
Review Comments and Suggested Revisions

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PageFormat

Introduction

Some specification writers feel a document on Page Format is not necessary. A few argue it is not even desirable, considering the various forms of typing. Nonetheless, whether a manual, automated, or computer print-out system is employed, each demands this discipline. When the Division and Section Formats were introduced, arguments against uniformity were heard. In each case the arguments failed as widespread use of the Formats brought acceptance. Specification practices have been upgraded through the uniformity provided by widespread use of these formats.

The first concern of the Page Format is an improved and clearer presentation of the construction message. The second concern is to provide a format which can be used with equipment existing in most offices as well as with currently available computer equipment.

In the resulting design of this Page Format, maximum density without obscuring the construction message or hindering rapid reference became the major consideration. The writer and the reader were put before the typist, the printer, the equipment manufacturer, but without placing unreasonable demands upon any of them.

The Page Format should then exhibit a reasonable amount of text density, providing visual recognition of the Parts and lesser levels, and arranging the subject matter in a logical, efficient and versatile page.

– excerpts from the CSI Manual of Practice, June 1974

Existing PageFormat

Page Format was the title of CSI Document MP-2E in the 1974 Manual of Practice.

It is clear that those who wrote the first version of PageFormat were interested in communication. It is also clear from reading the entire chapter on Page Format that the “equipment existing in most offices” and “currently available computer equipment” had limited flexibility.

The document makes several references to typewriters, to 12-pitch and 10-pitch typeface, and the abilities of typists. The only form of written emphasis mentioned is the underline, which is prohibited. “Emphasis...is achieved by capitalization, spacing and punctuation.” Other forms of emphasis and formatting techniques commonly used in publishing, such as boldface, italics, and varied line spacing are absent. There is little doubt that the original Page Format was designed for typewriters or for computers that were then capable of producing only typewritten output with fixed-pitch type.

The 1992 edition of PageFormat varies little from the 1974 version. Its only concession to the capabilities of current word processors is the use of bold font, which may be used to “enhance the appearance of...section heading; PARTS; articles; and end of

section.” It still recommends avoiding use of “[d]ifficult or awkward characters” including “asterisks and brackets which are commonly used in computerized text editing systems. . . .”

Learning from the experts

We are no longer restricted by the limitations of the manual typewriter. Most word processing programs introduced in the last ten years are able to provide all of the control that was formerly reserved for publishers. Rather than ignore these added features, we should look at how they are used by those who have been printing books for decades.

It may be well to review those aspects of format that were considered most important nearly twenty-five years ago.

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These remain valid criteria; all that has changed is the technology available in our offices. The essence of CSI’s Formats is communication – presenting information in the most easily understood manner. PageFormat should take advantage of all available means to make specifications easier to read.

Column width

The most visible difference between a specification that is prepared according to PageFormat and virtually any book or newspaper is the line length. The specification has a single column of text while a professionally produced document will usually have two or more columns, even if it is printed on standard 8-1/2 by 11 paper. Those documents that do have a single column usually have generous side margins. Why does this happen?

To find the answer to this and other topics discussed here we must understand what happens when we read. In this case, we are interested in eye movement.

As we read any printed material, our eyes scan the text from left to right, return to the left, drop down one line, and begin again. The longer the distance from one margin to the other, the more easily we lose track of which line we just finished. The result is often a second start on the new line when we become aware that it does not follow the previous text. Not only does this make reading slower; it can also cause misinterpretation if we unknowingly skip a line.

Publishers and style manuals use a variety of standards to establish column width. One old rule of thumb says that the length of a line in picas should equal the font’s point size times two¹. A 12-point font would then have a line length of 24 picas, or four inches, and a 10-point font would have a line length of 3-1/3 inches. Another rule

pica: unit of measure used by printers, equal to 1/6 inch. six picas equal one inch.

arrives at a similar dimension beginning with a line containing all of the letters in the alphabet.²

Other sources arrive at similar line lengths by dictating the number of characters or the number of words. The widest range for characters is thirty to seventy per line. The recommended number of words per line is ten for serif fonts, and eight or nine for sans serif fonts.

According to Colin Wheildon, in *Type & Layout*, “38 per cent of readers found body type set wider than 60 characters hard to read. A further 22 per cent indicated they probably wouldn’t read wide measure body type even though they didn’t find any difficulty reading it.”

