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Principles of Typography for User Interface Design

Typography is a major part of the graphical user interface (GUI). Good user interface design depends on our understanding of how type works as a visual system. In this article, we summarize the typographic principles that were developed through print practice and show how they translate and expand within the electronic medium. We define typography as a dynamic system of contrasts resulting from the relationship of the type (its color, form, rhythm, and style) to its background. We then explain how to manipulate these contrasts to design effective GUI systems and presentations of text on the computer screen. We conclude by outlining the limitations and advantages of electronic type.



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This article is meant to define the role of typography in user interface design. If this purpose seems rather grand, our intention is modest. We hope we can simply do this job by pointing out the obvious: Typography is a major part of the GUI. Understanding how type works as a visual system is a major factor in good user interface design.

Our written language is communicated through type. Typography conveys or obscures and gives voice to our message in one fashion or another. The GUI inherited from the two-decade-old Xerox PARC–Apple–Motif–Windows tradition is a combination of images and words. The images, whether they are bars and palettes of icons, layers of tabs, or cascading menus, have never told the entire story. The icon on the screen may tell you that you are looking at a program, but the words below the icon tell you the specific program or document at which you are looking.

Typography has its own meta-language. Its shapes and relationships convey meaning even

before we decode the words with which they give shape and voice. The System 8.0 Monitors & Sound control panel (Figure 1) is a useful example. We can read the meta-language of the dialog box from top to bottom and left to right, just as we would read any printed text. Variations in typography are used to establish five distinct uses of typographic language:

1. Small, thin black type on a gray background names the icons for the four groups of controls.
2. Larger and darker black type connected to box lines names the three choices for the selected control.
3. The same large, black type, when placed next to a radio button or a drop-down list or on a raised button, expresses a command option.
4. Thin, white type on a black background identifies the current selection.
5. Thin, black type on a white background identifies the other choices that could be selected.

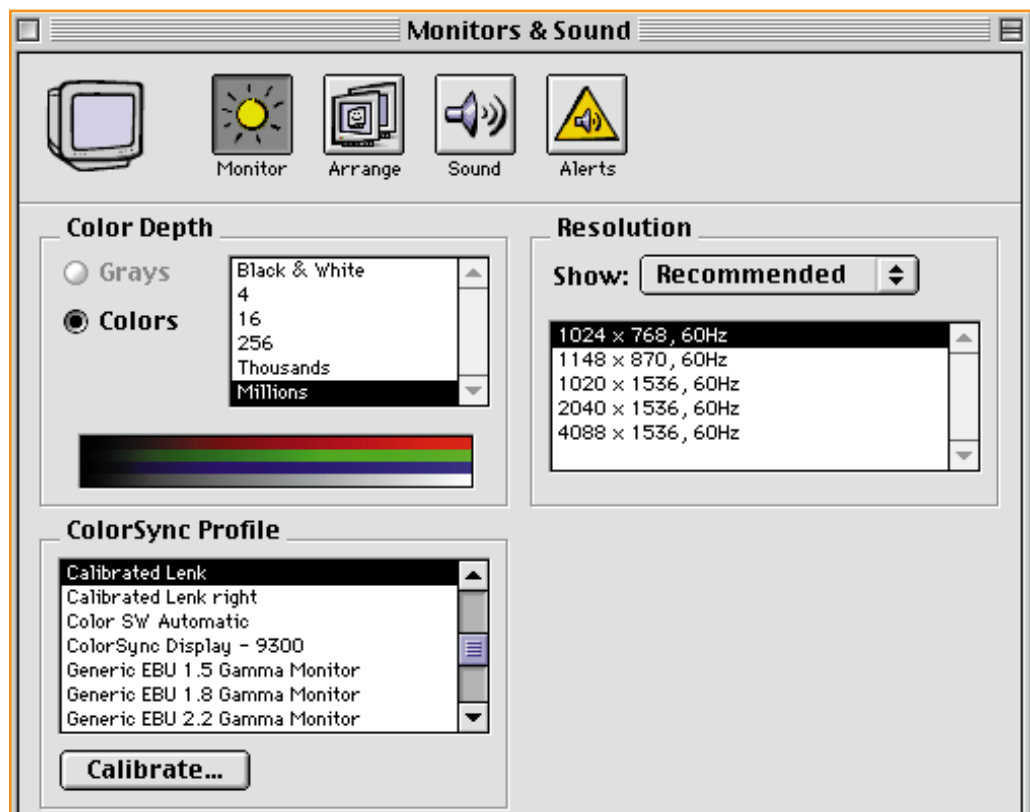


Figure 1. Meta-language of contrasts in size, context, and reverse color, applied consistently in all typography makes this control panel interface easy to read and use.

This system works through small, well-controlled modulations of size, color, and context. We explain next how these kinds of dynamic contrasts are the foundation of the typographic art.

The Art of Typography Is a Dynamic System of Contrasts

Type is about contrast. It is the contrast between the type and its background that makes the letterform visible to the human visual system. There is an old German saying: “Typography is the art of using black to expose whiteness.” We place black ink on white paper to communicate information. We think we see the black type when we look at the resulting page, but in fact, we see black only because of the whiteness exposed beneath it.

Type has color density as well as hue (blue, black, red, gray). The density of the type’s color (its volume) reaches us when it is contrasted with the color of a field (its background). It is a contrast of dark against light or light against dark (Figure 2). Thus, contrast is a function of color density. Color density is created by the shape of the individual letterform in relation to the negative space that exposes their form to our eyes.

Letters in the Roman alphabet are made up of four kinds of shapes: form/counterform, stems, bowls, and ascenders/descenders. Even a cursory understanding of how these four kinds of shapes work helps to identify why different type designs (fonts) can have such different appearances but still convey the same letterforms.

Form and counterform

Every letter consists of the shape filled with ink, the form, and the shape defined by that shape, the counterform. A counterform can be entirely closed, such as the interior space of the “o;” partially open like the “n;” or broadly open, such as the space defined by the curve and cross stroke of the “f” (Figure 3).

Stems and bowls

The stem of a letterform is the vertical stroke. The thickness of this stroke does much to define the color density of the type, that is,



Figure 2. Color in type can be expressed in black and white. These two samples are taken from a type book by MART.SPRUIJT bv, a printing company in Amsterdam. The various “color” banners on the top example are created with variations in weight of a single font, Futura. The dark to light fade-out effect in the second example is created by progressively increasing line spacing and character spacing using Primus-Antiqua.

