Scrolling and Paging

Designers must decide, early in the design process,

whether to create long pages that require extensive scrolling or shorter pages that will require users to move frequently from page to page (an activity referred to as paging). This decision will be based on considerations of the primary users and the type of tasks being performed. For example, older users tend to scroll more slowly than younger users; therefore, long scrolling pages may slow them down considerably. As another example, some tasks that require users to remember where information is located on a page may benefit from paging, while many reading tasks benefit from scrolling.

Generally, designers should ensure that users can move from page to page as efficiently as possible. If designers are unable to decide between paging and scrolling, it is usually better to provide several shorter pages rather than one or two longer pages. The findings of usability testing should help confirm or negate that decision.

When scrolling is used, a Web site should be designed to allow the fastest possible scrolling. Users only should have to scroll through a few screenfuls, and not lengthy pages. Designers should never require users to scroll horizontally.

8:1 Eliminate Horizontal Scrolling

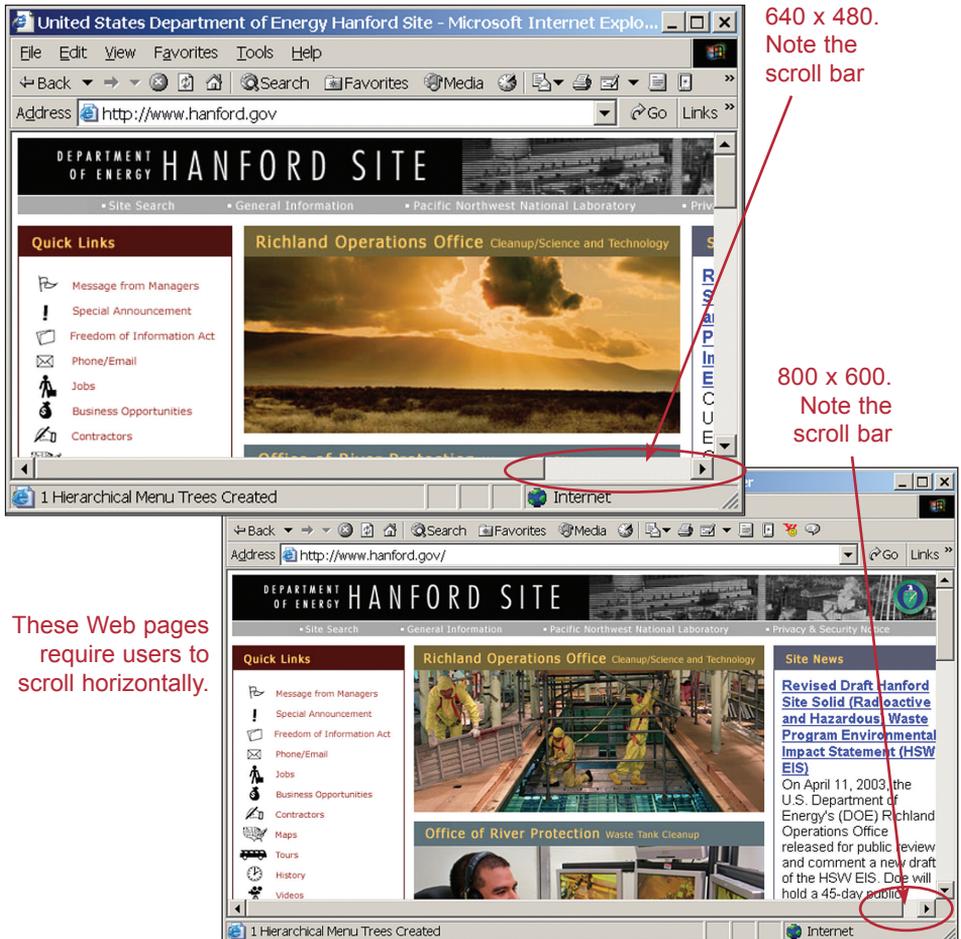**Relative Importance:**
①②③④⑤

Strength of Evidence:
①②③④○

Guideline: Use an appropriate page layout to eliminate the need for users to scroll horizontally.

Comments: Horizontal scrolling is a slow and tedious way to view an entire screen. Common page layouts including fluid and left-justified may require some users to scroll horizontally if their monitor resolution or size is smaller than that used by designers.

Sources: Bernard and Larsen, 2001; Lynch and Horton, 2002; Nielsen and Tahir, 2002; Spyridakis, 2000; Williams, 2000.

Example:

640 x 480. Note the scroll bar

800 x 600. Note the scroll bar

These Web pages require users to scroll horizontally.

