2021

Tableau for the Business User

Desktop II
Charts

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A Spreadsheet is NOT a Data Visualization

Spreadsheets are extremely valuable in business. They can be used in accounting, to store information, or to do calculations, just to name a few purposes. However, a spreadsheet or text table view of data is not a data visualization. Dashboards and data visualizations help users interpret data by leveraging the power of visualization. Further, once there is more than just one number in a report, a text table is the worst possible choice for analyzing the data. Not only is the bar chart easier to interpret than the raw numbers, it is more memorable, and thus, effective. Visualizing the numbers allows the data consumer a much faster way to digest the data.
If this is clear even when comparing two numbers, think about how much more value a visualization adds when we're looking at a table of numeric information.

Is a text table *ever* appropriate?

Crosstabs can be used to export raw data Sometimes there are legitimate reasons to get to the raw data. If end users are more comfortable using a tool like Excel and want to add their own calculations, for example, it would be nice to provide the data in an Excel-ready format. Fortunately, any view in Tableau can easily be duplicated as a crosstab. The crosstab view can then be opened in Excel. Here are the steps:

- From any view in Tableau, hover over Worksheet in the top navigation and select Duplicate as Crosstab.
- Hover over Worksheet again, hover over Export, and choose Crosstab to Excel.

Crosstabs can be used to create "Callout Numbers"

Use "callout numbers" to clearly communicate the most important points of the story. These numbers are standalone, which makes them descriptive in nature (typically with no prescriptive value), but they can help engage the viewers so they can immediately see what KPIs are prioritized by the designer. From here, hopefully the end users will continue exploring your dashboard so they can help answer why a callout number is the value that it is. Callout numbers are created by making a crosstab view, filtering it down to one number, and formatting the number so that is oversized (think a minimum of 36-point font). These numbers are then typically placed along the top or left side of a dashboard to provide a natural starting point of an analysis.

Crosstabs can be used to create dashboard filters or navigation

Another clever application of text table views in Tableau is to use the view as a dashboard filter or navigation. This approach has an added advantage of making your data process more efficiently. For example, if you wanted to create a dashboard filter for Region out of a crosstab, you would first make a crosstab view that displayed the four regions: North, East, South, and West. You would then place this view on a dashboard and add a dashboard action that filters the rest of the dashboard when a Region selection is made. Not only does this type of dashboard action process more quickly than a filter in Tableau, but it can be used for other purposes. Perhaps you want to add a dashboard action to the table view that takes end users to interior pages of your workbook or even conducts an online search.

Gestalt Principles

Gestalt theory is based on the idea that the human brain will attempt to simplify and organize complex images or designs that consist of many elements, by subconsciously arranging the parts into an organized system that creates a whole, rather than just a series of disparate elements. Our brains are built to see structure and patterns in order for us to better understand the environment that we're living in.

There are six individual principles commonly associated with gestalt theory: similarity, continuation, closure, proximity, figure/ground, and symmetry & order. There are also some additional, newer principles sometimes associated with gestalt, such as common fate.

Similarity

It's human nature to group like things together. In gestalt, similar elements are visually grouped, regardless of their proximity to each other. They can be grouped by color, shape, or size. Similarity can be used to tie together elements that might not be right next to each other in a design.

The squares here are all equally spaced and the same size, but we automatically group them by color, even though there is no rhyme or reason to their placement.

Of course, you can make things dissimilar if you want to make them stand out from the crowd. It's why buttons for calls to action are often designed in a different color than the rest of a page—so they stand out and draw the visitor's attention to the desired action.

In UX design, using similarity makes it clear to your visitors which items are alike. For example, in a features list using repetitive design elements (such as an icon accompanied by 3-4 lines of text), the similarity principle would make it easy to scan through them. In contrast, changing the design elements for features you want to highlight makes them stand out and gives them more importance in the visitor's perception.

Even things as simple as making sure that links throughout a design are formatted in the same way relies on the principle of similarity in the way your users will perceive the organization and structure of your dashboard.

Continuation

The law of continuity posits that the human eye will follow the smoothest path when viewing lines, regardless of how the lines were actually drawn.

The eye tends to want to follow the straight line from one end of this figure to the other, and the curved line from the top to the bottom, even when the lines change color midway through

This continuation can be a valuable tool when the goal is to guide a visitor's eye in a certain direction. They will follow the simplest path on the page, so make sure the most vital parts they should see fall within that path.

Since the eye naturally follows a line, placing items in a series in a line will naturally draw the eye from one item to the next. Horizontal sliders are one such example, as are related product listings on sites like Amazon.

Closure

Closure is the idea that your brain will fill in the missing parts of a design or image to create a whole.

In its simplest form, the principle of closure allows your eye to follow something like a dotted line to its end. But more complex applications are often seen in logos, like that for the World Wildlife Fund. Large chunks of the outline for the panda are missing, but your brain has no problem filling in the missing sections to see the whole animal.

The gestalt principle of closure is illustrated beautifully in the World Wildlife Fund's panda logo. The brain completes the white shapes, even though they're not well defined.

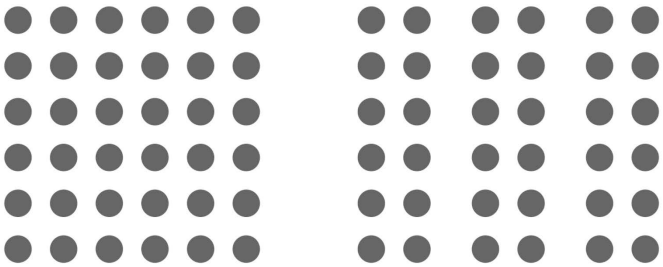
Proximity

Proximity refers to how close elements are to one another. The strongest proximity relationships are those between overlapping subjects, but just grouping objects into a single area can also have a strong proximity effect.

The opposite is also true, of course. By putting space between elements, you can add separation even when their other characteristics are the same.

In UX design, proximity is most often used in order to get users to group certain things together without the use of things like hard borders. By putting like things closer together, with space in between each group, the viewer will immediately pick up on the organization and structure you want them to perceive

Take this group of circles, for example



The only thing differentiating the group on the left from those on the right is the proximity of the lines. And yet your brain interprets the image on the right as three distinct groups

Figure/Ground

The figure/ground principle is similar to the closure principle in that it takes advantage of the way the brain processes negative space. You've probably seen examples of this principle floating around in memes on social media, or as part of logos (like the FedEx logo already mentioned).

Your brain will distinguish between the objects it considers to be in the foreground of an image (the figure, or focal point) and the background (the area on which the figures rest). Where things get interesting is when the foreground and background actually contain two distinct images, like this:

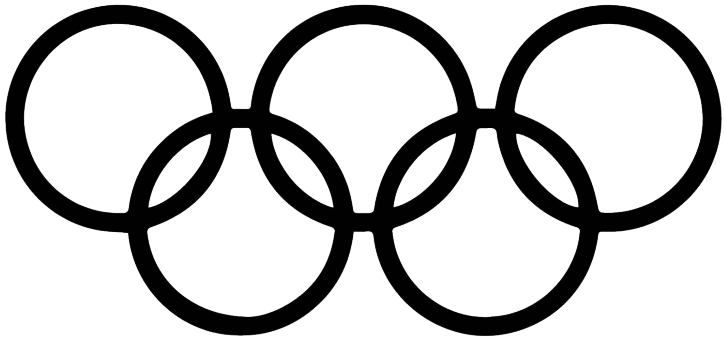
Some people will immediately see the tree and birds when viewing the logo for the Pittsburgh Zoo & PPG Aquarium, while others will see the gorilla and lion staring at each other

In general terms, your brain will interpret the larger area of an image as the ground and the smaller as the figure. As shown in the image above, though, you can see that lighter and darker colors can influence what is viewed as the figure and what is viewed as the ground.

The figure/ground principle can be very handy when product designers want to highlight a focal point, particularly when it is active or in use—for example, when a modal window pops up and the rest of the dashboard fades into the background, or when a selection is clicked on and the contrast is increased between it and the rest of the dashboard.

Symmetry & Order

The law of symmetry and order is also known as prägnanz, the German word for “good figure.” What this principle says is that your brain will perceive ambiguous shapes in as simple a manner as possible. For example, a monochrome version of the Olympic logo is seen as a series of overlapping circles rather than a collection of curved lines



Common Fate

While common fate was not originally included in gestalt theory, it has since been added. In UX design, its usefulness can’t be overlooked. This principle states that people will group together things that point to or are moving in the same direction.

In nature, we see this in things like flocks of birds or schools of fish. They are made up of a bunch of individual elements, but because they move seemingly as one, our brains group them together and consider them a single stimulus.

This is very useful in UX as animated effects become more prevalent in modern design. Note that elements don’t actually have to be moving in order to benefit from this principle, but they do have to give the impression of motion.

i ta e i a hb a e ig

Information Dashboard Design - Stephen Few

1. Exceeding the boundaries of a single screen
2. Supplying inadequate context for the data
3. Displaying excessive detail or precision
4. Expressing measures indirectly
5. Choosing inappropriate display media
6. Introducing meaningless variety
7. Using poorly designed display media
8. Encoding quantitative data inaccurately
9. Arranging information poorly
10. Highlighting important information ineffectively or not at all
11. Cluttering the display with visual effects
12. Misusing or overusing color
13. Designing an unattractive visual display

Exceeding the boundaries of a single screen

There are several reasons to make a dashboard that a user can drill into or navigate to other sections. The danger in this is when a user has to scroll or navigate away - the story becomes disjointed and not as cohesive.

If the dashboard should exceed a single screen, breadcrumbs are a great way to remind the user of selections.

Supplying inadequate context for the data

Telling a user a figure without the appropriate context, is useless. So, sales are $790,098 this quarter -- in comparison to what?