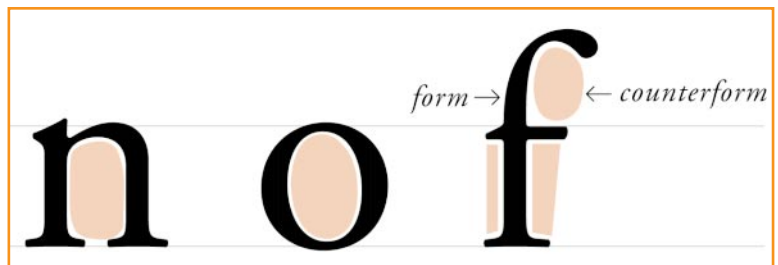


Figure 3. Form and counterform in three letters. We must see both the shape of the letter and the shape defined by the letter to read properly.

how much ink the letterform will express on the paper. The bowls of the letterform are the rounded shapes, the geometry of the curves that make the “e” and “o” and “c” move to the same visual rhythm (Figure 4).

Ascenders and descenders

The letters grouped together to make up a word align to four horizontal marks. The most obvious mark is the baseline, the bottom of letters such as “x” and “d”. Lowercase letters have a second mark, the x height, that is, simply the height of the lowercase “x” in any font. Variations in this height can make a font appear large or small in contrast to other fonts, independent of size. Ascenders and descenders are those parts of the letterform that rise above the x height, such as the stem of the “d,” or fall below the baseline, such as the stem of the “p,”

respectively. The top of the ascender defines the top of a capital letter, the cap height (Figure 5).

Most words contain some letters with ascenders/descenders, and this rising above and below the baseline/x-height range creates rhythmic contrast in the exterior shapes of words written in lower or mixed case. Words written entirely in uppercase letters do not share this contrast, having only baseline and cap height. Large amounts of text set in all caps are more difficult to read as a result of this lack of contrast (Figure 6).

The dynamic system of contrasts begins with the shapes of the letterform and continues with the contrasts created by combining letterforms into words, words into lines, and lines into a text column or block. These text blocks are then framed within a page or screen. Character spacing, word spacing, and line spacing are three contrasts that occur within any text block. Margin space is a fourth contrast that appears when the text block is placed within a frame. All four of these contrasts are highly interdependent and must work as a system to produce good typography.

Character spacing

This is the horizontal space between characters. It is another counterform, the shape exposed by the combination of letterforms. The space between “te” is quite different from “ve” or “th.” This shape is effected by the distance between the letters. Tight letter spacing can make it difficult to distinguish an “rn” combination from an “m.” Tighter letter spacing also emphasizes counterform within

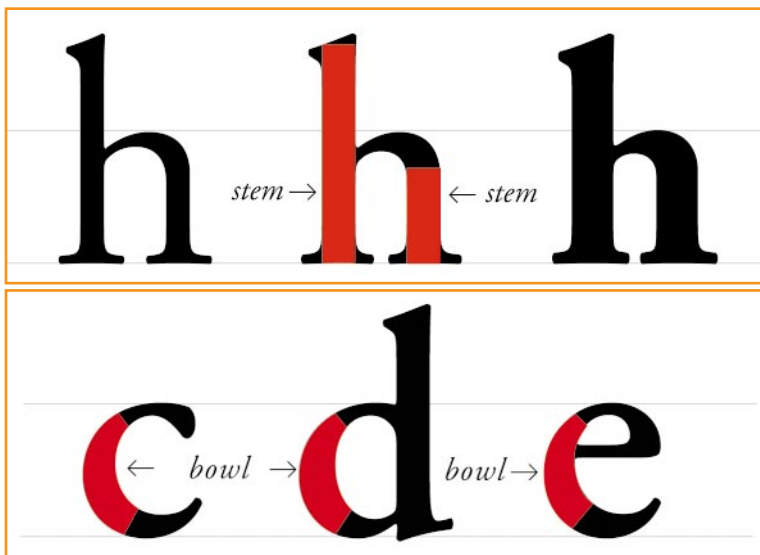


Figure 4. Stems and bowls are similar within a single font design. The variation in thickness does much to establish the color of the type. Note how the increased thickness of the stem in the “h” decreases the white counterform, making the letter dark black.



Figure 5. The x-height of the font does much to define its relative size. The larger the x-height the more white space is exposed by the counterform. These letters are the same point size, but the Helvetica on the left looks larger than the Times on the right.

letters over the form of the letter itself.

The appropriate amount of space between characters varies according to the letter combination. In computer typesetting systems, these space values were “tuned” and stored as kerning pairs, with the distances measured in very small increments, such as 1/1000 of the width of the letter “M.” The possible range for character spacing of type for the computer screen is limited by the coarseness of the display, from 0 to 2 pixels in most cases. This spacing varies considerably from font to font, with fonts specifically designed for the screen providing more uniform spacing (Figure 7).

Word spacing

Word spacing is the horizontal space between characters at a word boundary. Our visual system uses this space to identify letter groups as words. In typesetting systems that justify both left and right margins of a text block, the word space is divided into subunits and is expanded or compressed across a line (Figure 8). Most software for rendering type on the screen adjust lines to only one margin (left or right) and place a uniform space between words.

Line spacing

This is the vertical space between lines of text. It is sometimes called leading because thin strips of lead were used to increase this space when type was set in metal. Line spacing is an important attribute of font size. In fact, thinking of font size, such as 12-point type, in isolation is a common mistake, encouraged by the user interface to many word-processing programs, which historically imitated the user experience of mechanical typewriters (one

Most words contain some letters with ascenders / descenders, and this rising above and below the baseline/ x-height range creates greater contrast in the exterior shapes of words written in lower- or mixed-case. WORDS WRITTEN ENTIRELY IN UPPER CASE LETTERS DO NOT SHARE THIS CONTRAST, HAVING ONLY BASELINE AND CAP-HEIGHT. LARGE AMOUNTS OF TEXT SET IN ALL CAPS IS MORE DIFFICULT TO READ AS A RESULT OF THIS LACK OF CONTRAST.

