

6 Principles of Graphical Integrity

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Edward Tufte

- American statistician and professor emeritus at Yale University
- A pioneer in the field of data visualization
- He developed 6, widely accepted, principles of graphical integrity in his book *The Visual Display of Quantitative Information*
- “Above all else show the data!” - Edward Tufte

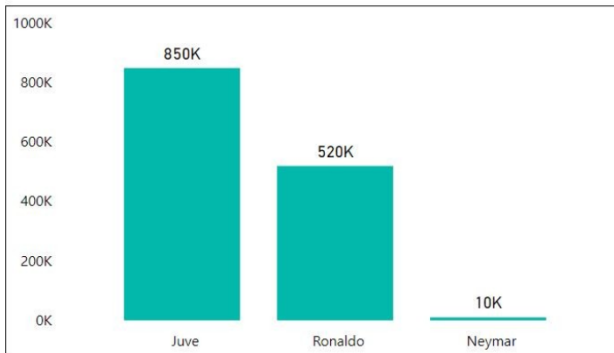
1. Graphical Integrity

- Tufte emphasizes the importance of displaying the data in a way that is as close to reality as possible. Avoid any additions that may disrupt the viewer's perception of the data.



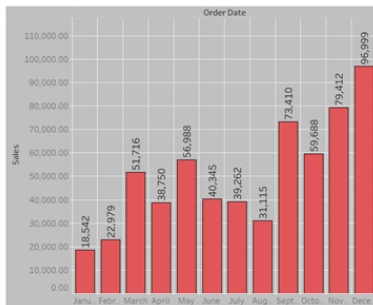
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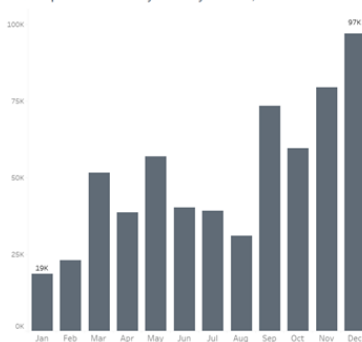
2. Use high data-ink ratio

Monthly Sales Analysis of a USA Superstore: Unveiling Revenue Trends and Seasonal Patterns for a Successful Business Year in 2020



Low Data Ink Ratio

USA Superstore Monthly Sales by Months, 2020



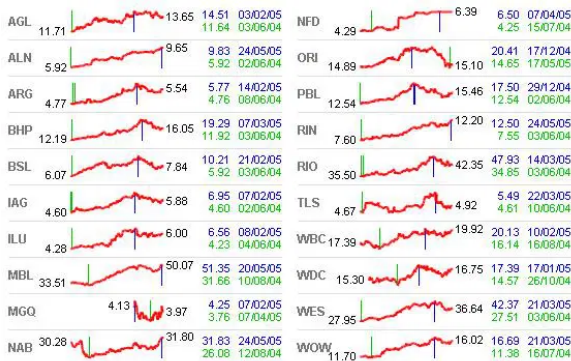
High Data Ink Ratio

3. Maximize data density

- Tufte advises displaying as much information as possible in a small space, provided that it doesn't compromise clarity. This can be achieved through the efficient use of tables, graphs, and other visualization techniques:
 - ▶ use a color to represent a category
 - ▶ order the data by a relevant variable
 - ▶ use small multiples

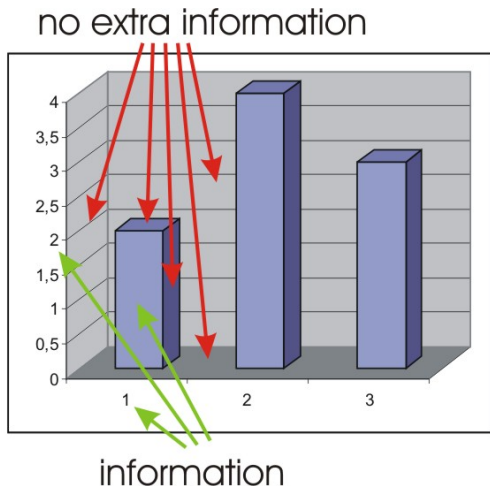
4. Use small multiples

- Small multiples are series of the same small graph repeated in one visual (e.g. `facet_wrap()` in `ggplot2`)
- Small multiples are a great tool to visualize large quantities of data and with a high number of dimensions



5. Avoid distorting the data

- Tufte warns against using visual techniques that distort the data, known as *chartjunk*: 3D effects, excessive color, or scaling that can mislead the viewer



6. Provide a clear, detailed, and thorough context

- Tufte emphasizes the importance of providing context for the data, including labeling axes clearly, using informative titles, and providing relevant explanations and references.
- Remember to include information about:
 - ▶ units used (e.g. inches or centimeters)
 - ▶ dates and times
 - ▶ use only widely recognized abbreviations
 - ▶ definitions of relevant variables
 - ▶ sources of data

Supplementary materials

Cool materials on Edward Tufte:

- How one man TRANSFORMED CHARTS forever
- Edward Tufte: Beautiful Evidence