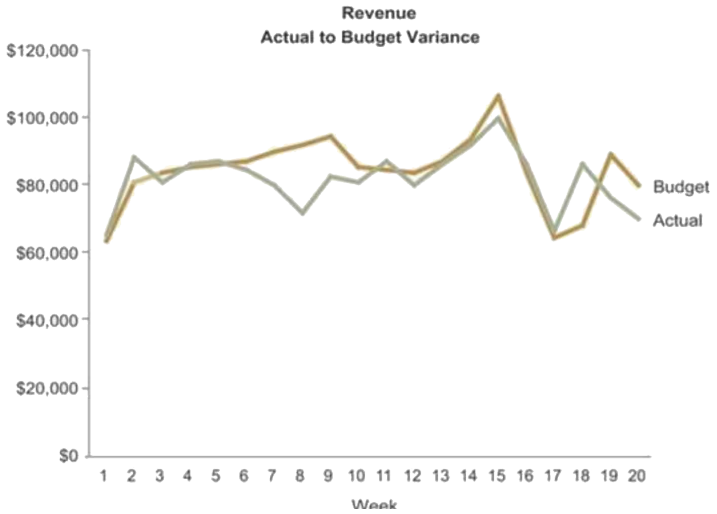
These gauges fail to provide adequate context to make the measures meaningful

Displaying excessive detail or precision

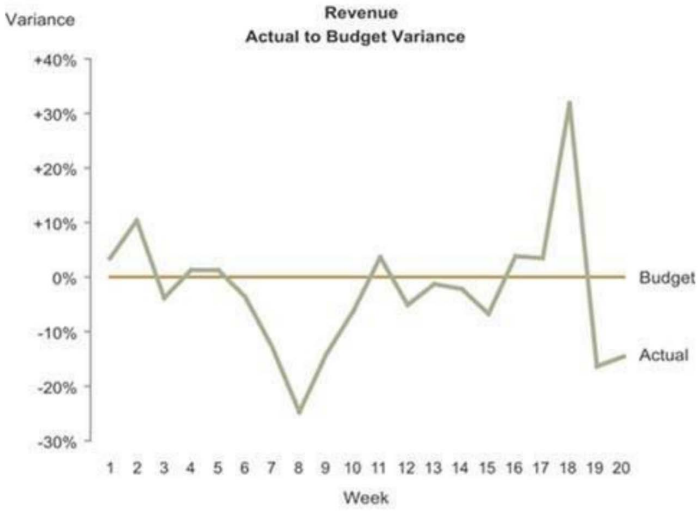
Dashboards almost always require fairly high-level information to support the viewer's need for a quick overview. Too much detail, or measures that are expressed too precisely (for example, $3,848,305.93 rather than $3,848,305, or perhaps even $3.8M), just slow viewers down without providing them any benefit. It draws too much attention to the detail that a user cannot fully identify

Expressing measures indirectly

For a measure to be meaningful, we must know what is being measured and the units in which the measure is being expressed. A measure is deficient if it isn't the one that most clearly and efficiently communicates the meaning that the dashboard viewer should discern. It can be accurate, yet not the best choice for the intended message.

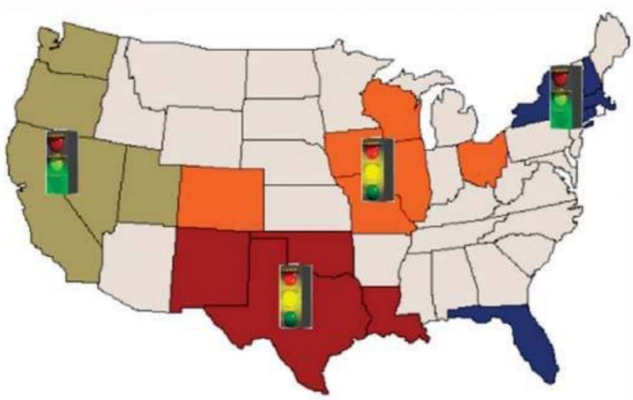


While this graph displays actual and budgeted revenues separately, its purpose is to communicate the variance of actual revenues from the budget.



Choosing Inappropriate Display Media

Choosing inappropriate display media is one of the most common design mistakes made, not just in dashboards, but in all forms of quantitative data presentation. For instance, using a graph when a table of numbers would work better, and vice versa, is a frequent mistake.

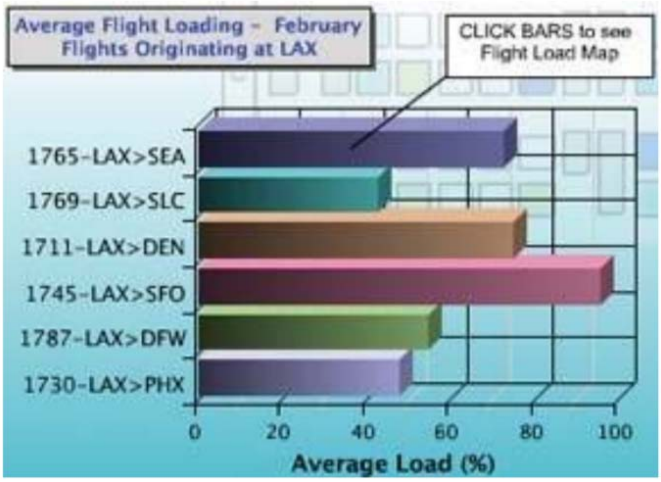


Meaningless variety

The mistake of introducing meaningless variety into a dashboard design is closely tied to the one we just examined. I've found that people often hesitate to use the same type of display medium multiple times on a dashboard, out of what I assume is a sense that viewers will be bored by the sameness. Variety might be the spice of life, but if it is introduced on a dashboard for its own sake, the display suffers. You should always select the means of display that works best, even if that results in a dashboard that is filled with nothing but multiple instances of the same type of graph. If you are giving viewers the information that they desperately need to do their jobs, the data won't bore them just because it's all displayed in the same way. They will definitely get aggravated, however, if forced to work harder than necessary to get the information they need due to arbitrary variety in the display media. In fact, wherever appropriate, consistency in the means of display allows viewers to use the same perceptual strategy for interpreting the data, which saves time and energy.

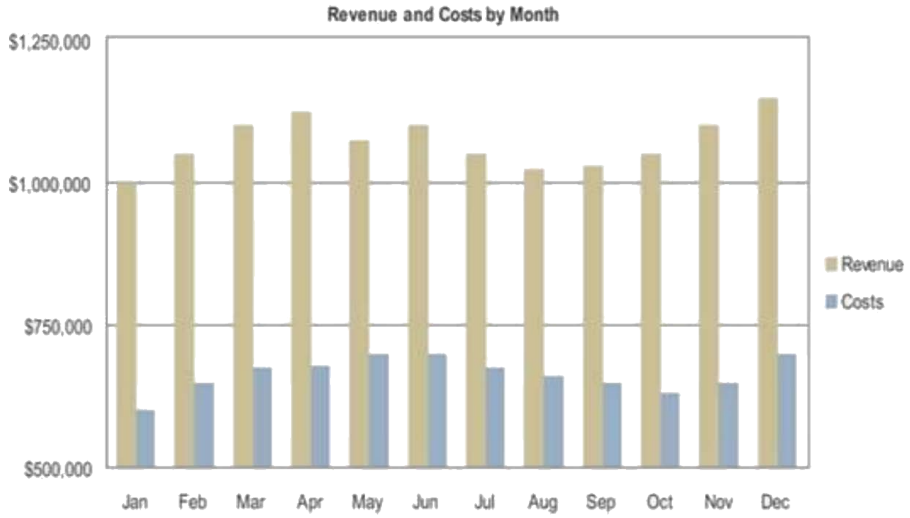
Using poorly designed display media

It isn't enough to choose the right medium to display the data and its messageyou also must design the components of that medium to communicate clearly and efficiently, without distraction. Most graphs used in business today are poorly designed. The reason is simple: almost no one has been trained in the fundamental principles and practices of effective graph design



Encoding quantitative data inaccurately

Sometimes graphical representations of quantitative data are mistakenly designed in ways that display inaccurate values. The quantitative scale along the vertical axis was improperly set for a graph that encodes data in the form of bars. The length of a bar represents its quantitative value. The bars in this graph that represent revenue and costs for the month of January suggest that revenue was about four times costs. An examination of the scale, however, reveals the error of this natural assumption: the revenue is actually less than double the costs. The problem is that the values begin at $500,000 rather than $0, as they always should in a bar graph



