LT-S
~~LBSC~~ 571 Soergel   **Lecture 5.2d, Reading 4**

Some useful document design guidelines

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Techniques to Increase the Problem-Solving Value of Technical Prose

Technique	Explanation	Example
(1) Emphasize functional or explanatory text features:		
Sentence structure (added by DS)	Use short, simple sentences. Use affirmative statements rather than negative statements. Use active voice rather than passive voice.	
Labeling	Assign each major cause, step, feature, or technique its own name to promote recall [Use consistent terminology (variation distracts)]	Headings such as 'Labeling,' 'Signaling,' and 'Organizing,'
Signaling	Crystallize items in lists / outline format, mark list items with numbers, bullets or asterisks	(1).... (2).... and (3)...
Organizing	Group text into overt sections by task or other features	Headings such as 'technique.' 'explanation,' and 'example'
Headings, indenting	Use headings and indented text blocks to indicate the grouping and relationships of ideas presented	
(2) Give concrete support for abstract rules and concepts:		
Modeling	Depict abstract relations concretely in diagrams, charts, or other models	See table 11.2 (only in the original paper)
Exemplifying	Supply explicit examples, cases, or analogies for each general role or concept	See this table, column 3
Visualizing	Choose terms and phrases that suggest vivid images for explanatory features. [Choose symbols and icons that express internal structure (DS)]	'Flow of control.' -virtual machine'
(3) Promote effective, active processing by the reader:		
Include study questions	Questions that stress functional relations and causes, not just rote memorization of facts	'How do disk directories support private batch jobs?' is better then 'List three disk-directory utilities.'
State problem-solving objectives	Use explicit statements and headings	'Problem-solving techniques' is better than 'Some ideas form the literature'
Supply summaries	Note taking promotes problem solving: summaries let readers compare their notes with summaries	See summary presented in table I 1.1 (only in the original paper)
Include a glossary	Missing prerequisite facts and inadequate definitions confuse readers and thwart problem-solving	List abbreviations; provide online glossary (e.g., via FIND command)

Evidence from many sources suggests that drafting text using these techniques not only increases readers' recall of specific facts later, but, more importantly, also improves the success rate with which readers can apply what they have read to solve their problems. (Giril in Dillon ed. 1991, Table 11.3)

Some guidelines for document layout and computer interface display design

Based on in Shneiderman's 92 Samples of the 162 data-display guidelines from Smith and Mosier (1986), with many additions and changes

Begin every display with a title or header indicating the contents and purpose.
Leave at least one blank line between the title and the body of the display.

At any step, show all information needed for the task.

Emphasize what is important for the task. Emphasize what is needed for scanning and quick selection.
Omit or de-emphasize what is not needed at the moment.

Make groupings helpful to task. Where appropriate, use familiar groupings

Arrange groups and items within a group by some logical principle helpful to the task.

To indicate groupings, use space or boxes / widows defined by border and/or background.
Use tables for two-dimensional organization

For any particular type of data, maintain consistent format.

Display data in directly usable form; do not make users convert displayed data.

Keep labels close to labeled data (separate by at least one space).

Use pictures for better comprehension and for keeping interest.

In a sequence of displays / multi-page (multi-screen) displays:

Maintain the context. Label each page to show its relation to the others.

Rewrite only those parts of the screen that change.

Do not obscure needed information through new windows.

Message area (as in a demo of a software package) should be in same place unless that would obscure essential parts of the screen.

For a multi-page table show column headings and row labels in all displayed sections of the table.

Typographical guidelines

As a rule use a serif font (easier to read)

Do not use full justification (straight right margins) if it leads to uneven spacing between words (hard to read)

Left-justify columns of alphabetic data to permit rapid scanning.

Use size coding and bolding for emphasis (for headings and other important text), use underlining or all caps sparingly, if at all. A larger symbol should be at least 1.5 times the height of the next smaller symbol.

Use color coding for applications in which users must distinguish rapidly among several categories of data, particularly when the data items are dispersed on the display. Inform yourself about rules for color schemes.

