Stacey Barr Pty Ltd
the Performance Measure Specialist
ABN 57 129 953 635
PO Box 422 Samford
Queensland 4520 Australia
Phone: 1800 883 458
info@staceybarr.com
www.staceybarr.com

Lesson 5: Using Smart Charts in KPI reports

Transcript

What we are going to cover in this final Lesson are these things:

How to set targets with Smart Charts and how to display those targets on your Smart Charts in a really meaningful way.

We're going to look at rules for traffic lights. Some of you will already know what traffic lights are in the context of performance measurement but if you don't it simply means giving each KPI a visual flag and called traffic lights because often the visual flag is a red, amber or green light or icon that signifies its priority for attention and action. With Smart Charts we have to really re-think the way we adding traffic lights to our measures.

We'll look at some tips and ideas for what you can do with Smart Charts, particularly on dashboards or wherever you need a chart that is just a little bit smaller than the kind of chart you have been seeing so far.

Stacey Barr Pty Ltd
the Performance Measure Specialist
ABN 57 129 953 635
PO Box 422 Samford
Queensland 4520 Australia
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info@staceybarr.com
www.staceybarr.com

Targets have a whole new meaning

Smart Charts make targets take on a whole new meaning when it comes to performance measures.

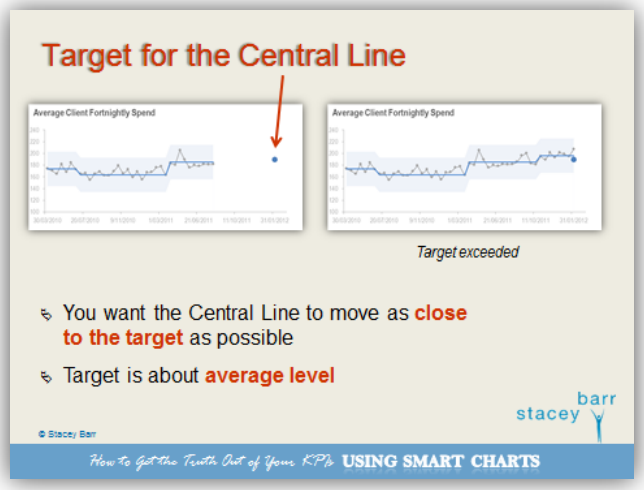
There is a **really big mistake** that people who aren't familiar enough with Smart Charts will make and that is they'll treat the Natural Process Limits as the targets and they absolutely are not the targets at all.

We need to make that distinction clear about how a target is different but also what you are setting the target for. That is the interesting question when it comes to Smart Charts – what exactly are you setting the target for?

There are a few things you can set the targets for and let's go through some examples.

Target for the Central Line

One thing you can set the target for is the Central Line.



So this example [the first chart] of Average Client Fortnightly Spend, is from our boutique health club. What this health club wants to do is increase their Average Client Fortnightly Spend.

They have managed to do it once already but they want to keep doing it to bring it up to a new level and they have set a target of about $185 per client per fortnight is what they are aiming for.

That **target dot** is saying that by 31 January 2012 we would like to see that Central Line move up to that level of $185. It's not too far off it now, but it's still not quite there.

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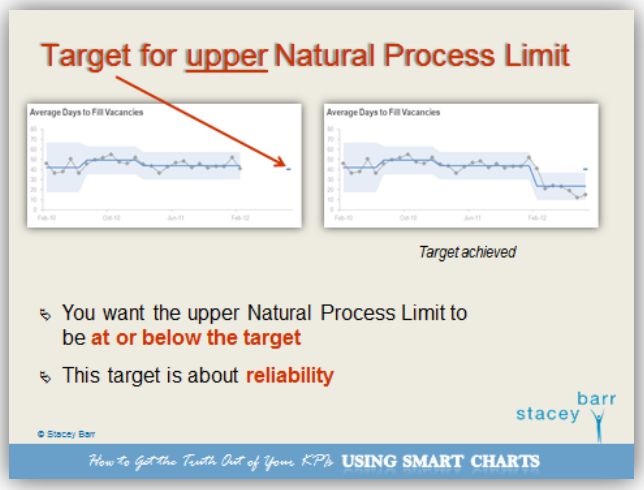
This [the second chart] is what it would look like once it had achieved it. In fact, exceeded it. Some kind of change gets introduced that does increase the client's average fortnightly spend. Maybe it's a new product, encouraging people to take an extra personal training session a week. Whatever the strategy is, it's worked and it's lifted that spend up to what turns out to be just above the target. So what we are comparing here is the Central Line with the target, and we want that Central Line to move as close to the target as possible.

