Transcript for Session 002

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Transcript:

Welcome to Chandroo.org Podcast Session 2. The show is all about making you awesome in data analysis, charting, dashboards, and VBA using Microsoft Excel. Thank you so much for joining me today and I have a wonderful show prepared for you.

In this show, we are going to talk about various Excel lookup functions, such as when you would use them, how you would use them better, and some tips and techniques over the years that I have learned of using Excel... So stay tuned.

Before we proceed, I want to share two really happy announcements with you. First, is that our Chandroo.org Podcast is now on iTunes, so now you can subscribe to the show and enjoy it. Yay! Just visit Chandroo.org/podcast. [There will you find information on how to subscribe to our show through iTunes and how to enjoy it there.] The second announcement [that I have for you] is our show is also listed on various leading podcast directories. [the show is accepted on] The first is called Sticher, which is a popular podcasting app for Android and iOS, and it's a big directory of various important podcasts and show, etc. I'm really glad our show is also included there, so go ahead and subscribe to our podcast on Sticher, if you use that. The other podcasting directory [to which our podcast is accepted] is Windows Phone Podcasts. Now, I personally don't have a Windows phone (I use an iPhone), so I cannot search for that podcast on my phone, but if any of you are using a Windows phone or a Zune audio player by searching our podcast there - search for "Chandroo" or "Chandroo.org" and I'm sure you can find our show there. So those are the announcements that I have for you. I just want to remind you that you can see all of the show notes, download the audio file, and learn a lot more about this particular podcast episode on Lookup function by visiting Chandroo.org/session2.

I also want to remind you that we have a free gift for you, because you are so awesome and for subscribing to the podcast and listening to it. So this gift can be obtained by visiting Chandroo.org/podcastgift.

So, let's move on and talk about the various Excel lookup functions - how they can help you and when you should use them. The first part of our show is "Why Lookup? What is the purpose of looking up information?"

Imagine you are the HR department head of a small company. Let's say you're looking at the annual bonus time and you want to award bonus payments to all of your employees (all the members of your team), right? So, you're looking at the list of names, the amount of experience they have had so far, and to which department they belong. You want to determine how much of a bonus we should give to these people.

You've prepared this list and let's say we have 100 employees in this company, which is a significant amount of data. John, from Marketing, calls you and he asks "What's my bonus for this year?" Now, you want to find out how much bonus John should get. How would you get it? If you have this list with you on paper, you would scan the list to find his name and tell him that his bonus is $12,000, which is a pretty good bonus. John will be happy and your job is done, but, the reality is, it's not so easy.

You never have this list directly in your hand; however, in some situations you do, but when you are talking about large companies, most often this data is sitting a computer file - like an Excel workbook. You would open that file and scan that file to find John's name - sometimes if there's 100 or 200 names, it would take a few minutes and would make a mistake or two, but you could find out bonus for John easily.

Now, what if you have 10,000 employees? Find the bonus amount for John is not an easy task. One of the quick and easy options is to filter the data. What we would do is open up Excel, set the filters, and filter for the name equal to John. We would probably find that there's only one person named John in the entire company and you would tell him his bonus amount.

Filtering is a very powerful way of drilling into your data and getting the detail that you want. The disadvantage of filter is that it's a manual process, meaning the next time someone else calls, like Joseph, you will again have to do this process of filtering for him and telling him is bonus amount. This requires 2 steps: First, you must clear the filter because we have already applied the filter for John. Then, apply the filter for Joseph. So, this is going to be quite annoying. The second aspect of this is, when you are filtering like this there's a slight chance of making a "human error" (i.e. a typing mistake), which can create a lot of confusion. For example, Joseph was only getting $3,000 bonus, but because you have made a typing mistake, it appears that he was getting a $9,000 bonus, which was for not for Joseph, but for Josephine. We made the mistake of telling Joseph he's getting a $9,000 bonus and then, at the end of the payment cycle, when Joseph looks at his payment and notices the difference, he will be

disappointed. In reality, it doesn't happen very often, but "human error" does happen and is quite common.