Use blink coding for immediate attention; the blink rate should be 2 to 5 hertz, with a minimum duty cycle (ON interval) of 50 percent.

Enable users (or a system administrator) to make changes to display functions when requirements change.

Another look at document design elements from the perspective of studying their effects

(grouped by the characteristics given in the table on p.13) (from Neuman 1993, p. 28, some bolding added, numbering system changed from 1., a. b, c to 1., 1.1, 1.2, 1.3 to reflect the structure of the list in the numbers.)

1. **Referential characteristics**, i.e., the symbol system(s) used to represent the content

    1.1   How do 'macro" elements of display design (e.g., overall format, various groupings of information, use of graphics, etc.) enhance and constrain students' extraction of useful information from databases?

    1.2   How do 'micro" elements (e.g., type sizes and styles, use of capital and lower-case letters, etc.) enhance and constrain this extraction?

    1.3   What changes in referential characteristics are likely to improve the usability of databases for students?

2.   **Informational characteristics**, i.e., the quality of the presentation of the content

    2.1   What are the most important types of information to include in databases for students? What is the most effective way of highlighting this information to enhance usability?

    2.2   How should the information in databases and on individual displays be rationed to enhance its usability for students?

    2.3   How should the information in databases be ordered to enhance its usability for students?

3.   **Relational characteristics**, i.e., the relationships expressed or implied in the content presentation

    3.1   What are the most effective devices for relating information in databases for children? Proximity? Similarity? Chronological, procedural, and/or hierarchical sequence?

    3.2   What are the most effective devices for making relationships apparent and enabling students to master them?

4.   **Demand characteristics**, i.e., the expectations of users inherent in the material

    4.1   What are the most effective devices for arousing and sustaining students' interest? For focusing students' attention on the most salient information?

    4.2   What are the most effective devices for enhancing students' abilities to anticipate the locations and types of salient information?

    4.3   What are the most effective devices for engaging students actively with the information in databases? For helping them think about it, process it, and elaborate it?

5.   **Image-of-the-other characteristics**, i.e., the ways in which the materials reflect the designers' conception of the user

    5.1   What learner characteristics are reflected in the design of databases? Reading 'levels? Spatial visualization abilities? Other symbolic and iconic skills required?

    5.2   What navigational tasks are required by the databases? Are these within the ability levels of the students?

There are many specific differences between friendly and unfriendly graphics:

(From Tufte , The visual display of quantitative information. Cheshire, CT: Graphics Press; 1983, p. 183)

Friendly	**Unfriendly**
words are spelled out, mysterious and elaborate encoding avoided	abbreviations abound, requiring the viewer 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-aids; words run in several different directions
little messages help explain data	graphic is cryptic, requires repeated references to scattered text
elaborately encoded shadings, crosshatching, and colors are avoided; inste2d, 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 chart chunk
colors, if used, are chosen so that the color-deficient and color-blind (5 to 10 percent of viewers) can make sense of the graphic (blue can be distinguished from other colors by most color-deficient people)	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	is all capitals, sans serif

Soergel's supplemental style rules

1	**Announce what your paper is about**

	1.1	Devise a **good title**
	1.2	Start the paper with a **one-sentence statement of purpose**. Don't keep the reader guessing as to why she should read this. Give results or claims early

2	**Keep content logic and physical expression in sync.**

2.1 Sections

2.1.1 Divide your paper into **numbered sections**.

2.1.2 Use an **expressive numbering scheme**, either 1, 1.1, 1.1.1 or A, A1, A1.1
(The 1, 1.1, 1.1.1 scheme is actually an international standard)
Roman numerals have been found inefficient more than a thousand years ago.
The usual numbering style (often taught in English 101 no less) I, A, 1, a, gives only the symbol for the present level and provides the reader very little orientation as to what section and subsection she is in.

2.1.3 **Bold section headings**

2.2 Use **bulleted or numbered lists** whenever separable points can be identified (as in stages of a process, or reasons in an argument). Separated items can be taken in much faster by the reader.
Note: White space is good; to save trees use recycling not cramped presentation.

