# Optimizing the User Experience

## Web sites 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 Web sites 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.

## 2:1 Do Not Display Unsolicited Windows or Graphics

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

**Relative Importance:** 1 2 3 4 5

**Strength of Evidence:** 1 2 3 ○ ○

**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.

## 2:2 Increase Web Site Credibility

**Guideline:** Optimize the credibility of information-oriented Web sites.

**Relative Importance:** 1 2 3 4 ○

**Strength of Evidence:** 1 2 3 ○ ○

**Comments:** Based on the results of two large surveys, the most important Web site-related actions that organizations can do to help ensure high Web site credibility are to:

- Provide a useful set of frequently asked questions (FAQ) and answers;
- Ensure the Web site is arranged in a logical way;
- Provide articles containing citations and references;
- Show author's credentials;
- Ensure the site looks professionally designed;
- Provide an archive of past content (where appropriate);
- Ensure the site is as up-to-date as possible;
- Provide links to outside sources and materials; and
- Ensure the site is frequently linked to by other credible sites.

**Sources:** Fogg, 2002; Fogg, et al., 2001; Lightner, 2003; Nielsen, 2003.



See page xxii for detailed descriptions of the rating scales 1 2 3 4 ○

# 2:3 Standardize Task Sequences

**Relative Importance:** 1 2 3 4 ○

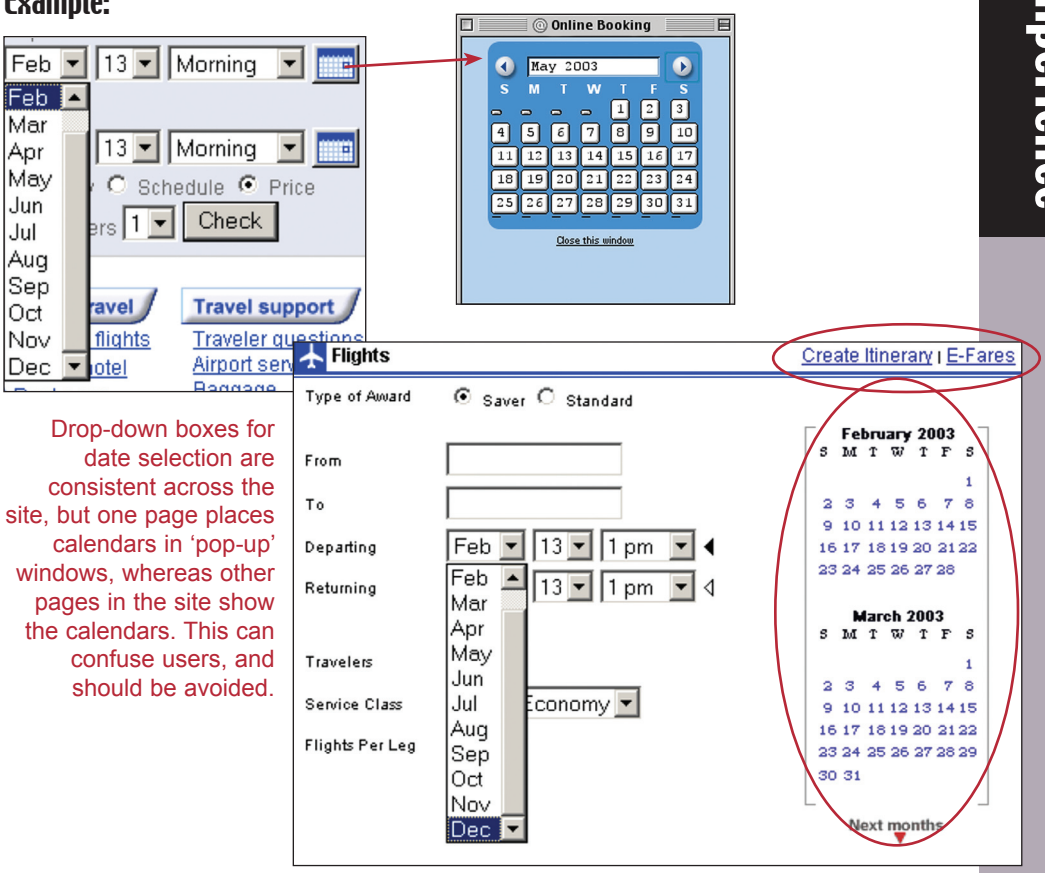
**Strength of Evidence:** 1 2 3 4 5

**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 Engelback, 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.