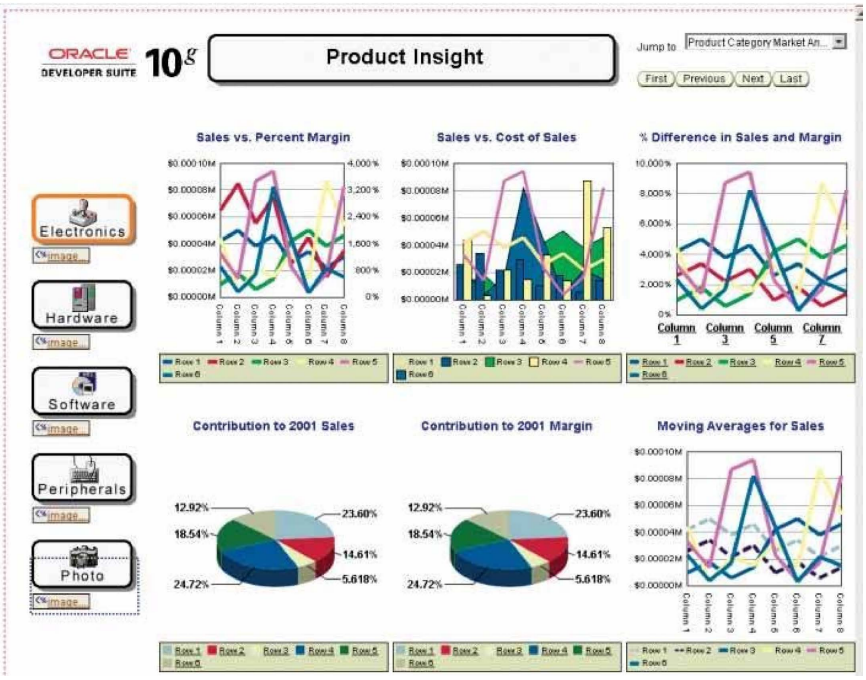
Arranging the Data Poorly

Dashboards often need to present a large amount of information in a limited amount of space. If the information isn't organized well, with appropriate placement of information based on importance and desired viewing sequence, along with a visual design that segregates data into meaningful groups without fragmenting it into a confusing labyrinth, the result is a cluttered mess. Most examples of dashboards found on the Web are composed of a small amount of data to avoid the need for skilled visual design, but

they still often manage to look cluttered and thrown together. The goal is not simply to make the dashboard look good, but to arrange the data in a manner that fits the way it's used. The most important data ought to be prominent. Data that require immediate attention ought to stand out. Data that should be compared ought to be arranged and visually designed to encourage comparisons

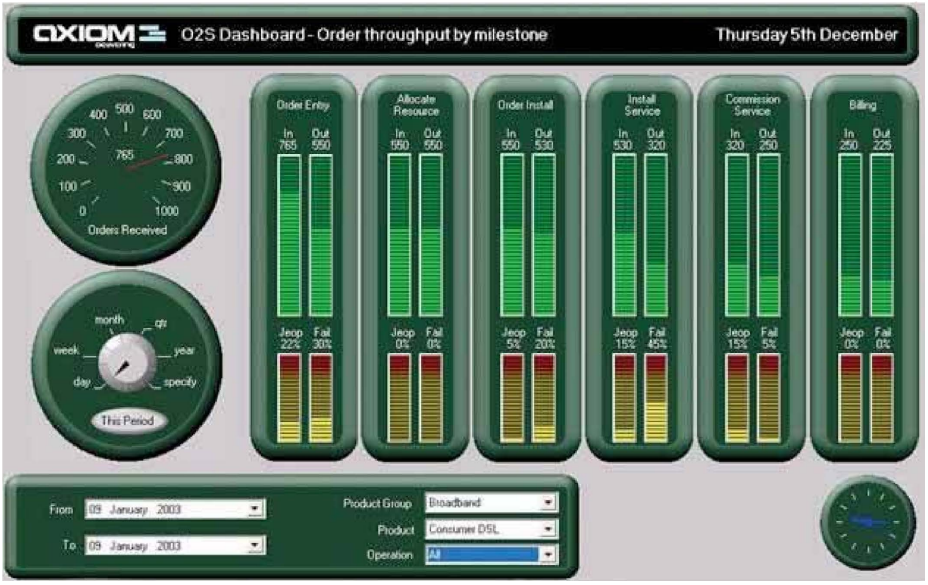
Highlighting important information ineffectively or not at all

When you look at a dashboard, your eyes should immediately be drawn to the information that is most important, even when it does not reside in the most visually prominent areas of the screen



Cluttering the display with visual effects

Another common problem on the dashboards that I find on vendor web sites is the abundance of useless decoration. They either hope that we will be drawn in by the artistry or assume that the decorative flourishes are necessary to entertain us.

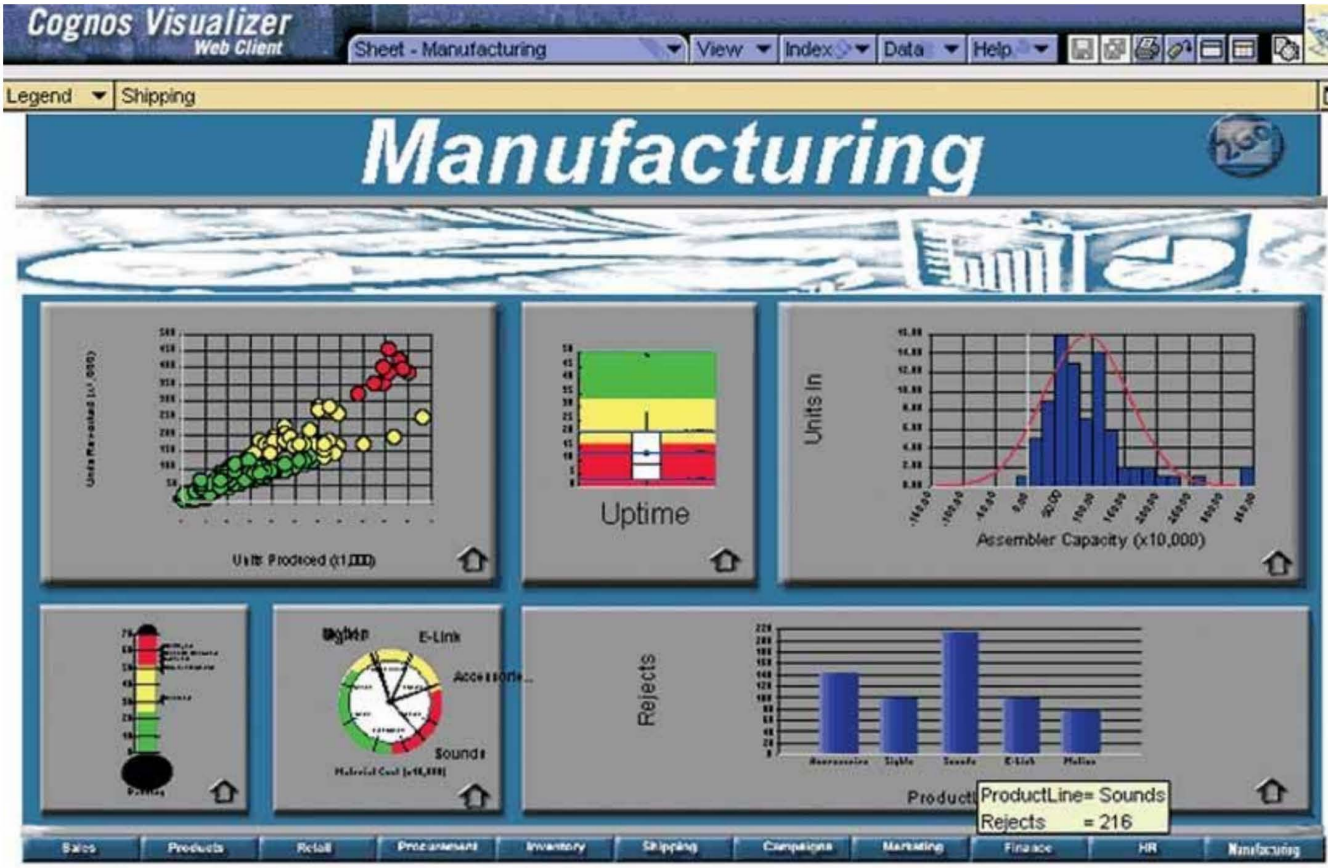


Misusing or overusing color

Color choices should be made thoughtfully, with an understanding of how we perceive color and the significance of color differences. Some colors are hot and demand our attention, while others are cooler and less visible. When any color appears as a contrast relative to the norm, our eyes pay attention and our brains attempt to assign meaning to that contrast. When colors in two different sections of a dashboard are the same, we are tempted to relate them to one another. We merrily assume that we can use colors such as red, yellow, and green to assign important meanings to data, but in doing so we exclude the 10% of males and 1% of females who are color-blind.

Designing an unattractive visual display

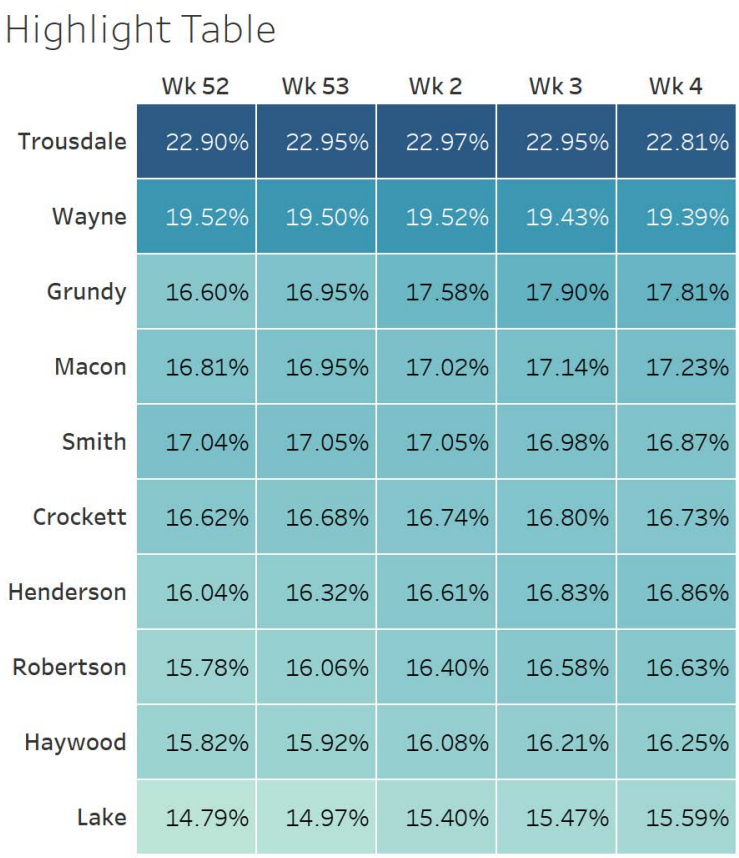
When a dashboard is unattractive unpleasant to look at the viewer is put in a frame of mind that is not conducive to its use



Charts

Highlight Table

Highlight tables are one of the simplest chart types to create, but are also among the most powerful. When compared to a crosstab (a.k.a. text table) view, this basic data visualization helps reduce the time to insight and improve the accuracy of insights. Highlight tables are definitely worth making a part of your chart type toolbelt, right alongside bar charts and line graphs. They are best used for: Quickly identifying highs and lows or other points of interest in your data As a means of enhancing a crosstab As a tactic for helping smooth the Excel transition Highlight tables consist of one or more dimensions and exactly one measure (the color).



