Transcript for Session 029

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Transcript:

Hi, welcome to http://chandoo.org/ podcast session 29. This podcast is dedicated to making you awesome in data analysis, charting, dashboards and VBA using Microsoft Excel.

Thank you so much for joining me in yet another podcast episode. Today, I have a very interesting and relevant topic for all us. It is **'How to impress your boss with Excel Charts'**. In this podcast, we are going to talk about a **6-step road map** that you can use when you want to create a chart and walk through that process with an example that I recently saw so that you can understand how this process is applied to real-world problems and how you can use Excel charts to communicate with and impress your colleagues.

But, before we jump into the topic, let me share some personal and work-related updates. First up, I want to tell you that I have very exciting news. Remember the **50 ways to Analyze Data** course which I have conceptualized to tackle most commonly occurring analytical problems and showcase how you can solve them using Microsoft Excel. This 50 ways to Analyze Data course has been brewing or cooking for the past several months. And, finally, it is being **launched** for you on **Wednesday, February 11th**. I am really excited because the initial response that I've got from people who have seen a sample video has been overwhelmingly positive. I will be sharing a couple of more videos with you during the next few days on the http://chandoo.org/ blog. So, please watch out for those as well. If you are listening to this podcast sometime in the future, you can always go and check the show notes page at http://chandoo.org/session29/ where you can find links and relevant material about this course as well as everything else in this podcast.

Apart from this, I also want to share a very good book that I read recently with you. It is the **biography of Albert Einstein written by Walter Isaacson**. It is a really good book. I bought it sometime last year but it has been lying on my bookshelf and somehow, I didn't pick it up. And, then, last month, I thought that I should read it and I picked it up and it was a really eye-opening moment. I mean most of us would know about Albert Einstein because he is one of the most famous physicists who have ever lived on Earth. So, naturally, we would know what his contribution to science is and, more or less, have a vague idea about his life, i.e. he was born in Germany, that he worked in a patent office in Switzerland and how he migrated to U.S. But, those are only tiny bits of his entire life and reading that book gave me a

very good glimpse into his life and the kind of person he was and the beauty of this thoughts, how he lived and a lot of lessons and inspirations for my own life and things like that. So, if you have some time and if you feel like learning from great personalities, look no further. Get a copy of this book and I am sure you will enjoy reading it. Obviously you can't get away with talking about Albert Einstein and not explain all his famous discoveries and principles but not only has the science part been made entertainingly easy for most non-science people like us, but also the life part is written in such a gripping, story-telling manner that it is really worth reading. So, go ahead and get a copy of it if you have some time to read a book like that.

Now, let's move into the topic of the day which is 'How to impress your boss with Excel Charts'. Let me tell me, when I was working, Excel charts and presentations were my only way of impressing my boss. I wasn't working in a circus where my boss was always looking at me and my performance. I was working in a cubicle and my boss had no clue about most of what I did. So, the only way for me to impress her was to email a workbook or presentation to her. And, once in a while, we would all get together in a boardroom or a presentation room where I would do a presentation but those were probably once a week. On a daily basis, I would interact with her through email and the only way I could impress her was by making sure that my email communication, i.e. not only the email and subject of the email but also the attachments, was perfect. This quickly helped me realise that if I create really ugly looking Excel charts then I can't impress my boss. So, I learned a lot of techniques about how to create beautiful and really insightful, elegant and gorgeous looking Excel charts.

In this podcast, let me share some of those **tips and concepts** with you. Obviously, since this is an audio podcast, I can't tell you how to make a chart look great. Instead, I am going to tell you the process and thinking that you need and what you should be looking at when you are creating a chart and use that process to create something beautiful.

To me, the process of creating an impressive chart includes **6 steps**. The first step is to **dig into the data**. You can't really open up a large database and start the analysis. The pre-cursor for these 6 steps has to be some sort of a need or requirement. We will examine all these steps in the context of a practical problem towards the end of this podcast. So, the first step is that we dig into the data. We explore the data as if we are people from the late 18th century or even prior to that who went looking for gold. Imagine that all of our data is like a massive desert or unpopulated area and we go there and dig into it to find some valuable nuggets of gold or information buried in it. So, we dig into our data. We can use any techniques like formulas, pivot tables or summarizing techniques like filters, slicers and whatever might be the case to pan through the data and slice and dice it and get to the insights.

