DATA VISUALIZATION

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Your data is only as good as your ability to understand and communicate it, which is why choosing the right visualization is essential.

CONTENTS:

- Data Types
- Data Relationship
- Chart Types and examples

DATA TYPES

1. Numerical

These data have meaning as measurement such as blood pressure, person's height or they are a count such as how many statistic book that you have, how many teeth a dog has.

1. a. Discrete

Numerical data that has finite number of possible values. Ex: numbers of products in a store.

1. b. Continuous

Data that is measured and has value within a range. Ex: speed of a train.

2. Categorical

Data that represent characteristics or data that can be shorted according a group (category), Ex : gender, types of product sold, material status.

DATA RELATIONSHIP

- Nominal Comparison 

Comparison of the quantitative value. Ex: types of product that sold.

- Time Series 

Quantitative values that changes over the time. Ex: Revenue in monthly.

- Correlation 

Data with two or more variable that may shows a positive or negative correlation to each other. Ex: price of product according to demand of product.

- Deviation 

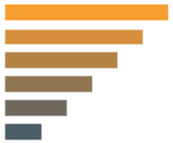
Describes how data point relate to each other or how far data given differs from the mean. Ex: mathematic exams result class A vs class B.

DATA RELATIONSHIP

- Distribution

Describe how data distribute around a central value. Ex: weight of people in a area.

- Ranking



How two or more variables compare to each other in a dimensions. Ex: sales types of product, ranked from highest to lowest.

- Part-to-whole-relationship

Subset data compared to larger whole. Ex: percentage of study course in a university

CHART TYPES

Bar Chart

Pie Chart

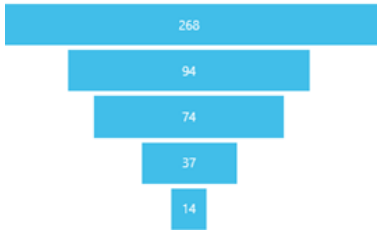
Line Graph

Area Graph

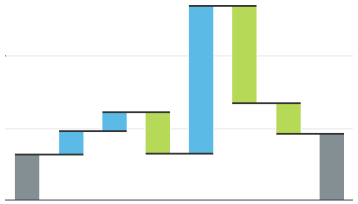
Scatterplot

Bubble Chart

Heat Map



Funnel chart



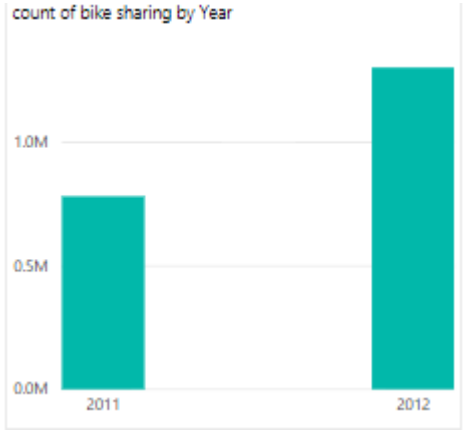
Waterfall chart

CHART TYPES

a. Bart Chart

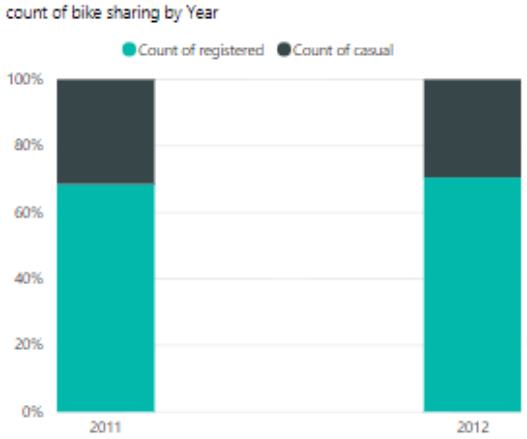
used when: - compare different categories, compare part of whole, show changes over time.

Vertical chart



Horizontal chart → data with long category label

Stacked or group → when need to compare multiple to whole relationship



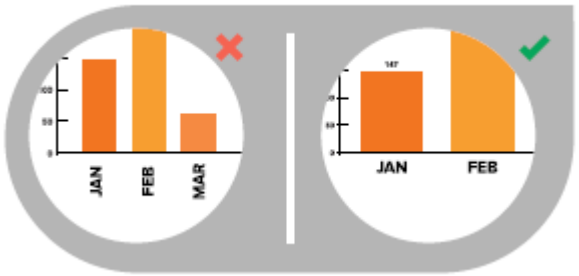
Stacked and 100% Stacked

CHART TYPES

Bar Chart _ Best Practices

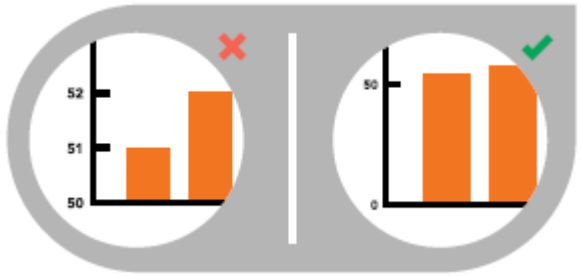
Horizontal labels

Use horizontal label instead of vertical or diagonal labels.



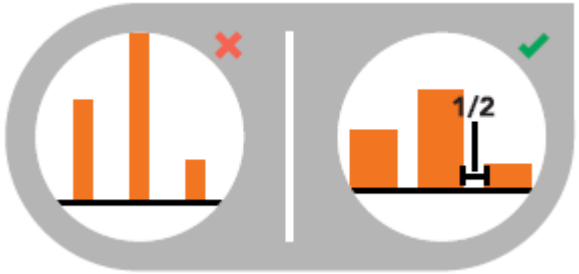
Y-AXIS value

Should be start at 0 y-axis, if don't the reflection of full value will not accurately.



