Bar Charts

As we have learned already charts are great for comparison in general. However, Bar charts are an especially good chart type to compare items when you have one variable per item and you have a lot of items to compare. Use bar charts, if you have need for the following:

1. At a quick glance, you can compare data sets between groups
2. It's easy to see the relationship between the two variables on the different axes
3. They can be an effective way to see trends when you display the same group's bar chart over time.

Bar charts are extremely common charts that we see every day on the news and in print.

One key tip that I must stress is that the axis should always start at zero for bar charts as that is assumed by the user. Here we see an example of a manipulated bar chart on Fox News: http://flowingdata.com/2012/08/06/fox-news-continues-charting-excellence/. See how it really impacts the story that the data tells, exaggerating the comparison and distorting the truth.

I really liked this example by Joey Cherdarchuk illustrating progressive improvement of a bar chart following Tufte's recommendations with what Cherdarchuk calls "remove to improve". Click here or on the image to see the presentation.

Bar charts are very popular because users can quickly see patterns rather than have to scour data tables of numerical data.

There are vertical bar charts, horizontal bar charts, stacked bar charts, both horizontal and vertical. Below are a few examples of the various types of bar charts. We will learn more about each in our readings this week.

Vertical Bar Charts

You can clearly see the trends as well as how they compare in this example of a vertical bar chart.

Data Comparison Bar Chart
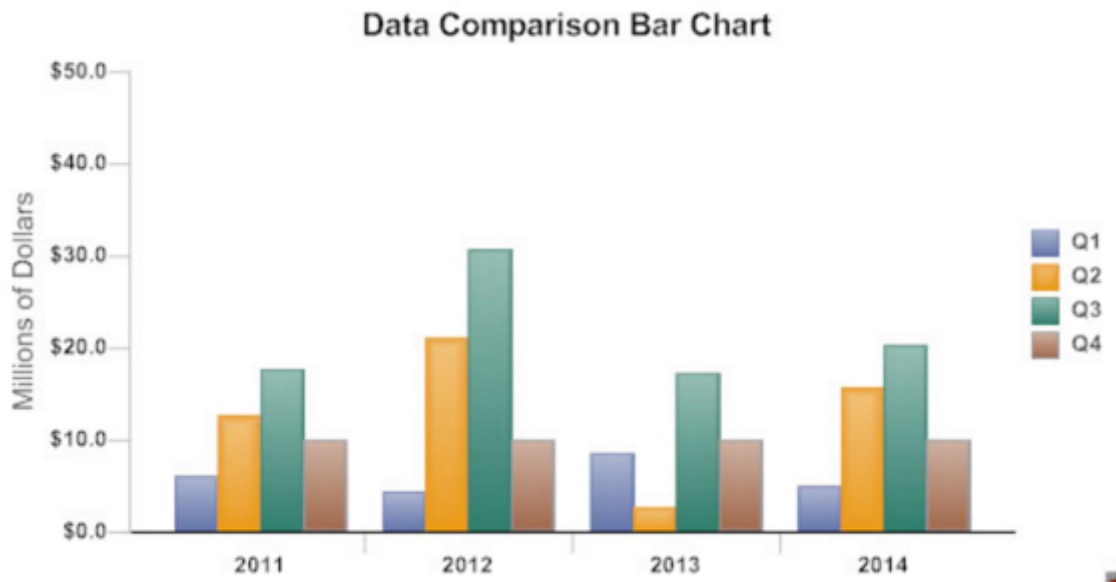
Horizontal Bar Charts

