

Share Data Through the Art of Visualization

Saturday, January 28, 2023 22:23

Understand data visualization

Sunday, November 27, 2022 20:46

Data visualization: the graphic representation and presentation of data

1. looking at visuals to understand and draw conclusions about data
2. creating visuals using raw data to tell a story

The McCandless Method



1. **Information**: the data you are working with
2. **Story**: a clear and compelling narrative or concept
3. **Goal**: a specific objective or function for the visual
4. **Visual form**: an effective use of metaphor or visual expression

Kaiser Fung's Junk Charts Trifecta Checkup





1. What is the practical question?
2. What does the data say?
3. What does the visual say?

Pre-attentive attributes: marks & channels



pre-attentive attributes are the elements of a data visualization that people recognize automatically without conscious effort

visualization that people recognize automatically without conscious effort

Marks: basic visual objects like points, lines, and shapes

1. **Position** 
2. **Size** 
3. **Shape** 
4. **Color** 

Channels: visual aspects or variables that represent characteristics of the data, basically marks that have been used to visualize data

1. **accuracy** - '● and ●' representing apples and oranges vs. numbers 5 and 55
2. **popout** -  line length, size, shape, hue, intensity
3. **grouping** -  proximity, similarity, enclosure

Principles

- choose the **right visual** (simple table vs. complex visual)
- optimize the **data-ink ratio**: focus on what is essential, minimize non-data ink (shadows, boxes around text)
- use **orientation** effectively
- **color**: use consciously and meaningfully, stay consistent throughout visual, use inclusive color scales
- **numbers of things**: how many elements to include?, plot five or fewer lines, keep number of segments on pie chart to less than 7, etc

→ where do you want your audience's focus?

→ visually represent only the data that your audience needs to understand your findings

Static visualizations do not change over time unless they're edited, to control data and data story, any viz printed on paper

and data story, any viz printed on paper

Dynamic Visualizations are interactive or change over time, stakeholders can adjust what they're able to view, visualizations in Tableau are automatically interactive

meaningful patterns in data:

- change - line, column chart
- clustering - distribution graph
- relativity - pie chart
- ranking - column chart
- correlation - scatterplot

Data viz decision tree example

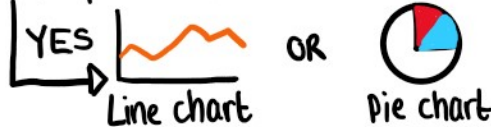
Which story would you like to tell?

start

does your data have only one numeric variable?



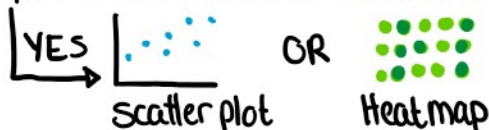
are there multiple datasets?



are you measuring changes over time?



do relationships between the data need to be shown?



Design data visualizations

Monday, November 28, 2022 19:50

The elements of art :

- Line - curved/straight, thick/thin, vert/horiz/diagonal
- Shape - should always be 2D
- Color - hue, intensity, value, shades, tints
- Space - can direct attention
- Movement - flow & action, use sparingly

Principles of design

1. BALANCE

key visual elements (color, shape) are distributed evenly, spaces between objects are equal, lines are similar in length

2. EMPHASIS

use color and value to create a focal point that draws the viewer's attention

3. MOVEMENT

path the viewer's eye travels or literal movement through animations, movement should mimic the way people usually read, use lines and colors

4. PATTERN

use similar shapes to create patterns, use to highlight similarities between datasets, break up a pattern with a unique shape/color/line to create emphasis

5. REPETITION

creates a more meaningful visual story

6. PROPORTION

can create a hierarchy, signal importance within the data, call attention to one visual over another

7. RHYTHM

sense of movement or flow

8. VARIETY

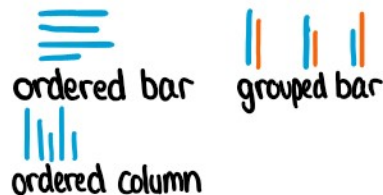
in chart types, colors, values, shapes, lines,
keeps the audience engaged, interesting & unified

9. UNITY

cohesion

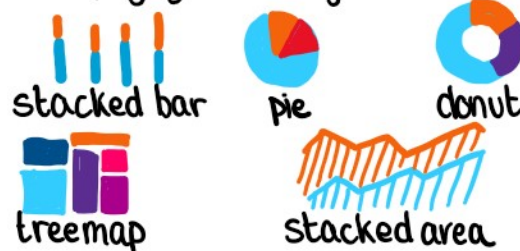
Chart types

Comparing Between Objects

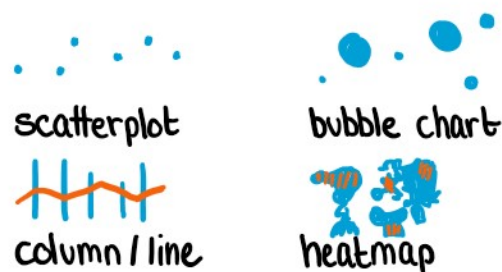


Data Composition: combining the individual parts in a visualization and displaying them together as a whole

