



Web Accessibility Evaluation of News Websites Using WCAG 2.0

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Abstract

Ever since internet is evolving day by day, new technologies and interfaces have been introduced. Now a day's all the services are available on the web. These advancements encourage disabled users (blind) to access the web content. For this screen readers have been introduced and guidelines have been set to establish the compatibility between both of them. This paper endeavors in guidelines and problems that blind people face when using the News website. A comparative study was done on local and international sites. They were evaluated manually and with web accessibility tools using WCAG 2.0 and found that news sites don't even meet Level A of WCAG 2.0 and the users are facing problems to access the core features of the site. In this study, an experiment was also conducted with disabled college students and professionals to test the usability of News websites (Local and International) to see how blind users access the News website and what are the problems they face using web with screen readers. The result showed that both have some web content accessibility problems but according to the results it was found that international news sites are more accessible than local sites.

Keywords: Blindness, screen readers, web accessibility, disability, usability.

Introduction

Today web is emerging day by day and it has a great influence on the life of the people. As per the study conducted by UNICEF four fifth of people having disability lives in developing countries¹. Developments in web sites grant lot of information and user-friendliness to the disabled users. Screen readers help is the main tool for the blind users to interact with the web. As, IT society is developing as the seconds run off so, the people are more into the web information. For this these Web accessibility guidelines provides full requirements for developing the sites according to the disabled persons.

Accessibility is important because as with the increasing number of users of the internet and the information gathering is all online so as to do this the website accessibility is really a significant part for the blind users which enables them to clutch the information which they needed certainly and in a cost effective way. Persons who are blind and deaf are frequently suffering when exercising the most basic things of daily life². While developing the sites the developer should evaluate the web accessibility.

Researchers have found that the number of domains and Webpages are increasing twice of the proportional every year. And hence a plenty of services are delivered through web (e.g. news sites). Point of focus is that these services should be available to all users. Modern social infrastructure implies the fact that these services must be accessible to the disabled users (e.g. blind). This has brought countless benefits to them at their rooms without leaving homes. Usually screen readers are used by the blind users to access the content on the web. Screen

readers speak aloud everything that is written on HTML pages. In recent years increasing interest have found to make websites accessible and usable, however W3C consortium has come up with guidelines to make website accessible (WCAG 2.0). Information accessibility on World Wide Web (WWW) still remains to be a complex issue for blind users as majority of websites are invaded by contents, both non-visual (audio) and visual (video and images). Accessibility measures in terms of a usable and blind-friendly website should be made available to blind users³. Web accessibility WCAG 2.0 guidelines consist of 4 guidelines i.e. Perceivable, operable, Understandable, Robust and all have three levels A,AA,AAA.

In this paper we discuss the problems associated to the web accessibility of the news site. Our purpose is to ensure the web accessibility of local sites and as well as the international sites to evaluate the usability of websites by blind users. We have evaluated both the websites with two screen readers (JAWS and NVDA) with the same task set for both the website and evaluated the results based on our research. We came across with lots of accessibility problems which blind users face when accessing the website and feels difficulty getting familiar with it.

So we have evaluated the websites with 6 users based on some task sets and we hypothesize the following: Hypothesis #1: International news sites will be more accessible than local news sites. Hypothesis #2: Users will avoid switching to other screen reader and prefer the one they use regularly. Hypothesis #3: Screen readers will support the entire content of WebPages. Hypothesis #4: If the guidelines are implemented then entire content of the website will be easily accessible by blind users.

