
Accessibility
Usability
User centred design

1

Accessibility

Contents

- Why accessibility?
- Assistive technologies and adaptive strategies
- Designing and developing

Why accessibility?

Accessibility

- Accessibility is...
 - an expression used to describe the degree to which a product, device, service, or environment is accessible by as many people as possible, without modification
 - the ability to access and benefit of something
 - also about accommodating things that people can't easily change...
 - and thus it is often used to focus on people with disabilities and their right of access to entities

Accessibility is not...

- Just about the Web but,...
in the context of this course, our main concern will be Web accessibility and even so, by the end, we will only address a small subset of the problem
- As such from now on, when talking about accessibility, we will most probably be referring to Web accessibility
- Nevertheless, lets take a look at ICT accessibility; and Web accessibility basic concepts...
before moving ahead

ICT accessibility

- Refers to the accessibility of information and communication technology, in general, to all regardless of disability or impairment
- Can also be conceptualized as the *ability to access* the functionality, and possible benefit, of some system

ICT accessibility

- Impairments affect the user's ability to perceive, understand or physically manipulate things
They can occur for many different reasons, including medical conditions, injury, the environment or simply old age
Impairments normally constraining ICT access include:
 - Visual impairments
 - Such as low-vision, complete or partial blindness, and color blindness.
 - Hearing impairments
 - Cognitive impairments and learning disabilities
 - Motor or dexterity impairments

Web accessibility

- Web accessibility basically means that people with disabilities can use the Web

As with computer accessibility, Web accessibility encompasses all disabilities that affect access to the Web, including visual, auditory, cognitive, physical, and neurological disabilities

Some people with tremors and older people with diminishing fine motor control can use a keyboard, but not a mouse

Some people have blurry vision and cannot read text unless it is very large

Some people cannot see at all and use a screen reader that reads aloud the information in the web page.

Screen readers are also used by people who can see just fine but have trouble processing written language

Web accessibility

- While access to people with disabilities is the primary focus of web accessibility, it also benefits people without disabilities

For example, a key principle of web accessibility is designing websites that are flexible to meet different user needs

This flexibility also increases general usability and lets people without disabilities use websites according to their preferences, such as using whichever browser they want and using keyboard shortcuts

Web accessibility

- Accessible sites are generally more usable to everyone, including people with disabilities and people without disabilities
 - Increased usability means website users achieve their goals effectively, efficiently, and satisfactorily
 - When users have a positive experience with a website, they are more likely to use the site more thoroughly, return to the site more often, and tell others about the site
 - Some accessibility guidelines can indirectly increase usability; for example, by making web pages load faster
- Some accessibility guidelines directly increase usability for all users, such as:
 - Clear and consistent design, navigation, and links
 - Blocks of information divided into groups
 - Clear and simple language as appropriate
 - Supplemental images and illustrations
 - Good color contrast

Web accessibility

- Although...

Tim Berners-Lee envisioned that the power of the Web relied in its universality and that access by everyone, regardless of disability, should be one of its essential aspects

The Web has the potential for disabled and impaired users to find information and use services on the same terms as everyone else

The Web should be an alternative means of accessing services for disabled and impaired people who found it difficult to leave their home



Web accessibility

- The proliferation of information in electronic format does not guarantee its accessibility

The fact that many Web sites are not accessible to large segments of the disabled community has created a *digital divide*

The accessibility barriers are systemic

In recent years, there has been a growing body of significant laws and standards concerning Web accessibility that impact people with disabilities

This effort has been systematically breaking down these barriers and fostering fuller accessibility implementation

Results include

education to raise awareness of Web accessibility

policies and guidelines for accessibility, and

Web-based applications and tools to facilitate Web accessibility, to name a few



Accessibility's digital divide

- By 2004

Out of 1000 British websites, 81% failed to meet the minimum standards for disable users

On average, each website had over 100 barriers that make it impossible or very difficult for the disabled to use

A further evaluation of 100 websites by a random disabled group found that because of poor accessibility, over 25% of the most routine and straightforward online tasks could not be completed successfully

