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ABSTRACT

This paper describes basic types of World Wide Web pages and presents design criteria for page layout based on principles of visual literacy. Discussion focuses on pages that present information in the following styles: billboard; directory/index; textual; and graphics. Problems and solutions in Web page construction are explored according to these principles. Discussion includes: (1) lack of common page layout tags, variability in the forms of HyperText Markup Language, and variability in equipment as the biggest problems facing Web designers; (2) solutions to layout/textual problems; include turning all text to graphics; (3) logical as preferred to physical styles in markup; (4) remembering to take into account users with non-graphical browsers and small monitors; (5) visual cues to identify "hot links" or links; and (6) "validating" the page by checking for nonstandard tags, misapplied tags, or improper syntax. (AEF)

Visual Design Principles Applied To World Wide Web Construction

by Donald D. Luck
and J. Mark Hunter

Abstract

The purpose of the article is to describe three basic types of web pages and begin to create guides for page layout design based on principles consistent with principles of visual literacy. Problems and solutions in web page construction are explored with these principles in mind.

Visual Design and the Web

The World Wide Web (WWW) has opened a new horizon for would be publishers of information in digital form. Until now, the power of the press was available to those who owned a press. Today, the power to communicate with millions of people is in the grasp of anyone who has a computer, the knowledge to create a web page, and the $20-$30 per month to maintain a connection to the Internet. One writer claims a new web page is added every 30 seconds (Descy, 1996). Given proliferation of web sites and wide spread access to the medium, a general lack of attention to the visual design elements of this medium is apparent. Many developers of WWW sites have little or no fundamental understanding of the elements or importance of visual design.

This paper has two purposes: 1) establish categories of web pages and 2) establish design criteria for these types of pages based on sound visual design principles. The intent is to help a WWW designer create a site that is not only rich in content, but is visually and aesthetically accessible to the user.

Heinich, Molenda, Russell, and Smaldino (1995) state the primary goals of visual design, those being to:

- ensure legibility;
- reduce the effort required to interpret the message;
- increase the viewer's active engagement with the message;
- focus attention on the most important parts of the message.

How this is accomplished varies based on the type or purpose of web page being designed.

What Medium?

The categorization of the WWW and the graphical face of the Internet is open to some debate. Is it a projected visual? Non projected? Is the interface just another type of multi-media? The primary, though not sole use of the WWW, is to display static images on a color cathode ray tube (CRT). Like applications of television and other projected visuals, some WWW pages are colorful and have a squarish aspect ratio (4:5) which varies among end users. Like print media, some WWW pages are text rich displays, but unlike print media the end user has a great deal of control over the final look of the document.

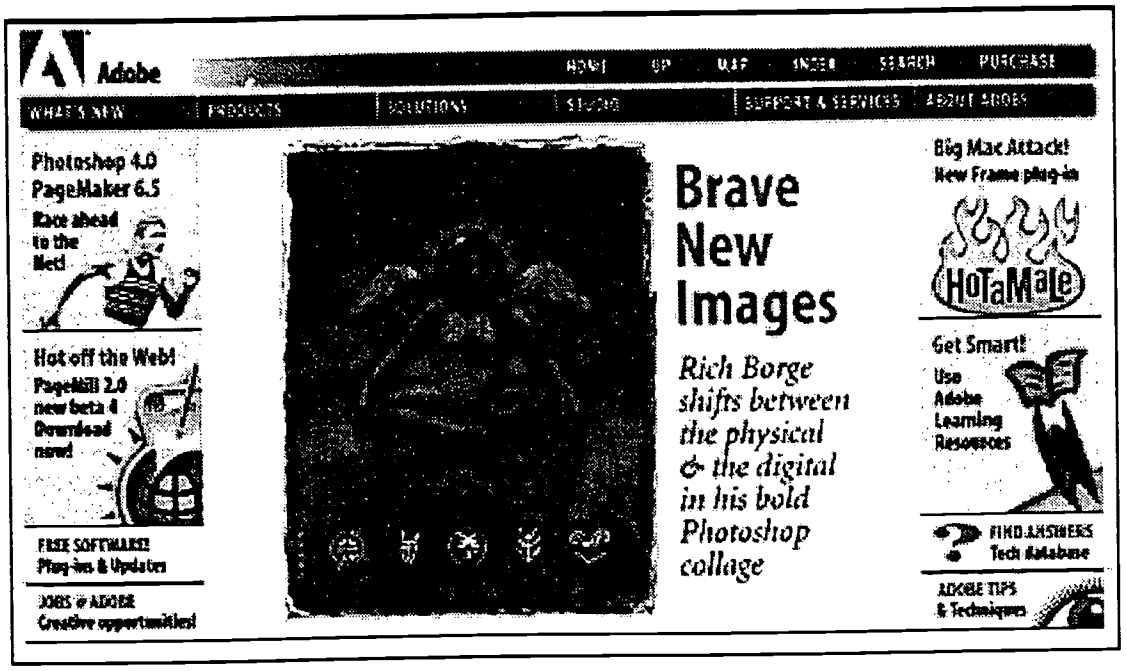
The result is a media combining aspects of projected and non-projected visuals, a media where the author relinquishes many of the format controls over the final document found in other forms of media. Which rules of design apply to which pages is based primarily on the purpose of the page. The remainder of this article establishes a set of categories for pages and parts of pages that are used for the basis for design rules.