Accessibility Evaluation (WCAG 2.0) of Websites: The accessibility evaluation was performed both manually and by accessibility evaluation tools (a checker, Sort site, Wave). In both the sites we get to know that the two principles violated more are perceivable and operable. We have evaluated both the news sites by the Web content accessibility using WCAG 2.0 guidelines. Following listed table shows the most common problems:

Table-1
Problems identified in international news websites

Problem 1: Animated images
Guideline: 2.2.2
Principle: operable
Level: A
Problem 2: A tag doesn't contain text.
Guideline: 2.4.4
Principle: operable
Level: A
Problem 3: unnecessary information in ALT text
Guidelines: 1.1.1, 1.4.1
Principles: Perceivable, perceivable
Level: A
Problem 4: Duplicate Ids
Guideline: 4.1.1
Principle: Robust
Level: A
Problem 5: Mark up errors
Guideline: 4.1.1
Principle: Robust
Level: A
Problem 6: ALT text which duplicates link text.
Guidelines: 2.4.4, 1.1.1
Principles: Operable, perceivable
Level: A
Problem 7: A button has no value text
Guidelines: 1.1.1, 2.4.4
Principle: Perceivable
Level: A
Problem 8: website language is not specified
Guideline: 3.1.1
Principle: Understandable
Level: A

Explanation: Accessibility is the main problem that blind users are facing while using the websites. The evaluation results in that; International news sites have smaller rate of errors than Local news sites while most of them are ignorable and do not create any blockage for the blind users to access the website. Accessibility help has been provided in the international news site for the visually impaired people so that is the appreciative approach towards web accessibility. International news sites are more accessible than local and have additional accessibility features.

Table-2
Problems identified in local news websites

Problem 1: A tag doesn't contain text
Guideline: 2.4.4
Principle: operable
Level: A
Problem 2: No use TH elements
Guideline: 1.3.1
Principle: perceivable
Level: A
Problem 3: No alternative content in IFRAME tags
Guideline: 1.1.1
Principle: perceivable
Level: A
Problem 4: Use of placeholder text in IMG ALT
Guideline: 1.1.1, 1.2.1
Principle: perceivable
Level: A
Problem 5: IMG tags doesn't have an ALT attribute
Guideline: 1.1.1
Principle: perceivable
Level: A
Problem 6: No TITLE attributes found for the frames
Guideline: 2.4.1
Principle: operable
Level: A
Problem 7: Unnecessary information in ALT text of the image
Guideline: 1.1.1, 1.4.1
Principle: Perceivable, perceivable
Level: A
Problem 8: JavaScript is used as a link
Guideline: 1.3.1, 2.1.1
Principle: Perceivable, operable
Level: A
Problem 9: Contain duplicate Ids.
Guideline: 4.1.1
Principle: Robust
Level: A
Problem 10: Mark up errors
Guideline: 4.1.1
Principle: Robust
Level: A
Problem 11: HTML headings tags missing
Guideline: 1.3.1
Principle: perceivable
Level: A
Problem 12: use of ALT text which duplicates link text
Guideline: 2.4.4, 1.1.1
Principle: Operable, perceivable
Level: A
Problem 13: Label of the form control missing
Guideline: 1.1.1, 1.3.1, 3.3.2
Principle: Perceivable, Perceivable, Understandable
Level: A
Problem 14: Missing field set
Guideline: 1.3.1
Principle: Perceivable
Level: A
Problem 15: Label text is empty
Guideline: 3.3.2
Principle: Understandable
Level: A

Explanation: It is evaluated that local sites have more accessible problems than international sites. Some common and few additional problems identified are: no use of alternative text for IFRAME, use of JavaScript for the links, Used CSS headings rather than HTML headings. It is suggested to ensure that the information should be relevant and the accessibility features are added so that screen readers can at least read the content and necessary information provided in the website.

Usability Evaluation Involving Users: After evaluating websites manually and from automatic tools, usability evaluation was also conducted involving blind users. Participants were asked to speak aloud whatever the problems they faced, helping approach was chosen. Error rate and timings were observed consistently.

Methodology

Participants: Six participants took part, all were male. Their age ranges from (18-40). Of which 3 participants had been blind for a period between three to five years and the other 3 were blind from birth. All participants used screen readers to access computers as their primary assistive technology. All of them used JAWS from day one; however they were also familiar with Narrator. Three participants were assumed as experts on the basis of their experience rating as interacting with computers for more than 7 years and the other three were beginners with the rating of three or less than three years. Internet Explorer was used by all participants as primary navigator.