# 2:4 Reduce the User's Workload

**Relative Importance:** 1 2 3 4 ○

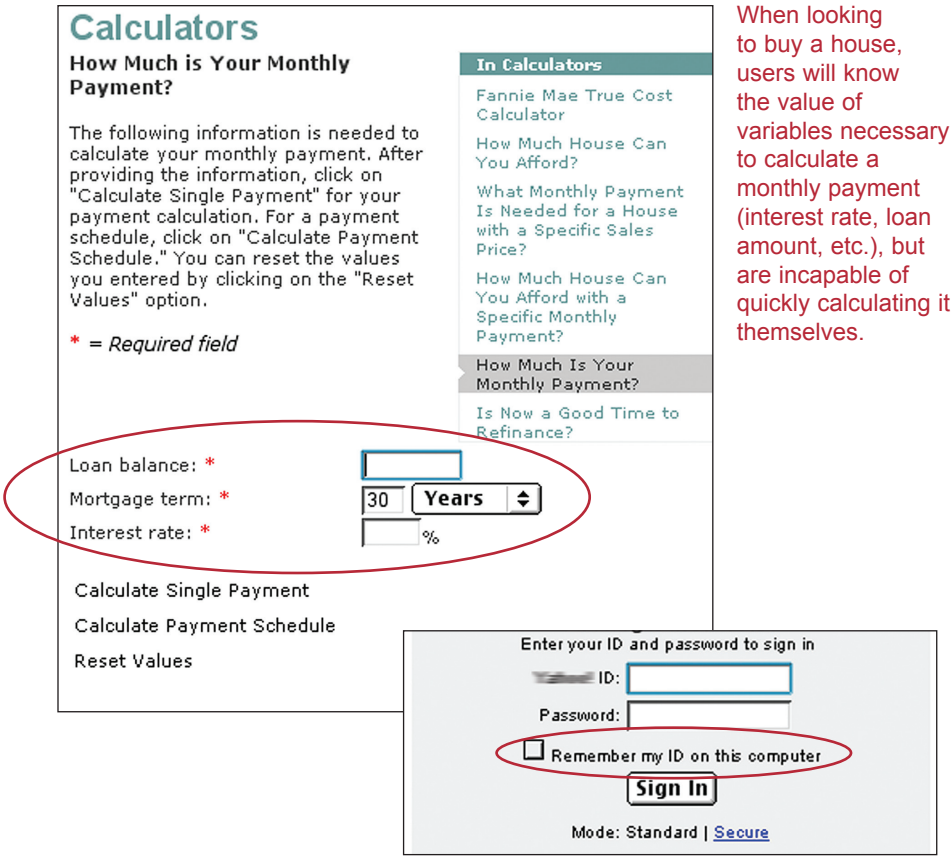
**Strength of Evidence:** 1 2 3 ○ ○

**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:**




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.



See page xxii for detailed descriptions of the rating scales
1 2 3 4 ○

## 2:5 Design for Working Memory Limitations

**Relative Importance:** 1 2 3 4 ○

**Strength of Evidence:** 1 2 3 4 5

**Guideline:** Do not require users to remember information from place to place on a Web site.

**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. One study compared the working memory performance of age groups 23-44 years and 61-68 years. The younger group performed reliably better than the older group.

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, 1992; 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; Nordby, Raanaas and Magnussen, 2002; Raanaas, Nordby and Magnussen, 2002; Spyridakis, 2000.

## 2:6 Minimize Page Download Time

**Relative Importance:** 1 2 3 4 ○

**Strength of Evidence:** 1 2 3 4 ○

**Guideline:** Minimize the time required to download a Web site'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, 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:** 1 2 3 4 ○

