a couple of bar charts, as well as some additional calculated values for each metric.
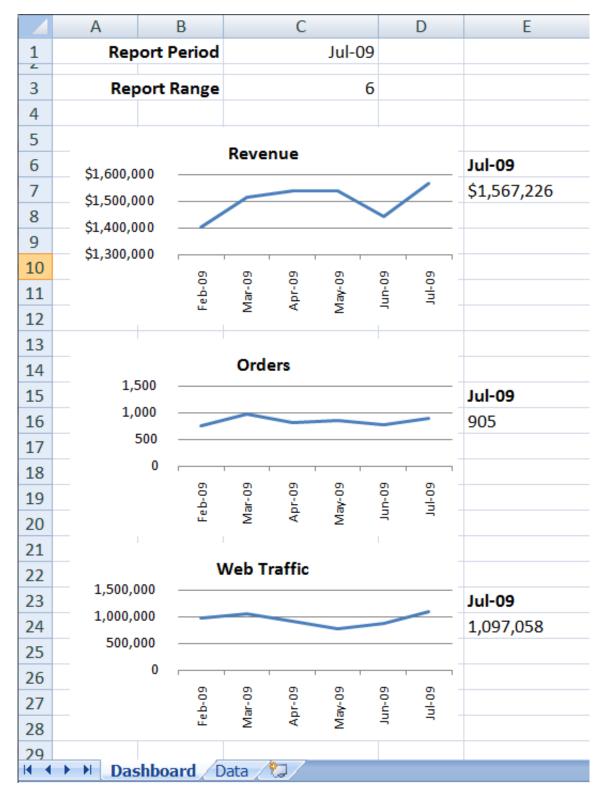
To add charts for orders and web traffic is a little easier than creating the initial chart. Just copy the Revenue chart a couple of times (if you hold down <Ctrl>-<Shift> and then click and drag the chart it will make a copy and keep that copy aligned with the original chart).

Then, simply click on the data line in the chart and look up at the formula box. You will see a formula that looks something like this:

```
=SERIES("Revenue",DynamicCharts_Example.xlsx!Date_Range,
DynamicCharts_Example.xlsx!Revenue_Range,1)
```

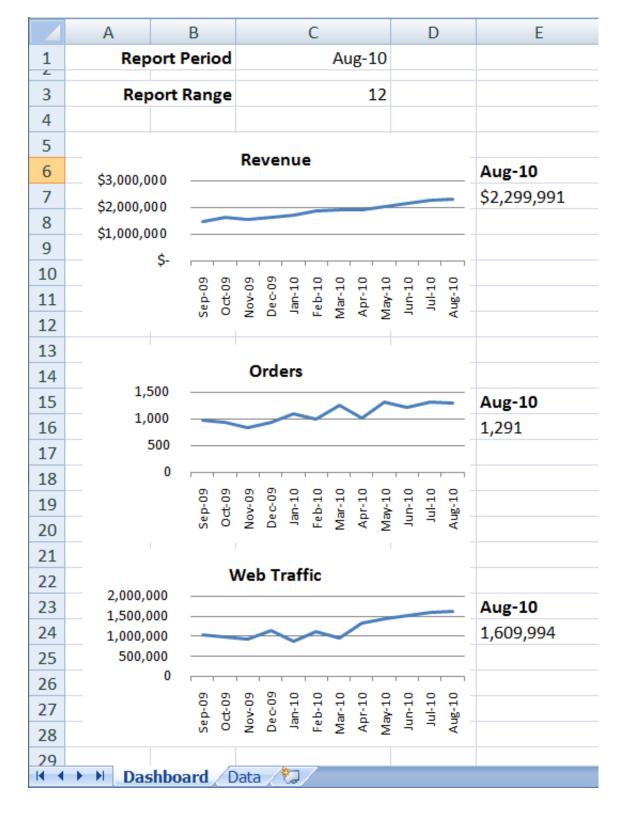Change the bolded text, "Revenue," to be "Orders" and the chart will update.

Repeat for a Web Traffic chart, and you'll wind up with something like this:

And…for the magic…

<drum rollllllllllll>

Change the dropdowns and watch the charts update!

