Improve the accessibility check-list taking into account the specificities of screen readers

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Abstract. The accessibility automatic validators gives a feedback about HTML code quality and attributes a conformance level rated from A to Triple-A according to the W3C Web Content Accessibility Guidelines 1.0. However, the users of screen readers such JAWS complain about a lot of navigation and understanding problems that may be found even in Triple-A labeled web sites. The aim of this study is to improve the accessibility guidelines in order to take better into account the specific needs and characteristics of visually impaired people. To do that, we have achieved a three steps approach: fist of all we examined the available check-lists and guidelines (AccessiWeb & WAI: WCAG). As a second step, we focused on user tests. The users were asked to realize some tasks of information searching, browsing with JAWS. Finally, thanks to this study, we have created a very powerful accessibility evaluation tool, able to take into account specific parameters related to hierarchical and semantic structure of web sites.

Keywords: WAI, W3C, web accessibility, law, automatic validator, tests, evaluation.

1 Introduction

The subject of this study is Web accessibility. We were interested in the various methods to evaluate the web sites accessibility. At the moment, several international guide-lines are available in this matter, in particular those proposed by the Web Accessibility Initiative (WAI) of W3C consortium and the American Section 508. These guide-lines are very useful, but they are based only on an automatic HTML code validation. Our experience in the field of usability and accessibility allowed us to observe visually impaired people browsing the Web. Thanks to these tests, we noticed that these users are often unable to find information and explore Internet sites in an effective way, even when these web pages are accessible from the guide-lines point of view. In order to improve the guide-lines, we started on a specific research aiming to identify the limits of the automatic validators and proposing complementary tools.

1.1 What is accessibility?

If something is accessible, it means that anyone can use it. More specifically, Web accessibility means that people with disabilities can perceive, understand, navigate, and interact with the Web.
Web accessibility encompasses all disabilities that affect access to Web, including visual, auditory, physical, speech, cognitive, and neurological disabilities.
Millions of people have disabilities that affect their use of Web. Currently most Web sites and Web software have accessibility difficulties that make it hard or impossible for many people with disabilities to use Web.
Web accessibility also benefits people without disabilities. From a larger point of view, accessibility corresponds to creating a flexible interface. In fact, a key factor of Web accessibility is designing Web sites and software that are flexible to meet different user profiles, needs, preferences, and situations (for example older users, people using a slow Internet connection, etc).
Currently, the most popular choice for accessing content in a web site is via a web browser, software that interprets HTML code, showing web pages on PC (or telephone and PDA) screens. However, visually impaired people feel the need of very different and specific visual characteristics. Reading web pages they may need to adjust the text size in browser window; the contrast between the foreground (text) and background colours or, if they have poor eye vision or are completely blind, install 'access technology'. The most common form of 'access technology' is a screen reader software, that works converting the text of a web page into a synthesised speech. The most commonly used screen readers are Jaws and Window-Eyes.

1.2 The automatic evaluation of accessibility

The accessibility validators tests a set of criteria concerning the structure of HTML code source and criteria concerning the presence and the content of CSS file (if the page has one). Validators best property is a fast analyzing way to detect problems. Moreover, most of them are quite easy to use for a Web developer.

Several national and international groups work on the elaboration and on the improvement of these validators (OCAWA, APINC, WDG, Bobby, Cynthia, etc.). All of them consider exactly the same criteria but the whole error reports don’t show the same format. Some can only produce a list output containing code lines that produced errors, others propose solutions to improve the page source code but seldom the output contains recommendations beyond the code syntax. For example, they check the presence of some relevant tags, but not their content and semantic pertinence, sometimes they are too tolerant and mention certain remarks as warnings and not mandatory requirements, and so on. This is a fundamental limit of these tools, which is the cause of several still present accessibility problems, due to the fact that they are unable to validate the content coherence and structure.

Moreover, Trenton Moss [1] underlines that an automatic validator makes a literal interpretation of criteria and can thus make a mistake in some cases. Thus, in order to

have a good result, it is necessary to cross the results of several error reports, because no one is good enough to take into account the wide range of accessibility issues.