2.3 Arrange text in logical blocks

2.3.1 **Use boxes to set off the main points of an argument** (a box may look like a slide you would use for a talk). Preparing slides is a great way to crystallize the points you want to make. (One doctoral student discovered a very interesting way to analyze her data while preparing the slides for the defense.)

2.3.2 **Use boxes to set off examples and detailed explanations** that are not necessary to understand the main line of your argument.
Note: A single-cell table is the simplest way to make a box.

2.3.3 **Keep text that belongs together on the same page**.

2.3.4 In slides and lists: **Put line breaks at meaningful points**; for example, do not break in the middle of a multi-word phrase (could get a computer program to implement this rule). (In Word, Shift-Enter makes a new line without starting a new paragraph.)
(See example at end)

3	Use easy words

3.1   Don't use a 50-cent word when a 25-cent word will do

Instead of	Use
utilize or employ	use
has to	must
on a daily basis	daily

3.2   Consistently use the same word for a given concept.
Avoiding repetition is a much overrated principle for scientific and scholarly writing. Using different words for the same concept only confuses the reader.

4	Miscellaneous formatting

4.1   Use **left justification**
This avoids hard-to-read irregular spacing between words. Full justification (the default in many word processors) gives the illusion of professionally typeset text, but quality typesetting distributes the spacing between words in a line evenly.

4.2   Avoid quotation marks by using italics

4.3   Avoid underlining (or use very sparingly). Use as bold or italics instead.

4.4   Avoid using all caps. Use large and bold or such instead

4.5   Do not center text unless there is a good reason. Several lines of centered text are hard to read.

4.6   In a long document, **use running headers at the top of the page** indicating the section. A lot of work, but it keeps the reader oriented.

4.7   In tables, avoid a cramped appearance by using top and bottom cell margins of .04 - 0.1 inches depending on the font size. In MS Word, right-click, select Table Properties > Options > Default cell margins, enter values.

5	Avoid fool rules

Follow common usage when it is helpful, deviate when there is good reason.
For example, in a bibliography the title of the piece (whether a book or a journal article) is most important and should be highlighted, contrary to common practice. Unfortunately, many people suspend thought and follow conventions, no matter how illogical or lacking in usefulness:

"When I read some of the rules for speaking and writing the English language correctly...I think--
        Any fool can make a rule
        And every fool will mind it."
-- Henry David Thoreau (1817-62), American writer, author, naturalist.

6 For slides

Note: You would be surprised how many slides presented at conference violate the simple rules laid out here. Paradoxically, people specializing in human-computer interaction are often the worst offenders.

6.1 **Avoid gimmicks**, such as flying in titles or making one point of a list appear at a time – all distractions. Animation used judiciously can be quite useful, but often animation is gimmicky and distracting.

6.2 **Use high contrast**
Black on white is best contrast, especially in a lighted room

In a dark room, **white on black or very dark blue** can look quite elegant.
Avoid textured background at all cost.
If you want to set off a block of text through a colored background, use a very light pastel color

6.3 **Use graphics to make a point, not as mere decoration**
Slides with graphics are more interesting.
Sometimes a diagram that shows how different ideas or concepts interrelate is easier to understand than discursive text

6.4 **Use Arial font** Make the font big enough, particularly for a large room.
20 points is generally just large enough.

6.5 In a bulleted list, **put enough spacing between bullets** (at least .6 lines).
For sub-bullets, use somewhat less spacing, .4 or .3 lines.
The idea is to make logical divisions of the text visible through physical blocks

6.6 Make sure the bullet has a good distance from the text (not glued on, not too far away) and make sure **all text under a bullet is aligned properly** at the left (easy to do with the PowerPoint ruler).

6.7 Make the **key points or phrases in each bullet (colored) bold** to give structure to a text slide and let the reader pick up the main ideas quickly.

Example for sensible line breaks	
Compare	**Expanding the possibilities of deliberation: the use of data mining for strengthening democracy with an application to education reform**
With	**Expanding the possibilities of deliberation: the use of data mining for strengthening democracy with an application to education reform**