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Choosing the right graph

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Graphs: When to use them

The decision to use a graph to convey an idea should not be automatic. Neither should it be based on the availability of computer software. More of ten than not, graphs seem to replace meaningful analysis of data. Graphs cannot replace analysis but, if properly used, they can communicate your findings effectively.

We will begin with a review of the underlying context in which graphs tend to be effective. Recent brain research shows that the human brain does a good job of comparing relative sizes when the information is graphically presented (eg. in a bar chart). But the brain does not do an equally good job of estimating absolute quantities presented in a graphical form. This is because these two types of information are processed in two different parts of the brain. They are also processed differently in the brain. **Use graphs to compare relative quantities. Do not use graphs to present absolute quantities.**

Graphs are effective for presenting 'digested information' ie. the producer of the graph has understood the data and knows what they mean and wants to convey this meaning to the readers. For example, if your analysis shows that sales have doubled in the past 5 years (see last month's article), this information is very clearly conveyed in a chart like the one presented on the right comparing A with B.

Graphs should not be used to convey quantitative information. We cannot judge absolute quantities where shown in a graph, making graphs a poor medium for presenting quantitative information. On the other hand, graphs are excellent for communicating qualitative information such as 'sales are going up' or '1992 was an exceptional year' etc.

Graphs - When to use what

Purpose	Example	What to use	Comments
Large amounts of quantitative information	Attribute ratings, sales figures	Numeric tables	Avoid graphs here
Limited amount of quantitative information	As above but no more than 3 or 4 values	A suitable chart with numbers specified or numeric tables	Unless you are showing a simple contrast, make sure you include the actual numbers
Comparing absolute values	Sales figures, demographics, limited number of attribute ratings	Bar charts with figures, column chart with figures	it is generally a good idea to include the numerics in all graphs
Comparing proportions	% profits by operations, relative expenditure on different items	Pie charts, stacked column/bar charts of constant height	
Relationship between two attributes	Price and units sold, overall rating and quality	Scatter chart	When you use a scatter chart, you may want to ad a line (or an elliptical circle) to alert the reader of the nature of the relationship
Trend	Sales over time, social attitudes over time	Line chart	
Present a collection of items that can be in any order		Checklist (bullet points)	Avoid numbering
Present a collection of items that should be in a given order	Marketing actions that should be performed in sequence to achieve a marketing objective	Numbered List	Avoid bullet points
Present a series of actions that may involve intermediate decision points	Our marketing strategies which will, at each stage, depend on our competitor's response.	Flow charts	
Present hierarchical relationships	Reporting structure with an organization	Organizational charts	
Simultaneous events	Work plan where two tasks can be carried out simoutaneously	Timeline charts	There are many similar ways of depicting timelines
Repeated patterns	Average sales during different seasons	Average for each cycle point (e.g. for each quarter) plotted and connected	

When to use what

For those who want to use graphs, options are endless: pie chart, area graph, layered graph, line graph, scatter chart, ribbon chart, spider chart, to name a few. Faced with such options, how should we go about selecting the most appropriate one for our data? Visual illiteracy often leads to the selection of the familiar and the attractive. What is familiar and attractive may not always be the best choice. The Exhibit on the previous two pages shows what charts to use when(More to come in the next issue of *Imprints*).

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