Equipment and software: The evaluation was performed using Core i3 laptops, running Windows 7 Operating system and equipped with wireless keyboard. JAWS version 14 (latest version at the time study conducted) and IE was used to conduct the study.

Tasks: Following is the task set which we have defined for the evaluation: i. Identify the current site. ii. Read the slide of the latest news, iii. Search particular news, iv. Access Live TV, v. Read details of the picture. vi. Access the blog page. vii. Fill up the contact us form. viii. Identify last updated time.

Procedure: Evaluation took place in blind institutions i.e. Ida Rieu School and college for blind and deaf and some professional participants who are visually impaired. We have evaluated the local and international sites. We had assigned them the task one by one and then calculated the time estimate of each task and rate the task as per the above rating scale. The evaluation of the websites was done by different screen readers with the similar task sets. A questionnaire was prepared which focuses on the process as an outcome of the study. To observe the usability aspects Post-Study-Satisfaction-User-Questionnaire (PSSUQ) was chosen, in which we did slight changes portraying to our study (resulting in total 16 statements).

Data Analysis: We assigned tasks to the users, based on our hypothesis and evaluation consideration. We used the following rating scale to grade task success: Got it quickly, got it eventually and Needed Help

Task 1: Identify current site

International and local: Result: All the participants did the task 1 easily as the screen reader reads the URL of the current site.

Observation: Task 1 was easily done by the participants for both sites.

Task 2: Read the slide of latest news

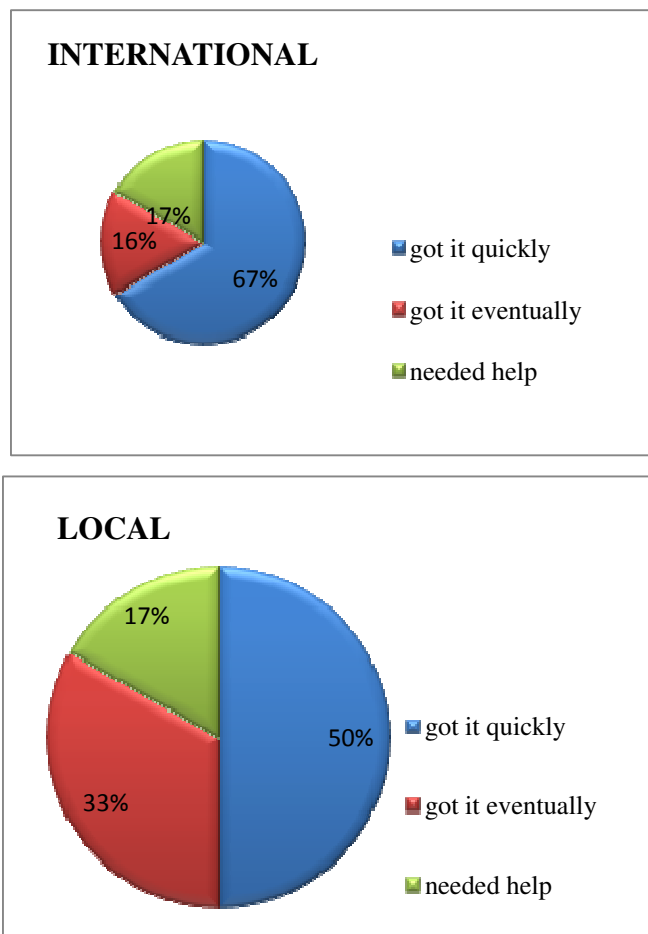


Figure-1
Read the slide of latest news

International: Result: Task was easily done by all the participants on international news sites. Observation: We observed that the slide of the latest news was presented as a slide show rather than the text so as the screen reader reads it as normal text.