In this situation the target is all about your average level of performance. You are setting a target for the average level of performance that you are aiming for, but that's not the only kind of target that you can set with a Smart Chart.

Target for the upper Natural Process Limit

You can also set a target for the upper Natural Process Limit.



This performance measure [the first chart], Average Days to Fill Vacancies, is the kind of measure where you want to be able to almost guarantee that it's not going to take any longer than 'x' number of days to fill a vacant position.

It's a good idea to do these things quickly, to fill positions that are vacant quickly, so that work can continue. It's not going to be as quick as instantaneous, but you may want to set a target for the upper Natural Process Limit and get your performance so good that you can say you are always going to be under. In this case maybe it's 40 days to fill a vacant position.

This [the second chart] is what it would look like if that target was achieved.

You can see that the upper Natural Process Limit is now sitting underneath that target value and that's a great result. That means the target is achieved, that this particular HR team could guarantee that they will virtually always fill a vacant position in under 40 days. That's what their data is giving them evidence of.

Whatever they have done to improve their recruitment process has worked and it's producing some very predictable results that fill vacancies very fast. Of course, not everything is in their control but that's not what performance measures are about. They are about what you can influence and about getting better at what you can do.

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Maybe a manager wants a position vacant and just refuses to send the position description through and that drags the time out to 60 days. That is going to happen from time to time but the recruitment team is doing all that they can to influence as much of that recruitment process as they can so that, by and large, it's almost always going to be under 40 days.

So you are setting the upper Natural Process Limit target so that you get that upper limit, the upper end of the routine variation, to be at or below that target value. This kind of target is about reliability. We can reliably say that we will always be better than 40 days.

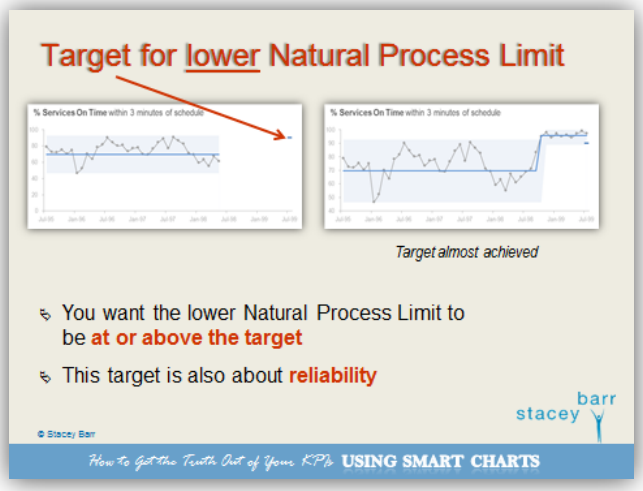
Some targets don't necessarily make practical sense. There will be a natural minimum number of days that it's going to take a fill a vacant position so there's no point in constantly aiming to bring the Central Line down and down and down over time with this. You'll never fill a position instantaneously so we really do need to bring common sense into where we would set these targets as well. When you look at your Smart Chart it gives you really good clues about what is possible and therefore what could be a reasonable and meaningful target to set.

Target for the lower Natural Process Limit

You can, just like you've set a target for the upper Natural Process Limit, you can also set a target for the lower process limit as well.

What that is saying is that we want our lower process limit to be at or above the lower Natural Process Limit.

This measure [the first chart] is percentage of Services On-Time within 3 minutes of schedule, and this is from the railways. They are measuring the percentage of train services that ran within 3 minutes of the published schedule.



You can see where they are now – they're fairly predictably between about 45% and about 92% on-time which is a pretty broad range. It's not out of control but it's a highly variable process and they've set a target to be probably at 90%. They want to guarantee that train services will be on-time at least 90% of the time, which means that

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lower Natural Process Limit has to be up above that target, and that's what that would look like [the second chart].

