# Two cultures? The disconnect between the web standards movement and research-based web design guidelines for older people

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*D. Sloan, Two cultures? The disconnect between the web standards movement and research-based web design guidelines for older people. Gerontechnology 2006; 5(2):106-112.* The Web Content Accessibility Guidelines (WCAG), published by the World Wide Web Consortium (W3C), are increasingly being adopted as a core aspect of the Web Standards movement, a cultural revolution in web design that among other things seeks to produce Web content that can be accessed regardless of a user's browsing technology or any disability they may have. Yet, according to a survey conducted by the author, this movement has not similarly embraced evidence-based guidelines that encapsulate necessary steps to overcome additional factors that limit older people's ability to use Web sites. This paper discusses some of the reasons why such a gap exists, and what can be done by gerontechnology researchers and Web developers alike to address it.

**Keywords: web standards; guidelines; accessibility**



The importance of the World Wide Web in enhancing the quality of life of older and disabled people through enabling access to information, services, communication and entertainment is widely acknowledged. Unfortunately, all too often the design of a Web site introduces barriers that may prevent access or use by many potential users on account of a disability or impairment. This contributes to the current situation where surveys find that in comparison to other Web users, older people have significant difficulty accessing and using Web sites[1].

There has thus been an ongoing battle to encourage, educate and equip Web site developers and content providers with the motivation, skills and tools necessary to create a Web site that can be accessed and used successfully by people with a range of sensory, physical and/or cognitive impairments – a group that may include many older people. While organisations with Web sites may be motivated by their legislative obligations towards disabled people and the commercial opportunities afforded by opening access to the growing population of older Web users, Web accessibility guidelines have become arguably the most important means of educating and supporting designers in achieving their objectives.

## The Web standards movement

The Web Standards movement (www.webstandards.org) promotes and encourages the design of Web sites that can be used across the widest range of Web browsing technologies and environments, including legacy browsers and assistive technologies, and at the same time promotes the development of Web browsing and assistive technologies that support open standards[2].

An important development in the recognition of accessibility's importance in

Web design has been the adoption of the World Wide Web Consortium (W3C)'s Web Content Accessibility Guidelines (WCAG)[3] as part of the Web Standards movement. The WCAG have become a de facto standard for Web site accessibility, used by Web site developers seeking to avoid barriers that may limit or prevent access by people with disabilities. Age-related decline in sensory, physical and/or cognitive capability that may be experienced by many older people may have significant implications on their ability to use technology[4]. There would thus appear to be a strong link between WCAG conformance and effective Web site design for older people.

The Web Standards movement has sparked a cultural revolution in Web site design, providing the catalyst for new design techniques that combine aesthetic appeal, high functionality and at the same time improve accessibility. In parallel, there has been increasing activity in development of standards-conformant browsing technology, illustrated by the emergence of as browsers such as Opera and Firefox. Through the Web Standards movement, accessibility has gained credibility amongst many Web developers, moving from a niche area to become a core aspect of many professional Web developers' skill sets.

While results of surveys such as that of Becker[5] and the UK's Disability Rights Commission (DRC)[6] show there is still much work to be done in ensuring accessibility and usability for older and disabled people, there are encouraging signs that accessibility is becoming more widely adopted as a basic component of Web sites produced by many developers.

## Research-based Guidelines for Accessibility

While the WCAG has had a profound influence on Web developers around the world in terms of raising awareness of accessibility and providing technical support, limitations of the guidelines have been identified. For example, the technical nature of the WCAG means the guidelines can be accused of being excessively generalised and vague[7], and fail to encourage consideration of contextual issues such as browsing location, intended purpose of the site, and prior knowledge and skills of the target audience[8].

The presence of alternative guidelines is a clear sign that for some, the WCAG is insufficient as a tool for supporting the design of an accessible and usable Web site for older and disabled people. Several alternative sets of research-based guidelines have been developed and published in recent years, each focusing on supporting designers in creating Web sites that can be accessed and used by disabled and/or older people. These guidelines have most commonly been generated either directly from observations of user evaluations, or from literature reviews of related work. A non-exhaustive list of some of the more prominent research-based guidelines is presented in Table 1.

The usefulness of published design guidelines is, of course, dependent on their prominence and credibility amongst Web developers and content providers. While the DRC research indicated that lack of awareness is still an issue, there is evidence that WCAG is relatively well-known amongst Web developers. For example, Lazar et al.[9] surveyed 175 Web developers on awareness of Web site accessibility and found 64% (112) were aware of the WCAG.

