

Guidelines, Icons and Marketable Skills: An Accessibility Evaluation of 100 Web Development Company Homepages

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ABSTRACT

Accessible websites are increasingly desired by clients with many web developers listing accessibility as a skill offered by their companies. An accessibility and validation study of 100 UK web development company homepages found that, while the skill set is gaining popularity in terms of visibility, the mention of accessibility on a developer website has no impact in terms of the actual accessibility of the homepage. The presence of validation and conformance icons for XHTML, CSS, WCAG 1.0 and 2.0 also does not necessarily reflect the current state of the site, which may have changed multiple times since the validation occurred. Accessibility errors are still common, with missing alt text and labels and poor keyboard accessibility in terms of keyboard traps as well as omission of “lang” attributes and reused id attribute values listed among the most frequent barriers encountered.

Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces – *Evaluation/methodology, User-centered design*;
K.4.2 [Computers and Society]: Social Issues – *Assistive technologies for persons with disabilities*.

General Terms

Human Factors, Design, Economics

Keywords

Web Accessibility, Web Developers, WCAG 2.0

1. INTRODUCTION

Although a wealth of guidelines and tools exist to help developers improve accessibility, many websites are still not accessible. Several recent studies have found that accessibility guidelines are still not being met in public and educational organisations [8, 10] and this data can likely be generalised to create a picture of a still widely inaccessible web little different from 2004 when Lazar found over 70% of websites examined in his study not conforming to Web Content Accessibility Guidelines (WCAG 1.0) [5].

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2. BACKGROUND

2.1 Web Accessibility

Accessibility is not only a build-phase concern, but also a site maintenance task. There is a trend for established websites to decline in accessibility over time [6] as sites continually update, allowing accessibility errors not originally present to appear in subsequent updates [8]. More recent research found that while some accessibility barriers such as non-descriptive alt texts have improved over time, keyboard navigation accessibility has declined with elements such as dynamic menus and Flash content having a growing negative impact on accessibility [10].

Legislation does not guarantee access. In the United States where Section 508 provides legally required standards for accessible website design for Federal agencies, such agencies still do not conform to requirements. Olalere found in his study of 100 government site homepages that over 90% of the pages tested had easily rectified accessibility errors including; mislabelled forms, unlabeled alt tags, missing keyboard skip navigation and missing keyboard equivalents for mouse-over interaction [8].

While testing is common among all developers, it appears to be generally casual, with accessibility ranking below usability and cross-platform compatibility as a testing priority [9]. Even for developers with experience of accessibility, designing, testing and finding workarounds were seen as the most difficult aspects of accessibility with testing seen the most time-consuming [11].

Lack of awareness of accessibility guidelines and practice still exists. One Brazilian study found that while 45% of web-related professionals were aware of screen readers for blind users, they did not know how to make web pages screen reader compatible [3]. In the UK, the Disability Rights Commission Formal Investigation (DRC 2004) found that only 29% of Small to Medium Enterprises took accessibility “into account” while building a website although 69% were “aware of accessibility as an issue”. Large organisations were more aware of accessibility at 97%, however only 68% considered accessibility during a build [1]. More recently, developers have indicated a need for more education about accessibility. A recent stakeholder survey found 85% of developers wanting more accessibility training with more information on disabilities and the use of assistive devices [7].

3. METHODOLOGY

Web development company websites provide the best opportunity for firms to showcase their talents and sell their skills. The research started with the question: *How accessible are the websites of companies selling web development services?* From

this question, three sub-strands of investigation arose concerning accessibility and conformance icons:

1. Do web development companies view accessibility as a selling point?
2. Does the mention of accessibility on developers' site have an effect on the accessibility of their own site?
3. Do conformance icons and accessibility statements have any bearing on the accessibility of the website?

One hundred homepages of UK Web Development companies were selected; 25 companies from 4 separate searches using Google based on it being the likely search engine used by potential clients, and the search term "web development" and name of a geographical area or city. Cities and geographical areas were chosen to cover as large an area as possible in terms of both size and population. All sites were checked for conformance icons, presence of accessibility statements as well as whether the company mentioned accessibility as a service or selling point.