That's a dramatic improvement. That would take a huge amount of effort, I imagine, to turn performance around form where it was, up to that really high-performing level where they could guarantee at least 90% on time all the time.

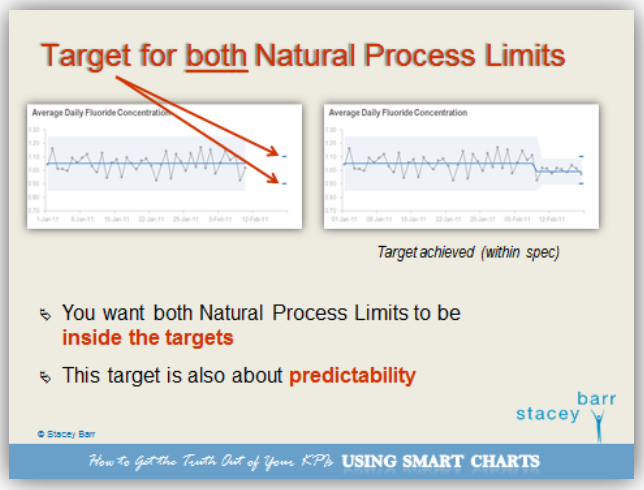
I had to do something to that chart, you might notice, to be able to zoom in and see enough of what is going on at the far end of that chart. Because when performance gets that good, and when routine variation is that narrow, it's very hard to pick up signals with your eye. That is why it's absolutely okay to play around with the vertical scaling of your graph.

Notice that the first graph starts at zero and goes to 100 which is a logical range for a percentage, but the second measure starts at 40 and goes up to 100%. Usually you don't want to chop off the bottom of the axis, particularly when people are making point-to-point comparisons. With a Smart Chart we are not making point-to-point comparisons. We are looking for signals, and we know that the thing we are comparing to is the Central Line and the Natural Process Limits. So it doesn't matter how much of the graph they fill up and it doesn't matter what the vertical axis scale looks like. As long we can see the limits of natural variation and the Central Line, we are good as gold. So we can zoom in like we have with that particular chart.

When you are setting a target for the lower Natural Process Limit the idea is that that Natural Process Limit has to be at or above the target. You are trying to shift it up. It's also a target about reliability. We can reliably say that our trains are always at least 90% on time.

Target for both Natural Process Limits

You can set targets for both the Natural Process Limits simultaneously, and in this particular example which is completely made up [the first chart] – this data is not real. I was hoping to get something form Cheryl in time but she was busy and I didn't want to bother her with the question.



So I did a bit of research and discovered that in drinking water, at least in some counties in the United States, a concentration of about 1mg per Litre is a healthy

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the Performance Measure Specialist
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info@staceybarr.com
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concentration. I don't know what sort of range you would want to keep that in but I'm pretty sure that the amount of variability around that concentration level is something people would be monitoring and trying to keep in control. So this example really picks up on that concept, even though the data is completely not accurate so don't trust it!

The idea of setting a target for both your Natural Process Limits generally is about making them narrower than they are. It's about getting more predictability and more control over the process that you are monitoring and measuring and managing.

To achieve this target it would look like that [the second chart]. You would end up with the much narrower process limits and it also requires that the Central Line comes down a little bit too. But that's an example of what it's like when you are trying to keep a particular performance measure within specification limits.

So, continual movement in one direction or the other is not appropriate. The idea is to keep it smack-bang around an ideal range, and that's a great application of setting targets for both Natural Process Limits.

So the idea is that both limits need to be inside those target values. This particular target is about predictability.

This is where a lot of the confusion comes for people who aren't too familiar with Smart Charts, when they look at them **they think those Natural Process Limits are the targets but they're not**. They're the voice of the process. They are telling you how things actually are. The targets are the voice of the customer; they are telling you how things should be.

So your idea with performance management is to make things move from where they are to where they should be. We need the Smart Chart to tell us where we are and we need our targets to tell us where we should be, so that we get that nice, neat comparison that we can make visually on these charts. And then once you see them, without a doubt you know whether or not you have achieved a target.