Space bars

Should be ½ width of bar.



Order data

Order data categories sequentially, alphabetically or by value.

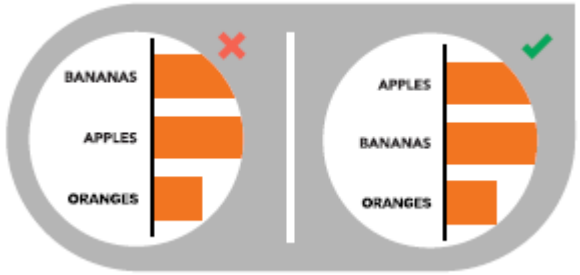
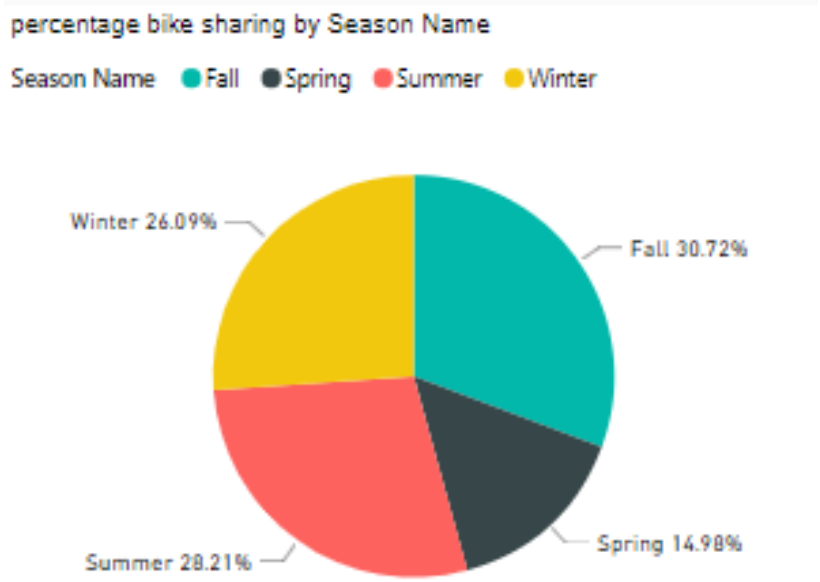


CHART TYPES

b. Pie Chart

Used when : want describes proportion or presentation between categories. Full circle represent the total sum of categories and equal to 100%.



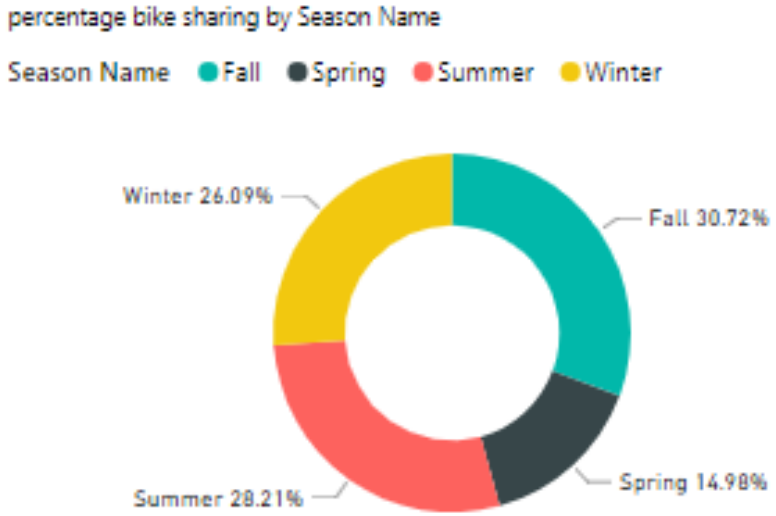


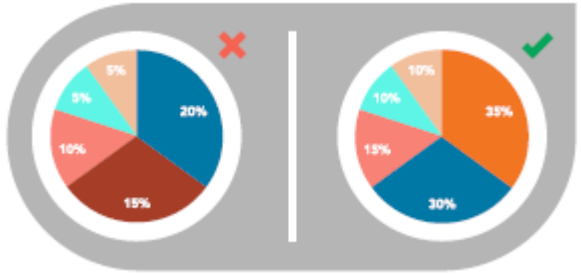
CHART TYPES

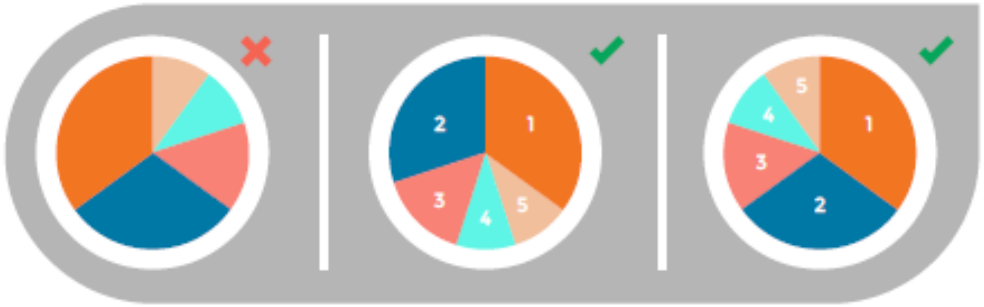
Pie Chart _ Best Practices

Numbers of categories
No more than 5 categories per pie chart.

Multiples Pie Chart
Don't use multiple pie chart for comparison. Use stacked bar chart instead.

All Data adds up to 100%
Make sure sum total of categories is 100%.