	A	B	C	D	E
1	**Report Period**		Aug-10		
2					
3	**Report Range**		12		
4					

Revenue

$3,000,000
$2,000,000
$1,000,000
$-

Sep-09 Oct-09 Nov-09 Dec-09 Jan-10 Feb-10 Mar-10 Apr-10 May-10 Jun-10 Jul-10 Aug-10

Aug-10
$2,299,991

Orders

1,500
1,000
500
0

Sep-09 Oct-09 Nov-09 Dec-09 Jan-10 Feb-10 Mar-10 Apr-10 May-10 Jun-10 Jul-10 Aug-10

Aug-10
1,291

Web Traffic

2,000,000
1,500,000
1,000,000
500,000
0

Sep-09 Oct-09 Nov-09 Dec-09 Jan-10 Feb-10 Mar-10 Apr-10 May-10 Jun-10 Jul-10 Aug-10

Aug-10
1,609,994

Dashboard / Data

So, is it worth it? Not if you're going to produce one report a couple of times and move on. But, if you're in a situation where you have a lot of recurring, standardized reports (not as mindless report monkeys — these should be well-structured, well-validated, actionable performance measurement tools), then the payoff will hit pretty quickly. Updating the report is simply a matter of updating the data on the Data tab (some of which could even be done automatically, depending on the data source and the API availability), then the Report Period dropdown on the Dashboard tab can be changed to the new report period, and the charts get automatically updated! You can then spend your time analyzing and interpreting the results. Often, this means going back and digging for more data to supplement the report…but I'm teetering on the verge of much larger topic, so I'll stop…

As an added bonus, you can hide the Data tab and distribute the spreadsheet itself, enabling your end users to flip back and forth between different date ranges — a poor man's BI tool, if ever there was one (in practice, there will seldom be any real insight gleaned from this limited number of adjustable dropdowns, and that's not the reason to set them up in the first place).

I was curious as to what it would take to create this example from scratch and document it as I went. As it's turned out, this is a lonnnnnnngggg post. But, if you've skimmed it, get the gist, and want to start fiddling around with the example used here, feel free to download it (http://www.gilliganondata.com/files/DynamicCharts_Example.xlsx)!

Happy dynamic charting!

---

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Sam · 5 months ago

hi, i'm attempting to use this on data with opposite axis but getting stuck at data tab setup part 2 lookup
=VLOOKUP(ReportPeriod,MainData,COLUMN())
trying to substitue this formula with =HLOOKUP(ReportPeriod,MainData,ROW()) but excel does not like
is this a fools errand or can this be adjusted to cater for opposite axis?

ᴧ | ᵛ · Reply · Share ›

Tonya Blesie Jansen · 5 months ago

Thank you so much for the post -- this is extremely helpful! I have a similar situation in which I am trying to create a dynamic chart in which I am letting the user select the metric that is displayed. In the example above, it would be as if there was a single chart with a drop down option for revenue, orders, or web traffic. I have used the Offset function to create named ranges for the metrics, but I can't seem to get the Named Range to populate in the chart.

I have tried using a compound if statement to return the appropriate named range to the chart series. Similar . =IF(E1="Revenue", Revenue, IF(E1="Orders", Orders, IF(E1="Web Traffic", WebTraffic, 0))), but the chart is informing me that it is an invalid function. (Less than helpful for troubleshooting)

Any other suggestions or tips to trouble-shoot?

ᴧ | ᵛ · Reply · Share ›

nickp · 5 months ago

First off I would like to thank you for putting this together. It has been EXTREMELY helpful in my path toward automating my reporting. I was able to combine this with some other information I found online to create an elegant SUMIFS in an array.

I now need to automate the creation of a pivot table. I don't necessarily want the pivot table at all I just want the data to be combined in the fashion that the pivot table provides it. Basically, I have a set of data that contains aggregated sales data on a monthly level broken down into product groups, customer, and then further broken down in to total sales of individual parts. I am able to create a pivot table and then copy the data into a new sheet but would prefer to have a formula do this for me as we have over 30 customers that I would then have to pivot into Top 10 part sales $ decrease, Top 10 part sales $ increase, and Top 10 parts sales $ overall for each of them.

An example of the data I have is as follows

Customer
MaterialGroup 1
Product
Period

see more

∧ | ∨ • Reply • Share ›

nickp ↱ nickp • 5 months ago
I suppose my question to you is, is there any way to aggregate this into a format such as

Customer Product 2015 2014

Where each year is the total of the months in that year without having to create a pivot table and then copy it over?

∧ | ∨ • Reply • Share ›

nickp ↱ nickp • 5 months ago
Well, apparently the formatting went to garbage...