Types of Pages

Billboard

Billboard pages are the opening page of any location or related group of pages. Good Billboards accomplish two interrelated tasks. The first is to get the users attention so they stop and examine the page. With over six million documents available on the web it is important that the initial page grab the user's interest either by being aesthetically interesting or indicating the information the user desires is available at the site. Second is to provide a beginning point where the user can find more information. Pages should not be looked at in isolation. The Billboard page should initiate a continuing graphic theme seen throughout the related pages. The most important requirements for a good Billboard page are aesthetic appeal, clarity of content and purpose, and ease of access to linked information.

Figure 1
THE ADOBE HOME PAGE
HTTP://WWW.ADOBE.COM



Aesthetic appeal can be achieved through use of color, pattern, and arrangement of visual elements and by appealing use of text. Colors and organization should draw attention without overpowering the message of the page. The pattern established by this opening page should continue throughout all related pages. Billboard layouts should include the principles of good graphic design including balance, alignment, shape, style, color scheme and color appeal. When designing Billboard pages one should follow rules and principles for design of projected visuals.

The Adobe page in Figure 1 illustrates good Billboard design. When seen on a color monitor has dramatic color that both draws attention to the various parts of the page and is aesthetically appealing. Objects are aligned creating a pattern which the users eye can follow and allows the user to easily make sense out of what they are seeing. Objects are defined by the vertical columns and by horizontal breaks. The page grabs your attention, defines what is there, and provides easy access to the divisions at the site.