You don't have to debate and say "This month we achieved it but the month before we didn't and next month we may or may not." None of that conversation makes sense any more. This is the way to look at comparing actual performance with targeted performance.

One other thing that people tend to set targets for is the individual measure values.

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www.staceybarr.com

Targets for invidual measure values…

It's a trick! Absolutely not – do not do this!

Do not set targets for individual measure values.

Really, you've only got those four options that I have given you: a target for the Central Line; a target for the upper Natural Process Limit; a target for the lower Natural Process Limit; or a target for both the upper and lower Natural Process Limits.

They are the only four things that make logical sense when you are managing performance and the Smart Chart, combined with the way that I have shown those targets, just works so brilliantly.

I am going to hit the pause button for a second because what I have attempted to do with this course is squeeze in as much content as I could, based on the interactions I have had with some of you leading up to the course and during the course.

I've wanted to be able to answer all of your questions and cover off on everything. The consequence, I've just realised, is that it's going to send us over time. My guess is here we've probably got another 15 or 20 minutes of content left. I want to give you the option right now of whether we continue on now and if you need to go you catch it on the replay, or whether you would like to pause here and next week I will schedule a fourth webinar and we'll come back to together at a similar time, probably on Tuesday morning next week for those of you in the United States that would be Monday afternoon. If you could all give me a quick comment now about if you are okay to stay or whether you would like to reschedule.

So far it's unanimous about continuing on for now. I'll give you a few more seconds to respond to that.

Anita is raising a good point, she'd love to reschedule so that she can get some input – I'm not sure what you mean by that Anita. Elke is okay to stay as well. Veronica would prefer to reschedule but can stay. I think what we will do is continue now but if any of you have any particular questions about what we have covered in the webinars so far I'll give you all of next week to email me any questions seeking clarification on what we have covered in the course. So if you can't stay now and you have to listen to the replay later then what we'll do is all of next week you can email me and that means that if you do have a question about something after you have watched the replay I'll send

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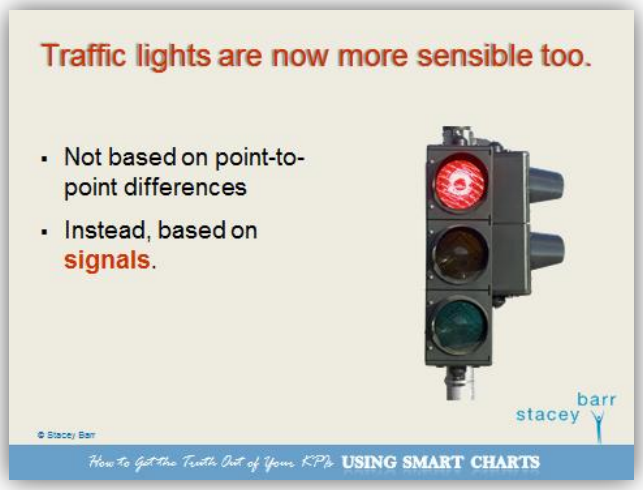
the answer and if I haven't answered it in any of the recordings I will document all the Q&A and publish that so you can all get a copy of it as well. Hopefully that covers everybody's concerns.

Traffic lights are now more sensible too

So another really important consideration with Smart Charts is how you combine them with traffic lights.



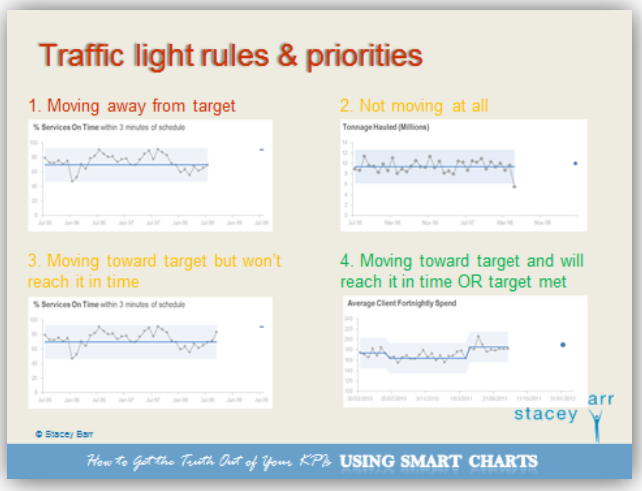
I have never felt actually that traffic lights used in dashboards are all that sensible.