∧ | ∨ • Reply • Share ›

Rachel Harris • a year ago
Tim, can this be modified to just have the most current month that is populated with data always display as my "reportperiod", instead of being able to choose which reportperiod i want to display?

∧ | ∨ • Reply • Share ›

Tim Wilson ↱ Rachel Harris • a year ago
That should be pretty easy. There are two ways to approach it:

1. As the "maximum date populated in the spreadsheet." Say that you've only

updated data through the end of June, so you want the report to show data with the "reportperiod" as June, even if you're looking at it in September. Then, once you add July and August...you want it to be August. All you need do do there is go into Name Manager (Formulas >> Name Manager), select "ReportPeriod," click Edit, and change the formula from a cell reference to be: "=MAX(DateSelector". Basically, that's just grabbing the maximum (most recent) date in the first column of the Data tab.

2. As "the most recent month" (or week, or yesterday). In this case, you still just want to update ReportPeriod, but you want to make it key off of the current date. So, to do "the previous complete month," for instance, you could make the formula for ReportPeriod be: "=DATE(YEAR(TODAY()),MONTH(TODAY())-1,1". Basically, you're just taking the current day (TODAY()) and going to the first day of the prior month. Excel is crafty in that, even if the current day is 1/2/2015, the formula will still resolve to 12/1/2014 (the YEAR would be 2015, the MONTH would be 1-1=0, and the DAY would be 1; Excel recognizes that a date of 0/1/2015 is actually 12/1/2014).

Does one of those get you what you're looking for?

⌃ | ⌄ · Reply · Share ›

Kannan · a year ago

Hi, I'm trying to work something similar. My worksheet has a dynamic range and I'm selecting the data I needed using a named range. However, when I use the name in chart formula, it shows an error "A formula in this worksheet contains one or more invalid references. Verify that the formula contains a valid path, workbook, range name, and cell reference. any thoughts why this happens?

⌃ | ⌄ · Reply · Share ›

Tim Wilson ➤ Kannan · a year ago

The chart formulas are notoriously finicky. The good news is, once you get it working, it will be solid and reliable. The most common issue I see people running into is that the filename has to be used in the chart formula (as shown in the example here). It will update cleanly on its own if you rename the file. It doesn't make sense that it's required, but it is. Any chance that is the issue you're having?

⌃ | ⌄ · Reply · Share ›

Kannan ➤ Tim Wilson · a year ago

Hi Tim, Absolutely!! That was the issue, now its working fine. I'm having a little more complex problem now, consider the data below -
Jack William Amy
Maths 50 77 11
Science 40 88 57
English 76 71 63
I want to create a dynamic chart that gets updated if I add a student next to Amy or a subject after English or both. Do you think that is possible using

Tim Wilson → Kannan • a year ago

Great! I'm glad that worked.

For the more complex problem, it should be doable. My initial reaction was to suggest flattening the data structure so that "Student" was a column with the student's name in it. It would be a much longer table:

Math Jack 50
Math William 77
Math Amy 11
Science Jack 40
:

If the raw table could be maintained that way, then a pivot table / pivot chart would make for dynamic viewing of the data, possibly without any named ranges at all!

But, if the base structure needs to stay as it is, then it's probably still doable. I'd definitely recommend using Excel tables for this (I wrote an updated version of this post that uses tables here: http://tim.webanalyticsdemysti.... If you do that, then you can get all the column headings (student names) with something like: =Table1[#Headers] and all of the subjects with something like: =Table1[Subject] (assuming you had a column heading for the first column of "Subject"). See the "Referencing tables and parts of tables" section in this post: http://tim.webanalyticsdemysti.... So, you could make those named ranges to get "all the possible values" to populate your dropdowns and then use MATCH, INDEX, VLOOKUP, and maybe even HLOOKUP to get the data you need to chart it.

The short answer: it's doable! But, it will take some tinkering. You'll definitely be a stronger Excel user once you've pulled it off, though!

∧ | ∨ • Reply • Share ›

Kannan → Tim Wilson • a year ago

Tim, Thanks for your suggestion. I have been using a macro to transpose the data in the way you'd suggested and created pivot charts to create dynamic charts. But I won't be able to restructure the data in the current problem in hand. I like the idea of tables, one problem again though - the data gets pulled from a different sheet, hence in case of multiple selections, the subjects would get added (as per my example above) or removed. There are already formulas

written in the cells, basically a VLOOKUP function, which shows the values of the subject if selected, otherwise shows a blank cell and blank cells for the students as well.. In this case, if I create a table, the entire range containing the formula gets selected. Hence, the chart would reflect some blank legend entries and axis. Not sure if I've explained my problem well and clear, please let me know if not.

