Yellowfin
Data Visualization
Best Practices Guide
Data Visualization Best Practices

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Data Visualization Best Practices

Everybody expects their Business Intelligence (BI) and analytics solution to turn data into insights. But your data is only as good as your ability to understand and share it. This guide to best practice data visualization will walk you through how to:

1. **Choose the right chart type:** Communicate the significance of your data in the most efficient way possible
2. **Optimize your charts:** Improve information absorption
3. **Share your insights:** Turn information into action

Effectively transform your organizational data into easily digestible and actionable business communications.

**Why Visualize Data?**

- **PROCESS INFORMATION:** Make your data sets coherent and easy to absorb.
- **TELL A STORY:** Present a convincing fact-based story.
- **MAXIMIZE VALUE:** Get the most out of your BI investment.
- **BETTER DECISIONS:** Understand your business and make better informed decisions.
Choose the right chart type

BEST PRACTICE #1

Choosing the right chart type will help you find and tell the story in your data. The appropriate chart will reveal patterns and trends, so you instantly understand the significance of the data set that you’re visualizing.

In this section, we’ll cover when to use the most common chart types.

What would you like to show?

If you know your question, and have the right data available, there is a perfect chart for you.

- **COMPARE ITEMS**: Compare values across different categories.
- **STATIC COMPOSITION**: Part-to-whole relationship.
- **CORRELATION**: Relationship between two or more variables.
- **TIME COMPARISON**: Compare changes over a period of time.
- **NON-STATIC COMPOSITION**: Part-to-whole relationship over time.
- **LOCATION**: Show where things happen.
- **DISTRIBUTION**: Frequency of values in a data set.
- **KPIs**: Key Performance Indicators.
Comparisons among items
How to compare values across different categories.

COLUMN CHART
Compare the values of different categories.
Compare sales by products

CLUSTERED COLUMN / BAR
Shows values of multiple category groups.
Compare sales by products by gender

TRELLIS CHART
Compare values of multiple categories across multiple dimensions.
Compare sales by products by region

BAR CHART
Compare values that have more than 12 categories or very long category labels.
Compare sales by salesperson

BULLET / LAYERED CHART
Highlight when one metric overtakes another (such as a KPI).
Compare departmental spend vs budget

RADAR / SPIDER CHART
Highlight strengths and weaknesses by comparing multivariate data with three or more quantitative variables.
Compare products by features
Comparisons over time

How to compare changes over a period of time.

**LINE CHART**
Displays a metric over a period of time. Line charts help you understand trends such as acceleration, deceleration and volatility.

*Compare sales by month*

**MULTI-LINE CHART**
Compare multiple categories or multiple metrics over time.

*Compare sales by product by month*

**TRELLIS LINE CHARTS**
Compare time across multiple categories.

*Compare sales by product by month*

**STEP CHART**
Highlight sudden changes in time-series data. Best used on granular timestamp data, or if data is missing some dates.

*Compare balance by hour*

**AREA CHART**
Similar to line charts, however the time-series relationship represents volume.

*Compare sales volume by month*

**WEEK DENSITY**
Displays when things are happening during the week. Can assist decision-making regarding, for example, resource planning.

*Compare usage by day by hour*
Composition

How to show part-to-whole relationship.

STACKED BAR
Show how a value of a category is comprised of another dimension.
Sales by product broken down by region

PERCENTAGE BAR
Shows a total broken down by percentage of proportions.
Percentage of product sales by region

TREEMAP
Display hierarchical data in a series of clustered rectangles, which together represent the whole.
Sales by product grouped by product category

STACKED AREA
Show part-to-whole relationships over time.
Sales by month broken down by products

FUNNEL
Used to identify bottlenecks in a workflow by ordering categories by stage.
Sales by funnel stage

WATERFALL
Shows how initial value is increased or decreased by a series of intermediate values, leading to a total value.
Number of employees by team over time

PIE / RING CHART
Shows total divided into categories by percentage.
Revenue by gender
Correlation

How to understand the relationship between two or more variables.

SCATTER PLOT
Show how two different variables correlate.
Correlate number of customers by age

HEAT GRID
Highlight relationships across two dimensions and a metric with color.
Correlate region and product by sales

EVENT CHART
Aligns the occurrence of events against the values of a numeric data set over time.
Show how events correlate with sales over time

BUBBLE CHART
Shows how three different variables correlate.
Correlate number of customers by age and revenue

CIRCLE GRID
Highlight relationships across two dimensions and two metrics with color and size.
Correlate region and product by sales and profit
Distribution

How to understand the frequency of values in a data set.

**HISTOGRAM**
Shows the number of times a value occurs in the dataset by a specific bin class (e.g. age bracket, grades, scores).