Blind users were the most affected not competing nearly 50% of the requested tasks despite the use of screen readers

Less than 10% of Web designers and developers claimed any expertise in fostering accessibility



Disability Rights Commission

Accessibility policies in Europe

- 1999

The European Commission launches the eEurope Initiative

The following ten areas have been identified where actions are necessary:

European youth into the digital age

Cheaper Internet access

Accelerating E-Commerce

Fast Internet for researchers and students

Smart cards for secure electronic access

Risk capital for high-tech SMEs

eParticipation for the disabled

Healthcare online

Intelligent transport

Government online

http://europa.eu/legislation_summaries/information_society/l24221_en.htm



Accessibility policies in Europe

- Under the **eParticipation for the disabled** item, three targets were set

By the end of 2000:

The European Commission and Member States should review the relevant legislation and standards programmes dealing with the Information Society, with a view to ensuring their conformity with accessibility principles and accelerating standardisation processes

The European Commission will propose a recommendation to Member States to take account of the requirements of people with disabilities in the procurement of information and communications products and services

By the end of 2001:

The European Commission and Member States should commit themselves to making the design and content of all public Web sites accessible to people with disabilities

By the end of 2002:

The European Commission will support the creation of a Network of Centres of Excellence, at least one in each Member State, that will develop a European curriculum module in Design-for-All to train designers and engineers



Accessibility policies in Europe

- 2000

During the Feira European Council, the member states agreed on the *eEurope 2002 Action Plan*

The 10 different areas that have initially been identified have been revised and clustered around three main objectives, each containing some subtasks:

A cheaper, faster, secure Internet

- Cheaper and faster Internet access

- Faster Internet for researchers and students

- Secure networks and smart cards

Investing in people and skills

- European youth into the digital age

- Working in the knowledge-based economy

Participation for all in the knowledge-based economy

Stimulate the use of the Internet

- Accelerating e-commerce

- Government online: electronic access to public services

- Health online

- European digital content for global networks

- Intelligent transport systems

http://www.support-eam.org/waec/docs/mod01/eEurope_actionplan_2002_en.pdf



Accessibility policies in Europe

- In the context of Web Accessibility, the subtask **Participation for all in the knowledge-based economy** is of great importance and includes the following actions:

Policies to avoid info-exclusion will be more effectively co-ordinated at European level through benchmarking of performance and exchange of best practice between Member States

Publication of *Design for all* standards for accessibility of information technology products, in particular to improve the employability and social inclusion of people with special needs

Review relevant legislation and standards to ensure conformity with accessibility principles

Adoption of the Web Accessibility Initiative guidelines for public websites

Ensure the establishment and networking of national centres of excellence in design-for-all and create recommendations for a European curriculum for designers and engineers



Accessibility policies in Europe

- 2001

The European Commission reviews the eEurope initiative now focusing on the widespread availability and use of broadband networks throughout the Union by 2005 and the development of Internet protocol IPv6 [...] and the security of networks and information, eGovernment, eLearning, eHealth and eBusiness.



Accessibility policies in Europe

- 2002

The Barcelona European Council called on the Commission to draw up a new action plan

As a result, the eEurope 2005 Action Plan was launched

The targets of the Action Plan have been summarized as follows:

By 2005, Europe should have:

- modern online public services

 - e-government

 - e-learning services

 - e-health services

- a dynamic e-business environment

and, as an enabler for these

- widespread availability of broadband access at competitive prices and

- a secure information infrastructure.



