2

Optimizing the User Experience

Websites should be designed to facilitate and

encourage efficient and effective human-computer interactions. Designers should make every attempt to reduce the user's workload by taking advantage of the computer's capabilities. Users will make the best use of websites when information is displayed in a directly usable format and content organization is highly intuitive. Users also benefit from task sequences that are consistent with how they typically do their work, that do not require them to remember information for more than a few seconds, that have terminology that is readily understandable, and that do not overload them with information.

Users should not be required to wait for more than a few seconds for a page to load, and while waiting, users should be supplied with appropriate feedback. Users should be easily able to print information. Designers should never "push" unsolicited windows or graphics to users.

Guideline: Display data and information in a format that does not require conversion by the user.

Relative Importance:
①②③④⑤

Strength of Evidence:
①②③○○

Comments: Present information to users in the most useful and usable format possible. Do not require users to convert or summarize information in order for it to be immediately useful. It is best to display data in a manner that is consistent with the standards and conventions most familiar to users.

To accommodate a multinational Web audience, information should be provided in multiple formats (e.g., centigrade and Fahrenheit for temperatures) or the user should be allowed to select their preferred formats (e.g., the 12-hour clock for American audiences and the 24-hour clock for European audiences).

Do not require users to convert, transpose, compute, interpolate, or translate displayed data into other units, or refer to documentation to determine the meaning of displayed data.

Sources: Ahlstrom and Longo, 2001; Casner and Larkin, 1989; Galitz, 2002; Gerhardt-Powals, 1996; Navai, et al., 2001; Smith and Mosier, 1986.

Example:

Displaying time in a 24-hour clock format is not suitable for U.S. civilian audiences.

Recognize that there is a difference between the data units used in science and medicine and those used generally. Data should be presented in the generally-accepted manner of the intended audience—in this case, pounds and ounces.

Guideline: Do not have unsolicited windows or graphics "pop-up" to users.

Relative Importance:
①②③④⑤

Strength of Evidence:
①②③○○

Comments: Users have commented that unsolicited windows or graphics that "pop up" are annoying and distracting when they are focusing on completing their original activity.

Sources: Ahmadi, 2000.

2:3 Provide Assistance to Users

Relative Importance:
①②③④○

Strength of Evidence:
①②③○○

Guideline: Provide assistance for users who need additional help with the website.

Comments: Users sometimes require special assistance. This is particularly important if the site was designed for inexperienced users or has many first time users. For example, in one website that was designed for repeat users, more than one-third of users (thirty-six percent) were first time visitors. A special link was prepared that allowed new users to access more information about the content of the site and described the best way to navigate the site.

Sources: Covi and Ackerman, 1995; Morrell, et al., 2002; Nall, Koyani and Lafond, 2001; Plaisant, et al., 1997.

Example:

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

2:4 Provide Printing Options
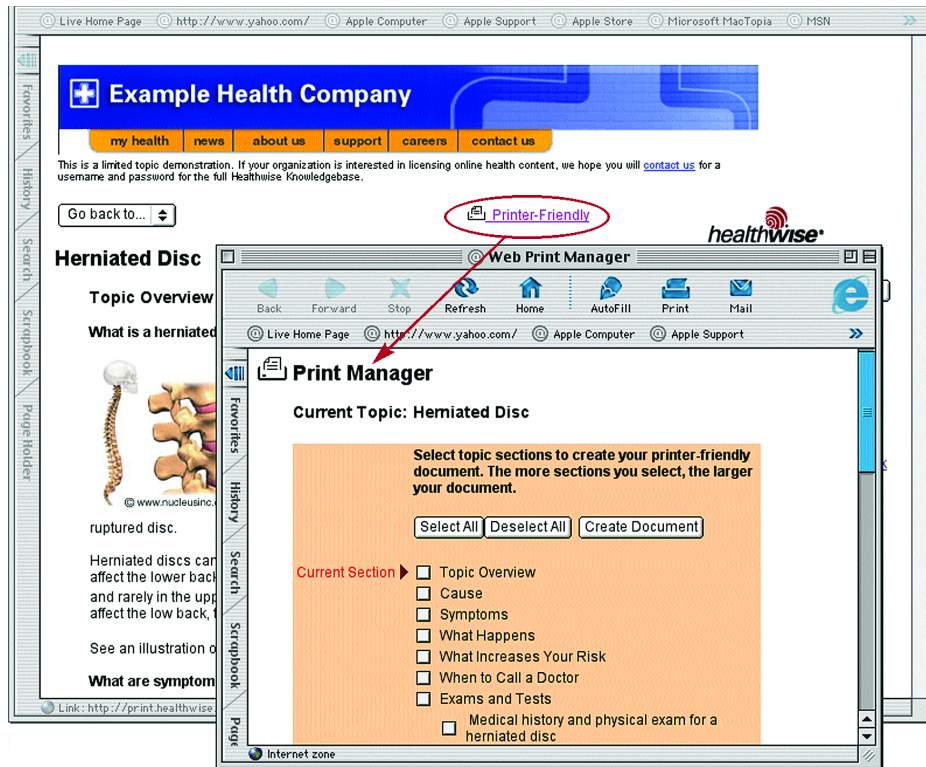
Relative Importance:
①②③④○

Strength of Evidence:
①②○○○

Guideline: Provide a link to a complete printable or downloadable document if there are Web pages, documents, resources, or files that users will want to print or save in one operation.

Comments: Many users prefer to read text from a paper copy of a document. They find this to be more convenient, and it allows them to make notes on the paper. Users sometimes print pages because they do not trust the website to have pages for them at a later date, or they think they will not be able to find them again.

Sources: Detweiler and Omanson, 1996; Levine, 1996; Lynch and Horton, 2002; Nielsen, 1997e.

Example:

Clicking on the "Print Friendly" link will open a new browser window that allows the user to choose the sections of the document they wish to print. This is particularly useful for long documents, where users may only be interested in a particular section.

2:5 Standardize Task Sequences

Relative Importance:
①②③④○

Strength of Evidence:
①②③④⑤

Guideline: Allow users to perform tasks in the same sequence and manner across similar conditions.

Comments: Users learn certain sequences of behaviors and perform best when they can be reliably repeated. For example, users become accustomed to looking in either the left or right panels for additional information. Also, users become familiar with the steps in a search or checkout process.

Sources: Bovair, Kieras and Polson, 1990; Czaja and Sharit, 1997; Detweiler and Omanson, 1996; Foltz, et al., 1988; Kieras, 1997; Polson and Kieras, 1985; Polson, Bovair and Kieras, 1987; Polson, Muncher and Engelbeck, 1986; Smith, Bubb-Lewis and Suh, 2000; Sonderegger, et al., 1999; Ziegler, Hoppe and Fahnrich, 1986.

