Beyond Pivot Tables
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CCH Learning:

Hello everybody and welcome to today's webinar Beyond Pivot Tables. My name is Susannah Gynther from Wolters Kluwer CCH Learning and I will be your moderator for today. A few quick pointers before we get started. The PowerPoint slides for today's presentation are available in the handout section on the go to webinar panel. If you're having sound problems, please check your audio settings, try to toggle between audio and phone, and just a reminder that within 24 to 48 hours, a notification for the e-learning recording will be emailed to you.

You can ask questions at any point during the presentation by sending them through the questions box. I will collate those questions and ask them at the Q&A towards the end of today's presentation. CCH Learning also offers a subscription service which many people have termed Netflix for professionals. It provides members with access to our entire library of recordings, as well as live webinars for a competitive flat fee, that's for over 500 hours of content. For CPD purposes, your viewing is logged automatically.

Your presenter today is Ryan Racelis. Ryan Is a certified Microsoft IT Trainer and lends his expertise in the industry as an Information Technology Consultant and Trainer to various businesses ranging from preschool centers to business process outsourcing facilities. He also took the lead role in the development of business applications and productivity tools for various small and medium enterprise both in the manufacturing and service sector. I will now pass you over to Ryan to begin today's presentation.

Ryan Racelis:

Thank you Susannah, and I just want to make sure I grab the correct screen here and I hope everyone can hear me well. Cool.

CCH Learning:

Yeah, we can see your slides.

Ryan Racelis:

Yes. Thank you. Now, good morning everyone, and in today's session, we will cover the following with regards Beyond the Pivot Table. We'll be focusing on the topic what's called what is Power Pivot? I'll try my very best in within an hour of webinar to make you understand what is Power Pivot in Excel, I'll show you how to activate if needed the Power Pivot in your Excel application. I'll show you how to manage the window and then how to go to the Power Pivot tab and then I'll show you a quick, I'll give you a quick look on how to add the data model from various resources, but if you are really keen in understanding more of this particular subtopic, later this afternoon I'll be doing another webinar whose focus is just data cleansing in Excel which is this topic right here.

And then also in this webinar regarding Power Pivot, we will be discussing on how to build relationship between the tables that you will be placing in your data model and we'll be ending the session by discussing what you call calculated and measures in Power Pivot. And then when we discuss on that topic, we will also display it in our pivot table. Now, let's move to my first slide here.

First, let's just understand why Microsoft created the idea of Power Pivot in Excel because basically, they have noticed that throughout the years, there is a gap between IT professional or technical people and the end user. As we all know, everyone is using Excel. So the idea of the Power Pivot is for you to apply some context and tools in databases inside your Excel spreadsheet. So on the left hand side of this slide right here, you will see Excel before Power Pivot and on the right is Excel if ever Power Pivot is installed or add in your application.

So we know in Excel that the maximum rows that you have in the sheet is just one million roughly. So that's the exact amount right there, but in Power Pivot, it can easily handle one table with millions of rows. Many people absolutely before this webinar starts, I'm here in Auckland, New Zealand. I have a two-hour consultation with the client regarding to this topic, and then she asked me, "What is the maximum number of rows in Power Pivot? In data modeling here in Power Pivot?" And I said it's like, "One table could handle two billion rows, two billion rows." And then in Power Pivot, it can also have more than two billion tables, so just imagine that.

In your Power Pivot, you can build the model with two billion rows in each table and you can have a maximum of two billion tables in your data model, that is mind blowing, that is amazing. But if we go back to the left hand side, we're limited in Excel with a maximum of a million rows. You cannot go beyond this number and if ever you're building what you call the pivot table and everyone knows how to use it, pivot table actually is just using one table. Also in Excel, it is formula based. So you create your calculation, you create, use your function like your V-lookup, X-lookup if you know it or match an index, but in Power Pivot, it's using just like what I said, the context of databases.

So I'll show you later on in my demonstration the context of relationship how you can build or create one. Now in Excel, remember, we know about Pivot Table if it's using only one table or referencing only in a single table. But in Power Pivot, when you build your pivot table, you can use two, three, five, 10 or you can go a million tables if you want and then just build a single pivot table right there, that is amazing. In Excel before Power Pivot, now, it uses the context of a cell. Remember, cell is the column and the row for your storage, but in Power Pivot, it's using a database engine.

So please take note, in Power Pivot, it's using a database engine in hosting your data. That's why it uses what you call the column base structure. It's a data based engine in the background. Now, in Excel before Power Pivot, it allows manually creating data. So that's the one, that's the skillset that you have. Now in Power Pivot, you can in data modeling using Power Build, you can import, you can link tables without editing those cells. You can even connect to multiple different sources. I'll give you a quick example on that one.

And then here lastly, so we know Excel is a great spreadsheet application and Power Pivot. It has a very powerful data storage and analysis engine. Now, this is the way I see a Power Pivot that can help many Excel users. Now, just like what I said, there are many people who are using Excel, so roughly in the survey, so they said there are 800 plus million active Excel user here in the planet. So just imagine that one, that's the reason why Microsoft created something like a bridge because in Excel, some of my clients when I'm doing consultations or training, they will ask me, "Hey Ryan, my source is a database. My source is a PLAT file, my source is a service, my source is somewhere in the web. So how can I use Excel to gather all of those and just build a single report?"

