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To Transpose or Unpivot? What you need to know about table structuring in Power Query

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ahmedoye 04-07-2020 01:03 PM

To Transpose or Unpivot? What you need to know about table structuring in Power Query

When you have a tool that can carry out up to 380 data transformations, mostly through simple GUI clicks, then the tool is not ordinary.

That explains why Power Query, originally born in Excel, is now a powerful engine in many other tools (Power BI, Power Automate, CDS, Azure Analysis Services, may be many more to come). Once a user understands [How to Clean Dirty Data](#), there is a 99.9% chance of finding all the buttons that will take data from Dirty to Clean in Power Query.

The GUI is packed with a lot of transformational buttons. I am not sure I have used them all in my many years of using Power Query. Some of them though, are more frequently used than others, like the Pareto Principle, the 80/20 Rule. The **Unpivot** and **Transpose** buttons fall within that category of 20.

When you Transpose a table, the physical occurrence is the conversion of items on rows to columns and items on columns to rows respectively.

When you Unpivot, the physical occurrence seems like the conversion of items on rows to columns. In fact, when you unpivot, the headers become items lined in a single column and every item belonging to each header forms another column in front of that.

Let’s look at a dataset that requires scenarios for Transpose and Unpivot to drive home the lessons and the points to note about these two features.

Problem

We have a table looking like the one below:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Segment>>	Consumer			Corporate			Home Office					
2	Ship Mode>>	First Class	Same Day	Second Class	Standard Class	First Class	Same Day	Second Class	Standard Class	First Class	Same Day	Second Class	Standard Class
3	Order ID												
4	CA-2011-100293												91.056
5	CA-2011-100706			129.44									
6	CA-2011-100895				605.47								
7	CA-2011-100916								788.86				
8	CA-2011-101266			13.36									
9	CA-2011-101560							542.34					
10	CA-2011-101770								1.869				
11	CA-2011-102274								865.5				
12	CA-2011-102673								1044.44				
13	CA-2011-102988							4251.92					
14	CA-2011-103317					242.546							
15	CA-2011-103366	149.95											
16	CA-2011-103807								21.19				
17	CA-2011-103989					590.762							
18	CA-2011-104283				616.14								
19	CA-2011-106054					12.78							
20	CA-2011-106810								310.88				
21	CA-2011-107573				23.472								
22	CA-2011-107811								661.504				
23	CA-2011-108207												10.268

Instead of looking like the one below:



	A	B	C	D
	Order ID	Ship Mode	Segment	Value
2	CA-2011-103366	First Class	Consumer	149.95
3	CA-2011-109043	First Class	Consumer	243.6
4	CA-2011-113166	First Class	Consumer	9.568
5	CA-2011-124023	First Class	Consumer	8.96
6	CA-2011-130155	First Class	Consumer	34.2
7	CA-2011-136861	First Class	Consumer	31.984
8	CA-2011-153927	First Class	Consumer	286.65
9	CA-2011-157784	First Class	Consumer	514.03
10	CA-2011-160094	First Class	Consumer	1000.95
11	CA-2011-164749	First Class	Consumer	9.912
12	CA-2011-166730	First Class	Consumer	39.128
13	CA-2012-102722	First Class	Consumer	106.5
14	CA-2012-102778	First Class	Consumer	18.176
15	CA-2012-117828	First Class	Consumer	194.32
16	CA-2012-130218	First Class	Consumer	59.48
17	CA-2012-132318	First Class	Consumer	182.91
18	CA-2012-137974	First Class	Consumer	2298.9
19	CA-2012-138625	First Class	Consumer	197.72
20	CA-2012-141327	First Class	Consumer	440.144
21	CA-2012-149300	First Class	Consumer	32.985

The difference here is the fact that **Ship Mode** and **Segment** are supposed to be arranged in two different columns with their amount values in front of them on a separate column. Instead, we have them arranged in two different rows.

It's obvious we need to transpose things. Of course, Transpose alone won't solve this problem.

Let's take this data to Power BI and see how we can resolve this issue.

The Solution

1. When the data is imported to Power BI Desktop, we are aware we need to carry out a **Transpose**. So, rows become columns and column become rows. However, a careful look at the table (below) shows that we have already lost Row 1 because Power Query has turned it into a header. We must delete the **Promoted Header Step** and Anything after it.

