

# **FACTORS AFFECTING INTERNET USABILITY FOR COMMERCIAL WEB SITES**

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## **ABSTRACT**

This paper examines the importance of Web design in regards to Internet usability. It identifies the major considerations of Web site design as: file size and graphics, fonts, contrast and navigation. Each aspect is extremely important in creating a pleasing web site for a specific user group. The paper also notes that the appropriate content and length can be determined best by working directly with specific users and finding out what their needs are. The concept of measuring Web site effectiveness, in regards to results, is also identified as being crucial to the success of a commercial web site.

## **INTRODUCTION**

This paper is a study of Internet usability and the different aspects that affect it. The Topics include: fonts, navigation, contrast, and simplicity of Web sites. The topic will be examined through the review of different articles and papers written about the Internet and the effective usefulness of the Web sites used by businesses and other entities. The issues are wide ranging and constantly changing due to a wide variety of different users. The paper will also take note of the importance of tracking and targeted data gathering in concern to commercial Web sites.

The different groups that have a major stake in Internet usability include businesses, consumers, general information gatherers, as well as many institutions. These institutions include, but are not limited to: institutions of higher learning, non-profit agencies and the scientific and research communities. Internet users who enjoy using the internet as a tool to introduce and discuss ideas or particular areas of personal interest should also be considered in any study as they are a large part of the Internet community. Through the development of Internet chat rooms, Message boards and interest based websites. These users are important to e-commerce as well, in the fact that their Web sites often draw many users and make up a large portion of sites that can be utilized for advertising purposes and as links to business Web sites

## **HUMAN FACTORS IN WEB SITE DESIGN**

When considering whether a web site is easy to use, one must keep human factors in mind. One must know who will be using the Web site. You would not need to show streaming video on a quilting website. Instead you could focus your efforts on photos that load much faster, concentrating on the fact that your older audience may prefer a lower screen resolution. Taking this into account allows you to design an ergonomic website targeting the audience that will use it.

Design of a Web site should revolve around the user and what he or she will need to fully utilize the Web site to their satisfaction. This will keep users coming back. But how does one do this? Jacob Nielsen in an article in *Internet World*, identifies the necessary steps:

Two simple steps to take before you design can help you build usability into your designs. First, observe users in their natural environments. Second, evaluate the usability of existing sites and

how they support the user tasks that were discovered during the field studies. Take advantage of other companies' mistakes. Why invest your own money when you can learn from others before you begin doing any work yourself? (Nielsen, 2000)

According to Nielsen, an excellent way for observing users is to visit them on the site of their workplace. The purpose of these site visits is to watch users or potential users in their own environment doing the tasks that you want them to do on your Web site, however they currently do it. Users might or might not currently use a computer to do these tasks.

Site visits help you to identify and prioritize the tasks users are trying to accomplish. Watching users work through these tasks not only deepens your understanding of the users' goals but also helps you to identify the obstacles and difficulties inherent in their current way of working. Site visits also help you to identify problems you didn't know needed solving. Site visits also help you profile your customers in a much richer way than most market research, which provides statistics and outlines trends but often fails to account for the human side of the story or the reasons underlying the trend. It is necessary to look at real behavior to find out what people really do, not simply what they say they do.

One example of using these techniques would be actually watching users of a University Web site as they use it. One would have to gather data from all the different user groups that would be potential users and identify all of their needs. Interviews and questionnaires would also be helpful in the quest to identify certain user needs. Using data collected from an Internet Cache Appliance or the history on a local workstation would be another. This would allow you to observe not only the sites that were visited how long the user was at each site but also could be used to show which links were selected most. This type of research can have problems due to legal ramifications; however, this can be remedied by a simple disclaimer. One could examine these results and determine placement for things such as links that you most want your visitors to visit.

### **Simplicity in Web Site Design**

Andrew Starling notes the importance of simplicity in Web site design in an article in *Internet Magazine Online* entitled "How to Make Your Site Easy To Use". According to Starling, as recent as a year ago, the Web was still packed with sites that were slow to load, hard to find your way around, or barely legible. It was so common to find bloated pages, bizarre navigation systems and misused fonts that users barely gave it a second thought. An overabundance of slow loading graphics is the culprit behind the problem Starling identifies. Starling explains how businesses are "cleaning up their act" in respect to the above noted problem. Businesses have discovered that Web surfer's patience can be worn thin quickly. It is not uncommon to see a user back out of a site before it loads even if the person is very interested in its content. No matter how great the site is, it will not survive a fickle and impatient user community. There are many choices on the Web today, If yours isn't accessible, it shouldn't be published. A point that will be repeated throughout is that relying on your customers to have a fast connection speed is a sure method of going out of business. Next we look at the major considerations one should use while developing a Web site.

### **Development Considerations**

The first major consideration in your design is file size and download speeds. Unless you're sure all of your visitors are high-end users with big fat download pipes, you have to assume the majority of them are downloading through a regular modem rated at 56k bits per second (bps). This is roughly equivalent to 5k bytes per second of downloaded file content. So large file sizes will affect the speed at which a page loads on a user's screen. It is probable that if a page loads particularly slowly on a user's workstation the user will find a different Web site on which to conduct business.