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Figure 6. The visual rhythm and variation established by the ascenders and descenders aid the reading process by creating strong external shapes in words. The use of all caps eliminates these variations, making it more difficult to see the letter shapes.

type face and size, single or double line space) rather than typesetters. When proportional fonts were added to the Macintosh in the 1980s, a “default” line spacing of one or two pixels became an invisible standard. The size of type should be expressed as a font size and line space in combination, such as 10-point type on 14 points of leading or 10/14 (pro-

Geneva: Åke Lernmark & Jurg Ott

Arial: Åke Lernmark & Jurg Ott

Palatino: Åke Lernmark & Jurg Ott

Georgia: Åke Lernmark & Jurg Ott

Verdana: Åke Lernmark & Jurg Ott

letterspacing

Figure 7. Good letterspacing varies depending on the combination of letter forms. (Bottom) Note the large space between the “le”, the thinner space between the “et” and the very thin space between the “tt” combination in the typeset example. When interpreted by screen fonts these variations in letterspacing are greatly reduced. In this enlargement of five screen fonts (top) the distance between the “rn”, the “rk” and the “rg” combinations vary considerably, sometimes reduced to a single pixel or none at all. The “rn” is difficult to distinguish from the “m”, the “rk” is joined, while the “rg” is distinct in all five fonts because of the counterform of the two letters.

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Figure 8. Word spacing is relatively uniform when only one margin is used. When text is justified to both margins, the word space will vary. To force justify a short line, character space must be expanded and contracted as well.

nounced “ten on fourteen”; Figure 9).

Line spacing exposes the space between the ascenders of one line and the descenders of the line above. The act of reading is a process of moving the eye in jumps over the shapes of groups of letters. The shapes of the top of letters carry more information than the bottom, but our ability to distinguish both increases legibility. This is why adequate line spacing is so important. The correct amount of line spacing reveals the ascender/descender shapes that play such a critical role in our ability to perceive characters. Too little line spacing will cause the descender and ascender to touch or join in patterns that are visually confusing.

Margin space

This is the distance of the edge of the letter-

12/12, no leading

This is the vertical space between lines of text. It is some-times called leading because thin stripes of lead were used to increase this space when type was set in metal. Line spacing is an important addition to font size. In fact thinking of font size, such as 12 point type, in isolation is a common mistake, encouraged by the user interface to many word processing programs. The size of type should be expressed in font size and line spacing in combination, such as 10 point type on 14 points of leading or 10/14 (pronounced “ten on fourteen”).

12/16, 4 points leading

This is the vertical space between lines of text. It is some-times called leading because thin stripes of lead were used to increase this space when type was set in metal. Line spacing is an important addition to font size. In fact thinking of font size, such as 12 point type, in isolation is a common mistake, encouraged by the user interface to many word processing programs. The size of type should be expressed in font size and line spacing in combination, such as 10 point type on 14 points of leading or 10/14 (pronounced “ten on fourteen”).

12/14, 2 points leading

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12/18, 6 points leading

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Figure 9. Line spacing affects the color of the type, increasing or decreasing the exposed background color, obscuring or exposing ascender/descender shapes.

form from the edge of the frame in which it sits. This frame may be a page, a screen, or a region within either. The margin space exposes the text column. The left margin space is often undervalued, especially in scrolling lists such as the ones seen in the Monitors & Sounds example mentioned earlier here (Figure 10).

Using Type

The typographer maintains the legibility and readability of text by balancing the variables described earlier here. The available professional tools, such as Photoshop, Illustrator, and Pagemaker from Adobe and Xpress from Quark, provide a great deal of control of space, contrast, and color. After many years of ignoring typographic controls, Macromedia finally added many of these features to Director and Flash. Web browsers have supported only a few of these controls, forcing designers to use bitmap images to deliver typographic messages with any sophistication. The addition of style sheet support in HTML promises to add some of these essential typographic controls, such as font, line spacing, and margin control, back into Web-page design, although as of August 1998, the implementation of style sheet support in the major browsers is inconsistent. With or without these new features, the user interface designer must learn how to do the same kind of balancing as the print designer within the constraints of the tools available for manipu-

lating letterforms on the screen.

Effecting a good balance is largely a matter of understanding how to control the visual signal being sent. A large part of this is understanding the viewer's level of cognition, what makes him perceive or not perceive edges and hierarchies of shapes. Type is a mixed message of voice and context. Both parts of this signal are modulated by controlling the variables of space, size, and color. It is the modulation of these variables, along with the sense of the content, that creates words, sentences, phrases, paragraphs, lists, and headings in the mind of the viewer.

There are two ways of using type: in isolation and in volume. Each of these categories has its own requirements for appropriate type-face characteristics. These categories apply equally to type in print publications or in the user interface of computer applications.

Type in Isolation

Type can be used as an element incorporated into a larger design. Examples of this use of type are signage and labels, covers for books, magazines, compact discs. This is how type is most commonly used in user interface design. It is characteristic to use a word or phrases to convey a message, often in relation to other visual elements such as icons, button, menus, or other user interface conventions.

Type in isolation favors a font design with strong distinction, something that carries a stylistic message in a concentrated space.

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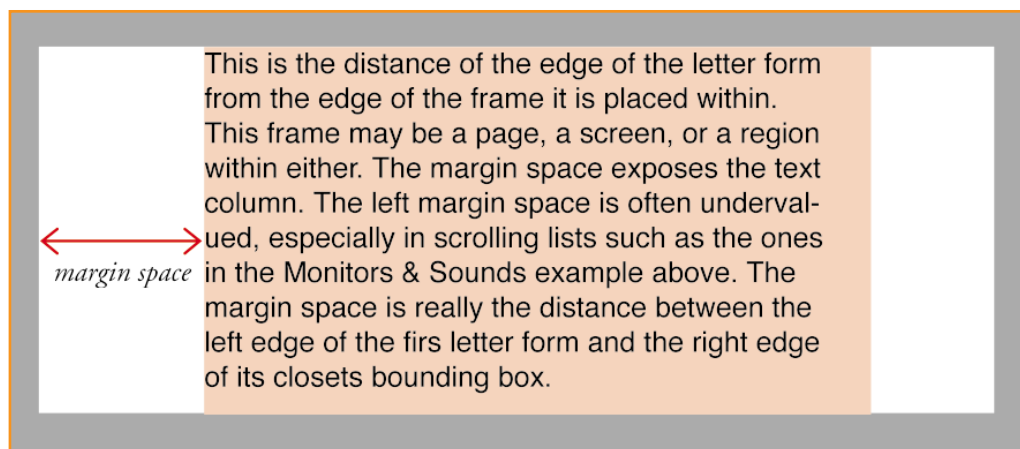


Figure 10. Margin space is the separation of the edge of the letterform from the edge of the frame. See the BBC News example [figure 14] for a dramatic example of margin space used to define the structure of a complex layout.