∧ | ∨ • Reply • Share ›

Tim Wilson → Kannan • a year ago

Unfortunately, it's a little tough to follow the description. I'll email you separately.

∧ | ∨ • Reply • Share ›

rashelle • 2 years ago

Thank you so much for posting this! I had been trying to find something online for awhile to help me with this exact problem, and through your steps was able to now save myself and my group tons of work. Thank you!

∧ | ∨ • Reply • Share ›

Rachel Harris • 2 years ago

Nevermind! I was able to figure out the issue from downloading your example worksheet - it was in the way something was named. Thanks!

∧ | ∨ • Reply • Share ›

Rachel Harris • 2 years ago

Hi Tim, thank you for the helpful tutorial!! I am getting an error message in my own Worksheet when I get to creating my dynamic chart (my data set is much larger than your example, fyi). The error message I'm getting is "Reference is not valid. Reference must be to an open worksheet." Could you provide some feedback on how to address this ? I really appreciate it. Thanks!

∧ | ∨ • Reply • Share ›

Catalina Camuyrano • 2 years ago

this post is really usefull! I'm also looking for a way to create dynamic mean formulas. Instead of a chart I have a table with the averages of different stuff. I want to be able to select the amount of periods I want the average to compute. So I can have the 5-year average, the 10-year average and so on. I think the match formula is taking me close to doing it, but still haven't nailed it. If you have any advice as on how to get there I'll really appreciate. Thanks!

∧ | ∨ • Reply • Share ›

Tim Wilson → Catalina Camuyrano • 2 years ago

Oops! I missed this request. You're on the right track, I think. A combination of MATCH (to find the starting cell) and then OFFSET (to actually select the range you want to average) should do the trick. If not, shoot me an email -- just my first name

@ this domain.

^ | ∨ • Reply • Share ›

Leon Claassen ➔ Catalina Camuyrano • 2 years ago

I have a similar workbook that does what you are wanting to do. My workbook totals my totals for the number of months I select or days, etc. Basically what I did was created a reference sheet where i have a my list. I then renamed the the cells using the Name Manager.

I then use an IF statement to see that my formula matches the desired criteria. Here is an example of the formula I use:

=IFERROR(IF($C$7=Criteria,F7,0),"")+IFERROR(IF($C$8=Criteria,F8,0),0)+IFERF

There is probably a better way of adding each cell, but this is a starting point
All the cell in column C have this formula in them: =IF(D12<=$P$4,$P$4,D12)

And Cell P4 is named Criteria
Column D I just have a list of numbers (in this case indicating the month number)

Let me know if this helps, but like I said, I am also positive that there is a genius out there who can fine tune my formula / way of working this.

^ | ∨ • Reply • Share ›

todtown • 2 years ago

Cool! Thanx, man! I'm creating something similar to this. I went through and built your example, and now I just need to modify it to fit my scenario.

^ | ∨ • Reply • Share ›

Gil • 3 years ago

I think I owe you my salary! It was thrilling to following your explanations and it open up my eyes for much more advanced possibilities with Excel (and I am a very advanced in Excel)

^ | ∨ • Reply • Share ›

Tim Wilson ➔ Gil • 3 years ago

That's great to hear!

^ | ∨ • Reply • Share ›

Barrington • 3 years ago

Many thanks Tim,
There are many versions on the web of "how to set up dynamic charts", but I have found your instructions and explanations here to be not only easy to follow but delivered great results. Thanks so much, you've opened up a whole new aspect of Excel for me, And made it fun!

^ | ∨ • Reply • Share ›

Martina · 3 years ago

Good job, Tim!! I have been looking for this kind of solution for a very long time. I was afraid it would be necessary to use Macros, but you have created such a descriptive guideline that I couldn´t screw it up :) It was really helpful, thank you very much.

∧ | ∨ · Reply · Share ›

> **Tim Wilson** → Martina · 3 years ago
>
> Great!
>
> ∧ | ∨ · Reply · Share ›

PJ · 3 years ago

I've seen umpteen tutorials and pages regaarding dynamic charts from Named ranges, but none seem to address the issue I am having.

