Design Process and Evaluation

There are several usability-related issues,

methods, and procedures that require careful consideration when designing and developing Web sites. The most important of these are presented in this chapter, including 'up-front' issues such as setting clear and concise goals for a Web site, determining a correct and exhaustive set of user requirements, ensuring that the Web site meets user's expectations, setting usability goals, and providing useful content.

To ensure the best possible outcome, designers should consider a full range of user-interface issues, and work to create a Web site that enables the best possible human performance. The current research suggests that the best way to begin the construction of a Web site is to have many different people propose design solutions (i.e., parallel design), and then to follow up using an iterative design approach. This requires conducting the appropriate usability tests and using the findings to make changes to the Web site.

1:1 Provide Useful Content

Relative Importance:
① ② ③ ④ ⑤

Strength of Evidence:
① ② ③ ④ ⑤

Guideline: Provide content that is engaging, relevant, and appropriate to the audience.

Comments: Content is the information provided on a Web site. Do not waste resources providing easy access and good usability to the wrong content. One study found that content is the most critical element of a Web site. Other studies have reported that content is more important than navigation, visual design, functionality, and interactivity.

Sources: Asher, 1980; Badre, 2002; Baldwin, Peleg-Bruckner and McClintock, 1985; Celsi and Olson, 1988; Evans, 1998; Levine, 1996; Nielsen and Tahir, 2002; Nielsen, 1997b; Nielsen, 2000; Rajani and Rosenberg, 1999; Sano, 1996; Sinha, et al., 2001; Spyridakis, 2000; Stevens, 1980.

1:2 Establish User Requirements

Relative Importance:
① ② ③ ④ ⑤

Strength of Evidence:
① ② ③ ④ ○

Guideline: Use all available resources to better understand users' requirements.

Comments: The greater the number of exchanges of information with potential users, the better the developers' understanding of the users' requirements. The more information that can be exchanged between developers and users, the higher the probability of having a successful Web site. These could include customer support lines, customer surveys and interviews, bulletin boards, sales people, user groups, trade show experiences, focus groups, etc. Successful projects require at least four (and average five) different sources of information. Do not rely too heavily on user intermediaries.

The information gathered from exchanges with users can be used to build 'use cases.' Use cases describe the things that users want and need the Web site to be able to do. In one study, when compared with traditional function-oriented analyses, use cases provided a specification that produced better user performance and higher user preferences.

Sources: Adkisson, 2002; Brinck, Gergle and Wood, 2002; Buller, et al., 2001; Coble, Karat and Kahn, 1997; Keil and Carmel, 1995; Li and Henning, 2003; Norman, 1993; Osborn and Elliott, 2002; Ramey, 2000; Vora, 1998; Zimmerman, et al., 2002.

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Guideline: Ensure that the Web site format meets user expectations, especially related to navigation, content, and organization.

Relative Importance:
①②③④⑤

**Strength of Evidence:**
①②③○○

Comments: One study found that users define 'usability' as their perception of how consistent, efficient, productive, organized, easy to use, intuitive, and straightforward it is to accomplish tasks within a system. It is important for designers to develop an understanding of their users' expectations through task analyses and other research. Users can have expectations based on their prior knowledge and past experience. One study found that users acted on their own expectations even when there were indications on the screen to counter those expectations.

The use of familiar formatting and navigation schemes makes it easier for users to learn and remember the layout of a site. It's best to assume that a certain percentage of users will not use a Web site frequently enough to learn to use it efficiently. Therefore, using familiar conventions works best.

Sources: Carroll, 1990; Detweiler and Omanson, 1996; Lynch and Horton, 2002; McGee, Rich and Dumas, 2004; Spool, et al., 1997; Wilson, 2000.