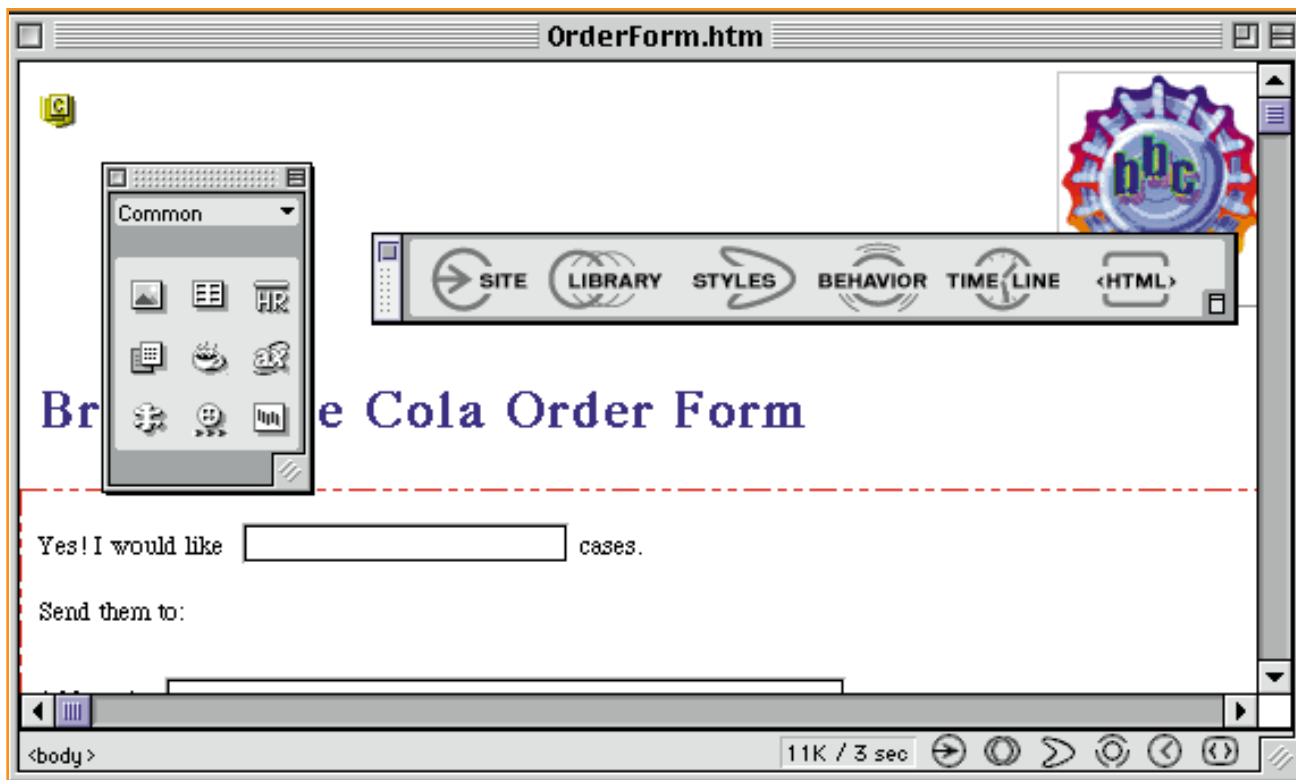


Figure 11. Type can be used in tool palettes to add both function and style to an application. The Dreamweaver 1.0 tool palette uses a non-system font integrated with command icons to convey both style and information.

These are the characteristics of display type, typefaces that speak clearly in short bursts. The counterform around each letter and word group varies widely. Visual rhythms are brief and irregular. Individual letter shapes are highly exposed (Figures 11 and 12).

The main issue in choosing and managing type in isolation is to convey style. The use of type in the packaging design we see in supermarkets and drugstores is an instructive example.

The package is the user interface for the act of product purchase, the visual point at which the customer interacts with the product on the shelf, distinguishes one type of aluminum foil or tomato sauce from another, perceives (or overlooks) the ingredients, and makes the purchase decision. This is user interface as container. Certainly the type is not the taste of the tomato sauce, but it must say something about that taste. The type must express some distinction, feeling, and/or attraction in order to compete with other packages.

The same issues are in play when a font for the user interface of a program is chosen. If the

font being used is the “system font” from the operating system, there is no distinction at all in the package. For various technical reasons, the distinction in user interface has been carried by icon design rather than type, although even the choice of a “b” to represent “bold” or a “q” for “quit” is a use of type in isolation. When we choose Syntax or Meta rather than the “system font” to convey meaning in the user interface, we give up a certain transparency in exchange for a distinct identity.

Type in Volume (en grosse)

When type is used to present continuous linear text, the requirements for the typeface change. The presentation of type is controlled by left-to-right, top-to-bottom visual syntax. The period of visual exposure is much longer than what the reader experiences with type in isolation. Regular margins and indents are part of the structural language.

There are six visual characteristics that can be used to convey distinction and variation within blocks of continuous linear text: all caps/small caps, regular face, italic face, bold