Example:
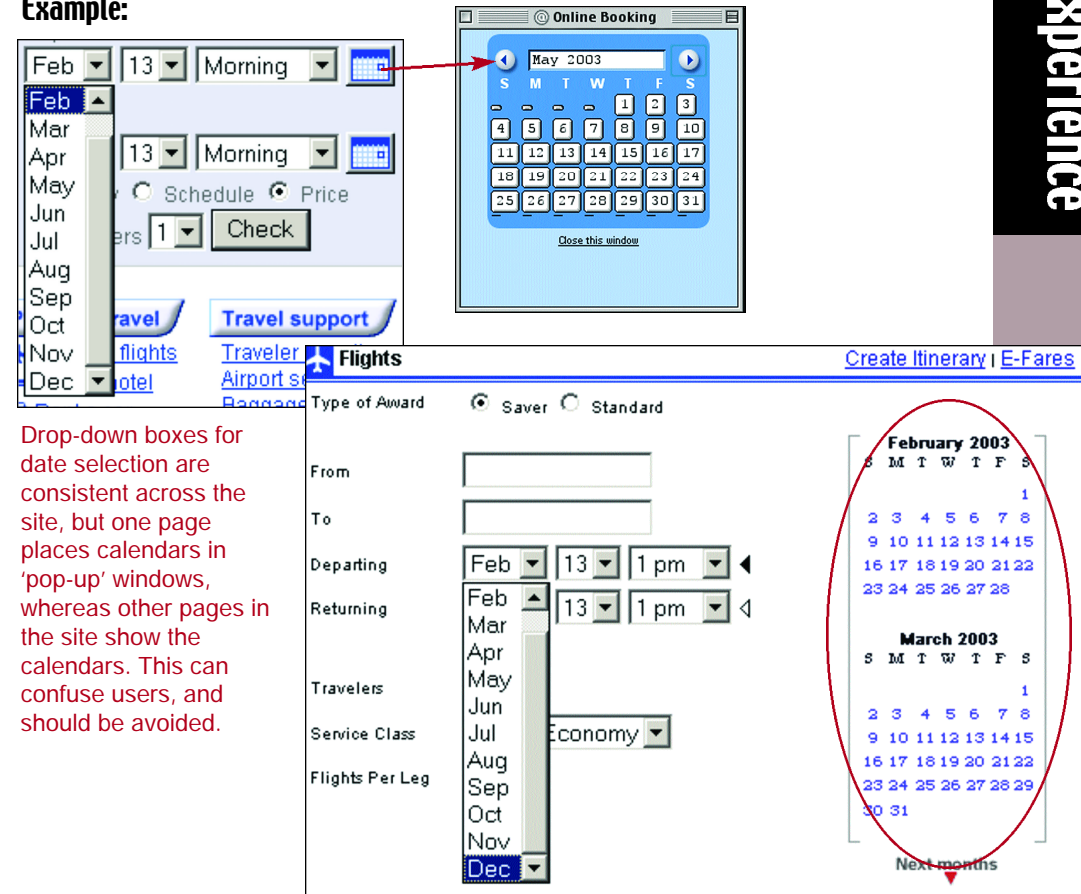
Drop-down boxes for date selection are consistent across the site, but one page places calendars in 'pop-up' windows, whereas other pages in the site show the calendars. This can confuse users, and should be avoided.

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

2:6 Minimize Page Download Time

Relative Importance:
❶❷❸❹○

Strength of Evidence:
❶❷❸❹○

Guideline: Minimize the time required to download a website's pages.

Comments: The best way to facilitate fast page loading is to minimize the number of bytes per page.

Sources: Barber and Lucas, 1983; Bouch, Kuchinsky and Bhatti, 2000; Byrne, John, et al., 1999; Evans, 1998; Lynch and Horton, 2002; Nielsen, 1997d; Spool, et al., 1997; Tiller and Green, 1999.

2:7 Warn of 'Time Outs'

Relative Importance:
❶❷❸❹○

Strength of Evidence:
❶❷❸○○

Guideline: Let users know if a page is programmed to 'time out,' and warn users before time expires so they can request additional time.

Comments: Some pages are designed to 'time out' automatically (usually because of security reasons). Pages that require users to use them within a fixed amount of time can present particular challenges to users that read slowly or make entries slowly.

Sources: Koyani, 2001a; United States Government, 1998.

Example:

Email Member

⚠ For your protection, this page will time out in 45 minutes. Please send your email before time is up.

First contact? It's easy! Just let this person know what caught your eye, and what makes

Microsoft Internet Explorer timeout problems.

Microsoft Internet Explorer ("IE") users, please note that if you are running reports on large chapter 11 cases, such as PG&E, the IE browser may "time out" before the report is completed. Unfortunately, the "time out" problem is beyond the court's control.

Although the current version of WebPACER was developed specifically for Netscape 4.x, other browsers such as IE may also work. If you are using IE and you receive the "This page can not be displayed" message, please increase the "time out" settings on your browser. We apologize for any inconvenience.

To obtain a copy of the latest version of Netcape.
Instructions for Microsoft IE browsers.