Order slice correctly.
The largest slice put at 12 o'clock, going clockwise. Or the second largest slice at 12 o'clock, going counterclockwise.

CHART TYPES

c. Line Chart

Used to show the trends and analyze the data has changed over time, also help to show acceleration, deceleration and volatility.

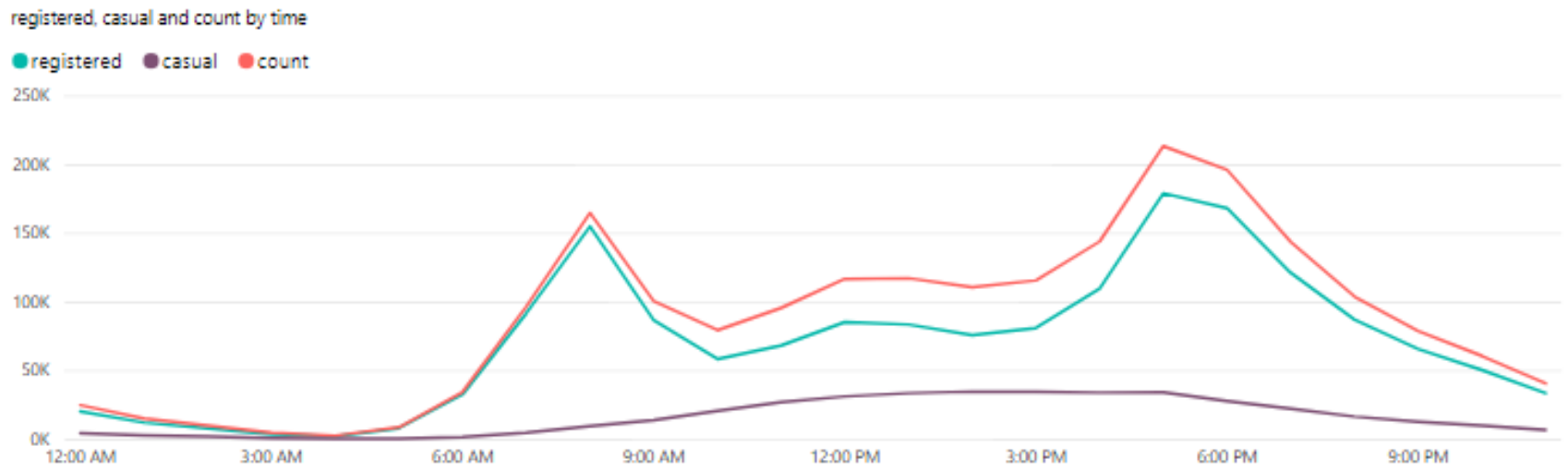
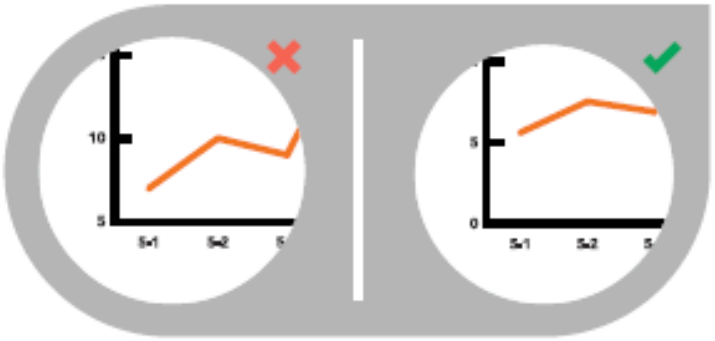


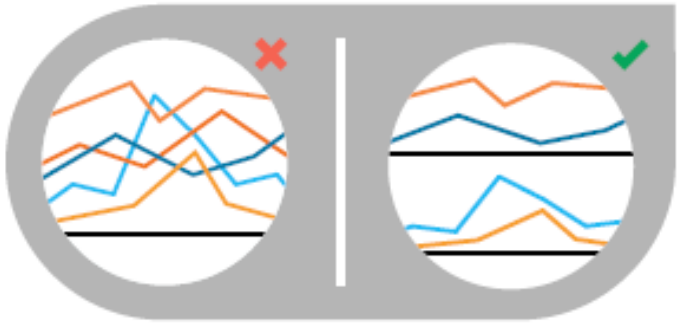
CHART TYPES

Line Chart _ Best Practices

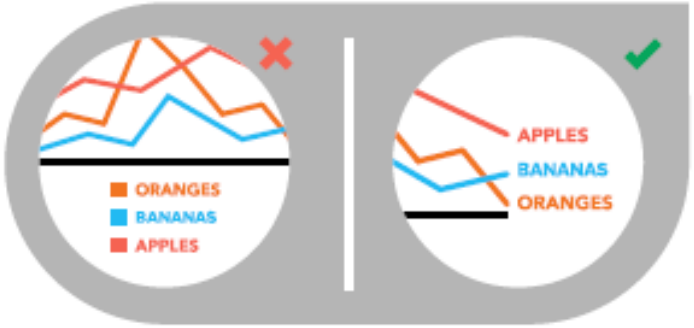
Zero baseline should be included.



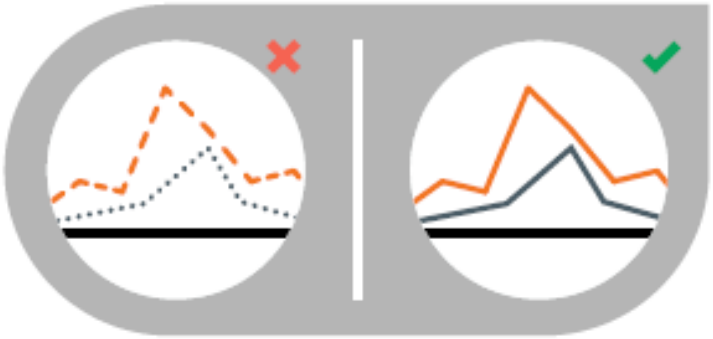
No more than 4 lines per line chart.



