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Use of Screen Real Estate on University Home Pages

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Abstract

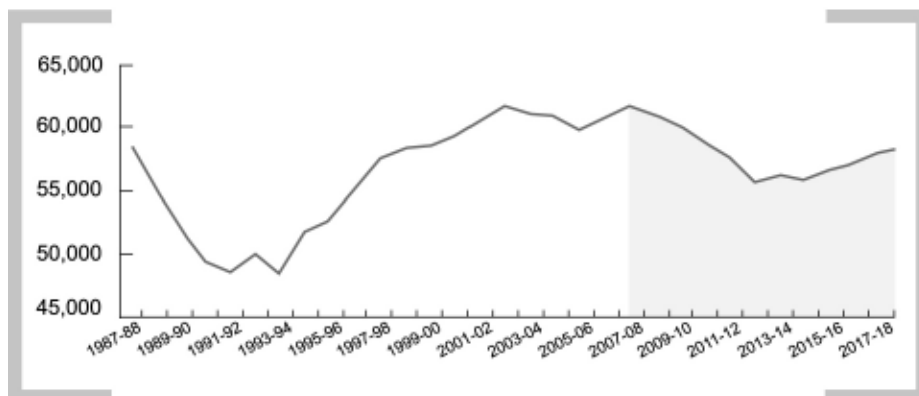
In this project, the home pages of the 11 comprehensive universities in the University of Wisconsin System were analyzed and compared according to categories suggested by Jakob Nielsen. This research clearly defines eight categories of screen real estate and then uses them to compare home pages of each university. Results show that the universities do not use space efficiently and that they vary according to how they use their Web sites for such things as promoting themselves or providing content of interest. Design suggestions are offered for improving the allocation of screen real estate on university home pages: use design that takes advantage of the entire screen; allocate more space to content of interest and navigation; and limit use of self-promotion content and filler.

Introduction

The home page is the most important page on any Web site, and university Web sites are no exception. The home page is the university's face to the students, parents, alumni, and most importantly to the rest of the world. Increasingly, potential students will look at a university online before making contact with it. The first impression of the university often depends on the way the Web site looks and functions. Satisfied users will most likely return to the Web site, because of positive experience from interactions with it. The visitor could be a student, who is considering applying to the university; parents, who might recommend that their children look at a certain university; or an alumnus, who would be proud to donate money to a university that has a great alumni Web site. In every case, the university benefits from having a Web site that provides its visitors with a positive experience.

According to the Western Interstate Commission for Higher Education, Wisconsin will see a decline in the number of high school graduates, especially over the next six years, as shown in Figure 1 (2003). For universities, this trend means fewer prospective students, and therefore the competition is growing. Wisconsin

Figure 1
1987-88 to 2001-02 (Actual), 2002-03 to 2017-18 (Projected)



universities seek to increase enrollment, faculty, and state funding for some obvious reasons, one of which is that Wisconsin ranks near the bottom in attracting high school graduates, according to University of Wisconsin System President Kevin Reilly (Foley, 2006). Thus, it is becoming more crucial to use Web sites to send the right message to prospective students, parents, alumni, and the community.

Today institutions usually put a lot of effort into designing more appealing Web sites. One way to increase user satisfaction with an institution's Web site is to make it compliant with usability standards that are readily available to organizations. One aspect of usability depends upon the space allocations within the layout of the page, also known as the screen "real estate," which is defined as the space available on a screen to display a Web page. This research particularly focuses on how university home pages use screen real estate.

The information presented in this research is practical and will assist UW System Web masters. Most importantly, this project will pinpoint common mistakes Web designers make when allocating space for various elements on the page. Thus, some changes could be integrated into the design or redesign of UW System home pages.

Literature Review

Usability is not a new topic. According to The Usability Company, the first usability studies appeared during World War II as a result of intensive research about the use of more advanced technology. The science spread into the field of telecommunications in the 1950s and was applied to computers in the 1980s. Before the Internet existed, numerous human-computer studies provided a solid base for studying usability on the Web. Jakob Nielsen, one of the pioneers in the new field of the Internet, developed guidelines for the Web that he summarized in *Designing Web Usability: The Practice of Simplicity* (2000). It offered eye-opening information that

changed the way Web developers thought about the Web. In collaboration with Marie Tahir, he next published *Homepage Usability: 50 Websites Deconstructed* (2001). Nielsen and Tahir showed usability guidelines in action by analyzing 50 homepages of the most popular Web sites at the time. The Web has changed dramatically since 2001, and so have its users. Thus many usability guidelines that were developed by Nielsen in 2000 are no longer as critical, but the basic approach is still valid. In 2006, he published *Prioritizing Web Usability*, which addressed the changes that happened since the previous release. Now that the usability standards are established, the goal is to make them take a higher priority when designing Web sites. *Research-Based Web Design and Usability Guidelines* (Koyani, et al.), written in 2004 by a team of usability experts from the U.S. Department of Health and Human Services, outlines previous research findings in usability. It also provides ratings in terms of relative importance and strength of evidence for each guideline.