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

2:8 Reduce the User's Workload

Relative Importance:
❶❷❸○○

Strength of Evidence:
❶❷❸○○

Guideline: Allocate functions to take advantage of the inherent respective strengths of computers and users.

Comments: Let the computer perform as many tasks as possible, so that users can concentrate on performing tasks that actually require human processing and input. Ensure that the activities performed by the human and the computer take full advantage of the strengths of each. For example, calculating body mass indexes, remembering user IDs, and mortgage payments are best performed by computers.

Sources: Gerhardt-Powals, 1996; Moray and Butler, 2000; Sheridan, 1997.

Example:

Calculators

How Much is Your Monthly Payment?

The following information is needed to calculate your monthly payment. After providing the information, click on "Calculate Single Payment" for your payment calculation. For a payment schedule, click on "Calculate Payment Schedule." You can reset the values you entered by clicking on the "Reset Values" option.

* = Required field

In Calculators
- Fannie Mae True Cost Calculator
- How Much House Can You Afford?
- What Monthly Payment Is Needed for a House with a Specific Sales Price?
- How Much House Can You Afford with a Specific Monthly Payment?
- How Much Is Your Monthly Payment?
- Is Now a Good Time to Refinance?

Loan balance: * [   ]
Mortgage term: * [30] [Years ▲▼]
Interest rate: * [   ] %

Calculate Single Payment
Calculate Payment Schedule
Reset Values

Existing Yahoo! users
Enter your ID and password to sign in
Yahoo! ID: [   ]
Password: [   ]
☐ Remember my ID on this computer
[Sign In]
Mode: Standard | Secure

When looking to buy a house, users will know the value of variables necessary to calculate a monthly payment (interest rate, loan amount, etc.), but are incapable of quickly calculating it themselves.

Optimizing the User Experience

Guideline: When giving guidance about using a website, use the users' terminology to describe elements and features.

Relative Importance:
①②③○○

Strength of Evidence:
①②③○○

Comments: There is varied understanding among users as to what many website features are called, and in some cases, how they are used. These features include 'breadcrumbs,' changing link colors after they've been clicked, the left and right panels on the homepage, the tabs at the top of many homepages, and the search capability. For example, if the term 'breadcrumb' is used in the help section, give enough context so that a user unfamiliar with that term can understand your guidance. If you refer to the 'navigation bar,' explain to what you are referring. Even if users know how to use an element, the terms they use to describe it may not be the same terms that a designer would use.

Sources: Bailey, Koyani and Nall, 2000; Foley and Wallace, 1974; Furnas, et al., 1987; Scanlon and Schroeder, 2000.

2:10 Provide Feedback When Users Must Wait

Guideline: Provide users with appropriate feedback while they are waiting.

Relative Importance:
①②③○○

Strength of Evidence:
①②③④○

Comments: If processing will take less than ten seconds, use an hourglass to indicate status. If processing will take up to sixty seconds or longer, use a process indicator that shows progress toward completion. If computer processing will take over one minute, indicate this to the user and provide an auditory signal when the processing is complete.

Users frequently become involved in other activities when they know they must wait for long periods of time for the computer to process information. Under these circumstances, completion of processing should be indicated by a non-disruptive sound (beep).

Sources: Bouch, Kuchinsky and Bhatti, 2000; Meyer, Shinar and Leiser, 1990; Smith and Mosier, 1986.
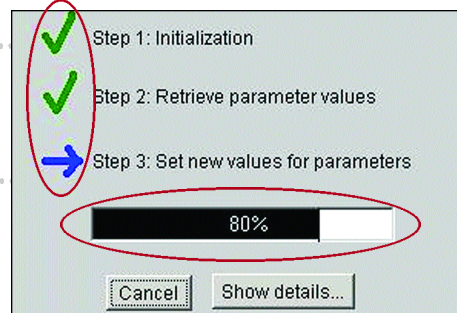
Example:

✔ Step 1: Initialization
✔ Step 2: Retrieve parameter values
➜ Step 3: Set new values for parameters

80%

Cancel   Show details...