Each homepage was then validated to WCAG 2.0 AAA using AChecker [16]. Only the homepage was tested, as this page is the first port of call for most people viewing a site and may, if it is poor, be the only interaction with that company's content. AChecker was selected due to the low number of errors compared to two other validators used for the first 25 homepages examined. Following validation, each page was checked manually by a person experienced in accessible web development using WCAG 2.0 Guidelines in Firefox (version 6+) and rechecked at least once to verify results. Manual checks focused particularly on keyboard accessibility and alt tag descriptiveness and are included in the discussion section to enhance and verify the automated output and where significant, mention false results arising from the automated process. To maintain data coherence, this data is not included in graphics discussing validator output.

3.1 Limitations of the study

As only the homepage of each site was examined for accessibility, some aspects of accessibility will be under-represented or not represented at all. Not all accessibility barriers are visible to automated checkers and both false positives and false negatives can occur. These are not reflected in the graphical representations of the frequency data.

4. RESULTS

4.1 Accessibility as selling point

Accessibility as a skill listed by development companies is common, with 46 out of 100 companies listing skills in accessible web development. The accessibility information provided ranged from bullet point phrases or single sentences listing accessibility services (this accounted for the majority of companies) to entire pages discussing accessibility, legal requirements and/or design philosophies. Other companies chose to integrate accessibility into their overall design methodology or philosophy information and one company had a separate accessible website. Only five of the 46 companies specifically cited aims to meet a specific level of WCAG 2.0 conformance, one company aiming for compliance at all levels, three companies to meet level AA, and one citing Level A as a minimum requirement. Three companies mentioned accessibility in their portfolio, demonstrating that they had clients who required accessibility. Techniques for achieving accessibility were also discussed in four company blog posts.

The mention of accessibility as a selling point had no effect on the number of automated Level A accessibility validation errors of the company homepage ($M = 11.8$, $SD = 23.7$) than companies that did not mention accessibility ($M = 10.1$, $SD = 12.9$) conditions; $t(98) = -.463$, $p = .644$. Therefore, no association between the mention of accessibility on the site and a decrease in the number of Level A accessibility errors could be found.

Sixteen companies have accessibility statements that are discoverable from the homepage with a total 23 companies in total having discoverable accessibility statements on the site. Two sites had accessibility as a selling point or skill located within the accessibility statement.

The inclusion of an accessibility statement on a developer website had no effect on the number of automated Level A accessibility validation errors ($M = 6.1$, $SD = 6.2$) of the company homepage than companies without accessibility statements ($M = 12.3$, $SD = 20.7$) conditions; $t(98) = 1.42$, $p = .159$. Therefore, no association between the inclusion of an accessibility statement on the site and a decrease in the number of Level A accessibility errors could be found.

Of the 23 companies that had discoverable accessibility statements 16 were from companies listing accessibility as a selling point.

4.2 Validation icons, accessibility statements and conformance

Validation icons are not a prominent feature of the majority of sites. Figure 1 shows a breakdown of validation pass/fail frequency as well as the frequency of several conformance icons. Only 23 out of 100 sites have discoverable XHTML or HTML W3C validation icons for a page. The number of sites with CSS validation icons drops to 17 out of 100 with only eight out of 100 sites having WCAG 1.0 conformance icons and one out of 100 sites with a WCAG 2.0 conformance icon.