Local: Result: Participants took more time than international news to complete the task. Observation: We have observed that the latest news was a slide show but the users feel comfortable and quickly get the news updates.

Task 3: Search Particular News

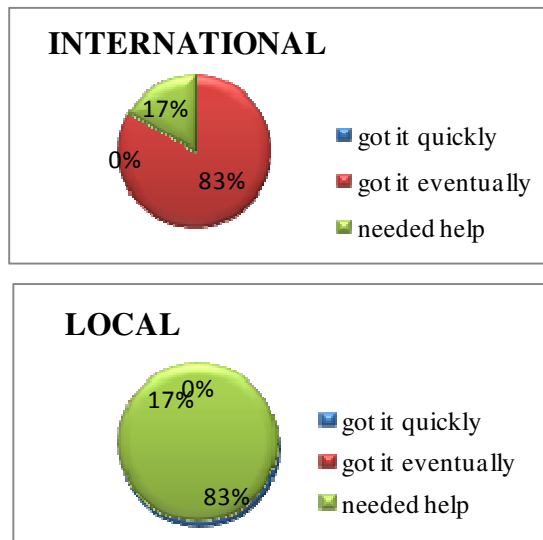


Figure-2
 Search particular news

International: Result: Participants done this task quickly except some who needed help to know the exact location of the search field. Observation: We have observed that the search field is just on the top of the website at the starting so it's easy for the blind users and screen readers to catch the things easily and quickly.

Local: Result: In local news the participants searched the particular required news very easily and quickly. Some of them got it eventually. Observation: In local news the similar as international but the search results are not accurate as international news.

Task 4: Access the Live TV

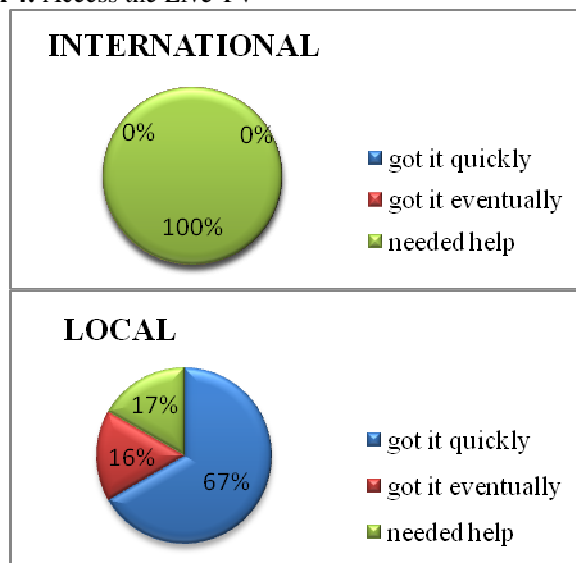


Figure-3
 Access Live TV

International: Result: In international to access the live TV it was a tab rather than the link but the participants got it quickly. Observation: In international to access live TV the tab of the live TV is after the search button it takes more time to get it than local news

Local: Result: In local news similarly like international some participants get it quickly while other participants faced some problem to perform the task. Observation: In local news to access the Live TV they have given it as a link so participants took much time than international news.