Label the lines directly.



Use solid line instead of dashed or dotted line.



Use the right height.

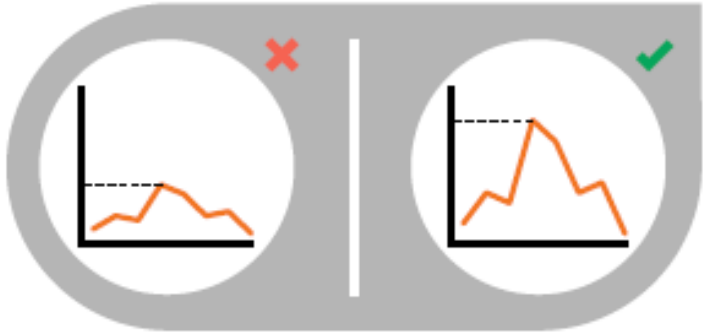
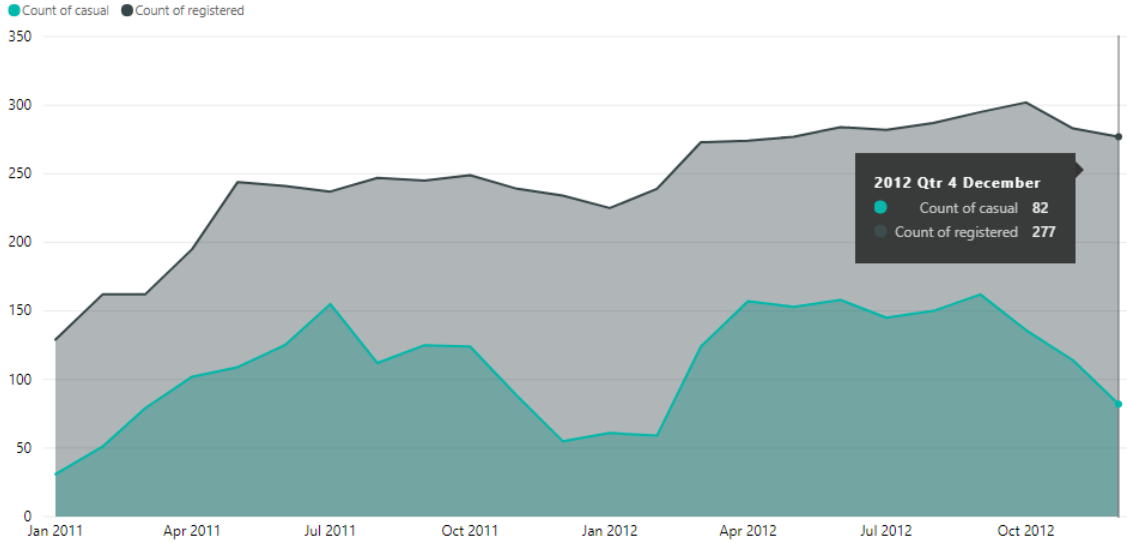


CHART TYPES

d. Area Chart

Use when to display development of quantitative values in a interval or to represent volume in each category. The top value shows sum of total the categories.



Stacked area, best used to help show how each category contribute to cumulative total.

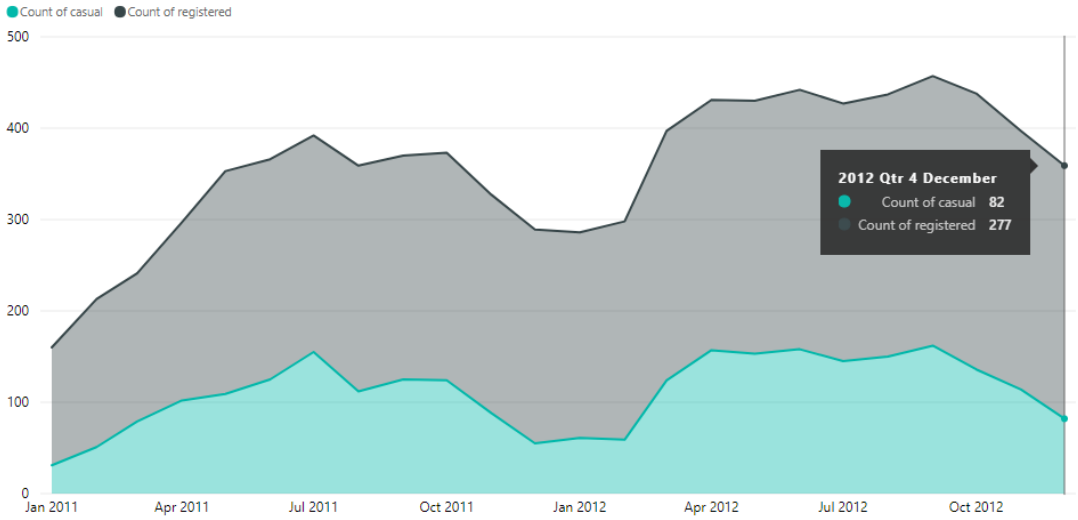
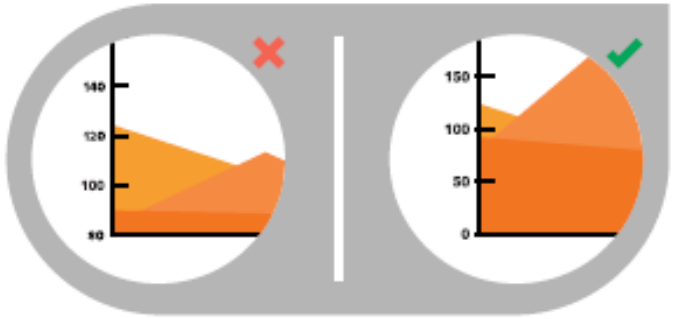


CHART TYPES

Area Chart _ Best Practices

Arrange data position.
Highly variable on the top the chart and low variability on the bottom

Y-AXIS value.
Should be start at 0 y-axis



Numbers of categories.
No more than 4 data categories.