Horizontal bar charts are a great option when you have long labels. Notice the bars are marked with the percentages directly rather than expecting the reader to decipher the value in its placement on the grid.
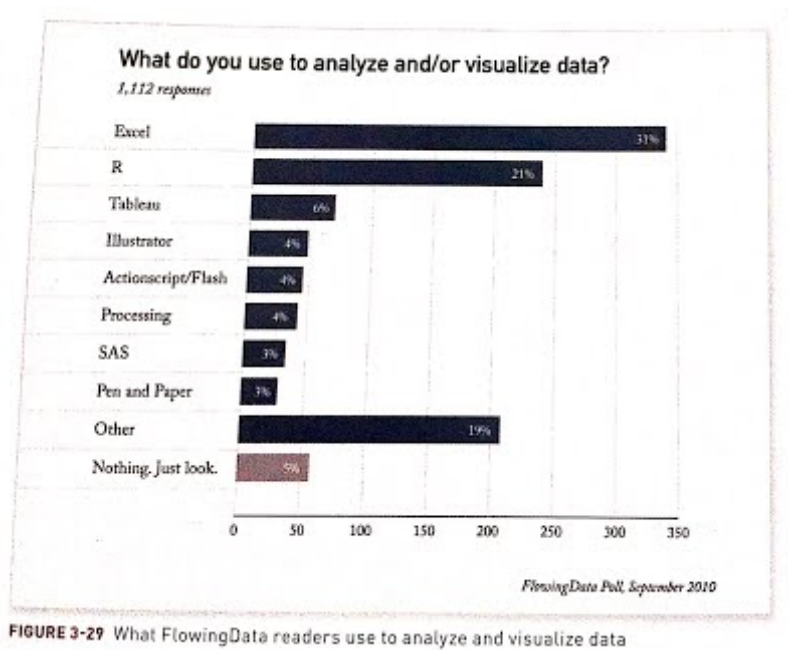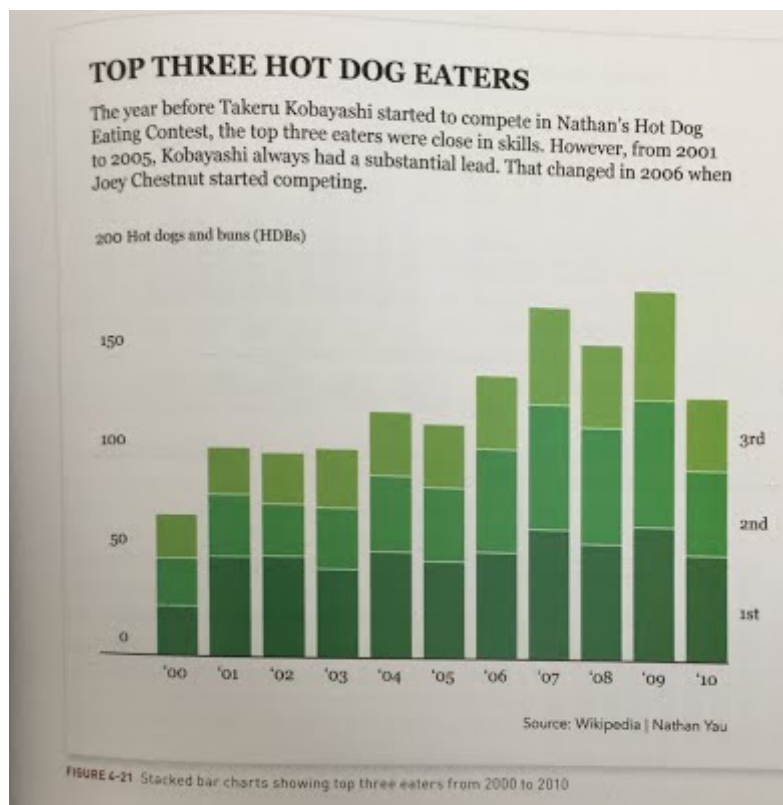

What do you use to analyze and/or visualize data?
1,112 responses

Tool	Percentage
Excel	31%
R	21%
Tableau	6%
Illustrator	4%
Actionscript/Flash	4%
Processing	4%
SAS	3%
Pen and Paper	3%
Other	19%
Nothing. Just look.	5%

FlowingData Poll, September 2010

FIGURE 3-29 What FlowingData readers use to analyze and visualize data

(Source : 2011 book entitled *Visualize This: The FlowingData Guide to Design, Visualization, and Statistics* by Nathan Yau)

Stacked Bar Charts

Stacked bar charts are a great way to compare multiple part-to-whole relationships. These are much better at showing parts of a whole than pie charts and should be used instead in almost all cases, say for a particular point in time such as a year when you want to show multiple data values. You could put three

bars next to each other and put a large amount of space between each year on the X axis but why do this when you can easily represent the same information using a stacked bar chart. Below we see the top three winners for a hot dog eating contest from the year 2000-2010. Using a slightly different shade of color for each place (1st, 2nd, 3rd).