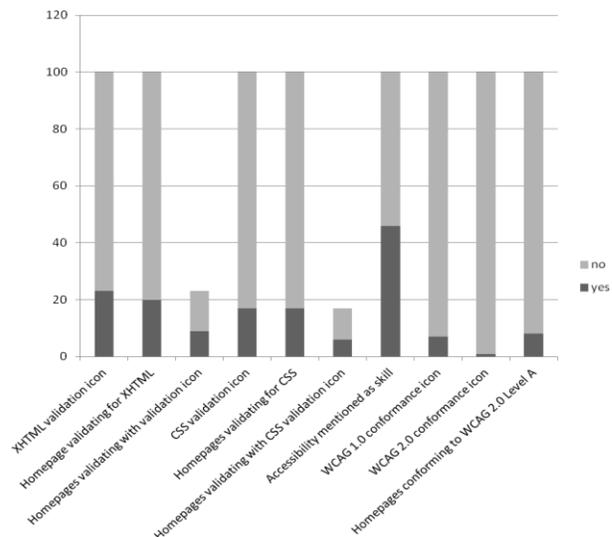


Figure 1: Validation and validation icon frequencies

Each homepage was revalidated using the W3C validators for XHTML/HTML [15] and CSS [14]; only 9 of the 23 websites with HTML or XHTML validation icons passed the revalidation out of the total of 20 homepages successfully validating across the

100 tested. For sites with CSS validation icons, 6 out of 17 passed from a total of 17 sites out of 100 validating without error. One site with WCAG 1.0 icons passed Priority 1 using AChecker and the site with the WCAG 2.0 conformance failed Level A. Only eight out of 100 sites passed Level A through AChecker.

4.3 Accessibility errors

The most common accessibility barriers found on the 100 developer homepages are listed below and the error details are shown in figure 2.

4.3.1 Text alternative errors

WCAG 2.0 Guideline 1.1A states that developers should, “provide text alternatives for any non-text content so that it can be changed into other forms people need,” [17]. This error was present in 46 out of 100 sites. Manual checks found five false positives, making an adjusted figure of 41. The most common error, present in 20 sites, is missing alt text for images in slideshow banners. A further eight sites had buttons made from images missing the “alt” attribute.

4.3.2 Adaptable

Guideline 1.3A: requires developers to, “create content that can be presented in different ways without losing information or structure” [17]. Sixty-four homepages passed Guideline 1.3 validation. Missing form label elements were the most common error. Twenty-three errors of this type occurred due to the text element missing the associated label. Other errors involved missing label text in input elements such as radio buttons, checkboxes and password fields (22 out of 100) as well as missing fieldset and legend tags for grouping radio buttons.

4.3.3 Keyboard accessible

Guideline 2.1 aims to, “make all functionality available from a keyboard” [17]. Eleven sites did not pass the automated keyboard accessibility check, however when manually checked most of these homepages were broadly accessible with inaccessible content appearing to be redundant content.

Manual checking of the 100 homepages resulted in 10 sites failing keyboard accessibility. A total of 15 sites did not work properly in Firefox – mostly as a result of Flash content either creating a keyboard trap, or by skipping the Flash content. When tested in Internet Explorer (IE) the number failing Level A due to keyboard traps dropped to six with the remaining failures caused by general inaccessibility to keyboard navigation. The majority of accessibility errors in sites failing manual checks were caused by forms which would either prevent the user from navigating out of the search box or for skipping radio buttons where one of the radio buttons was pre-selected. Drop-down menus navigation difficulties also contributed to keyboard failures at level A. Five out of 100 sites did not have keyboard navigation that followed a logical order.

4.3.4 Navigable

Guideline 2.4 seeks to, “provide ways to help users navigate, find content, and determine where they are” [17], with 75 out of 100 sites passing automated validation. The main occurrence of this accessibility barrier occurred in banner slideshows with images containing links to portfolio or other pages on the website having no alt text.

4.3.5 Readable

Guideline 3.1 aims to, “make text content readable and understandable” [17]. This guideline had the greatest rate of failure at level A with 71 sites failing to add markup allowing the default language of the page to be programmatically determined.

4.3.6 Input assistance

Guideline 3.3 states that developers must, “help users avoid and correct mistakes” [17]. Forty two sites failed the automated check with all failures due to lack of labels or instructions on input elements.

4.3.7 Compatible

Guideline 4.1 is concerned with parsing of content and aims to, “maximise compatibility with current and future user agents, including assistive devices” [17]. Fifteen sites had parsing errors due to the reuse of the html id element.