2 The study

The aim of this study was to enlighten difficulties or constraints, that are not noticed nowadays, in the access to the information for visually impaired people, using screen reading software. MDPH06 Web site (French governmental web site which give administrative information about Handicapped persons) was not validated by the automatic accessibility validators (APINC, CYNTHIA, OCAWA, WebXACT, Wave 3.0). To study accessibility validators problem, it was necessary to apply their recommendations studying in order to identify their limits. Thus, an AAA version of MDPH06 web site was realized, modifying necessary tags to obtain the highest validation level assigned by the international consortium W3C.
After that, we accomplished user tests with seven visually impaired persons (familiar to Personal Computer and usually using the screen reader JAWS). Their tasks consist in finding some documents and information in this site, showing administrative contents. We aimed to study the information access, the navigation and the sequence of actions to accomplish the tasks. We recorded the number of actions of the participants and we took into account their observations as well as the emotional aspects connected to the realization of the tasks. Screen recording software recorded the actions of every test session and of every task and user. The test began with a questionnaire about the frequency of use of Internet and the user profile of the subject. Then two tasks were sequentially realized, separated by a food break of some minutes. Every task is preceded by oral instructions about the information to find (excel file) and action to accomplish (filling in a form).

A post-test questionnaire ended the test gathering information about difficulties, emotional answers, open questions.

The two tasks details and some of our experimental results are explained below.

2.1 Download task

During the first task participants has been asked to localize the "demand of handicap compensation file" then to download and save it. The link to this file is labeled "PDF - 1Mb". This link is the only one which allows downloading the requested file. A brief text presents the file, and mentions that it can be downloaded in PDF format. The link it’s just after this text. It is the first link placed in the contents of the page (after the main navigation menu). Nevertheless inspite of the coherent location and the presentation by some sentences, only 2 users out 7 succeed in localizing it. Two users downloaded no file. Three users downloaded the "demand of service", an incorrect file and one of these three users opened also another wrong file, "details to be supplied". The users having downloaded the "demand of service" thought they found the good file.

To identify the requested file the users scanned (via JAWS) an average of 63,33 links.

2.2 Filling on-line form task

In the second task the participants has been asked to localize a form called "applicant identification index form" then opening and filling it on-line. The link of this file is "3 - index form of identification ". Six users out seven succeeded in localizing this Pdf document.

To identify this document the users read an average of 16 links, thanks to a more explicit and verbose file name.

The T-Student analysis shown a significant difference between the average of link crossed in task 1 compared to task 2 ($t=7.55$; $p <.001$).

These data demonstrate the accessibility problems related to links names. Visually impaired people use specific navigation tools which take out the links of their contexts (JAWS proposes a shortcut allowing extracting the list of all the links of current using page). The use of this function is a very common navigation strategy to allow a more effective and deep web exploration. Although this function is very useful and fits the needs of visually impaired people (allowing them to read only the links on the page, not the plain text), very often the text employed in the links is understandable without its semantic content. This is the case of our first task. Links named in a more semantic reliable way allows the users to be more effective (less lickings) and performing (less time waste).

We stressed the fact that none of the available validators was able to take into account this characteristic and all the different criteria necessary to create valid and accessible links. This kind of analysis required human validation.

2.3 Qualitative data

After the tests, the participants answered a questionnaire about the description they have of the tasks done. Five users thought they’ve found the right document concerning the search of "demand of handicap compensation file", but actually only two users downloaded the good file. Five out seven users declared to have met difficulties looking for this file. Concerning the second task (find the "applicant identification index form") six participants identified quickly the file and declared to have found the right document.

A lot of data about the fundamentals needs (or incompatibility between usual web habits and the vocal synthesizer) have been obtained during this part of the study.

3 Conclusion

We highlighted problems met by visually impaired users during a searching for administrative documents session. The results of this study let us to better understand blind people needs and the enormous limits of automatic validators, in particular

concerning semantic content of web pages. We described above the problems related to hypertext links names but we also found some difficulties related to the way of coding some information (such as telephone numbers), the use of tables and access-keys etc.

On the basis of these results, we have been able to create complementary criteria, to be integrated in the available accessibility check-lists. Our research work based first of all to the creation of a unified evaluation check-list. As explained above, available tools are incomplete and don't provide developers to all the necessary information to create/modify Web pages to make them accessible to everybody. As a second step we developed a complementary check-list, based on our experimental researches. This check-list will guide developers in the validation of web accessibility taking into account a more extensive list of parameters, user needs, specificities and semantics characteristics of the code.

References

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