Specialty

Data visualization

Represents data with shapes, positions, and colors so they can be compared, explored, and understood.



In Spanish

Visualización de datos

Origin

Bertin (1967) defines the visual variables; Tufte (1983); Cleveland and McGill (1984)

What problem it addresses

Not all charts are read equally well: comparing angles or areas is much harder than comparing positions.

Principles

The question chooses the chart

First what has to be compared or found; then the form.

What matters, where it reads best

Position on a common axis beats angle, area or color.

Honest proportions

What is drawn changes as much as the data.

Applications in design

✓ Use it like this

Before choosing the chart type, write down which question it has to answer.

✗ Avoid

Pie charts with many similar slices.

Don't fall for it

Start bars at zero: otherwise you exaggerate the differences.

Connections

Builds on

- Cognitive load
- Lie factor
- Accuracy of visual encodings
- Data-ink ratio
- Sonification

Related to

- Data storytelling

Authors and works

1967	**Jacques Bertin**	Defined the visual variables (position, size, value, color, shape…) used to encode any data.
1983	**Edward R. Tufte**	Argued for devoting a chart's ink to the data and removing what does not inform.
1984	**William S. Cleveland and Robert McGill**	Ranked, through experiments, which ways of representing values are read most accurately.
2014	**Tamara Munzner**	Proposed analyzing each visualization by what data it shows, why (for which task) and how it encodes them.

Sources

Original sources

- Bertin, J. (1967). Sémiologie graphique: Les diagrammes, les réseaux, les cartes. Gauthier-Villars. (Trad. inglesa: Semiology of graphics, University of Wisconsin Press, 1983).
- Tufte, E. R. (1983). The visual display of quantitative information. Graphics Press.
- Cleveland, W. S., & McGill, R. (1984). Graphical perception: Theory, experimentation, and application to the development of graphical methods. Journal of the American Statistical Association, 79(387), 531–554. View source (https://doi.org/10.1080/01621459.1984.10478080)

Academic reviews

- Munzner, T. (2014). Visualization analysis and design. CRC Press (A K Peters). View source (https://www.cs.ubc.ca/~tmm/vadbook)

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