Accessibility policies in Europe

- 2005

The European Commission...

launches a five-year strategy to boost the digital economy by releasing the communication *i2010: A European Information Society for growth and employment*; and

The Commission proposed three priorities for Europe's information society and media policies:

the completion of a Single European Information Space which promotes an open and competitive internal market for information society and media

strengthening Innovation and Investment in ICT research to promote growth and more and better jobs

achieving an Inclusive European Information Society that promotes growth and jobs in a manner that is consistent with sustainable development and that prioritises better public services and quality of life.

http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm

releases a Communication on eAccessibility



Accessibility policies in Europe

- 2007

Under i2010's third priority, the Commission proposed an European Initiative on e-Inclusion addressing issues such as equal opportunities

ICT skills and regional divides

These measures resulted in actions on active monitoring, digital literacy and research into accessible technological solutions



Accessibility policies in Europe

- As a result, a number of countries does, in fact, have specific or related legislation on ICT and Web accessibility
 - Denmark
 - Finland
 - France
 - Germany
 - Ireland
 - Italy
 - Portugal
 - Spain
 - United Kingdom

W3C

Accessibility policies in Europe

- Nevertheless, by 2007...
 - Text relay services (essential for deaf and speech impaired people) are only available in one-half of the Member States
 - emergency services are directly accessible by text telephone in only seven Member States.
 - Mobile operators in only seven Member States provide dedicated information for customers with disabilities on their websites
 - On average, less than one-third of national language broadcasts of main public broadcasters in Europe were provided with subtitling (for deaf people) in 2006
 - there is wide variability (from 95% to none) in the amount of subtitling across individual countries
 - On average, less than one-tenth of national language broadcasts of main commercial broadcasters in Europe were provided with subtitling in 2006
 - most of this is provided in just a few countries
- http://ec.europa.eu/information_society/activities/einclusion/library/studies/meac_study/index_en.htm

Accessibility policies in Europe

- Nevertheless... (continued)

Public broadcasters in only five Member States provided any of their programmes with audio description (for visually impaired people) in 2006 and, where they did, the levels provided amounted to a very small percentage of their overall programming

only in one country did any commercial broadcaster provide any audio description.

Only a very small proportion of key government web sites in the Member States meet the accepted minimum international standards on accessibility

12,5% passed automated testing and only 5,3% passed both automatic and manual examination

The share of key commercial web sites (railways, TV, newspapers, retail banking, etc...) providing this minimum level of accessibility is even lower

only 3,9% passed automated testing while not a single site passed both automatic and manual testing

Only in six Member States has one of the leading retail banks installed ATMs with *talking* output (enabling self-service for customers with visual impairments)

across countries, on average only 8% of all ATMs that have been installed by the two main retail banks in the EU 25 Member States provide such output, with the bulk of this provided in just a few countries.

Accessibility around the world

- But ICT and Web accessibility are not just an European concern

Countries enforcing specific or related ICT and Web accessibility include:

Australia

Canada

Hong Kong

India

Israel

Japan

New Zealand

Switzerland

United States of America

Accessibility around the world

- The *standard* case study is United States' Section 508
Section 508 is an amendment to USA's Rehabilitation Act and was enacted to
eliminate barriers in information technology
to make available new opportunities for people with disabilities, and
to encourage development of technologies that will help achieve these goals
Section 508 applies to all Federal agencies when they develop, procure, maintain, or use electronic and information technology
Although not the law does not require private web sites to comply unless they are receiving federal funds or under contract with a federal agency, commercial best practices recommend voluntary adoption of Section 508

<http://www.section508.gov/>

Accessibility around the world

- Section 508 includes sections on
 - Technical Standards
 - Software applications and operating systems
 - Web-based intranet and internet information and systems
 - Telecommunication products
 - Video and multimedia products
 - Self contained, closed products
 - Desktop and portable computers
 - Functional Performance Criteria
 - Information, Documentation, and Support

Accessibility is not...

- For minorities

TESCO registered a GBP 13 million yearly income increase as a result of improving its website accessibility

<http://www.tesco.com/help/accessibility/>

www.rnib.co.uk

Accessibility issues will probably affect us all one day

It's a continuum, You have people with very severe impairments to people with very minor impairments and when you get up into your 40s you start getting into that category of minor impairments. I'm already in a situation where websites with fixed font sizes are getting harder to read for me.