Task 5: Read Details of picture

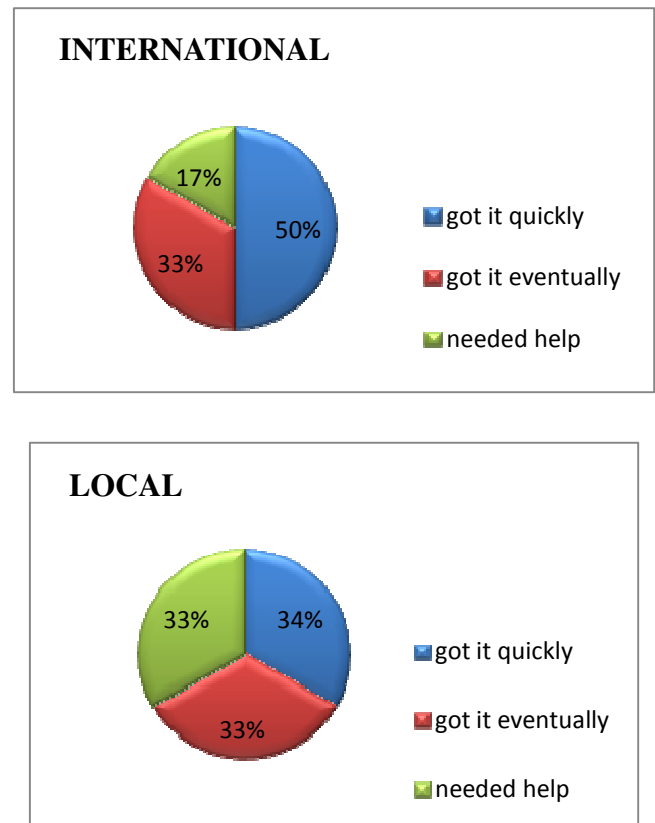


Figure-4
 Read Details of picture

International: Result: To read the details of a particular image, few participants got it quickly while majority took time to complete the task. Observation: In most of the images the alternate text of the image is not given.

Local: Result: To read the alternate text of the picture majority got it quickly while only few got eventually and fewer participants needed help to accomplish the task. Observation: The alternate text of the picture was read by the screen reader after we click on the image.

Task 6: Access the Blog page

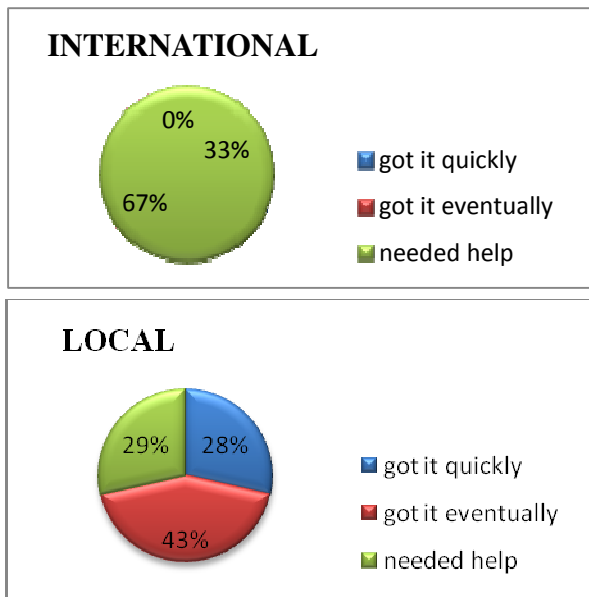


Figure-5
 Access Blog page

International: Result: The blog page is accessed by the participants eventually while only few got it quickly. Observation: The blog page is a link rather than the text.

Local: Result: 28% of the participant got it quickly and of the same ratio needed help to complete it and only 43% got it eventually. Observation: There is a blog tab in the list of the all the headings.

Task 7: Fill up the contact us form

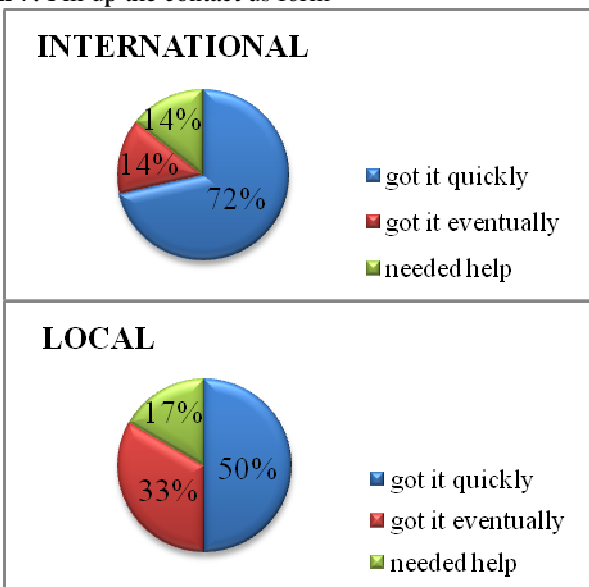


Figure-6
 Fill up the Contact us form

International: Result: The contact us form is filled by the participants in less time estimate and they got it quickly except some who got it eventually and needed help.