Composition



Relationships



Elements for effective visuals

- **clear meaning** - clearly communicate intended insight
- **sophisticated** use of contrast - identify most important data using visual context
- **refined execution** - deep attention to detail using shapes, lines, color, space, movement

Design thinking : a process used to solve complex problems in a user-centric way

1. **Empathize** : emotions and needs of target audience
2. **Define** : what exactly does the audience need from the data ?
3. **Ideate** : generate ideas for data visualization
4. **Prototype** : make several viz's for testing and feedback
5. **Test** : show prototypes to people before stakeholders see them & iterate using their feedback

Data visualization considerations

Tuesday, November 29, 2022 08:36

5-second rule : within the first 5 seconds of seeing a data visualization, the audience should understand exactly what you're trying to convey

- use:
- **headlines** : a line of words printed in large letters at the top of the viz to communicate what data is being presented, large, bold, left-aligned
 - **subtitles** : supports the headline by adding more context and description
 - labels, use **directly** on data vs. in a legend
 - **legend** : identifies the meaning of various elements in a data viz

make visualizations more accessible

- labeling
- text alternatives (large print, braille, speech)
- alternative text : provides textual alternative to non-text content
- text-based format
- distinguishing - use textures & shapes instead of just colors
- avoid overcomplicating

diverging color palette displays two ranges of values using color intensity to show the magnitude of the number and the actual color to know which range the number is from

- Respect **conventions** & audience **expectations** when choosing a color palette
- use **minimal labels**

Combine multiple data sources in tableau

- set up data sources

- join data
- create relationships
- blend data
- combine date fields

Crafting Stories with data

Friday, December 2, 2022 18:14

Dashboard: A tool that organizes information from multiple datasets into one central location for tracking, analysis, and simple visualization

Data storytelling: communicating the meaning of a dataset with visuals and a narrative that are customized for each particular audience

3 data storytelling steps

1. Engage your audience
2. Create compelling visuals
3. Tell the story in an interesting narrative

Engagement: Capturing and holding someone's interest and attention
↳ consider who is listening

2. → show the story of your data (don't tell), take the audience on a journey of how the data changed over time, highlight the meaning behind the numbers
3. → connect data to project objective, clearly explain important insights, have a beginning, middle, and end, organized and concise

Speaking to your audience

- what role does this audience play?
- what is their stake in the project?
- what do they hope to get from the insights I deliver?

Choose your primary message

Spotlighting: scanning through data to quickly identify the most important insights, write insights on sticky notes, spread over whiteboard, identify trends/reoccurring themes → explore those discoveries, find meaning behind the numbers, identify which insights are most likely to help

discoveries, find meaning behind the numbers,
identify which insights are most likely to help
solve the business problem

Use **Filters** in tableau to limit the data displayed on the dashboards.

The narrative should have:

- **Characters** - people affected by the story, human context
- **Setting** - what is going on, background information about project
- **Plot** - creates tension in the current situation (challenge from a competitor, inefficient process, new opportunity)
- **Big Reveal** - how the data has shown that you can solve the problem by doing X
- **Aha moment** - share recommendations and explain why you think they will help

Effective Presentation

Saturday, December 3, 2022 20:47

Presenting with a framework

- use the business task to frame the presentation
- showcase what business metrics were used
- give your audience context to better understand your data
- help focus on the most important information

Weaving data into a presentation

1. help your audience understand what data was available, if new data has come up, if you need different data
2. establish the initial **hypothesis**: theory you're trying to prove or disprove with data
3. explain solution to the business task using examples and visualizations

McCandless method :

1. Introduce graphic by name
2. Answer obvious questions before they're asked
3. State insight of your graphic
4. Call out data to support that insight
5. Tell your audience why it matters

Components of a good presentation

- title slide: include title, name of presenter, date last updated
- table of contents
- purpose statement / objectives
- tell your story (with data)
- conclusion
- appendix
- transition slides

Presentation tips

1. Channel your excitement. take deep breaths

Presentation tips

1. Channel your excitement, take deep breaths
2. Start with the broader ideas
3. Use the five second rule
 - a. wait 5 seconds after showing a data visualization
 - b. ask if they understand
 - c. give your audience another 5 seconds
 - d. tell them the conclusion
4. Preparation is key

Present like a pro

- curse of knowledge: audience doesn't have the same context as you do, focus on what they need to reach the same conclusion you did
- answer basic questions: where did the data come from? How is it collected? does it focus on a specific time/place? include guiding hypothesis, assumptions
- audience has a lot on their mind → Keep presentation focused and to-the-point
- how you speak
 - keep your sentences short
 - build in intentional pauses
 - keep pitch of your sentences level
- be mindful of nervous habits (movement, posture, eye contact)

Anticipate questions

- understand your stakeholder's expectations & objectives
- test-run by colleagues / seek feedback
- start with zero assumptions
- consider limitations of your data & the tools used

Handling objections

- types of objections:
 - about the data · is it up-to-date?
 - about the analysis · is it reproducible?
 - about your findings · are they accurate?

- about your findings · are they accurate?
- responding to objections
 - communicate any assumptions
 - explain why results might be different than expected
 - acknowledge valid objections and investigate further

Q & A best practices

- listen to the whole question
- repeat the question (if necessary)
- keep detailed information ready in the Appendix
- understand the context
- involve the whole audience
- keep your responses short and to the point