

Information Graphics

A Comprehensive Illustrated Reference

Graphs

| | Brand A | Brand B | Brand C | Brand D | Brand E |
|-----------|---------|---------|---------|---------|---------|
| Feature 1 | ● | ○ | ○ | ○ | ○ |
| Feature 2 | ○ | ○ | ○ | ○ | ○ |
| Feature 3 | ○ | ○ | ○ | ○ | ○ |
| Feature 4 | ○ | ○ | ○ | ○ | ○ |

Tables

| | 1993 | 1994 | 1995 | 1996 | 1997 | Total |
|-----------|------|------|------|------|------|-------|
| Product A | 23.1 | 23.7 | 24.2 | 24.9 | 25.6 | 121.5 |
| Product B | 2.7 | 3.1 | 2.5 | 1.8 | 0.9 | 11.0 |
| Product C | 10.7 | 11.2 | 11.5 | 11.9 | 12.5 | 57.8 |
| Product D | 5.9 | 7.2 | 9.8 | 12.4 | 15.7 | 51.0 |
| Total | 42.4 | 45.2 | 48.0 | 51.0 | 54.7 | 241.3 |

Diagrams

Charts

Visual Tools for Analyzing, Managing, and Communicating

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Information Graphics

A Comprehensive Illustrated Reference

Visual Tools for Analyzing, Managing, and Communicating

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Information Graphics

A Comprehensive Illustrated Reference

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All data used in the examples in this book are fictitious. Numeric values in the

Organization and major contents

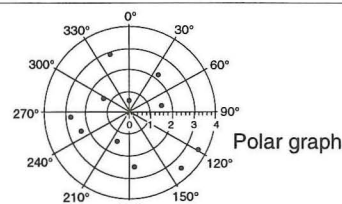
The contents of this book are organized for ease of use. Towards this goal:

- Entries are alphabetized using the letter by letter system in which spaces, hyphens, commas, etc., between words in the major headings are ignored.
- Although the major headings of Chart, Graph, Map, Diagram, and Table are each listed in their proper alphabetical location, the individual graphics and features that make up these major categories also have their own headings in the master alphabetical listing.
- Specific applications are described and illustrated to relate the theoretical to the practical.
- Entries are accompanied by one or more graphic examples (frequently annotated) that complement the written descriptions.
- Terminology applicable to specific graphics are explained in the text, shown on the example, or both.
- General terminology such as Variable, Fill, Legend, Matrix, Polygon, Plane, Coordinate, etc., are discussed under their individual headings.
- For the convenience of the reader, some information is repeated under multiple headings.

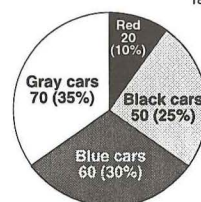
The following additional features have been incorporated.

Four major types of cross-referencing

- When an information graphic has a single name but might be classified several different ways, the major write-up is included under one of the headings and cross-referenced under the others. For example, the main write-up for polar graph (right) is under Polar Graph but it is referenced under Graph, Circular Graph, and Point Graph.
- When an information graphic is commonly referred to by several different names, the major write-up is shown under only one of the headings. The other names are included at their proper alphabetical locations along with a short description, an example, and a reference as to where the major write-up is listed. For example, various users refer to the chart at the right by nine different names. The major description is included under Pie Chart, with only thumbnail descriptions under the other eight headings.
- In cases where the same name is used to describe entirely different information graphics, each situation is handled on an individual basis. An example is shown below in which each of the graphics is sometimes referred to as a bar chart. In this particular case, the information graphics are different enough that each is given its own write-up. Each is cross-referenced appropriately, although all are not referenced to one another. Superscripts are assigned in cases where the exact same name is the one most frequently used for multiple graphics.

