

The Effect of Usability Guidelines on Web Site User Emotions

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INTRODUCTION

Two decades ago, the U.S. Air Force asked human factors experts to compile a set of guidelines for command and control software because of software usability problems. Many other government agencies and businesses followed. Now hundreds of guidelines exist. Despite all the guidelines, however, most Web sites still do not use them. One of the biggest resulting usability problems is that users cannot find the information they need. In 2001, Sanjay Koyani and James Mathews (2001), researchers for medical Web information, found, "Recent statistics show that over 60% of Web users can't find the information they're looking for, even though they're viewing a site where the information exists". In 2003, Jakob Nielsen (2003), an internationally known usability expert, reported, "On average across many test tasks, users fail 35% of the time when using Web sites." Now in 2005, Muneo Kitajima, senior researcher with the National Institute of Advanced Industrial Science and Technology, speaks of the difficulties still present in locating desired information, necessitating tremendous amounts of time attempting to access data (Kitajima, Kariya, Takagi, & Zhang, to appear).

This comes at great costs to academia, government, and business, due to erroneous data, lost sales, and decreased credibility of the site in the opinion of users. Since emotions play a great role in lost sales and lost credibility, the goal of this study was to explore the question, "Does the use of usability guidelines affect Web site user emotions?" The experimenter tasked participants to find information on one of two sites. The information existed on both sites; however, one site scored low on usability, and one scored high. After finding nine pieces of information, participants reported their frequency of excitement, satisfaction, fatigue, boredom, confusion,

disorientation, anxiety, and frustration. Results favored the site scoring high on usability.

BACKGROUND

In 2003, Sanjay Koyani, Robert W. Bailey, and Janice R. Nall (2003) conducted a large analysis of the research behind all available usability guidelines. They identified research to validate existing guidelines, identify new guidelines, test the guidelines, and review literature supporting and refuting the guidelines. They chose reviewers representing a variety of fields including cognitive psychology, computer science, documentation, usability, and user experience. "The reviewers were all published researchers with doctoral degrees, experienced peer reviewers, and knowledgeable of experimental design" (Koyani et al., 2003, p. xxi). They determined the strength of evidence for each guideline, based on the amount of evidence, type of evidence, quality of evidence, amount of conflicting evidence, and amount of expert opinion agreement with the research (Koyani et al., 2003, pp. xxi-xxii). They then scored each guideline with points for evidence as follows: 5 = strong *research support*, 4 = moderate *research support*, 3 = weak *research support*, 2 = strong *expert opinion*, and 1 = weak *expert opinion*.

The author organizes this article in the following groups throughout to discuss usability topics:

- **Visibility of Location:** Pearrow (2000, p.167) states, "Users want to know where they are in a Web site, especially when the main site contains many microsites." One way to help users know their location is to provide a site map (Danielson, 2002). A site map is an outline of all information on a site. Koyani et al. (2003, p.62) found moderate research support that

site maps enhance use if topics reflect the user's conceptual structure. Other aids such as headers and navigation paths may also be useful.

- **Consistency:** WordNet, maintained by the Cognitive Science Laboratory of Princeton University (2005), defines consistency as "a harmonious uniformity or agreement among things or parts". The purpose of consistency is "to allow users to predict system actions based on previous experience with other system actions" (NASA/Goddard Space Flight Center, 1996, p. 1). Ways to make a Web site consistent include placing navigation elements in the same location (Koyani et al., 2003, p. 59), and placing labels, text, and pictures in the same location (Koyani et al., 2003, p. 97). Using the same or similar colors, fonts, and backgrounds for similar information will also provide consistency, as will following business, industry, and government standards.
- **Error Prevention and Error Recovery:** The least costly way to prevent errors is to provide a well-designed Web site at the outset. Even though users tend to accommodate for inconsistencies, Koyani et al. (2003, p. 97) found strong research support showing a relationship between decreased errors and visual consistency. In addition, Asim Ant Ozok and Gavriel Salvendy (2003) found well-written sites decrease comprehension errors. Additional ways to prevent errors may be to provide Undo and Redo commands as well as Back and Forward commands, provide a Frequently-Asked Questions section, and provide help menus and search menus. However, even the best designed site will not prevent all errors. When errors do occur, sites need to provide users with ways to recover from them. Ben Shneiderman (1998, p. 76) advises, "Let the user see the source of error and give specific positive instructions to correct the error."
- **Inverted Pyramid Style:** For the purposes of this paper, the inverted pyramid style refers to putting the most important information at the top of the page. Koyani et al. (2003, p. 47) found moderate research support for the usefulness of putting the most important information on the top of the page and the least used information at the bottom of the page.
- **Speaking the User's Language:** Speaking the user's language refers to speaking the language of the intended audience. Koyani et al. (2003, p. 145) found a strong expert opinion to support avoiding acronyms. It follows that if site owners must use acronyms, they should provide an acronym finder and/or glossary. Other ways to speak the user's language are to avoid jargon and to provide a search engine that recognizes naturalistic language, or language consistent with real-world conventions.
- **Easy Scanning:** Koyani et al. (2003, p. 157) found with moderate evidence that "80% of users scan any new page and only 16% read word-by-word." Therefore, it may be useful to make information easy to scan, especially when presenting large amounts of information. Ways to accomplish this may be to use a bold or italicized font when users need to understand differences in text content. Avoid underlining, however, as users may confuse an underlined word or phrase with a link. In addition, highlighting may make information easy to visually scan. However, Koyani et al. (2003, p. 77) advise, "Use highlighting sparingly...(use it for)...just a few items on a page that is otherwise relatively uniform in appearance."
- **Proper Printing:** For this study, providing for "proper printing" means providing for the *printed* page to look the same as the *presented* page on the computer screen. For example, a printed copy of a Web page should not show the right side of the page trimmed off, if it does not appear as such to the user. Not all users know how to query the Help function to assist them with this problem. Although Koyani et al. (2003, p. 21) did not find support for providing proper printing in experimental research, they did find a strong expert opinion supporting proper printing.
- **Short Download Time:** Download time refers to the time "to copy data (usually an entire file) from a main source to a peripheral device" (Webopedia, 2005). Koyani et al. (2003, p. 16) found moderate support for the usefulness of minimizing Web page download time. The best

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