Open the **i** **lati** data source in a new workbook

Highlight Table

Make a crosstab of data

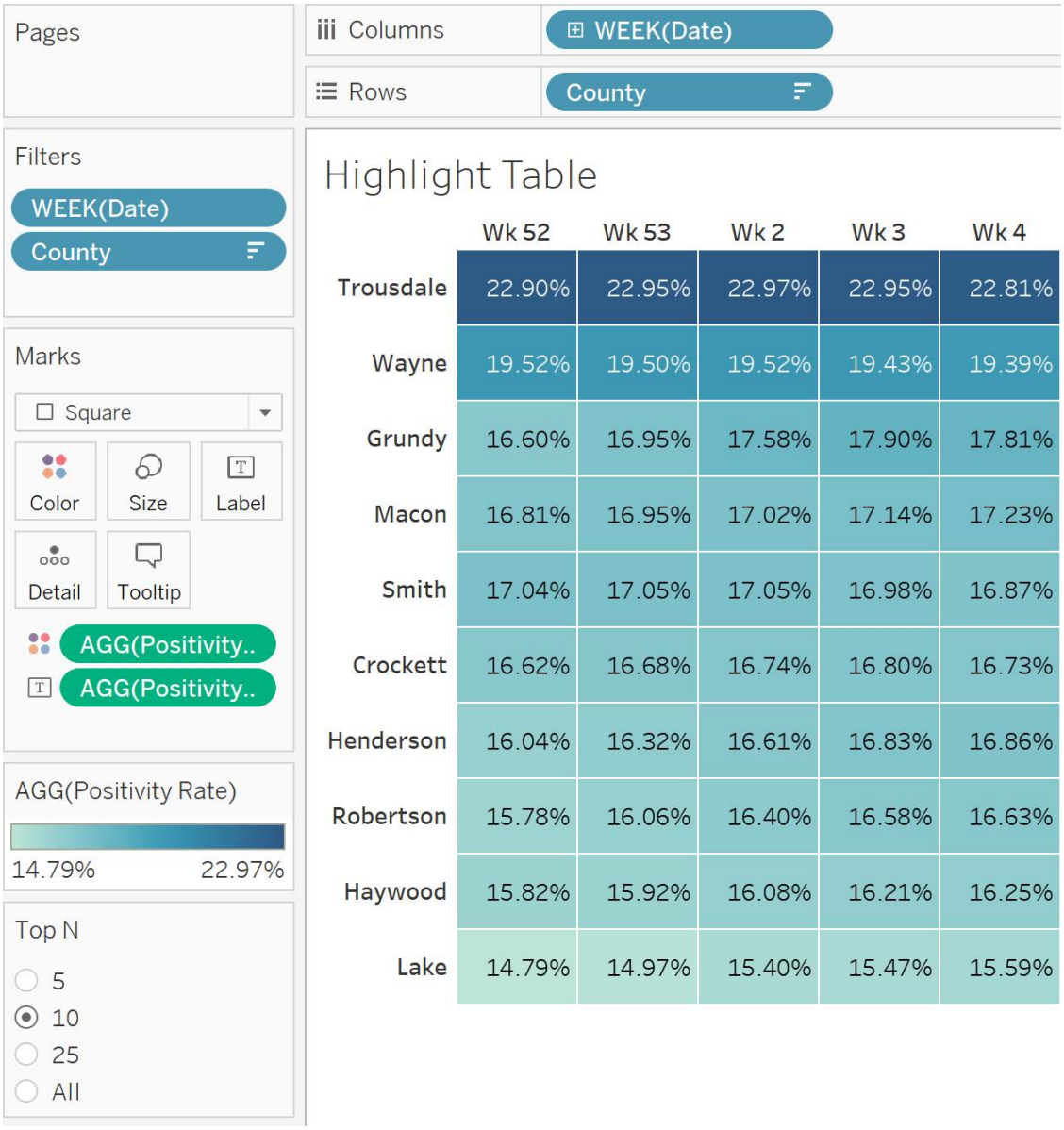
Filters

Top 10 County and the most current 6 weeks

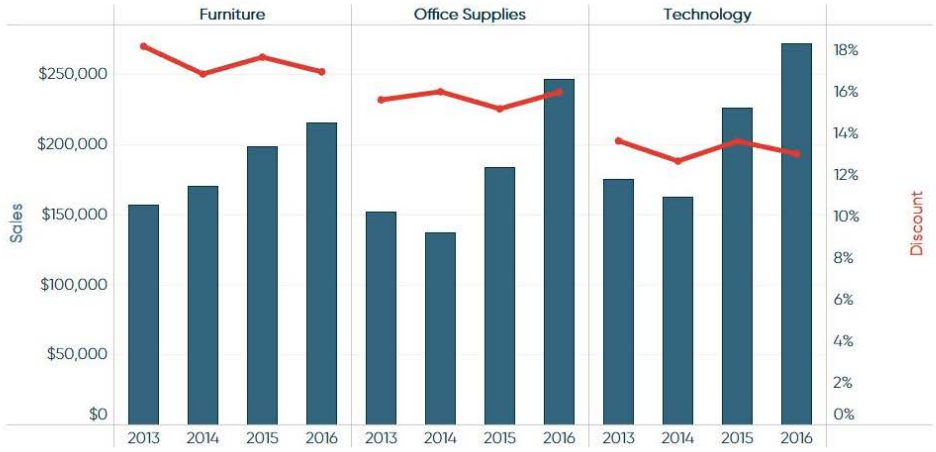
Date on columns and County on Rows

Marks - Square

Format appropriately

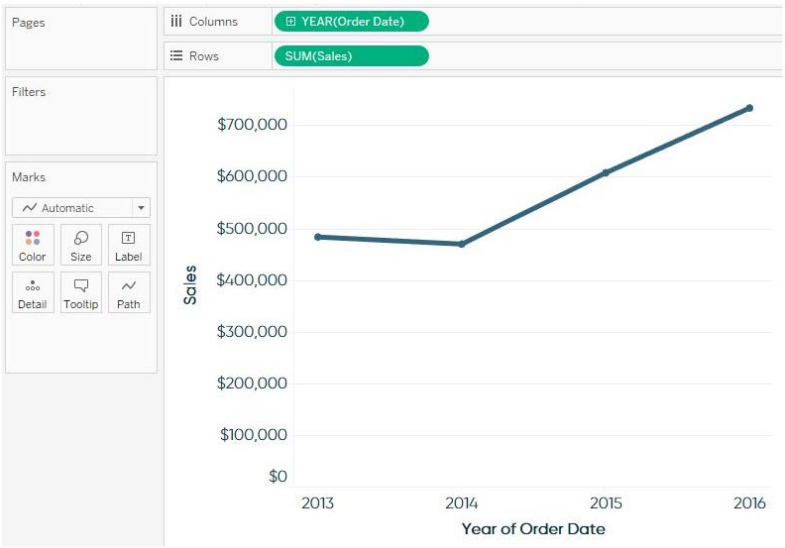


Dual-Axis Combo Chart

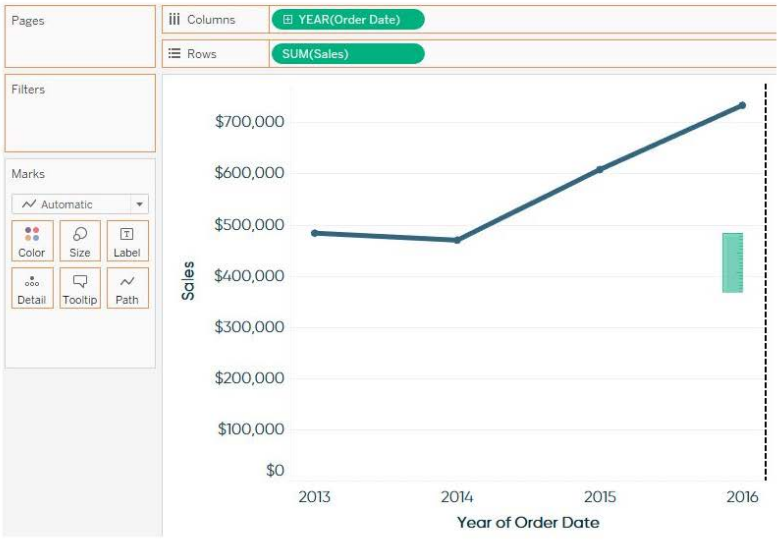


1. Make a graph of one of the measures.

   The first step is to make a graph for one of your measures. It doesn't matter too much which of your two measures you begin with, but the first measure you select will always form the lefthand y-axis or bottom x-axis (depending on the chart's orientation). Let's start by making a line graph for sales by year. To create the first graph, drag the Order Date field to Columns Shelf with an aggregation of Year Continuous. Then drag the Sales field to the Rows Shelf. At this point, the view looks like this:

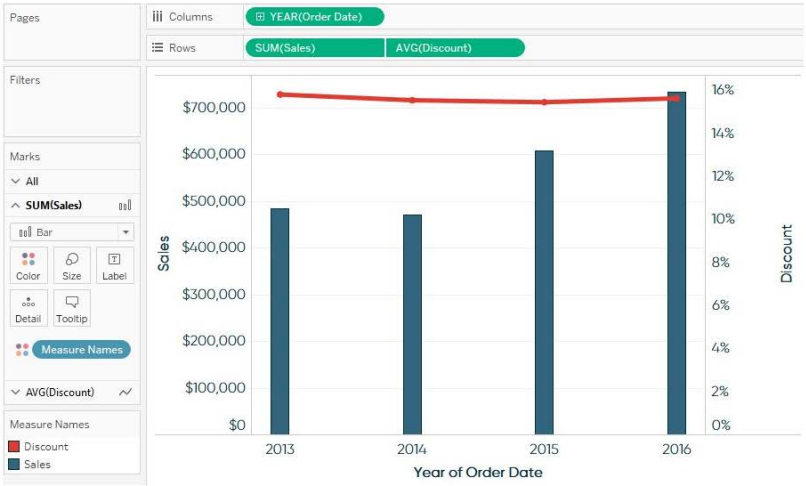


2. Drag the second measure onto the opposite axis.
   In order to create a dual-axis chart, you will drag the second measure onto the opposite axis from your first measure. In my case, Sales is on the left y-axis. I want to add the Discount measure to the view, so I will drag it to where the right y-axis will appear. As I get close to the opposite axis, Tableau is giving me a hint of where I can drop the measure as indicated by a dashed line:



Once I drop the field on the opposite axis, Tableau generates a dual-axis chart. Note that this is a dual-axis chart at this point, but not a dual-axis *combination* chart. The name combination chart comes from using a combination of mark types, and so far, we only have one mark type (line):

3. Create a dual-axis combination chart by changing one of the mark types.
   When the second measure was dropped onto the view, not only did the field appear on the Rows Shelf, but two new Marks Shelves were generated. The first new Marks Shelf, "All," affects all of the marks on the view, and the second new Marks Shelf is for the marks on the right y-axis. The marks for each measure can now be edited independently of each other, allowing you to display a *combination* of mark types on your view.
   Let's change the mark type of the Sales field to Bar and leave the mark type for Discount as Line. This is accomplished by clicking the Marks Shelf for SUM(Sales) and changing the mark type from Automatic to Bar. At this point, the view looks like this:



After the bar chart and line graph, I find the scatter plot to be one of the most effective visualization options for analyzing data. A scatter plot displays data points at their respective intersections of two measures, and displays every data point on the same view. The marks can then be further encoded by up to three additional measures and/or dimensions by leveraging the Color and/or Size and/or Shape Marks Cards.

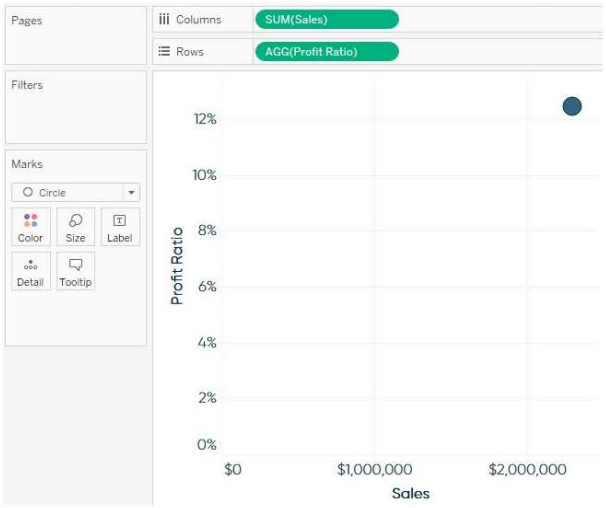
> **NOTE**
>
> While scatter plots allow you to use several combinations of dimensions and measures, each new encoding increases the cognitive load on your end users. In other words, it makes it harder for them to process the view.

This ability to slice and dice data points in several ways within a condensed space provides an effective means for identifying patterns. Not only that, scatter plots provide a natural way to segment the marks into four quadrants by simply adding a reference line to each of the two axes. You can even take this a step further in Tableau by creating sets for each of the four segments to use for deeper analysis later. This chapter shares how to create a scatter plot in Tableau and use the results to create segments.

How to Make a Scatter Plot in Tableau

For this walkthrough, we'll be evaluating all of our products across the Sales and Profit Ratio measures. When you build a scatter plot, one measure will form the y-axis and one measure will form the x-axis. The marks on the view will then be plotted at the intersection of the values on the two axes. It is typically best to put the most dependent metric on the y-axis and the explanatory metric on the x-axis.

To create a scatter plot, drag and drop the Profit Ratio measure to the Rows Shelf and the Sales measure to the Columns Shelf. Scatter plot is the default chart type in Tableau when two measures are used, so you could have got to this same point by just double-clicking Profit Ratio, then double-clicking Sales to add them to the view. At this point, your view should look similar to this:



So far, we have just one point that represents the intersection of Profit Ratio and Sales for all of the records in our dataset. This is because we have yet to specify a level of detail for our analysis. For more on this topic, you can review Chapter 10. Our analysis is going to look at products, so change the level of detail by dragging the

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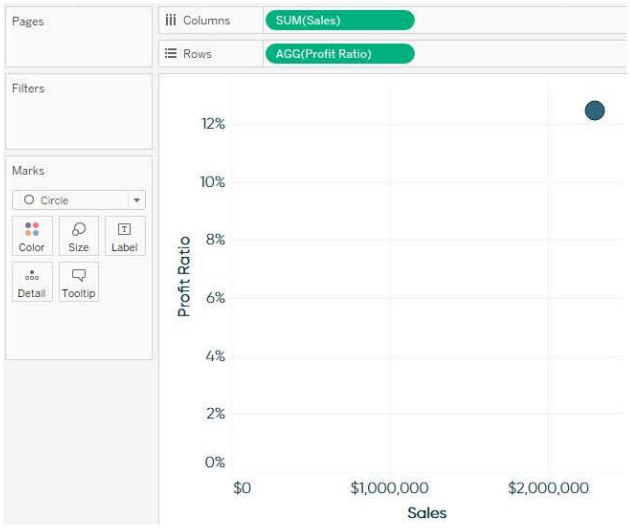

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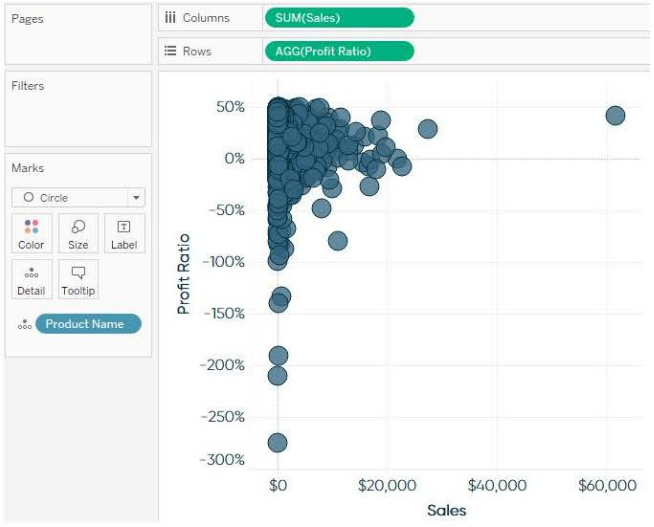

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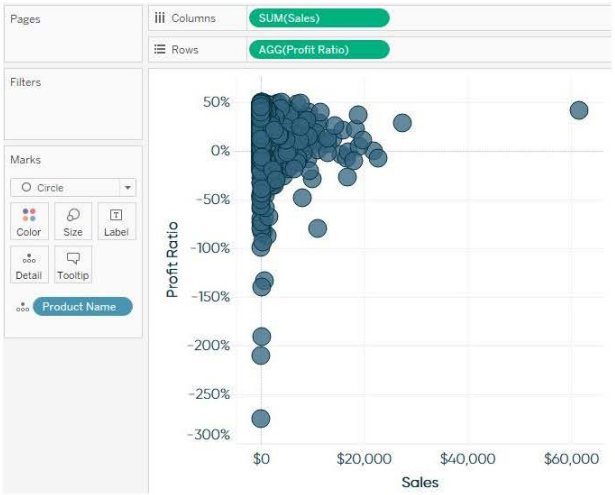
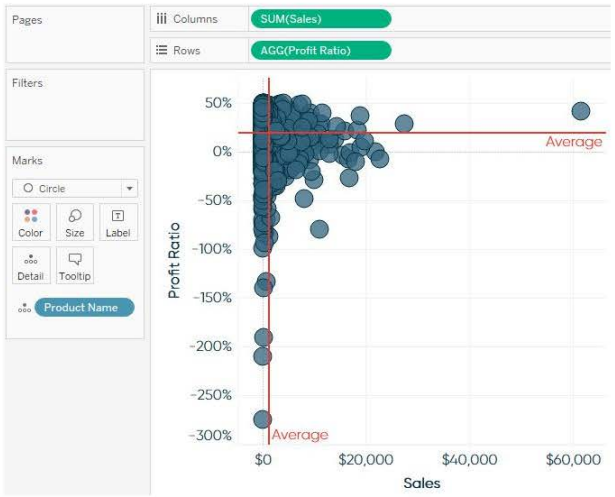


What's powerful here is that we are looking at all 1,850 of our products at once, which helps us evaluate them quickly in context of each other. You can see outliers, unprofitable products, and segments are beginning to emerge (i.e., high sales/high profit ratio, high sales/low profit ratio, etc.). One way to make the segments more apparent is to add reference lines to each axis. Here's what the view looks like when I add a reference line for the average of each axis by right-clicking each axis and choosing "Add reference line":