So this brings us to the function option in Excel. Excel functions are formulas that are a powerful way to automate things like this. Instead of filtering or manually scanning the list, you could just ask Excel, for example "What's the bonus amount for the person whose name is in cell D5?" So, you would just write a function (or a formula) and Excel will come back and tell you the answer. These kinds of functions are called lookup functions. In essence, you are looking up information in your data. So, you have a list of 100 names, and you're asking Excel "Look up the name John and tell me how much of a bonus and we are giving to him". Most of the analysis work that you do requires some sort of looking up. You're always asking questions that go along the lines of "What is the x of y?" or "What is the a of b?" Here, you can substitute x and y with anything. For example, in this case, "What is the bonus of John?" So, "x" and "y" are "bonus" and "John", respectively. Likewise, you could ask questions like "What is the department of Joseph?" or "What is the experience of Maria?" So, these questions are quite common in analysis situations. Many times when you are analyzing data, you're, in essence, asking questions of this nature -- "What is something of something?" This is where lookup functions really help; they can answer questions like this very quickly and easily. Also, because it is a function, it's linked to the cell where the data is - If the data changes, then the function's answer changes. If the bonus amount we are giving to John has changed from $12,000 to $16,000, the function will now return $16,000. This is beauty of Excel functions.

So, now we understand the necessity of looking up in Excel. Let us learn some key lookup vocabulary. There are 5 important lookup functions in Excel, but beforehand let's assume the sample data for this podcast. Since you're listing to this podcast and while probably driving, going on a jog, or falling asleep (I hope my voice is not too soft), let's assume you're not in front of your computer and not looking at an Excel workbook. For the sake of simplicity, we are going to use the employee bonus data situation used earlier. Imagine in your head, a small table with 4 columns. Column 1 contains the Employee Name, Column 2 contains Experience (in number of years), Column 3 contains Department of the Employee, and Column 4 contains the Bonus Amount. Now imagine that this table has only 5 or 10 rows, but I don't need to tell you what the data is because it's completely irrelevant for what we will be doing in the podcast. When you go to Chandroo.org/session2, where you can download the resources, links, and the MP3 file for this podcast, you will also find an example Excel work that I have prepared for you. So, download that workbook and you can use it after you have finished listening to this podcast, if you feel like practicing a little more with the lookup functions. For the sake of learning or listening, you don't need to have any data in front of you. You just need a little bit of imagination, and I'm sure you have a lot of imagination because you are awesome!

To reiterate the same data has 4 columns: Name, Experience, Department, and Bonus Amount.

Now, let us talk about the 5 important functions in Excel's library that help us in looking up data. You might be thinking "only 5, I thought Excel has lots of functions" - let me remind that you Excel has more than 400 functions to manipulate data and calculate things. It has a function to tell you what the value of Pi, which, you may remember from school, is used to calculate the area or the circumference of a circle. There are hundreds of functions in Excel that help us do a lot of things and help us do our calculations better. But for the sake of simplicity, we are only going to talk about 5 functions that help us with the lookup aspect. In the show notes and resources, you can find a lot more functions and scenarios by going to Chandroo.org/session2.

So, I won't tease you anymore and let's talk about the five functions. The first function is called VLOOKUP. The second function is called HLOOKUP. The third is simply called LOOKUP. The fourth function is called MATCH. The fifth function is called INDEX. These are the ones that we will be talking about for the next several minutes.