The problem is rooted in two main areas. One, that the Series function always converts entries to absolute RC:RC references, and the other, that using OFFSET to obtain the relative range by use of another defined cell will only remain valid if the Named ranges are still in the same relative order from the reference used to base the OFFSET.

∧ | ∨ · Reply · Share ›

> **Tim Wilson** → PJ · 3 years ago
>
> I'm not sure I understand the specifics of either issue. I definitely have used named ranges in the definitions of the series that get charted (download the spreadsheet at the end of this post). And, I'm not sure what you are referencing regarding named ranges being in the "same relative order." Let me know, and perhaps I can help!
>
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Jon · 4 years ago

Hi Tim,

I am using your formulas to draw information from multiple sheets into one concise page. Basically the same as the post but instead of showing info on a chart, displaying (on the upwards of 20 columns) into one table, with the date selection decending and all the information showing exactly as it appears on other pages going across. I haven't been able to find anyone else doing anything close to this in scope and size. VBA only led me circles. Can you please help? Thank you for your time!

∧ | ∨ · Reply · Share ›

> **Tim Wilson** → Jon · 4 years ago
>
> Jon and I had an email exchange offline that involved swapping some additional details and, ultimately, a sample spreadsheet. The solution involved the same principles as described in this post, but added on the use of Excel tables, which were something I wasn't using heavily when I initially wrote this post. If either Jon's question, or my reference to tables, is something you have questions about, shoot me an email or leave another comment here. There's another post or two that I need to write coming out of the exchange, but it's more than will fit reasonably in a

comment!

^ | ∨ • Reply • Share ›

Tim Wilson · 4 years ago

Katie, I'm not sure I fully understand the question. It's doable to make the named range include more than one column of data, but it makes my head hurt a little bit to think through how the charting would work. If you're looking to show two series on the same chart (say, Revenue and Orders in the example in this post), that is totally doable -- it's actually how I use the tool in practice. You simply have to add another series to the same chart.

Now, if you're looking to what Dave was referring to earlier in the comments -- to enable a way to toggle between different views of the data, I actually stumbled across a nifty trick today that Chandoo came up with some time back (I was looking into something entirely different than this post): http://chandoo.org/wp/2008/11/.... That adds another hidden worksheet, but it might do that trick.

If I haven't understood the question...let me know!

^ | ∨ • Reply • Share ›

Katie · 4 years ago

Fantastic post! Just what I was looking for. I know it was mentioned earlier in the comments and maybe I missed a response, but in 2010 is there a way to add more series of data from named ranges? If each series has two variables? We're tracking the relationships between two variables for each date. Thoughts?

^ | ∨ • Reply • Share ›

Menaya Garces · 4 years ago

You are amazing. I'm sure I'll eventually understand these (since the instructions are perfectly clear), and I have to since I'm learning (on the job) to create dynamic charts. Thank you for all that you do!

^ | ∨ • Reply • Share ›

Tim Wilson → Menaya Garces · 4 years ago

I'm glad to hear it!

^ | ∨ • Reply • Share ›

Tim Wilson · 4 years ago

Derek -- I hadn't planned for that use case. You want a chart that takes all the "Nov" values and plots those in order? So, the line would plot 52, 67, 65, 22, 22? What would the x-axis labels be (or would it be unlabeled?). Help me understand the use case a little bit better (and I apologize for another slow response!).

^ | ∨ • Reply • Share ›

Derek · 4 years ago

That make sense Tim. Thanks!

I ran into another issue...

if i had column A with the same dates for 5 rows, then column B with data:

ColA ColB
Nov 52
Nov 67
Nov 65
Nov 22
Nov 22

can i dynamically plot a line chart using range? It appears the formula only works for unique date set?

thanks

∧ | ∨ • Reply • Share ›

Tim Wilson · 4 years ago

Derek -- there are a number of ways to show the previous period's value. In this specific example, the easiest way is to just do a VLOOKUP for [Current Selected Month minuse 1]. So, if, for instance, you add a row on the second tab and, at the top of each column in the new row, you want to display the value for the previous month, simply use the following formula:

=VLOOKUP(DATE(YEAR(ReportPeriod),MONTH(ReportPeriod)-1,1),MainData,COLUMN(

If you break this down a bit, you'll see that it is the exact same formula as the "Current" value, but, rather than looking for "ReportPeriod," you're looking for ReportPeriod...minus one month. That's what "DATE(YEAR(ReportPeriod),MONTH(ReportPeriod)-1,1)" does.