These reference lines create four quadrants on the view that can be used to segment the data:

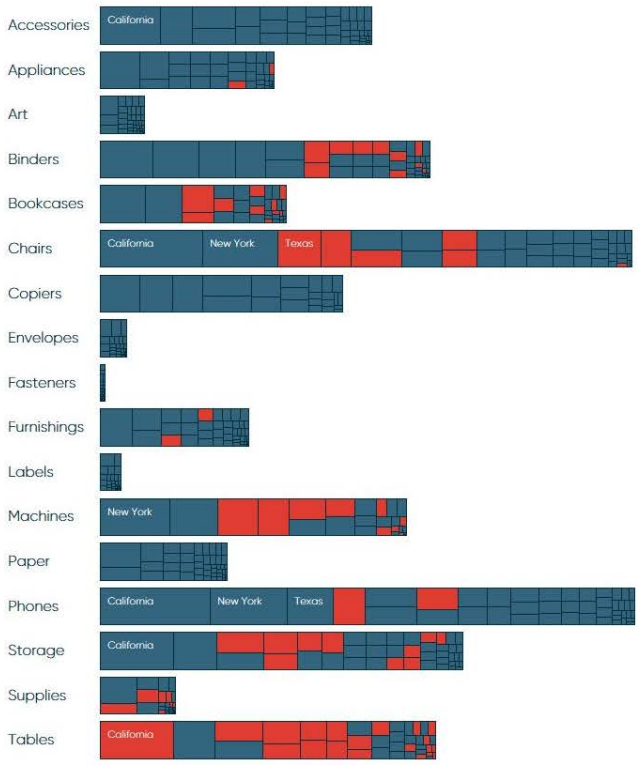
- **Top-left quadrant:** High Profit Ratio & Low Sales
- **Top-right quadrant:** High Profit Ratio & High Sales
- **Bottom-left quadrant:** Low Profit Ratio & Low Sales
- **Bottom-right quadrant:** Low Profit Ratio & High Sales

Treemaps

A tree map is a visualization that nests rectangles in hierarchies so you can compare different dimension combinations across one or two measures (one for size; one for color) and quickly interpret their respective contributions to the whole. When used poorly, tree maps are not much more than an alternative pie chart. When used well, they provide at least two big benefits:

- Depending on the analysis, some portions of the tree map will be composed of large rectangles where additional context can be added as labels. This is beneficial when the visualization will not be interactive and you still want the written information represented.
- In addition to the scatter plot, tree maps are one of the only visualization types that allow you to reasonably communicate and consume hundreds of marks on a single view. This makes it easier to spot patterns and relationships that you would not otherwise be able to see.

For this tutorial, we will be making the following set of tree maps:



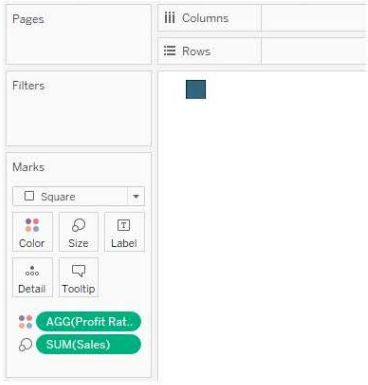
This analysis shows not only the sales amount by sub-category, but the sales contribution of each US state per sub-category and whether or not those states were profitable within each sub-category.

By changing the level of detail to make our analysis more granular and encoding the marks by a second measure of Profit Ratio provides more context to the view and helps us avoid the dreaded question, “So what?”

How to Make a Tree Map in Tableau

Tree maps are one of the out-of-the-box Show Me options, but as with most charts in Tableau, I find building them from scratch helps me not only understand how they work, but also helps me get to my desired output faster.

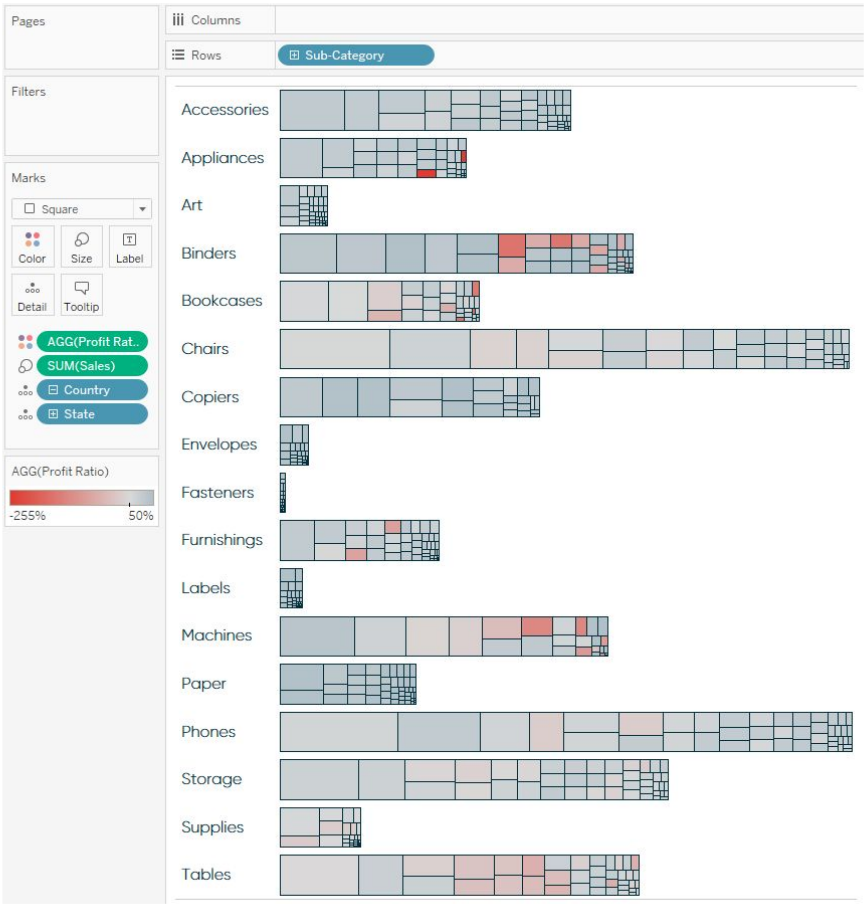
To make a tree map in Tableau, begin by changing the mark type for a view from Automatic to Square. Then drag the primary measure that you want to evaluate to the Size Marks Card and the secondary measure to the Color Marks Card. Just as it sounds, the primary measure will control the size of the squares on the view, and the secondary measure will control the color of the squares. In our case, I've dragged Sales to Size and Profit Ratio to Color:



At this point, we've simply laid the foundation of the tree map. There is no detail, so we just see one square colored by the overall profit ratio in the Sample – Superstore dataset. To create a square for each state, drag State to the Detail Marks Card:

At this point, we have a tree map and a solid analysis. You can see there is quite a bit of real estate to add information to the Label Marks Card and have it displayed on the view (the first benefit mentioned in the introduction).

If I wanted to see this same analysis done at the Sub-Category level as just pictured, I would drag the Sub-Category dimension to the Rows Shelf. This will create a row with the sales and profit ratio by state tree map for each sub-category:

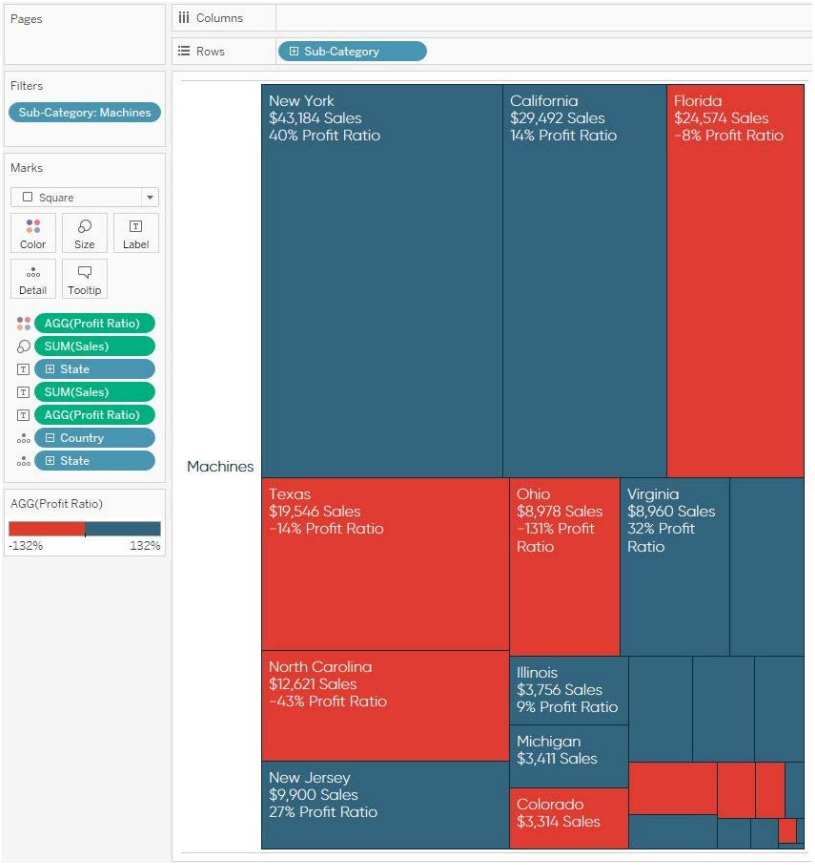


The final steps required to match the example would be to drag the State dimension to the Label Marks Card and double-click the color legend to choose the colors and steps. I changed the steps to 2 and changed the colors so that any state with a negative profit ratio per sub-category would be colored red and any state with a positive profit ratio per sub-category would be colored navy:

This tree map provides several insights, including:

- The overall sales are strongest in the Chairs and Phones sub-categories. This is the main insight we would see when looking at a simple sales by sub-category bar chart.
- The Tables sub-category is largely composed of unprofitable states, and two out of the top three highest selling states are unprofitable.
- The overall best-selling state and sub-category combination is Phones in California, which was profitable.