The way that people generally decide whether a performance measure gets a red or a green light is by generally comparing the actual value to a target or the actual value this month to last month or something like that. They are basing the traffic light decision on those misleading, trivial comparisons that we've already blown out of the water.

What I do like is that we have traffic lights that are based on signals from our Smart Charts. How would that look? Let's take a look at the kinds of rules that you could set up for your traffic lights based on signals in your Smart Charts.

Traffic light rules and priorities

Your first signal, which would get a red colour if you are using that classic colour scheme for traffic lights, would be the worst case scenario for your performance measure. And that is performance is going in the opposite direction to where you want it to go.



That really does raise alarm bells. If performance is showing a signal that it is moving in the other

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info@staceybarr.com
www.staceybarr.com

direction to where your target is you would want that top of your priority list. You would want to be talking about that first and working out what needs to happen to fix it.

So in this example [the upper left chart] you can see that there is a long run below the Central Line but the target is asking us to move up. In fact, that target is a straight little line, not a circle, and that makes it a target for the lower limit. So there is a long way to go for improvement and this measure is showing the opposite direction.

The next highest priority for attention [upper right chart], and this is something that you could give red if you wanted to but in this case I have just chosen amber – as long as you are consistent it doesn't matter, and as long as those colours highlight the correct priority order that's fine too.

This signal about performance not really changing at all. Remember, this is the Tonnage Hauled, so that final point is a data anomaly, not an outlier, so you can ignore that really and you could safely say that performance has not changed at all.

So even though we have set a target for improvement we are not yet seeing any evidence of an improvement in the Smart Chart so that needs attention as well. We need to talk about that. Usually you've put in some kind of initiative or project to improve performance and you want to see a return on that investment. You want to see performance improve so this could be a clue that what you have done there isn't being implemented or it's not working. So it's definitely a priority for attention.

The third type of situation with performance is priority number three [the bottom left chart]. I give this one an amber, and I would definitely keep this one amber. I wouldn't make it red. This is where your measure is giving you a clue that it is moving toward the target, it is showing early signs of heading in the right direction, but very unlikely that it's going to reach the target on time.

You are seeing an improvement but you are running out of time, or your improvement is nowhere near big enough to really reach that target at the time you have set the target for. So that's the example with this one – Services on Time. The performance is looking like it's starting to head up but it's unlikely you are going to reach the level of improvement that you need within a year. It might be possible, but it's an alarm bell. Make sure you really have got your finger on the pulse with that particular performance measure and the initiatives aimed at improving it.

Finally, we have the green traffic light – or the good result [the bottom right chart]. It's the lowest priority in terms of how much attention and energy that you give to it but you still want to know it. You still want to know what is going on with all of your performance measures.

With this signal, performance is definitely moving toward the target and it looks like the improvements are big enough, or we have enough time, in order to meet that target. So things are on track. That's what this is saying.

Sometimes you could use this green signal also for when you have actually achieved the target. If you had a target for the Central Line, when you can see the Central Line

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info@staceybarr.com
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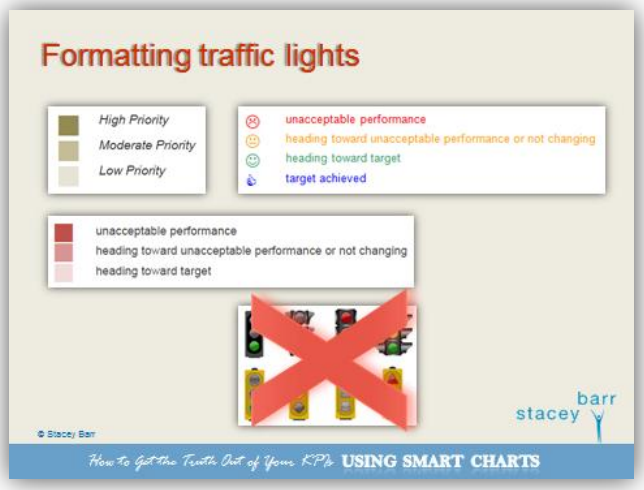
is at or above the target value then the target has been met and you may give that a green as well. But there is another option for that – sometimes I just give that a blue, blue being my colour for a target being met, so it's like having a four colour traffic light system. Red, amber, green and blue.