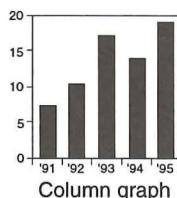


Polar graph

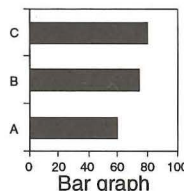


Sometimes referred to as:
Pie chart
Cake chart
Circle diagram
Circle graph
Circular percentage chart
Divide circle
Sectogram
Sector chart
Segmented chart

- In cases where the same name is used to describe entirely different information graphics, each situation is handled on an individual basis. An example is shown below in which each of the graphics is sometimes referred to as a bar chart. In this particular case, the information graphics are different enough that each is given its own write-up. Each is cross-referenced appropriately, although all are not referenced to one another. Superscripts are assigned in cases where the exact same name is the one most frequently used for multiple graphics.



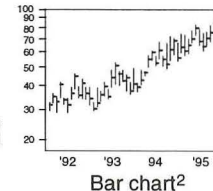
Column graph



Bar graph



Bar chart¹



Bar chart²

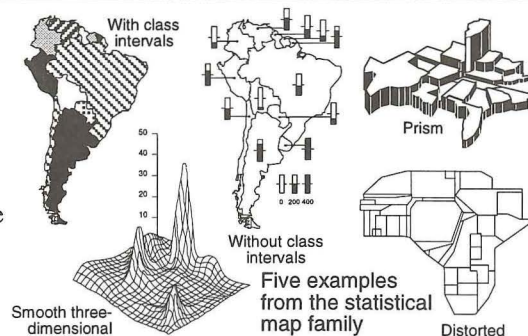
- When a topic is related to an entry or it would be beneficial for the reader to be aware of a related topic, the related topic is noted in the write-up.

Meaningful groups and families of information graphics

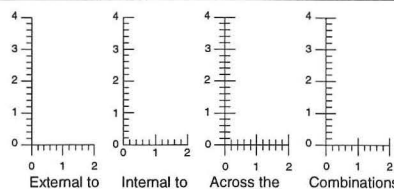
With so many different information graphics used in such diverse applications, it is sometimes helpful to group them into families or categories. For example, it is useful to know which graphs are used to study data distribution or to look for correlations. It is helpful to know which graphs present percent-of-the-whole data most efficiently or what types of graphs are used to determine probabilities. In the area of maps, it is useful to know that most maps that are used as charts fall into six major categories, the four major ones being statistical, descriptive, flow, and topographic. The sections that discuss the various groupings of information graphics are in addition to the sections that discuss the specifics of the various graphics.

Key construction details

Most information graphics software programs have construction details designed into them. For instance, the initial decisions are made largely by the software manufacturer regarding line size, tick marks, grid lines, scales, type of text, etc. Many programs give the operator the option of changing these, and as people become more proficient they often generate their own unique graphics. If the graphic is being made by hand, all the construction decisions must be made by



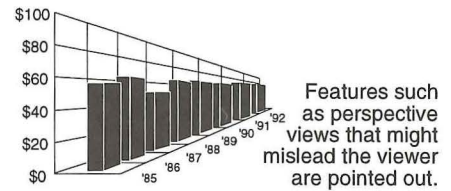
Five examples from the statistical map family



Organization and major contents (continued)

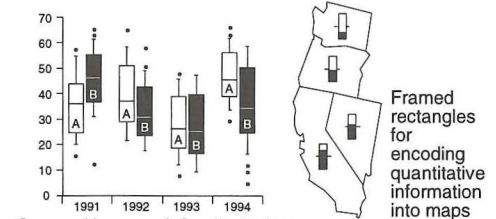
Design features that might mislead the viewer

Certain methods of presenting data have been found to frequently mislead the viewer. Many times these methods are used because the person making the graphic is unaware of the hazard or does not know an alternative. These misleading design features, such as broken scales and perspective views, are discussed under their individual headings such as Scales and Perspective Projection, as well as under certain specific types of graphs and maps.



The most up-to-date developments in information graphics

Many advances have been made in the area of information graphics, both as a result of creative individuals such as W.S. Cleveland, E.R. Tufte, and J.W. Tukey as well as many excellent software developers. In some cases an entirely new information graphic has been invented, such as the box graph. In other cases it might be a component, such as a framed rectangle symbol, or a concept, such as the data-ink ratio. Because previously there has been no vehicle to bring these developments to the attention of the vast majority of users, many of the new designs and techniques are largely underutilized.