Yet it is the contention of the author that, amongst the Web development industry in general and even amongst those who enthusiastically advocate Web accessibility, awareness of alternat-

*Table 1. Selected Research-based guidelines for accessible Web design*

| Name | Authors | Scope | Research method | Availability |
|---|---|---|---|---|
| (A) Beyond ALT Text: Usability for Disabled Users | Coyne & Nielsen[10] | Disabled people | Usability tests with 84 disabled people | To be purchased |
| (B) Web Usability for Senior Citizens | Coyne & Nielsen[11] | Older people | Usability tests with 44 people aged 65 and over | To be purchased |
| (C) Research-based Web Design and Usability Guidelines | National Cancer Institute[12] | Non-specific, but does include a section on accessibility | Expert analysis of relevant literature | Free online, to be purchased as a book |
| (D) Making your Web site senior-friendly - a checklist | National Institute on Ageing and National Library of Medicine[13] | Older people | Expert analysis of relevant literature | Freely available |
| (E) Guidelines for Accessible and Usable Web Sites: Observing Users Who Work With Screen Readers | Theofanos & Redish[14] | Disabled people, specifically people with no functional vision | User evaluation with 16 screen reader users | Freely available |
| (F) Research-derived Web design guidelines for older people | Kurniawan & Zaphiris[15] | Older people | Expert analysis of relevant literature, validated with older Web users | Access to ACM Digital Library required |

ive accessibility guidelines is significantly lower than WCAG. The author conducted a survey in November 2005 to establish the level to which Web site developers and accessibility advocates were aware of a number of research-based guidelines (*Table 1*).

Three email discussion groups were contacted each either directly focussing on Web site accessibility or in which discussion of accessibility plays a strong part – the aim being to solicit replies only from those who had a clear interest in Web accessibility, and an awareness of the WCAG. The lists contacted were the W3C Web Accessibility Initiative Interest Group (WAI-IG) email list; the Guild of Accessible Web Designers (GAWDS) email discussion forum; and the UK Web-support discussion list, run for Web developers based at UK Higher education institutions. The request was subsequently posted to www.accessifyforum.com, a widely used online discussion forum for Web accessibility issues.

Potential survey respondents were asked to reply to the author rating their level of awareness of each of the six sets of guidelines, using the following scale:

1. I've never heard of them.
2. I've heard of them but never read them.
3. I've read them but never used them in my work.
4. I've used them occasionally to inform my work.
5. I use them regularly.

No additional information was sought from respondents, but several replied with explanatory text supporting their ratings.

Over a period of 5 days, 57 replies were received, including some from prominent figures in the Web accessibility ad-

*Table 2. Survey results - levels of awareness of guidelines; 1 = I've never heard of them, 2 = I've heard of them but never read them, 3 = I've read them but never used them in my work, 4 = I've used them occasionally to inform my work, 5 = I use them regularly*

| Guideline set | Level of awareness (n=57) | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| (A) Beyond ALT Text: Usability for Disabled Users | 15 | 20 | 7 | 12 | 3 |
| (B) Web Usability for Senior Citizens | 35 | 14 | 2 | 6 | 0 |
| (C) Research-based Web Design and Usability Guidelines | 45 | 6 | 1 | 5 | 0 |
| (D) Making your Web site senior-friendly - a checklist | 52 | 3 | 1 | 1 | 0 |
| (E) Guidelines for Accessible and Usable Web Sites: Observing Users Who Work With Screen Readers | 41 | 4 | 5 | 6 | 1 |
| (F) Research-derived Web design guidelines for older people | 49 | 3 | 5 | 0 | 0 |

vocacy movement. Replies were predominantly from the UK and US, but replies were also received from respondents in Canada, Australia, New Zealand, Ireland and Turkey (*Table 2*).

## Survey findings: a brief discussion

Overall awareness of the six sets of guidelines in question was surprisingly low (*Table 2*). Of the guidelines chosen, Guidelines A, 'Beyond ALT Text: Usability for Disabled Users' were by far the most well-known, 74% (42) of respondents having heard of them and 26% (15) having used them in their work. By contrast, respondents were significantly less aware of all other guidelines sets included in the survey. The publication 'Making your Web site senior-friendly - a checklist' (Guidelines D) was the least well known, with 91% (52) of respondents never having heard of it. Only four respondents indicated that they used any of the guidelines regularly in their work - three of which cited Guidelines A, and one of which cited 'Guidelines for Accessible and Usable Web Sites: Observing Users Who Work With Screen Readers' (Guidelines E).

There are a number of possible reasons for the results. Availability of guidelines may be an issue – some (Guidelines A and B) were available only at a cost, which may be prohibitive to many, while 'Research-derived Web design guidelines for older people' (Guidelines F) were presented in an academic paper, access to which at the time of the survey required registration with a digital library, again at a cost.

The short time of availability is highly likely to have been a factor in the lack of awareness of Guidelines F, given that they were presented at a conference only one month before the survey, although a review of these guidelines was very quickly published by a prominent accessibility advocate[16].

It is also possible that the results may not be truly representative of Web developers, and that people more aware of the guidelines chose not to reply, or were unaware of the survey. However, it is suggested that given the characteristics of the audience targeted by the survey, those who responded would be most likely to have heard of or used a variety of the guidelines. Indeed, it may be that the reported level of awareness may be artificially high, if one considers that other potential respondents may have been unwilling to respond for fear of admitting their lack of awareness of certain sets of guidelines.

Acknowledging the above reasons, it is argued that there are two primary reasons for this lack of awareness – their visibility to the community expected to implement them, and their credibility amongst that community.