Example:
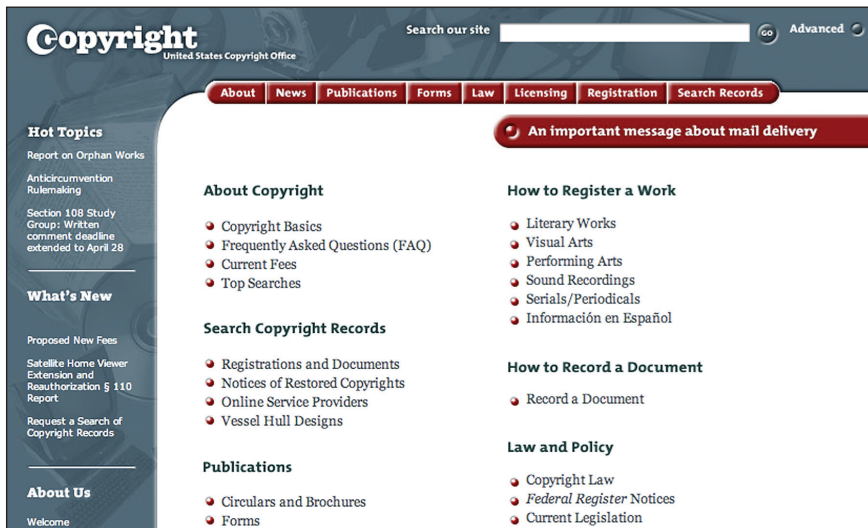
The Copyright Office Web site meets user expectations—links to the most likely user activities or queries (searching records, licensing and registering works, etc.) are prominently displayed and logically ordered, and there are very few distractions on the page.

1:4 Involve Users in Establishing User Requirements

Guideline: Involve users to improve the completeness and accuracy of user requirements.

Relative Importance:
①②③④⑤

Strength of Evidence:
①②③○○

Comments: One of the basic principles of user-centered design is the early and continual focus on users. For this reason, user involvement has become a widely accepted principle in the development of usable systems. Involving users has the most value when trying to improve the completeness and accuracy of user requirements. It is also useful in helping to avoid unused or little-used system features. User involvement may improve the level of user acceptance, although the research is not yet clear that it does in all cases. There is little or no research suggesting that user involvement leads to more effective and efficient use of the system. Finally, the research suggests that users are not good at helping make design decisions. To summarize, users are most valuable in helping designers know what a system should do, but not in helping designers determine how best to have the system do it.

Sources: Barki and Hartwick, 1991; Baroudi, Olson and Ives, 1986; Foster and Franz, 1999; Heinbokel, et al., 1996; Ives and Olson, 1984; Kujala, 2003; McKeen and Guimaraes, 1997.

1:5 Set and State Goals

Relative Importance:
①②③④⑤

Guideline: Identify and clearly articulate the primary goals of the Web site before beginning the design process.

Strength of Evidence:
①②○○○

Comments: Before starting design work, identify the primary goals of the Web site (educate, inform, entertain, sell, etc.). Goals determine the audience, content, function, and the site's unique look and feel. It is also a good idea to communicate the goals to, and develop consensus for the site goals from, management and those working on the Web site.

Sources: Badre, 2002; Coney and Steehouder, 2000; Detweiler and Omanson, 1996.

1:6 Focus on Performance Before Preference

Guideline: If user performance is important, make decisions about content, format, interaction, and navigation before deciding on colors and decorative graphics.

Relative Importance:
①②③④○

Strength of Evidence:
①②③○○

Comments: Focus on achieving a high rate of user performance before dealing with aesthetics. Graphics issues tend to have little impact, if any, on users' success rates or speed of performance.

Sources: Baca and Cassidy, 1999; Grose, et al., 1999; Tractinsky, 1997.

1:7 Consider Many User Interface Issues

Guideline: Consider as many user interface issues as possible during the design process.

Relative Importance:
①②③④○

Strength of Evidence:
①②③○○

Comments: Consider numerous usability-related issues during the creation of a Web site. These can include: the context within which users will be visiting a Web site; the experience levels of the users; the types of tasks users will perform on the site; the types of computer and connection speeds used when visiting the site; evaluation of prototypes; and the results of usability tests.

Sources: Bailey, 1996; Buller, et al., 2001; Graham, Kennedy and Benyon, 2000; Mayhew, 1992; Miller and Stimart, 1994; Zimmerman, et al., 2002.