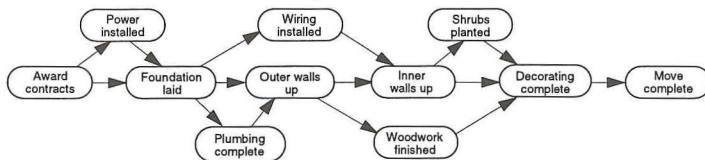


Grouped box graph for displaying the distribution of sets of data

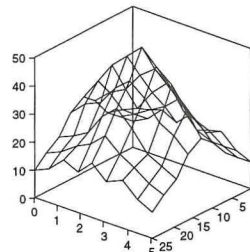
Examples of some of the most recent developments in information graphics

Information graphics available as a result of new software

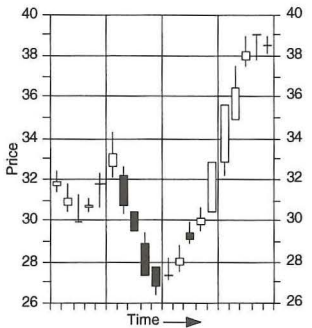
There are a number of information graphics that have been around for many years, but because there was no efficient way to generate them, they have not been widely used. With the development of powerful desktop computer software, these graphical tools are now economically available to anyone interested. These charts are discussed in the context of all of the other charts with no special category assigned to them. Three examples are shown here.



PERT chart used for planning and tracking major programs



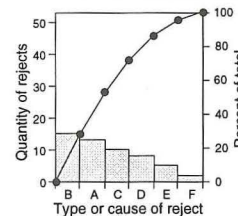
Wire frame graph used for displaying data with three variables



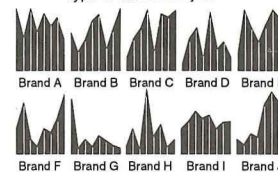
Candlestick chart used for recording the price of stocks, commodities, etc.

Information graphics used in many different fields

In some cases information graphics developed in one field can be directly applied in other fields. In other cases, a slight modification might make the graphic useful, or in still other cases, a specific information graphic may not work but the idea of how the chart elements are used might trigger a completely new chart design. One of the purposes for including application-specific information graphics is to serve as a catalyst in the transfer of graphic ideas from one field to another.



Pareto chart for analyzing quality situations



Icon comparison display used to compare three or more characteristics for multiple entities

| | |
|--------|----|
| City A | 15 |
| City B | 19 |
| City C | 24 |
| City D | 13 |
| City E | 4 |
| City F | 10 |
| City G | 36 |
| City H | 15 |
| City I | 34 |
| City J | 15 |
| City K | 10 |
| City L | 30 |
| City M | 31 |
| City N | 11 |
| City O | 19 |
| City P | 16 |
| City Q | 21 |

One-half bidirectional table for data in which row and column headings are the same

Interrelationships of complex information graphics

In most cases a brief explanation plus an example is all that is required for readers to understand how a chart or graph is constructed and functions. In a few cases it is not obvious how a particular graph or map is generated or how two or more graphs or maps relate. In these cases a more detailed explanation is sometimes given, as shown at the right. Taking the time to study these more detailed explanations is not necessary for an understanding of the basic graphs or maps. Such explanations can be skipped without detracting from the main content of the section.

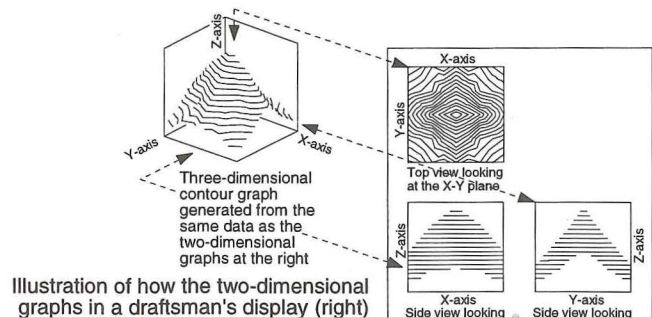


Illustration of how the two-dimensional graphs in a draftsman's display (right)

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