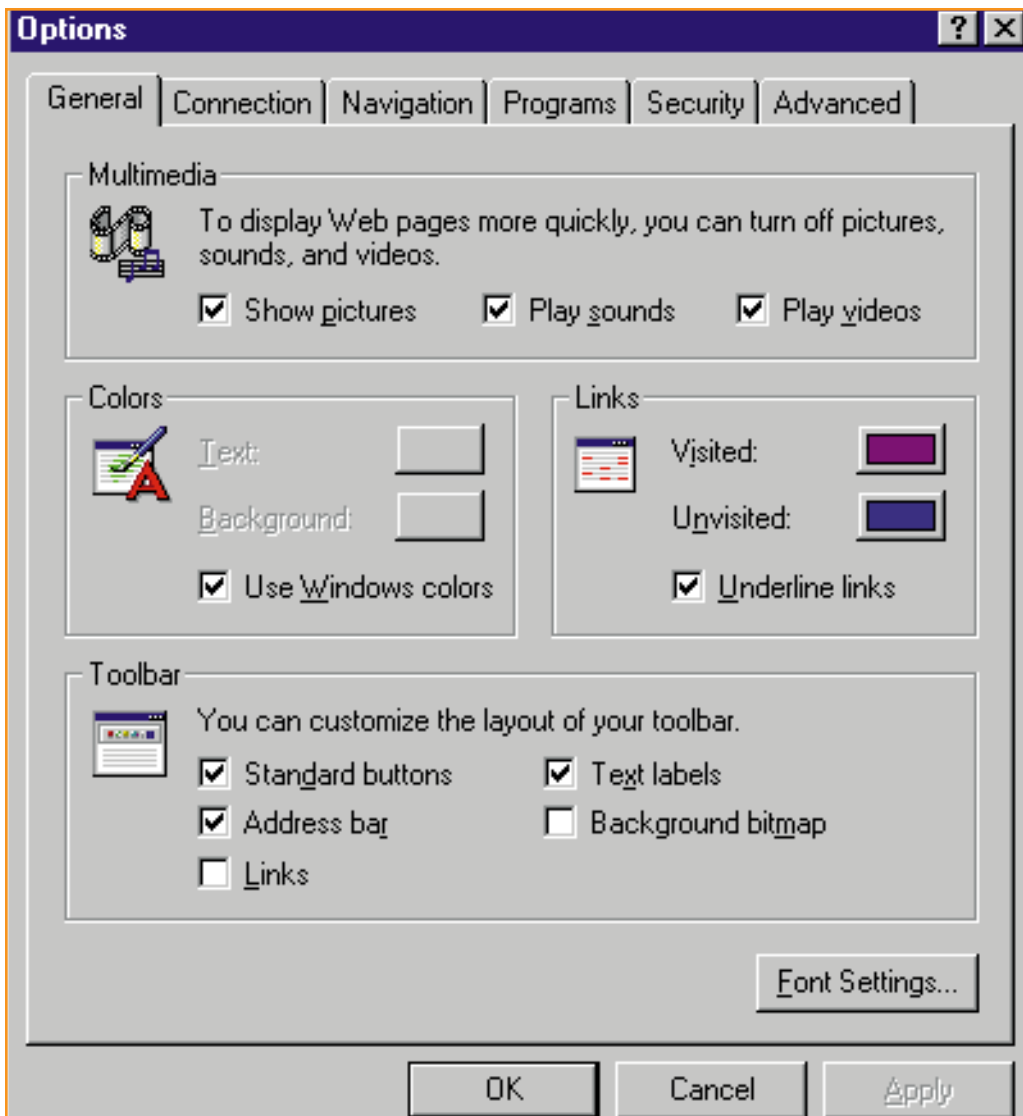


Figure 12. Lack of typographic variation in the user interface can obscure information. This options dialog from Internet Explorer 3.0 uses the system font with no variation to differentiate groups of options, options, commands, and further dialogs. The colorful icons draw the eyes away from the type. The important “Font Settings” option is very difficult to see.

face, overspacing/condensing (stretching or reducing character space), and color variation. These six distinctions are relatively easy to see in print. On the screen, the italic variation is often problematic. Based on a slanting of the letterform, italic is often distorted by coarse screen resolution and is difficult to read. Overspacing and condensing of character space can be achieved in a limited number of programs and is consequently rare. Color, on the other hand, is rarely used in print because it represents an additional production expense. On the screen, it is largely free, although it is difficult to control with any precision.

There are three other visual distinctions for type that can be used in print: black (or ultra bold), small caps, and underline. The first two are of limited utility on screen. Screen fonts cannot support two weights of bold, largely again because of the coarseness of the screen resolution. True small caps are not a feature of screen fonts, although the designer can fake it by setting a word in caps and reducing the font size to approximate the x height of the body text. Underlining text is possible on the screen but has taken on a special meaning in Web browsers.

Type in volume has color. The color of a

**ERASERDUST:
THE AVAILABLE FONTS FOR
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ARE LIMITED TO BODY TYPE.
THESE FONT DESIGNS EMPHASIZE
THE EVENNESS OF COLOR WITHIN
THE BLOCK OF TYPE.**

Impact:

The available fonts for working with type in volume are limited to body type. These font designs emphasize the evenness of color within the block of type.

Georgia:

The available fonts for working with type in volume are limited to body type. These font designs emphasize the evenness of color within the block of type.

Trebuchet:

The available fonts for working with type in volume are limited to body type. These font designs emphasize the evenness of color within the block of type.

Figure 13. Some typefaces such as EraserDust and Impact are very expressive, but they accomplish this with large variations in letterform that become very difficult to read in volume. Typefaces designed for body type such as Georgia and Trebuchet are more transparent, creating a calm rhythm in blocks of text.

block of type has two meanings here. The first is color density. This is the relative lightness or darkness of a typeface controlled by the thickness of the lines and exposure of counterforms. The second is the color: the hue of ink/pixel used to fill positive form (black, red, blue). The color density is independent of the color used to set the type. A great deal of variation within a single color can be achieved by manipulating the typeface, character, and line spacing.

The available fonts for working with type in volume are limited to body type. These font designs emphasize the evenness of color within the block of type (Figure 13).

In addition to all we have said about the

importance of space and margins, once we arrange type into a line and lines into columns, we see that line length and column width effect legibility. The common-sense rules of typographic legibility are the result of 500 years of practice. Although there is much to be said for user testing, usability studies, and psychological tests, the greatest source of knowledge about how to treat body type is to be found in the study of how type has been used in printed books.

Type size

First, there is the choice of an appropriate size for the letterform. The most common sizes used in print are 9-, 10-, and 11-point type. Smaller sizes can be used for elements that require a different voice or less emphasis. Larger sizes must be used in moderation for titles and headings.

For type on the screen, a range of larger sizes must be used to compensate for lower resolution. Sizes of 12 and 14 point are comfortable to read, whereas 10-point type is legible in small amounts.

Line length

The recommended number of characters in a line does not vary between the medium of paper and screen, however. A range of 65–75 characters per line is a comfortable maximum for a single column of text in print, with a range of 30-40 characters per line common in multicolumn layouts. The reason for this maximum is based on the characteristics of our visual system. We scan a line of text in groups of letters, first picking up the exterior shapes of word groups, then decoding words as our eye bounces along from left to right. The sweeping motion of turning our eye back to the left becomes increasingly difficult as the line gets longer. Our ability to pick the start of the next line is decreased by combinations of long lines, tight line spacing, and lack of white space on the left-hand margin.

Levels of heading

Like line length, the need to distinguish two to three levels of heading is a problem to both print and screen typography, and like line

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Thursday, July 2, 1998 Published at 06:36 GMT 07:36 UK

World: Europe
US wants Kosovo ceasefire



Kosovo Liberation Army fighters on the front line

The United States says there will almost certainly have to be a halt to the fighting in the Serbian province of Kosovo before Belgrade can be expected to withdraw its forces.

In what correspondents say is a shift in policy, state department spokesman, James Rubin, said Washington's short-term aim was a ceasefire.

Previously, the US has demanded the unconditional withdrawal of President Milosevic's forces.