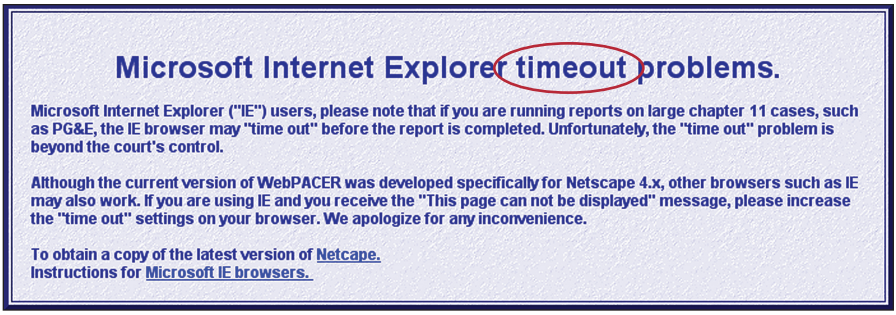
**Strength of Evidence:** 1 2 3 ○ ○

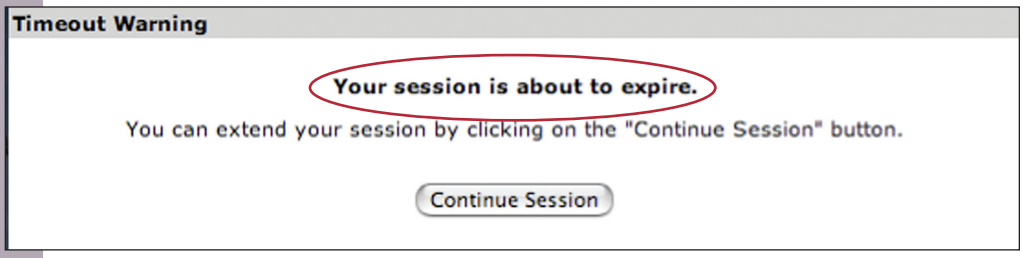
**Guideline:** Let users know if a page is programmed to 'time out,' and warn users before time expires so they can request additional time.

**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 who read or make entries slowly.

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

**Example:**




See page xxii for detailed descriptions of the rating scales
1 2 3 4 ○

# 2:8 Display Information in a Directly Usable Format

**Relative Importance:** 1 2 3 4 ○

**Strength of Evidence:** 1 2 3 ○ ○

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

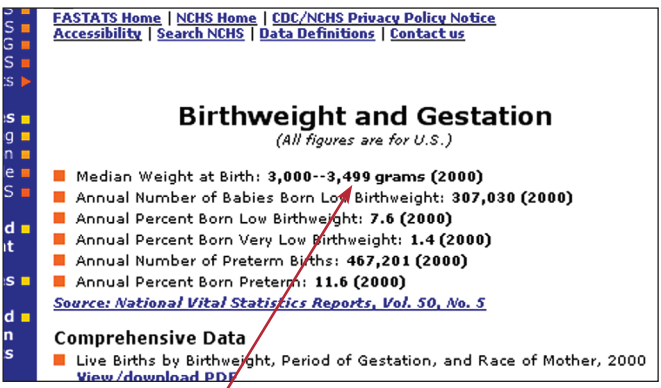
**Comments:** Present information to users in the most useful and usable format possible. Do not require users to convert or summarize information in order for it to be immediately useful. It is best to display data in a manner that is consistent with the standards and conventions most familiar to users.

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.

| US NAVAL OBSERVATORY MASTER CLOCK | Ticks Left |
|---|---|
| Fri May 12 14:14:47 2006 UTC | 22 |

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.

## 2:9 Format Information for Reading and Printing

**Guideline:** Prepare information with the expectation that it will either be read online or printed.

**Relative Importance:** 1 2 3 4 ○

**Strength of Evidence:** 1 2 3 ○ ○

**Comments:** Documents should be prepared that are consistent with whether users can be expected to read the document online or printed. One study found that the major reason participants gave for deciding to read a document from print or to read it online was the size of the document. Long documents (over five pages) were printed, and short documents were read online. In addition, users preferred to print information that was related to research, presentations, or supporting a point. They favored reading it online if for entertainment.

Users generally favored reading documents online because they could do it from anywhere at anytime with 24/7 access. Users were inclined to print (a) if the online document required too much scrolling, (b) if they needed to refer to the document at a later time, or (c) the complexity of the document required them to highlight and write comments.

