

The Art of Dashboarding

1.0 Introduction

This article is for developers who want to attempt the layout and styling of dashboards. In addition, graphic artists who are just starting out in designing dashboards may find some of these points informative. This is not a definitive guide, but a consolidation of common practices I've come across while exploring my own creative side in dashboard design. A lot of the material here is based on simple color theory and discussions with graphic artists who stylize dashboards.

I will cover individual data visualization styling (charts, gauges and maps) such as fonts and colors, as well as overall dashboard layout and styling considerations. In addition, it is important to mention that when creating dashboards, function should always follow form; i.e. how the dashboard works and how the user should interact with the dashboard should take precedence to how the dashboard is going to look and feel. However, you find that there is a balance between the two.

2.0 General Styling

Before starting any styling, you should look for a starting color palette. Often, there are corporate colors to work with or, at worst, you can create a simple palette from a logo you may be using. If there are no brand colors or logos, then I would generally go with a simple palette of white, a primary color like a cool blue, and a light gray. You generally can't make a horrible-looking dashboard with this approach, but anything is possible when you're an artistically challenged developer like me.

Color	Hex Value (RGB)
Cool Blue	#6b97bf (107,151,191)
Light Gray	#bdbdbd (189,189,189)

Fig. 2.1 Neutral colors used as base color palette

Color	Hex Value (RGB)
Blue	#1a3b69 (26,59,105)
Orange	#fcb441 (252,180,65)
Red	#e0400a (224,64,10)

Fig. 2.2 Dundas corporate color palette

From this base color palette, you can use a palette generator to create a more diverse range of colors for use. When you have multiple data visualization components and various legends, you will need all these extra matching colors. I like to have at least eight colors on hand.

Hex Value (RGB)
#69BF92 (105,191,146)
#E3D0BF (227,208,191)
#BFBD69 (191,189,105)
#BF6995 (191,105,149)
#696ABF (105,106,191)
#9FD5D6 (159,213,214)
#AF7F4B (175,127,75)
#B9D69F (185,214,159)

Fig. 2.3 Color palette using a free open source tool

Data visualization backgrounds and the dashboard background generally use neutral colors such as light pastel colors and light tones of gray; if possible, use a very light version of a color from the base color palette. This allows for data visualization elements like bars and pointers to stand out more.

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Color	Hex Value (RGB)
Light Gray 1	#EDED (237,237,237)
Light Gray 2	#F0F0FF (240,240,255)
Pastel 1	#F7FFF0 (247,255,240)
Pastel 2	#FFFFB3 (255,255,235)

Fig. 2.4 Some neutral background colors

Attention to detail is important in general, but fonts should get extra attention. Use consistent font types and sizes throughout the entire dashboard. In a web environment, you can use **Trebuchet MS** or **Verdana** and, for desktop dashboards, you can use **Myriad**, **Calibri**, or **Arial** for titles and **Verdana** or **Tahoma** for content. General font sizes for objects like axis titles, axis scales and legend descriptions are around **10pt**. Use **12pt** to **14pt** and possibly bolded text to distinguish main titles from the other titles.

3.0 Chart Styling

3.1 Chart Taxonomy

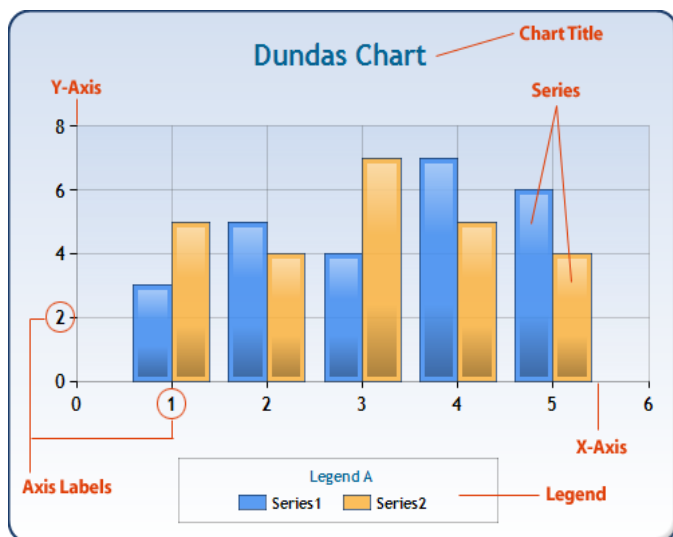


Fig. 3.1 Elements of a chart

3.2 Tips and Tricks

- Be careful with using colors that are similar; this may make it hard for some users to distinguish between the series.