The first function is called VLOOKUP and this is probably the single-most important function that you will learn in Excel. If you already know it, give a pat to yourself because only a few people (top 20% of Excel users) know this function. Here's proof: I only heard of VLOOKUP after 4 years after starting using Excel. I still remember writing a lengthy nested IF formula just to calculate how much bonus to be paid to the person named John. Here's a vague explanation of the formula, you don't have to really memorize it, but the nested IF formula that I used to write is something like this: "If A1 is equal to John, get the value of the bonus. If not, if B1 is equal to John, what is the bonus of that particular row. If not, then C1. If not, then D1"... and you can imagine going on like this. Now, back in Excel 2003, there's a limitation of 7 nested IF formulas, so there was only so much that I could do. I was always struggling with this formula, and then a colleague helped me by introducing me to the VLOOKUP function. I was like "Oh My God! This is so beautiful! This is so powerful! It is just saving me a lot of time!" That's when I started exploring with various other functions in Excel and learned a little more about each and every one of them. This happened after 4 years starting to use Excel. Initially, I never had a requirement for VLOOKUP, but even then, after I learned how to use IF formulas, I learned how to use Pivot tables. Even then, I didn't know what VLOOKUP was or what it did, because (probably) most of the time my data was only 3 or 4 rows long, so I could always use a nested IF formula and get it done. So, I never really investigated what else was out there or tried to learn new things, but once I learned VLOOKUP, I realized how much more powerful Excel can be and I started (actively) learning new things in Excel. So, there same is true with you, if you already know VLOOKUP, pat yourself on the back, because you are one of the top 20% of people in the Excel user world who knows how to use this function. If you don't know it, then better late than never, so now is your chance to learn this.

So, what the VLOOKUP function does is answer the question that we asked earlier of "What is the bonus for John?" What VLOOKUP does is mimic human behavior - when you're scrolling down a list of names to find out a name you're looking for. What would you do, if I asked you (in a printed list) "What is the bonus for John?" You wouldn't be jumping around to look for the name; instead you would scan from

top to bottom in a structural, methodical way to find out the name "John". So what you are doing is using your index finger (or maybe a pencil or a pen) and vertically scrolling the down list until you find the name "John". When you find it, you would move it (your index finger or pen) along that row (that line) until hit the bonus column to find the bonus amount. Again, so you are moving your index finger vertically down and, once a match is found (find the name "John"), you would move it sideways until you find the bonus column. So, is what VLOOKUP does also, in a very simple way to understand this. It asks you what to find and it goes and scans the list vertically until it find the match. The simple syntax for VLOOKUP is like this: VLOOKUP("what do you want to find","the list where all of your data is","which column you want to extract the value"). So, in your original data, we have: Name, Experience, Department, and Bonus. "Name" is what we are trying to find, and, once the name is found, what do we want - the "Bonus". So from "Name", "Bonus" is the fourth column. A simple VLOOKUP formula for finding the bonus amount for John would be something like this: VLOOKUP("John",{my entire list},4,FALSE).

Now, you might be wondering, "I understand the first 3 parts: I know what John is (that's what we're looking for), I know what the entire list is (that's where the data is), and I know the number 4 (that's the column from which we want to get the data). What is FALSE doing at the end?" Now, to understand what FALSE is doing at the end, we must understand how computers behave. In fact, not just computers, but human beings (how we behave), because most of the computer things are designed and modeled based on human behavior. So, imagine you're looking at the telephone directory of Chicago. I know telephone directories like the yellow pages are no longer fashionable. Many people are throwing away these yellow page books. I remember when I was a cleaner last summer, I used to bicycle to some beautiful places (like a conservation close to our house), where there used to be a big garbage area just dedicated for throwing away your yellow page books. Like Recycle Yellow Pages or something like that. When I peered down to see what people have thrown away, it was just a massive pile of yellow page books, because you can find anything you want on a Google search. So, for the sake of argument, you are looking at a yellow pages book and you wanted to find out the phone number for somebody famous, like the mayor of Chicago - I don't know who it exactly is, but let's imagine it's Maria. So, how would you go about finding the phone number for Maria? You wouldn't start from the first page and reading for "Maria", using your index finger, because the yellow pages book is really thick (like 2,000 pages). You would be spending time, until Christmas, to find the name Maria. Instead, what you would do, knowing the book is arranged in alphabetical order, is flip into the middle and find the letter "M". Once you are on the page that starts with the letter "M", you go one for one more letter "A", because Maria is spelled M-a-r-i-a. You would find the next letter and continue narrowing it down. Essentially, because the yellow pages is alphabetically arranged, or, in computer terms, it's "sorted", all you have to do is jump to an approximate where you could find the match of the name you are looking for and look there. You don't have to start from the very first page; you could actually cut down the amount of time taken, because it's all alphabetically arranged. So, this is the human behavior, because we know that the yellow pages are "sorted". Similarly, computers also want to know whether your data is "sorted". The functions, like VLOOUP, are essentially what they are doing is looking up data and they can behave a lot faster if you tell Excel that your data is sorted. If you tell Excel that you data is sorted, then it must be sorted.

