

Evaluating the Need for a Comparison Tool of Web Accessibility Standards

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ABSTRACT

Web accessibility is an integral part and need of today's highly dynamic and rapidly developing society. There is a growing, worldwide recognition that users with disabilities have the same rights as others to access information and use technology.

Meeting needs of Web Accessibility while developing software applications/ web sites is a highly meticulous task. To achieve the most optimized /satisfactory results as well to ensure people with disabilities can use those, different standards and regulations of web accessibility across various regions and organizations are established. These standards need to be studied and compared in detail; to ensure product/ solution meet the requirement(s).

Comparing accessibility standards would be done to address major outcomes like developing a tool which will provide systematic project estimate for a specific accessibility standard. Such a tool will significantly and positively impact managing accessibility projects effectively.

In this paper, we analyze the need for comparison tool of web accessibility standards through survey and statistical analysis and research.

1. Introduction

The web accessibility movement started globally in the late nineties. United States of America introduced section 508 in US rehabilitation act followed by Americans with disabilities act

(ADA). World Wide Web consortium also started web accessibility initiative (WAI) in 1996 and started developing guidelines for content accessibility, authoring tools accessibility, browser accessibility etc. Product based software companies like Microsoft, IBM, Oracle; Adobe etc. also started developing accessibility standards for their own products at the same time.

First version of Web content accessibility guidelines (WCAG1.0) was published in 2003. India introduced a government of India guidelines for web accessibility (GIGW) in 2009 to address accessibility issues in government web portals.

Managing accessibility projects is a challenge with the growing need in IT industry, since there is no one tool for generating accessibility projects estimate. [1]. Due to this accessibility professionals end up spending more time and efforts to prepare an estimate for the web accessibility projects.

This paper is part of research study to evaluate and develop a tool for generating estimate(s) for accessibility project(s) by using comparative analysis of accessibility standards across regions and organizations. This would also help understanding on providing similarities and differences in the standards.

The comparative study will be carried out on various parameters of accessibility standards and the one(s) that need to get into client website design. Providing complete analysis of selected web accessibility standard and regulations will be helpful to organization and also for designing accessibility estimation tools for addressing multiple compliances.

With the help of sample data collected through pilot study it is found that largely accessibility experts are not aware of any such detailed comparative analysis of various accessibility guidelines and standards, or not aware of the availability of any such tool for comparison of accessibility standards.

This research application integrates the systematic comparison of accessibility standard, help in generating project estimate report for specific accessibility standards (considering the parameters of the accessibility guidelines that help in accessibility remediation of the website). Overall this research will work towards developing this application.

To start with, the application can be used to generate report for WCAG, SECTION 508 and GIGW implementation. The application can be compatible to adapt newer version of accessibility standards.

2. Historical background:-

As for the normal person the assistive technology helps to enhance the experience of using computer/ information technology, like laptop touch screen or the logic of assistive technology extends further as an aid to persons with disabilities (or differently enabled). These assistive technology devices are mostly used on user/ client side to access WebPages. Different type of disability requires specific assistive technologies, (<http://webaim.org/intro/>). Example

- a person with blindness uses screen readers [Y]
- a person with low vision uses screen magnifiers[Y]
- a person with motor disabilities use speech recognition software, special key board, track ball, mouse[Y]
- a person with auditory impairment uses sign language interpreters and captioning for audio visual material etc.[Y]

To provide smooth usability to users with disabilities, the web interfaces should be compliant to various national and/or international accessibility standards and regulations. Designers need to refer to these standards and choose the most appropriate one(s).

The web accessibility movement started early '90s. United States of America was the 1st nation to introduce section 508 in US rehabilitation act, followed by 'Americans with disabilities act (ADA)'. Subsequently, World Wide Web consortium also started web accessibility initiative (WAI) in 1996 and started developing guidelines for content accessibility, authoring tools accessibility, browser accessibility etc. Product based software companies like Adobe, IBM, Microsoft, Oracle, etc. as well started developing accessibility standards for their own products during late 90's.

3. Related work

This research work is triggered from these main criteria

1. Person with disabilities face many challenges to access the website

2. Accessibility expert are unaware about the availability of a tool to compare various web accessibility standard

3. Organisation seeks comparison of various web accessibility standards in order for smooth implementation of the guidelines.

4. Objectives of the Study:-

- A. *To gather and analyze Web Accessibility Standards and Regulations globally available and understand their specific context.*
- B. *To provide systematic comparative information of Web Accessibility Standards and Regulations with similarities and differences.*
- C. *To find out usability of selected accessibility standards and regulations for users with disabilities.*

5. Hypothesis:-

A) Systematic Comparative information of various accessibility standards and regulations of latest versions is unavailable.

B) Comparative study of various web accessibility standards and regulations are helpful in addressing multiple compliances.

6. Research questions: -

Questions pertaining to objective A.

- I. How many accessibility standards are available in world?
- II. What is the specific objective of each accessibility standards and regulations?
- III. What is the scope of each accessibility standards and regulations?

Question pertaining to Objective B.

- I. How comparative analysis can be done, presented and made available to public
- II. What are the similarities and differences in selected sample of Accessibility Standards and Regulations?
- III. What is co-relation of each accessibility standard and regulation

- IV. How by addressing one accessibility standard or regulation can fulfil compliance requirements against which of other standards & regulations

Questions pertaining to objective C:

- I. How effective is the selected accessibility standards and regulations?

7. Definitions:

Comparative analysis: The item-by-item comparison of two or more comparable alternatives, processes, products, qualifications, sets of data, systems, or the like.
www.businessdictionary.com/definition/comparative-analysis.html

Web accessibility standards and regulations: Universally accepted, agreed upon principals to control the web access in order to avail the information for all kind of internet users.
www.JimThatcher.com

Analysis: Detailed examination of the elements or structure of something.
www.oxforddictionaries.com/definition/English/analysis

Web: A very large collection of documents, pictures, sounds etc. stored on computers in many different places and connected through the Internet.
<http://www.macmillandictionary.com/dictionary/british/web>

Accessibility: easy to approach, reach, enter, speak with, or use. 2. That can be used, entered, reached, etc. <http://dictionary.reference.com/browse/accessibility>

Standards: Universally or widely accepted, agreed upon, or established means of determining what something should be. www.businessdictionary.com/definition/standard.html

Regulations: A Principle or rule (with or without the coercive power of law) employed in controlling, directing, or managing an activity. www.businessdictionary.com/definition/regulation.html

8. **Research methodology:** -

Experimental method will be followed for comparative analysis.

A pilot study: A survey will be conducted amongst accessibility professionals. The responses are analyzed to understand overall awareness sample population has about the Accessibility standards and comparative analysis.

9. **Data Collection:**

Primary data will be collected from the free samples of experts that are accessibility professional. This will be through a survey questionnaire.

10. **Tools used:** -

- I. Survey Questionnaire used to collect feedback of the accessibility professionals
- II. Spreadsheet will be used for analyzing the data and deriving meaning out of the data.
- III. SPSS/ Equivalent analytics will be used to test the hypothesis

11. **Pilot Study:**

Pilot Study Design:

We designed a questionnaire to understand the awareness of accessibility expert on various parameters related to comparison tool for web accessibility standard. The parameters considered for the study are.

- a) Area of accessibility
- b) Total no of accessibility
- c) Difference between accessibility standard
- d) Types of accessibility compliances
- e) Merits & Demerits of accessibility standard
- f) Importance of accessibility compliances for business.
- g) Cost effecting of accessibility compliances

The survey was conducted amongst 60 accessibility professionals. 20 questions pertaining to above parameters were framed & designed in 4-point Likert Scale. Survey has 2 sections.

First section covers participant's demographic information like first Name, Last Name, email-id, organization, designation, etc.

Second section included questions from the parameters listed above. The respondents were also asked that point of view on adopting accessibility compliance for their organization.

The 2nd section response options (depending on nature of question) included, example

- Yes / No, May be, Other
- Yes / No, Partially no, & Other
- Aware, Not Aware, can't say, other
- Yes / No, cannot comment, other
- Yes / No, don't have any idea or other
- 1, 2, more than, other.

The 4 Point Likert Scale was administrative to Survey response from 60 accessibility experts. Responses received are complete and provided us adequate sample data. The survey respondents belonged to different roles related to accessibility areas like digital accessibility, accessibility tester, accessibility expert, developers, accessibility trainer, team lead & projects manager. Most of the respondents were experienced in the field of implementation of web accessibility standard.

Pilot Study Result:

The survey responses are analyzed and findings of this pilot study are very interesting. The respondents chosen are from leading organizations in IT sector (22 organizations) and Educational sector (1 institute). (Refer table below).

Table

| Sr. No. | Name of the Organization/ Institute | Respondent | Percentage |
|----------------|--|-------------------|-------------------|
| 1 | Amdocs | 11 | 22 % |
| 2 | G&D | 1 | 2 % |
| 3 | Technical Training Institute (TTI) | 6 | 12 % |
| 4 | Accenture | 10 | 20% |
| 5 | TCS | 1 | 2% |
| 6 | Barrier Break | 3 | 6% |
| 7 | Index 9 | 1 | 2% |
| 8 | HCL | 1 | 2% |
| 9 | Wipro | 1 | 2% |
| 10 | HSBC | 1 | 2% |
| 11 | YARDI | 1 | 2% |
| 12 | WAI Tech | 1 | 2% |
| 13 | Fiserv | 1 | 2% |
| 14 | Tek System | 1 | 2% |
| 15 | Tech Mahindra | 1 | 2% |
| 16 | Cognizant | 2 | 4% |
| 17 | Infosys | 1 | 2% |
| 18 | Mega Engineers | 1 | 2% |
| 19 | Hitachi | 1 | 2% |
| 20 | Lava tech Technology | 1 | 2% |
| 21 | Opstech Solution | 1 | 2% |
| 22 | SBI | 1 | 2% |
| 23 | SPPU | 1 | 2% |

Summary observations from the survey response data analysis as below:

Population spread, 62% male and 38% female respondents.

