

Web Accessibility for Older Adults Project Highlights

Shirley Ann Becker
Northern Arizona University
Flagstaff, Arizona 86011

Research Objectives

The overall goal of this research is to promote Web accessibility for adults who are sixty years or older. Due to normal aging, older adults have vision, cognition, and physical impairments that impede the use of many Web sites. As such, older adults may find a Web site virtually inaccessible because of its color scheme, design layout, navigation, mouseovers, and reading complexity, among other factors. In order to achieve this goal, the following research objectives were pursued:

Develop software tools for the design and evaluation of a Web page. Software tools were developed in order to promote Web accessible designs for older adult users. Software tools readily identify Web barriers that may prevent older adults from accessing online resources. As such, they minimize the time and effort required to modify an existing Web site for improved senior-friendliness. They can also be used as educational mechanisms for broadening awareness regarding older adult barriers to Web use.

Conduct Web site assessments. The first step in removing Web barriers is building awareness of their existence. Assessment studies were conducted in order to uncover existing Web barriers primarily on state and federal Web sites. The results are being disseminated via journal publications and on our Web site.

Disseminate information about senior-friendly designs. In order to achieve broad dissemination of our work, a Web site (www.cba.nau.edu/beckera/Accessibility/main.html) has been developed. It makes publicly available software tools, assessment findings, illustrations, and other supporting content.

Provide educational resources. Web barriers are illustrated on our site in order to draw attention to design, performance, translation, and literacy issues facing older adults when using popular sites. These resources can be used by both educators and practitioners to promote Web accessible designs.

Software Tools

Software tools have been developed as a viable means of improving Web sites for older adult use. These tools are available on our Web site for public download. One of the tools, called DOTTIE, is modeled after the popular BOBBY™ tool (www.cast.org), which provides automated support for making Web sites accessible to those with disabilities. DOTTIE generates automated feedback on potential accessibility barriers for a selected Web page. Its findings are based on the National Institute on Aging's (NIA) guidelines for making senior-friendly Web sites. (NIA guidelines are made available at: <http://www.nlm.nih.gov/pubs/checklist.pdf>).

The ReadMe tool provides an automated means of assessing the reading complexity of online content. From a multicultural perspective, this is extremely important because of the number of older adults for whom English proficiency is low. ReadMe generates popular reading metrics and provides feedback on syllable, word, and sentence counts.

Other tools include the Usability Enforcer, GraphicAnalyzer, and Aging Vision Simulator. The Graphic Analyzer automatically translates a Web page into a more usable one based on user-selected criteria. Many of these criteria are based on NIA guidelines, though some are taken from the World Wide Web Consortium (www.W3C.org) accessibility guidelines. The Graphic Analyzer shows a gif file as it would be seen by a person with color-deficient vision. The Aging Vision Simulator illustrates the impact of aging vision by yellowing and darkening of an image.

Many Web developers are constrained by time when designing new pages or modifying existing ones. These tools provided automated supported and instant feedback on design layout and information content such that improvements can be readily made. They are also important in teaching Web developers about potential barriers of which they may be unaware.

Web Accessibility Assessments

Fifty state government sites were assessed for older adult accessibility in terms of link descriptions, navigational depth, and reading complexity (Becker, 2004). The results showed that the information architecture of most state sites did not promote easy access to senior resources. Only 5% of the sites had descriptive homepage links navigating directly to senior resources. Fifteen percent of the sites required navigation through four or more secondary pages to access these resources. Reading complexity was an issue, as the average reading grade level associated with sampled Web content from the state sites was twelfth grade. (Health organizations recommend range from 6th – 8th reading grade levels.) Over 91% of the sampled content had reading grade levels higher than eighth grade.

Another study assessed 50 state and 50 federal sites in terms of potential Web barriers facing older adult users. In terms of cognition issues associated with aging, approximately one-fourth of the federal sites had homepages that were three or more vertical screen pages in length. Only a small percentage of federal (9%) and state government (3%) homepages downloaded in less than the recommended guideline of 10 seconds (56.6k modem speed). This is significant because many older adult home users rely on slower network access speed to connect to the Internet. For those with low or no English proficiency, there are many government sites that do not offer translated versions. Only 10 percent of state and 33% of federal sites offered a Spanish version, many of which had translation errors.

A third study was conducted on 125 state, commercial, and nonprofit Web sites offering health resources (Becker, 2004). From a legibility perspective, approximately 93% of the sites used 10 point or smaller font sizes on some information content. For those older adults with unsteady hands, the use of mouseover technology may impede Web use. It was found that 24% of the sites would be difficult to navigate for these older adults. The median download times for all categories were over twice the recommended guideline of ten seconds. Only 12% of the sites offered a Spanish version. Many contained non-translated text, which posed a usability barrier to those with low English proficiency. About 30% of all sites required higher than a high school education to comprehend health content.

The DOTTIE and the Usability Enforcer software tools were used to assist in the identification of visual barriers on government Web sites (Becker, 2004). Data generated by the software tools and by manual assessment were used to evaluate e-government compliance with vision-related NIA accessibility guidelines. These guidelines include effective use of color, no patterned background images, and sufficiently large font sizes and types, among others. It was found that both state and federal sites have color combination issues that may impact their use by older adults.

Electronic Resources

Our Web site has been developed with the objective of disseminating educational resources that cannot be found in other centralized locations. These resources can be used to teach students about Web barriers for older adult users. They have been developed with younger Web designers in mind who often are not aware of normal aging and its impact on Web use.

Illustrations are provided for many of the barriers facing older adult users. Poorly translated versions of e-government sites, for example, are illustrated to draw attention to the need for better designs. Student teams produced homepage assessments, which are posted on the site to highlight potential barriers facing older adult use of state government sites.

Future Research

There are trust issues associated with older adult use of government and commercial sites. This is the case when security and privacy information is not readily available or understood. Future research will focus on Web accessibility and security and privacy barriers.

References supplied upon request. This research is supported by the National Science Foundation under Grant No. 0203409. Any opinions, findings and conclusions or recommendations expressed in this content are those of the author(s) and do not necessarily reflect the views of the NSF.