Now on Excel on its own, I will tell you, it can be done. I've done it several times, but it requires a specific in an advanced skillset. The idea of the Power BI team or Microsoft is they want to develop something so that everyone will be able or enabled to connect to any data sources, build the idea of what you call data model in Excel and build your graphs and build your pivot table. So right now, I'm jumping over to my Excel application and let me discuss a few things here.

First things first is where can I activate my Power Pivot? So if your version of Excel is Office Excel 2016 up to the latest version, or if you're using Office 365, there's nothing you need to do because it's already embedded in your application, embedded in the program. So that's why if I go to the data tab because I'm using Office 365, I can now go to the far right, follow my mouse pointer here. Under the data tools, I can see that green icon. When I click this, if this is the first time, it will ask me, "Do you want to enable your Power Pivot?"

So you just need to say yes, and what will happen is it will create the Power Pivot tab and these are the different tools that you can see right there. Okay? So that's how you can activate it easily if you have Excel version 2016 until the latest version or if you're using Office 365. Now, if ever you're using a very, very, very, very old version of Excel like 2013 or 2010, hopefully you are not using 2010. Just in case, you can go to the file tab and then you can go to options on the lower right corner right there of my screen, and then here in the Excel option, you need to go to add in, and then here on the Manage on the lower left, click the dropdown because it is what you call the a COM add-in.

Only to those old version like 2010 and '13 Excel, and then you will notice, so there's a list here. You just need to tick the boxes, Microsoft Power Pivot and Power Query. Those main two things, Power Pivot and Power Query. Just like what I said, I don't need to do this because I'm using Office 365. It's automatically embedded now in my application. So that's how to enable Power Pivot and that's the Power Pivot tag. Now, before you can go to Power Pivot, normally the strong suggestion is you connect to your source.

Now in this demonstration, let me go to my file explorer. So to start this demo, what I did is I just connected to this Excel workbook. I grabbed what you call the calendar table. So basically, the calendar table has some date and then has a bunch of columns that I want to present in my pivot table or in my grabs. So now, let me go back here and then let me quickly show you how did I do that? So remember I mentioned to you Power Query, so there is a new name for that. It's called Get and Transform.

So basically, later on this afternoon I will be focusing in this one that I'm demonstration at this point in time. So get data and then look at this. This is an array, a list of different sources that you can import your data and push to Power Pivot to apply the context of data modeling. Remember, data modeling is a database ID or concept. I can connect to Excel, to a CSV. So some PDF file, that's interesting. You can even now use a PDF file as a source for your pivot table, that's amazing, this is a crazy idea three or four years ago, but right now, you can connect to this source from folder, SharePoint folder that's a service from databases.

If you are using one of these database platforms, you can connect to your database if you're for permitted to do so and grab some sources. Now, there are some other sources here like your Azure, Power platform, online services, and then some other resources. Just like we said, I will focus on this one in the afternoon's webinar. So what I did is I tried to connect to an Excel spreadsheet and then push it to my Power Pivot which is my data model.

Now, let me give you a quick example how can I grab now the different tables that I have here in this Excel workbook? So, data source contoso, that's the file name. So let's do that. So data tab, far left. Get data, you need to identify your source. So I go from file and I know it's an Excel workbook. So let me click this and then, I need to navigate where it is. So I see the file, I navigate to the file and look at this button. It's say import. Remember, power query is importing your data.

So click this one. Now because the focus of our discussion is Power Pivot, what I'm going to do is I will not do any transformation. I will do the discussion on the next webinar this afternoon. All you need to do is to select all of the tables or data sources or data set that you have right there on the source, and then all you need to do is transform your data if you need to, that's power query. But what I'm going to do is I'll say I will load now to the data model, the Power Pivot.

So I now grab those sources. I'm now pushing it so to my Power Pivot or my data model. So look at this one, create a connection, add to the data model. Yes, I'm happy to do that. Let me hit OK. So you will notice on my queries and connection pane on the right, I'm now importing those data. It's now loading to my Power Pivot to my data model, and there you go. Okay, so it's now loaded to my Power Pivot. I have now a bunch of resources or dataset that I can now use in building my pivot table.

Now the important thing about the pivot table is this. You need to make sure you build the correct relationship. Now, that's the common problem and question of many people who is not a database person or no experience, or have no clue what is a database. So for us to do this, let me go to the Power Pivot tab and then on the far left, there is an icon for me to go now to the Power Pivot window. So when I click this, I'm now in the Power Pivot window. Now, please take note, this is the data modeling now in the background of your Excel application.

Remember, 2016 version up to the latest in Office 365 version, it is automatically embedded in your Excel. So I have now this hips of sources in my model. Now, I can navigate one by one. So you will notice this on the lower left, I can see how many records I have in each of my sources. So let me quickly click so that focus on the lower left, you will notice the number of records in each of those table sources. Now, when I go to the last one, the transaction table, I have now 100,000 rows.

What I'm going to do is to show you why I'm so happy, Microsoft created this. Now let me hit the save button. I'm saving the file. One more time, I'm saving the file. The name of the file is Power Pivot Beyond Pivot Tables demo. So that is the name of the file. Let me just go quickly here on the file Explorer. I just saved the file right there. So this is the file. Look at the size of this.

