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## Chart With Purpose

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>> Moderator: Good afternoon and welcome. I know you saw directions to sketch out a visual. We ask you to hang on to those to use later. We want to welcome you to chart with purpose, overcoming pitfalls to create effective charts. We want everyone to know the session is being recorded. We have muted all lines.

We request you to put your questions in the chat box. We'll get to them as time allows. We'll send out an evaluation after the talk. This is the first in a series of data visualization.

We'll use your feedback to improve the quality of the session.

I'm happy to introduce our speakers. We have Kerry Beledoff and Denise Mauzy with us today. We will access tools for data visualization. I'll turn it over to Kerry now to explain data visualization.

>> Kerry: We'll talk about why data visualization is so important. It's a curve line equal with the center. Most people are stumped. Sometimes someone comes up with the answer. Then I show this slide. People are shaking their heads, saying, oh, yeah, a circle. This visual communicates the same thing as the previous text. With the visual, people get that I'm describing a circle.

In the case of the circle, it can be interpreted more quickly. Visuals are more likely to engage us from the start. Interpretation, retention and engagement are important in hearing data. They support the goal to collect and analyze, use and support children. There are two main purposes of data visualization. The first is digging into the data and exploring. We are looking for friends, relationships, what are the outliers, patterns, things we want to drill into more closely.

The second purpose, that's when the data gets used. We use data visualization to communicate our findings so our stakeholders can use the data to make decisions. Let's go back to the warm up opening activity. If you can in the chat, let us know how you will visualize a finding that 80% of children evaluated for part C are identified as eligible. Please use the chat box to tell us how you might visualize the 80%.

>> Kerry: I see people typing, graphic, one child equaling 10%. These are all great ideas. The point here is that there are many ways to visualize any statistic or finding. There isn't always a right or wrong way. That makes visualization fun. You get to be creative and try new things, which we don't always do with data. That can make it tricky.

Today talking about pitfalls, we hope to decipher what makes certain charts more effective than others. With that, we'll let Denise identify the five pitfalls.

>> Denise: Thank you, Kerry. There are five pitfalls we'll show you in depth. The first is not articulating the message, data overload, misrepresenting your data, being dull, dull, dull, and forgetting about accessibility. Let's think about the first pitfall. It's not clearly articulating the message. When developing chart, it's important to think about what you are trying to convey and whether the chart selection conveys the message otherwise five people can walk away with three different messages, defeating the purpose of your activity. Let's look at an example of the chart we found that highlights the pitfall and we'll look at how it could have supported the take away message.

Okay, we have a chart here that is published by a public school. It includes data on K-12 enrollment and district employees. It has two axis and it's unclear which data align to the access point. You can probably infer it. It doesn't have a descriptive title. Ultimately, you can walk away with multiple messages. We want to ask you in the audience, what do you think the message is for the display? We have a poll we are posting on the right-hand side of the screen. It should pop up any moment. There it is. If you think the take away is that the student to staff ratio has decreased, select that. The number of employees has doubled in the past six years, there are more staff than students in the district, we have had the lowest enrollment in years but staff is growing, or you are not sure what the message is.

We see the votes coming in. We can see how important it is to convey the message. There is a lot of confusion within the audience today not being sure what the message is and an equal distribution of the lowest enrollment in years but staff is growing and staff to student ratio has

decreased. We have two takeaways we thought were viable from this. We wanted to share with you what the takeaways look like with different visual database technique. We can close the poll. Let's take a look at another example of how we could have approached this if this was one of our visualizations.

You can see the descriptive subtitle, total district employees is expanding as others are expanding. We are still including the data K-12 enrollment and district employees, but we have made it easier in that we have two separate graphs nestled up next to each other so you can easily make that comparison. Finally, we have included arrows that visually draw your eye in the proper direction of the trend. This could be a way to convey the message if it was about the district employees expanding as the enrollment is declining. If you selected student to staff ratio, this is another way to convey the message. We have a descriptive subtitle. Student to staff ratio decreased 2005-2010, FTE staff grew 3% while enrollment dropped 7%. The strong title conveys a clear message.

We had to combine two data points and used a staff to student ratio. We transformed the data to clearly convey the message. It gives you opportunities to make sure the message is received appropriately by the audience and what kind of tools can I use to do that. I'm turning it over to you for the second pitfall.

