Why make the Web Accessible for People with Disabilities

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Session Agenda

Time Duration	Topic	
11:15 – 11:20	Introduction	
11:20 – 11:30	A Day in the Life of a Disabled User (DU)	
11:30 – 11:55	 What is Web Accessibility As perceived by a DU As defined by UN As a subset of Usability 	
11:55 – 12:15	An overview on Assistive Technologies	
12:15 – 12:30	 Making the Web Accessible Regulatory Considerations (Laws) Standards and Guidelines Voluntary Efforts 	
12:30 – 12:45	Some Techniques used in Web Accessibility	
	Free Interaction and Q&A	

Goals of This Session

Sensitize people with the special requirements of people with disabilities

Understand the challenges in web accessibility

Present
developments and
advances in
enabling web
accessibility to
people with
disabilities

A Day in the Life of a Disabled User

- Learning
 - Becoming sensitive to the specific requirements of a disabled user is the first step to addressing accessibility
 - Making the non-obvious...obvious
 - Proximity to infants and old people provides better understanding of special needs.

Web Usability and Accessibility

Usability

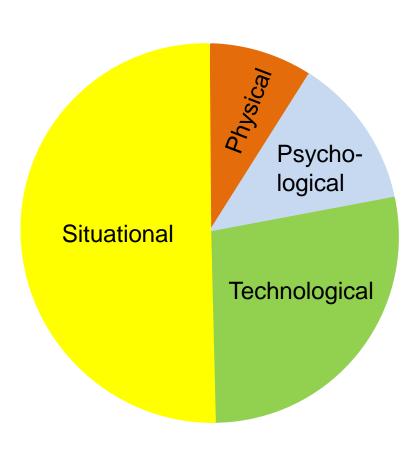
making a website as simple
 and fast to navigate as
 possible, and presenting
 information / products in an
 easily readable format

Accessibility

making the content of a
 website available to everyone,
 including those with
 disabilities of various orders.

What is Disability in the context of Web usage

- Disability is substantial inability to perform / complete a task as a result of one of the following
 - Physical status such as blindness or motor impairment
 - Psychological status—such as cognitive disabilities or attention deficit
 - Technological status— low bandwidth, dial-up networks, older browsers, screen resolutions, monochrome screens,
 - Situational status accessing audio in noisy environments, accessing keyboard / mouse while driving, lost spectacles etc.



What is Accessibility?

It depends on who you ask:

- "People with disabilities can use the Web ... more specifically [they] can perceive, understand, navigate, and interact with the Web"
 --Web Accessibility Initiative of the W3C
- "Accessibility must be perceived nowadays as a crosscutting concern over users, devices, and usage situations"

-- Lopes and Carriço, 2007

 "Accessibility is a subset of usability; accessibility problems are particular types of usability problems"

--Thatcher et al., 2003

 "Anyone using any kind of Web browsing technology must be able to visit any site and get a full and complete understanding of the information contained there, as well as have the full and complete ability to interact with the site"

-- Letourneau, Starling Access Services

So What is Web Accessibility?

Enabling people with disabilities to access the World Wide Web

Visually challenged users (Completely blind, partially blind, color blind)

- 2. Audio impaired users (Deaf or hard of hearing)
- 3. Users with a motor disability
- 4. Users with cognitive disabilities
- 5. Users accessing the web with mobile or other non-PC device
- 6. Non-standard internet connections

Users
Users
Without limitations
Users with limitations
Users with disabilities

Website

Web Accessibility involves the steps that must be taken to enable users to access and experience a website, prior to considering its usability.

The Scale of People with Disability Worldwide



Web Accessibility: Myths and Realities

Myth

Fact

Accessibility is only for blind users

• It is about respecting people with different needs and varied preferences. Not everyone would have similar equipment to use or same abilities to perceive.

Accessibility and aesthetics are at loggerheads

 Use color, graphics and multimedia but ensure availability of text alternatives and keyboard access

Offering text- only version is the best thing you can do

• It is additional burden and unnecessary, rather, have a single accessible site

Accessibility is just an icing on the cake. Bother about it only at the end.