Use transparent colors.
Ensure data isn't concealed in the background by ordering properly and using transparency.

Not good for discrete data.

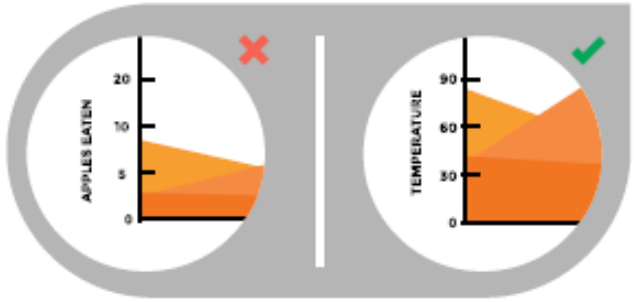


CHART TYPES

e. Scatter Plot

Used to describes relationship or correlation between two variables exists.

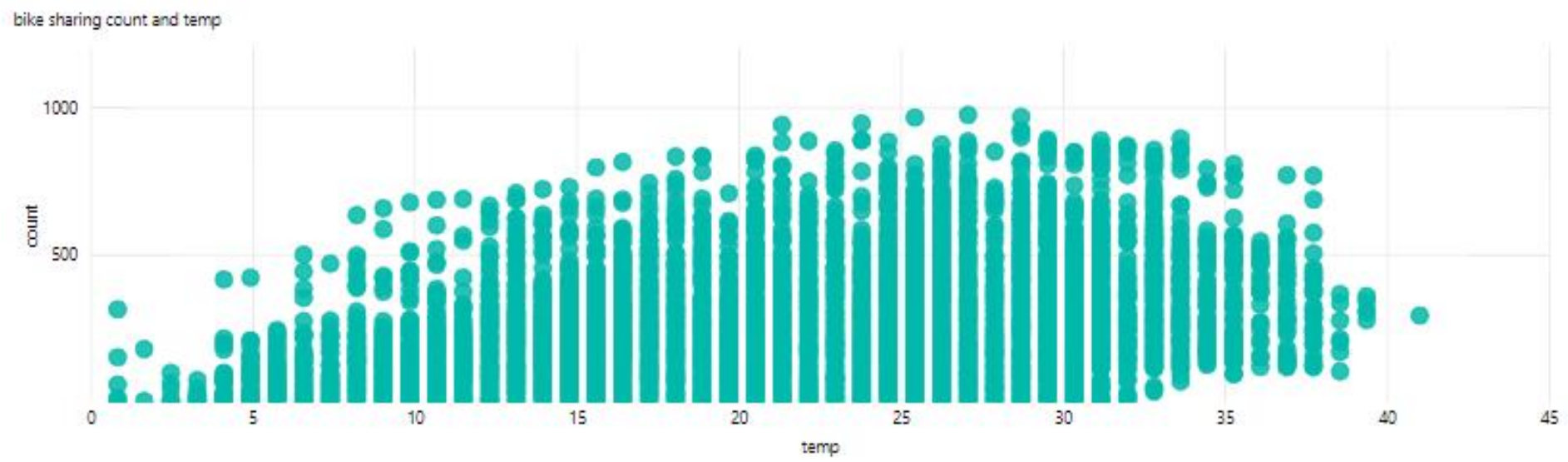
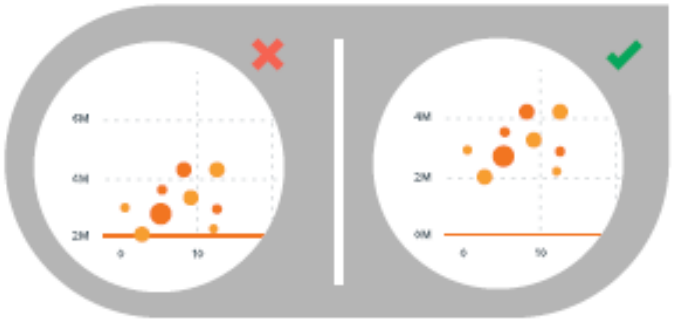


CHART TYPES

e. Scatter Plot _ Best Practices

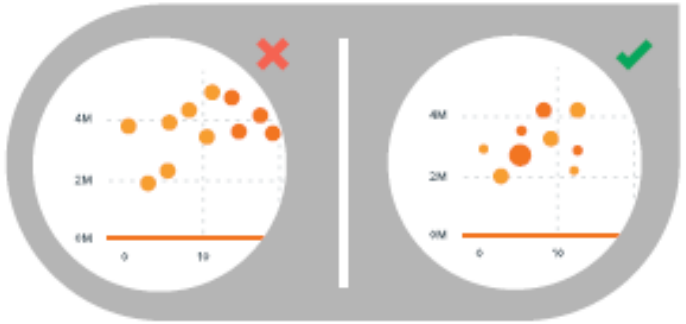
Y-AXIS value.