Once we find the insights, we **validate the insights**. For example, we could find that the average of this data, for example, is 28. From prior episodes of http://chandoo.org/ podcast as well as if you have been following our website for a while, you know that an insight like the average is 28 is probably not really all

that much. So, whenever you are finding insights from data, whether those are summary statistics like averages, mean, median or quartiles or any additional information, you need to go ahead and validate whether these insights are really information or just a data dump. For example, your boss gives you some data and you go and do the analysis and come back and say that there are 600 million transactions in the database. Now, this as such is not going to give a lot of information. But, if you present the information in such a way that there are 600 million transactions in the database and the trend for the number of transactions for the last ten years looks like this and, based on this, I feel that our transactions per year are going down and that means that if we don't do something about this, we might end up in a situation where we have fewer transactions every year going forward. This is insightful information now. Simply reporting a gross total or an average in itself is not information. You have to go and validate those insights and find out which chunk is harvesting more of all the gold that you discovered, i.e. cleaning it up and purifying it before actually turning it into a piece of jewellery or something worth wearing.

Then, in step 3, we **pick the charts that convey these insights in a powerful way**. For example, we want to convey the fact that the number of transactions is going down. Now, you can't pick a pie chart for that. Obviously, a pie chart would depict that information but it is a poor medium. You can't really look at 10 slices in a pie-chart and come to the conclusion that each slice is smaller than the previous slice. That kind of thing will require a lot of processing power and many people might miss that insight completely. But, if you take the same data and present the same insights in a line chart then you can see that the line is sloping down and, naturally, we come to the conclusion that whatever the client represents is going down and it will eventually reach 0 at some point in the future. You have to pick the right type of chart that conveys this information and insight in an elegant way. It's as if you have dug out a piece of gold, purified it and let's say arrived at 3 ounces of gold. Now, you can make a biscuit or a small brick out of it or you could make a very good looking piece of jewellery out of it or anything like that. Or, you could leave it in an un-shapely lump fashion and that isn't going to attract a lot of eyes. But, once it is turned into a piece of jewellery or something, it will get enough attention and people will see and understand what its true value is. The same applies for charts also. You have to go and make a chart that is relevant for the piece of information that we are trying to convey.

How do we go about picking these charts? That's a topic for another podcast in itself but on the show notes page of this podcast which you can access at http://chandoo.org/session29/, I will leave a link to a detailed article that explains the process behind picking the right charts for providing insights. The articles, in a very detailed way, will explain the charts to use when you want to convey certain information and certain type of meaning. Go ahead and check that out.

The fourth step is that sometimes it is not enough if you just add a chart; instead you have to **add a very clear title or message for the chart** whether it is part of an Excel workbook itself or whether it is part of a presentation. You have to add a title at the top and maybe a clear, descriptive message at the bottom. This is because people, especially when you are mailing this to a colleague, client, manager or boss,

everybody has their own agendas and things going on in their lives and they might be busy and miss the whole thing in a casual way. You want to avoid that kind of a mistake by adding a clear title as well as a message at the bottom so that whoever is looking at it can understand what the chart is saying and, if they have some doubts, they can read the message and get some clarity about it.

The fifth step is that whenever you create a chart in Excel, Excel being an over-enthusiastic software, goes and adds a little bit of clutter to it. This clutter could be unnecessary data labels or an extraneous legend on the chart or extra heavy formatting or a poor choice of default colors that Excel picked for the chart and these kinds of things. Your job, as an Analyst, is not done when you create a chart and add a title on it; you must **go ahead and de-clutter it**. You should ruthlessly remove or tone down anything that you deem is not necessary for the core message of the chart. For examples, the gridlines are not adding too much value but you believe that the gridlines can serve some purpose if someone wants to pin-point to an exact location on the chart. So, you could change the color of the gridlines to a very dull shade of gray color. Likewise, if you believe that the fill colors for the columns are not adding much value, you could go ahead and fill them with a neutral color like gray or a light shade of blue or green or something like that so that they aren't too prominent and the focus shifts to the chart itself. This de-cluttering process is very important.