 Accessibility is a part of the cake, it is wired through the site from design to testing

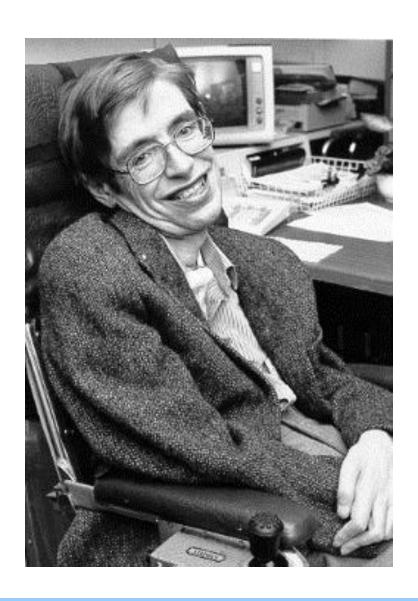
Run the accessibility evaluator and the job is done

 Tools can speed up the process but can not judge the correctness of accessibility implementation

Accessibility is costly and it requires too much of intelligence

• It is just common sense, and requires hardly any extra effort if taken care of right from design

Does this person need any introduction?



How do People with Disability Access the Web?

- They use assistive technologies
- Assistive technologies are hardware, software or combination of both which enable these user to accomplish tasks which they otherwise can not perform
- The most ancient assistive technology is pair of spectacles
- Assistive technologies for computer and internet access are usually highly sophisticated and many are exorbitantly priced
- They involve significant system level programming from development point of view
- They have large number of customization options to enable a user to get maximum out of it
- Generally these technologies have a considerable learning curve

For Visually challenged users

- Screen readers, the software converts visual information on the screen into an audio stream using synthetic speech.
- Screen Magnifiers, the software magnifies the portion of the screen under focus that enables a low vision user to perceive the visual information.
- Refreshable braille displays, it is an electro-mechanical device for displaying Braille characters, usually by means of raising dots through holes in a flat surface.



For Motor disabled users

- Mouth stick used to type and perhaps to manipulate a trackball.
- Sip and puff devices
- Head wand is a stick strapped to head and used for typing characters, navigate through web documents, etc. by head movements.
- Voice recognition software allows typing by using voice alone or in conjunction with the alternative keyboard/pointing devices.
- Alternative keyboards that conform to shape and movements of the wrist and hands.
- Alternative Pointing Devices such as trackballs, ergonomically designed mice, and touch-pads.

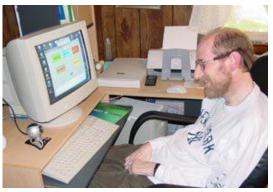












For Audio Impaired

 Close Captioning provides text description of the audio tracks in the movie so that the person can understand the speech content.

For cognitive disable user

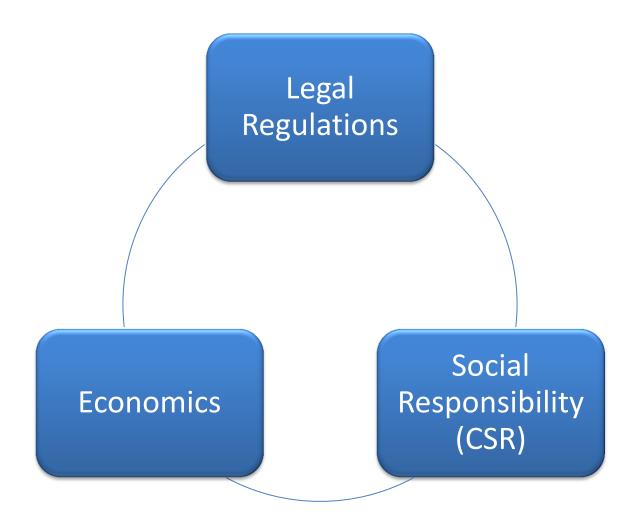
- Word Prediction Software predicts the user's words based on the words recently typed and the frequency of usage of the words
- Scanner/Reader, it converts typewritten or typeset material into clearly spoken synthesized speech..
- Augmentative Communication
 Devices, Utilize bright, colorful
 symbols to allow users to
 communicate using digitized text-to speech capabilities.