**Sources:** Shaikh and Chaparro, 2004.

## 2:10 Provide Feedback when Users Must Wait

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

**Relative Importance:** 1 2 3 4 ○

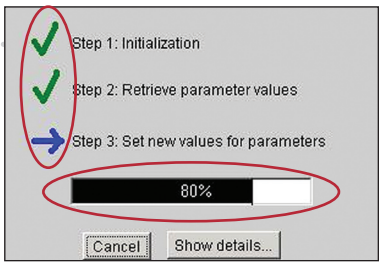
**Strength of Evidence:** 1 2 3 4 ○

**Comments:** If processing will take less than 10 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:**



# 2:11 Inform Users of Long Download Times

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

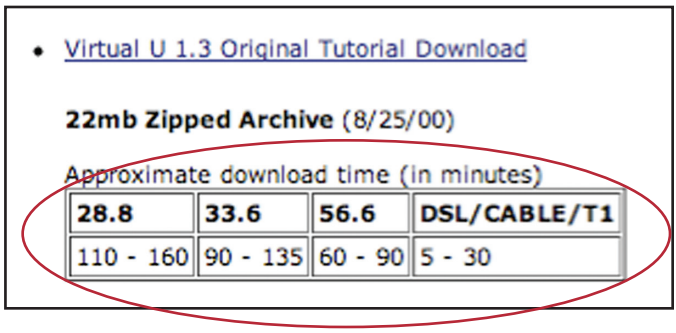
**Relative Importance:** 1 2 3 4 ○

**Strength of Evidence:** 1 2 3 ○ ○

**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 Web site navigation performance.

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

**Example:**

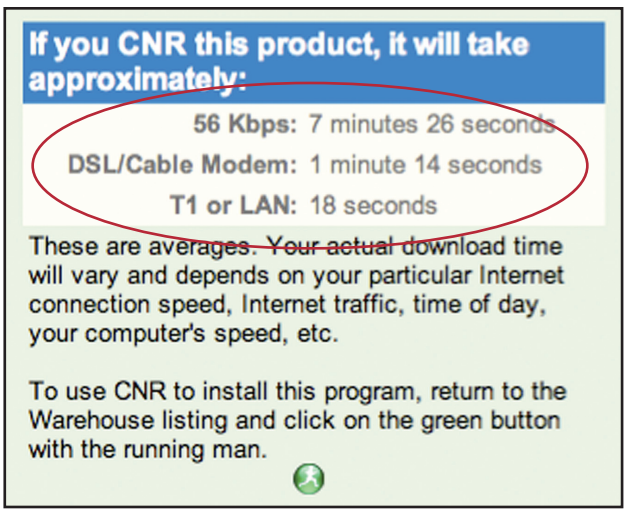


- Virtual U 1.3 Original Tutorial Download

**22mb Zipped Archive** (8/25/00)

Approximate download time (in minutes)

| 28.8 | 33.6 | 56.6 | DSL/CABLE/T1 |
|---|---|---|---|
| 110 - 160 | 90 - 135 | 60 - 90 | 5 - 30 |



**If you CNR this product, it will take approximately:**

**56 Kbps:** 7 minutes 26 seconds
**DSL/Cable Modem:** 1 minute 14 seconds
**T1 or LAN:** 18 seconds

These are averages. Your actual download time will vary and depends on your particular Internet connection speed, Internet traffic, time of day, your computer's speed, etc.

To use CNR to install this program, return to the Warehouse listing and click on the green button with the running man.

See page xxii for detailed descriptions of the rating scales 1 2 3 4 ○

# 2:12 Develop Pages that Will Print Properly

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

**Relative Importance:** 1 2 3 4 ○

**Strength of Evidence:** 1 2 ○ ○ ○

**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:

## 2:13 Do Not Require Users to Multitask While Reading

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

**Relative Importance:** 1 2 3 ○ ○

**Strength of Evidence:** 1 2 3 4 ○

**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.

## 2:14 Use Users' Terminology in Help Documentation

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

**Relative Importance:** 1 2 3 ○ ○

**Strength of Evidence:** 1 2 3 ○ ○

**Comments:** There is varied understanding among users as to what many Web site 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.