Another consideration is what font to use. As with newspapers, magazines, movie credits and anything else where a person must read, font is very important. Not only can font decrease readability, it can also add an unprofessional look. Taking these facts into consideration, font becomes a very important element to a Web site. According to Starling better fonts have been developed for the Web, and the easiest to read is Verdana, closely followed by Anal and Georgia, with Helvetica running fourth. Times is fine for large text, but small text should almost always be in Verdana or Arial. Text at default font size reads OK in Times, but is even easier to read in one of the recommended Web fonts.

Jacob Nielsen seems to agree with Starling on the issue of font, but also brings up the fact that it is possible to let the user choose font sizes. This would seem to be more advantageous toward advanced users. However the option should definitely be made available; however it should not be relied upon. The other design considerations that Starling notes are: contrast level, contrast direction and navigation. So a developer should be careful of what colors to use for background and foreground. A good contrast should be present and all the pages should be easy to read.

Contrast direction is a bit different. It has to do with what order the background and foreground colors are in. When designing a web site a designer should not try to be overly creative with colors. Often simple is better when it comes to color schemes. The text of most books and magazines are created in black and white. This is not by mistake, it is by design.

Navigation is the other consideration. A Web site should be easy to navigate so that users will not become frustrated. Starling explains the general guidelines:

1. If your site structure (directories, subdirectories) is a mess, your navigation will be messy too. So make sure your structure is flexible enough to accommodate new sections and changes to your site, since these are the main causes of structure going off the rails.
2. Make sure every page has at least one navigation link. The search engines will bring visitors straight to pages deep in your site, so make every page an acceptable starting point. That means: never rely on the Back button for navigation, because visitors arriving direct from a search engine will go back to the search engine they came from.
3. Don't overdo it. Too many navigation links can be as frustrating as too few. If you've got more than 10 links--and on a menu page that's highly likely-- split them up into groups of 10 or less. Humans can deal with tens, but once we run out of fingers we get confused.
4. If possible, try to give your visitors some indication of where they are on your site right now, perhaps by changing the color of the current section in the navigation area.
5. Count the maximum number of clicks it takes to get from any one page on your site to any other. The theory used to be that the maximum should be three clicks, but with today's huge sites that's not practical. If you've got more than a thousand pages, you're in the four-click league, and more than 10,000, probably five.
6. If your navigation devices are image based, work out how you'll guide visitors who can't see images. Many people browse with graphics switched off, and partially sighted people use talking browsers. Every navigation image should have an Alt description in its image source tag--these

shows on screen even when graphics are turned off, and are read out by talking browsers. If you're using image maps, the problem is worse, and you'll almost certainly need to offer an alternative text-based navigation system somewhere on the page -- it's usually tagged on the bottom as an afterthought.

All of the aforementioned considerations of Web site design focus on the visual design of a Web site. The Web site should always focus on meeting the needs of potential users.

### **Measuring the Effectiveness of a Commercial Web Site**

S. Gomory, R. Hoch, J. Lee, M. Podlaseck, and E. Schonberg discuss the importance of measuring the effectiveness of e-commerce and the different methods of measuring a commercial Web sites success in a paper entitled: "E-Commerce Intelligence: Measuring, Analyzing, and Reporting on Merchandising Effectiveness of Online Stores". They note that In Just a few years, Web sites have moved from displaying electronic brochures to providing a channel for sales, customer service, and information gathering for small and large companies. More and more business processes have moved to the Web, and the Internet is turning into a virtual marketplace. As this trend continues, it is increasingly critical for Web merchants to understand the effectiveness of their Web sites, and to gather, analyze and act on Web usage data for competitive advantage. They go on to note that simple measurement of page hits is not the most effective way to measure the success of a Web site. There are other tools available. . A business that expects to effectively utilize a Web site needs to use these tools to maximize profit from having a Web site.

Web traffic analysis through mining usage data recorded in Web server logs is an actively studied area, and there are a number of commercial Web traffic analysis tools available which extract data from Web logs. Web traffic analysis tools typically keep count of hits, rank the most popular pages requested, and tell where the user came from, the length of time each page was viewed and the page from which the user exited the site

Other important e-commerce usage metrics include the banner ad *click-through rate*, which is the percentage of viewers who click on a banner ad, and the *conversion rate*, which is the percentage of visitors who purchase from the store. More recently, banner ad return on investment (ROI) has become the significant metric for effective marketing. None of these metrics are reliably computable from Web logs alone. Measuring the click-through requires obtaining the banner ad *impression* count, which must be obtained from external sources. Measuring ROI requires knowledge of sales and products in addition to traffic.

At any rate one can see that effectively measuring Web sites effectiveness and determining what user data is important is a very involved and complex process. However it is very important in effective management and design of a dynamic Web site, especially when online sales are thrown into the equation.

### **CONCLUSIONS AND FUTURE RESEARCH**

This paper examines the importance of Web design in regards to Internet usability. It identifies factors influencing the effective usefulness of the Web sites through the review of different articles and papers. An empirical study which could be the subject of a future research can strengthen this study further. References are available upon request.