Observation: It was easily found and done by the participants.

Local: Result: 50% of the participants got it quickly while 30% got it eventually and 20% needed help to complete it.

Observation: The contact us form was not a big deal for the participants to be completed

Task 8: Identify the last updated time

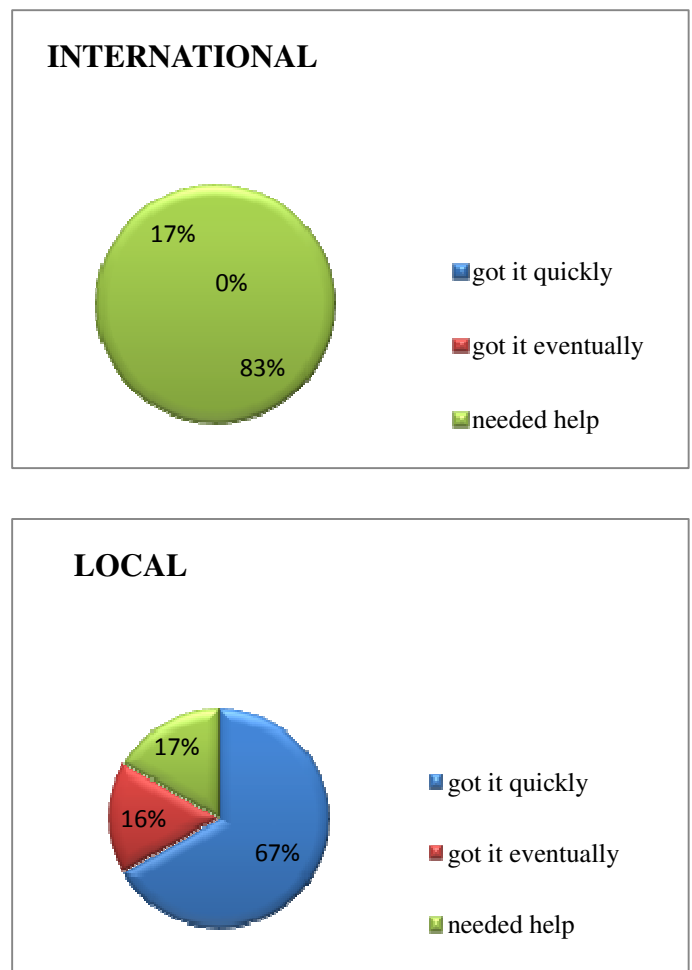


Figure-7
 Identify the last updated time

International: Result: The last updated time was asked by the participants so in international news sites it was clearly defined. Observation: It was easily found and done by the participants.

Local: Result: In some local sites, the time was not mentioned at which the site was last updated. Observation: The participants took some time to accomplish the given task.

