

Week 1: Data Visualization



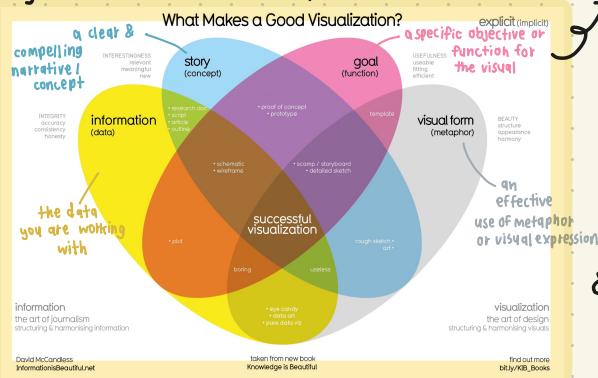
understand in 5 mins

* Avoid misleading visualization * not change over time unless they're edited
Static vs. Dynamic
Interactive / change over time

- Data Visualization → the graphical representation and presentation of data.
- ① Looking at visuals in order to understand & draw conclusions about data.
 - ② Creating visuals using raw data to tell a story.

What makes a good visualization? → "ISGV"

- ① by the McCandless Method



Types of Graphs / Charts:

- **Bar Graphs** → use size contrast to compare two or more values, clarify "trends"
- **Line Graphs** → help your audience understand shifts / changes in your data
- **Pie Charts** → how much each part of sth. makes up the whole.
- **Maps** → helps organize data geographically.
- **Histogram** → a chart that shows how often data values fall into certain ranges.
- **Correlation Charts** → show relationships among data.



* **Causation** → occurs when an action directly leads to an outcome.



- **Scatterplot** → shows relationship between different variables (typically used for 2 variables).



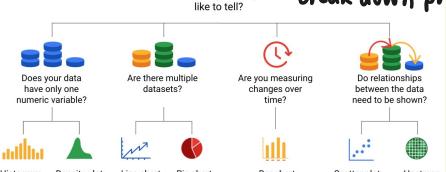
trends in numerical *



Decision tree example

for making decision
break down problems into smaller

Which story would you like to tell?



Frameworks for organizing your thoughts about visualization

Helps audience when understanding the content

② Kaiser Fung's Junk Charts Traictors Checkup

→ help consumers of data viz critique

what they are consuming and determine how effective it is. With these questions:

- > what is the practical question?
- > What does the data say?
- > What does the visual say?

③ Pre-attentive attributes: Mark and Channels

→ elements of a data viz. that people recognize automatically without conscious effort.

Position (relation to others)

Size (big/small)

Shape (what shape communicating)

Color

color: good when distinguish the differences like apple, but may less effective in like amount (Quantitative)

Accuracy

Popout

Grouping

distinguish certain values from others, consider proximity, similarity, connectedness, and continuity of the channel



② channels
(variables that represent char. of the data)



variables

data values

Correlation

vs.

Causation

• Correlation → two variables move in relationship to each other.

e.g. "As the temp goes up, ice cream sales also go up." ↗ Positive Neg/

* It indicates a pattern with relationship to each other, but it doesn't mean that one event causes another.

• Causation → Event leads to a specific outcome e.g. "When lightning strikes,

we hear the thunder (sound wave), caused by the air heating and cooling from lightning strike" (Lightning causes thunder)

- The elements of art

- × Line → Horizontal / vertical (add visual form to your data & help build the structure for viz)
- × Shape → should be 2 dimensional, not 3 because it can cause confusing.
- × Color → Hue = color
→ Intensity = how bright/dull the color is?
→ Value = lightness/blackness
- × Space
- × Movement

- 9 Basic Principles of design:



Data Composition

→ combining the individual parts in a viz. and displaying them together as a whole



Elements of Effective visuals *

- ✓ Clear meaning → clear commu.
- ✓ Sophisticated use of contrast
↳ separate the most important part out
- ✓ Refined Execution → deep attention to detail

Design thinking

↳ a process used to solve complex problems in a user-centric way.

* 5 phases of the design process *

- 1) Empathize → thinking about the emotions and needs of the target audience for data viz.
- 2) Define → define audience needs from data
- 3) Ideate → generate ideas for data viz.
- 4) Prototype → putting vizzes together for testing and feedback.

- 5) Test → showing prototype vizzes to people before stakeholders see them.

Alternative text

content provides a textual alternative to non-text. (e.g. more brief story behidn describes the visualization)

* You can avoid the color for blind by using items to distinguish it



More pleasing to readers, you can add:

- **Headline**: a line of words printed in large letters at the top of viz to communicate what data is being presented: should be clear & concise.
- **Subtitle** supports the headline, description.
- **Legend** identifies the meaning of various elements in a data viz. → less effective than Label as it positioned far away from the data

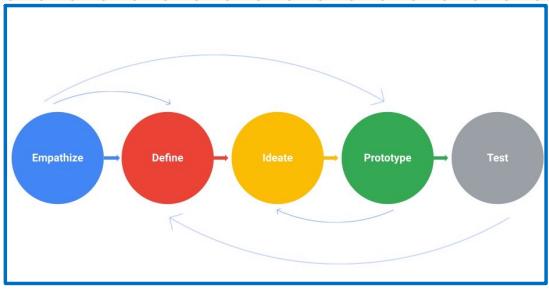


Average Rents in the Tri-City Area → Headline

Oceanside, Vista and Carlsbad → Subtitle



Designing chart in 60 min



Week 2: Data Viz. with Tableau

Workshop on Tableau

- 1) Filters
- 2) Marks [Color Detail]

Week 3: Crafting stories with Data

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

③ Data story telling steps:

- 1) Engage your audience → engaging & holding someone's interest & attention.
→ have "primary message" → find this by using **Spotlighting**
- 2) Create compelling visuals → show story of your data (visualisation)
- 3) Tell the story in an interesting narrative.



Live & Static insights

- ↳ screenshots or snapshots dashboards, in presentations reports, views to automatically updated data

Diverging color palette

→ displays two ranges of values using color intensity to show magnitude of the number and the actual color to show which range the number is from.



Should be considered to help Data Viz.

1. Five-second rule → data viz should be clear, effective, and convincing enough to be absorbed in ≤ 5 secs
2. Color Contrast → should use a "diverging color palette" to show contrast between elements.
3. Conventions & Expectations → with their org. (Red-, Green-)
4. Minimal Labels → titles, axes, annotations should use as few labels to avoid busy and confusion.

"convince them to see what you see; have "primary message" * know your audience"



Scan through data quickly identify the most important insights. e.g. write on board

Data Storytelling tips

- ✓ Characteristics → people effected your data
- ✓ Settings → background describes
- ✓ Plot → create tension, conflict.
- ✓ Big reveal → how the data was shown that prob can be solved.
- ✓ Aha moment → recommendations are shared.