Tip Number 1: When you need to use Transpose, you should delete any Promoted Header Step.



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(I will add some other tips to this in part 2 of this article).

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2. After deleting the **Promoted Header** step (and other steps after it), we can now go to the **Transform** Tab and hit "Transpose".

Transpose the table

Order ID looks bad

Segment & Ship Mode look good

Oops....Now, **Ship Mode** and **Segment** are looking good but **Order ID** is looking bad. We must now find a way to make **Order ID** good while keeping **Ship Mode** and **Segment** intact. Surely, we cannot do a **Transpose** again because this will keep us running in circles. **Transpose** just flips the whole table. Instead, we'll need something that can do a partial **Transpose**. Keep the good columns and **Transpose** only the bad one.

3. In order to have only the **Order ID** section to transpose, we must use **Unpivot**. **Unpivot** should make the **Order IDs** stand straight inside a column, while all the values form another column that matches the combination of each **Segment**, **Ship Mode** and **Order ID**. To achieve this, first we need to
- (a) **Promote Headers**
 - (b) **Fill down** the nulls on **Segment** to carry the values above them
 - (c) Select the good columns and ask Power Query to **Unpivot** the other columns (**Order IDs**)

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Table.TransformColumnTypes

1 Consumer First Class null Same Day null Second Class null Standard Class Corporate First Class null Same Day null Second Class null Standard Class Home Office First Class null Same Day null Second Class null Standard Class

Segment>> Ship Mode>> Ord

1 Consumer First Class 2 Consumer First Class 3 Consumer First Class 4 Consumer First Class 5 Consumer First Class 6 Consumer First Class 7 Consumer First Class 8 Consumer First Class 9 Consumer First Class 10 Consumer First Class 11 Consumer First Class 12 Consumer First Class 13 Consumer First Class 14 Consumer First Class 15 Consumer First Class 16 Consumer First Class

CA-2011-103366 149.95 CA-2011-109043 243.6 CA-2011-113166 9.568 CA-2011-124023 8.96 CA-2011-130155 34.2 CA-2011-136861 31.984 CA-2011-153927 286.65 CA-2011-157784 514.03 CA-2011-160094 1000.95 CA-2011-164749 9.912 CA-2011-166730 39.128 CA-2012-102722 106.5 CA-2012-102778 18.176 CA-2012-117828 194.32 CA-2012-130218 59.48 CA-2012-132318 182.91

Copy Remove Columns Remove Other Columns Add Column From Examples... Remove Duplicates Remove Errors Replace Values... Fill Change Type Transform Merge Columns Group By... Unpivot Columns Unpivot Other Columns Unpivot Only Selected Columns Move

Segment>>	Ship Mode>>	Attribute	Value
1 Consumer	First Class	CA-2011-103366	149.95
2 Consumer	First Class	CA-2011-109043	243.6
3 Consumer	First Class	CA-2011-113166	9.568
4 Consumer	First Class	CA-2011-124023	8.96
5 Consumer	First Class	CA-2011-130155	34.2
6 Consumer	First Class	CA-2011-136861	31.984
7 Consumer	First Class	CA-2011-153927	286.65
8 Consumer	First Class	CA-2011-157784	514.03
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14 Consumer	First Class	CA-2012-117828	194.32
15 Consumer	First Class	CA-2012-130218	59.48
16 Consumer	First Class	CA-2012-132318	182.91

Now we have the structure that we require. We will only have to rename the headings to our desire.

Conclusions and Things to Note:

It is important to think about the behavior of Transpose and Unpivot to know how it will affect our data tables.

When we use Transpose, our table will flip all rows to columns and vice versa.

Therefore, we must ensure that the table does not have headers, by deleting the promoted headers step from the Query Settings pane. If we don't delete headers, we would have lost a row of data because Transpose makes rows become columns, the headings just tend to disappear.

When we use Unpivot, a section of the table is transposed. This is done by making all the headings of that section appear on a single column to be named **Attribute** by default, and everything under the headings now



becomes a separate column to be named **Value** by default.

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Therefore, to flip a particular section only, the items required to be on a column must first be on the headers row. We must have a Promoted Header step before Unpivoting.

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