Should be start at 0 y-axis



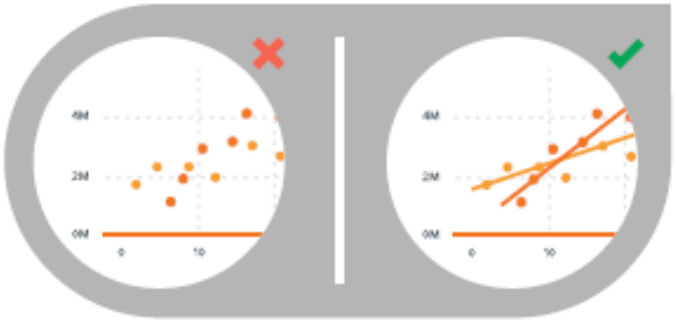
Size and Dot color

Use size and dot color to encode additional data variables.



Trend Line

Use trend line to help draw correlation.



No more than 2 trend lines.

Don't compare more than 2 trend lines, too many line lines makes difficult to decipher.

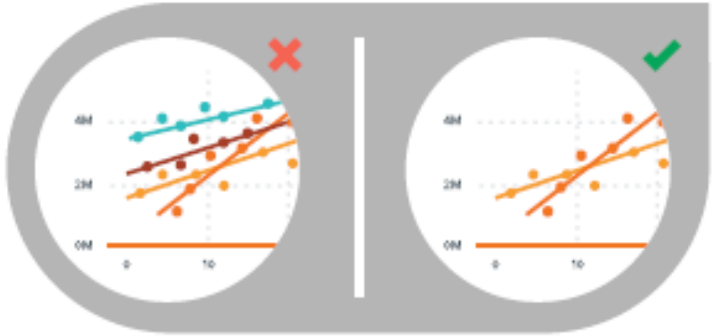
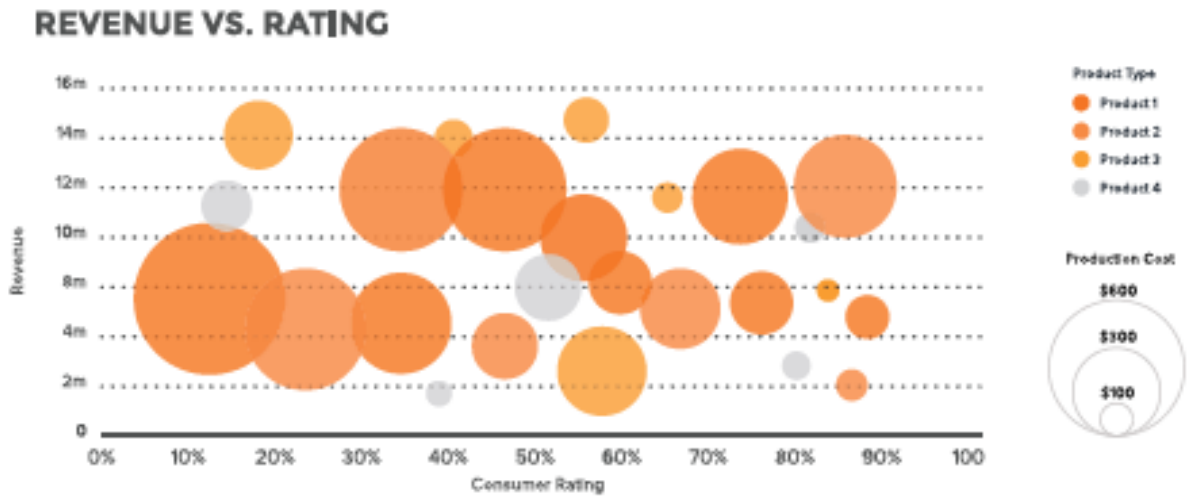


CHART TYPES

f. Bubble Chart

Bubble chart is good for showing comparison or ranking relationship.



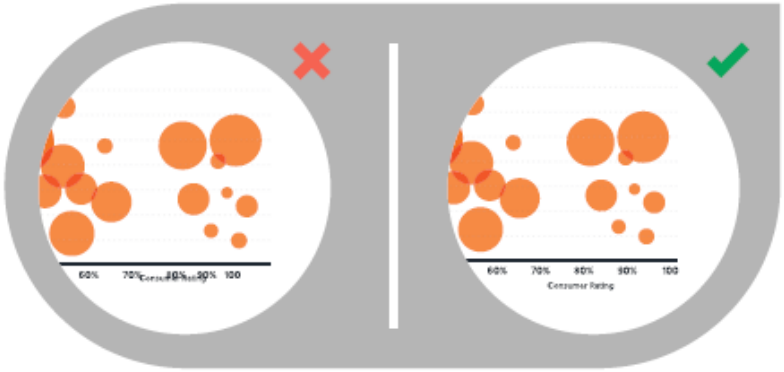
By adding bubble chart on the map can shows a visualization value for specific area