Ratings Based on Questionnaire

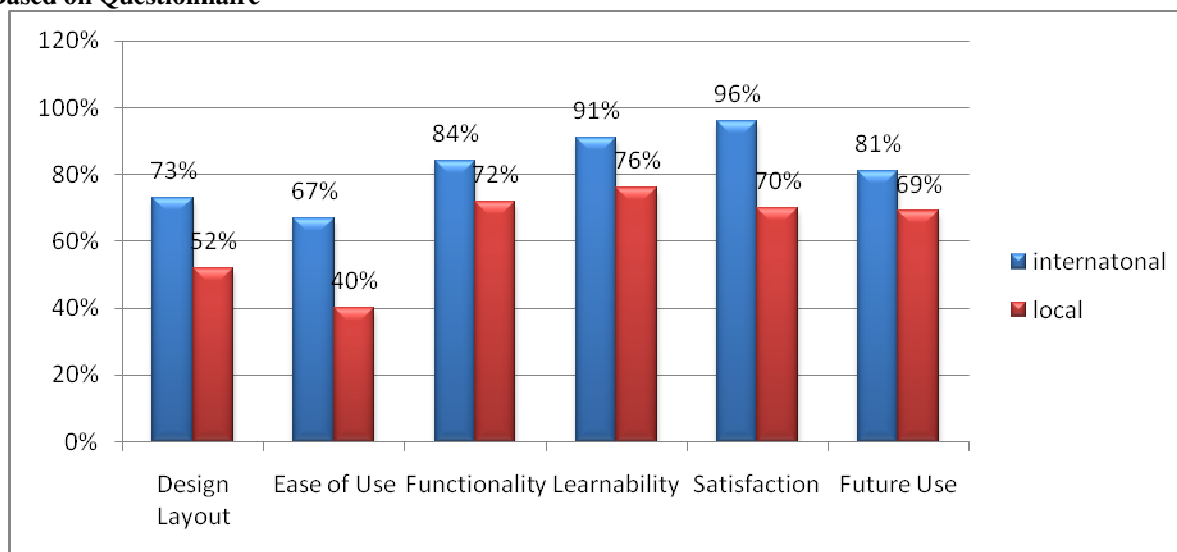


Figure-8
Rating scale based on questionnaires

Results and Discussion

This study reveals the problems encountered by the blind users when using News sites, screen readers, WCAG 2.0 principles. Through evaluation, we get to know that international news sites are more accessible than local news sites, this show that our hypothesis one is true. Content and information is more consistent and accessible in international news.

Next, The users are more familiar with the JAWS as they are used to with it and the accent of JAWS is more clear than other screen readers so they prefer JAWS more over any other screen reader and it is hardly possible that they can switch to any other screen reader. Hence second hypothesis is also true. The screen reader plays an essential role in accessibility. It was observed that some of the screen readers are not supporting entire content of the website and mostly it reads the simple text other than any flash content or complicated graphics. So our third hypothesis is False.

Last, we discovered that the websites are not fully accessible for the blind user's .Many of the WCAG 2.0 principles are violated which results in the lack of usability. Even if the guidelines are fully followed, still there are few problems that are creating inaccessibility in the real environment. Hence hypothesis fourth is false.

Future Enhancement: With the increasing move toward web-based applications, the usability of interfaces is important. Making intelligent interfaces will help disable users and will provide more accessibility and usability to the web content. For WCAG 2.0, one would expect there to be a larger decrease in the number of user problems from non-conformant websites to Level A conformant websites than there was for WCAG 1.0.

However, the results show conformance of a website to WCAG 2.0 Level A does not mean that users will encounter fewer problems on it and as a result it does not necessarily mean that following WCAG 2.0 will “make content accessible to a wider range of people with disabilities”².to overcome this problem the only solution is to involve the real users while developing the web based application so that the problems encountered can easily be resolved at initial stages and making the screen readers enough intelligent and supportive that meets the requirements of the evolving interfaces.

Conclusion

After evaluation of local and international websites, results show that websites were complaint to perceivable and operable principles. It was also found that websites does not even meet level A criteria. International websites in compare of local websites are found to be more accessible as fewer problems are identified in them as were found in the local sites. Study conducted on real users shows that, in some of the task they needed help while other they done it quickly. In the study, the major problems that were identified; empty label text, use of duplicate Ids and alternate text was missing .It was observed that due to the weighted content international news sites was a bit frustrating for the users to locate to their desired content. The findings and results are quite expected and a suggestion was made that web accessibility should be integrated and managed when developing the website so that it can be easily accessed by the visually impaired people.

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