I also see that California is the highest-selling state in all sub-categories except for Machines and Binders. Note that I was not able to see that insight in the screenshot alone, but by hovering over marks in the interactive version of the workbook. You can also simply provide a filter that looks at one sub-category at a time and add even more context to the mark labels:


Pages
Columns
Rows
Sub-Category
Filters
Sub-Category: Machines
Marks
Square
Color
Size
Label
Detail
Tooltip
AGG(Profit Ratio)
SUM(Sales)
State
SUM(Sales)
AGG(Profit Ratio)
Country
State
AGG(Profit Ratio)
-132%
132%
Machines
New York
$43,184 Sales
40% Profit Ratio
California
$29,492 Sales
14% Profit Ratio
Florida
$24,574 Sales
-8% Profit Ratio
Texas
$19,546 Sales
-14% Profit Ratio
Ohio
$8,978 Sales
-131% Profit Ratio
Virginia
$8,960 Sales
32% Profit Ratio
North Carolina
$12,621 Sales
-43% Profit Ratio
Illinois
$3,756 Sales
9% Profit Ratio
Michigan
$3,411 Sales
New Jersey
$9,900 Sales
27% Profit Ratio
Colorado
$3,314 Sales

Sparklines

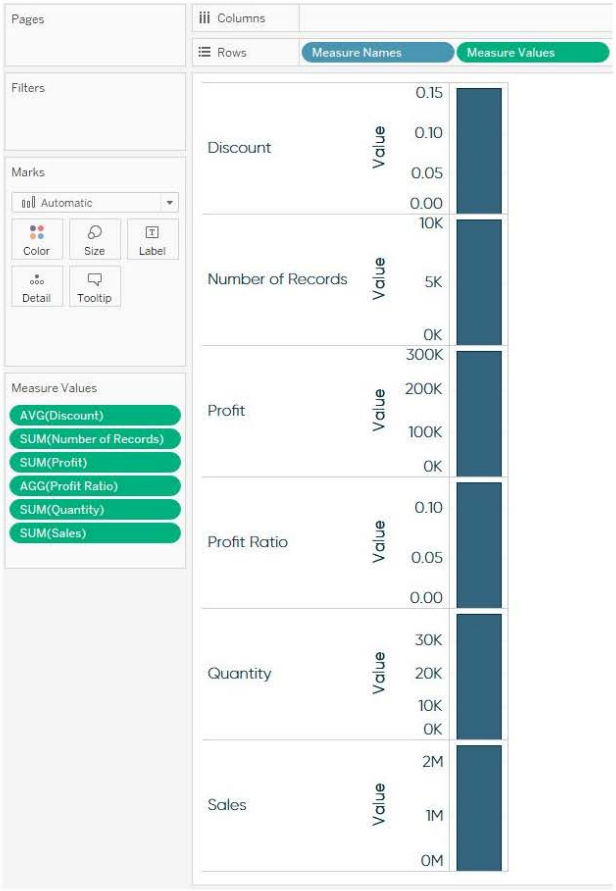
Sparklines are condensed graphs or charts that can be used in-line with text or grouped to show trends across several different measures. The term sparkline was introduced by Edward Tufte, a data visualization pioneer, and proponent of the chart type. Sparklines are typically so small that the chart itself usually does not contain familiar context that you would find in a full-size chart, such as axes. Despite this limitation, I find sparklines to be one of the most effective corporate chart types for quickly communicating trends across KPIs. After all, you can always provide context in the surrounding text, and if you are using Tableau, context can be added through other approaches such as tooltips (the information that appears when you hover over a data point).

It is very common for sparklines to be a foundational piece of the corporate dashboards I create. I think they are a great place to guide an end user to start, so I usually place sparklines in a prominent area of my dashboards, such as down the left side. For more on dashboard layout and design, see tip five in Chapter 90.

How to Make Sparklines in Tableau

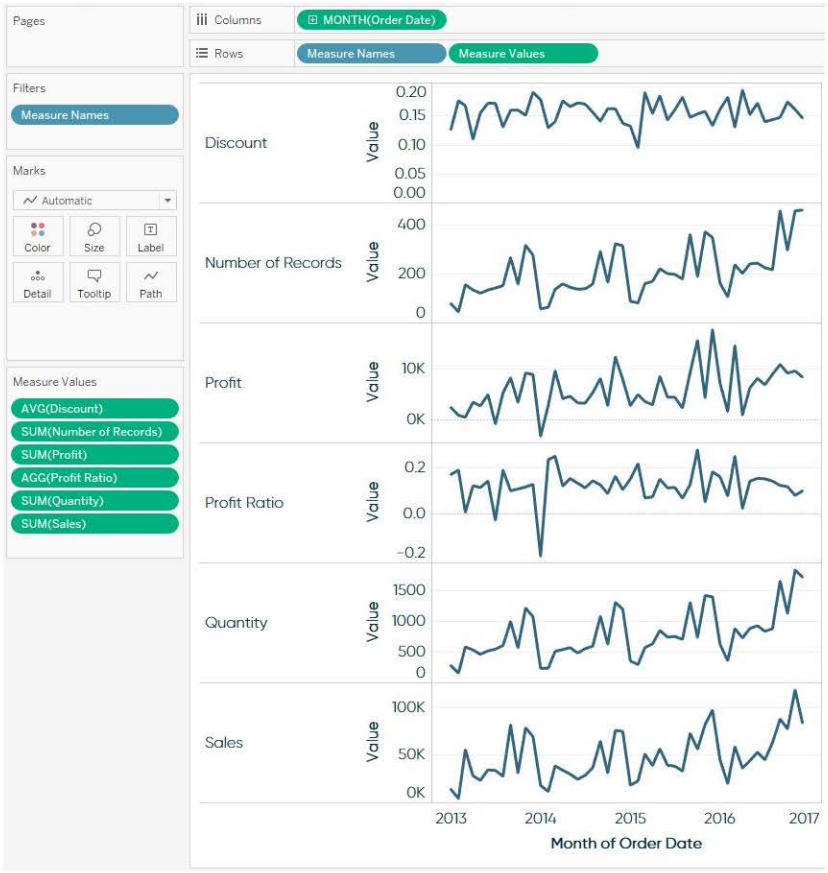
Sparklines are easy, and (dare I say?) fun, to create in Tableau. To get started, you will leverage two special fields in your data, *Measure Names* and *Measure Values*. These fields are automatically generated in your data by Tableau so they will be available to use even though they do not exist in your underlying data:

1. PlaceMeasure Names, then Measure Values on the Rows Shelf:



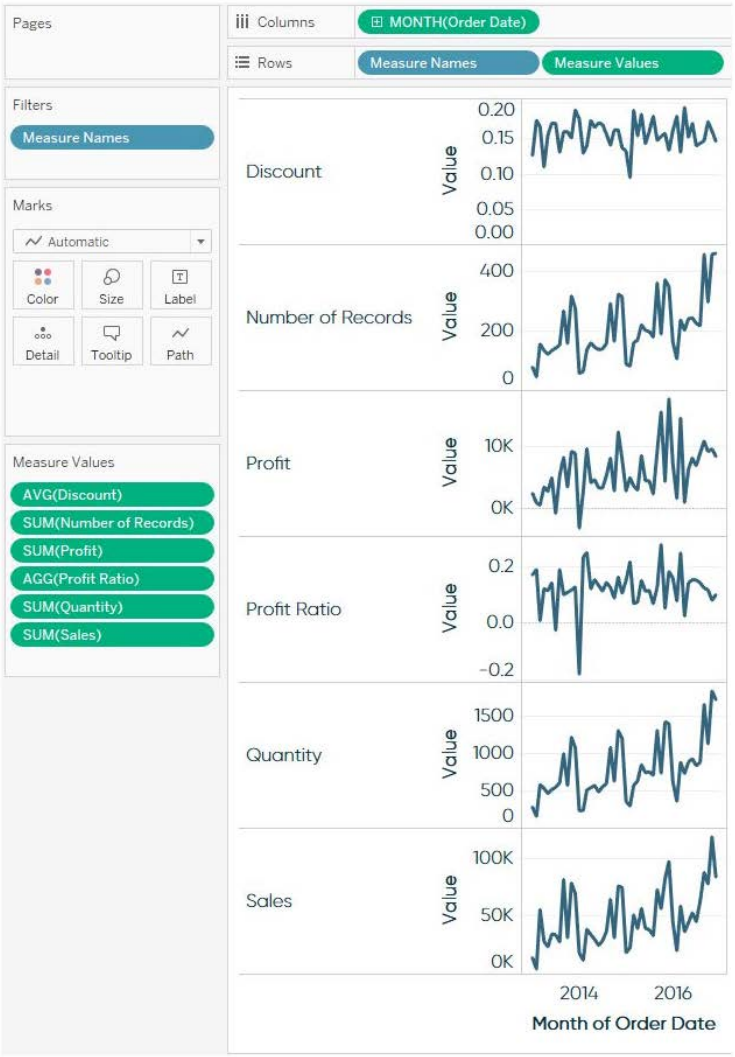
Notice that *every* measure name appears in your chart, whether it is relevant to your analysis or not — more on filtering out specific measure names later. Since you placed Measure Values on your view as well, each measure name has an accompanying value, shown by default as a bar in each measure's default aggregation (i.e., SUM, AVG, etc.). I have also changed the view's fit to Fit Height so that I can see all of the measure names and values without scrolling.
This is a good start, but now we need an element of time to trend the measure values.