Remember, I grabbed this Excel workbook, create calendar and data source contoso, I grabbed the contents and pushed this into this particular file. Look at the file size. It is much smaller compared to the sum of these two. That's why when I first saw that like, "Oh my god, this is a pretty much amazing tool that Microsoft created and embedding in Excel." Okay? So let me go back to Power Pivot. Ryan, my question is how does Excel did that?

Okay, how did Excel did that amazing thing? Just like what I said, the one that you're looking right now is in what you call a database engine. So it's trying to flatten your sources per column. So I mentioned this in my previous slide. So per column, it's trying to flatten it because you are now using this database engine in been building your data model. Now, my next thing to show, the next thing I want to show you is, okay, you told me Ryan, I need to grab my source, push it to my data model in Power Pivot, and then the next thing is to build my relationship.

It's like I have no clue what is a relationship. So let me click this button here on the far left of my ribbon. So it's called the diagram here. Now, those tables that you saw because we are in the data view, I want to see the table in the data within those table. I'm right now in the diagram here, so I can only see the table in the columns within those table. So, now look at this. I will just try to organize everything here on my screen so that everyone will be able to see what is the content of this data model.

I believe I'm missing one table. There you go, that's it. Let me push this somewhere here and then making sure you can see everything. Now, in all of this table, we have here the transaction table. So in this transaction table, this is our main one. So in other words, this is the Excel spreadsheet that you use wherein you will be typing your lookup function, either B lookup matching index or H lookup.

So just imagine this with me. If this is an Excel spreadsheet, all of this are Excel spreadsheet, the transaction spreadsheet is where you put all your helper columns. So now, what will happen here? Rather than building your lookup function, what you're going to do is you're building what's called relationship. So now, let's start, how to build relationships here? Okay, now all you need to do is go to your table and just simply drag and drop right there so it builds now what you call relationship.

Now, in database, we have three types of relationships here or cardinality that we can use. We have one-to-one, one to many, and many to many relationship. We strongly suggest if you could create a model with a one to many, so cardinality or relationship, that will be amazing. So now one more time. I just drag and drop, simple and then it builds the relationship for me. Because of this, I don't need to create lookup functions anymore, and I'll give you a demo of that one in a bit.

So let me just finish this building of relationship. So now, because I know the data set, so I will be doing this a little bit faster now. So channel T to channel right there. So I can also use the employee number here and then I know it's the product name that I need to use for the product field or column. And then the last one is what you call the region num and then the region number. For me, this is the easiest way to build the relationship, but if just in case you want to build your own in a different way, I strongly believe if you go here somewhere on your design tab, there is now what you call create relationship option.

Rather than drag and dropping, you can go here and then you can choose the table that you want and then you will be able to build the relationship. So you just need to select one column to another column to build that relationship. And then if you want to check what the relationship created in this particular model, you can also always go manage relationship. So you can see now those relationship whether it's an active or inactive. So that's how to navigate, view and then that's also how to create some relationship in your data model here in your Power Pivot.

Now, why is this important? Because just like what I said, I want to build a single pivot table report or a graph based in any of this table. So without doing hips of calculation. One more time, without doing hips of calculation. I just built this relationship, one more time, we have not built any calculation yet. I did not do any look up function. Now let me go back to the home tab and let me show you I'll create a pivot table. So let me hit that button. So I will go to this existing sheet and then I'll just grab this. So I'll just grab this location right here.

Now, everyone here I will assume knows a pivot table or have created or have used a pivot table. Now, look at the fields pane on the right. I have now many tables that I can use in building this pivot table. Remember, we have not created yet any calculation. If you are not using Power Pivot or a data modeling here in Excel, you need to spend a good amount of time of creating those function, those look-ups and building this transaction table. So let me go to transaction because I saw that there is a sales quantity.

So I'll drive that to the values and as I know, so that's how pivot table works. The default summarization is some for me at this point, so I'm happy with that value, but look at this. I will now go to other tables here. So just to change my real estate so you can see all of my tables. There you go, let me start with the calendar and I see already the year. So I grab the year just like that, boom. It's like, "Wait, wait, wait, how does pivot table Excel did that?" Because you're using the data model as a source.

Let me say again, because we are using the data model in the source. Now, let me even add another one from the other table. Let me go to the channel right here. So look at this. I can even add the channel name right here on my columns and let me zoom on a bit and look at that. Okay? Now technically, I'm using one model, but I'm using three tables in this particular pivot table without doing any calculation. I just did drag and drop, I clicked some buttons and then I'm done. So that is pretty much amazing for me when I first saw that.

Now, let's move on what to do next after building your relationship. So there are many other things that I would like to discuss with regards on this one, but because of time, because we only have a one hour webinar, that's the reason why in the succeeding, days, Susannah will mention to you when it might be, but this afternoon I'll be doing the data cleansing in Excel which is the power query. So what I'm going to do is I will now go back to my Power Pivot or in my data model.

I mentioned to you, you need to make sure you build the relationship properly. So the strong suggestion from the Power BI team is as much as you can, create what you call a one to many relationship, but personally, because I have some database background and I created databases before, I will strongly suggest when you're building a relationship, make sure that is the relationship needed to answer your business process. If you're writing some notes. So your options are one-to-one, one to many, and many to many relationship because the database engine knows your data.