Making the Web Accessible

Key Drivers of Accessibility Compliance



Global Legislations and Regulations



United States of	Rehabilitation Act, <u>Section 504</u> (USA, 1973)		
America	Americans with Disabilities Act (ADA) (USA, 1990) – Title II & Title III		
	Amended <u>Section 255</u> of the Communications Act (USA, 1996)		
	Rehabilitation Act Amendment, <u>Section 508</u> (USA, 1998)		
United Kingdom	Disability Discrimination Act of 1995 (UK, 1995)		
	Disability Rights Commission (DRC) published a Code of Practice for "Rights of Access –		
	Goods, Facilities, Services and Premises" (UK, 2002)		
	DRC Published Code of Practice for Website Accessibility (PAS78) (UK, 2006)		
Australia	Disability Discrimination Act (1992)		
	WWW Accessibility (Disability) Policy (Australia, 2000)		
Canada	Canadian Human Rights <u>Act</u> (Canada, 1977)		
	Employment Equity Act (Canada, 1995)		
	Ontarians with Disabilities Act (Ontario, Canada, 2001)		
	Common Look and Feel Standards for the Internet (Canada, 2006)		
Germany	Ordinance on Barrier Free Information Technology or BITV (Germany, 2002)		
France	Equal Opportunities Rights (France, 2004)		
Netherlands	Dutch <u>Law</u> on Quality of Government Websites (2006)		
European Union	Unified Web Evaluation Methodology 1.0 (2006)		

Important Guidelines and Standards

- Web Content Accessibility Guidelines (WCAG) 1.0
- WCAG 2.0
- Fujitsu Guidelines
- Mitsubishi Guidelines
- IBM Developer Guidelines
- Microsoft Accessibility Guidelines
- ISO/IEC TR 29138 Part 2
- ISO/IEC 23026, Part 4 (Design Practices), Sub-section 4.2.7
- JIS Web Content Accessibility Guideline
- Unified Web Accessibility Guidelines
- Java Look and Feel Design Guidelines
- Adobe Flash accessibility design guidelines

Recent Accessibility Landmarks in Industry...



Partnerships with Government - April, 2007

 A large online retailer entered into an agreement with the United States National Federation of the Blind to improve its website accessibility

Legal rulings supporting accessibility - 2008

 A California court ruled against a large retail chain, in a class action suit filed by the National Federation of the Blind and required that website of the retailer provide access to visually impaired users.

Interpretation of legislation - Ongoing

 There is some suggestion from the court case that accessibility may also be required under the Americans with Disabilities Act as well, meaning a ruling that is currently only focused on California, it could be extend to the rest of the United States.

Increased Emphasis on Social Responsibility

Legal Regulations

Social Responsibility (CSR)

Responsibility of the enterprise towards the society

- The Internet is an open platform for information exchange, from which no one should be excluded.
- Those for whom the Web is inaccessible for whatever reason will become increasingly excluded from mainstream life if it is not made accessible to them.

Jeffrey Immelt, Former CEO - GE

- "For many people, the website is the first touch point for the company,"..... "Given our breadth and depth, it's important to be accessible. We have a broad impact on a lot of people's lives."
- Moreover, even a titan doesn't want to chance a lost sale. First impressions are important to all web surfers...Maybe they'll purchase something as a result of the initial online scan"

Economics: Market for Accessibility Support Online

ie

Regulations

Worldwide, 650 million people have a disability

•three out of every 10 families are touched by a disability

Economics Social Responsibility (CSR)

By 2015

- •20% of the EU will be over 65 years of age;
- •the number of people aged 60 or over will double in the next 30 years
- •the number aged 80 or over will increase by 10% by 2050

In USA, the discretionary income of people with disabilities is \$175 billion!