2. Place a date field on the Columns Shelf.
   By right-clicking and dragging my Order Date field onto the Columns Shelf, I was given an extra option to select the date part (i.e., Year, Month, Week). To get the view to look as it does here, I chose the MONTH option preceded by a green icon. The green indicates that the date will be continuous:



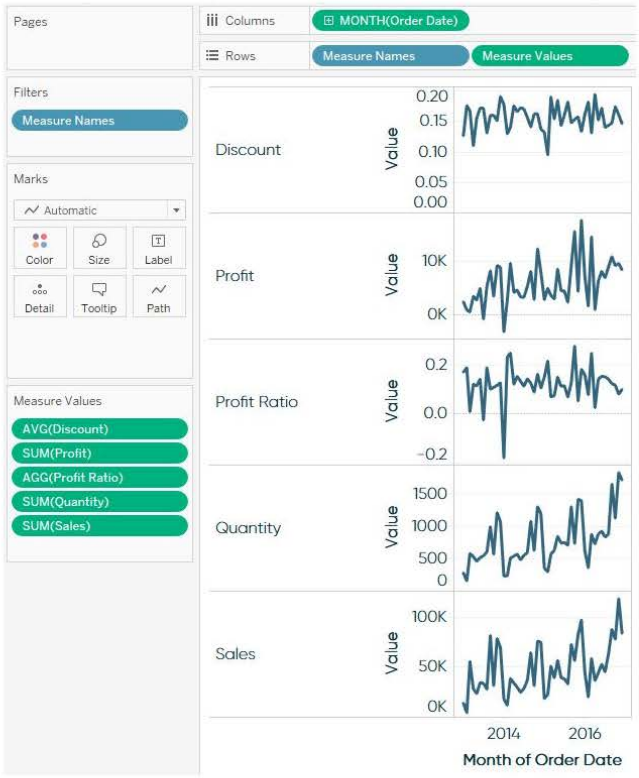
We have now essentially made a series of line graphs, but they are not very "sparky," making it difficult to quickly glean insights. This is an easy fix in Tableau by clicking and dragging the right side of the graph to the left to reduce the width of the view.

3. Reduce the width of the sparklines view to make the trends pop:


Pages
Columns
MONTH(Order Date)
Rows
Measure Names
Measure Values
Filters
Measure Names
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Path
Measure Values
AVG(Discount)
SUM(Number of Records)
SUM(Profit)
AGG(Profit Ratio)
SUM(Quantity)
SUM(Sales)
Discount
Value
0.20
0.15
0.10
0.05
0.00
Number of Records
400
200
0
Profit
10K
0K
Profit Ratio
0.2
0.0
-0.2
Quantity
1500
1000
500
0
Sales
100K
50K
0K
2014
2016
Month of Order Date

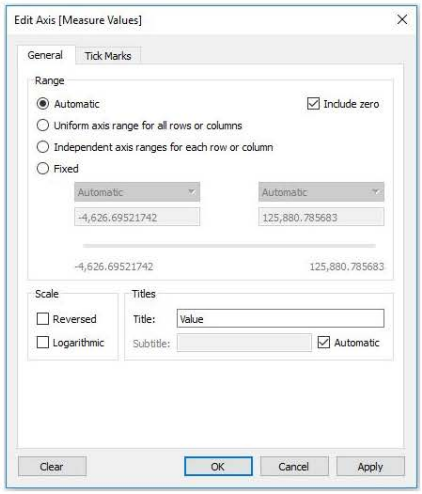
You can see at this point that the sparklines are coming together, but as previously mentioned, we have an irrelevant measure name that is not adding much to our analysis.

4. Remove irrelevant measures from your view:

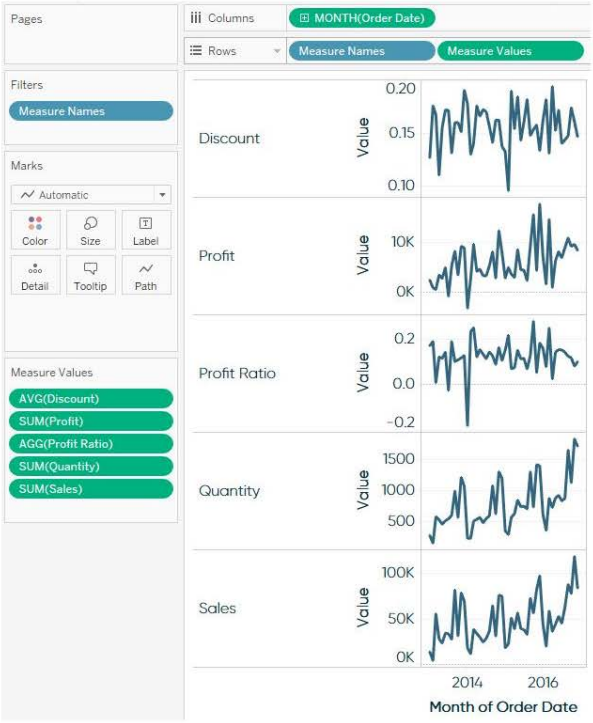


For the purposes of this analysis, I removed the Number of Records measure by dragging its green "pill" from the Measure Values Shelf. Number of Records is a generated field and not needed for this analysis. We're getting even closer now, but notice that Discount is not providing much insight because this measure has very little fluctuation. For this reason, I typically remove zero from my axes in sparklines. There is much debate around whether it is ever appropriate to exclude zero from your axes because it is easy to mislead your audience when an axis starts anywhere but zero. In the case of sparklines, and measures with little to no volatility, I recommend either excluding zero on the axes, or removing these types of measures completely from your view. Remember: if you cannot gain any insight from these measures in your sparklines, they are not adding any value. There may be times when you expect to see little to no volatility, in which case control charts (covered in Chapter 43), may be a better choice.

5. Exclude zero from your axes or remove measures that have little to no fluctuation.
   If you're comfortable excluding zero from your axes, right-click any of the axes in your sparklines and choose Edit Axis. You will see a box specifically created to give you the option to include or exclude zero in your axes. By default, the box to "Include zero" is checked. To exclude zero, uncheck this box:

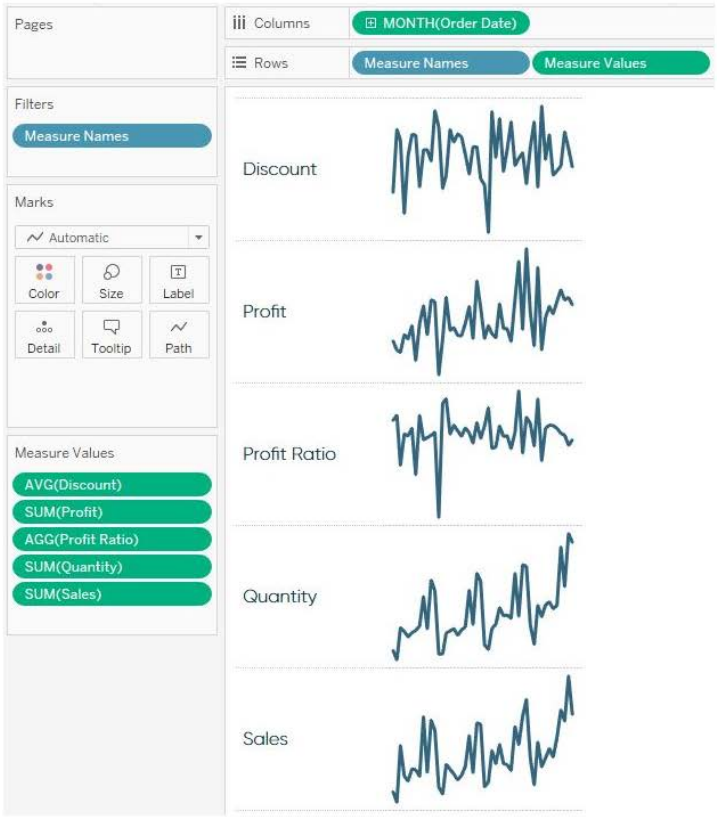


You can now see the fluctuation in Discount:



From here, all that's left is to format the sparklines to your preference. Remember, sparklines are not quite like regular charts or graphs in that they are meant to provide quick trends at a glance. They don't usually contain typical context, such as the axis values.

6. Hide axes and format your view:



Formatting changes I made to finalize this view include:

- Hid the y-axis by right-clicking the axis and deselecting Show Header.
- Hid the x-axis. Some prefer to keep the axis that shows the date range. I personally exclude this from my sparklines, but if you need to show it, I recommend only showing the start and end points.
- Removed the gridlines.
- Removed the column separators.
- Softened the row separators by choosing a dotted line instead of a solid line.

Small Multiples

Small multiples are a group of charts or graphs that share the same axes and scales, which allows the user to compare trends across dimensions in a single view. They have been praised for their ability to provide a great deal of context, reducing the need for end users to ask the dreaded, "So what?" The term "small multiples" was popularized by Edward Tufte, who puts it best in his book, *Envisioning Information*:

"At the heart of quantitative reasoning is a single question: *Compared to what?*"

While smaller series of small multiples can work well on an executive summary dashboard, I typically like to use them as a second layer in an analysis. My executive level view, or "first layer," may provide higher-level information about a particular measure, such as the overall sales trend and progress toward goals. This is a "descriptive" view of the data answering the question, "What is happening with sales?" From here, I may provide an option to view sales across different dimensions and sub-categories as a series of small multiples in a second layer of the dashboard (often located away from the first view). While small multiples is still a "descriptive" view, it helps answer the question, "Compared to what?"

In this chapter, we will be re-creating the following small multiples view: