

A Survey on the Accessibility Awareness of People Involved in Web Development Projects in Brazil

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ABSTRACT

Accessibility has become a very important issue to promote inclusion in the Information Society, and people involved in Web development projects have a very important role to contribute with the development of a more inclusive Web. In this paper, we propose an investigation on the accessibility awareness of people involved in Web development in Brazil. We have conducted the research by means of an exploratory survey with a Web based questionnaire and a sample with subjects from academy, industry and government. The study had 613 valid answers and involved representatives from all of the 27 states of Brazil. The results show that accessibility is still far from being actually considered in Web development projects in Brazil, as only 19.9% of the participants have stated that accessibility is considered in their projects. The lack of education on accessibility, as well as the poor spread of the Brazilian accessibility law are important issues to be dealt with to boost a stronger accessibility awareness among people involved in Web development.

Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces—*User-centered design, Theory and methods*

General Terms

Design, Human Factors

Keywords

Web Accessibility, survey, developers, perception

1. INTRODUCTION

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W4A2008 - Technical, April 21-22, 2008, Beijing, China. Co-Located with the 17th International World Wide Web Conference.

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The World Wide Web has become a ubiquitous technology, as it is deeply intrinsic to several of our day-to-day activities. The Web is also a platform for business, education, government and many other services that can be reached from anywhere at anytime.

Such a powerful technology may be even more effective if we enable access to it by any people, regardless of disabilities and other constraints. Making the Web more accessible is a very important challenge to be addressed to empower a more inclusive “Information Society”.

The Web development process involves several activities to produce systems. As other software systems, Web systems development also involves tasks ranging from system analysis to software maintenance issues. These activities are usually done by a wide range of people, such as stakeholders, designers, developers, testers, content producers and others.

The success in producing accessible Web systems depends on how people involved in Web development projects are aware of accessibility. It is very important that since the beginning, accessibility is taken into account during the whole software development process.

Although many techniques have been developed to help on including accessibility issues in Web development [10], many Web systems remain still inaccessible. Many developers and people involved in the development process may be not aware of accessibility issues and may not know how to use appropriate techniques to address them.

The need to know better how these people perceive accessibility, how accessible their Web pages are and why they develop pages accessible or not is crucial to propose new approaches to boost Web accessibility.

A couple of studies have investigated the perception of accessibility by Web developers [16] [5] regarding people from different contexts and backgrounds. Two other surveys have investigated the perception of accessibility by Brazilian developers [21] [6], specially people from governmental organizations.

These studies presented interesting data about the accessibility awareness of Brazilian Web developers. However, the studies did not involve a significant and varied range of people. Besides, the studies were not planned aimed at enabling further statistical analysis.

In this paper, we proposed a survey to investigate the accessibility awareness of people involved in Web development projects in Brazil. The main goal of this work was

to examine basic issues related to accessibility in software development, and how developers and other people tackle accessibility.

The research was done by means of a Web based survey with the participation of 613 people from all of the 27 states of Brazil. The questionnaire was designed in a way that further statistical inferences could be done. A preliminary analysis of the data obtained is discussed by means of a descriptive analysis.

This paper is organized as follows. Section 2 presents accessibility issues involved in Web Development. Section 3 discusses related work, summarizing four other surveys similar to the one presented herein. Section 4 presents the experimental settings and the conduction process of the experiment. In Section 5, the main results obtained from this research are discussed. Finally, Section 6 presents conclusions and future work.

2. ACCESSIBILITY ASPECTS IN WEB DEVELOPMENT

From a technical point of view, Web accessibility corresponds to making possible to any user, using any user agent (software or hardware to view Web content) to understand and interact with a Web site, despite of disabilities, languages or technological constraints [22, 13].

Accessibility has become a very important issue in Web development as a quality requirement. The need for building accessible Web systems has been a challenge for many developers.

The dissemination of legislation regarding accessibility in several countries has also boosted the interest for accessibility. The *Section 508* [23] from the US Government, the Decree/Law 5.296/2004 and the *e-MAG* (electronic government accessibility model) [4] from the Brazilian government are examples of laws that discuss the need for developing accessible governmental Web sites.

Developers and designers have a very important role in the development process, and are among the people who are most responsible for making accessible systems.

Besides the development of Web accessibility guidelines, such as the “Web Content Accessibility Guidelines” (WCAG) [25, 27] from W3C, many other techniques have been proposed to help the development of accessible systems from system design to maintenance [10].

Many proposals have approached accessibility as not only a topic to be discussed merely during design and evaluation of Web systems, but also an issue to be effectively addressed in the whole Web development process. Thus, accessibility should be considered in every phase of the software development.

There are reports about the use of techniques regarding accessibility during requirements elicitation [19], architectural design [17], navigational design [2] [15], interface design [28], content design [3] [7], software construction, evaluation, maintenance, measurement [24] and training [18] [9].

The creation of new techniques to support Web accessibility during software development shows that accessibility should involve not only designers and developers, but also stakeholders, content creators, testers, coordinators and managers.

Nevertheless, although many techniques have been proposed to help the development of accessible Web applica-

tions, many studies have shown that accessibility is still poor in many Web sites [14] [8] [12].

These evidences show that there is still a gap between techniques been developed to help building accessible applications and its actual use by people involved with Web development.

The results described in this study and in other ones [16] [5] [21] [20] [6] show that many of these techniques have not been used in practice, not even well known techniques such as manual and automatic guideline review evaluation and code validation. Therefore, it is an important issue to investigate how people involved with Web development have perceived accessibility to identify pitfalls and opportunities to increase accessibility awareness.

A better knowledge of how people consider accessibility in their projects and which techniques they use (or not), as well as how they use them may arise many interesting issues to enhance Web accessibility.

3. RELATED WORK

The investigation of the perception of accessibility by Web developers has been an important target pursued by several research projects.

Following we summarize four surveys conducted with Web developers.

3.1 Lazar et. al, 2004

The first large-scale survey on the perception of accessibility by developers and designers was carried out by Lazar et. al [16]. The main target of the survey were webmasters and Web developers.

The participantes were invited to participate through a Web questionnaire sent by e-mail to HCI-related lists. A total of 175 developers and Web site maintainers participated in the survey, 45% of them from the US.

In this survey, most of the participants (65.7%) said that they have already created an accessible Web site; 73.7% indicated that they are familiar with Section 508. Around 78.9% said that they know accessibility evaluation tools, and 69.1% have already used an evaluation tool. However, only 38.9% answered that they have already navigated the Web using a screen reader.

The main challenges for making a Web site accessible by people with visual impairments pointed by the subjects were: the lack of consciousness of their clients, the trade off between accessibility and graphical design, lack of time, lack of training and need for better tools to help the development.

When asked about who are the main responsible for making a Web site accessible, 52% answered the webmaster should be in charge of this task, 30.18% pointed the system analyst, 34.9% pointed the programmer, 10.18% pointed the help desk manager and 31.63% pointed the office for special needs.

The participants indicated that the main reasons for making their Web sites accessible were governmental requirements, the use of the Web site by people with visual impairments, external fundings, requirements from management or clients, training on accessibility and better tools.

It seems that the results of this study may have a bias, due to the major participation of HCI-related people. This is the survey that indicate the most optimistic results found in the literature.

3.2 Enabled Group, 2005

The second study, performed by the ENABLED¹ Group [5], also involved a Web based questionnaire. Participants of the project and of the *Health on the Net* were invited to participate in the survey. A total of 269 subjects participate in the survey, 87% from North America.

Around 29% of the participants were webmasters, 29% from a non-specified area, 21.9% were managers and 7.8% were content editors.

Only 36% answered that they try to make their Web sites accessible. The main reasons pointed for this were the lack of knowledge on Web accessibility guidelines, lack of technical knowledge and lack of time.

When asked about **usability**, 51% answered that they are concerned about it. The main reasons pointed by users that do not concern about usability were the lack of technical knowledge, lack of time and of usability skills.

Around 63% of the participants answered that they use tools to help in Web development. *DreamWeaver* and *Front-Page* are the most used tools, and HTML/CSS, PHP and ASP are the most used languages. Around 41% of the subjects answered that they have an intermediate level of programming skills and 37% claimed to have high level programming skills.

Only 13% answered that had already had training on accessibility, mainly from the Internet, school or university and from friends. Around 74% answered that they would like to receive training on accessibility.

The main topics the subjects would like to be covered in a training course would be: the WAI (*Web Accessibility Initiative*), Web accessibility guidelines, usability and accessibility evaluation.

It is possible to notice that the main goal of the survey carried out by the ENABLED Group [5] was to identify opportunities for providing training on usability and accessibility. Although the questionnaire had a lot of participants, there was little variability in terms of user types.

3.3 Tangarife and Mont'alvão, 2006

The first research on the perception of accessibility with Brazilian developers was developed by Tangarife & Mont'alvão [21] [20]. This study had the participation of 68 subjects, from 70 people invited by the authors by e-mail.

The majority of the subjects were male (75%), and around 61% were between 25 and 35 years old. Most of the participants were from government organizations (57.35%). The main occupations pointed by the subjects of the survey were system designer (41.18%), programmer (25%) and Web designer (20.59%). Most of the participants (75%) had been working with Web development for more than five years, and almost half (44.11%) considered themselves as experts in computing. Most of them (83.82%) also answered that they consider very important to make a site accessible by any person.

The vast majority of the subjects (94.11%) answered that they have never taken part in a project that involved accessibility. Most of the participants have also answered that they do not know accessibility legislation: 82.35% do not know Section 508 and 81% do not know the Brazilian accessibility law. Around 80% of the subjects are not sure whether their

Web sites are accessible or not. Around 49% answered that they know accessibility evaluation tools, but only 18% said that they actually use them. Only 8.9% of the subjects answered that they have already evaluated a Web site using a screen reader.