A specification section using a 12 point font and the margins and indents found in PageFormat will have approximately fifteen words, or 75 characters, with a line length of over six inches. If a 10-point font is used, the number of words jumps to nineteen. This may seem like a great way to save paper, but it is not as easy to read as the same text with a shorter line length.

Given the marked impact of long lines on reading, there should be little disagreement on establishing guidelines for line length.

Fonts

Without getting into the fine points of definition, a font is simply a set of all of the characters of a given typeface in a given size and style. Due to the widespread use of scalable fonts, the meaning has become somewhat blurred, as TrueType or PostScript fonts can be almost any size the writer wants them to be.

There are two major families of fonts, serif and sans serif. A serif font, such as the one used here, has “tails” at the tops and bottoms of the characters, while a sans serif font has a simpler design, without the tails.

It should not be surprising that we accept most easily the font we first learned to read. In this country, serif fonts are most popular, while sans serif fonts are more common in Europe.

Typesetters have found that a combination of these two families makes it easier to distinguish between headlines and body text. For example, headlines will often be set in a bold sans serif font, while the body text is in plain serif.

There are those who claim that sans serif fonts are “cleaner” or have some other overriding characteristic, but there is substantial evidence that serif fonts are significantly easier to read. There is a variety of theories to explain why we read serif fonts more easily, but the result is clear: use only serif fonts for body text.³

The size of a font is also important. If it is either too small or too large, it will be hard to read. The apparent size of a font is affected by two factors: leading and x-height.

Leading (rhymes with bedding) defines the space between lines. Typesetters frequently add space between lines of body text, and take it out between lines in headings. The additional space makes body text easier to read, as we are less likely to return to the beginning of the line we just left. The reduced space in headings makes them look

serif: the little “tails”
found at the tops and
bottoms of a character.
sans serif: without
serifs.
the body text of this
document is Garamond,
a font with serifs, while
the headings are in
Arial, a sans serif font.

better, and makes them easier to read, as well. Most word processors automatically provide a reasonable amount of leading, but it should be checked to make sure that one to two points of leading are added to body text.

The x-height is the height of the lowercase x, which marks an imaginary horizontal line through the font. Ascenders rise above that line, while descenders fall below the bottom of the baseline. As the x-height becomes smaller, the font begins to look like musical notes. As it becomes larger, the ascenders almost disappear, interfering with the pattern recognition necessary for quick reading.

Most people prefer body text in the range of ten to twelve points. A font as small as eight points may be used for tables, and larger fonts may be used for titles or headings. Very small fonts should be sans serif, as serifs become so tiny that they are no longer usable.

In *Type & Layout*, Colin Wheildon presents an extensive list of combinations of font size and leading, ranging from an eight point font with eight points of leading (8/8 in the printer's language) to a fifteen point font with 17 points of leading (15/17). Participants in his studies were asked to read text in various combinations and indicate which they preferred. Seventy-five percent chose fonts from 10/11 points to 12/14 points.

Emphasis

Relying on a simple typewriter, the early Page Format had no choice but to avoid any printed form of emphasis. Even though underlining was possible, it was probably considered too difficult for the typist. The only simple way to lend any prominence to Part titles was to add an extra line space after the preceding paragraph.

Other forms of emphasis already in use by the publishing industry included bold face, italics, and varying the amount of space between paragraphs. Those same tools are now available in current word processors, and should be used to improve readability.

Books and newspapers regularly use a combination of bold face, larger font, and a change in font style to make headings more visible. Word processors can be made to automatically apply different characteristics to different paragraph levels within a section, so there is no good reason to not use them.

In the world of typography, the underline is *not* used for emphasis.⁴ It is occasionally used in footnotes and other references, but in the publishing world the underline is the proofreader's symbol mark to say, "set this in italics," and that is how body text is emphasized.

In body text, boldface slows reading, while italics have less effect.⁵

In the comments found at the end of this report, there are two suggestions for use of italics. Both have merit, but I recommend using italics in much the same manner as used in other documents, i.e., for titles. I have also found them useful to distinguish between manufacturers' names and the names of their products. For example, W.R. Grace *Bituthene*.

Uppercase

Uppercase text is often used to emphasize. Unfortunately, although it does draw attention, it drastically reduces readability.

When we read, we rely not only on the individual characters, but on the shapes created by combinations of letters when they form words. The uniform height of uppercase letters removes most of the pattern formed by ascenders and descenders, and turns the text into a meaningless blur.