Let me say that again. The database engine knows your data because remember, there is a data view, it knows everything now in every point in every column. That's why when I tried to drag and drop earlier, it distinguishes what are the contents of this column table and then what is the contents of that column in this table, and it decided which one contains the one and the many. What is this? That is what you called mapping. When you say mapping in databases, it means there's one date here in your calendar table and there are many same dates of that value in the transaction table.

For example, so 2nd of February 2023. So in your calendar table, you only have one value right here, but in the transaction table you could have three or five or 20 sales today. So that date will be repeated 10 times. For example, if you have 10 transaction, that's why the star or the asterisk represents many. And lastly, we have here what you call the cross filtered direction. This is unique here in Power Pivot or Power BI. It means calendar can filter transaction, but transaction cannot filter the calendar table.

So we're done with building the relationship. You just need to rewind this or watch this again in the recording. If you're still like, "Wait Ryan, I forgot what you mentioned." So again, three types of cardinal relationship. You can build one-to-one, one to many and many to many. So we strongly use the one to many, but my strong suggestion is when you're building this, make sure this is your business process. This is how your business process work. Now the common question when I'm training this in a full scale three days.

So when I'm training this in a full scale three days, many people ask me, "Hey Ryan, is there any requirement in arranging your model?" No. So you can arrange it whatever you want as long as you can easily understand the flow of your model. Now, let me go back to my slide right here because after grabbing your source and importing the data to your Power Pivot in your data model, after building now your relationship in each of those tables, what you need to do next is you need to build now some calculation. In Power BI, you can do this in the Power Pivot.

So if you want to do those expression and calculation, you need to learn DAX. Let me say again, you need to learn DAX. So DAX is short for Data Analysis Expression. You can use DAX in creating those custom calculation like your calculated columns and measure. There is a documentation in Microsoft Learn, you can just have a quick search on this one, Microsoft Learn docs reference. Just type it out and you will see the documentation regarding the function that is available for you.

Now DAX is basically the programming language for a list of functions, operators that you can use in building task calculation or expression here in Power Pivot. Now, we will just focus today in building simple calculated columns and measure, and I know in the next coming months, I'll be doing also a webinar focusing only how to build this DAX expression. So today, we'll just try to keep it simple. Now let's start with calculated column.

Now, you're familiar with this idea of the calculated column because you've been doing this for quite some time in Excel. So I always tell people, actually, this is like the way you do things in Excel, you create a new column, you calculate. So a calculated column in Power BI is a column of data added to your table in the data model using data analysis expression formula or function. So what do I mean by that? For example, I have here amount and then service amount, so tip amount and service amount.

So I want to know the tip percentage. So if you know accounting, you know Excel, you know your expression, you know how to calculate, you will just say that column called tip amount divided by the service amount. So those of you who is using already this type of expression in your Excel tables, you might be familiar already with this one. You can create a calculated column in the data view of your Power Pivot window. Now, let's have a quick example for that one. Let me go back to the Power Pivot window.

Then remember, if you want to build some additional calculation, you can now go to what you call data view. Okay, now I'm right now at the F transaction table. So I have an invoice number here. I believe this is the date and this is the channel key, region number, employee number. This is the product name by the way, and then this is my sales quantity. Now this is my table of transaction all about, but what if, so let's say the scenario that my client this morning is asking me, "Hey Ryan, I want to add here the unit cost and the unit price dependent on that product."

So I asked her, "What is the function that you normally use in Excel in grabbing this?" She told me she's using X lookup. And I say, "Oh, good on you." Some of you attending in this webinar probably you will say, "I'm using H lookup, I'm using V lookup, I'm using matching index." Now, any of all those lookup function will be fine with me as long as it's working, but let me show here, how are you going to do this easily here in Power BI, in the Power Pivot using your DAX expression.

Remember we're going to build a calculated column. Now in the product table, let me show you this. In the product table, you will notice I have a unit cost and I have a unit price and you what's going on here, if this is a normal Excel spreadsheet, I will just add two columns using my V lookup, matching index or any lookup function this morning. This lady that I helped with is using X lookup. I told her, "In Power BI, in Power Pivot, in the data modeling here in Excel, there's no lookup function. They change it."

Now, let's start with the unit cost. So let me add a column and call this one unit cost. I just double click on that column to add a new one and then I just gave it a better name. So I can see now the column called the unit cost and I see the formula bar. Now as a default, it's very small onto our screen. I can do some adjustment right there if my mouse permits that. Okay, so let me, I'll go do that so that you can see it and let me try to zoom in as much as I can so you can pretty much see the formula bar. Okay, so there you go.

I think I did it too much. So probably I think this will be enough. Okay, so this will be enough. Now, how can I grab the information which is a unit cost from the product table. Remember, the product table is the other table. Take note, they are related using the product name. So you don't need to use any lookup function, there is a function in DAX called related. The moment I use the related function, it gives me any related field in this table.

You can compare this now to your X lookup, V lookup, matching index. I'm telling you, this is a lot easier because I just need to select unit cost, close the bracket and hit enter. One more time. I've been using Excel since the late '90s, since late '90s, more than 20 years, two decades of using the product. I see it change through time, but when I first saw this DAX expression, it's like, "No way, it will not work." Then I tried it, "Oh, it's working." So there you go.

