Technical Communication
Engineering 100.250
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Visuals

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Choosing, Finding and Using What You Need


Please describe an eggbeater

Here’s one…

Use visuals to teach people about things that are difficult to put in words

*But always recall that visuals are an adjunct, not a replacement of text.*

“The greatest number of ideas in the shortest time with the least ink in the smallest space.”

Edward R. Tufte on what makes an excellent visual.

Visually are used for two purposes

Keep them in mind: you will know what to use

The two purposes

Informative       Dramatic
Visuals: Two Purposes

Informative

www.ukbikestore.co.uk/acatalog/HOPE_M4_Caliper.html

Dramatic

www.swantycito.co.uk/

Or both purposes?

Consider the following slide…

A graph showing the amount of federal appropriations over the years. The dark line indicates reading scores from 1975 to 1999.

Source: United States Department of Education https://www2.ed.gov/parents/academic/involve/nclbguide/overview.html

Keep in mind your purpose

Purpose determines what visual is used

The mere fact that you can make a visual does not mean you should use one.

Purpose determines what visual is used

And even whether you use one.

Some examples of visuals

Graphs
Pictures
Photos
Drawings
Maps
Organizational charts

Diagrams
Exploded diagrams
Tables
Flow Charts

Examples of Graphs (Charts)

- Line graphs
- Bar graphs
- Pie charts
- Flow charts
- Organizational charts
- Gantt charts

Line graph

- Shows continuing data
- Show the relationship between a dependent and independent variable

Line graph

- X axis shows independent variable
- Y axis shows dependent variable

Bar graphs

- Useful for showing relative amounts of different things at the same time.
Bar graphs are useful for showing relative amounts of different things at the same time.

*The are good for showing big differences.*

![Vertical Bar Chart](http://www.ncsu.edu/labwrite/res/gh/gh-bargraph.html), 17 March 2004

**Horizontal Bar Chart**

![Horizontal Bar Chart](http://www.ncsu.edu/labwrite/res/gh/gh-bargraph.html), 17 March 2004

**Pie charts**

Are useful to show a series of parts that add up to 100%

*But they must not have too many slices.*

![Pie charts](http://www.ncsu.edu/labwrite/res/gh/gh-bargraph.html)

**As a rule, avoid 3-D pie charts**

![3-D pie charts](http://lilt.ilstu.edu/gmklass/pos138/datadisplay/)

**Can you see a problem?**

![3-D pie charts](http://www.math.yorku.ca/SCS/Gallery/)
Can you see a problem?

Pictures

Vivid but not always informative.

But be sure that the data presented are meaningful.
Make sure that data presented are meaningful: avoid things such as percentages without bases.

Numbering conventions for tables and visuals

Tables are numbered this way

Table 1
Table 2
Table 3

All other visuals are numbered this way

Figure 1
Figure 2
Figure 3

Tables and figures are numbered independently

Figure 1
Figure 2
Table 1
Figure 3
Table 2

Tables are labelled above, and all other visuals are labelled below, thus:

<table>
<thead>
<tr>
<th>Table 1: Selected New Car Prices for 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobile</td>
</tr>
<tr>
<td>Chevrolet Cruze</td>
</tr>
<tr>
<td>Chevrolet Equinox</td>
</tr>
<tr>
<td>Honda Civic</td>
</tr>
<tr>
<td>Honda Civic Si</td>
</tr>
</tbody>
</table>

Figure 1

http://www.nadaguides.com/Cars

http://chat.hum.com/chat/RandomHomestuckStuff/
What are the advantages of drawings over photographs?

Maps: You should already have some idea of what they are.
Diagrams

Tables

Good for setting out figures

Not good for showing trends

Make sure a table displays one class of information

But visuals do not speak for themselves

You must title them

You must label them fully

Table 1: Legal Costs

<table>
<thead>
<tr>
<th>Avg salary</th>
<th>$100K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median salary</td>
<td>$60K</td>
</tr>
<tr>
<td>Avg cost of law school</td>
<td>$120K</td>
</tr>
<tr>
<td>Avg rate of employment requiring JD</td>
<td>50%</td>
</tr>
</tbody>
</table>

NEGATIVE EXAMPLE

THE TALE OF THE
ROMAN PARROT

designoval.com
An open window in Rome

Not a parrot after all

For example, what’s this?