Guideline: Facilitate fast scrolling by highlighting major items.
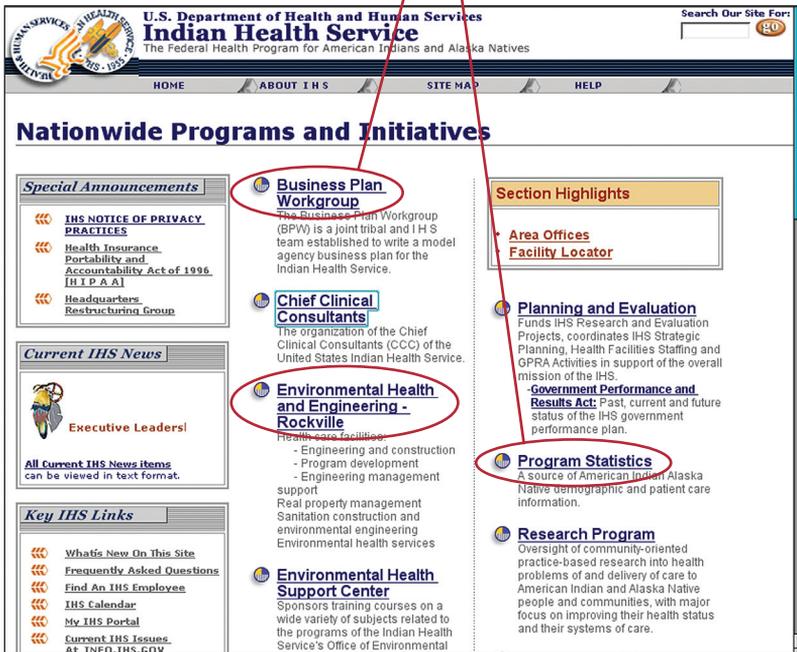
Relative Importance:
❶❷◯◯◯

Strength of Evidence:
❶❷❸❹◯

Comments: Web pages will move quickly or slowly depending on how users elect to scroll. Some users click on the arrows at the ends of the scroll bar, which can be slow but does allow most information to be read during the scrolling process. Other users drag the scroll box, which tends to be much faster. When the scroll box is dragged, the information may move too fast on the screen for users to read prose text, but they can read major headings that are well-designed and clearly placed. Keep in mind that older users (70 and over) will scroll much more slowly than younger users (39 and younger).

Sources: Bailey, Koyani and Nall, 2000; Koyani and Bailey, 2005; Koyani, et al., 2002.

Example:

Bold, large text and an accompanying graphic are effectively used to draw the user's attention during fast scrolling.

8:3 Use Scrolling Pages For Reading Comprehension

Guideline: Use longer, scrolling pages when users are reading for comprehension.

Relative Importance:
❶❷○○○

Strength of Evidence:
❶❷❸❹○

Comments: Make the trade-off between paging and scrolling by taking into consideration that retrieving new linked pages introduces a delay that can interrupt users' thought processes. Scrolling allows readers to advance in the text without losing the context of the message as may occur when they are required to follow links.

However, with pages that have fast loading times, there is no reliable difference between scrolling and paging when people are reading for comprehension. For example, one study showed that paging participants construct better mental representations of the text as a whole, and are better at remembering the main ideas and later locating relevant information on a page. In one study, paging was preferred by inexperienced users.

Sources: Byrne, et al., 1999; Campbell and Maglio, 1999; Piolat, Roussey and Thunin, 1998; Schwarz, Beldie and Pastoor, 1983; Spool, et al., 1997; Spyridakis, 2000.

8:4 Use Paging Rather Than Scrolling

Relative Importance:
❶❷○○○

Strength of Evidence:
❶❷❸❹○

Guideline: If users' system response times are reasonably fast, use paging rather than scrolling.

Comments: Users should be able to move from page to page by selecting links and without having to scroll to find important information.

Sources: Nielsen, 1997e; Piolat, Roosey and Thunin, 1998; Schwarz, Beldie and Pastoor, 1983.

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

8:5 Scroll Fewer Screenfuls

Relative Importance:
❶❷◯◯◯

Strength of Evidence:
❶❷◯◯◯

Guideline: If users are looking for specific information, break up the information into smaller portions (shorter pages).

Comments: For many Web sites, users deal best with smaller, well-organized pages of information rather than lengthy pages because scrolling can take a lot of time. Older users tend to scroll much more slowly than younger users. One study found that Internet users spend about thirteen percent of their time scrolling within pages. Even though each event takes little time, cumulative scrolling adds significant time.

Sources: Detweiler and Omanson, 1996; Lynch and Horton, 2002; Nielsen, 1996a; Spool, et al., 1997; Spyridakis, 2000.

Example:

Good design of a long, content-rich document. This single document is divided into numerous sections, resulting in each page being no longer than four screenfuls.

IRAS Explanatory Supplement
V. Data Reduction
D. Point Source Confirmation

Chapter Contents | Introduction | Authors | References
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Section V.D has been split into multiple files due to its size.

1. Processing Overview
2. Overview of Seconds-Confirmation

    a. Band Seconds-Confirmation
    b. Position Reconstruction
    c. Optical Crosstalk Removal
    d. In-Band Seconds-Confirmation Decision
    e. Double-Detection Mode
    f. Triple-Detection Mode (Edge Detections)
    g. In-Band Seconds-Confirmation Confusion Processing
    h. In-Band Seconds-Confirmation Position Refinement
    i. In-Band Seconds-Confirmation Photometric Refinement
    j. In-Band Seconds-Confirmation Statistical Processing

11. Band-Merging

    a. Overview of Band-Merging
    b. Band Filling

decision is not straight forward.

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Fundamentals of Technology Roadmapping

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The process identified within "Fundamentals of Technology Roadmapping," was customized to develop the DOE Robotics & Intelligent Machines Technology Roadmap.

Undersecretary Moniz testified to the House Science Committee on September 23, 1998. His testimony highlighted the Robotics and Intelligent Machines roadmap.
A few key phrases:
"good example of a roadmap",
"started with a carefully thought through needs document",
"DOE has the broadest and most demanding needs for robotics",
"we are a leader in defining the future of robotics and intelligent machines for the country",
"DOE must push the leading edge in order to meet its mission requirements."

The single-page design of this document requires users to scroll more than twenty-seven screenfuls.