Guideline: Indicate to users the time required to download an image or document at a given connection speed.

Relative Importance:
①②③○○

Strength of Evidence:
①②③○○

Comments: Providing the size and download time of large images or documents gives users sufficient information to choose whether or not they are willing to wait for the file to download. One study concluded that supplying users with download times relative to various connection speeds improves their website navigation performance.

Sources: Campbell and Maglio, 1999; Detweiler and Omanson, 1996; Evans, 1998; Nielsen, 2000.

Example:

Download Options:

Click here to download entire report without images (pdf format)
File size: 1.5 mb
Approx. download time using 56K modem: 4 minutes
Approx. download time using T1: 10 seconds

Click here to download entire report without images (zip format)
File size: 1.15 mb
Approx. download time using 56K modem: 3 minutes
Approx. download time using T1: 6 seconds

Click here to download entire report with images (pdf format)
File size 82 mb
Approx. download time using 56K modem: 3.5 hours
Approx. download time using T1: 8 minutes

Click here to download entire report with images (zip format)
File size: 62.9 mb
Approx. download time using 56K modem: 2.5 hours
Approx. download time using T1: 6 minutes

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

2:12 Do Not Require Users to Multitask While Reading

2:14 Develop Pages that Will Print Properly

Guideline: If reading speed is important, do not require users to perform other tasks while reading from the monitor.

Relative Importance:
①②③○○

Strength of Evidence:
①②③④○

Comments: Generally, users can read from a monitor as fast as they can from paper, unless they are required to perform other tasks that require human 'working memory' resources while reading. For example, do not require users to look at the information on one page and remember it while reading the information on a second page. This can reliably slow their reading performance.

Sources: Baddeley, 1986; Evans, 1998; Mayes, Sims and Koonce, 2000; Spyridakis, 2000.

2:13 Design For Working Memory Limitations

Guideline: Do not require users to remember information from place to place on a website.

Relative Importance:
①②③○○

Strength of Evidence:
①②③④⑤

Comments: Users can remember relatively few items of information for a relatively short period of time. This 'working memory' capacity tends to lessen even more as people become older.

When users must remember information on one Web page for use on another page or another location on the same page, they can only remember about three or four items for a few seconds. If users must make comparisons, it is best to have the items being compared side-by-side so that users do not have to remember information—even for a short period of time.

Sources: Ahlstrom and Longo, 2001; Baddeley, 1986; Bailey, 2000a; Broadbent, 1975; Brown, 1958; Cockburn and Jones, 1996; Curry, McDougall and de Bruijn, 1998; Evans, 1998; Kennedy and Wilkes, 1975; LeCompte, 1999; LeCompte, 2000; MacGregor, 1987; McEneaney, 2001; Spyridakis, 2000.

Example:

A user ordering publications from this page is required to remember which

Brochures

20	**NEW** Colorectal Cancer Screening Saves Lives (996948) (max 25 copies)
☑	**NEW** Colorectal Cancer Screening – A Circle of Life for Alaskan (997150)
20	Cáncer Colorrectal: Rompamos el Silencio (996198)(max 100 copies)
0	Colorectal Cancer: Let's Break the Silence (996010)(max 100 copies)

of the three similarly-titled fact sheets they want to order. A link to the fact sheet on the order form would allow the user to compare the products during the ordering process.

Guideline: If users are likely to print one or more pages, develop pages with widths that print properly.

Relative Importance:
①②○○○

Strength of Evidence:
①②○○○

Comments: It is possible to display pages that are too wide to print completely on standard 8.5 x 11 inch paper in portrait orientation. Ensure that margin to margin printing is possible.

Sources: Ahlstrom and Longo, 2001; Evans, 1998; Gerhardt-Powals, 1996; Lynch and Horton, 2002; Spyridakis, 2000; Tullis, 2001; Zhang and Seo, 2001.

Example:

Sections of this page are trimmed when printed on standard 8.5 x 11 paper because of the design of the page.