If you original data of employee bonus details is arranged in alphabetical order, by name, then you could ask Excel VLOOKUP "John" and give me the fourth column data. My data is sorted. So, it can tell if your data is sorted or not, with the fourth argument. Remember, we said that VLOOKUP("John",{my entire list},4,FALSE). If the data is sorted, then you can use TRUE (instead of FALSE). Excel will assume the data is sorted and it will do the same thing you did when you wanted to find out the phone number for Maria. It kind of jumps into the approximate location where John should be and if it finds a match it will come back and tell you. So that's what FALSE and TRUE is. If you say TRUE as the last parameter of VLOOKUP that simply means your data is sorted and VLOOKUP will try to look up assuming your data is sorted. If you say FALSE, then VLOOKUP will behave like your index finger - it will start from the very first row and continuously goes through the entire list to find a match that you're looking for. Since, it is difficult to explain the intricacies of TRUE and FALSE, I highly encourage you to visit the show notes for this particular episode, so you can find out a little more about how to use the VLOOKUP function and how to use this better. Again, the link is Chandroo.org/session2. So, that's a little bit about the VLOOKUP function.

Now, let's talk about HLOOKUP. HLOOKUP, as the name suggests, is a horizontal lookup function. In our data set, we said when we ask you to imagine this data as a table with 4 columns: Name, Experience, Department, and Bonus, and the data is flowing vertically. But sometimes, very rarely, your data may not flow down the screen, but it may flow across the screen. That is the data is arranged is that Employee Name is in one row, Employee Experience is in another row, Department is in another row, and Bonus Amount is in another row, with each and every Employee is maintained in one separate column. So you could imagine whatever original data you had imagined in your mind, by rotating it by 90 degrees and that's what you will get. Now, I know it's tricky and it's probably a lot of mental effort for us to rotate this in our mind, so don't take the trouble if you cannot do this and go to the episode link Chandroo.org/session2 and you will find an example that explains this situation of how the data would if you were doing the HLOOKUP.

So, if the data is across the screen, instead of down the screen, what you do to find out what is the name is still using your index finger, but you will be moving it horizontally, until you find the name. That's what HLOOKUP does - it is exactly similar as VLOOKUP - all it does is when the data is arranged horizontally, it will go and search for each and every column and, once it finds a match, it will tell you what the corresponding bonus amount is.

That's what VLOOKUP and HLOOKUP does. Now, that brings us to the third (and probably important) function called LOOKUP. What the LOOKUP function does is that it's a special function built just for handling alphabetically arranged, or sorted, lists. Keep this in mind, both VLOOKUP and HLOOKUP with any data, whether it's sorted or not, they work happily. Whereas, the LOOKUP function is specifically designed to work with sorted lists. What the LOOKUP function does is that it takes 2 lists: the list where

data you want to lookup is and the list from which you want a value. For example, in the case of finding out the bonus for John, the LOOKUP function wants know what you want to lookup - the name "John", where will name "John" be - in the "Names" column, and what do you want to extract - the "Bonus" column. So, that's what the LOOKUP function takes: LOOKUP "John" in the "Names" column and get me the bonus from the "Bonus" column. So, that's what it asks. It's not asking you which column number the data will be in, instead it just wants to know what the 2 columns are from, which column 1 what you will be looking into and column 2 is what your corresponding item is from. Once "John" is found, I want the corresponding item from the "Bonus" column. So, this really is what the LOOKUP function does. But, keep in mind that the LOOKUP function can only work if the data is arranged alphabetically.