Jackob Nielsen

Disability statistics

[EU] http://www.edf-feph.org/Page_Generale.asp?DocID=12534

[US] <http://www.ilr.cornell.edu/edi/disabilitystatistics/>

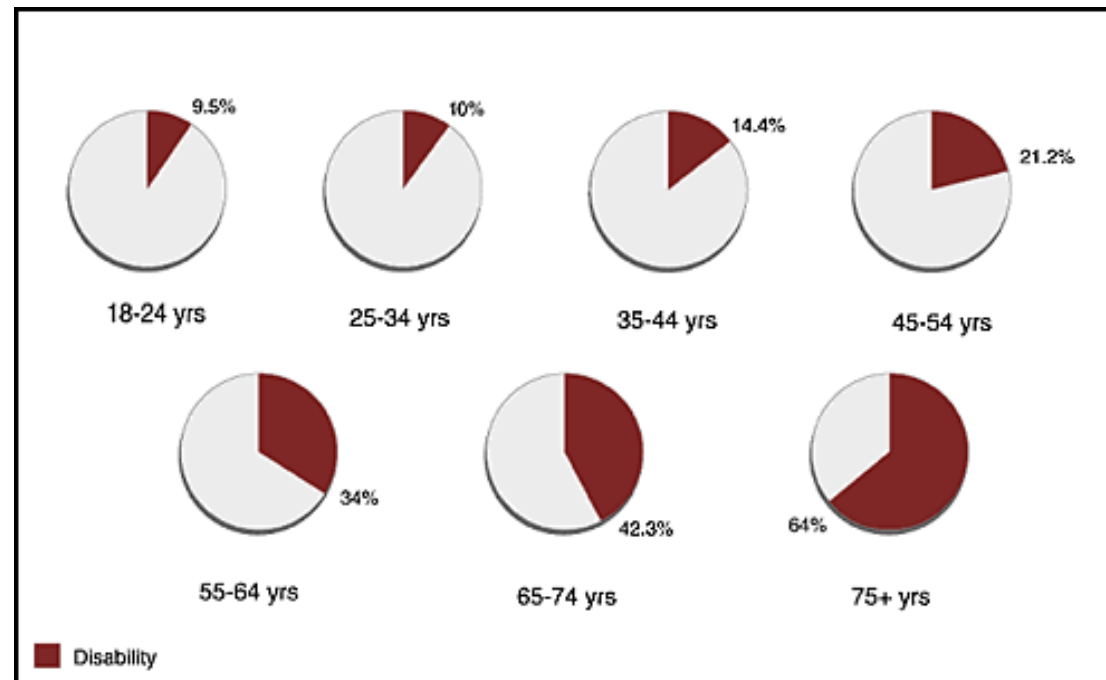
Ageing statistics

[general] http://www.tiresias.org/accessible_ict/ageing_population/index.htm

[US] <http://trace.wisc.edu/docs/function-aging/>

Accessibility is not...