Now, we come to step six. Anytime that you have a bunch of charts or even a single chart, often, the whole purpose of making the chart is that either someone wants to know what is going on or somebody wants to know what decision should be made. Usually, when people are making charts and when we go and look at the charts, our intention is to either seek the status (for example, we look at the clock to find out what time it is) to know what is going on or we want to know what we should do next. For example, when you are driving your car, the speedometer tells you what speed you're driving at. This is more for status whereas the fuel gauge tells you when to re-fuel. It will prompt you to take a decision; if you look at the fuel gauge and see that it's nearly empty, you'll immediately get a re-fill at the nearest gas station. Likewise, sometimes, the speedometer itself can tell you the decision. For example, if you are speeding in a school zone, the speedometer tells you the relevant information and your mind processes the information and makes a decision. This is the last step. After you de-clutter, you have to **add an action item** especially in a presentation setting or a boardroom setting where you have to present to a bunch of people and prompt them to take an action. Go ahead and do that; don't be shy. Don't leave the decision making steps to your seniors; you should take the initiative and add to your chart or presentation that, based on the information depicted here, the conclusion is that our transactions per year are going down and we should do something about it. What that something is can be discussed in the meeting and people can figure it out. But, at least, the prompt or nudge towards action should directly happen because of the chart and you should take the initiative for that as an Analyst.

This is the 6-step process. To **summarize**:

1. Dig in to your data

2. Validate the insights

3. Pick the right kind of chart that goes with those insights

4. Add a clear title and message

5. De-clutter the chart

6. Add an action item or what-next step to your chart, if needed (i.e., based on this chart, what should I do?). Spell that out very clearly.

Now, let's go ahead and explore a practical scenario where all these six steps are applicable and how I would go about doing that. This is actually a question that has been emailed by one of the users of http://chandoo.org/ and I am using the same question to drive the discussion in this podcast. Let's say that the scenario is that you are an inventory controller in a large manufacturing company manufacturing bicycles. You manufacture bicycles, and to make bicycles, you obviously need a lot of parts. So, you're importing parts from various countries all over the world and you have an inventory of parts like seats, handle bars, gear shifts, derailleurs, break cables etc. You're looking at this inventory and your job is of a Controller, so you hold and maintain this inventory and you are responsible for updating this inventory and placing new orders. Your CFO comes to you and says, "I have a feeling that we have way too much inventory. For our current manufacturing workloads and demands, it seems like we are holding a lot more inventory than we should be". Why should that be a concern for the CFO? Obviously, if I am holding 1 million bicycle pedals in my warehouse and I am only manufacturing 300,000 bicycles next year then, since we only need 2 pedals for each bicycle, we just need 600,000 pedals and we have one million. So, 4000,000 of them are not going to be used anytime soon which means that the money that I have paid to get those 400,000 extra pedals is just laying waste. It's as if I take half a million dollars and I just keep them in my pocket and not use them for anything. A CFO would usually think of using that money to pay off a loan or investing that in something else or for paying a bonus to stockholders etc. So, purely from a financial or utilization point of view, if the inventory is not being utilised well then it is not correct and you're holding too much.

So, as an Inventory Controller/Analyst, your job is to figure out whether the suspicion of your CFO is true or not. Obviously, you can't walk into the warehouse and look at all the inventory lying there and make a decision about this. You have to go and do some sort of proper analysis. Depending on the type of work and number of units, you've decided to go ahead and examine the pattern for the last 12 months. If you are really responsible for a very large organization where this kind of analysis should be done, you should probably figure out the right time frame. For certain cases, a once a week analysis might be fine whereas for other companies, you might want to do more than 12 months. Let's go with 12 months for now. So, to start with, you need to get the inventory behavior data for the last 12 months. What data should we get? To keep it really simple, let's get the data in this format - when did we get an item and when is it utilised. So, for each and every item that we have in our warehouse, the arrival and departure times are recorded in a database or spreadsheet and you're looking at the spreadsheet. Arrival time is the time when you paid the vendor or when you ordered the item from the vendor and the vendor

shipped that item to your warehouse. Departure time is the time when the item is taken out and moved into the production facility where they assemble a cycle.