So they are the basic rules for how to use Smart Charts to determine meaningful traffic lights for your KPIs, but the colour scheme is something that is up for question.

Formatting traffic lights.

There are different ways that you can format traffic lights.



You can give them colours like this [the top left example], where you have got a single colour but you are just looking at different tones of it. The darker and more intense the tone, the higher priority for attention the measure is. This is a concept that Stephen Few, author of *Information Dashboard Design*, has put forward.

A slight variation [middle example] is that it just uses a slightly different colour scheme, or different labels as well for what that means. Unacceptable performance is the deepest colour red. Heading towards unacceptable performance or not changing is that medium pink colour. The pale rose is heading towards target. You've got different options and be conscious of the option that you are choosing or what you are creating and be consistent with how you use it.

A more trivial approach [upper right example] is to use some sort of symbol, whether it's a smiley face or some ticks and crosses. They are okay. I think they can be more of a distraction than anything and that's what I've learnt over time. I used to use those but I think I found them to be more distracting and not as visually prominent as the blocked colours in the monochromatic scheme.

You'll also see other types of symbols and objects and icons [bottom example] used to highlight what performance is doing. The bottom line for me is don't use them. They are definitely too distracting and take up way too much space. It's really an inefficient way to communicate information and they are there more for entertainment and fun and simply because the software developers have found a way to do it. Just because you can do it doesn't mean you should.

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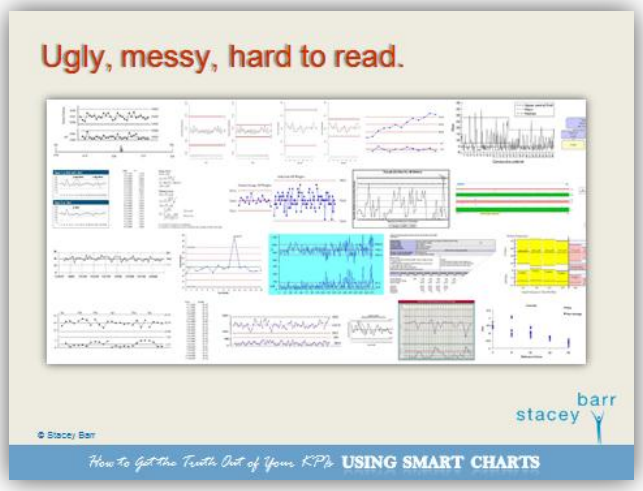
Smart Chart formatting: traditional

In terms of the formatting of the Smart Charts themselves, a lot of the software that does these sort of charts tends to be created by technicians who don't really have Stephen Few's flair for visual design.



When you've looked at a really well designed report or well-designed dashboard or graph you really appreciate the power that it has in helping the right information jump off the page and almost slap you in the face.

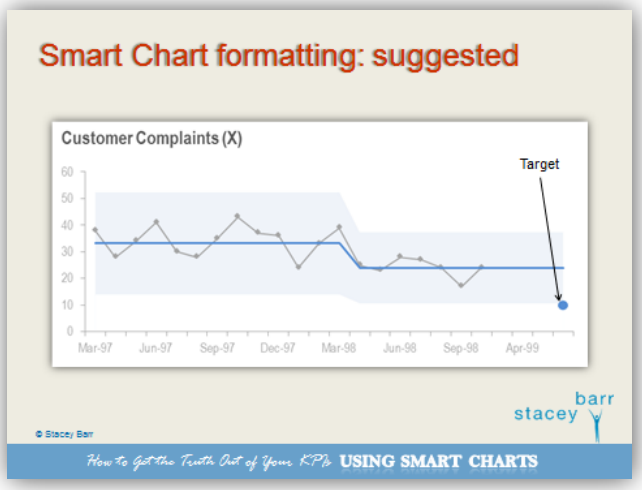
A lot of these old-fashioned ways of displaying Smart Charts are hard to look at, hard to interpret, very cluttered and messy and not engaging at all. There are too many lines, too many harsh colours and definitely too much clutter.