Uppercase should never be used in body text.⁶

Finding information

Different paragraph levels are typically denoted by a combination of address and indent. The most commonly used addressing system is similar to the common organization for outlines, as is the series of indents.

Using a combination of varying line spacing and bold face type, it is possible to make paragraph levels obvious without deep indents, thus allowing more uniformity of line length. Word processors now allow us to use increments of vertical space smaller than that produced by a carriage return, so paragraphs may be automatically separated by spaces smaller or larger than a single line space.

Headers and footers

According to the old Page Format, “most project manuals are printed on one side of the paper,” but it attempted to allow for printing on two sides by centering the header and the footer, and placing the optional project identification at the unbound edge of the page.

The most recent PageFormat places the project name, number, and date – a lot of information – on one line at the bound edge, the page number in the center, and the section title at the unbound edge. The CSI example does not use a header, and the CSC example does not use a footer.

The best location for the title, date, and so on, is certainly open to debate. Using only a footer or only a header unnecessarily restricts flexibility. The indicated location of the section title, on the unbound side of the footer, helps the contractor (and the specifier as well!) when looking up specific material. For the owner, who may have several volumes of different project manuals out at one time, a prominent location for the project title may be more important.

Using both a header and a footer, along with more flexibility in placement of critical information will allow project manuals to better fit the needs of each project.

Alignment

When typewriters were used, flush left alignment was the de facto standard, as it was impossible to simultaneously align both margins. Only publishers had the ability to add space between characters and words to make all lines come out even on both sides.

flush left: all text
aligned with the left
margin.

justified: text aligned
with both margins.

The introduction of proportional fonts and automatic hyphenation made it possible for word processors to create justified text, though often without the control exercised by typesetters. It is still not unusual to see justified text with `t o o m u c h s p a c e` between characters or `between` words, making reading very difficult.

Oddly enough, publishers are now using flush left alignment more frequently. Justified text may look nicer, but flush left aligned text is easier to read.

The reason is again related to eye movement and to the way we see text. When we are reading we do not see individual words, but take in small groups of words each time our eyes pause as they scan a line. When we make that jump from one line to the next, it is easier to tell one line from the next when they differ in length, as the end is still in sight, at least for lines that aren't too long.

There is some disagreement as to whether it is easier to read text that is justified or that is flush left.⁷ Most sources I found were on the side of flush left. I believe that justified text can be as easy to read, but only if the space between characters and words is controlled much more carefully than is possible with word processors. Unless these spaces are carefully adjusted, the result is what is called "rivers of white" running through the text. If text is justified, hyphenation is mandatory to control spacing.

Section title, article titles, end of section, capitalization

For some unknown reason, it was decided in 1974 that both the title and the end of section indication should be centered. In addition, the section number occurs on one line, with the section name located two lines below.

Logic and common use indicate that the section title is really a single item comprising both the section number and the section name. As such, they should not be separated, but should be on the same line.

Although centering in itself is not unusual for a title, left aligned titles are also common, and one could make a strong case for a right aligned title, where it is closest to the unbound edge of the page. For consistency, though, both the title and the end of section indication should be left aligned.

Use of uppercase reduces comprehension of titles, just as it does for body text; a bold title of mixed case is easier to read.⁸ Because there are rarely more than a few words in specification titles or article titles, the difference is probably minimal, but mixed case should still be recommended.

Make your point, save a tree

Some have argued that two-column printing saves paper. Indeed, I have found that most specification sections take up a little less space when printed in two columns. To really save space, though, we could use single columns with small margins and miniscule fonts, and include a magnifying glass with each project manual.

It is the combination of all of the above changes that makes text more readable, and, as a bonus, saves a few pieces of paper. One could continue to use a 12-point font and increase the unbound margin to produce lines of fewer words; the result would look

like the page you are reading. One could also use a 10-point font and two columns per page. (Examples of two-column format are included at the end of this report.)

Using bold face for titles and articles obviates the need for an extra line space before Part numbers and between the last paragraph and the end of section indication. Deleting one level of indent for all levels after the article picks up a little more space, and using only a half instead of a full line space between paragraphs gains even more.

The frequent use of bullet-type items, especially in Part 2, often results in lines with only a few words. Though longer sentences will take up more lines in two-column format, many of the shorter statements remain on a single line.

PageFormat - is it broken?