CHART TYPES

Bubble Chart _ Best Practices

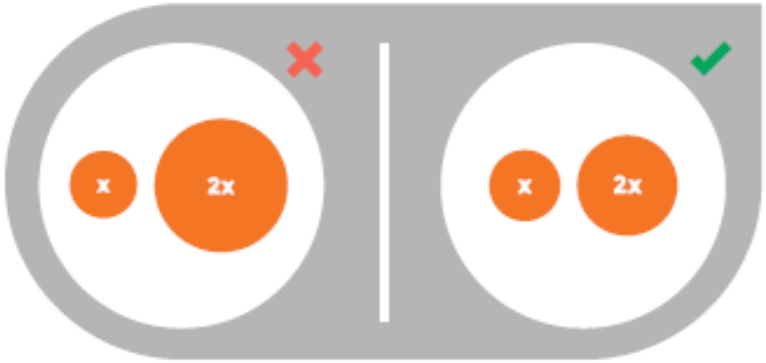
Labels are visible

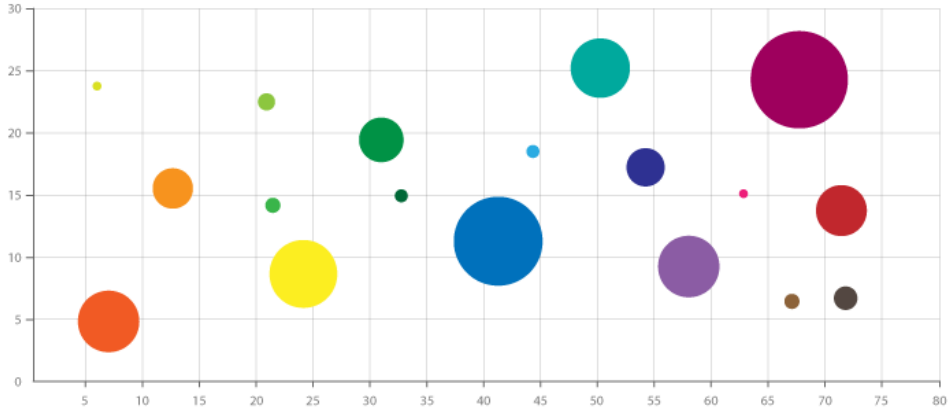
Ensure all labels easily identified and should be unconcealed.



Size of bubble appropriately.

Size of bubbles should be scaled according to area not diameter.





Too many bubbles categories can make the chart hard to read and may look chaotic, show only categories that are important.

CHART TYPES

g. Heat Map

Heat Map or Choropleth Map used to display categorical data, the data variable uses color intensity to represent itself in each region on the map. Typically can be single hue progression, transparent to opaque, light to dark or entire color spectrum.

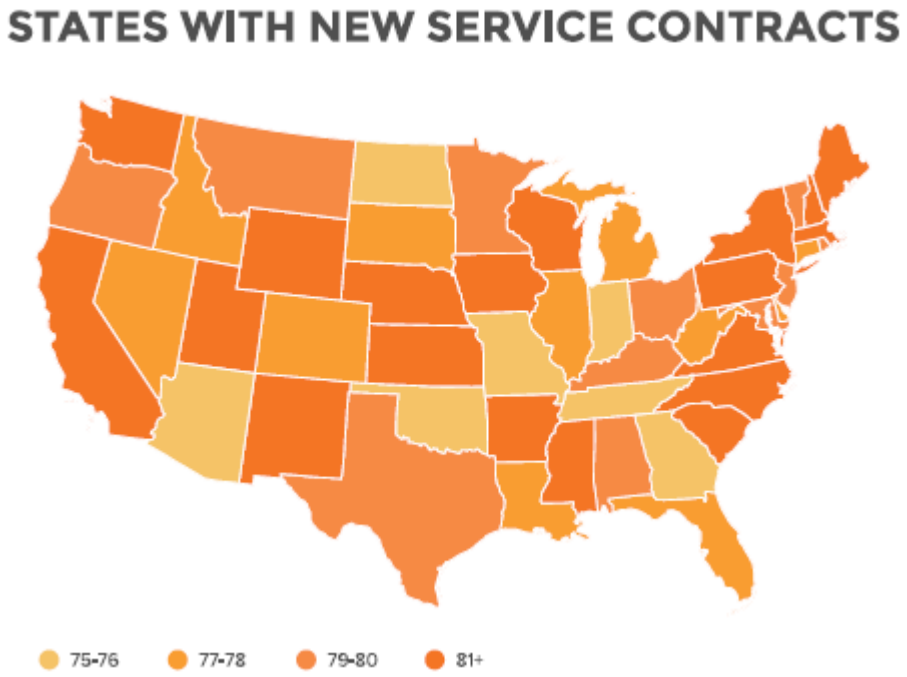
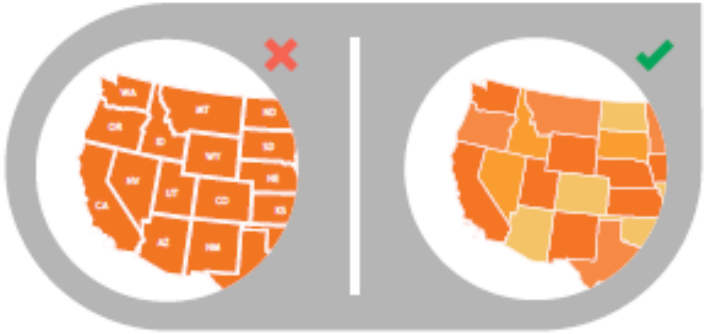


CHART TYPES

Heat Map _ Do & Don't

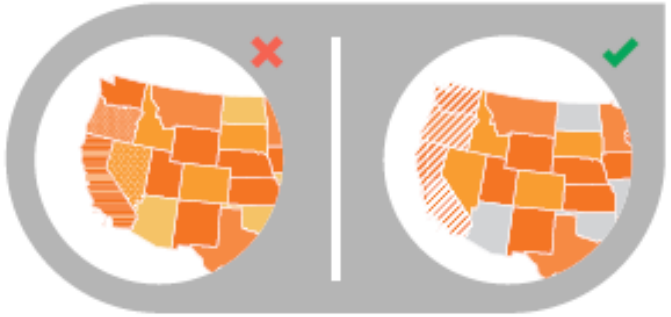
Use simple Map Outline

Use outline of the map that easy to read and not distract.



