

# Design Principles for Infographics

## ***Visual language.***

Horn, R. E. (1998). MacroVu, Inc.

### **in·for·ma·tion graph·ic /n/**

Moderately sized, meaningful combination of words, images, and shapes that together constitute a complete communication unit. Visual and verbal elements are tightly integrated. Is as self-contained as possible on 1 or 2 pages or on a large screen. Usually contains considerably more information than a concept diagram, although an information graphic may use any of the types of concept diagrams as its central visual element. Usually contains several blocks of text. **Abbr.** infographic.

*The entire book is an exposition of the morphology, syntax, semantics, and pragmatics of visual language through the use of numerous infographics.*

## ***The Visual Display of Quantitative Information***

Tufte, E. R. (1983). Graphics Press.

Principles of Graphic Excellence – p. 51

1. Graphical excellence consists of complex ideas communicated with clarity, precision, and efficiency.
2. Graphical excellence is that which gives to the viewer the greatest number of ideas in the shortest time with the least ink in the smallest space.
3. Graphical excellence is nearly always multivariate.
4. Graphical excellence requires telling the truth about the data.

Principles of Graphic Integrity – p. 77

1. The representation of numbers, as physically measure on the surface of the graphic itself, should be directly proportional to the numerical quantities represented.
2. Clear, detailed, and thorough labeling should be used to defeat graphical distortion and ambiguity. Write out explanations of the data on the graphic itself. Label important events in the data.
3. Show data variation, not design variation.
4. In time-series displays of money, deflated and standardized units of monetary measurement are nearly always better than nominal units.

5. The number of information-carrying (variable) dimensions depicted should not exceed the number of dimensions in the data.
6. Graphics must not quote data out of context.

Theory of Data Graphics – p. 105

1. Above all else show the data.
2. Maximize the data-ink ratio.
3. Erase non-data-ink.
4. Erase redundant data-ink.
5. Revise and edit.

Data Density and Small Multiples – p. 175

Well-designed small multiples are

- inevitably comparative
- deftly multivariate
- shrunken, high-density graphics
- usually based on a large data matrix
- drawn almost entirely with data-ink
- efficient in interpretation
- often narrative in content, showing shifts in the relationship between variables as the index variable changes.

Small multiples reflect much of the theory of data graphics:

- For non-data-ink, less is more.
- For data ink, less is a bore.

Aesthetics and Technique in Data Graphical Design – pp. 177, 183,

Attractive displays of statistical information

- have a properly chosen format and design
- use words, numbers, and drawing together
- reflect a balance, a proportion, a sense of relevant scale
- display an accessible complexity of detail
- often have a narrative quality, a story to tell about the data
- are drawn in a professional manner,
- avoid content-free decoration, including chartjunk;

There are many specific differences between friendly and unfriendly graphics:

Friendly	Unfriendly
Words are spelled out, mysterious and elaborate	Abbreviations abound, requiring the viewer

encoding avoided.	to sort through text to decode abbreviations
Words run from left to right, the usual direction for reading occidental languages.	Words run vertically, particularly along the Y-axis; words run in several different directions.
Little messages help explain data.	Graphic is cryptic, requires repeated references to scattered text.
Elaborately encoded shadings, cross-hatching, and colors are avoided; instead, labels are placed on the graphic itself; no legend is required.	Obscure codings require going back and forth between legend and graphic.
Graphic attracts viewer, provokes curiosity.	Graphic is repellent, filled with chartjunk.
Colors, if used, are chosen so that the color-deficient and color-blind can make sense of the graphic.	Design insensitive to color-deficient viewers; red and green used for essential contrasts.
Type is clear, precise, modest; lettering may be done by hand.	Type is clotted, overbearing.
Type is upper-and-lower case, with serifs.	Type is all capitals, sans serif.

- If the nature of the data suggests the shape of the graphic, follow that suggestion.
- Otherwise, move toward horizontal graphics about 50 percent wider than tall.

### ***Visual Explanations***

Tufte, E. R. (1997). Graphics Press.

Visual and Statistical Thinking – p. 53

Visual representations of evidence should be governed by principles of reasoning about quantitative evidence. For information displays, design reasoning must correspond to scientific reasoning. Clear and precise seeing becomes as one with clear and precise thinking.

Such dual principles – both for reasoning about statistical evidence and for the design of statistical graphics – include (1) documenting the sources and characteristics of the data, (2) insistently enforcing appropriate comparisons, (3) demonstrating mechanisms of cause and effect, (4) expressing those mechanisms quantitatively, (5) recognizing the inherently multivariate nature of analytic problems, and (6) inspecting and evaluating alternative explanations.

Multiples in Space and Times – p. 105

Multiple images reveal repetition and change, pattern and surprise – the defining elements in the idea of information.

- Multiples directly depict comparisons, the essence of statistical thinking.
- Multiples enhance the dimensionality of the flatlands of paper and computer screen, giving depth to vision by arraying panels and slices of information.
- Multiples create visual lists of objects and activities, nouns and verbs, helping viewers to analyze, compare, differentiate, decide ...
- Multiples represent and narrate sequences of motion.
- Multiples amplify, intensify, and reinforce the meaning of images.

Visual Confections: Juxtapositions from the Ocean of the Streams of Story – p. 121

A confection is an assembly of many visual events, selected from the various Streams of Story, then brought together and juxtaposed on the still flatland of paper. By means of a multiplicity of image-events, confections

### ***Beautiful Evidence***

Tufte, E. R. (2006). Graphics Press.

Mapped Pictures – p. 45

Well-designed and thoughtfully mapped pictures combine the direct visual evidence of images with the power of diagrams: Images representational, local, specific, realistic, unique, detailed qualities; Diagram's contextualizing, abstracting, focusing, explanatory qualities.

Most explanatory and evidential images ... should be mapped, placed in an appropriate context for comparison, and located on the universal grid of measurement.

Mappings often represent an explanatory theory applied to the visual evidence.

Therefore the standards of what constitutes a credible account also apply to mappings.

Mappings help tell why the image matters.

Links and Causal Arrows – pp. 78-79

This ... diagram demonstrates excellent analytical practices for displays that use links and arrows to tie nouns together: timelines, trees, networks, organization charts, project management charts, and the like. These practices are:

Focus on causality -

Multiple sources and levels of data – Too often diagrams instead rely solely on one type of data or stay at one level of analysis.

Annotated linking lines – Links and arrows should provide specifics: when and how the link operates, its strength and persistence, credibility of evidence for the link.

Annotated nouns – Like linking lines and causal arrows, nouns in diagrams should be labeled, annotated, explained, described.

Efficiency of design – Designs for analytical diagrams should be clear, efficient, undecorated, maplike; the content should be intense, explanatory, evidential, maplike.

Credibility – An analytic graphic should provide reasons to believe.

#### Principles of Analytical Design – pp. 127-136

1. Show comparisons, contrasts, difference.
2. Show causality, mechanism, explanation, systematic structure.
3. Show multivariate data; that is, show more than 1 or 2 variables.
4. Completely integrate words, numbers, images, diagrams.
5. Thoroughly describe the evidence. Provide a detailed title, indicate the authors and sponsors, document the data sources, show complete measurement scales, point out relevant issues.
6. Analytical presentations ultimately stand or fall depending on the quality, relevance, and integrity of their content.