Based on that product name, it quickly grabbed the related unit course onto the other table, that's pretty much amazing on my first glance of this one. So let's add quickly another column. So let's call this one unit price. So again, I'm adding now this column, I'm giving it a good name and then when it's done, so it's a little bit slow because of the other application probably that I have up and running, but that's fine. I can see now the formula bar.

Then let me zoom in so that everyone can see it. So I need to type the function related and then I start also typing the first few characters of the unit cost. You will notice that the unit cost and unit price is coming from the product table. So I can double click from the list, I can start typing some keywords right here, and then I can hit the tab key in close bracket to finish the function and I can now have that unit price right there.

So what I'm doing, I'm building a calculated column. Now, I'm just showing to you the equivalent of those lookup function here in DAX. Technically, or if this is me, I will not actually push the unit cost and the unit price here in this particular table. I'm just doing this for the benefit of our discussion. Actually, what I'm going to do is this. If this is me, I'm not grabbing the unit cost and unit price, I'm going directly in building my expression.

So what I want to do is I want to know the cost of the goods per transaction. Let me say again. In this column I want to build, I want to know what is the cost of the goods that we sold per transaction right here because we have hundreds of thousands of transaction. So let me call this one cost of goods. So I'm trying it to be short. So cost of goods. So now, when I see the formula board, let me start now my expression. So I see now the equal sign, I can start now my expression. So basically, cost of goods is sales quantity column multiplied by the unit cost.

Now, let's assume the unit cost doesn't exist in this table. So how can I calculate the cost of goods? So I start typing sales quantity right here. So there you go, sales some keyword, and then let me select the sales quantity. By the way, the best practice in building expression is you type the table name and then the column name. So you're familiar with this when you're referencing to the output of your pivot table or referencing to the contents of your tables in Excel.

So to those of you who knows that, it's pretty much the same here on my screen right now. So multiply two, remember we can grab the unit cost from the product table using the function called related. So rather than grabbing unit cost and push it here, I can actually put it directly to this expression and start typing some keyword so that I can quickly select the column that I want or hit the tab and close the bracket and hit enter and just like that, I can see now. So the result of the cost of goods.

So when it's done now this way, so it's easy to check at this point in time because I grab the unit cost column from the product table. So it's easy because the quantity here are all 10 by the way. So that's why, there you go. My expression is all good. So I'm happy with that one. Now, let's try to finish this calculated column discussion by creating what you call sales amount. So we will try to use the unit price. So let's try to quickly do that. Let's add the column here.

So the name will be sales amount. Now, it's the same as the cost of goods. We will just use the unit price. So the moment it's ready, I will now go to the formula bar and quickly say I want to use the sales quantity, and then I want to multiply that to the related unit price in the other table, and there you go. So again, it's easy to check if I got it right because I grab the unit price column from that table. So right now, I can quickly just delete these two columns because remember, I just did this for the discussion purposes.

So if I'm doing something like this, I will never use this two columns right there. I'll go straight with cost of goods and then the sales amount. Now, what is this set of columns that we created? This is called the calculated column. Now, please take note. When you're building a calculated column, you just need to build a single expression and it will be calculated within the table. So that's the reason why when I build one expression, remember, I only build one expression and then it calculates in every record of that particular table.

So that's how to build what you call that calculated column. It will be expressed one more time in each row of your table. Now, let's go to the next topic and then the last topic for today, it's now what you call your measure. Let me say again. This is what you called your measure. Now, what is measure? So measure is basically calculated field that you create when you use your DAX formula or your AutoSum features. So it's what you call an explicit calculation.

Now when you say measures in data model or Power BI, so basically you are trying to do what you call an aggregation or a summary calculation, your average. Probably you are not familiar with the term aggregation. It's like your sum. It's like your average. I strongly believe everyone here are familiar with the term, that is an aggregation. You're summing up the column, you're aggregating it, you're getting the average of it, you're aggregating it. We call it explicit measure.

When you say explicit measure, you are telling the application on how to calculate it. Let me say again. You're telling the application on how to calculate it. That's the idea when you're building your measure. So the question here is how can I do that in Power Pivot? Now, I showed you earlier how to build calculated columns. Now remember, this expression will be calculated in each row of your table. So if you have 100,000 rows, you have 100,000 results. How about a measure?

Remember, measure is a summary, an aggregation of one or more columns. Now, to do that in Power Pivot, you need to go to what you call the measure grid. So let me change the real estate here because our focus now is measure. Now this is your measure grid. One more time, this is your measure grid. So just to give us an example, you can select any cell in the measure grid and start building your measure. So let me say again, you can start anything here. You can select any cell and you start building now your measure.

Now, to have a quick okay sample. Let's try to sum up the sales quantity. So, now how can I do that? I can go directly to the cell and say, I want to know the total. S as you notice, I click a cell, I start typing. I can see that in the formula bar, total quantity. Okay. Now, when you're building a measure in, so Power Pivot, it's a little bit different when you are trying to have your expression.

So if I will zoom in. So you will it's a little bit different right there. So total quantity is a column equals. So what is this? This is now the sum. Okay, so everyone is familiar with this. And then remember, I want to sum up the sales quantity column. So I can see now the sales quantity column, and there you go. And what will happen here, as we all know about the idea of average or some or aggregate function. So that's the term right here. Let me expand this so that you can see, there's only one result.