A number of studies have already been done about Web site usability, but there is still room for further research, because as we know “[for] every industry or type of company, there will be many detailed guidelines that address the ways customers of such companies expect to interact with websites and the best ways to serve those users’ needs” (Nielsen & Tahir, 2001, p. 8).

Research Questions

The use of screen real estate is one issue among many that universities have to examine to produce a sound design. For several reasons, it certainly should be one of the first issues addressed. Sound design determines how all the elements on the page are placed, how well the design functions as a whole, and how much information is presented in a given space. This leads us to the formulation of the first research question.

RQ1. How is screen real estate allocated on UW System home pages?

According to Nielsen the two most important areas of a home page are content of interest and navigation. A balance among content of interest, navigation, and other elements is crucial. For example, if a Web site is overloaded with graphics, it does not have enough space to present valuable content. On the other hand, if it is loaded with text, it might lack visual appeal and thus not attract users. Therefore, the following two research questions help determine how Wisconsin universities are presenting their two most important kinds of Web content.

RQ2. How do UW System comprehensives compare in navigation?

RQ3. How do UW System comprehensives compare in content of interest?

Proper use of screen real estate on home pages achieves balance between all elements on the page, which provides users with the best experience on the Web site and increases their trust and satisfaction. Proper use of screen real estate determines the message a Web site is trying to convey, which helps the university stand out from the competition.

Methods

In this project, the home pages of the 11 comprehensive UW System institutions are analyzed and compared according to standards of Web usability. The focus is on regional comprehensive institutions, as shown in Table 1.

Table 1
Wisconsin Comprehensive Institutions

Name	Size
University Of Wisconsin-La Crosse	7,888
University Of Wisconsin-Eau Claire	9,636
University Of Wisconsin-Stevens Point	7,967
University Of Wisconsin-River Falls	5,417
University Of Wisconsin-Platteville	5,408
University Of Wisconsin-Whitewater	8,844
University Of Wisconsin-Oshkosh	9,112
University Of Wisconsin-Stout	6,938
University Of Wisconsin-Green Bay	4,799
University Of Wisconsin-Superior	2,283
University Of Wisconsin-Parkside	3,970

Each university’s home page was analyzed according to the use of screen real estate, based on the categories taken from Nielsen & Tahir’s *Homepage Usability* (2001). Concise definitions of each category were developed specifically for this research. They are as follows:

Welcome and Site Identity: The welcome and site identity area informs the user of the site and what its main purpose is. It could be a university’s logo, tag line, or welcoming statement.

Content of Interest: This is information the user is seeking. The defining characteristic of content of interest is reliance on text, graphics, and pictures that are designed to convey to users information on a given subject (Koyani, et al., 2004).

Navigation: Navigation represents the structure of a Web site. It shows users where they are, where things are located, and how to get the things they need (Bailey, 2006). Navigation refers to a number of links that guide the user through the site.

Self-promotion: Self-promotion refers to internal advertising, which is defined as “advertising-looking areas that promote [the] site’s own products or services” (Nielsen & Tahir, 2001, p. 50).

Advertising and Sponsorship: Advertising is traditionally identified as “any paid form of non-personal communication about an organization, product, service, or idea by an identified sponsor” (Belch & Belch, 2007, p. 17). On the Web, these are sponsored banners, or links, which promote other Web sites.

Operating System and Browser Controls: Operating system and browser controls refer to the browser window interface, including toolbars, scrollbars, and a window title bar.

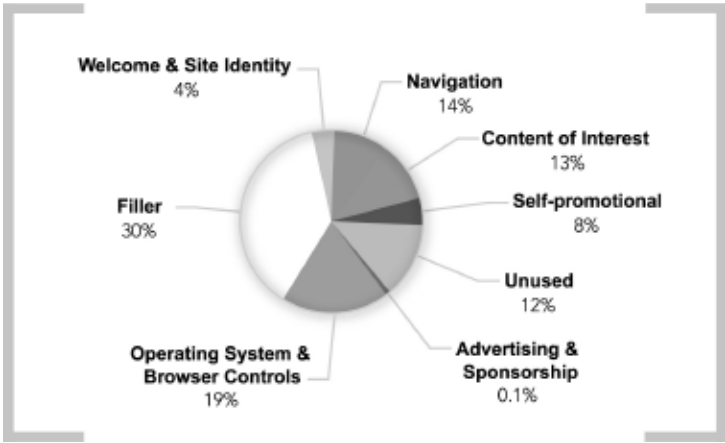
Filler: Filler represents graphic elements on a Web page that do not provide the user with valuable information. It could be clip art imagery, patterns, or even solid color that is used to fill the space.