Now, you might be asking "What if my data is not alphabetically arranged and I use the LOOKUP function?" Well, nothing serious happens, it's just that Excel will, as you - your data is sorted, try to do the approximate position by jumping where "John" should be and looking around that place. If it cannot find anything, it will give you (or what Excel calls) an approximate match. To understand what an approximate match really is, we really need to think like a human being. Going back to the example of finding the phone number for Maria in Chicago, you would go all the way to the page where Maria would be listed; you look there, and find that there's no one named Maria in the entire city of Chicago. What happens then, you wouldn't come back and say "I can't find Maria", instead you would say a natural (human) response like "Did you mean Mary Ann, not Maria?" Maybe there was a spelling mistake in the name and said "Mary Ann" and not "Maria". So, you would try to change the question and will give an approximate match. Again, understanding the concept of approximate match can be somewhat tricky, so I would encourage you go to go the session page Chandroo.org/session2 to download the example workbook when you have some free time.

Now, let's move on and understand the 2 other important Excel lookup functions called MATCH and INDEX. Before we talk about MATCH and INDEX, we have to understand why may have to use these functions. So far the case for VLOOKUP, HLOOKUP, and LOOKUP is very clear. You want to look up the name and find the bonus amount, VLOOKUP helps. You to find the name and bonus amount, assuming the data is horizontal, you would use HLOOKUP. You want to find out the bonus amount, assuming the list is alphabetically arranged, and then you would use LOOKUP. So, what is the requirement for using these other functions? Let's say you want to ask a question like "What is the name of the person to whom we are paying the bonus amount of $12,000?" For the sake of argument, let's assume that there's only one person that's getting paid this bonus amount. In that case, what you are doing is looking up in the "Bonus" column and no longer looking up in the "Name" column, and, once you find the value of $12,000, you would go and find the name from the "Name" column. So, this is really like a LOOKUP or VLOOKUP, but doing it the other way around. What we did, in the earlier example, was looking up the name "John" in the very first column (the Name column) and then finding the bonus from the fourth column (the Bonus column). Now, we are reversing this, we are finding the bonus amount $12,000 in the Bonus column and then going back to the Name column to find out who is the person getting this bonus amount. So, in this case when your manager (or client) wants to know "Can you tell me the invoice number for which the amount is $97.46?" What you would do is first find the amount of

$97.46 and come back to the invoice column and give the answer (the invoice number). So, these kinds of questions are also very, very common. Just like the question "What is the invoice amount on invoice number 0075?"

To answer these kinds of questions, VLOOKUP is not useful, because the way VLOOKUP is structured; it only works when you are looking up in the leftmost column. If you list of data is Name, Department, Experience, and Bonus Amount, where you want to find something, you can only look up on the Name column, assuming this is the entire list you are passing to the VLOOKUP function. VLOOKUP will only look up on the leftmost column and give you the corresponding amount. It's similar to the yellow pages analogy - you can only get the name and corresponding number. If you only have the phone number and want to the find the name, the yellow pages is useless, because you will have to through each and every page to find out whose phone number is something you're looking at. That is where these other functions can very handy - MATCH and INDEX.