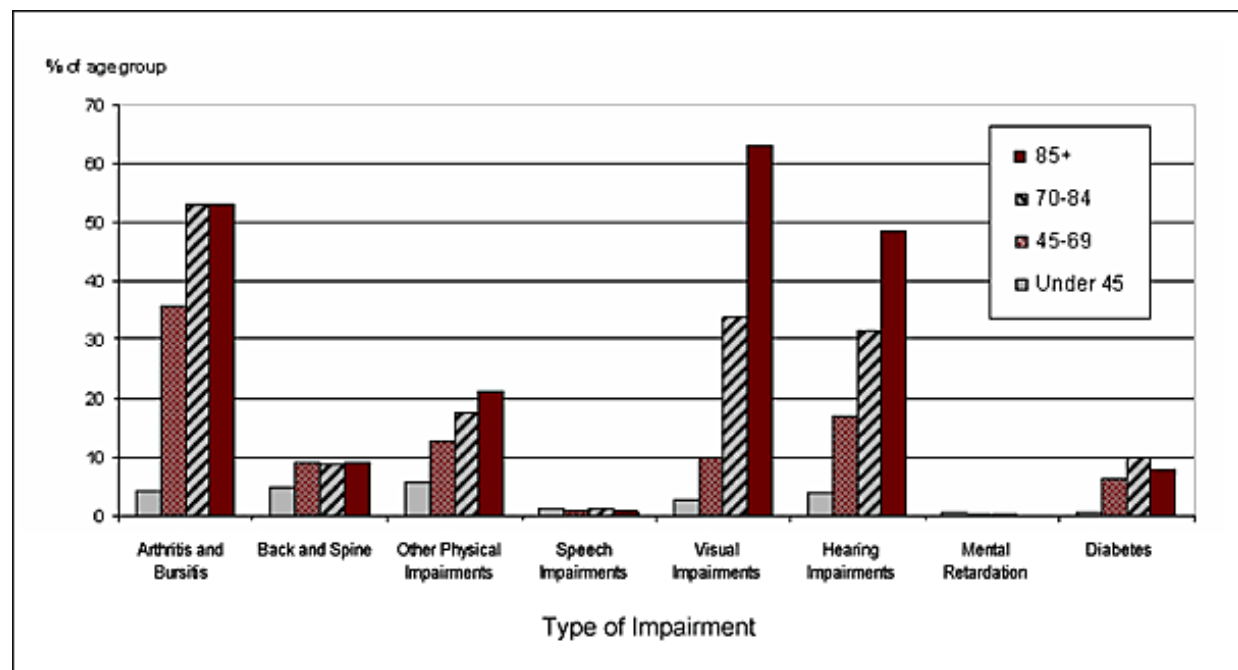
- For minorities



<http://trace.wisc.edu/docs/function-aging/>

Accessibility is not...

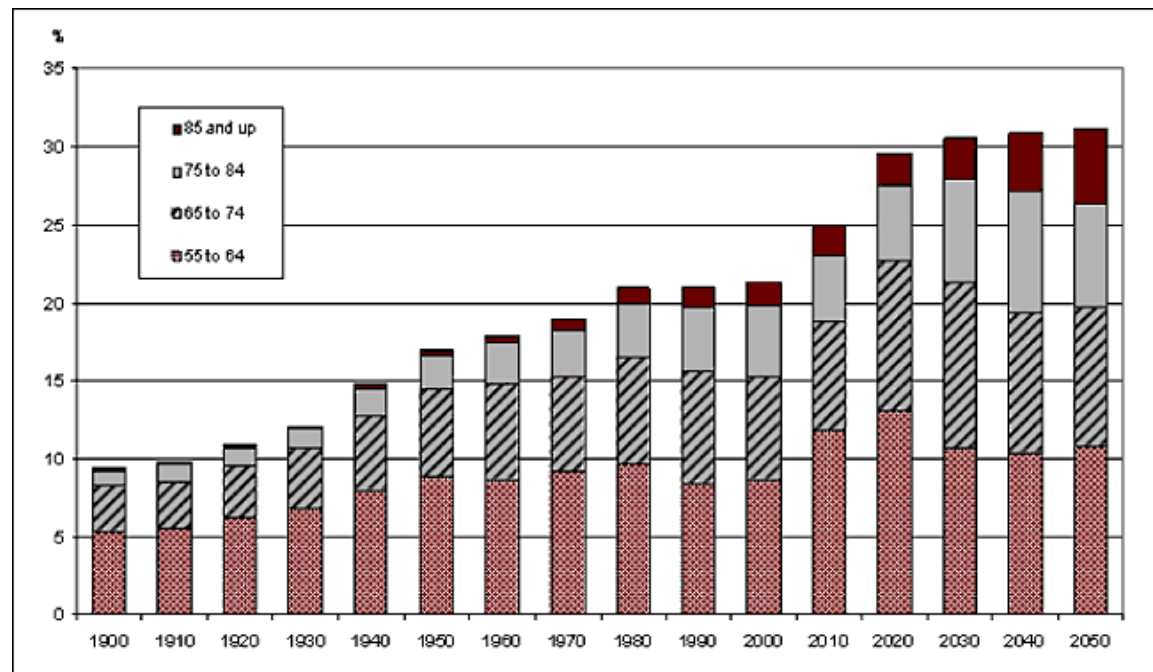
- For minorities



<http://trace.wisc.edu/docs/function-aging/>

Accessibility is not...

