Transcript for Session 041

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Transcript:

Hi and welcome to http://chandoo.org podcast. This is session number 41. http://chandoo.org podcast is dedicated to making you awesome in data analysis, charting, dashboards and VBA using Excel.

Before we begin this episode I just want to wish you **Awesome August**. I know that there is a possibility that some of you might be listening to this podcast well beyond August 2015 but I must tell you about this Awesome August festival that I am running at http://chandoo.org. The idea is really simple. For each and every day of August 2015, I will be publishing a new piece of content on http://chandoo.org. It could be a post, video, podcast, tip, tutorial or a template but for the 31 days you will get 31 pieces of content. Why do I do this? It is because I want you to be in awesome not just in August but in all the months beyond it. So, this month, I am going to give a big push and put out a lot of content that will help people become awesome in their day to day work using Excel. So, I am running this festival. Today is 4th August when I am recording this podcast and hopefully this podcast will go live on 6th August and by then we would have published 6 episodes of Awesome August. You can visit http://chandoo.org/session41 where you can access all the links and resources mentioned in this podcast and also access a link to the Awesome August page with all the content that has been published so far.

In order to participate in this festival, all you have to do is something very simple. Just visit http://chandoo.org on each and every day of August, grab the new piece of content and use it in your work and become awesome. That's all. If you are feeling a little more generous, you are welcome to share the link with your colleagues and friends so that they can also become awesome. What else is better - if more people are getting awesome it makes me happy.

So, let's talk about the topic of the day which is **'6 Charts that you will see in Hell'**. It sounds like an ominous title but the idea here is that because Excel is a very enthusiastic and feature rich software, it offers you a lot of varieties when you want to create a chart. Now, some of those varieties are really booby traps. If you get into that kind of a chart and if you create such a chart, no matter how much polish you do to it, it is still going to look ugly and clumsy. So, we should avoid some of the chart types and some of the ideas when it comes to charting if you don't want your audience to feel like they are in hell and they are being tortured by these information visualizations that they are seeing.

What are these 6 charts and why should you avoid them? Before I talk about those 6 charts, I just want to tell you that almost 7 years back in 2008 I published an article on http://chandoo.org called '6 Charts You Will See In Hell'. This podcast is basically a version 2.0 of that article. In that article, I showcase 6 charts that are ugly. Nowadays I see that not many people are making those kinds of charts anymore. So, we know have to revise the idea of what is a clumsy, ugly and very confusing chart and talk about ways to avoid it. So, today, I am going to showcase some ideas that are really bad and you should avoid them at all costs.

This is an audio podcast; so how can I talk about charts that are highly visual? Well, let me try my best. The 6 charts that you should avoid are:

1. **3-D charts** - A little bit of 3-D is maybe okay. I am saying maybe because if you stretch it a little bit beyond that, it can get very ugly and confusing to read. As a rule, I never create 3-D charts but I can understand and I can empathize with you if you are inclined to adding a little bit of 3-D effect to your charts. But, any kind of a chart that really has 3 dimensions like height, width and depth or charts like bar charts that look like down-town New York or down-town Boston should be avoided at all costs. 3-D charts create an illusion that there is depth, width and height and it forces us to think in 3-dimensions. But, the really sad part is that the medium on which you consume a 3-D chart, i.e. whether you print it out on a paper or you project it on a projector screen or you watch the chart on a computer monitor or you are looking at a chart on a tablet, all of them are 2-dimensional mediums. That means that you can only see two dimensions on any of these mediums. So, what does a 3-D chart do? It creates distortion and it forces our mind to do a lot of extra work when you look at the 3-D chart and you want to understand what is there. This is nothing but putting your users in hell. They are in data hell where they want some information and want to understand what is going on so that they can make better decisions but the chart is puzzling them. It is no longer a chart; it is actually a problem that they must solve to understand what is going on. That, in my opinion, is data hell for them. So, avoid 3-D charts as much as possible. If you have a boss or template or somebody who just says 'Give me a 3-D chart or I am going to fire you' then maybe we can go with that. But, in all other cases, please avoid them and do yourself and your audience a favor. That's your 3-D chart; the first chart to avoid.

2. The second one is a **pie-chart with too many slices**. The other day I saw a pie-chart on Twitter. I am going to link to that pie-chart in the show notes page at http://chandoo.org/session41. The pie-chart title is 'What do others think about your pie-chart' and it has these gazillion slices or pies - each one with one reason that people give when they look at a poorly formatted pie-chart. For example, one of them is 'Why are there so many colors; it is like a rainbow wheel'. The other reason is 'I can't read these labels; one label is on top of another'. Another is 'Oh, what are the values; please put data labels on this pie-chart' and so on and so forth. So, jokes aside, I think pie-charts do work if you have 2 or 3 slices and they are distinct and you can set them apart because the values are like that. If that is not the case, i.e. if there are too many slices and the values can get close to each other, then in such cases, pie-charts are basically torture for anybody watching them because what pie-charts convey is that this number is

bigger than the other number by giving more angle to the first number. So, if you have a pie-chart with 2 slices - 30 and 40 - the slice 30 will have a lesser angle compared to slice 40. If you kind of abstract it to one level higher, the area of the pie-chart taken up by 30 would be less than the area taken up by 40. How does this all matter to us who are looking at the charts? This is because what happens when you have a pie-chart is that we look at it and we try to compare one area to another area. When it comes to concepts like length or width, we can do a lot better comparison because by means of evolution and by means of human eye design, we are designed to compare lengths, widths, heights and depths. But, when it comes to areas or angles, we are really bad at it. We can't tell the angles 30 degrees from 33 degrees. Unless you have some kind of equipment to measure the angle you can't really say which one is what with a lot of confidence - either that or you need a lot of practice. It is really hard; believe me.