What the MATCH function does is that it can find an item in a list. For example, it can find the $12,000 bonus in the list of bonus amounts and it will tell you what the position of that particular item is. It's not going to tell you what the name of the person is; it just tells you what is the position of it. To understand this concept of position, you must first understand what this concept is called in human terms. So, let's say you're calling this person, Maria, the mayor of Chicago, every day and asking for something silly like repairing your street lights or adding a stop sign near your intersection or something like that. Instead of, every day, opening the yellow pages book and searching for the name "Maria", you would place a bookmark there - like dog-ear that particular page or put something at that page where Maria's phone number is - so that next time you want to call her, you would just flip open to that exact page and get the phone number and give her a call. This is called "bookmarking" in real life, so we want a quick hook to access that particular piece of data. The MATCH function is similar to bookmarking. What it is doing is not giving you any specific data, like what Maria's phone number is or what is the bonus amount we are paying to John, instead it is coming back and telling us what is the position of that particular item in the list. So, in our example, where we are asking "What is the bonus for John?", we are asking "Where is John in the list of names?" The MATCH function will come back and tell me that John is the 6th person in this list. So, once I know that John's name is the 6th position in the list of names, all I have to do to find out the bonus amount for that person is go to the Bonus amount column and get the 6th amount, because they are all arranged in a table structure. The MATCH function comes back and gives us the position of a particular item in a list of items. I am not going to talk about the syntax or a specific example here, because you can find example workbook as part of this particular show's download file. To get that please visit Chandroo.org/session2. That's the MATCH function.

Since the MATCH function is only telling us the position of a particular item and not the exact item itself, we need some other way to get that item. To go back to the problem of who is it that we are giving the bonus of $12,000? This problem can be broken down into 2 steps. Step 1 is find out the position of $12,000 in the list of bonus amounts and that's what the MATCH function does - match $12,000 in the

list of bonus amounts and it comes back and tells you that "$12,000 bonus is appearing as the 6th item in the list of bonus items". Now, then question becomes "Who is the 6th person in the Name column?" This is where the INDEX formula helps. What the INDEX formula does is... Well, it can do a lot of things, and I love the formula so much that I wrote an article called "7 Reasons Why You Should Get Cozy With the INDEX Formula". I have a link to that in the show notes, so you can actually read that article and learn a lot more about the INDEX formula. At the very, very lowest level is that the INDEX formula does is that it can take a list of values and give you a value at a specific position you ask for. So, it really does something like for the INDEX of all of the names, give me the 6th name, and it will tell you that the name is "John". This is what the MATCH and INDEX formulas do.

Now, you may be wondering "This is all fun and nice, but how is it going to help me?" It's going to help you when you have data in the structure you've already imagined of Name, Experience, Department, and Bonus. Where you now want to know who is getting the bonus of $12,000. In this case, MATCH and INDEX formulas will help you, because the VLOOKUP formula is useless in the situation - it can look up the name and give you the bonus, but not the other way around. So such cases, you will first find the bonus amount and then go to the Name column and get the corresponding name. That's what INDEX and MATCH do. This particular way of formula is called "INDEX plus MATCH combination". Again, you can learn a lot more about this from the show notes, so make sure that you go to that page. So, those are the 5 functions.

To summarize the 5 functions that we learned so far are: VLOOKUP, HLOOKUP, LOOKUP, INDEX, and MATCH. VLOOKUP does vertical lookups. HLOOKUP does horizontal lookups. The LOOKUP function is just like VLOOKUP or HLOOKUP, but with sorted (or alphabetically arranged) lists. The MATCH function tells you the position of a particular item in the list. And the INDEX function can give you an item, provided you know the position of that item. So these 5 functions are very, very powerful. If you don't know any of these 5 and you just somehow master these 5 functions within 1 week, I promise you will see tremendous improvement in your productivity and your Excel skills. You certainly will be able to answer a lot of questions that your boss is asking without lifting a finger. I have seen the transformation myself and I personally do believe that you too can experience similar things, if you can understand how these 5 particular functions work and how to use them better.

