

---

# A New Era of Web Accessibility Testing

## Author

Lavanya Lakshman (QA Lead)  
&  
Srinivasu Chakravarthula  
(Accessibility Manager)  
Yahoo Software Development  
India Pvt. Ltd.  
Torrey Pines, Embassy Golf Links  
Business Park,  
Koramangala Intermediate Ring  
Road, Bangalore-560071

## Abstract

Web 2.0 compliant websites are many but how many of them are usable by people with special needs?

Internet is sort after by individuals/ groups as a source of information, communication and collaboration. Today we have many websites catering to various needs like job sites, shopping, education, matrimony, etc. The websites should cater to wide range of audience, starting from regular users to those who need help of

assistive technologies. Having said that, how many websites today are accessible?

The scope of this paper is to answer the above question by following accessibility standards and to point out ways to enhance the existing and upcoming websites so as to make it accessible to everyone including people with special needs. It is titled as "*A New Era of Accessibility Testing*" because of the sensitivity demonstrated towards accessibility needs and addressing a wider audience.

The paper also suggests the **A2, Adaptability for Accessibility, process model** which can be adapted by either the existing or upcoming websites to be enhanced from accessibility perspective. This A2 process model fits well within any of the pre existing SDLC model.

The process suggested is inline with the SDLC (Software Development Life Cycle) model pre-existing in the IT industry. Adapting to this process in phases will help both the Engineering as well as the QA team to certify the build (websites) from Accessibility stand point during every release and also raise the level of Accessibility compliance.

Functional testing of any Front End application is critical and that extended to collaborate with Accessibility testing will improvise on the Return of Investment, (ROI), in terms of user base.

The final intent is to be able to ensure that anyone new to Accessibility understands the above technicalities well before adapting to the A2 process model. The best testing practices put forth will help the reader to make the right choice.

### **Keywords**

Accessibility, WCAG 2.0, A2 Process Model, ROI, Core Accessibility Team, SDLC

### **Abbreviations**

WCAG 2.0: Web Accessibility Compliance Guidelines 2.0  
WAVE: Web Accessibility Evaluation Tool  
FAE: Firefox Accessibility Testing  
ROI: Return Of Investment  
AT: Assistive Technologies

### **Introduction**

As per World Health Organizations (WHO), there are about **600 million** people with disabilities either by birth and caused due to accidents. In US alone, there are 29% of the people who have learning disability, 23% - Orthopedic impairment, 16% - vision impaired. In India alone, there are about 70 million people with disabilities.

The **Web** is increasingly playing an important role in many aspects of human life; education, employment, research, entertainment, travel, shopping and almost everything!

Web and assistive technologies are very much helpful for people with disabilities since they could perform several tasks without actually leaving their homes or depending on somebody. These online tasks could involve payment of bills, grocery/ commodities shopping, and also aid towards employment opportunities.

So what's important to enable them to participate in an era of Web? It's essential to make Web accessible so as to provide people with disabilities equal access and equal opportunity.

Let's talk for a while about what Assistive Technologies (AT) are all about? AT can either be a software or hardware that assists people with disabilities to access the computer or mobile device and perform the desired tasks. People with visual impairment use screen readers that convert text into voice and read aloud. Using screen reader, individuals can use office applications, surf the web and communicate with the world! People who have mobility difficulties use

alternate input devices such as on-screen keyboard, track ball, Head mouse etc. People who are deaf-blind, use Refreshable Braille Displays that convert regular text into Braille text that they can feel and read. Yet, is assistive technologies a perfect solution for people with disabilities to access the web? To some extent yes, but then assistive technologies rely on the correct mark up to help people with disabilities. So designing according to accessibility standards is rather important.

So what's accessibility? Accessibility is nothing but to ensure that our design works for everyone regardless of whether a person is a normal user or one with special needs, for e.g. people who rely on low band width. As per Web Accessibility Initiative of World Wide Web Consortium, one has to ensure that their website is perceivable, operable, understandable and robust with latest technologies and user agents such as assistive technologies.

For most companies to get the knowledge of Accessibility Testing and standards is easier. However the most common problems exist with the lack of process within Software Development Life Cycle. Some times, accessibility is addressed out of good will and some times, it will not get addressed. But as for any of the global products, addressing accessibility is as important as any other process.

### **Accessibility Testing:**

Before talking about A2 Process model, it is critical to understand what accessibility testing is all about. What does it take to make a website accessible?

Functional testing of any front end project involves both automated and manual testing. There is a human

judgment involved to each of the front end website which cannot be addressed by automation tools.

Similarly in case of accessibility testing also, not all testing can be done by automation tools. Manual testing is essential and better results are achieved when people with disabilities are involved in the process of testing.

For automated accessibility testing there are a set of tools to choose from starting from WAVE (Web Accessibility Evaluation Tool), FAE (Firefox Accessibility Extension), Color Contrast Analyzer, etc.

For manual accessibility testing tools available are Screen Readers, Screen Magnifiers, OnScreen Keyboard, alternate input devices etc.