Let me say again, there's only one result for your measure because you're trying to sum up, to summarize the whole column. Now look at this, let me go back to my Excel application. Now let us try to keep it simple. Let's remove first the columns right there. Now, to give you a reminder, what I did earlier is I just grab the sales quantity from my table and then drop it. So what happened here? This is what you call implicit calculation.

It's my application which is Excel, implicitly calculating the sales quantity column, but if I try to look for total quantity. Now, let me drag and drop it here. Now, you will see a difference. There's no sound function added here, but that's the same result. Let me say again. It's the same result, but the sum of sales quantity is an implicit calculation, the total quantity is an explicit calculation.

If I click the dropdown and go value field setting, you will notice I'm not allowed to do some changes in the way that this value to V summarize because my measure is telling the application. If this field is used total quantity, you need to sum the sales quantity. So please take note about that. Let me hit cancel, but the sales quantity is a column. One more time, a column, and I click the dropdown value field setting, I can change the way it can be summarized because it is what you call an implicit calculation.

So therefore, depending on your need, do you want an explicit calculation or do you want other people? So to have flexibility on the way to calculate that particular column. So you have many options here, that's what I'm driving to. So you need to understand the idea of an explicit calculation and the explicit calculation. Explicit is the measure. So let's go back to the model. So let's go back to the model and then let's try to calculate more or build more measure.

So let me build, select another cell. One more time, you can select any cell, it's up to you. Some people that I know, they select it underneath that particular column. So if that helps you, you can use that. But for the sake of our demonstration, I'm just staying here in this particular selected column. So what I'm going to do for us to see those implicit and explicit calculation differences, so I will now try to summarize the cost of goods in the sales amount.

So basically, if I'll summarize this, this will be the total cost and this will be the total sales. So total cost and total sales. So I will add that here in my measure grid. So let me start typing. So total cost, let's start with that and okay, column equals. If you want to see it, so I'll try to submit as much as I can. Sometimes the zooming in is not easy to do, but anyways, so this is the sum of the cost of goods calculated column.

Now you will notice I can see right there on the top now the cost of goods. So this one will give me now the total cost. Now, if you want to do some changes. So it's easy to change the data type and formatting of your calculated columns and measure, because again, if you don't change some formatting here, that is the way it will be displayed. So if I go to cost of goods here in my Power Pivot in my reboot, I can change the data type into a currency.

So if I change this one, you will notice the formatting also changes for me here. And then if I will now look when it's finished now doing the changes, I can also go here and make sure the formatting of this one is also a currency because it was a general formatting to begin with. So if you want to do some changes, you can go directly and select it. Let's do it one more time on the sales amount and change this into a currency because the next thing I want to do is what you call your total sales.

So let me do this one measure and we'll focus on our pivot table in a bit. So total sales. So column equals, this is the sum of my sales amount. So sales amount. There you go. So let me hit enter right there, and then the moment it's done doing the calculation, just like what I said what I love is making sure I'm applying the formatting that I want. Okay. Now, because of time, I'm just doing this simple calculation.

You will notice that the quantity is a total quantity is based on the quantity column. You will notice that the total cost in total sales is based on the calculated columns, COGS, sales amount respectively. It means if I don't have cost of goods, the total cost will not work. If I don't have a sales amount, the total sales will not work. That's why if we have more time, if this is a full scale training, I will show you how to create measures without creating calculated column.

So that will be a different discussion on a different day. So please take note. You can create some measures without creating a calculated column. We can discuss that in a different time. So because we only have seven minutes left in our session, so I'm just doing this basic calculation for us. Now look at this, I have the total quantity, I have total cost and total sales. Let me go back to my pivot table. Let me remove the quantity right there, and on the cost and the sales. There you go.

So remember, once I build one calculation because I know pivot table, I can now say, "Okay, I can now put the channel name here in this column, and then I can now put the different regions here so I can create even a hierarchy. I can say I can put the island and then I can put now the different region." So by the way, in New Zealand, we have what's called north and south island, and then we have a regions within that. So if I zoom out, I can see now. So the way things are done. Okay, calculated the cost and the sales.

So I see here some blank spaces. So therefore, we're not doing any revenue or sales on that. So that particular channel. So I can actually remove the channel, and then probably what I can do is I can remove the region and then put those islands and then probably look at the different here. So let me zoom in a bit. So based on those years of transaction on those different islands. So we have the north island here, so we have the south, and then, of course, all you need to do is to apply now your pivot table skillset.

So it's up to the requirement or prerequisite that you want to do this. I can start building now grabs out of this because I know in the Power Pivot, I can quickly create what you call grabs. I can apply some slices if I wanted to. Now look at this one. What I'm going to do is I will just go to the, I have a product key here. So not the products. Probably what I can do is anything that they want to use. So let's go to product just to show here.

Okay, so some quick slicers. So let's say a product name. Now, there will be too many. So let me now go to, let me now go to the channel. So channel name, quickly add it as a slicer. So you can do something like that. You can play around and apply all your skillset. So develop now your, massage now your area. When I say area, that's the four quadrants or buckets that controls your pivot table. Apply some filters or apply some slicer. Any better like the slicer. That's my preference. Then look at this.