Unused Space: Unused space represents the area of the page that is empty, often because of a fixed width design. “Unused space does not include pixels used for white space or separators, which are coded as belonging to the category they were inside or adjacent to” (Nielsen, 2003, p. 3).

The appearance of screen real estate in each of these categories varies depending on the operating system, resolution, and type of browser used to look at a Web site.

Usability-Related Web User Profile Statistics retrieved on September 23, 2006, from www.webusability.com indicated that 82% of users used Windows® XP operating system, 86% of the time they used Internet Explorer® 6.x browser, and 60% of the time their monitor resolution was 1024 by 768 pixels. Therefore a snapshot or picture of a computer screen with a 1024 by 768 pixel screen resolution was taken using the Windows® print screen key, while each Web site was open in the Internet Explorer® 6.x on a computer running Windows® XP. Then the screen capture was pasted into a graphics-editing program Adobe® Photoshop® CS2, which allowed the precise measurement pixel by pixel of the screen real estate of each category. Using Photoshop® CS2 tools, the areas of interest were highlighted in different colors, as shown in Figure 2. The data were presented in the form of pie charts representing the percentages those areas occupied on the screen. The screen shots with color-coding and corresponding pie charts allowed for visual representation of the data. Then percentages of how much screen space each category occupies were recorded and compiled into a database, which was used to draw further conclusions.

Figure 2
Average Percentage of Pixels Allocated to Each Category



Coder reliability was established with the help of a research associate, who analyzed a subset of the data following the same methodology to determine screen real estate allocation for each home page. The intercoder reliability index was then calculated. Depending on the category, it deviated on average anywhere from zero to 6.6%, indicating a reliability index of more than 93% in all cases.

Results

Based on the collected data, the majority of universities’ home pages do not use screen real estate to its full potential, which shows an obvious need for redesign in compliance with current usability guidelines and industry trends. The pie chart in

Figure 2 gives an overview of average percentage of pixels allocated to each category across the 11 university home pages.

The most important elements to users, content of interest and navigation, take up 27%, which is a clear indicator of an inefficient use of space. According to Nielsen, more than 39% should be allocated to those elements (2003, p. 1). A good example of extensive use of navigation is UW Stout. It allocates 29% to navigation. This may be partially explained by UW Stout's focus on engineering and physical sciences. It makes sense for the site to emphasize navigation because this appeals to its users.

The information that users typically ignore, according to Nielsen, is all types of promotions, site identity, filler clip art, and unused space, which represents lost pixels (2003, p. 3). Welcome and site identity and self-promotion content are not useless, although welcome and site identity should be kept to a minimum. The 4% in that category is an indicator of an efficient use of space; however, in some cases it can be further reduced. The primary purpose of that category is to "offer just enough to let users know what site they are on and its main purpose" (Nielsen, 2003, p. 3). On average 8% is allocated to self-promotion, which may be an indicator of increasing efforts by some universities. UW Oshkosh and UW River Falls are the highest in this category with 18%, which shows their increasing efforts to brand themselves.

The unused space and filler elements should be considered. There is a fine line between those elements. Unused space represents empty areas, often caused by a fixed width design; filler, on the other hand, is more of a placeholder, which, like unused space, gets ignored most of the time. Neither element delivers a message to the user. Unfortunately, a combination of those elements on average takes up 42% of a page. It is a significant design flaw mostly caused by a fixed width design as opposed to a liquid design, which stretches to fill all the available space on the screen. This should be one of the first issues addressed when redesigning a university home page.

The last category, which takes up 19% of the average page, is operating system and browser controls. Unfortunately, a designer cannot do anything about these pixels, although eliminating vertical and especially horizontal scrolling can save screen real estate. The fact that 19% of screen real estate is lost to this category puts pressure on the designer to focus more on the remaining space.

Discussion

To achieve an efficient use of screen real estate, the designer should ensure that the majority of space is allocated to the elements the user is looking for—content of interest and navigation. All the other elements on a page should be kept to a minimum, so they do not take away from the most important elements. Research findings offer three guidelines. The first focuses on placement of home page elements. The second looks at how much space should be allocated to the most important elements. And the third offers tips about how to turn the elements of a page that are typically ignored into content of interest.

Use Liquid Design

According to this study, on average 40% of screen space is unused due to a fixed design, which does not expand beyond a specific width. Of course, fixed design has its own advantages. It gives a designer more control over a space he or she has to work with. Text line lengths are easier to control, and they do not become extremely

long and hard to read when the browser window is maximized on a large screen. Also, fixed design is the easiest way to control specific placement and proximity of text and images. The design stays intact and visually unified regardless of the width of the browser window.