See page xxii for detailed descriptions of the rating scales
①②③④○

1:8 Be Easily Found in the Top 30

Relative Importance:
①②③④○

Strength of Evidence:
①②③④○

Guideline: In order to have a high probability of being accessed, ensure that a Web site is in the 'top 30' references presented from a major search engine.

Comments: One study showed that users usually do not look at Web sites that are not in the 'top 30.' Some of the features required to be in the 'top 30' include appropriate meta-content and page titles, the number of links to the Web site, as well as updated registration with the major search engines.

Sources: Amento, et al., 1999; Dumais, Cutrell and Chen, 2001; Lynch and Horton, 2002; Spink, Bateman and Jansen, 1999.

Example:

The below snippet of html code illustrates one important way of ensuring that a Web site will be found by search engines—embedding keyword metatags. These keywords are read by search engines and used to categorize Web sites; understanding typical users will provide clues as to what keywords should be used.

<meta name="description" content="The Official Website of the Federal Bureau of Investigation">

<meta name="title" content="Federal Bureau of Investigation">

<meta name="subject" content="Federal Bureau of Investigation, FBI, F.B.I., The Bureau, G-man, G-men, Mueller, Intelligence, Terrorism, Counterterrorism, Counterintelligence, Espionage, Crime, Most Wanted, J. Edgar Hoover, Department of Justice, Fraud, Money Laundering, Public Corruption, Cyber, Fingerprints, Be Crime Smart, Submit A Crime Tip, E-Scams, forensics, Kids Page, jobs, careers">

1:9 Set Usability Goals

Relative Importance:
①②❸◯◯

Strength of Evidence:
❶❷❸◯◯

Guideline: Set performance goals that include success rates and the time it takes users to find specific information, or preference goals that address satisfaction and acceptance by users.

Comments: Setting user performance and/or preference goals helps developers build better Web sites. It can also help make usability testing more effective. For example, some intranet Web sites have set the goal that information will be found eighty percent of the time and in less than one minute.

Sources: Baca and Cassidy, 1999; Bradley and Johnk, 1995; Grose, et al., 1999; Sears, 1995.

1:10 Use Parallel Design

Relative Importance:
❶❷◯◯◯

Strength of Evidence:
❶❷❸❹◯

Guideline: Have several developers independently propose designs and use the best elements from each design.

Comments: Do not have individuals make design decisions by themselves or rely on the ideas of a single designer. Most designers tend to adopt a strategy that focuses on initial, satisfactory, but less than optimal, solutions. Group discussions of design issues (brainstorming) do not lead to the best solutions.

The best approach is parallel design, where designers independently evaluate the design issues and propose solutions. Attempt to 'saturate the design space' before selecting the ideal solution. The more varied and independent the ideas that are considered, the better the final product will be.

Sources: Ball, Evans and Dennis., 1994; Buller, et al., 2001; Macbeth, Moroney and Biers, 2000; McGrew, 2001; Ovaska and Raiha, 1995; Zimmerman, et al., 2002.

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❶❷❸❹◯

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1:11 Use Personas

Relative Importance:
❶○○○○○

Strength of Evidence:
❶❷○○○

Guideline: Use personas to keep the design team focused on the same types of users.

Comments: Personas are hypothetical 'stand-ins' for actual users that drive the decision making for interfaces. They are not real people, but they represent real people. They are not 'made up,' but are discovered as a by-product of an investigative process with rigor and precision. Interfaces should be constructed to satisfy the needs and goals of personas.

Some usability specialists feel that designers will have far more success designing an interface that meets the goals of one specific person, instead of trying to design for the various needs of many. The design team should develop a believable persona so that everybody will accept the person. It is usually best to detail two or three technical skills to give an idea of computer competency, and to include one or two fictional details about the persona's life. Even though a few observational studies have been reported, there are no research studies that clearly demonstrate improved Web site success when personas are used.

Keep the number of personas for each Web site relatively small – use three to five. For each persona include at least a first name, age, photo, relevant personal information, and work and computer proficiency.

Sources: Cooper, 1999; Goodwin, 2001; Head, 2003.

See page xxii for detailed descriptions of the rating scales
❶❷❸❹○