*Visibility*: The alternative guidelines are seldom mentioned in printed literature and online resources devoted to Web accessibility. Consequently their presence may be missed by developers seeking to enhance their skills in accessible Web design.

*Credibility*: Comments made in the survey feedback, and commentary by Web accessibility advocates on alternative guidelines[16] indicate that while many of the guidelines in question reinforce best practice already being followed, certain guidelines appear excessively prescriptive to some Web site developers.

It is also interesting to note that while the Web Standards movement embraces the WCAG, the very existence of other guidelines implies dissatisfaction with the WCAG. Indeed, in a recent paper in this journal discussing age-specific Web design guidelines[17], no mention was made of WCAG amongst the other Web design guidelines considered. It is thus possible that a situation exists where from the ageing and technology researcher's perspective, the WCAG appears to provide insufficiently evidence-based guidance on design for older people, while from the Web developer's perspective, the research based guidelines lack credibility in not referencing the *de facto* industry standard that is WCAG.

## Guidelines for accessibility, or usability for older people?

Clearly there is a disconnect between those researchers who consider the WCAG insufficient in supporting the design of Web sites that can be accessed and used by older people, and the Web Standards movement, which readily adopts WCAG but seems unwilling to embrace, or is even oblivious to, alternative research-derived guidelines.

So, is this a symptom of two distinct cultures? The situation is, it is argued, an illustration of the artificiality of an attempt to distinguish between 'accessibility' and 'usability for disabled and older people'.

The W3C's Web Accessibility Initiative takes a tripartite approach to accessibility. It stresses that responsibility lies not just with Web content providers, but also with the manufacturers of browsing and access technology and with the manufacturers of tools used to create Web content, and has published additional accessibility guidelines accordingly[18].

The recommended W3C approach is thus to design a Web site in such a way that, while a majority of the site audience should be able to use it without any difficulty, any user who needs to do so can make the necessary changes to their browser or apply other accessibility solutions in order to optimise accessibility for their specific needs, for example by enlarging text or altering text and background colours. This approach of meeting a technical level of accessibility defined by guideline conformance has, it is argued, been instrumental in 'selling' accessibility to Web designers traditionally hostile to any attempt to constrain their creativity. Advocates of WCAG and Web standards have consequently expressed frustration at users' lack of awareness of how to optimise their own computing set-up for accessibility[19]. The limitations of widely-used browsing and access technology in making the most of the additional benefits of standards-based Web design only add to frustration.

The research-derived guidelines, on the other hand, identify and acknowledge the real world problems facing many older Web users who do not have, and may never have, the necessary technical skills and equipment to optimise the accessibility of the Web sites they visit[20].

As such, these guidelines frequently prescribe aspects of appearance that, if applied, minimise potential problems arising from a user's inability to change the appearance of a page, for example:

"For links, use blue, bold underlined text" (Guidelines B)

"Use black text on plain, high-contrast backgrounds" (Guidelines C)

"Use sans-serif type font i.e. Helvetica, Arial of 12-14 point size. Avoid other fancy font types" (Guidelines F)

One can see how a tension arises whereby a designer, adopting an approach that allows and assumes user-customisation, discovers evidence-based guidelines that specify appearance characteristics such as those listed above, placing what may be perceived as unacceptable restrictions on the look and feel of a site. This may be frustrating for Web developers, but it has been demonstrated that adherence to the WCAG is not enough to guarantee that a person with a disability can access and use a Web site[6]. The assumption that all users will have the appropriate awareness and technology to take advantage of a Web site's design is arguably an idealistic approach that has little chance of success in the short term.

## A WAY FORWARD

The results of the survey suggest that there is a pressing need for researchers looking to identify and disseminate best practice in terms of Web design for older and disabled people to engage more effectively with the Web Standards movement. Key goals must be to expose Web developers to the rich information available in these guidelines, and also to understand more about the movement, its approaches and philosophy. There is also a need for researchers to acknowledge the current prominence of the WCAG within the Web design industry as the pre-eminent reference to Web accessibility, and demonstrate how application of the WCAG can be combined with additional design guidelines aimed at overcoming the particular challenges facing older Web users.

At the same time, Web developers have much to gain from absorbing the material present in research-based guidelines. There is a need for a greater recognition amongst developers of the real world problems that older and disabled people face when using the Web; and of the resultant reduction in the practical worth of a design philosophy that assumes that users will customise the interface to compensate for accessibility problems. This is a pressing issue that cannot simply be overcome by a technically accessible Web site and a hope that users become more technologically aware.

Encouragingly, ongoing work improving browsing technology by developing additional accessibility functionality, such as that of Hanson et al.[21], may help to bridge the gap that currently exists. It is hoped that work such as this will help bring accessibility options more clearly to the attention of Web users who most need them, capitalising on the accessibility features provided by standards-compliant Web design. In the e-learning field, work led by the IMS Global Learning Consortium[22] may also point the way forward, in developing formal structures for describing (i) an individual's accessibility requirements and (ii) the accessibility features of an electronic resource such that it may be automatically adapted to meet a user's accessibility needs.

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