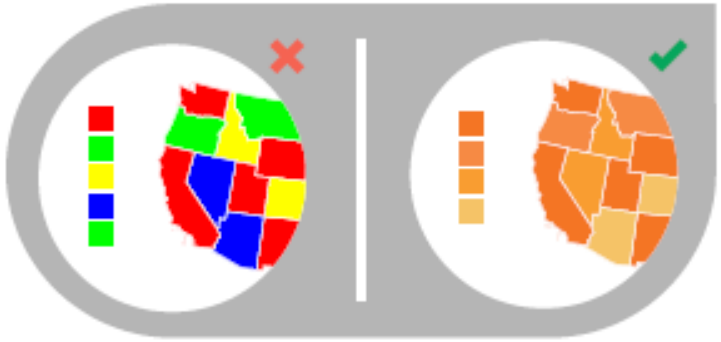
Use pattern providently

Using multiple pattern is interfering.



Select color appropriately

Use single color with varying shade to explain intensity.



Select data range appropriately

Choose 3-5 numerical range to show distribution data between them.

CHART TYPES

h. Funnel Chart

Funnel charts will be a great choice when:

- Data is sequential and move through at leas 4 stages.
- The number of category in the fist stage is expected to be greater than the number in final stage.
- Want to reveal a bottleneck in linear process.
- Want compute potential by stages.
- Want track the progress and success of the campaign.

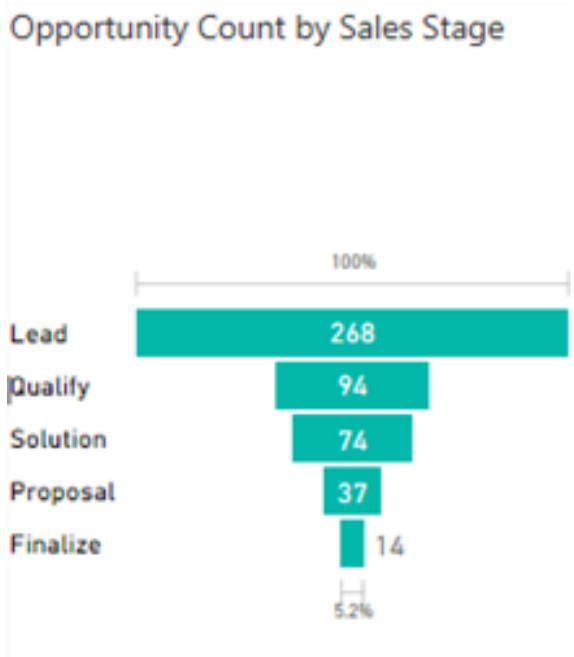
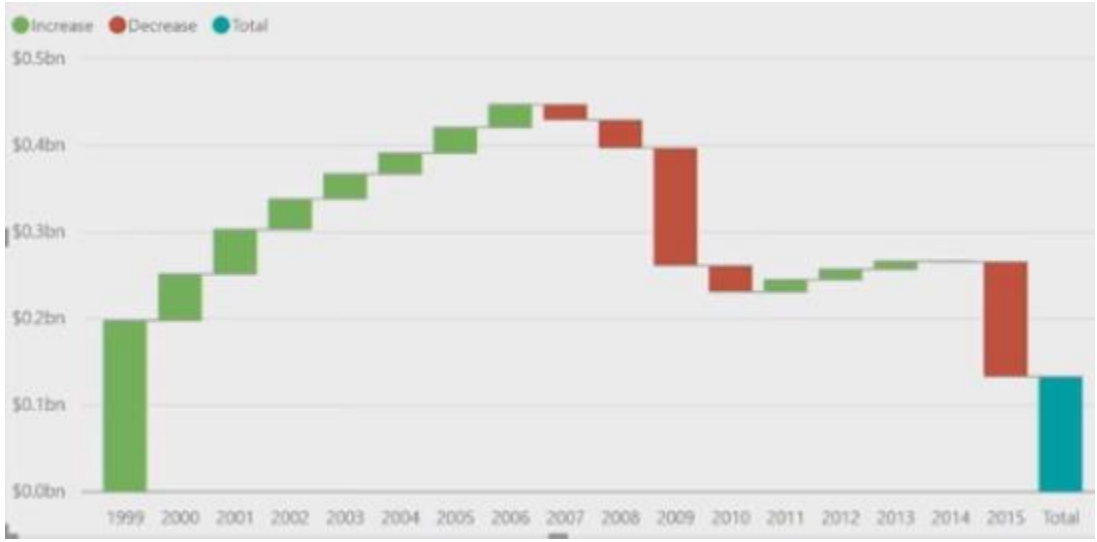


CHART TYPES

i. Waterfall Chart

Waterfall charts will be a great choice when:

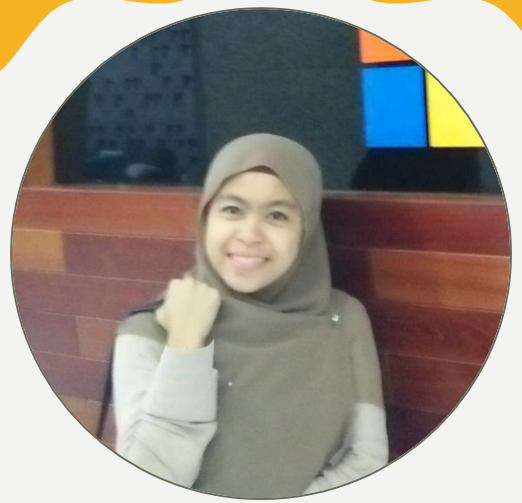
- You have a changes of measurement of different categories across the time
- Want to check the major changes contributing to the total value.
- Want to plot a company's annual profit



SOURCES

- https://docs.microsoft.com
- https://datavizcatalogue.com
- Data_Visualization_101_How_to_Design_Chart_and_Graphs.pdf

Thank you



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