Given all of this, you are trying to assess if we are holding items for too long. For example, if I am holding an item for six months before it is being utilized, we could go and say that maybe we should place these orders a little closer to the time that we manufacture them and need them. It is as if we are getting something and not even using it. This is one reason why the CFO might feel that we have too many items lying in the inventory. So, we go and get the data and find the insights and figure out at what point it is coming in and at what point it is going out and the time between these two. We could go and calculate this for each category of inventory time. For example, bicycle seats, pedals, handle bars, bells and brake cables etc. For each category of inventory, what is the median holding time, what are the 25th and 75th percentiles, what is the average, what is the maximum and minimum? You can calculate these descriptive statistics and once you calculate them, you can go ahead and visualize them in a typical chart like a box plot or a bar chart. That will give you a clear visual representation of how long we are holding inventory. Any box that is too wide is a cause of concern for you. If there are too many categories where the boxes are way too wide, for example the box width for the box plot which indicates the middle half for the entire inventory is 6 months then you can go ahead and optimize your ordering pattern. For example, you could place orders a little later than you do so that you can minimize the holding time of the inventory. In this manner, we will go through each and every step and, eventually, based on the raw data and the facts, we can reach a conclusion which could be that we should order fewer pedals or we should order pedals only one month prior to bicycle manufacturing or we should order them more frequently and in smaller batches and/or other conclusions like these.

This is how you could go ahead and create a chart and when you follow this process and create a chart, your boss would obviously be impressed. When I said 'impress your boss', I didn't mean with flashy colors and 3-D effects. There could be a few bosses out there who might be impressed with that kind of stuff but, most bosses and people who are savvy and have business sense, would only appreciate things that are properly backed by clear data and analysis and convey the message in as simple terms as possible. So, if you are making a chart, always look at it from their eyes and figure out if the chart is conveying the message in a clear way, whether it has a title and message and what action item that chart is nudging towards. As long as you validate it and as long as you format the chart in an eye-pleasing manner, it doesn't have to contain all these radical colors and 3-D formats. You can **keep it simple** and your boss will be impressed. That's how it was for me. I've created charts like this many times and my bosses, colleagues and clients would come back and tell me that because of the communication through the chart or presentation, they were able to make better decisions and they and I were both happy. That's the feedback that I got and it seems to be the case that **every time you follow this process, you will create something that is worthwhile**.

Here are a couple of action items for you. If you want to learn how to create charts following this kind of process and the charts that can be created in this manner, what the process of going from the raw data

to the final chart looks then I would recommend you to visit the charting page at http://chandoo.org/. I will provide a link to that in the show notes of this podcast. Likewise, you can also examine some of the contest winners on previous http://chandoo.org/ contests. We run this contest every year and the contest winners usually have really spectacular dashboards that convey a lot of information, prompt you to make right decisions and also provide compelling amount of analysis in a limited amount of space. Check them out; I will link to them in the show notes page. You can also visit the New York Times visualizations. They create a lot of visualizations almost every day. Some of them are interactive and some are powerful and you can examine them to understand how they are approaching a problem, analysing the data and coming up with conclusions and you can use that as an inspiration whenever you deal with work problems. Finally, you can also check out other Excel-related websites like Peltier Tech and Excel Charts websites. I will link to both of them in the show notes page. They contain a lot of information on how to create charts that look and match the requirements that you or your boss might have. So, go ahead and check them out. Please visit http://chandoo.org/session29/ for all the show notes, resources and links for this podcast.

Thank you so much for listening. I hope you enjoyed this podcast. I'll talk to you in the next one. Until then, stay awesome. Bye.