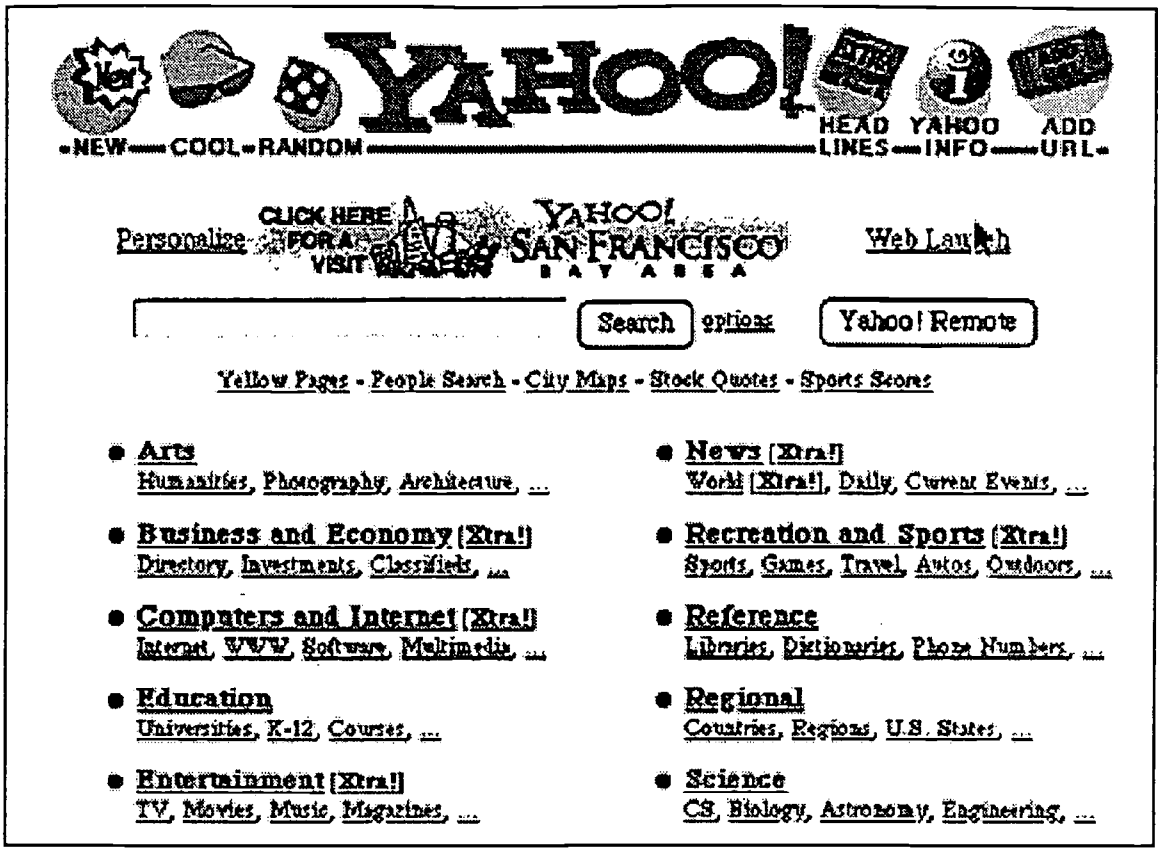
Directory/Index

Directory and index pages provide a means to easily find information at a web site or to move from information to information. Some sites are exclusively indexes while others use an index to send users to the appropriate location within the site. Whichever, the primary purpose of a Directory/Index page is reducing the effort required by the user to find information. Directory/Index pages should be as straight forward as possible. Clarity and organization are key. These can be achieved by careful attention to using a consistent, appropriate organizational scheme throughout the index.

To alleviate long scrolling lists many directories use a multi-column format. Columns place more information on a page. When columns are used one must be aware of vertical and horizontal white space. Space is needed to separate both the columns and the entries in the columns to produce a useable document.

Indexes should provide easy access to the most chosen sites. This can be accomplished by use of either a most often chosen list or placing the most popular under the classification heading at the root level.

Figure 2
YAHOO DIRECTORY
HTTP://WWW.YAHOO.COM



The page example above from Yahoo illustrates good directory design. The directory is broken into two columns providing more information without scrolling. Major headings are logical and the most often used sub-directories are available on the main page. The page also provides and easily accessible search capability.

Text

Textual pages provide information in written form. Text and graphic are often the heart of a web site providing the meat for which the user is searching. Although no research could be found, it is reasonable to assume most extended text pages are printed for reading. Textual pages should therefore follow as closely to good print rules as possible keeping in mind the limitations of the media. Rules for textual pages would include number of words per line, indentation, and justification. The indent, a basic rule of text, is nonexistent in HTML code. The most common means of producing an indent is through the use of a clear GIF graphic occupying a ten to fifteen point horizontal space.

Graphics

Like text pages, pages that provide information graphically are often the reason users are at a web site. Care should be taken to insure graphics on your pages follow as close as possible to the same rules that govern placing the graphics in printed form. Special care must be taken to insure the graphic is compressed using the correct compression algorithm. Good graphics becomes a compromise between the quality of the graphic and its size. Quality graphics add to the aesthetics of a page but long downloads reduce the usability of a page.

An important use of graphics is for use as an index through a process called image mapping. Areas on an image are identified as "hot spots" or links by the author.

Clicking on these hot spots transfers the user to another location in the same way clicking on hot text transfers the user. The Adobe home page in the first illustration shows the use of an image-map.

Input

A unique feature of web pages is their ability to allow input from the user. Often the sole purpose of the page is to allow the user to provide input in some form. Clarity and ease of use are primary requirements for such pages. It should be clear not only what type of information is needed, but also how that information can be entered and sent by the user.

Multi-Purpose

While the following illustrate three of the most common purposes of web pages and suggestions for a resulting style, these do not describe all the types of pages. The most common type of page may well be a combination of two or all three of the defined types. In these cases, styles appropriate to the purpose should be applied to that part of the page.

Problems in Authoring

The biggest problems facing web page designers are lack of common page layout tags, variability in the forms of HyperText Markup Language, and variability in equipment. HyperText Markup Language, the language of web pages, does not contain standard commands for setting parameters easily established in text. When one "lays out" a page in HTML one cannot be certain of the width and therefore length of the document, the size or style of font, or even the type face. Most browsers allow the individual to use standard settings for font and size but these settings can be easily changed in the two most often used browsers to meet the needs or aesthetic temperament of the user. Such standards are being introduced by the two largest browser manufacturers but haven't yet been adopted by all browser manufacturers or approved by Internet Engineering Task Force (IETF), the organization that oversees the "official" HTML code.