1. 82% respondents belongs to digital accessibility, whereas 18% to both digital and physical accessibility.
2. 86% respondents are aware of web accessibility standard, 7 % not aware & 7% may be or may not be aware
3. 42% respondent knows that there is only one accessibility standard. 33% knows 2 accessibility standards, 23% respondent knows more than 2 accessibility standards and 2 % responded not applicable.
4. Difference between available web accessibility standards, is known to 18% respondents, 43% respondents don't know the difference, whereas 38% respondents said that web accessibility standard partially know.
5. 80% respondents did not compare web accessibility standards, 5% respondents have partially compared & 15% compared the web accessibility standards.
6. 78% responded the comparison of web accessibility standard will be helpful in addressing multiple compliances. 22% respondents said that may be helpful.
7. 60% respondents cannot identify factors to consider; in deciding time estimates to implement specific web accessibility standard. 17% respondents can't say whereas, only 23% can identify factors.
8. 72% respondents are not aware about efforts in implementing specific web accessibility standard, 22% are aware about the efforts in implementing specific web accessibility standard. 7% respondents don't know.
9. 82% respondents know the national & international accessibility compliance for government & corporate organization. 17% don't know, whereas 2% respondents may know the compliance.
10. 43% respondents replied that they are aware about web content accessibility guidelines (WCAG). 30% respondents replied that they are aware about web content accessibility guidelines (WCAG) 2.0 & GIGW. None are aware about web content accessibility guidelines (WCAG) 2.0 & section 508 of US rehabilitation act. 27% responded that they are aware of all standards.

11. 65% respondents have confusion for adopting accessibility standard in their organization. 30% responded not having confusion for adopting accessibility standard in their organization, where as 5% responded tentative.
12. 83% respondents believe that comparative analysis of accessibility standard & regulation will be helpful in decision making. Only 5% think otherwise and rest 12% respondents did not comment.
13. 62% respondents do not know merits& demerits of specific accessibility standards. 33% knows about merits & demerits of specific accessibility standard. 3% respondents can't say to anything and 2% other (no comment).
14. 68% respondents have known the importance of digital accessibility standards in business. 28% respondents do not know, 2% respondents felt less importance and rest 2% respondents can't say anything.
15. 72% feels will create goodwill & increase customer base of the organization. 22% can't comment on importance of the accessibility compliance. 7% respondents replied for organization can make charity by adopting accessibility standard.
16. 42% respondent replied that accessibility compliance mandatory by law for all the organization. 28% feel that, it is mandatory for government & desirable for corporations. 28% respondents cannot comment anything and rest 2% feel that it is not mandatory for any organization.
17. 58% respondents thinking for adopting accessibility compliance in the organization.27% not sure, 8% not is able to adopt accessibility compliance in their organization, whereas 7% respondent cannot comment anything.
18. 10% respondents answered that adopting accessibility compliance associate is a costly affair, 32% feel that it is not costly affair, 58% respondents said that they don't have any idea.
19. 48% respondents replied that, they will search their vendor for accessibility compliance services through business listing website.28% respondents replied that they search through social media. 15% replied that they will search from their personal contacts and 8% are not aware about that.

20. 65% respondents replied that accessibility compliance service provider is genuine by checking their previous experience & certifications & government emplacement. 13% respondents replied that they will check the authenticity from organization contact to check their service provider is genuine. 5% respondents replied that anyone service provider can be genuine. 17% respondents cannot give their comments.

12. SPSS Analysis:

The sample data is run through reliability test using SPSS for Cronbach's alpha test [2].

Cronbach's alpha determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability. Alpha coefficient ranges in value from 0 to 1 and may be used to describe the reliability of factors extracted from dichotomous (that is, questions with two possible answers) and/or multi-point formatted questionnaires or scales (i.e., rating scale: 1 = poor, 4 = excellent). The higher the score, the more reliable the generated scale is. Nunnally (1978) has indicated 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature.

The analysis output has an overall raw alpha of .731 which is good considering that .70 is the cut-off value for being acceptable. So, the result shows that the response data is consistent.

13. Concluding Remarks:-

The study, analysis and results indicate that based on random sample population considered for survey,

- There is fairly good awareness amongst people about existence of accessibility standards
- People do not have detailed understanding of these standards though
- People do not know if comparative study of such standards exists?
- People feel that Systematic Comparative information of various accessibility standards and regulations of latest versions is will help improve development of accessibility designs.
- A comparative tool will be developed as part of this overall study.

14. References: -

[1] Web Accessibility: A Broader View: John T. Richards, Vicki L. Hanson, (May 2004, ACM Press, ACM 1-58113-844-X/04/0005).

[2] Cronbach's Alpha: A Tool for Assessing the Reliability of Scales, by **J. Reynaldo A. Santos**, Extension Information Technology, April 1999 // Volume 37 // Number 2 // Tools of the Trade // 2TOT3

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