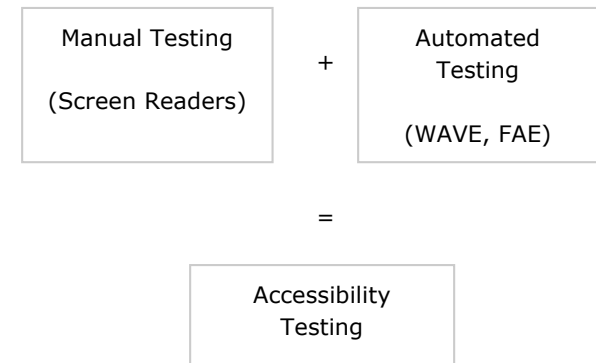


Fig 1: Scope of Accessibility Testing

### **Accessibility Standards:**

We at Yahoo follow a set of guidelines and checklist in line with WCAG 2.0 so as to be easily followed by individual teams which helps to make the properties accessible.

Ensuring that these accessibility checklists are considered during the design stage itself makes the property usable by a larger set of audience.

Some of the commonly used checklists are as mentioned below:

- 1) Alternate to visual CAPTCHA
- 2) Clear contrast should exist between foreground and background color.
- 3) Title is essential for every page within the web property.
- 4) Different heading levels should be appropriately used.
- 5) Links should be readable.
- 6) Expansion for abbreviations is essential.
- 7) Alt text inclusion for images is critical and should be null for spacer images and for images that are included with same anchor tag for a textual link.
- 8) Row and Column headers should be provided for all data tables, <th> tags.
- 9) Keyboard access is very critical, considering that there could be few users who wouldn't be using mouse at all.
- 10) Appropriate mark up should exist for the lists used.
- 11) Site map should be provided for every property.
- 12) "Skip to Main Content" should be available.

13) ARIA (Accessible Rich Internet Application) should be implemented for Ajax based properties.

14) Frames are difficult to use for keyboard users and hence its usage should be very restrictive.

### **A2 Process Model**

In any business, process adapted plays a key role in tracking the progress. Accessibility compliance or enhancement is no different from it. Thereby the below defined Adaptability to Accessibility Process model will help individual products to be accessible compliant and hence cater to larger audience which includes people with special needs.

The suggested process model can be used within the scope of industry wide accepted software development life cycle (for eg: Agile model, Waterfall model). The prime reason being that the Core Accessibility Team, (defined as one which has the expertise to perform accessibility check on any given website), needs to know the design, code as well as capable of doing testing.

- Existing Web Product / Property:

Firstly we will be discussing about leveraging the A2 Process model for an existing web base product/ property:

1. Core Accessibility Team does the first round of accessibility testing on the selected product/ property and lists down all the accessibility non compliance aspect.

2. Tracking bugs are logged for all the above listed down accessibility non – compliance.
3. As a norm, bug triage will include Engineering Manager/Lead, PM and QA Manager/Lead. However the bug triage for the accessibility bugs will involve the subject matter expertise, who would help in assigning the right priority and also to validate the severity logged by the core team.
4. The list of bugs that needs to be fixed for the designated release is agreed upon.
5. During the build cycle, the bug fixes are verified by core head
6. Signed off is done by the subject matter expertise at the end of the release only if all the agreed upon bugs are fixed.

- New Web Product / Property:

Secondly we will be discussing about leveraging the A2 Process model for a new web base product/ property. Core Accessibility team is involved right from the design stage until sign off to suggest ways to make the product/ property accessible.

1. Core Accessibility Team along with the design team agrees upon the accessibility related design suggestions to be included.
2. During implementation if and only if required, the subject matter expertise gets involved for resolving any accessibility related blocking issues.

3. Depending on whether the build cycle, the core team does the accessibility testing and reports issues related to accessibility non compliance.
4. Bugs are triaged and accordingly the right priorities are assigned and the severity is validated.
5. The list of bugs that needs to be fixed for the designated release is agreed upon.
6. During the build cycle, the bug fixes are verified by core head
7. Signed off is done by the subject matter expertise at the end of the release only if all the agreed upon bugs are fixed.

### **Benefits**

The following 3 stages are critical and the accessibility team's involvement is essential:

- 1) Design stage (Content and Visual design)
- 2) Internal Releases
- 3) Staging environment

The benefits of adapting to the A2 Process model are listed below:

- 1) Adhering to the law.
- 2) Adhering to the industry wide accepted WCAG 2.0 standards.
- 3) Accessibility compliance of the website can be achieved without altering the existing SDLC model.

- 4) Since the website is accessible, the user base with respect to people with special needs also increases.
- 5) The more the number of users, the revenue generated from the website increases exponentially.

### **Conclusion**

Understanding the needs of accessibility and using various techniques to comply with the standards makes the web property usable by a larger audience. Addressing the larger audience always has a better ROI. When these accessibility enhancements are incorporated without much process change that's when they are easily accepted. Being able to come up with a quality product is the intent of any product based company.

**Acknowledgements**

We would like to thank USID for providing a platform to submit this paper. We would also like to thank Sandeep Datar, Prashanth C for encouraging us to write this paper and Victor Tsaran for his valuable inputs.

**Example citations**

[1] Web Content Accessibility Guidelines (WCAG) 2.0  
<http://www.w3.org/TR/WCAG20/>

[2] . National Policy for Persons with disabilities 2006

<http://socialjustice.nic.in/disabled/national%20policy-%20English.pdf>

<http://www.disabilityindia.org/nationalpolicyfordisable.cfm>

[3] World Health Organizations -  
<http://www.who.int>

[4] World Wide Web Consortium  
<http://www.w3.org>

[5] About Assistive Technologies from Wikipedia  
[http://en.wikipedia.org/wiki/Assistive\\_technology](http://en.wikipedia.org/wiki/Assistive_technology).