>> Kerry: Pitfall two. This may look familiar to many of you. This is a classic spaghetti chart. It has so much data to share but we can't use it meaningfully. It's called data overload. It's a common occurrence. We need to be able to see individual data points as well as compare cost groups. We think putting all of the data into one chart is important. When you have too much data, everything shout and you can't hear the clear message. In the case of data overload, the secret weapon is to break up the data into several smaller charts.

Again, if you feel you have data overload the answer is small multiples. Small multiples is breaking the chart down to tiny charts in the same column, or grid and each piece of data can stand on its own and be compared across groups. On this chart here you see the distribution of any sport and across Olympic Games. We can see the peak age for ice hockey is between ages 25-30 and that's also the peak age for curlers, but that distribution is flatter and there are curlers competing at age 50. We can look within each group and across groups.

This is another example using slope graphs. It appeared in the Washington post. There are 12 cities included. We gave you a snapshot so you can see it clearly. We are comparing adults in and across cities. Imagine if this was all in one chart. It would look like the spaghetti chart we saw on the first line. Here using our secret weapon, small multiples, all small charts on the scale, we have provided the viewer with detailed information and the ability to look across the data for data points. Denise is going to share our next pitfall.

>> Denise: The third pitfall is misrepresenting the data. You don't want this kind of headline after you do a data presentation. It's important to think about how your charts support your message, and that it's accurate. Let's take look at another example. In this example, the group is trying to portray growth and membership for new members and to track members over all. You can see they have used callout boxes to align specific events by growth by month. The theme that is misleading about this visualization is that the blue line for new members, actually, it appears to go down between November and December, to January. In November and December they had 244 new members, January, they had 70. The use of a line graph makes it look like a dip in membership instead of continual group of members. There is another way to look at or tools available in terms of data visualization.

We have cleaned it up for data visualization as well. You can see on the new chart that we are showing the new members for December and November. You see them in lilac. When you get to January in the stacked bar chart, you can see the existing member, 244. New members, 70, right on top of the stacked bar. It gives you a better sense of the growth over all, but the new addition by month as well. We have added a more descriptive title, and we have made sure to think about the overall appeal of the chart itself. Are we ready for the next pitfall, number four?

>> Kerry: We are ready. This is when your charts are dull, dull, dull. One of the key reasons we use visualization is to engage the audience and help people see the data. We want to get rid of the snooze factor that accompanies just another chart or figure. So here we have a chart created in excel. You know it was created in Excel because this is what you see. We can do better than the default. The default is dull. It doesn't follow all of the best practices, they can disengage quickly. Even if you are working with a typical chart type in a medium like Excel, there are ways to default your chart to make it more engaging and interesting. We have taken the same chart from the previous slide and removed the default things Excel has moved in. Chart junk is things that you don't need or grid lines that aren't helping. Then we have added data labels that instantly help you see what data you are looking at without having to line anything up. We have also made the plot size a lot bigger.

Easier interpretation, more engaging. I have gotten rid of the key and added a color-coded title, removing anything not needed to get a clean chart.

>> Speaker: Kerry?

>> Kerry: yes?

>> Speaker: We had someone say they are having trouble hearing. If you can speak up a bit, that would be great.

>> Kerry: Is it better?

>> Speaker: No one is saying it isn't, so I believe it is. Thanks, Kerry.

>> Kerry: If you are looking for ways to induce engagement, there are ways out there.

Interactive experience allow you to drill down on what you want to while having more data than an independent chart that can provide. There are charts to make it easy. They can be embedded on a website or e-mailed to your audience. If you are interested in learning to use interactive charts, there are ways to help you get started which we'll talk about in just a few minutes. Now we have Denise with our final pitfall.

>> Denise: Thank you, Kerry. We often think about accessibility in terms of 508 compliance. When you are thinking about data visualization, it's important to think about general accessibility. We want to raise the hand option on Adobe. You see at the top of the screen you can raise your hand. We are curious if you have had this experience. Raise your hand if you have been in a presentation before and the speaker has said to you, I know you can't see this chart, but I'll tell you all about it. I'm seeing pretty much every hand in the room go up. We know that for sure. Everyone can take down their hands, and let's take a look at the next one.