- For minorities



<http://trace.wisc.edu/docs/function-aging/>

Accessibility is not...

- Usability

Although often lumped together, accessibility is not the same as usability

Accessibility is about ensuring that all users can access all its services and content

Usability is ensuring that the process of accessing services and content is as intuitive and efficient as possible

Assistive technologies and adaptive strategies

Assistive technologies...

- and adaptive strategies are the means by which disabled or impaired user access the Web

Some assistive technologies are used together with graphical desktop browsers, text browsers, voice browsers, multimedia players, or plug-ins

Other accessibility solutions are built into the operating system, for instance the ability to change the system font size, or configure the operating system so that multiple-keystroke commands can be entered with a sequence of single keystrokes

Assistive technologies

- Assistive technologies are tools which enable a person with a disability to carry out the same tasks as a person without any type of disability

An example would be a hearing aid used by a person with an auditory disability to perceive sound information from the environment

A wheelchair is another assistive technology that a person with a back injury would use to gain mobility

Assistive technologies

- Further, assistive technologies are special instruments or devices enabling the undertaking of different activities which would otherwise be impossible

In other words, they are elements which facilitate or help individuals to lead their lives as normal as possible by compensating the disability and transforming the environment with a view to facilitate integration

Assistive technologies

- All assistive technologies should have the following characteristics:
 - simplicity
 - they should be easy to use;
 - efficacy
 - they should offer a suitable solution to the problem;
 - propriety
 - they should be used when there is no other reasonable means by which to solve the problem
- These technologies are classified according to ISO 9999

Assistive Technologies for the Web

- In the realm of web access, a series of assistive technologies is available to facilitate access for users with disabilities

Assistive technologies for the Web include:

- alternative keyboards or switches
- Braille and refreshable Braille
- scanning software
- screen magnifiers
- screen readers
- speech recognition
- speech synthesis
- tabbing through structural elements
- text browsers
- visual notification
- voice browsers

Screen readers

- Screen readers are specialised software which enable blind users or those with severe vision impairment to use a computer

The software is used in combination with hardware to interpret text and images appearing on the screen and transform them into voice

Some examples of screen readers are:

Jaws

<http://www.freedomscientific.com/products/fs/jaws-product-page.asp>

HAL

<http://www.yourdolphin.com/productdetail.asp?id=5>

Windows Eyes

<http://www.gwmicro.com/Window-Eyes/>

A comprehensive comparison can be found here

http://en.wikipedia.org/wiki/Comparison_of_screen_readers

Speaking browsers

- A speaking browser is software enabling blind or visually impaired users to browse through web content expressed in voice form

Speaking browsers are somewhat limited compared to screen readers as they do not guide the user in the use of the operating system and they lack advanced accessibility options such as the reading of complex tables, location of headers, lists, etc

One example is the IBM Home Page Reader

http://www.ibm.com/jp/accessibility/raku2web/jp/start_en.html

Screen magnifiers

- Screen magnifiers are software tools which considerably enlarge the size of information appearing on the screen thus facilitating access for visually impaired users

Additionally, they have the ability to adjust contrast, colour, font types and sizes

Examples include:

LunarPlus

<http://www.yourdolphins.com/productdetail.asp?id=4>

Magic

<http://www.freedomscientific.com/products/lv/magic-bl-product-page.asp>

ZoomText

http://www.synapseadaptive.com/aisquared/zoomtext_9/zoomtext_9_home_page.htm

Text-only browsers

- A text-only browser enables the user to navigate through web content, displaying all information in text format through disabling style sheets and displaying text alternatives instead of images

Lynx is the most popular text-only browser worldwide

It is freely distributed and can be downloaded automatically

It was originally developed for the Unix platform but today there are versions which work on other operating systems

Voice recognisers

- Voice recognisers are information input devices used by persons who have difficulties using a keyboard or mouse

The voice recogniser converts the user's voice into commands, which are sent to the operating system via a microphone, taking the place of mouse movements or keyboard strokes