Although all browsing software recognizes a standard set of commands or tags, some browsers do not recognize the command set of "extras" created for competing browsers. A magnificent effect on one browser can become a muddied hodgepodge of lines on another. Some browsers are incapable of showing graphics at all. If a directory is based solely on allowing the user to "click on" parts of a graphic for navigation and the user's browser cannot show graphics the page is wasted.

Size differences in user's monitors as well as the type of computer or monitor being used adds another variable. A graphic which fits well on a fifteen-inch monitor needs to be scrolled on a thirteen-inch losing the aesthetic input of the graphic. Different computers also portray color palettes in different ways. For example, a graphic designed on a Macintosh using the standard palette may appear darker or muddied when shown on an MS-DOS based machine.

Solutions

Layout/text

Web pages follow the rules of design for projected visuals in some cases, non-projected in others. When pages are meant to capture the attention of the user rules for projected visuals are appropriate. Rules for non-projected visuals or text should be followed as closely as possible when designing pages that provide information. Common rules of text are difficult to enforce. Although lengths of text per line should remain between 50 to 70 characters (Arntson, 1993) this is nearly impossible to enforce when users are able to set their own font size and face, and width of page. There are ways to bypass these text layout problems.

It is possible to turn all text to graphics. This gives the author absolute control over common text formats but requires the author to make a separate page for people without graphic browsers. It also increases the download time, complicates printing, and adds to the authoring process. In addition, the author must establish all links through an image map rather than the much easier and more universally used text link. Authors can place web pages in Adobe Acrobat format or other cross-platform readable format. This insures layout integrity but requires the user to have

additional software that while free requires downloading and setup and additional memory overhead.

Some web authors provide guides on text documents suggesting the font face, size, and width of page to be used. Others may try pre-formatting the text. The new browsers by Netscape and Microsoft allow the user to set font face, and font size relative to the base size established by the user in their browser setting. This produces typographical effects closer to those achieved in print but still does not control for width of page or base font size. These tags work only on the specific browsers mentioned and the text appears the default standards for other browsers.

Whenever marking up text it is best to use logical rather than physical styles. Logical styles refer to markups such as "strong" or "citation." Each browser is capable of showing these styles in some manner. All browswer can not show logical markups such as "italics" or "bold." The use of italics is discouraged as it is illegible at the default size of most browsers.

Graphics

When including graphics in a page authors should always remember to include alternate text for those who do not have access to a graphical browser. Graphics on the web use two formats, GIF and JPEG. GIF should be used for graphics with large sections of solid color. JPEG should be used with graphics with subtle changes in color or transitions from color to color. Use of the wrong format can result in larger files or banding. When using GIF files experiment with decreasing the color palette. Web graphics are a balance between size and picture quality. Remember there may be people downloading that beautiful 250K picture using a 2400 Baud Modem.

Also, remember to downsize your pictures to insure the picture will fit the user's monitor. Most browsers use some space with command buttons, sliders, or information palettes. Having to scroll to see an entire picture destroys the aesthetic value of a picture. Often it is better to use thumbnails or small pictures that can be clicked to load the entire large picture if the user chooses.

Color palettes differ among computers. Colors can be improved by creating images using the color palette of a specific browser. The graphics will be adequate on any browser and look spectacular on the browser for which they were designed.

One concern for web authors is insuring hot spots on image-maps are identifiable. Most browsers provide a visual clue by changing the cursor from arrow to browsing finger when passing over a hot spot but many users are unaware of this change and other visual clues are necessary to inform the user of the hot spot. These visual clues could include text stating the image is linked to other pages, text, or animations. Always include a textual index on the page for those without graphic browsers.

Testing the Page

The first step in checking a page should be validation. Validation checks your pages for nonstandard tags, misapplied tags, or improper syntax. Various services such as those at the WebTechs location at HTTP://www.webtechs.com/html-val-svc/ exist which will validate your pages over the web. Before publishing a page it is always wise to view the page in many browsers both graphic and text based. By trying your page in different browsers you can see what problem may happen for your users and alleviate them before the page is made public.

If you want to produce a page that uses specific tags not usable on some browsers one might give the user a choice of type of page to access and let them make the choice based on the browser they use or use. With proper software information from the browser that is received by the server software can be used to select the type of page to send back. In either case additional work is required to produce multiple forms of the same page. It may be simpler to produce a single page that uses only standard tags and can be viewed on any browser.

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