We might have people with their hands up throughout the time. If you have ever encountered where the slides are in black and white but the key takeaways are in color, so if you look at it later you don't know what the key takeaways were. Lots of hands going up and smiley faces, pieces chuckling. The charts include colors of the rainbow and you are not sure what the take away is and you are confused by the color. Often times we love color. We think more color the better. When it's data visualization, it's counter to your purpose. There is a complicated graphic you can't understand, and it leaves you wondering, what? All right, lots of hands staying up. People are keeping their hands up at this point. There are ways to build in accessibility so it's a better experience not only for the audience members but as they walk away, they are able to go back to your materials and have a sense of what you were trying to convey. Remember, though, visualizations are by their very nature images.

We need to think more closely about building accessibility. We encourage people to think about using the data visual ability to create the alt text equivalent for non-text element. We encourage you to think beyond a note with for instance, a chart with data on children. It's not helpful for someone looking at the alternative text to see what the data was about the children. Go the extra step and write a more descriptive overview, please.

A color contrast checker is important for accessibility. It helps you know if the text is visible on the background of the chart you have selected. Sometimes you look at color options and think they work well together. These have been tested, and it gives you good direction. Oftentimes people gravitate toward the spotlight color coordination because it's something we are familiar with in our everyday lives. People with color-blindness don't use the color, so we ask you to avoid the color combinations. Consider whether the data will be presented, if the room is going to be large and if people in the back are going to be able to see it.

Then also think about with your audience in mind, consider the need for multiple formats beyond the alt text. If you can, provide color handouts if you are using color in your charts so the material will be able to stand on its own as we move forward. We are really excited. Kerry will share information about our tool kit because it has so many resources and tools that can help you in data visualization.

>> Kerry: So we have five comments, pitfalls, creating effective charts, and if you enjoyed learning about those and are looking for more resources and tools to support you in creating effective data visuals, we encourage you to check out our data visualization tool kit. A search of data visualization will return millions of hits. We have created what's out there in this tool kit so you have access to the best resources, low cost and no cost tools and have relevant examples. The tool kit is divided into nine sections here. We have a section on maps where you find information and tools on making polygons, Google maps, to find out about services in graphic areas. We have a section for displays on making charts that are dynamic. We have a great section on dashboards that will help you if you want to think through what are the key considerations when creating a dashboard or working with I.T. or vendors to create dashboards.

The info section is popular. We have free tools that create info graphic easy. We have an animation section with how to and other simple video creators. We have a color section with tools such as the contrast checker that Denise mentioned earlier. The color section is one of

my favorites. It has a lot of great information to pick colors that work well together and lots of tools and information about how to update the colors in various displays. Our chart section includes a lot of information you heard today as well as templates you can download to create charts in excel. Our presentation section has great tips for putting together a presentation and tools you might have not thought to use and our data section helps you think about making it effective with things such as conditional formatting. After you check out our tool kit, or while you do, if you would like more T.A. or resources on data visualization, please reach out to us.

We have lots on our website as well as we can provide individualized T.A. on data visualization. Feel free to contact Denise or I and we'll connect you with the T.A. and resources. At this point, if you have general questions from today's presentation and you want to put them in the chat box, we are available to answer.

>> Where do you find the testchecker. Were you referring to something like a website or a report or PowerPoint presentation or something like that?

>> Kerry: I'm not sure about the alt text checker. Typically it's read by a screen reader. There are tools out there so you can have a screen reader read what your alt text is to see if it makes sense. That's something we can look into more. As mentioned in the color section of the tool kit, we have tools, not on alt text, but picking colors that are accessible generally.

>> I'll add on PowerPoint 2015 and 2016, you can run word checker built in. That's not necessarily online. It will tell you if Ault text is missing.

>> That's great. Thanks, Kellan.

>> Kerry: Elena has provided many the chat box a free accessibility checker. Denise, do you want to give an example of alt text?

>> Denise: Sure. One of the examples I was talking about earlier in terms of alt text, often times people put in the alt text to say a chart with a description of child outcomes. Instead of saying that, to go to a more descriptive text to write the discussion point of what you are trying to convey in that chart. Much like you would have been speaking at that point in time. It really allows the person to walk away with a good understanding. Do you want to give other examples, Kerry?

>> Kerry: I think that's great. Just as you are in your chart trying to drive home the key messages, you want to do the same thing with alt text. I don't see any more questions coming through, so at this point, we'll say thank you so much for joining us today. The presentation will be available on the Dasy website shortly. Feel free to follow up with any requests. Thank you.