So, for that reason, when you have a pie-chart in your presentation or your report, you are forcing your audience's brain and eyes to really work hard to understand what is out there and that's a lot of extra stress on them. In other words, you are putting them in data hell. You are giving them some information but they can't get it because they are struggling with the chart. So, any time that you have a pie-chart, a donut chart or anything like that that has too many slices or too many levels going on, you should avoid them.

Do you know what is worse than a pie-chart with too many slices? -- A pie-chart with too many slices in 3-D. That can be clumsy, ugly and confusing as hell. So, please avoid those kinds of charts unless you want to torture your boss. That's your second chart to avoid - pie-charts with too many slices. I say pie-charts but the same rule applies for donut charts or multi-level donut charts or whatever.

3. The third chart that you should avoid which is a direct corollary from the pie-chart rule is **any chart with too much data**. How much is too much data? That depends a lot on what you are trying to present and what is the core message here. But, in general, any time that you are trying to plot a chart with more than 15-20 values, you are really in the territory of a big data chart. You should try to avoid such charts as much as possible. That's because our short-term memory, i.e. our random access memory(!) or whatever you might want to call it has a capacity of storing up to 7 or maybe 10 things at a time. That's why telephone numbers, social security numbers and all of these are shorter ones because our holding capacity itself is really low. When we are looking at a chart what are we doing? We are trying to grab all the data that is presented there, i.e. all the 10 bars or all the 3 lines or whatever, and store them in our internal short-term memory so that we can do some comparative analysis, and so we could understand the trend and process that information. So, anytime that you have a chart with 25 bars or 75 dots, you are really pushing it, right?

I said at the beginning of this topic that the too much data - how much is too much - actually depends on what you are trying to portray. For example, if your intention seems to be to explain the trend of things, like if you are analyzing the share price of Microsoft company and you want to know how things have been going for Microsoft as a company in the stock market over the last decade. Now, you are looking at the data of daily closing prices over the ten year period which could be close to 2500 data points but you don't feel overwhelmed even when such large data is there because you are not really pin-pointing to each and every number but you are looking for a general trend instead, i.e. what have been the

movements in the share price over a period of time like what happened during the release of a major operating system or versions of Office to the company and things like that. So, you are looking at the lines and you are trying to figure out the key milestones in the journey of the stock and so you don't feel overwhelmed even though there are 2500 data points. But, if you were to do similar analysis and if you were presented the same data in a different way like bars or some other types of things then naturally we tend to focus on individual elements and that can get overwhelming and confusing. Anytime that you have too much data in the chart that is kind of pushing the chart into the data hell territory and forcing your users to work extra hard, how do we avoid that and how do we still present charts with too much data? There are some elegant solutions, for example you could add some filtering mechanism on top of the chart so even though the chart contains all the data, your users can choose to see only this much data. For example, they can choose to see only the data for the last one year or last 12 months alone. Or, they can choose to see only the data for the last 3 months or only this product versus all the products or something like that. So, you could add a slicer or build some form controls or something like that that can slice the chart, i.e. cut the chart and filter it out so that they can remove a lot of data elements and only showcase a small snapshot at a time.

Likewise, you can break down the chart into multiple charts and present them as panel or small multiple charts. Panel charts are a great way to showcase a lot of data but not make users feel overwhelmed. There are many elegant solutions like that. I am going to link to some resources and case studies on this along with Excel templates on the show notes page. Please visit http://chandoo.org/sesiion41 for that. That's your third kind of chart to avoid - too much data.

4. The fourth kind of chart that you should avoid is **any chart that is overly formatted**. What constitutes overly formatted? Well, formatting a chart involves a lot of things. A chart has more than a dozen different elements and each one can be formatted in several number of ways. For example, you could set up the fill colors, you could set up the borders, you could add some shadows, you could add reflection effects, you could add 3-dimensional effects and so on and so forth. Even something like fill color itself has many options. You could fill with a solid color, you could fill with a pattern, you could fill with a gradient, you could fill with some shapes or pictures and when it comes to lines, again, you can do a lot of things. The colors themselves are millions in numbers. So, you can see that there are really infinite ways in which you can format a chart. What would happen when you spend a lot of time and when you go extra creative and combine various things is that sometimes we end up with an overly formatted chart, i.e. a kind of chart that looks really clumsy and ugly and very intimidating. It is not intimidating in the sense that you look at the chart and get frightened but intimidating in the sense that our mind needs to de-clutter the chart, remove all the unnecessary ink in the chart, and all the junk in the chart in order to get to the core message. That's why in the earlier episode of http://chandoo.org podcast we talked about how to optimize data to ink ratio. So, any chart that has a very poor data to ink ratio is a chart that you want to avoid. So, stay away from all the unnecessary effects. Obviously, you may want to add a little bit of bling or wow factor or a little bit of fanciness to the chart because a bar chart can look really boring and dull on a dashboard or in a board room presentation. So, you may want to add a little bit of wow factor to it just for the sake of it. But, don't overdo it. Just keep it to the bare minimum so that the chart can kind of set itself apart. But, that's