This pivot table and slicer is involving now four different tables. The calendar for the year, the transaction, and then the island from the region. And then from the channel is the channel key right here. So basically, look at all of those things working because of your data model. So if I try to click this, it's working fine. The filter is working fine. Why? Because I build a data model. Now, if I'll be asking you how you're going to do this in Excel, just like what I said, you will be building your transaction table.

One more time. You will be building your transaction table. If I try to minimize this one and then change my real estate, you will be spending a good amount of time building this table, creating your local functions. When you're done, then you will be building now your pivot table. Now, depending on your skillset, it might take you a while to finish this. Now, here's the other thing. Here's the other thing that I can tell you.

If you use the old fashioned way in Excel, if something changes, pretty much, you might need to do some changes in your calculation, pretty much. Here in data modeling, the advantage of this is you can just hit the refresh button. Now, please take note, this pivot table is based in the model. The model is based on your queries. Your queries is based on your source. So if you just hit the refresh all, it will refresh basically your query, then it will refresh now your model, then it will refresh now your pivot, your pivot table basically, or if there's a chart, it will automatically refresh your chart.

So pretty much, this is the easiest way for you to do things moving forward because the moment you are finished with the data cleansing, you don't need to do the data cleansing anymore, that's our lesson in this afternoon, in the next webinar. Then, when your model is finished, you don't need to change the model, you don't need to change any calculation, unless you literally need to change now a particular set of values. So rather than grabbing four, you want to grab three, that's a different question. So that's the reason why everyone who's using Excel should explore the idea of using Power Pivot.

So that's it for me. I'm done discussing what is Power Pivot, how to add that into your Excel application. So how to insert or how to grab some sources, how to push it into your model. So that's what you call the queries, and then how to go to your Power Pivot window. So that's the manage button, and then how to build the relationship, just do a drag and drop. Then how to build those calculations. Mainly, you can do calculating columns that will enable you to create what you call implicit calculation in your pivot table, calculated columns is calculated every row of your table.

Now, you can also build the measure. So measure is the aggregation of your columns or columns, depending on the expression that you have. We strongly suggest when you're building something like this, try to build a measure without the calculated column, but that will be a discussion on the different day. When you're finished, do some formatting change and start building now your pivot table. And that's it for me and I will give it back to Susannah if there are some other questions regarding the webinar.

CCH Learning:

Thank you very much for that Ryan. Lots of information there. So I'll give you all a moment to digest. So yes, we are spending a few moments, next few minutes taking questions, so please type them into the questions plane, and I've got a few already, but if you do have a question, please put it into the pane and we will get to them. To give you some time to type them up, I will let you know, so about our upcoming webinars.

So as mentioned this afternoon, we're looking at data cleansing in Excel which is further from this morning's webinar. Next week, we're starting our Cyber Security Update series. We're also looking at Division 7A Essentials. Succession Planning for SMSFs, Choosing a Business Structure, and we're looking at Salary Packaging Opportunities the week after. So let's have a little look at our questions. So hold on a moment. Okay, so Anna asked, "Can you please repeat how to get the data into the workbook?" So if I just give you back.

Ryan Racelis:

Yep. Okay, I will choose my screen.

CCH Learning:

Yep. I'll just give you back the ability to show people what you're doing. So if you can just show again how you get data into the workbook.

Ryan Racelis:

Yes. What's the name again of, who sent the question? Anna?

CCH Learning:

It was Anna who was asking this.

Ryan Racelis:

Anna. Okay. Anna, in the afternoon, this is the focus of my webinar, but just like what I said, to answer your question, you need to go to what you call the data tab because you need to use what you call power query. Depending on the version of your Excel, the name keeps on changing. I'm using Office 365, the latest name is called Get and Transform.

So I need to go to what you call get data, and I need to identify my source. So make sure you know your source, I'll discuss more of this one in the afternoon. And then when you hit the source, so that's the application for example, you just need to navigate where it is. Then when you're done navigating where it is, you will notice now the button is called import. Remember, when you say import, you will grab the data and push it to your model, to your data model which is the Power Pivot.

So that process, so what happened is it creates the following query. So in the afternoon, I will have an hour to discuss this. So basically, just a snippet to those who is still thinking, "Should I attend this afternoon?" I strongly suggest you attend this. Just give me a moment to give you a snippet. I was spending an hour explaining to you how you can do a data cleansing in a very easy way. Then when it's done, what I did earlier is I load the model.

Technically, the loading is easy, so you just grab the source. If you're finished with this one, you hit that button on the upper left, close and load, and it will be now loading to the model which is your Power Pivot. So that's how it's done. It's now called in Office 365 the get data button.

CCH Learning:

Thank you for that Ryan. I hope that helps you Anna, just a reminder that this is recorded and you will have access to the recording. So you can watch this video again and again and again if you need to. So Vivian had a question Ryan. Vivian's question was can you change to a different data source without rebuilding the relationship and the calculations if the data source is the same format?

Ryan Racelis:

The answer is yes. The second question right there one more time will be discussed this webinar in the afternoon. So one more time. The answer is yes, and I'll focus on those one. So at least I have now an idea what is being asked today. The answer is a massive yes. So basically, you can see it now. So I'm now going ahead of myself. So again, later in the afternoon, I'll show you an example on how to do things then, but it is right here on my screen, it's a simple icon that you can click so that you can change now your source, even though it's in a different folder or network or different location.