I reckon Stephen Few's advice applies to Smart Charts as much as it applies to any other form of visual analysis. We need to move away from this traditional approach where generally the data line is quite prominent, the Central Line is really thick and bold and a gaudy colour, the upper and lower limits are usually dashed lines and often they're red and then if you want to add a target line as well, often the target line is a line right across the graph and you've got to give it a different colour so that it stands out. It's a gaudy, messy, ugly looking chart.

Smart Chart formatting: suggested

I had a phone call with Steve Few about formatting Smart Charts just to see how we could apply his approach.

I had a starting point that I took to him and emailed to him and he was looking at it while we were talking and together we came up with a way to display a Smart Chart that I think truly is



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probably the best way that I have seen them displayed.

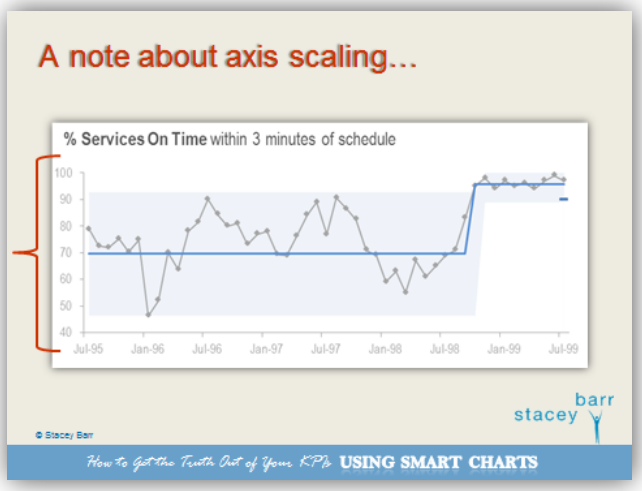
You are already familiar with it, you have seen it: we have been looking at them all the way through the course.

Now you understand why they look this way. They are cleaner, they are simpler, and they really do help highlight the comparison that matters most.

Steve's first question to me was 'What comparison do you most want to highlight?' and I said 'Well usually it's the Central Line compared to the target'. He said 'Well fine, that's what you need to make visually prominent. That's what you give the colour and the rest of it you can just tone down to a level where it's still useful but you're not being distracted by it.'

Now putting the targets there as points above the dates by which you want to achieve them has been my little invention, so that was something that I was doing already but Steve helped with the shading and making the measure line still visible but not the dominant thing on the chart, and certainly highlighting, using the bright blue colour, the comparison that you most want to make.

I mentioned before about scaling. That's a little reminder – don't be afraid to rescale the vertical axis of your Smart Charts if it makes it easier to pick up signals when your data is getting quite tightly predictable: small, routine variation.



You need to be able to see what is going on and to be able to check the signals so don't be afraid to rescale that vertical axis to make that possible.

Now, sometimes you have multiple graphs that you want to fit in.

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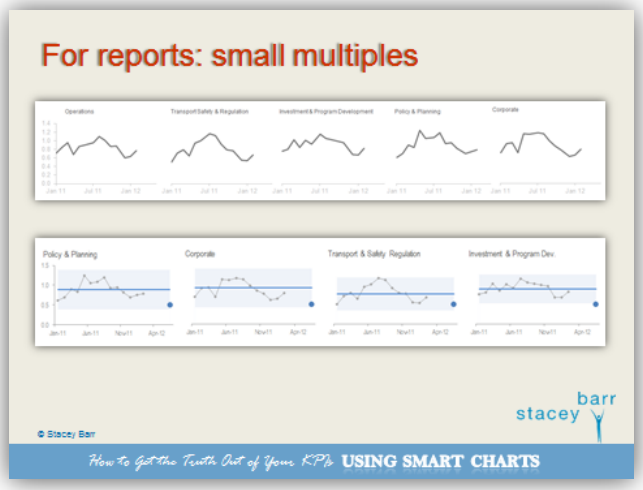
www.staceybarr.com

For reports: small multiples

Sometimes you are measuring something that you also want to measure by department or by customer segment and that's a very viable thing to do, to be able to compare those departments or customer segments for that same measure.



Another idea from Steve Few is this idea of small multiples which is small versions of the same measure in the same graph but produced for multiple sub-groups [the top series of charts].

In this case it's departments in an organisation.

A couple of things to thing about when you do these sorts of small multiples is that you really need to have all of the graphs **scaled exactly the same on the vertical axis**. So in this case they all need to start at zero and go up to 1.4, otherwise you can't make valid comparisons between each of the departments and that's the great thing of laying them out side by side, is that you can make those comparisons.

You can see they are all pretty roughly around the same ballpark but there's a bit of a hump in the middle of each of them where it's taking on a different shape. Maybe this middle one is a little bit higher than the others on average? You sort of get that ability to compare.

Delete the vertical axis from all but the first chart and that gives it a cleaner line. You can make these quite small when you do this because you simplify their formatting quite dramatically. You can do this for Smart Charts and that's how it would look [the bottom series of charts]. A little less de-cluttered than the first but of course you have the right information on it when you have a Smart Chart. But all the same formatting features apply – remove the vertical axis on all but the first one, make sure they're all scaled the same and that way you've got that ability to compare departments.

There is a template for this for you and it is called the small multiples template and it helps you set up exactly what you can see on the bottom here. It lays out all of the measures in their Smart Chart calculations on one sheet and then on the next sheet it includes all of the little Smart Charts, formatted together. So you can use that and overlay it with some of your data.

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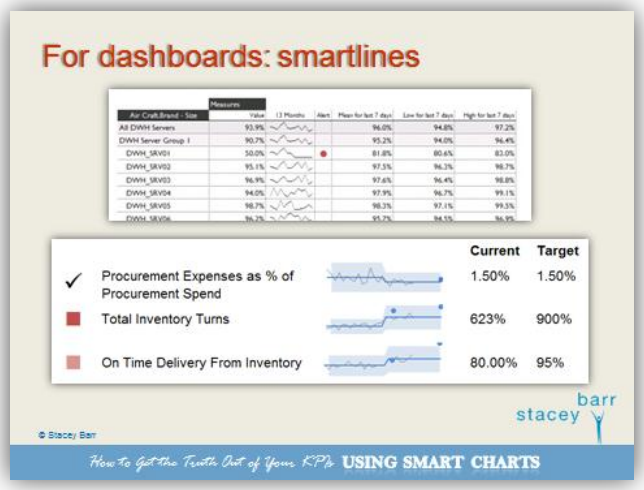
Of course, check the scaling of your axis and make sure they are all the same and change the chart titles etc. Just do all those basic little things, but essentially most of the hard work is done for you with that.

For dashboards: smartlines

On dashboards you might be familiar with a convention called a sparkline. They were designed to put some kind of visual information about the direction of a trend into a very small space, so basically they'd be in line with text in a table like this one is [the top example].



Sparklines, however, tend to still be combined with other data that encourages those misleading point-to-point comparisons. I don't like that and I think it's risky.

But I do love the idea of tiny charts because if you've got a lot of information to put in a dashboard you don't want to miss out on that trend information. You don't want to miss out on the signals.

So I invented smartlines to extend on the concept of a sparklines but to make tiny little graph a bit more useful. These smartlines have four essential pieces of information on them and all the rest of it was taken out. You don't need the axis or titles or anything. You've got your data line, your upper and lower Natural Process Limits, your Central Line and your target. Straight away that helps you make comparisons. So when you report numbers like current level of performance and the targeted level, your current level of performance is where your Central Line is sitting at and your target is obviously that point that is your target point. Much more valid comparisons, these are, than what we traditionally see in dashboards with sparklines. So replace your sparklines with smartlines.

Again, I have a template for you in Excel for how I did these little smartlines. They are not easy and they are quite fiddly because I don't have any software yet that can automate them. You will find that in the template called the smartlines template in the downloads for this Lesson.

End of transcript.