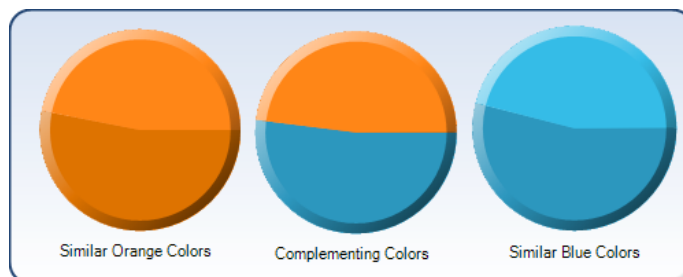


Fig. 3.2a Color perception

- Pick a base color as a starting point for one series and find complementing colors for the other series.
- If you need more than three series, you should rethink your chart. For example, will the end user be able to distinguish between four or more lines? This could make it hard to read.

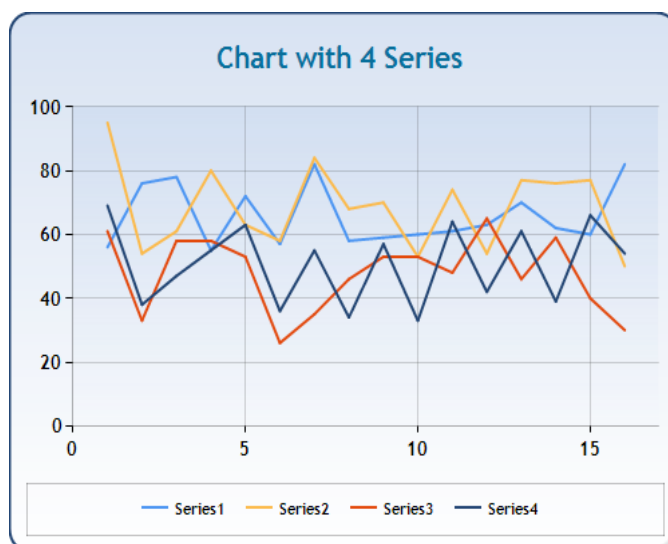


Fig. 3.2b Chart with four series

- Even with three series, consider using either three-column charts or a combination of area, column and line charts.

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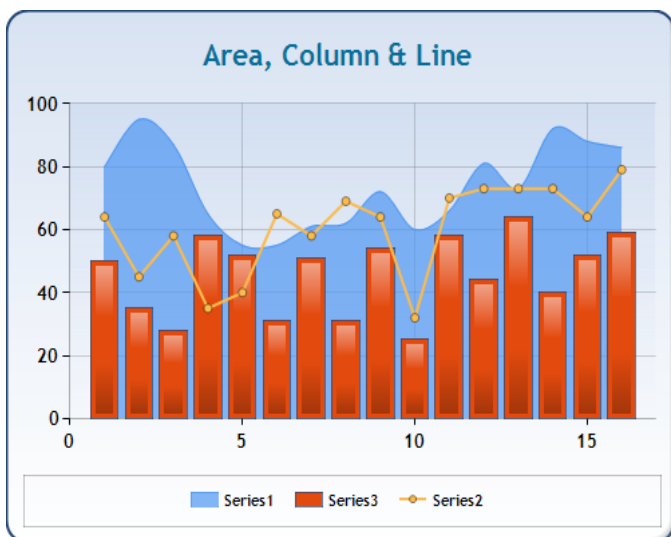


Fig. 3.2c Area, column and line combination to distinguish series

• If comparing two trends, consider showing one as an area chart with a neutral color (as a base comparison point) and the other as a line with a bold color. This will help the end user in comparing the two.