See page xxii for detailed descriptions of the rating scales 1 2 3 4 ○

# 2:15 Provide Printing Options

**Relative Importance:** 1 2 3 ○ ○

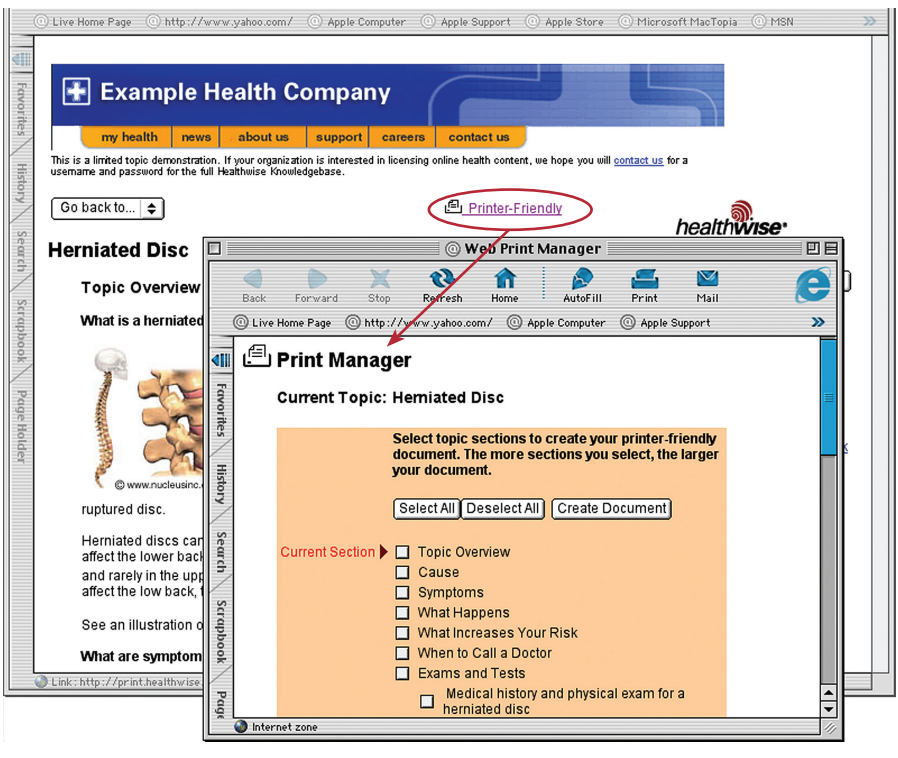
**Strength of Evidence:** 1 2 ○ ○ ○

**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 Web site 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.



# 2:16 Provide Assistance to Users

**Relative Importance:** 1 2 ○ ○

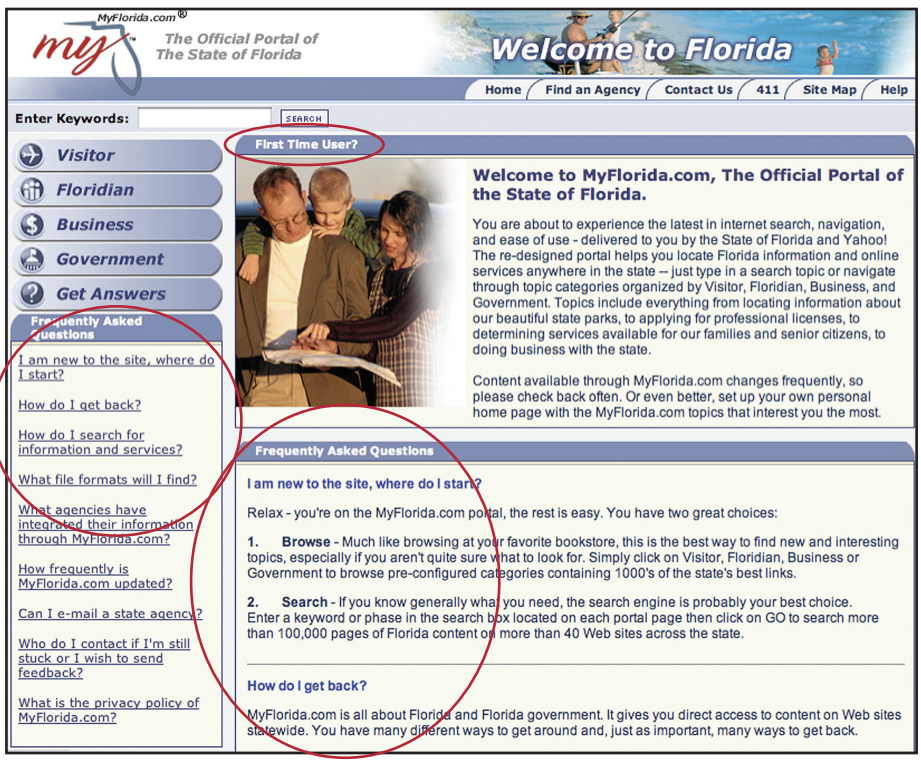
**Strength of Evidence:** 1 2 3 ○ ○

**Guideline:** Provide assistance for users who need additional help with the Web site.

**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 Web site 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 xxii for detailed descriptions of the rating scales
1 2 3 4 ○