Now that we have understood the 5 important functions in the Excel lookup library, let us talk more about the extreme cases. Life is all rosy, fun, and happy if everything that you want is always there, but the reality is now that. Just like in life, in Excel we always surprises, errors, and annoying things. One of the common things that happen when you are analyzing data and answer questions like this is very, very simple. Let us say a person named Joshua is calling you and asks "What's my bonus? I'm in the Operations department". So you go can look in the list and can't find the name "Joshua"... what would you do? You tell Joshua "I can't find you" and he suddenly remembers that he's no longer working with your company and accidentally dialed your number instead of his HR number in the new company. This happens many times in real life, where we are trying to find something but it's not there. Just like your

car keys or your remote control when you want it. So, the same thing can happen in Excel, too. What would happen when you're doing a VLOOKUP, or a MATCH or HLOOKUP, or anything, and you're asked to find the name "Joshua", but it's not there. In the case of VLOOKUP or HLOOKUP or MATCH, they come back and throw an error. This error is similar to asking "What is the bonus amount for Joshua?" through VLOOKUP. VLOOKUP comes back and give you can answer like this "#N/A". What this really means is "I cannot find what you're looking for or I don't know what it is".

Now, this "#N/A" might be a very proper way for Excel to tell us that it cannot find the value, but when Joshua is on the phone we don't say "#N/A", we say something like "We cannot find your name in the list". So, why doesn't Excel also do this? Why is Excel being crazy and tell me "#N/A"? It would a lot simpler if it came back and said "Value Not Found" or "I cannot find the name Joshua in the list" or something like that. The formulas and Excel functions, they don't work like that. They have their own mind and their own set language and they go by those rules. Fortunately, there's a way around this for us. In case you are anticipating an error, you can use a formula called IFERROR. So, you could say something like IFERROR({your original VLOOKUP formula inside},"Not Found"). What happens is if the VLOOKUP formula throws an error, the IFERROR formula would capture that error and brings you the message "Not Found" instead. If the VLOOKUP is not giving an error, then it show the value as it is. The IFERROR formula is a very powerful way to handle errors like this and show them in a pleasant and proper way in your output or report. The IFERROR is also a very useful formula. There are many examples and scenarios for it, so make sure you visit the show notes page on Chandroo.org/session2 so that you can learn a little more about the IFERROR formula. This is the first extreme case.

The second case that happens is... let's say we're getting a call from Stella and she wants to find out how much her bonus is. But as is the case with anybody working in a large company, you find out there are several Stellas, not just one. What would you do then? The real human process, in this case, would be something like "Stella would can you tell me your department name, badge number, or employee ID so that I can give you the correct answer, because I'm getting a lot of people with the name Stella here?" This is what we do in real life, but in case of Excel lookup functions, they don't really behave like that. If your data has multiple persons with the name "Stella", what VLOOKUP it finds the first person with the name "Stella" and gives the corresponding answer. It does not go any further. So, this is actually a limitation of VLOOKUP. Not just VLOOKUP, but even MATCH or HLOOKUP it will behave the same way. In the case of LOOKUP, it is different, because it works on alphabetically arranged lists, so there are some other extreme behaviors that you can anticipate there. So, you might be wondering "How do I then answer what is the bonus amount for Stella in our list? I want the second person not the first person with the name 'Stella'?" So, to do such things, you have to do one extra step. Now, explaining that on a podcast might be tricky, so I encourage you to go to our show notes page where I will provide you a link about this and how to answer these kinds of questions. So, that's the second extreme scenario.

There is a third extreme scenario. Sometimes, in real life, we are asking questions that have too many conditions. Here, our question of "What is the bonus for Josh?" is very simple. It has only one condition, "Name" is equal to "Josh". For this we use VLOOKUP. What if I have a question like this "What is the bonus for John in the Marketing department?" Now, I have 2 conditions "Name" is equal to "John" and "Department" is equal to "Marketing". In such a scenario, what we have to do is called a "multi-condition lookup", because we are looking up based upon multiple conditions. Again, explaining the scenario and technique for this particular one is somewhat tricky, but I will provide a link to this technique and how to answer questions like this in the show notes page. So, go ahead and see that and I'm sure you'll learn and appreciate that. So these are the three extreme scenarios.