When asked about the observation of accessibility in organizations, around 3% answered that their organizations have always considered accessibility, 31% that they currently consider accessibility, and 66% answered that the organization has never considered accessibility. The main reasons for not considering accessibility were: budget limitations (32.35%), lack of experts (32.35%), time (27.94%) and lack of accessibility awareness by managers (26.47%).

Only 16.17% answered that they were familiar with WCAG [25], 13.23% with ATAG [26] and 7.35% with UUAG. Around 87% answered that they had never read the Brazilian e-government accessibility model (e-MAG) [4].

This study has shown many interesting results. However, the study had a small representativeness of Brazilian developers, and was only focused on few developers invited by the authors.

3.4 Ferreira et. al, 2007

The second study with Web developers in Brazil was carried out in 2007 with governmental organizations [6]. The main goal of the study was to check whether governmental institutions are taking the Decree/Law 5,296/2004 in account or not. The study also involved the evaluation of Web pages from federal, state and municipalities Web sites.

After the evaluation of the Web pages, the responsible for each organization Web site was e-mailed with a questionnaire. A total of 87 organizations answered to the survey.

A percentage of 69% answered that they knew the Decree/Law 5,296/2004, 53% answered that they knew about the deadline for adapting their Web sites (December 2005) and 42% said that they knew the *e-MAG*.

From the organizations that said that they had already made their Web sites accessible (22% from the total), 47% do not use an accessibility icon. Around 42% answered that their own staff had conducted the adaptation process, 37% by an external team and 21% by other ways. The biggest challenges to adapt their Web sites were the big amount of information and lack of experts. A percentage of 47% answered that they had performed testes with users with disabilities.

From the organizations that answered that were still adapting their Web sites (31% of the subjects), and 64% had an internal team to carry out the process. The biggest challenges to make the adaptations were the low priority of accessibility projects in their organizations, big amount of information, lack of experts and too many standards to be observed.

A percentage of 47% answered that their Web sites are not accessible and they are not making any adaptations. Around 68% of them do not even have any plans for making the adaptations. Around 83% answered that they do not know *daSilva* [1], a popular Brazilian accessibility evaluator. The biggest challenges to implement accessibility projects, lack of experts, and big amount of information to be adapted.

This survey also presents very interesting results about the Brazilian panorama on accessibility development. However, the sample was restricted to governmental organiza-

¹Enhanced Network Accessibility for the Blind and Visually Impaired - <http://www.enabledweb.org>

tions.

The four surveys presented in this section show different aspects of accessibility awareness by Web developers. Although it is possible to see differences between the perception of accessibility in different groups, it is not possible to perform any inference, as the sampling method for each study was very different.

The studies performed in Brazil presents important data about accessibility in organizations. However, it is possible to notice that most of the participants were from governmental settings. Besides, both studies did not have a wide representation from the whole country.

Another issue related to these studies is the fact that the variables were not planned properly to perform more rigorous statistical analysis.

4. EXPERIMENTS DESIGN AND CONDUCTION

The *survey* research method is usually employed to obtain data or information about characteristics, actions or opinions from certain groups of people, indicated as representatives from a target population. The questionnaire is the most common research instrument in survey researches [11].

There are different ways to plan and conduct survey researches, according to the needs of each research question. Survey researches may differ mainly in their goals, sampling and questionnaire filling methods.

The main goal of the survey reported in this paper was to perform an **exploratory** study, using a non-probabilistic sampling method and a Web-based questionnaire.

4.1 Questionnaire design

In the questionnaire design, we have included questions involving different accessibility aspects, ranging from technical to organizational issues.

The questionnaire design was done in two steps. In the first step, a preliminary version was created to be used in the pilot study. In the second step, an improved version was developed from the issues pointed out by the subjects in the pilot study.

A total of ten subjects took part in the pilot study. There were five subjects from the academy, three from industry and two from government institutions. The questionnaire was sent by e-mail and the answers were not considered in the final analysis. Important issues were pointed to be improved, such as difficult to understand questions and problems with the completeness of closed questions answers. Subjects have also pointed out some questions that might make participants embarrassed. The average time to fill out the questionnaire was about 10 minutes.

After adapting the questionnaire according to the main issues pointed by the subjects of the pilot study, the final version was published in a Web site. The Web-based questionnaire was developed employing usability and accessibility principles, and was tested using guideline-based accessibility evaluation tools and assistive technologies.

The questionnaire had seventeen questions: six questions related to demographic data, nine closed and two open questions. The questions set was divided into two sections: the first with general questions, and the second with questions related to reasons why developers consider or not accessibility in projects they take part.

In the demographic questions, subjects were asked to answer about the state where they live in, gender, age, field of work, education and function in their organization.

In the closed questions set were included questions regarding: knowledge on HTML and CSS, awareness about how people with disabilities use the Web, knowledge about assistive technologies, knowledge about the Brazilian accessibility law, use of techniques for accessibility evaluation, opinion about the actual consideration of accessibility in the projects they take part in, and reasons for considering or not accessibility in development projects.

In the open questions set, subjects were asked to describe their opinion about the importance of accessibility in Web development projects in their organizations and to give suggestions on how to improve Web accessibility in Brazil. They were also asked to provide a couple of URL's of Web sites they have participated in some way during the development.

After filling out the questionnaire, subjects were asked to state whether they agree to give permission to use their data in the analysis, under the conditions of anonymity and confidentiality.

4.2 Sampling

It was not possible to use probabilist sampling methods, due to the difficulty in determining the whole population of people involved in Web development projects in Brazil. In order to increase the representativeness of the study, we have distributed the records of people to invite to the survey in all states of the country from academy, industry and government.

The selection of participants from industry was done from the *Softex*² database, searching for industries from Web development and other Web related areas, such as e-commerce and e-learning. Other local industry catalogs were also used for states with low representativeness in Softex database.

The selection of participants from government was done by registering the contact e-mail address of maintainers of e-government Web sites. Entities from federal, state and municipality governmental Web pages were selected.

The selection of people from academia was done using a national researcher search engine named *Portal Inovação* (Innovation Portal)³. This portal uses the national researchers database *Lattes Platform*⁴. The search key was "web development", and we have filtered the results by state of the federation. For each state, we have selected the first 200, 250, 100 or 50 results, according to the size of each state.

Registered participants were invited by e-mail from the databased obtained as explained above. However, participants were also able to forward the invitation to other people who might be interested in taking part in the survey.

4.3 Conduction

After recording the participants contacts to be invited and to implement the Web interface to the questionnaire, the invitation e-mails were sent. We estimate that around 58% of the recorded e-mails were valid.

The questionnaire was available to be filled in from June 25th to August 25th, 2007. We have received a total of 613 valid answers. If we do not consider people that have

²Brazilian Software Exportation Program - <http://www.softex.br>

³Available at <http://portalinovacao.mct.gov.br>

⁴Available at <http://lattes.cnpq.br>

participated from forwarded invitations, the return rate was around 22%.

After the questionnaire was closed, automatic guideline review evaluations were carried out, and subjects received the results by e-mail.

As the next step, we are conducting metric-based analysis of the accessibility of the web pages provided by the subjects.

5. SURVEY RESULTS

After the data collection, a total of 630 answers were obtained, and 613 of them were valid. As the questionnaire was open for everyone on the Web, 17 answers were not valid. Some of these answers were not complete, were filled in incorrectly or corresponded to people who were not related to Web development.

The number of valid answers is very significant, and makes this survey the broadest survey on Web accessibility in number of subjects, when compared to other related work, as reported in Section 3.

5.1 Demographic data

In this survey, we had subjects from all of the 27 states of Brazil. Although we have tried to spread participants among geographical regions, the biggest number of subjects were from the southeast region, the most developed region of the country. About 41.8% of the participants were from this region, while 21.7% were from the South, 17.8% from the Northeast, 10.3% from the Center-west and 8.5% from the North of Brazil (the Amazon region), as may be observed in the pie-chart in Figure 1. The distribution is very close to our perception of the distribution of Web developers in Brazil.

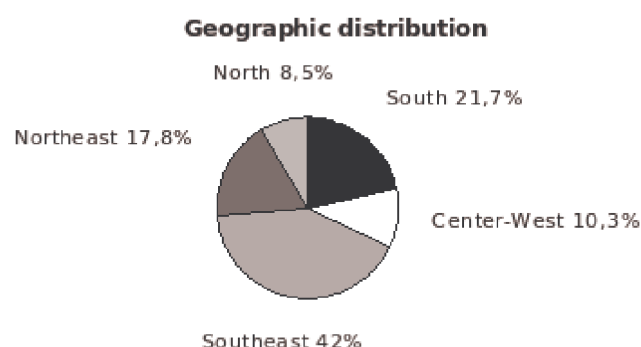


Figure 1: Subjects distribution according to Brazilian geographic regions

Regarding the personal profile, the majority (70.15%) of the subjects were male, 28.55% were female and 1.31% did not inform their gender. The age with the greatest number of subjects was the range between 25 - 35 years, with 41.76% of the participants, followed by the range of 36 - 45, with 26.26%, as may be observed in the Figure 2.

In despite of our efforts to distribute the participants among government, academia and industry, more than half of the participants were from research and education fields (56.12%), as may be observed in Figure 3. One of the possible explanations for this is the fact that people from academia are usually more prone to participate in research surveys.

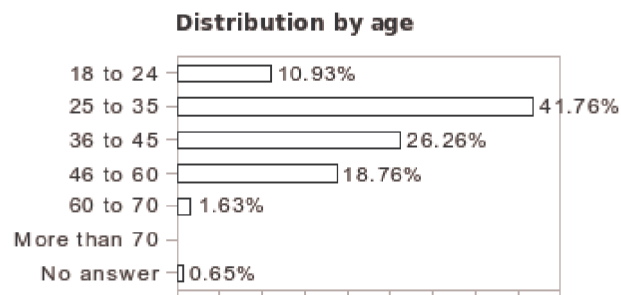


Figure 2: Distribution according to age

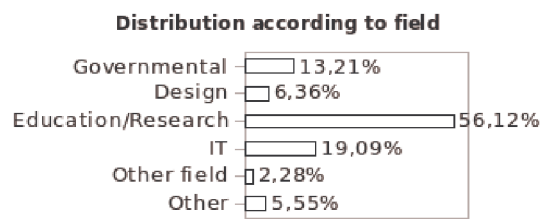


Figure 3: Distribution according to business field

The large representativity of people from academia could be also verified by participants' education. That is 30.67% of them had PhD degree, 23.49% had MsC degree, and 16.15% specialization, as can be seen at Figure 4. The same happened with the job position, which 43.07% of participants affirmed they were researchers or lecturers. The other more representative positions were systems analysts (12.40%), managers (10.28%) and coordinators (8.65%), as can be seen at Figure 5.

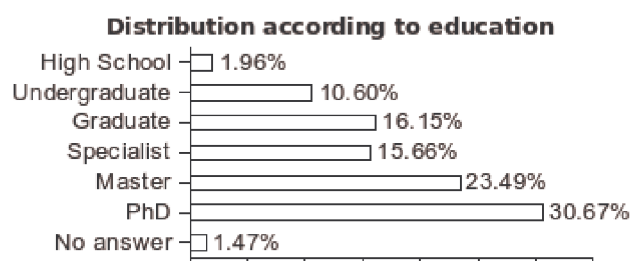


Figure 4: Distribution according to education

The large number of participants from industry with positions of manager or coordination can be due to the fact the contact e-mail provided in catalogs are, in general, from managers since they are the responsible for giving information to people.

5.2 Question 1. HTML and CSS skills

It was noted that the majority of participants affirmed to have basic (23.33%), intermediate (30.02%) or advanced (30.83%) knowledge about the most popular markup languages and stylesheet in the Web, as can be seen in the graphic at Figure 6.

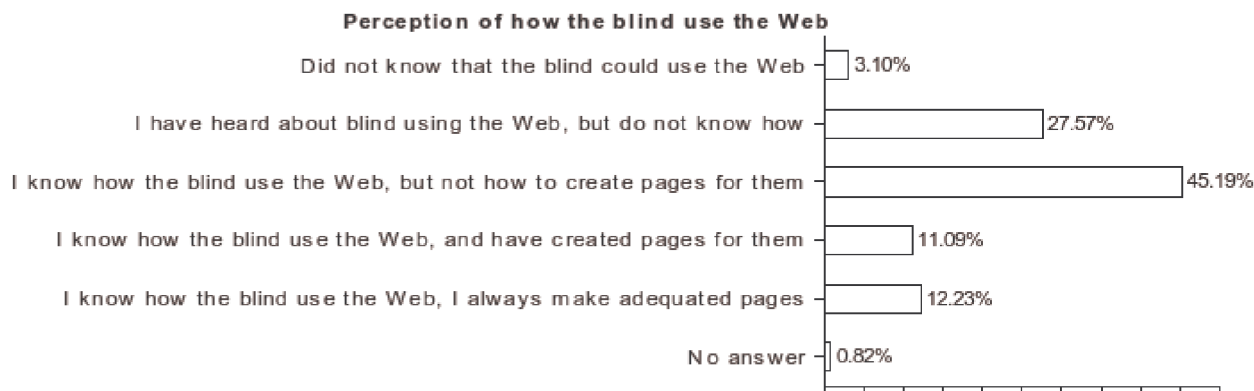


Figure 7: Perception of how the blind use the Web

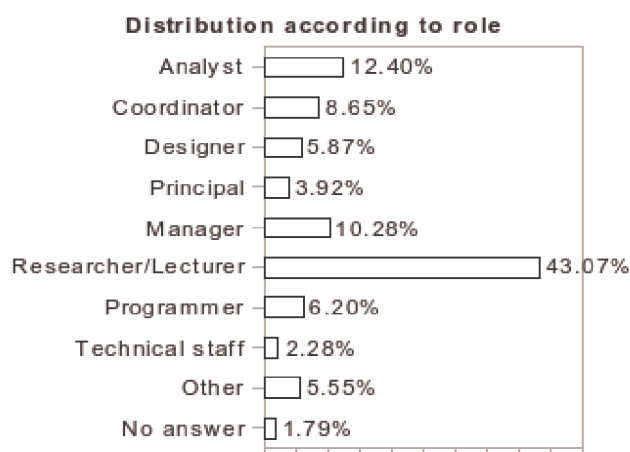


Figure 5: Distribution according to the subjects' roles in their organizations

5.3 Question 2. Awareness of problems faced by blind people using Internet

From the analysis of question 2, we have observed that few participants said that they had already built a Web page accessible for the blind. As it may be observed in Figure 7, a large number of participants (45.19%) state that they know technologies to make the Web accessible by the blind, but they do not know how to create pages that are accessible by these users. A percentage of 27.57% states that they have

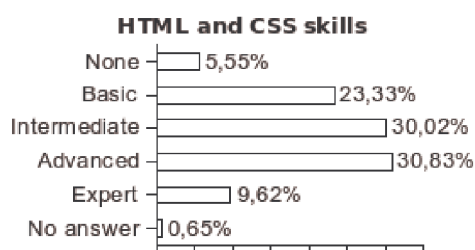


Figure 6: HTML and CSS skills

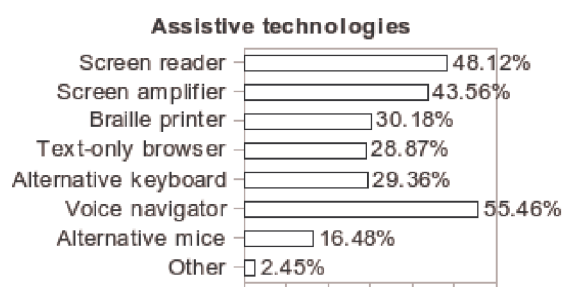


Figure 8: Assistive technologies participants were familiar with

already heard about the possibility of blind people to use the Web, but do not know how it is possible.

5.4 Question 3. Assistive technologies known or already used

In question 3, we have observed which assistive technologies the participants were more familiar with, allowing more than one possible answer. In Figure 8, it is possible to observe that the assistive technologies they were more familiar with was the voice navigator (55.46%), the screen reader (48.12%) and the screen amplifier (43.56%).

5.5 Question 4. Knowledge of Decree/Law No. 5.296/2004 and its implications to the Web

In question 4, we have observed that a small percentage of the participants were aware of the Brazilian accessibility law. In Figure 9 it is possible to observe that 40.29% said that had never heard about the decree before, and 32.95% had heard about it, but either do not know it or scarcely know it.

5.6 Question 5. Knowledge on the W3C Accessibility Guidelines

From the analysis of the question 5, it was observed that many of the participants did not have any knowledge about the WCAG (39.15%) or have only basic knowledge (30.18%), as it may be observed in Figure 10.

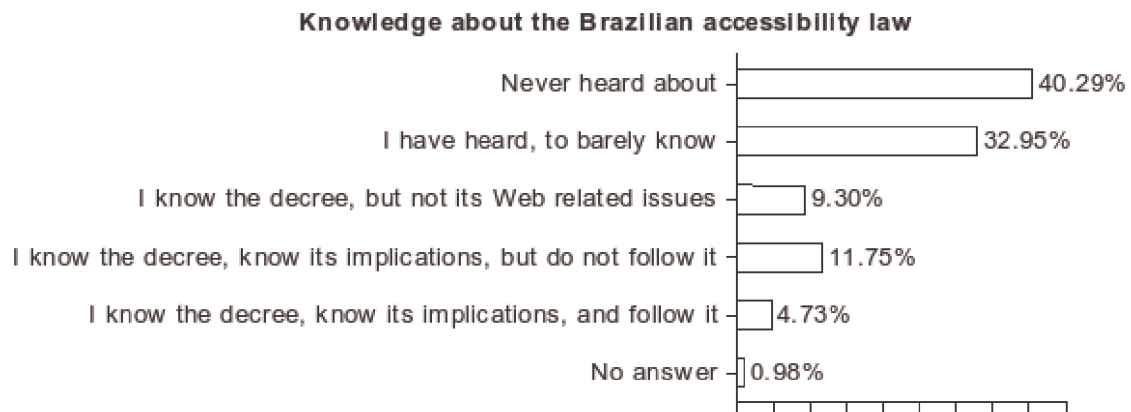


Figure 9: Knowledge about the Decree/Law 5,296/2004

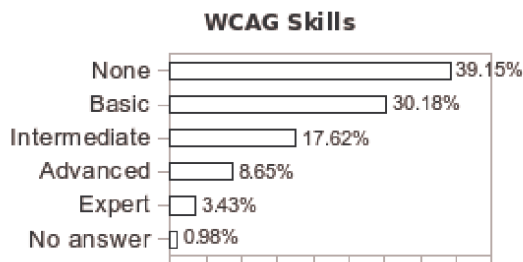


Figure 10: WCAG Skills according to the participants

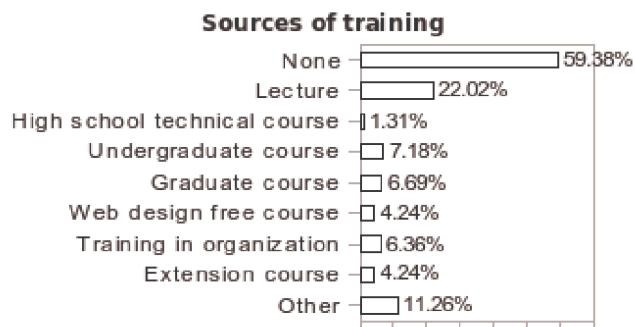


Figure 11: Sources of training on Web accessibility

5.7 Question 6. Training in accessibility received by participants

In question 6, we have observed the types of training on accessibility the participants have taken before. This was a multiple choice question. In Figure 11, it is possible to observe that more than half the participants (56.38%) said that they have never had any training on accessibility. The most frequent types of training were lectures (22.02%) and other types (11.26%). Among the types pointed out as "others", the most current were research projects, voluntary jobs, workshops and self learning.

5.8 Question 7. Accessibility Evaluation Forms performed by the participants

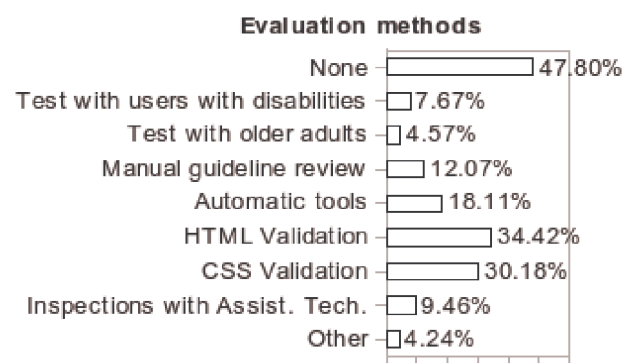


Figure 12: Evaluation methods used by participants

In question 7 (a multiple choice question), we have observed that a big amount of the participants (47.8%) stated that they do not use any accessibility evaluation method. As it may be observed in Figure 12, the most frequent types of test were HTML validation (34.42%) and CSS Validation (30.18%), followed by the use of automatic accessibility evaluation tools (18.11%).

By observing these data, we can infer that accessibility evaluation is still not frequent. The types of evaluation that participants most use are not exactly accessibility evaluation methods, but Web standards conformance. Manual inspections and tests with final users are not frequent.

5.9 Question 8. Regarding accessibility in the projects in which the participants are involved in

In question 8, we have asked participants to state whether accessibility is considered, is partially considered or not considered at all in the projects they take part in. As it may be observed from the graphic in Figure 13, only 19.9% of the participants stated that they consider accessibility, while 44.37% just consider it partially and 35.4% do not consider accessibility at all.

5.10 Question 9. Arguments given by the participants for regarding accessibility in the projects

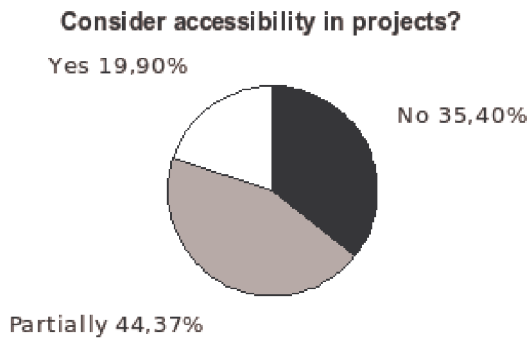


Figure 13: Opinion of the participants about whether accessibility is considered or not in projects they take part

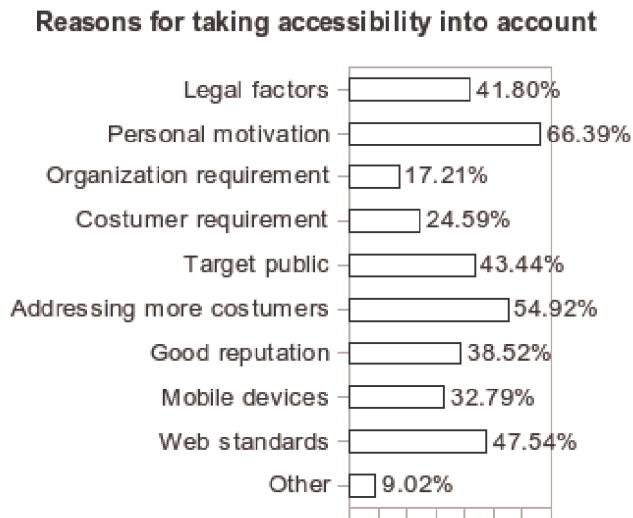


Figure 14: Reasons pointed by participants for considering accessibility in their projects

For participants who answered “yes” to the question 8, a new set of questions was presented, asking them to point out their main reasons to consider accessibility in the projects they are involved in (enabling multiple choice). As it may be seen in the graphic in Figure 14, personal motivation had the largest number of indications. Curiously, the existence of organization and costumer requirements had the lowest number of indications, 17.21% and 24.59%, respectively.

The reasons most pointed in “others” were social responsibility and digital and social inclusion.

5.11 Question 10. Arguments given by the participants for not regarding accessibility in the projects

Participants who answered “no” or “partially” in question 8 were asked to point out why accessibility is not considered in their projects (enabling multiple choice). As it may be seen in Figure 15, the main reasons were the lack of formal requirements from the organization (51.33%), lack of costumer requirements (49.08%) and lack of training (53.17%).

The main reasons pointed out in “others” were the need

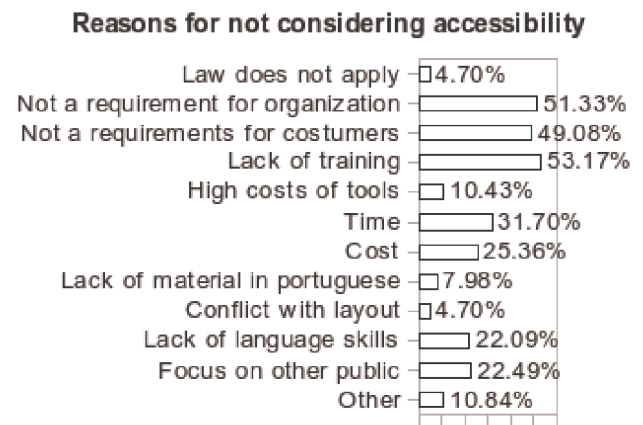


Figure 15: Reasons pointed by participants for not considering accessibility in their projects

for using new technologies that do not support accessibility, the reduced number of people to develop, and the lack of conciousness of managers.

5.12 Question 11. Comments about the relevance of accessibility in the participants' organizations

In question 11, participants were asked to point out how accessibility is seen in their organizations. In general, many users said that inclusion is a very important aspect in their organizations. Other comments stated that accessibility is considered only in some departments, but not in others, such as management.

Following we transcribe some interesting comments:

“A Higher education institution should provide access for everyone, regardless of any kind of disability”.

“I think that digital inclusion of the disabled and the elderly is very important indeed! It may open doors to many people who were excluded until now.”.

“All the resources should be used to maximize accessibility. Unfortunately, society is still not aware of this problem. Only now, with a broader promotion of the legislation people may start to have some idea of the problems. It is a matter of time!”.

“This concern is not inserted in my projects currently. The questionnaire has made me think about it. I believe that I should start considering accessibility in my next projects.”

“Currently accessibility is just considered partially, but it is necessary to re-think our projects to actually embrace accessibility, because it is very important to go ahead and develop universal access systems.”

5.13 Question 12. Suggestions to improve accessibility in the Web

In question 12, participants were asked to point out suggestions to improve Web accessibility. In general, the main

suggestions were related to a more intensive promotion of the accessibility legislation and to promote a more effective consciousness, by providing training inside organizations and including accessibility in Web related courses.

Following, we transcribed some interesting suggestions:

"Promoting consciousness, and including this topic in every software development process".

"More ample promotion of standards and legislation, making organizations interested in adopting them".

"Firstly, promoting consciousness of the society about the importance of the access to information and knowledge. Afterwards, to develop tools or objects to make the implementation of accessible Web applications easier.".

"I do not believe in actions that would obligate people to follow rules. I believe in conciousness and training for developers to improve accessibility and usability".

"Wide promotion of the number of potential costumers that may not buy products and services from organizations because of inaccessible pages. Wide discussion about the time and money spent to build an accessible application, tested and validated with real users.".

"I believe that every organization that develops Web sites should perform tests with all the different types of users they want to reach during the development of each project".

6. CONCLUSIONS AND FUTURE WORK

Accessibility is a very important issue in all types of computational systems. However, its importance becomes even more evident in the context of the Web. Making people involved in the development of Web applications aware of accessibility issues is very important to promoting an effective inclusive agenda.

Knowing how is the accessibility awareness of these people is very important to identify the main problems in education, training and policies to promote accessibility.

In this paper, we have discussed the results of a survey carried out in Brazil with 613 people involved in Web development projects. From the results, it is possible to observe that few people are really aware of accessibility issues in Web development.

One of the main possible explanations is that few of the participants have ever had any kind of training regarding accessibility. This lead us to think that it is crucial to include accessibility in the Web development related courses, since technical high school until graduate courses.

It was possible to notice that the promulgation of a legislation regarding Web accessibility in 2004 was not effective to promote accessibility awareness. Few people know the legislation, and even fewer people actually apply its requirements.

Accessibility has to be dealt as a serious issue, and should involve government, educators and the whole society to promote consciousness.

The results obtained from this work may be a start point for researchers to think over how to raise accessibility consciousness among development teams. We think that the

panorama of low accessibility awareness is not only a reality in Brazil.

As future work, we intend to finish the analysis of the Web pages informed by the participants and to perform metric based analysis to obtain quantitative information regarding the accessibility level of these Web sites.

Besides the descriptive analysis reported in this paper, we also intend to perform more advanced statistical inferences. With these inferences, we hope we are able to point out deeper conclusions to help the proposal of strategies to promote accessibility among people involved in Web development projects.

7. ACKNOWLEDGMENTS

Our thanks to CNPq, FAPESP and Microsoft Research for funding this work, and for Dr. Agma Traina for her contributions with the revision of this paper.

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