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Figure 14. This page from the BBC world news web site (<http://news.bbc.co.uk>) demonstrates several subtle and effective uses of typography. Great care is used to establish even margin space between the three columns, with a right-justified first column and left-justified second and third columns. Even white space separates groups of text lines. Small variations in size make it easy to distinguish the headline from the body text, and the subheads for two groups of links in the third column from the links themselves. Finally, the font selected for the body text balances well with the graphic sans-serif font used in the header/navigation bar along the top of the screen. The net effect is a transparent design that is easy to use.

length, the rules of common experience in print can be applied to solve the problem on the screen. For example, to distinguish three levels of heading, use some combination of three contrasts: size, position, and color. Size is easy enough to understand, although the visual distinction between 12- and 13-point type on the screen is often difficult to see in isolation. Variations in position (left, center, right, outdent) are often easier to see and work well in combination with other distinctions. Differences in color can be achieved with changes in weight within a single font (bold, italic, or extra bold/black), as well as with variations in the hue of the type itself (black, red,

green, etc.) (Figures 14, 15 and 16).

Scrolling text in a window is a unique feature of type on the screen. This small frame moving around a larger text column requires a greater articulation of distinctions among levels of heading than the printed page. There is simply less of the page visible on the screen at any one time. The distinction of multiple indents is lost as a result. The perception of a text's structure is dependent on the reader's memory rather than the visible design.

In all of these examples, the main issue when designing body type is to convey content. Matters of style are secondary to matters of legibility.

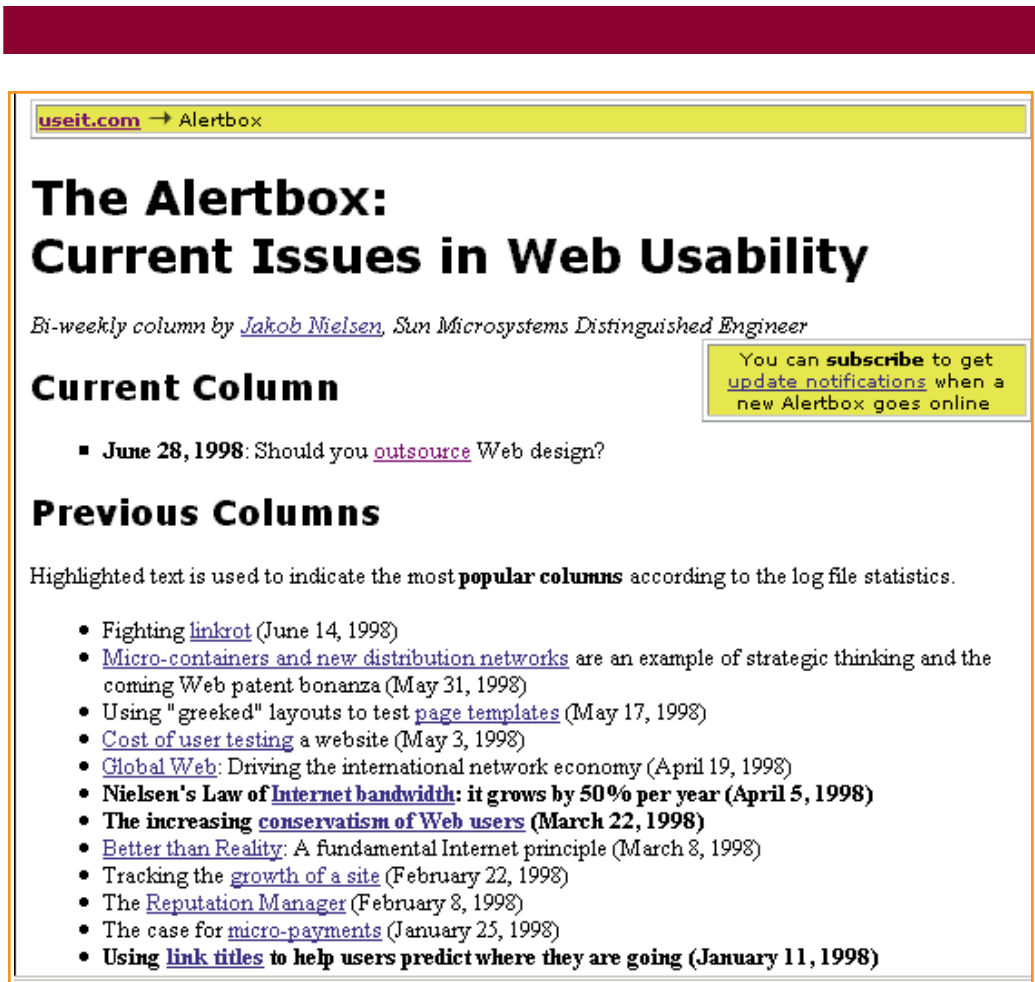


Figure 15. This screen from Jacob Nielsen's Useit.com web site (<http://www.useit.com>) makes poor use of typography. The headings are unnecessarily large. The list of previous columns is very difficult to read due to seemingly random use of bold, blue color, and underline, the latter two a side-effect of link anchors which seem to be used for emphasis. Centered text in the yellow box creates uneven margins on both sides, and the random position of this box lines up with nothing. There is no visual rhythm for the user's eye to follow.

Special Characteristics of Type on the Screen

After pointing out the differences between print and screen typography, it is easy to see the limitations we face when using type on the screen. The most fundamental limitation is the low resolution of the image surface. The resolution of most computer monitors is a small range of 72-75 pixels to the inch. Screens with so-called "higher resolutions" simply decrease the size of the pixel, which visually shrinks the image to fit more pixels into a small space rather than increases the resolution of the image itself. This resolution compares unfavorably with 1200-3600 lines to the inch for typesetting that image ink onto paper.

This is the reason that the thicks and thins of some font designs are still lost in sizes under 12 point, and some of the more delicate letter

shapes are lost entirely. In recent years, various antialiasing techniques have been used to smooth curves in character shape. By varying the color of the pixels around the letter, more of the visual information of the letterform can be preserved. The result can be effective or fuzzy, depending on the algorithm used to render the type and the skill of the designer with the tool.

Color is one area in which type on the screen holds distinct advantages over type on paper, at least in terms of production cost. Printing is ink on paper, and ink carries color. One-color printing is a standard cost. Adding color involves mixing ink and running a sheet of paper through a press more than once. Two-, three-, and four-color printing is an added expense.