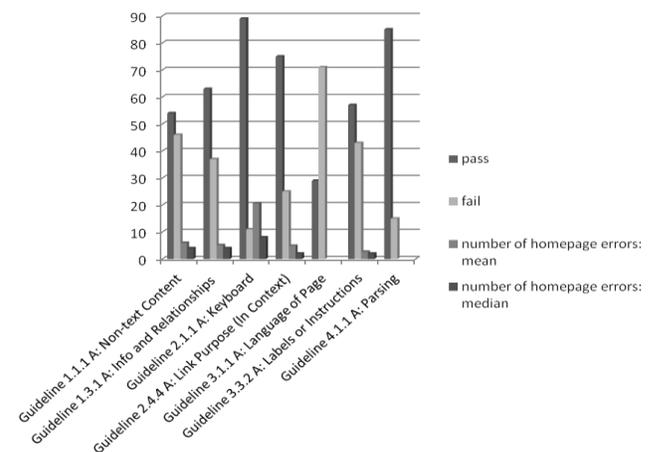


Figure 2: AChecker output of errors at Level A

5. DISCUSSION

5.1 Conformance icons and selling points

Conformance icons were visible in only a minority of sites and do not guarantee that the page currently validates. The absence of such icons similarly does not mean that the site does not validate. Less than half of the sites with conformance icons passed validation during the study. This lack of validation is likely due to updates or pages not going through a revalidation process as suggested by Lazar and Olalere. However, some companies were clearly revalidating their content and it was noted during the course of this study that several homepages fluctuated over time in terms of whether they passed HTML validation.

Only eight sites had accessibility conformance icons and seven of these icons were for WCAG 1. Only one site had the WCAG 2.0 AChecker conformance icon. As the WCAG 1.0 guidelines were superseded by WCAG 2.0 in 2008, it is intriguing that only one site is currently displaying the WCAG 2.0 icon. A number of questions arise: Why is the WCAG 2.0 conformance icon not being used? Are the WCAG 2.0 guidelines a part of the web developers’ toolkit? Or is the reliance still on WCAG 1.0? One of the goals of the conformance icons, namely to raise awareness of accessibility, is not being met as such icons are buried in the accessibility statement rather than displayed on a page-by-page

basis, in support of an older set of standards (WCAG 1.0) or, as in the majority of cases, not used at all.

Of the 46 sites that mentioned accessibility, four of the sites described accessibility purely in terms of screen readers and/or visual impairment. While this is not a large number, it is of interest to note that this visual impairment-centric view of accessibility still exists.

5.2 General Accessibility

The lack of alt tags for links and images remains a key barrier. Generally, most of the pages did have alt tags but the failure to have alt tags in banners hints that accessibility declines over time as banners are updated. The failure to include alt tags for images was also present in portfolio content displayed in grid formation on the homepage. Again, the likelihood of this content being regularly updated, implies degradation of accessibility.

The most common barriers to keyboard navigation were caused by Flash and HTML forms. HTML forms fieldsets would greatly increase the accessibility of the form and for sites with Flash content, either using JavaScript solutions [13] or using Actionscript 3 (AS 3) and JavaScript/Jquery tabbing fixes in Firefox [2] would help with Flash content accessibility.

The most common, easily correctable, accessibility barrier at 71% was the failure to declare a language for the page. This creates a barrier for people using assistive technology such as text-to-speech or a screen reader.

The idea that keyboard accessibility is primarily the interaction method for screen reader users was evident in a number of sites. One site had an invisible skip navigation link that would not be easily spotted by people not using screen readers and the lack visual cues for keyboard navigation for over a third of sites as well as the inconsistency of visual focus cues on other sites reinforces the theory that for many developers, accessibility is still primarily about visual impairment.

5.3 Conclusion and future work

While accessibility has increased both in profile and compliance, WCAG compliance icons do not have the visibility of XHTML or CSS validation icons and WCAG 2.0 conformance icons are virtually non-existent. In contrast, the desire and willingness of developers to develop accessible products and to advertise these skills to potential clients is far more visible. Further research into whether developers consider their own sites to be accessible, their views on the relevance of conformance and validation icons as well as more information on who drives accessibility as a requirement, clients or developers, may shed further light on how accessibility is integrated as a practice within industry. While there is no association between the mention of accessibility and the conformance of the site in terms of validation, the recognition of accessibility as a marketable skill marks an important step in raising awareness of accessibility.

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