And regarding on the question, I like the framing of the question because it says it's a different structure. So I like that because that's the prerequisite if you really want to do this. But again, later on I'll discuss more about that, but the answer is there you go, on my screen, it's called the source step.

CCH Learning:

Thank you for that Ryan. So there you go Vivian, might be a good idea to check us out this afternoon. So Sam had a question. He was asking in regards to the unit cost and unit price columns you added in the transactions worksheet. How does the formula know that the price/cost has to match the product name?

Ryan Racelis:

That's a good question, and the answer to that question is because we spend a good amount of time in making sure that the relationship is created properly. So what happens here right now if you're looking onto my screen. Remember, we build first the relationship using product name from product and product column from transaction. Now, in other words, it's like saying something like this if I will connect to your Excel skillset. It's like I want to get the unit cost, it's like writing like this.

Okay, we look up, okay, that's my look up value and then my table array is this, and then I want to grab the third column. So something like that, but you did not write it, okay? So we didn't write any look up function, we just did a drug and drop. So that's how powerful data modeling is. Let me say again, that's how powerful data modeling is. I just did a drag and drop without any calculation, and then because of that technology, it knows what product to look for in the products table and grab the correct unit cost or a unit price. So that's the answer, relationship, the power of the data modeling in Power Pivot.

CCH Learning:

Thank you very much for that, Ryan. So there you go, Sam. It's why using this type of program is useful. Brett had a question. He is asking, "Is this a live link to the data sources? I.e. if the calendar source was to add in the next 12 months after connection, would this update automatically?"

Ryan Racelis:

Now, not that much. So at this point, you just need to hit the refresh button. But if ever your organization is allowing you to use a technology called Power Automate. So there's a technology called Power Automate, and then using that technology, you can automate everything. So it's like you can't create a rule when someone at the new row in my calendar table, I want to update my Excel spreadsheet. So there are two things now involved, but regarding in today's webinar, not that much because you need to hit the refresh button, but if you want to automate that, my personal suggestion is the use of power automate application.

CCH Learning:

Thank you for that, Ryan. So there you go, Brett. You do actually have to force it to refresh or have other applications to help you out. I also have another question from Sam. Sam was asking, "Can you show how the north/south island sales can be expressed as a percentage of the total?

Ryan Racelis:

The north and the south. Again, I think somewhat if you're looking to any calculation. So basically, if you are looking at the pivot table, so any of your calculation. If you're familiar with this, with the pivot table. So in the value field setting, so are you familiar with these options? So I think this is the easiest answer to your question. The longer answer is you can create your own measure, you can create your own calculation, but if you're familiar with pivot table, there is a tab here. So let me do it again. I might be super fast.

So I can click the dropdown on each of the field on the values area, click the dropdown, and then I can go value field setting. I hope I understand the question correctly because you want to show it as a percentage of the total of both. So if that's the case, show value as if you have not tried this one yet, you have many options here. So there is an option on how to do that in the pivot table itself. You don't need the data model at this point. But my answer, I also do this in the data model, the answer is also a yes. You can create your own calculation. In other words, I would need to build another measure on how to do that.

CCH Learning:

Thank you for that. Sam says, "Ryan has understood the question. Thank you." So I think he was looking at that extra pivot table thing there. I just had one last question from Cynthia. Cynthia was asking, and I think this might be more just an example thing. "There's a letter D in front of each of your queries and connections, e.g. D employee, D calendar." She was just checking is that just a thing that you're doing?

Ryan Racelis:

This one on my screen?

CCH Learning:

Yeah, I think just checking that's not a requirement or is it just the way you've named things?

Ryan Racelis:

It's not a requirement. This is just a personal thing. So every time I see a preface like this, because again, I'm training also people how to build databases. So the moment I see that letter D, it tells me something else. So that is just a thing for me. You don't have to have those D or F or whatever. You can just call this Calendar, Transaction Region. So that's fine. You can ignore those prefixes. So this is just my old school 20 years ago database brain. So you can ignore that.

CCH Learning:

No worries Ryan. It's just a naming convention there.

Ryan Racelis:

Yes, yes, yes.

CCH Learning:

So don't worry too much about them. Well, that does seem to bring us to the end of our questions for today. So in terms of next steps, I would like to remind you all to please take a moment to provide your feedback when exiting. We have asked you a couple of questions about today's webinar. So it's really important for us to hear your opinions.

So also a reminder that within 24 to 48 hours, you will be enrolled into the e-learning recording which can be watched multiple times and have access to the PowerPoint transcript, any other supporting documentation and a CPD Certificate. I will just quickly say we are CCH Learning is experiencing a few issues with our notifications.

So hopefully, you will get the email notifying that the e-learning recording is available, but if you don't get the email, please, have a quick look on your learner dashboard because you will be enrolled into the e-learning recording even if unfortunately at the moment you don't receive the notification. So please keep that in mind. If you're going, "Where's that notification?" Just check your learner dashboard within 24 to 48 hours and you will find that you have been enrolled. I very much like to thank you Ryan for the session today, and to you, the audience for joining us. We do hope to see you back online for another CCH Learning webinar very soon. Enjoy the rest of your day. Thank you very much.