The answer is a qualified no. The format standardized twenty years ago is still widely used with little complaint. Specifications that conform to PageFormat can be read and understood without noticeable difficulty.

A better question would be, "Can PageFormat be improved?" The answer is an unqualified yes. That we are not consciously aware of the greater difficulty in reading a particular page format is not a reason to ignore potential improvement.

It is my position that any change that does improve communication should be incorporated in the appropriate CSI Format. It is almost certain that there will be resistance, even as there was resistance in 1974 to Page Format, yet we must show the courage of our founders and establish standards that support our motto – "Advancement of Construction Technology."

Should we not have the courage to take a positive approach, we must at least expand the existing requirements to include the above recommendations.

The electronic age

Specifiers would find it much easier to adopt a recommended format if it weren't necessary to change all of the settings found in today's word processors. CSI should develop document templates for single column and two column formats, each with the macros required to apply styles to paragraphs, for both Word and WordPerfect.

As more CSI documents are issued by disk or by Internet, it seems reasonable that we furnish formats in electronic files, along with a list of recommended fonts. Those that are in the public domain or available without charge should also be furnished.

PageFormat is not the only CSI document that should be changed to take advantage of standard writing and publishing practices. The MOP chapter that addresses specification language could also be updated, and all CSI publications should be reviewed for conformance to accepted standards the next time they are revised.

PageFormat and other documents should be converted to HTML, with hypertext links between related topics. This would provide greater integration and reduce the need for repeating common information in different documents. Updates would also be easier to distribute, using the Institute web site as a cyber store.

Endnotes

¹ “In general, choose a maximum line width for body copy that, when measured in picas, will be no more than twice the size of the type when measured in points. *The Professional Look*.

² “Column width has a profound effect on readability... To determine the proper column width... type 1.5 lowercase alphabets... and measure the result.” *Design Principles for Desktop Publishers*.

³ “...the serif makes life easier on the reader by accomplishing three things: It cuts down on the reflection of light from around the letter into the reader’s eye... it links the letters in a word and provides a horizontal guideline, and it helps distinguish one letter from another. The word “Illinois” is a classic example. Without their serifs, the first three characters all blend together. The serifs provide the clues necessary to differentiate the uppercase *I* from the lowercase *l*.” *Design Principles for Desktop Publishing*

“Research results are clear: When the time comes to choose text copy, go with *serif* type. When the eye has finished reading one line of type, it more easily tracks back to the beginning of the next line when it can follow along an imaginary line formed by the serifs along the baseline of the type.” *The Professional Look*.

Effect of font, from *Type & Layout*. The effect is expressed as the comprehension level of those taking a comprehension test; figures are the percentage falling in each scoring category.

Font/Comprehension level	good	fair	Poor
Text printed in serif	67	19	14
Text printed in sans serif	12	23	65

⁴ “*Underlining undermines readability*. More than a few underlined words cause visual clutter and confusion. Also, it takes more time for readers to separate the words from the horizontal line. In addition, portions of the descenders often become lost in the underlining, making the letters harder to identify.” *Looking Good in Print*.

⁵ Effect of boldface in body text, from *Type & Layout*. The effect is expressed as the comprehension level of those taking a comprehension test; figures are the percentage falling in each scoring category.

Text/Comprehension level	Good	Fair	poor
Text printed in Times Roman	70	19	11
Text printed in Times Roman bold	30	20	50

⁶ “The eye is most efficient at recognizing patterns, not words, and that’s how we read: by recognizing visual patterns and combining them into meanings. Those patterns, for the most part, are determined by the top half of the word. Without serifs along the tops of letters, pattern clues are inadequate. The eye is forced to read, rather than scan.

⁷ “Flush-left type is easiest to read.” *Looking Good in Print*.

“Research shows that rag right [flush left] is most legible in body copy. After reading one line of type, the eye jumps naturally back to the left margin to find the start of the next line. ... for the average reader, justified and rag right type are equally legible. However, slower readers find rag right to be more legible. Why? Possibly because the spacing between words and letters... remains more consistent, or perhaps because the eye tracks more easily from the end of differing-length lines back to the beginning of the next line. *The Professional Look*.

⁸ Effect of capitals on comprehension of titles, from *Type & Layout*. Effects are the percentage of participants showing good comprehension.

Font/Comprehension level	Lowercase	Uppercase
Serif old style	92	69
Sans serif	90	57

Bibliography

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