Only 23% US federal government websites, 11% Non Profit Organization's websites and 6% corporate websites in the US are accessible

In 2001, 180 million people worldwide were blind or visually impaired,

7.7 million people in the United States

In the United States, one in five people have some kind of disability and one in 10 has a severe disability

•That's approximately 54 million Americans

Across European Union approximately 46 million people have a disability;

Economics: Substantial Web Usage by Disabled Users

Legal Regulations

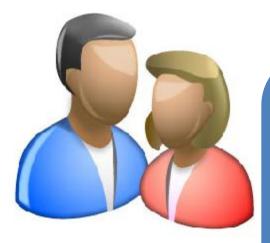
Economics

Social Responsibility (CSR)

Of the 54 million Americans with a disability, 4 in 10 are online

About 97% of websites fail to meet the most basic requirements for accessibility*

These users spend more time logged on and surfing the Internet than non-disabled users



On average, they spend 20 hours per week online

According to the Harris Poll*, 48 percent of respondents with disabilities reported that "the quality of their lives had been significantly improved by the Internet" compared to 27 percent of respondents without a disability

Industry Sentiment Towards Value of Accessibility

 "There are definitely revenues to be made. We know the [market for] the disabled and the periphery of people around them is over \$200 billion."
 Barbara Kaplan, national marketing operations manager - Verizon Wireless

- "There's a good deal of disposable income in the disability community. We've
 learned if you gain the community's loyalty, they're going to travel with you and
 recommend you to friends."
 - Lisa Anderson, Heads of the customer insight group Southwest Airlines

• "The site's multiple images, all visually attractive, had none of the corresponding ALT tags that speech-synthesizing applications need for the translations they provide to vision-impaired users. No one realized what a barrier we were creating for consumers to do business with us. It hit me that we had to do something".

Jeff Sluder, digital brand manager - P&G

Benefits of Accessible Websites

Revenue

- Savings of 12-35%
 - Cost to reach disabled and older people compared to other advertising / marketing means
- Increased Loyalty amongst disabled customers
- Increased cart conversions
- Peer Influence higher reference value
- Annual savings of £ 200,000 on site maintenance*
- 100% ROI in less than 12 months**

Non -Revenue

- Natural Search Engine traffic 30% growth
 - Significant improvement in Google rankings for target keywords)
- Upto 75% reduction in loading time for pages
- Increased Browser compatibility
- Less time to manage content
- Intuitive customer experiences

^{*} Source: Heerdt, V. and Strauss, T. (2004) A cost-benefit approach for accessible web presence. In: K. Miesenberger at al. (Eds.) ICCHP 2005, LNCS 3188, pp. 323-330



World Wide Web Consortium (W3C)

The World Wide Web Consortium (W3C) is committed to lead the Web to its full potential which includes promoting a high degree of usability for people with disabilities.

The Web Accessibility Initiative (WAI) develops its work through W3C's consensus-based process, involving different stakeholders in Web accessibility.

These stakeholders include industry, disability organizations, government, accessibility research organizations, and more.

WAI, in partnership with organizations around the world, pursues accessibility of the Web through five primary activities:

- ensuring that core technologies of the Web support accessibility
- developing guidelines for Web content, user agents, and authoring tools
- facilitating development of evaluation and repair tools for accessibility
- conducting education and outreach
- coordinating with research and development that can affect future accessibility of the Web

Overview of Web Accessibility Guidelines

- W3C-WAI developed and published WCAG1.0 as a first set of guidelines for accessible web in 1999
- In 2008 it replaced WCAG1.0 with WCAG2.0 that addresses newer web technologies
- Several nations have accepted and adapted the guidelines to form country specific legislatures
- Section 508, UK Disability Discrimination Act, Government of India guidelines are some examples of country specific guidelines adapted from WCAG.
- WAI has also published accessibility guidelines for authoring tools and user agents
- WAI-ARIA suite is useful for making rich internet applications accessible to assistive technologies

Specific Guidelines by W3C

- Web Content Accessibility Guidelines (WCAG) 1.0
- WCAG 2.0
- Authoring Tools Accessibility Guidelines (ATAG)
- User Agent Accessibility Guidelines (UAAG)
- Best Practices for Mobile Web
- Accessible Rich Internet Applications (ARIA) specifications

W3C Guidelines – WCAG 1.0

- It is organized into 14 guidelines and 64 checkpoints
- Each guideline has multiple checkpoints
- Each checkpoint has been assigned a priority on the basis of its impact to accessibility viz. priority 1, priority 2 or priority 3
 - Priority 1: Satisfying this priority is a basic requirement for some groups to be able to use Web documents.
 - Priority 2: Satisfying this priority will remove significant barriers to accessing Web documents.
 - Priority 3. Satisfying this priority will significantly improve access to Web documents.
- Three levels of conformance are specified
 - Conformance Level "A": all Priority 1 checkpoints are satisfied
 - Conformance Level "Double-A": all Priority 1 and 2 checkpoints are satisfied
 - Conformance Level "Triple-A": all Priority 1, 2, and 3 checkpoints are satisfied