*Number of customers by age group*

**SCATTER PLOT**
Plot how your data is distributed by value across two metrics to identify clusters and outliers.

*Individuals by height and weight*

**BOX AND WHISKER**
Shows distribution in data sets by category. Box contains median and first and third quartiles (e.g. 25% greater and less than the median). Whisker typically represents minimum and maximum points in the data.

*Revenue distribution by region*
Location

How to see where things happen. (Or where things aren’t happening in order to uncover your next opportunity)

**THEMATIC / GIS MAP**
Show location areas or boundaries using color in order to compare values.
*Population by state*

**HEAT MAP**
Shows concentration of occurrences of interest in the same location.
*Usage by location*

**BUBBLE MAP**
Show location of data points using bubble size to compare values.
*Sales by store*

**RASTER MAP**
Show where data is on a custom map.
*Sales by sections of a shop floor*
Key Performance Indicators (KPIs)

How to show if you are on target.

21,845
Users Online

BIG NUMBER CHART
Show the value of a metric as a number.
How many online users in total?

DIAL
Measure performance or rate of change against predefined targets using the metaphor of a dial.
Revenue vs target

THERMOMETER
Vertical representation of a dial chart.
Revenue vs target

BULLET / LAYERED CHART
Highlights when one metric overtakes another.
Compare departmental spend vs budget

METER
Measure performance, or rate of change, against predefined targets using the metaphor of a meter.
Growth vs target
Format style

BEST PRACTICE #2

Format your charts to make them easier to understand and more aesthetically pleasing.

Colors

Data can be represented by color. You can use colors to highlight different categories or to represent a secondary metric on your chart. Be careful: Color used poorly can obscure insights and confuse people.

Did you know?

One in 12 men (8%) have some sort of color blindness. To make your charts as accessible as possible, think about choosing a color scheme that will work for colorblind people too.

Colors can give your charts more meaning

Use colors to highlight different categories or metrics.

- **CATEGORICAL**
  - Every category is labeled with a different color.

- **SEQUENTIAL**
  - Single color represents a metric ordered low to high.

- **DIVERGING**
  - Two color schemes with critical midpoint value.

Use legends as your key

Include a legend to define what your color scheme means. You do not need a legend when you only have one data category.
Grid lines communicate key thresholds

Be careful not to overuse grid lines; too many can make your chart harder to read.

Grid lines help you compare key thresholds. Without them, your mind has to draw an imaginary line to make comparisons.

Labels enhance visual representation by displaying exact values. Labels are especially useful for paper-based or static charts that don’t have hover tooltips enabled.

Format your axis to control the scale and intervals of your charts. Make sure your axis labels and spacing are easy to read.

Labels reveal exact values

Support visual representation with precise figures.
Add clarity

BEST PRACTICE #3

Make your charts easy to understand by telling people exactly what they represent.

Chart titles & descriptions

Use chart titles to frame the story, purpose and meaning of your charts. Use chart descriptions to add additional context to your chart, such as from where the data comes.

Sorting

Sorting can help people make sense of what your charts mean, by telling the story in the right order.

Annotations & comments

Add context and perspective by annotating data in charts or adding comments.

Chart titles frame the story in your data

There are two ways to tell people what they are looking at.

DESCRIBE THE QUERY

For monitoring data without bias.

EXPLAIN THE INSIGHT

Use data to tell a story.

Website traffic per quarter

Website traffic growing exponentially

Sorting tells your story in the right order

Sort your data to make finding insights easier.

ALPHABETICAL

Quickly find a category.

ASCENDING

Tell a story in order.

DESCENDING

Compare categories.
Highlight what’s important

BEST PRACTICE #4

Data visualizations can contain, display and communicate lots of information. But, you can make critical insights and data points stand out by directing your audience’s attention to what’s important.

Directing attention with conditional formatting, reference lines or trends and forecasts increases the ‘dwell time’ of your reports, leading to a better understanding of the significance of your data.

Direct attention

Draw people’s eye to what’s important.

**CONDITIONAL FORMATTING**
Colors data that is above or below defined thresholds.

**REFERENCE LINES**
See if you are on target to reach a goal.

**HIGHLIGHT TRENDS**
Uncover patterns in your data.

**PROJECT FORECASTS**
Predict what will happen next.
Data is more valuable when shared

Deliver insights to people where they make decisions.

**DASHBOARDS**
Set-up personalized dashboards to help people monitor what matters to them.

**EMBED**
Embed insights into the platforms and applications people use every day.

**BROADCAST**
Tell people when to take action with periodic reports and data-driven alerts.

**LIVE PRESENTATIONS**
Include real-time interactive charts to tell compelling stories to live audiences.
About Yellowfin

Yellowfin is a Business Intelligence platform that makes finding and sharing insights easy. Transform your data into rich visualizations and interactive dashboards. Answer your organization’s most important questions. Then share, collaborate and make data-driven decisions.

For more information, visit www.yellowfinbi.com

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