So, let me summarize them again. What if the value you're looking for is not found? In that case, the lookup functions come back and throw a "#N/A" error. To suppress this "#N/A" and turn it into something meaningful, you can use the IFERROR formula. What is there are too many items that match your lookup criteria? The lookup functions stop at the first match and give the answer. What you want to look up with multiple conditions? This can be done, but building functions with VLOOKUP have the limitation of taking only one condition at a time, so we need to use some other advanced functions or complex syntax. In all of these three cases, how to avoid or overcome these limitations is explained in our website in a very detailed manner. I will leave links to them in the show notes pages at Chandroo.org/session2.

That's about it for Excel lookup functions session on the Chandroo.org podcast, but before we wrap up, let us take stock of all these newly-acquired powers - all the new things you have learned in the last 45-50 minutes. The first thing is when you would use the lookup functions - what is the necessity for that? Once we have appreciated the necessity for these functions, then we learned 5 very important functions: VLOOKUP, HLOOKUP, LOOKUP, MATCH, and INDEX. Apart these 5 functions, you have also the powerful function called IFERROR that can be used to suppress error messages. All-in-all, you have learned 6 different functions.

Now you are familiar with the 5 important lookup functions in Excel, some of the other things that can happen - like the extreme scenarios and what to do when there is an error. You might be wondering "How can I learn a little more about these lookup functions and become efficient in using them?" That's why I have prepared 4 resources for you and they can be found by visiting Chandroo.org/session2.

The first resource I have for you is called "A Comprehensive Guide on Excel Lookup Functions". This is basically a collection of all of our lookup articles in one page. I will provide a link to that in the session notes, so make sure that you go there. That's the first resource.

The second resource is called "VLOOKUP cheat sheet". This cheat sheet is a one page PDF that can be used to quickly understand VLOOKUP does and how to handle some of the sticky situations you may get into.

The third is called "VLOOKUP quiz". This is a quiz that I have prepared to test just how good your VLOOKUP skills are. Make sure that you go to the quiz if you're already feeling comfortable with the lookup functions, so that you can maybe uncover some of the gaps or learn something new that you already don't know.

And the last resource that I have for you is my own book called "The VLOOKUP book". I have published this book in October last year, 2013, and more than a thousand people have purchased this book so far. This book is available on Amazon and our website also. It's an eBook and it's pretty good. It's not very expensive... I think it's $9.99 (the standard Kindle price you see) and it's a very comprehensive guide on all of the lookup functions in Excel. How to use them, how to handle various scenarios when you're working with data or you need to answer questions like "What is sales of this product in this particular region?" etc., etc. using the lookup functions. That's the fourth resource.

Again, if you like what you're hearing here today, then you would definitely enjoy all these four resources. You don't have to really buy a book, but if you do buy it then I certainly appreciate your support for what we do and I think it's a good investment on your part, because you want to learn these things a little more. So, that's about it. Make sure you visit Chandroo.org/session2 to download or access all these resources. Before I forget, I have also created an example workbook based upon this podcast, so that you can see the sample data and understand some of the concepts that we discussed in this show. Again, that workbook can also be found in the session page on Chandroo.org/session2. So, that is about it and thank you so much for joining me today and learning about Excel lookup functions. I hope you have enjoyed this podcast. If you like what you have heard, please visit our iTunes page and rate our podcast. It certainly helps me reach out to more people and promote our show better. I'm happy to tell you that our podcast is listed in the "New and Noteworthy" section of iTunes, so I'm sure quite a few people might be discovering Chandroo.org podcasts, but it certainly helps if you go can go there and drop us a review or subscribe to our channel through iTunes. Thank you so much and I wish you a fantastic day ahead. Bye bye.