TOP THREE HOT DOG EATERS

The year before Takeru Kobayashi started to compete in Nathan's Hot Dog Eating Contest, the top three eaters were close in skills. However, from 2001 to 2005, Kobayashi always had a substantial lead. That changed in 2006 when Joey Chestnut started competing.

FIGURE 4-21 Stacked bar charts showing top three eaters from 2000 to 2010

(Source : 2011 book entitled *Visualize This: The FlowingData Guide to Design, Visualization, and Statistics* by Nathan Yau)

No matter which type of bar chart you use please avoid using 3-D. The perspective projection often distorts the data. Also in your own consumption of data through the media beware of 3D charts as they signal manipulation of data.

Also keep in mind your spacing between your bars. When the space between your bars are the same as the width of the bars you run into a situation where you get visual vibration and the spaces and bars reverse making it more confusing as to which is the data.

Here is a great overview of design best practices for handling bar charts.

BAR CHART
DESIGN BEST PRACTICES

USE HORIZONTAL LABELS
Avoid steep diagonal or vertical type, as it can be difficult to read.

SPACE BARS APPROPRIATELY
Space between bars should be ½ bar width.

START THE Y-AXIS VALUE AT 0
Starting at a value above zero truncates the bars and doesn't accurately reflect the full value.

USE CONSISTENT COLORS
Use one color for bar charts. You may use an accent color to highlight a significant data point.

ORDER DATA APPROPRIATELY
Order categories alphabetically, sequentially, or by value.

(source: https://cdn2.hubspot.net/hub/53/file-863940581-pdf/Data_Visualization_101_How_to_Design_Charts_and_Graphs.pdf)

Well Done Bar Chart Example

FIGURE 4-5 Bar graph showing results from Nathan's Hot Dog Eating Contest
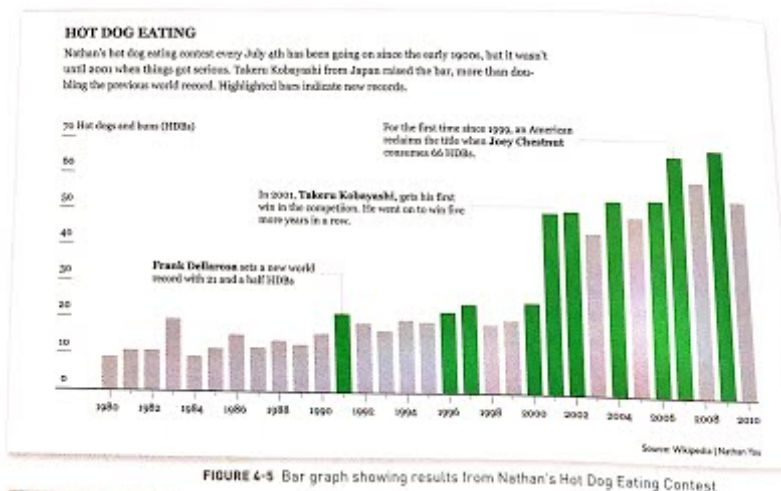
A few things to note about the above bar chart that are done well. First of all there is a title to the chart. Note the selective use of color to highlight years where the world record was broken for hot dog eating. They directly label a few bars of interest. The reduce the Y-axis to hash marks and bring in the labels making it easier to scan. Notice they don't have a lot of horizontal rules making it very clean so the data can really come through. One last thing is that they include the data source in the graphic which provides credibility as well as context.

One final thing, you may want to check out this video (https://youtu.be/75c7a4R4pZ0) and similar on YouTube to understand how folks lie with bar charts so we can avoid unintentional deception when using them.

How to Lie with Bar Charts - Data Visualization and D3.js