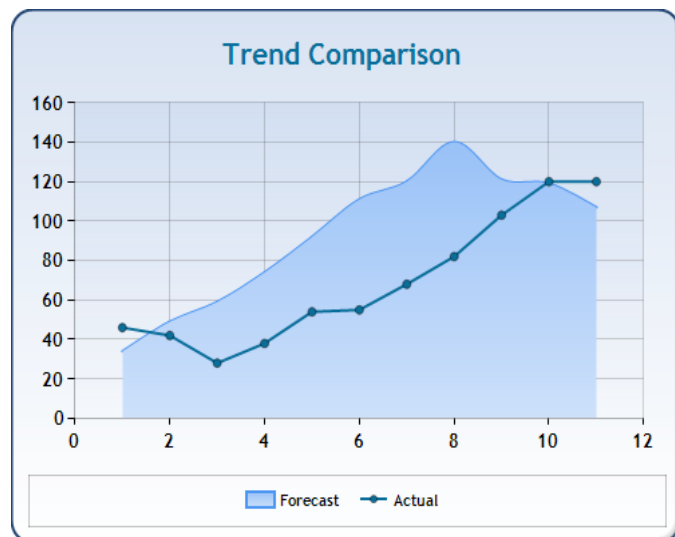


Fig. 3.2d Comparing two lines

• Generally, for trend charts, make it wider than it is tall - and make sure to show the legend at the bottom. This is the most space-efficient layout.

• You should generally use bar graphs for showing category series, simply because bar graphs are easier to read in this context.

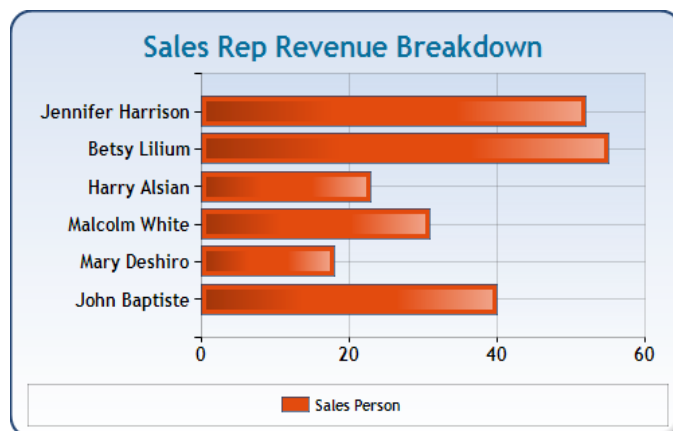


Fig. 3.2e Using a bar chart to make the text easier to read

• Giving the chart a meaningful title can eliminate the need for axis titles and give you back some valuable screen real estate.

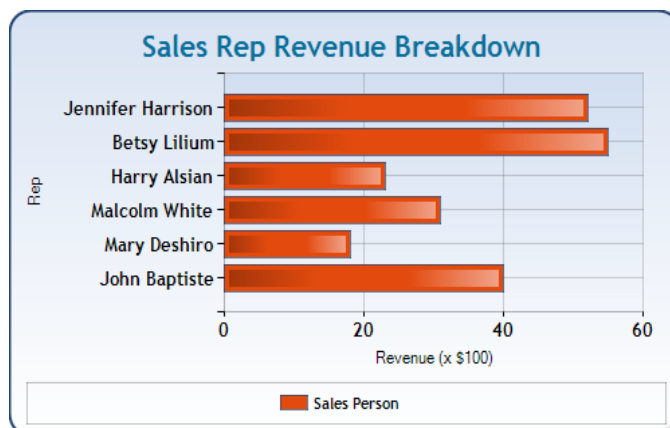


Fig. 3.2f Using axis labels. Note the space the axis titles take up relative to the chart in Fig. 3.2e

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4.0 Gauge Styling

4.1 Gauge Taxonomy

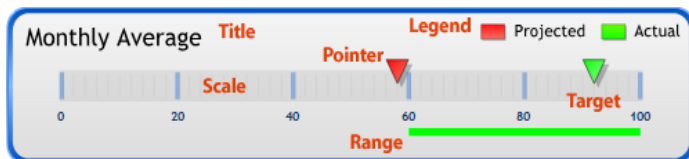


Fig. 4.1 Gauge taxonomy

4.2 Tips and Tricks

• Be careful with using colors that are similar for pointers; this may make it hard for some users to distinguish between the pointers.



Fig. 4.2a Pointers with similar colors

• Pick a base color as a starting point for one pointer and find complementing colors for the other pointer(s).

• If you need more than two pointers, you should rethink your gauge. You need to ask yourself, will the end user be able to read the pointers at a glance?

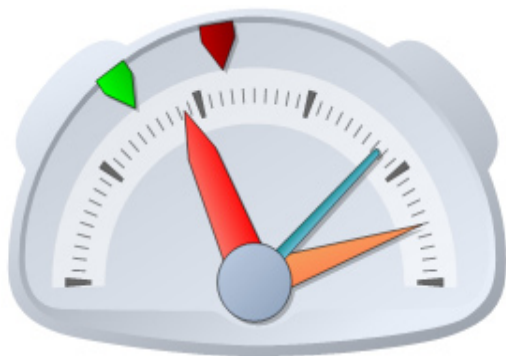


Fig. 4.2b Gauge with too many pointers to read

• Make sure to have a legend to distinguish pointers (most of the time there are at least two pointers, the actual value and a bench-marking value such as an average, a target, etc.). If you have multiple gauges showing the same metrics, a global legend can save you space and reduce the proliferation of redundant information on your dashboard.



Fig. 4.2c Unified legend to save space

• Gauge style (circular, linear) choice can be dependent on the kind of information you are presenting, but is usually dependent on the overall layout. For example, you'll want to use linear or semi-circular gauges when the area you have to work with isn't in a square aspect ratio and fully-circular gauges when the area is in a square aspect ratio.

• Use a neutral color for the background of the gauge to make the overlaid elements (such as the pointer and scale) pop.



Fig. 4.2b Neutral background to make pointers pop out

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- Pick a bold color for the actual value pointer and a complementing color for a target pointer. If a corporate color is neutral, then use a strong primary color such as blue or red as the pointer.
- For ranges, use colors that depict what the range implies, such as green to reflect a good range or red for bad.



Fig. 4.2b Gauge with ranges to show if a value is good, okay, or bad

- Labels for the scale should generally be kept at a minimum as they tend to overlap when you have many tick marks. Keeping a small font size (10pt) should also give more visibility to the scale.

5.0 Map Styling

5.1 Map Taxonomy

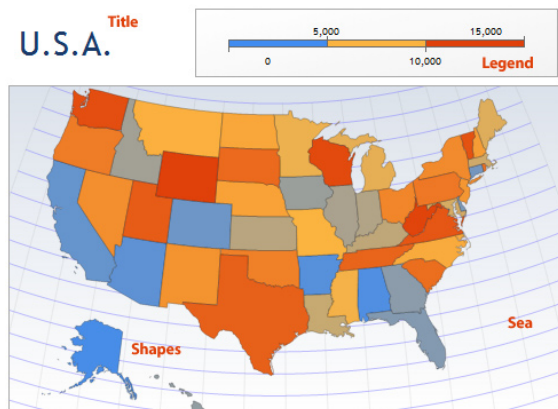


Fig. 5.1 Map taxonomy

5.2 Tips and Tricks

- Use a neutral color for “the sea.”
- Be careful with using colors that are similar; this may make it hard for some users to distinguish between color coded shapes.

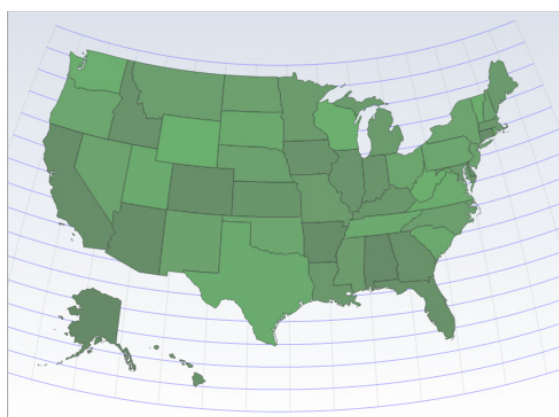


Fig. 5.2a Using similar negative-to-positive colors

- For a negative-to-positive color-coded map, use a hot-to-cold range of colors.

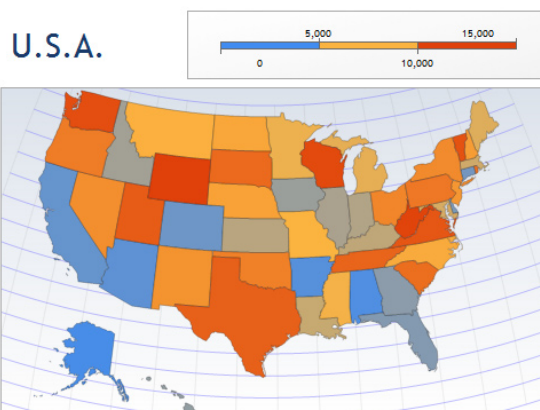


Fig. 5.2b Using hot and cold colors

- Position your legend in such a manner that it least interferes with the visibility of the map regions. If you’re having problems achieving this, consider changing the

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aspect ratio of your map to allow for more blank space to tinker with so you can get an acceptable result.

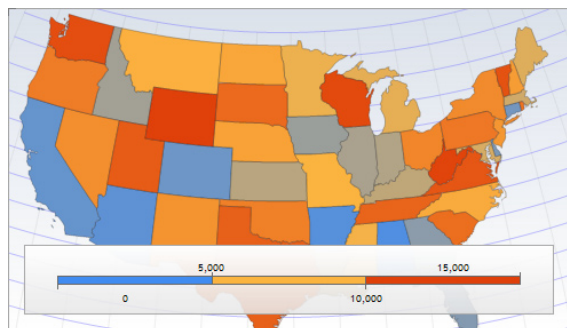


Fig. 5.2c Legend that overlaps shapes

- If the map is not a color-coded map, a neutral color that complements a corporate color should be used to fill in the shape(s). See Fig. 5.2d
- Color the borders of the map regions with either a dark-gray/black or with a darker tone of the overall color already used in the regions. This'll usually result in a clean and elegant look for the map.

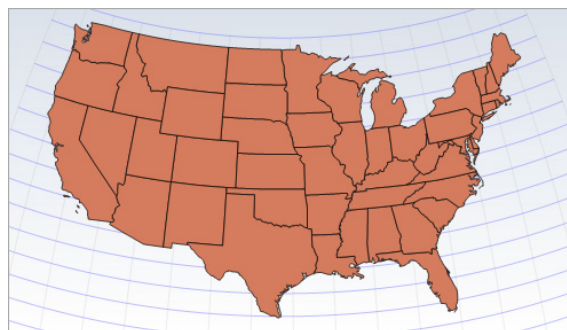


Fig. 5.2d Filling and outlining tips

6.0 Dashboard Styling

Dashboard styling is hard to generalize; however, this section will hopefully give you some base templates from which to work.

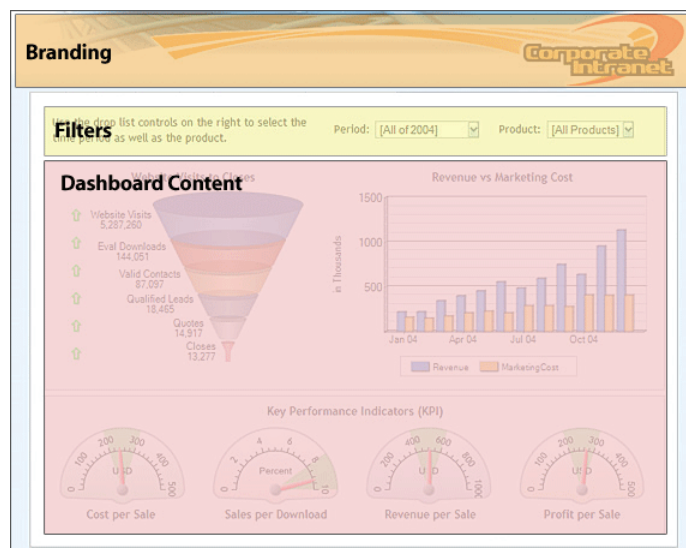


Fig. 6.1a Standard dashboard layout

Figure 6.1 depicts a classic dashboard layout where you have space for branding, space for dashboard filters, and finally the area where the data visualization components will reside. There are many variations of this layout; e.g., the filters may be in a left column panel, there may be navigation tabs above the filters, and there may not be any filters at all.

As for the dashboard content, here are two common layouts that might work for you:

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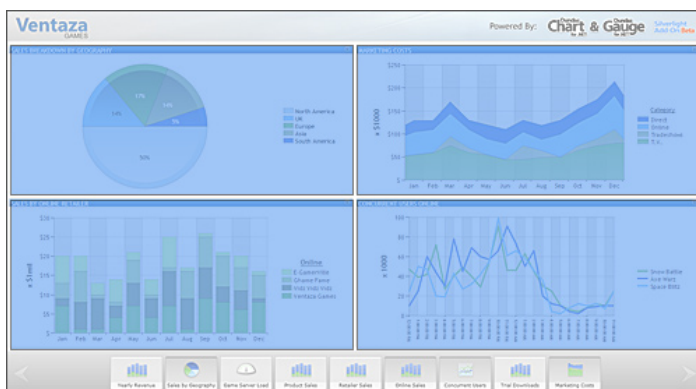


Fig. 6.1b 2x2 layout

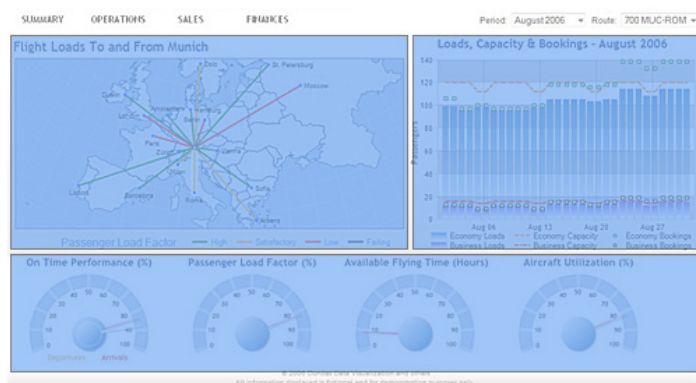


Fig. 6.1c Map, chart, gauge layout

Remember, the KPIs you have decided to show should drive the layout design and not the other way around. If you take the converse approach, you may start discovering additional KPIs that need space or KPIs that must be removed due to a lack of space.

7.0 Summary

I've covered very basic color theory points, data visualization styling points, and overall dashboard layouts. The biggest consideration to take home with color theory is picking light colors for the majority of the space. If you are artistically challenged like me, sticking with white as your predominant back color will get you a long way.

Fonts should be taken seriously, but if you don't care to think about it, stick with **Trebuchet MS** and **Verdana** and you should be okay. With overall dashboard layouts, keep in mind that you can start with one of the basic layouts described here and through feedback, you can tweak accordingly.

Ideally, your dashboard will go into the hands of a graphic artist, but if you are a one-person show - or you have no graphics person on hand - this article may help in creating a more visually appealing dashboard.