W3C Guidelines – WCAG 2.0

- The 12 guidelines have been classified under four principles,
 Perceivable, Operable, Understandable, and Robust.
- The principles provide the foundation for Web accessibility
- For each guideline, testable success criteria are provided to be used where requirements and conformance testing are necessary
- Sufficient techniques to meet every success criteria is also specified
- Three levels of conformance have been defined A, AA and AAA, where A is the lowest and AAA is the highest
- Sufficient and Advisory Techniques for each of the guidelines and success criteria have been provided
 - Sufficient techniques are necessary for meeting the success criteria
 - Advisory techniques go beyond what is required by the individual success criteria and allow authors to better address the guidelines
 - Some advisory techniques address accessibility barriers that are not covered by the testable success criteria

W3C Guidelines – ATAG

- The requirements are useful for the developers of Web Content Authoring software
- if the requirements are satisfied it would lower barriers to accessibility by achieving accessible authoring tool that supports and encourages creation of web content that meets WCAG requirements
- · The three goals of the guidelines are
 - That the authoring tool be accessible
 - That the authoring tool produce accessible content by default
 - That the authoring tool encourage the creation of accessible content
- It is organized into 7 guidelines and 28 checkpoints
- Each guideline has multiple checkpoints
- Each checkpoint has been assigned a priority on the basis of its impact for meeting the goals of the specification, viz. priority 1, priority 2 or priority 3
 - Priority 1: If the checkpoint is essential to meeting the goals.
 - Priority 2: If the checkpoint is important to meeting the goals.
 - Priority 3: If the checkpoint is beneficial to meeting the goals.
- Some checkpoints are assigned a relative priority
 - Relative priority means, the checkpoint has the same priority as that of the corresponding checkpoint in WCAG1.0
- Grouping links in navigation bars is a priority 3 in WCAG 1.0. Therefore, it is only priority 3 for the authoring tool to check for (
- Different tools may satisfy the same checkpoint using different techniques
- Three levels of conformance are specified
 - Conformance Level "A": all Priority 1 checkpoints are satisfied
 - Conformance Level "Double-A": all Priority 1 and 2 checkpoints are satisfied
 - Conformance Level "Triple-A": all Priority 1, 2, and 3 checkpoints are satisfied

W3C Guidelines – UAAG

- User Agent Accessibility Guidelines
- The requirements are for the developers of user agent software
- if the requirements are satisfied it would lower barriers to accessibility
- It is organized into 12 guidelines and 83 checkpoints
- Each guideline has multiple checkpoints
- Each checkpoint has been assigned a priority on the basis of its impact to accessibility viz. priority 1, priority 2 or priority 3
 - Priority 1: Satisfying this priority is a basic requirement for some groups to be able to use Web documents.
 - Priority 2: Satisfying this priority will remove significant barriers to accessing Web documents.
 - Priority 3. Satisfying this priority will significantly improve access to Web documents.
- Three levels of conformance are specified
 - Conformance Level "A": all Priority 1 checkpoints are satisfied
 - Conformance Level "Double-A": all Priority 1 and 2 checkpoints are satisfied
 - Conformance Level "Triple-A": all Priority 1, 2, and 3 checkpoints are satisfied

W3C Specifications – ARIA

- WAI-ARIA, the Accessible Rich Internet Applications Suite, defines a way to make dynamic content and advanced user interface controls developed with Ajax, HTML, JavaScript, and related technologies accessible to assistive technologies
- It provides a framework for adding attributes to identify features for user interaction, how they relate to each other, and their current state.
- It describes new navigation techniques to mark regions and common Web structures as menus, primary content, secondary content, banner information, and other types of Web structures.
- with WAI-ARIA, developers can identify regions of pages and enable keyboard users to easily move among regions, rather than having to press Tab many times.
- It also includes technologies to map controls, Ajax live regions, and events to accessibility application programming interfaces (APIs), including custom controls used for rich Internet applications.
- The techniques apply to widgets such as buttons, drop-down lists, calendar functions, tree controls (for example, expandable menus), and others.
- WAI-ARIA provides Web authors with the following:
 - Roles to describe the type of widget presented, such as "menu," "treeitem," "slider," and "progressmeter"
 - Roles to describe the structure of the Web page, such as headings, regions, and tables (grids)
 - Properties to describe the state widgets are in, such as "checked" for a check box, or "haspopup" for a menu.
 - Properties to define live regions of a page that are likely to get updates (such as stock quotes), as well as an interruption policy for those updates—for example, critical updates may be presented in an alert dialog box, and incidental updates occur within the page
 - Properties for drag-and-drop that describe drag sources and drop targets
 - A way to provide keyboard navigation for the Web objects and events, such as those mentioned above



Screen Readers

Sr. No.	Tool Name	license information	URL
1	JAWS	paid	http://www.freedomscientific.com/product s/fs/jaws-product-page.asp
2	Window-Eyes	paid	http://www.gwmicro.com/Window-Eyes/
3	NVDA	free- open source	http://www.nvda- project.org/wiki/Download

Disability Simulators

Sr. No.	Tool Name	License Information	URL
1	Colour Contrast Analyzer	free	http://www.wat-c.org/tools/CCA/1.1/
2	Visual Impairment Simulator	free	http://vis.cita.uiuc.edu/index.php
3	Opera browser	free	http://www.opera.com/download/

Browsers

Sr. No.	Tool Name	License Information	URL
1	Firefox	free	http://www.mozilla.com/en-US/firefox/ie.html
2	Opera	free	http://www.opera.com/download/
3	IE	free	NA
4	WEBBIE Text Browser	free	http://www.webi.org/soft-free-web-browsers-software.html
5	Google Chrome	free	http://www.google.com/chrome

Browser Plug-ins

Sr. No.	tool name	license information	URL
1	Web Developer Toolbar for Firefox	free	http://webdevelopertoolbar.com/install.php
2	Web Developer Toolbar for IE	free	http://webdevelopertoolbar.com/install.php
3	Firebug for Firefox	free	https://addons.mozilla.org/en-US/firefox/addon/1843/
4	Fire Vox for Firefox	free	http://www.firevox.clcworld.net/downloads.html
5	Complex Table Toolbar for Firefox	freeware	http://www.visionaustralia.org/info.aspx?page=1812
6	Web Accessibility Toolbar for IE	free for personal, non- commercial use	http://www.visionaustralia.org.au/info.aspx?page=1569
7	Web Accessibility Toolbar for Opera	free for personal, non- commercial use	http://www.visionaustralia.org.au/info.aspx?page=1569
8	HTML validator for Firefox	free	https://addons.mozilla.org/en-US/firefox/addon/249/

Thanks for Your Patience!!

Ajay Kolhatkar@infosys.com

Infosys iProwe

Web Accessibility Assessment and Remediation

Infosys iProwe

A patent pending product from Future Web Research Lab at SETLabs

Developed with over 10 person years of effort

Leverages built-in intelligence for

- Automatically analysing accessibility issues with a website
- Recommendation for remedial measures to make the website accessible

Assess website accessibility for users with the following disabilities

- visually challenged users
- hearing impaired users
- low-vision users
- colorblind users
- users with a motor disability and cognitive disabilities.

Tests HTML pages and file types including .php, .jsp, .asp, .aspx, .do, .cgi, .cfm

High Level View of iProwe

Assesses website for conformance with following guidelines

- WCAG 1.0
- WCAG 2.0 (final draft)
- Section 508 of the US Rehabilitation Act
- American with Disabilities Act of USA
- Disability Discrimination Act of UK
- Disability Discrimination Act of Australia
- British Standards Institution's Publicly Available Specification (PAS78)
 Guide to good practice in commissioning accessible websites
- Federal Ordinance on Barrier-Free Information Technology (BITV) of Germany
- Government of India Web Guidelines

Significantly reduces the time, cost, effort as well as errors involved in assessing and fixing Web accessibility issues.

Key Differentiators



Infosys iProwe Homepage Screenshot