Adding color to type on the screen is a

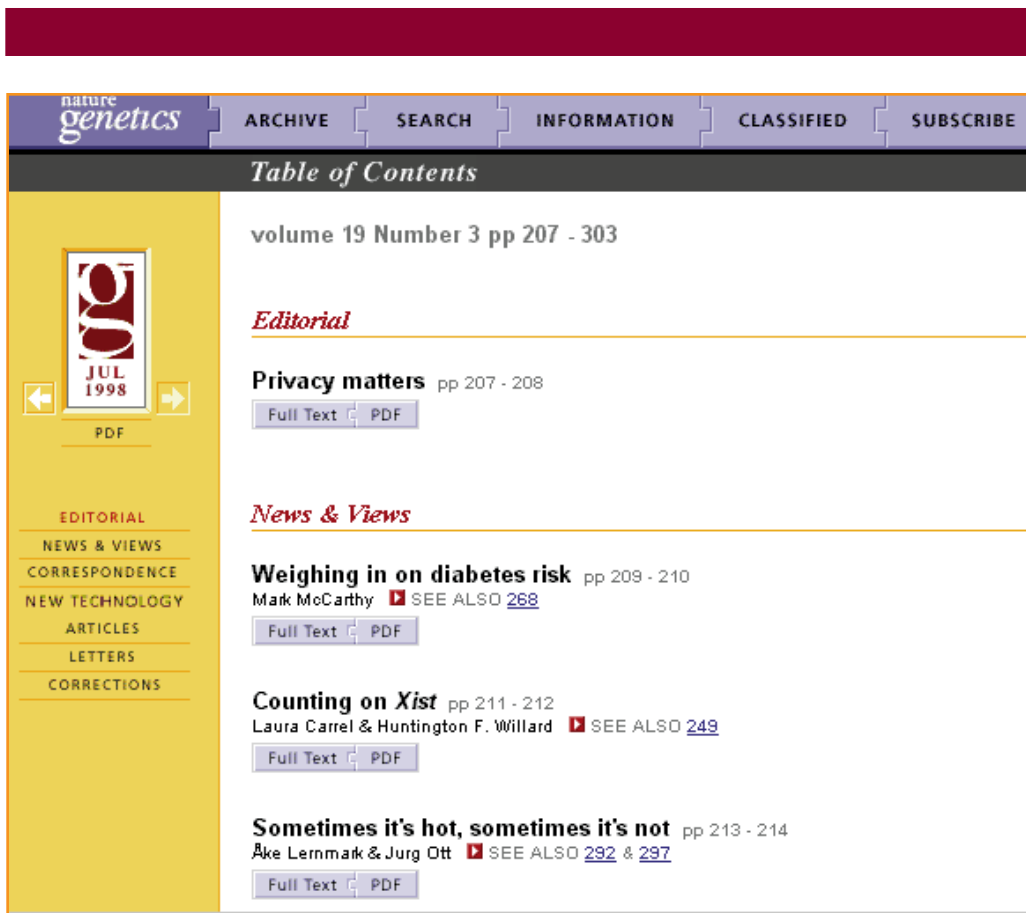


Figure 16. This screen from the Nature Genetics web site (<http://genetics.nature.com>), designed by Dynamic Diagrams, uses consistent variations in color, size, and position to separate the logical elements of a table of contents. The typography is a combination of styled HTML text and graphic text.

completely different process. On screen, 8-, 16-, and 24-bit color is not a cost to the producer. Instead, it is a cost to the consumer, the person who purchases the monitor and video card for the computer itself. There is no cost to adding the color; instead, there is the problem of predicting what the color will look like on various monitors. The limitations on the screen are the number and range of colors that are supported (Figure 17).

The most exciting characteristic of type on the screen is the added dimension of time. Type on the screen includes motion. This adds a new factor to typographic communications, a factor that we have seen most often in movie titles and television commercials. There are four characteristics of type in motion:

1. Speed (slow, fast).
2. Direction (from left, from right, up, down).
3. Duration (change in focus, transparency).
4. Variation in size (grow, shrink).

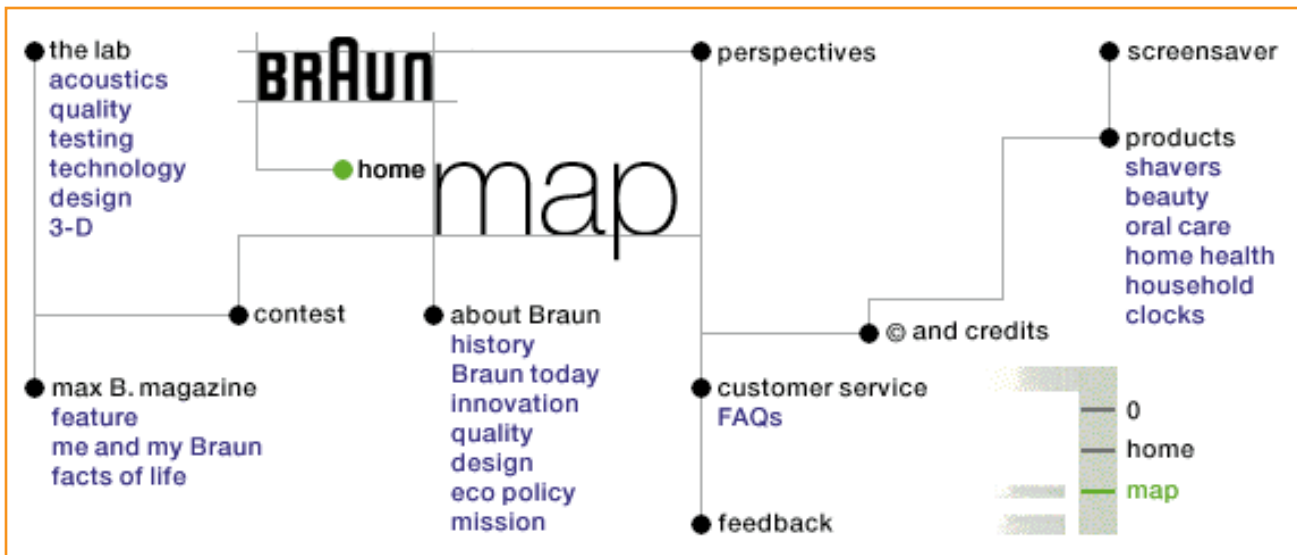
Each of these characteristics carries its own

syntax and its own meaning, defined largely by context. Speed can effect legibility as well as style. Direction carries a meaning of going with or against the flow of reading. The words that appear on the right and move left can be decoded as they appear, whereas the words that enter from the left and move right can be read only after they have been entirely revealed. Type moving from top to bottom will move with our sense of gravity, whereas type that moves from bottom to top defies the same sense. The duration of type, how long it appears during a process of evaporation or dispersal, effects our sense of the content. The act of growing or shrinking carries its own level of meaning, which modifies the meaning conveyed by the type form and content and the word (Figure 18).