You can then make these "Previous" values named cells and display them on the first worksheet.

∧ | ∨ • Reply • Share ›

Derek · 4 years ago

How can i display the current period and previous period's values?

∧ | ∨ • Reply • Share ›

Antony · 4 years ago

thanks Tim - I actually don't have a full column because my validation criteria is within hidden rows at the top of the sheet. However, your solution does work for me because I can just move my OFFSET command into the Name Manager and this does the trick as the validation source is now just the name reference - thanks very much for your help!

Lenn - sorry your post made no sense - and wasn't any help!

∧ | ∨ • Reply • Share ›

Lenn Johnson · 4 years ago

Lehh Johnson · 4 years ago

Data --> Range
How difficult would that be?

∧ | ∨ · Reply · Share ›

Antony · 4 years ago

sorry in the post above i should have said:

"- so in this case, the OFFSET command takes the value of D21 as the offset."

∧ | ∨ · Reply · Share ›

Antony · 4 years ago

Hi Tim,

I've hit your post searching for Excel 2010. Basically my problem is that I used Data Validation Lists to pick a list of data which can change in length according to other information entered. If you specify a source list, you may not know the length of the list (how many rows) and this causes a load of white spaces in the dropdown (for all cells in the range which had no data in them).

In previous Excel versions, there was a neat trick using the OFFSET command in the Data Validation list source criteria to prevent the white space cells at the end of the dropdown list...

Example:

My variable list of values is in Cells D2-D20. In cell D21 I work out how many cells have data in them using the formula '=19-COUNTIF(D2:D20,"")'

I can now create a dropdown list which uses the specific amount of data in my list in the Data Validation settings:

Source: =($D$2:(OFFSET($D$2,$D$21-1,0)))

- so in this case, the OFFSET command takes the value of D20 as the offset.

The problem is that now in Excel 2010, using OFFSET (or INDEX for that matter) as a Data Validation List source gives the error:

"You may not use reference operators (such as unions, intersections, and ranges) or array constants for Data Validation Criteria"

Do you know if there is any way around this problem. I am in a real mess now because i've started using some other features new to Excel 2010 - so I am stuck with a worksheet which i cannot save in either format!!

∧ | ∨ · Reply · Share ›

Tim Wilson → Antony · 4 years ago

@Antony I wrote a post on this separately: http://www.gilliganondata.com/.... It used

a variation of your OFFSET trick (in 2010), and then one of the commenters had a separate tip that was more straightforward (assuming you can use a full column for each set of dropdown values you want to use -- it requires defining the named range as a full column). Do any of the options there work for you?

∧ | ∨ • Reply • Share ›

Dave · 4 years ago

I wish you luck Tim, in the meantime... I'll reserve a place under the desk...lolol

∧ | ∨ • Reply • Share ›

Tony Kau · 4 years ago

Phenomenal. I was about to try to use VBA for a similar task. Thank you for this walk-through!

∧ | ∨ • Reply • Share ›

Tim Wilson → Tony Kau · 4 years ago

Tony - You're welcome! Let me know if you hit any snags. It's pushing the non-VBA interactivity capabilities of Excel a bit, I'm finding out -- as the comments note, some environments don't seem to support the approach, and we haven't been able to get to the bottom of exactly why.

∧ | ∨ • Reply • Share ›

Dave · 4 years ago

Wish you luck, I'm getting to the stage where after ripping out all my hair I'm now hiding under the desk wishing I'd never used the words: Yep, I can do that boss...lololol

let me know if you get it to work.... every time I attempt to use another range... things just go sideways... (well, I'm sure you get the idea)

∧ | ∨ • Reply • Share ›

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Tim has worked in digital analytics since 2001 in a diverse range of environments and with a wide range of analytics platforms. He managed the business intelligence team at a $500 million high tech B2B company, established and grew the digital analytics practices at three different agencies, and has worked with numerous clients to establish high-functioning analysts and analytics processes both as an agency analyst and as a consultant. He has been a consistent contributor of pragmatic thinking on digital analytics topics since 2007 through his blog, as a contributor to industry publications, and as a frequent and sought after speaker at industry events, including Internet Retailer, DAA Symposia, ACCELERATE, eMetrics, and a wide range of regional events around the world.

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