On the other hand, liquid design is a Web page that stretches to fill the entire space in the browser window. Only one out of 11 schools took advantage of liquid design—UW Oshkosh. Liquid design's main advantage is the ability to efficiently use screen real estate by filling the entire space in the browser window. It reduces, and sometimes eliminates, scrolling. Only two out of 11 Web sites did not require any scrolling on their home pages, which allowed them to devote more pixels to the elements that are most important to the user.

According to Nielsen and Loranger's study, "only 23 percent of users scrolled the home page during their initial visit and even fewer scrolled on subsequent visits. This is because users know or think they know where the important areas on the home page are after one visit" (2006, p. 47). This relates to a common rule widely used by Web designers: designing "above the fold," which means one has to make sure the most important information is located up top and clearly visible without scrolling. None of the home pages required horizontal scrolling. Vertical scrolling was present on all pages except for two out of 11, but the rest kept it to less than a half a page. The page fold is not static and depends on the browser, operating system, and different display resolutions. In this case, it is the top 612 pixels. Designing a page above the fold, eliminating scrolling if possible, and using a liquid design are good practices for Web designers.

Allocate More Space to Content of Interest and Navigation

According to Nielsen, the most important elements on a home page that the user is looking for are content of interest and navigation. Content of interest represents something that communicates the site's purpose and offers value, which distinguishes it from the competition. Navigation refers to the actionable area of a home page, which shows all major options available on the Web site. A home page that concentrates users' attention on content of interest and navigation fulfills its primary goals. Therefore, as the most crucial elements, content of interest and navigation should take up the majority of space on the screen.

Merely 13% of screen real estate, on average, is allocated to content of interest and only 14%, on average, is allocated to navigation. Major improvements are needed in those areas. One way to address this issue is to take advantage of white space. There are two types of white space: macro white space, which is the space between major elements on a page, and micro white space, which is the space between smaller elements such as list items, words, letters, and lines or text (Boulton, 2007). Moderate use of white space is recommended; too much requires more scrolling, while too little may provide a display that looks too busy.

The majority of home pages' macro white space is concentrated around the edges of a page because of the fixed width design, therefore limiting the breathing room between major elements. Readability can be improved by allowing more room for major elements and adjusting the size of letters and the space between the lines of text and paragraphs, making content of interest look cleaner. As a result of allocating

more space to content of interest and navigation, unused and filler space is minimized. Therefore, more space is allocated to the things the user is seeking.

Limit the Use of Self-promotion Content and Filler

Users look for content of interest on a home page. It is an element of a page that provides useful information and sparks more interest, inviting the user to explore the rest of the site. On the other hand, according to Nielsen, any promotional content, site identity, filler clip art, and unused pixels are usually ignored. Although each element on a page has a purpose, excessive focus on the elements that are not important to the user is not a good practice. As we can see from Figure 2, excessive screen real estate is allocated to filler, unused space, and self-promotion. Those are the three major areas where each home page can improve. Two previous guidelines focus on significant reduction of unused space, which is why this guideline suggests reducing self-promotion content and filler.

A Web site could be well-structured and visually appealing, but without good content it fails to reach and retain the user. A home page overloaded with self-promotion discourages users from returning.

There is a fine line between self-promotion content and content of interest, which designers and content producers often fail to address. Content of interest can easily become self-promotion because of slight changes in wording or presentation. For example, instead of a link that directs a user to a news release, which is considered self-promotion, the user could be taken to a page where the content is presented in a non-promotional format.

On average, filler space takes up 30% of a page. This is often caused by a fixed width design, where designers use solid color or graphic elements as a background of a home page. There is also a portion of filler space allocated to clip art graphics, banners, or images that do not serve any particular purpose. Often those areas fail to provide useful information to the user and therefore become filler space. In some cases, filler space could be turned into content of interest. Providing a caption to an image or tying it to the main text will turn it into content of interest, which would justify the space allocated to that image.

At the top of a home page, designers often use horizontal banners with catchy graphics to spice up the design and improve the visual appeal. Such graphics are not useful to the user and, therefore, become filler space. A simple tag line, slogan, or link can justify the use of banners, turning them into content of interest. Knowing the difference among self-promotion content, filler, and content of interest allows a savvy designer to efficiently allocate space for each category without undermining the user's experience.

Web designers are encouraged to consider the guidelines outlined in this research. This research focused on the screen real estate aspect of usability, and the guidelines suggested here can be used in the design process of any university home page. But screen real estate is not the only aspect of home page design that should be addressed. There are numerous studies about other aspects of usability, Web functionality, and Web design that should be considered by savvy Web designers. The Internet is constantly evolving along with the users. Being able to keep up with new technologies and user preferences is crucial for any university in order to maintain a competitive edge.

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