Moving type is a new area, one that has enlivened many aspects of interactive design.

Conclusion

As the utility and impact of interactive com-



State
of mind
inside

Ask an Israeli Guy
Horoscope
Flirting for Fearless

ELLE
international

Web Explosion!

The number of Australian households using computers at least weekly jumped 23 per cent to 2.4 million in the two years to February 1998, according to new survey data released last week by the Australian Bureau of Statistics. **Almost 2.9 million homes had a computer in February 1998.**

Home computers are mostly used for **games (3 million persons)**, **study and learning (2.8 million persons)** and **work related activities (1.9 million persons)**.

However, a **dramatic 258 per cent** increase in the number of people logging on to the Internet at home means that 1.1 million Australians aged five and over are now regular internet users.

Thirteen per cent (850,000 households) had Internet access in February 1998. **A further 470,000 households with a computer and no Internet access** reported an intention to acquire the Internet from home by February 1999.

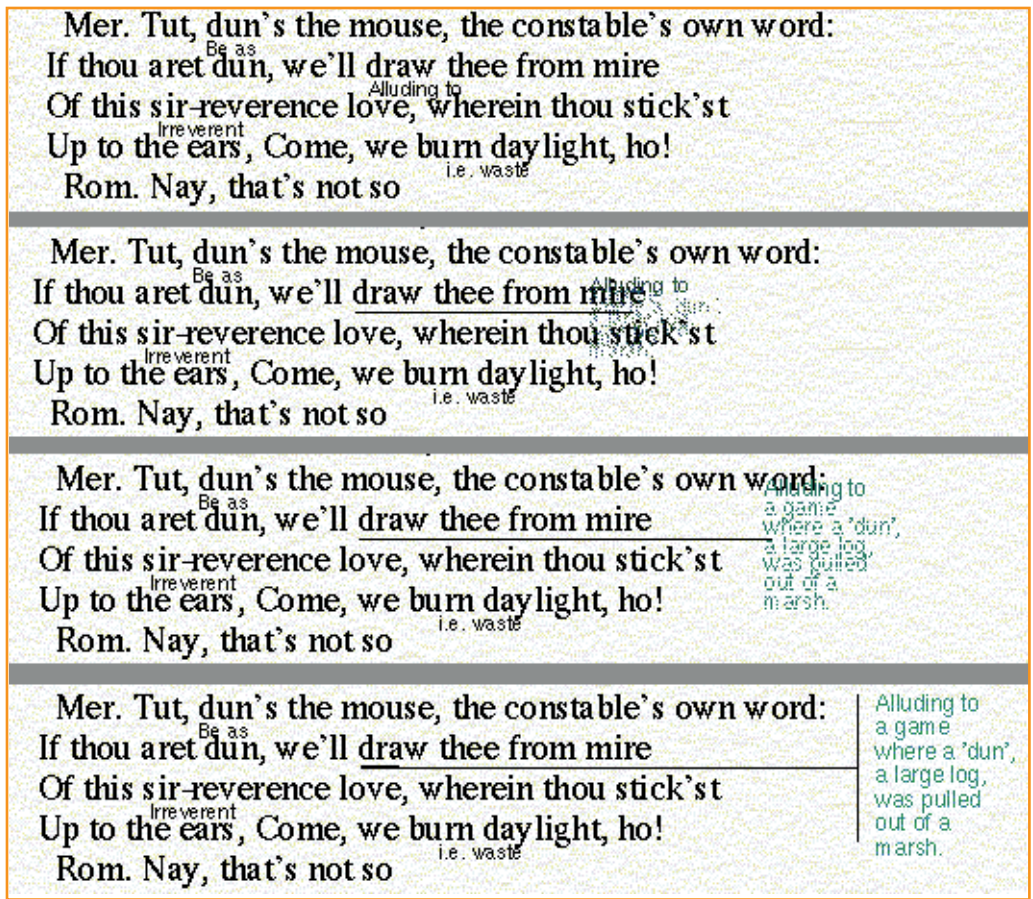
Adults (18 years and over) are the major computer user group with **7.5 million** accessing a computer in the 12 months to February 1998. **More than 76 per cent of these (5.7 million persons)** frequently accessed a computer once a week or more.

Interest in on-line shopping from home by adults increased **13 per cent** since February 1996 to 3.2 million. Interest in on-line banking from home by adults increased **16 per cent** over the same period to 4.6 million persons.

The February 1998 survey also showed that **46 per cent of adults (6.2 million persons)** expressed an interest in accessing on-line educational services from home and **further 40 per cent (5.4 million persons)** expressed interest in accessing government information services or forms lodgement services.



Figure 17. Color in type can be used to create a simple hierarchy, as in this graphic table of contents of the Braun web site (<http://www.braun.de>). It can also be used to add variety and style to text, as in this page from the web site of Elle (<http://www.elle.com>), an international fashion magazine. Notice how the broad variations in color on this page makes the sentences appear to move toward or away from the viewer, creating an odd sense of depth.



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Figure 18. An interesting example of dynamic typography is the Fluid Documents Margin Callout technique being developed at Xerox PARC (see Zellweger et al, "A negotiation architecture for fluid documents" in UIST '98). This progressive sequence of four screen images shows an animated transition to reveal an annotation on Shakespeare's Romeo and Juliet. Note that the small word indicating an available annotation sits in the line space below the word(s) it explains. The annotation, which fades in as it moves into place, is located in the margin space.

puting continues to grow, the importance of understanding type as a visual information system increases. The user interface designer is manipulating signs and symbols, appealing to metaphor, theatrics, and imagination. The raw materials of this theater are light, sound, color, image, and that most common of all visual systems, type. The technology worked with has been changing rapidly, and we often hear that each change is a revolution, a paradigm shift, a rewriting of the rules. In the case of type, however, the rules have not changed significantly for hundreds of years. The rules derive from the interaction between the Roman letterform and the human visual system, not from protean digital computing technology. A fundamental goal of the user interface designer is to help the user

read the screen. Whether it appears in isolation or in volume, type will always play some role in the interaction. To accomplish this goal, the designer must understand a visual system developed from analog signs communicated as ink on physical paper. Only then can we master the technique of building these symbols from the bits of light on the digital screen to communicate our message. ☺

Suggested Readings

Götz, Verushka and Ben Erben, *Color & Type for the Screen*, RotoVision SA, 1998.
 Mullet, Kevin and Darrell Sano, *Designing Visual Interfaces. Communication Oriented Techniques*, SunSoft Press, A Prentice Hall Title, 1995.
 McKelvey, Roy, *HyperGraphics*, RotoVision SA, 1998.