Hubble Space Telescope
Beware of Excel

It will make graphs for you very easily

It will make bad graphs for you very easily

Excel will make bar charts like this

Or like this…

Why is this a poor visual?

Why not use a table instead?

<table>
<thead>
<tr>
<th>Table 1: Selected New Car Prices for 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobile</td>
</tr>
<tr>
<td>Maserati Gran Turismo</td>
</tr>
<tr>
<td>Cadillac CTS Coupe</td>
</tr>
<tr>
<td>Chevrolet Volt</td>
</tr>
<tr>
<td>Mercedes-Benz C Class Coupe</td>
</tr>
<tr>
<td>BMW 1 Series 128i</td>
</tr>
</tbody>
</table>

http://www.nadaguides.com/Cars
Honesty and Clarity

Wrong

SPAD S.XIII

Right

Honesty: you must credit the creator or owner of any visual that you use

Honesty and clarity

Obviously, you must be honest in presenting your data

*But if you are not careful you may produce a deceptive visual*

A majority of residents of the red states voted for George Bush in the 2004 election, while a majority of the residents in the blue states voted for John Kerry.

www.cscs.umich.edu/~crshalizi/election/
Politics!

Consider the previous visual in light of these facts:

Of those who voted in the 2004 election, 50.7% voted for George Bush and 48.3% voted for John Kerry, a difference of 2.4%.

Previous map redrawn to reflect the size of states by population instead of land area

www.cscs.umich.edu/~crshalizi/election/

Text reads: "This line, representing 18 miles per gallon in 1978, is 0.6 inches long."

from Tufte, 1983, p. 57

Text reads: "This line, representing 27.5 miles per gallon in 1985, is 5.3 inches long."

http://www.math.yorku.ca/SCS/Gallery/infobites.html#LieFactor

“Standard deviation of batting averages for all full-time players by year for the first 100 years of professional baseball. Note the regular decline.”

www.math.yorku.ca/SCS/Gallery/images/gould.gif

www.math.yorku.ca/SCS/Gallery/images/gould2.gif
A graph showing the amount of federal appropriations over the years. The dark line indicates reading scores from 1975 to 1999.

Source: United States Department of Education https://www2.ed.gov/parents/academic/involve/nclbguide/overview.html


Beware of Excel

- It will make pie graphs from data that do not add up to 100%
- It will make 3-D graphs
- It will make bar graphs with too many bars

Visuals can be dangerous

Visuals can be dangerous if you rely on them without realizing that many people cannot understand them

This means they can be not only useless to the reader, but dangerous to you.

Remember: Many people have difficulty with graphs

“Another psychologist tested grownups... The vast majority were unable to see what the charts and graphs were supposed to show: they couldn’t even grasp general facts or spot basic trends.”

Don’t assume your reader will understand your visual.

“Try to teach people with a picture and you may find that you need a thousand words to tell them exactly what to look at and why.”


### Concert Flute

- A tube (often of silver) consisting of three main sections
  1. Head joint
  2. Body
  3. Foot joint
- Has a set of keys of one or two sorts
  1. Plateau keys or American keys (closed)
  2. French keys (open holes)
- Head joint has embouchure surrounded by lip-plate

### Concert Flute: Structure

- Consists of three main sections
  1. Head joint
  2. Body
  3. Foot joint
- Has one or two sorts of keys
  1. Plateau keys or American keys (closed)
  2. French keys (have open holes)
- Head joint has embouchure surrounded by lip-plate

### Some interesting historic visuals

www.fluteworld.com/Yamaha-YFL-481H--and--YFL-461H.html
Visual Pointers

Visuals, by themselves, are not clear.

Visuals never take the place of text; they are an adjunct to it.
Visual Pointers

Visuals, by themselves, are not clear: you must explain what you want the viewer to understand.

Visuals never take the place of text; they are an adjunct to it.

Visuals need to be introduced and explained.

Visual Pointer

If a visual is not yours, you must attribute it, or you are plagiarizing.

Visuals Summary

Decide what you are trying to convey before choosing a visual:

- Information
- Dramatic effect

If you wish to convey information, decide which visual is the most efficient means:

- Introduce the visual
- Explain to the audience what they are to understand from the visual

Visual Pointers

Visuals need to be introduced and explained.

Visuals need to be labelled properly.