about it. There is no need to really overdo the formatting. Again, I am going to link to some resources on what constitutes as over-formatting and how to avoid it. There is a really great article on http://chandoo.org called 'Avoid Gangnam Style When it comes to Excel'. We talk about various formatting traps that people fall into and how to avoid them and what are more elegant and subtle ways to do these things. So please avoid any chart that is overly formatted.

5. The fifth kind of chart that you should avoid is a **complex chart**. As a rule, any chart that takes more than 30 seconds to read is a complex chart. By that definition, any of the default charts in Excel, like your line charts, scatter plots, bar charts, column charts, area charts to a certain extent and pie-charts to a very low extent are good and you can use them. If you go beyond this default realm of charts - bars, columns, lines, scatter plots - and come up with something that is fancy and funky by using a mix of combination charts or god knows what, you are now entering the territory of complex charts. A complex chart is something that would not only take a lot of time to prepare but it is going to take a lot of time to read as well. In other words, a complex chart is pushing your users into data hell and asking them to spend a lot of time and concentrate a lot harder to decipher the chart. So, avoid complex charts. What are these complex charts? I can give you some examples. Any chart that is not usually seen in the business setting can be called a complex chart. For example, there is a popular chart used in stock markets called candle stick chart or Japanese candle sticks or whatever people call them. These are fairly standard charts for people who are in stock broking or trading or investment analysis industries. But, the moment you walk out of that industry and you use a candle stick chart in a marketing presentation or operational analysis or HR analysis, you now have a complex chart. That's because people in that domain are not familiar with the metaphor of candle stick and how that relates to the data that is being analyzed, how to study that chart and how to use it. So, depending on your industry and situation, what is to be considered as a complex chart varies. So, keep that in mind and avoid complex charts. There is no such thing as 'this is a complex chart in all situations' but, in general, any chart that takes more than half a minute or a minute to read can be safely assumed to be a complex chart and something you should not trouble your users with. So, take the high road and avoid these kinds of charts.

6. The last charts that are really bad and you should definitely avoid are **charts that don't tell a story**. Remember, a chart is essentially a picture. So, any chart that fails to convey a message or a story or add a bit of information to the puzzle that you are constructing is a waste. So, please create charts that contribute to the narrative and the story. So, if you are putting up a dashboard and the dashboard has 6 charts and one of the charts is not really telling anything, you can immediately see that it has no place in that narrative and you can remove it. So, anytime that you have a chart that doesn't tell a story, please get rid of that because that chart is pushing users into data hell.

These are, in a nutshell, the six charts that you should avoid. I am going to do quick **recap**. Avoid any kind of 3-D charts, pie-charts and donut charts that have too many slices, any chart that has too much data, any kind of overly formatted charts, any charts that are complex and take more than 30 seconds to read, and any charts that do not tell a story or narrative or highlight a key message.

If you are thinking that this is all good but if this case what kind of charts should you make, don't worry. Please visit http://chandoo.org/session41 where I am going to link to some articles, presentations and tutorials that talk about good principles when it comes to charting along with some previous podcasts so that you can get started with creating awesome charts that will make you and your users feel like they are in heaven. Thank you so much for listening to this podcast. I hope you enjoyed it. I just want to remind you again about the Awesome August festival. Although I say Awesome August, even after August is over, all the content will be available. So, no matter when you are listening to this podcast, please head over to http://chandoo.org/session41 and you can access the Awesome August page from there and check out all the awesome content that is there.

One more thing that I just want to say before we wrap up - **thank you so much for dropping a lot of reviews on our iTunes page**. I know that in session 39 I asked you to write a review on http://chandoo.org podcast telling us honestly how you feel about it and there were more than 10 people who dropped reviews there. So, thank you each and every one of you. I got lots of good and positive feedback and I got some suggestions too. One of them is about the length of podcasts and so I am going to work on that. As you may have noticed, compared to the earlier episodes of http://chandoo.org podcasts, in the later episodes (probably from episodes 17 or 18 onwards) I tried to reduce the duration of podcasts to less than 30 minutes unless I am bringing in an interviewer in which case I really want to take everything that they've got and keep talking until they say enough! So, that's that and there is other positive feedback too. So, thank you so much for writing a review on http://chandoo.org podcast iTunes page. In case you haven't done so, may I request you to kindly spare a minute or two and head over to our iTunes page and write a review - tell us what you feel about this podcast, how I can improve it and what are the aspects about it that you really love and enjoy. Thank you so much and stay awesome. Bye.