The software has evolved quite a lot in recent years and now provides a large number of options. Voice detection has also improved and only requires a few short exercises prior to use. The supply of voice recognisers is limited

These are some of the most frequently used:

Dragon Naturally Speaking

<http://www.nuance.com/naturallyspeaking/products/editions/preferred.asp>

IBM Via Voice

Braille display

- A Braille display is a hardware device which, in combination with specific software, displays screen content in Braille characters, enabling blind and deafblind users to access information on the computer screen

The system interprets the words or graphics on the screen and translates them in Braille

Braille displays offer some screen movement options and even command activation, although the input device is typically the conventional keyboard

Braille display



Alternative Web access

- In many cases, Internet surfers use a graphic browser with the majority of players or plug-ins installed and control the browser via the mouse and occasionally the keyboard

However, this is not the only possible scenario

Not all web users use the same devices to surf the Internet, nor do all users navigate in the same way

Alternative Web access

- Blind web users typically use a screen reader programme to access the information displayed in the browser
They listen to the textual content of web pages via voice synthesiser applications called screen readers or speaking browsers.

Alternative Web access

- Visually impaired users normally use screen magnifiers to enlarge images or activate a larger font size available in their browser
They frequently disable the colours defined in web pages in order to get the maximum possible contrast between text and background
- Deaf or hearing impaired users do not perceive acoustic signals or the audio band of multimedia content
In the case of those who were born deaf, vocabulary may be relatively restricted, thus hindering the comprehension of excessively long texts or those with an abundance of new terms or complex syntax
Adapted subtitles and information embedded in images and diagrams are very useful for this type of user, as is the inclusion of videos in sign language

Alternative Web access

- Users with motor deficiencies, and elderly persons, encounter difficulties in handling certain cursor movement devices such as the mouse
Users affected by these deficiencies control the computer exclusively from the keyboard or special devices using the accessibility aids provided by their operating system
- Users affected by mild cognitive difficulties may encounter problems in correctly interpreting symbolic language and may easily become disoriented when faced with a complex web navigation scheme
Simple vocabulary, simple syntax and the use of explanatory texts and category lists are all helpful in order to adequately comprehend texts

Alternative Web access

- Web developers should bear in mind the various characteristics of web users when devising the best way to apply accessibility conditions to a website and to all projects undertaken with web technology

Similarly, they should envisage this variety of situations and construct sites which can be visited and used by any of these users

Designing and developing

The Web

- The Web was almost fully accessible for the first few years after its appearance
Disabled people, including blind and partially sighted people, deaf and hearing impaired people, people with conditions that resulted in limited use of their arms and people with cognitive disabilities were able to use the web with relative ease
- Assistive technologies worked relatively faultlessly
Most websites were coded by hand using standards
Assistive technologies could easily convert web text into audible, synthetic speech that blind people could hear

The Web

- Unfortunately...
 - accessibility has never been properly understood and addressed by web designers and developers
 - very few of the Web authoring software tools introduced since the mid 1990s produce standards compliant code
 - This meant that the web ceased to be based on standards-compliant mark-up
 - disabled users now find that their access to technologies does not work as expected
 - And this resulted in isolation from a significant number of web services.

Achieving accessibility is not...

- About stripping out anything visually appealing and publishing text-only websites
Accessibility is about adding redundancy and giving the user a choice about how to experience your content
- Or about reating a separate text-only equivalent as it can lead to a number of problems:
 - A text-only version is not necessarily accessible
 - Two versions of the same website represents a huge time and money investment for you
 - Your primary site may still be inaccessible to many users
 - An *extra* website for blind and disabled users can be one more way to make them feel marginalised from mainstream society

Achieving accessibility is not...

- Complicated and expensive

To develop an accessible website from scratch will cost virtually the same as to develop an inaccessible website

A very large, highly inaccessible website may take a bit more time and money to fix up, although the basic layout and design usually need not change

Web accessibility is not complicated and anyone with basic web design skills can easily implement it.

Achieving accessibility is not...

- Ugly and dull

Many advocates of web accessibility tend to have rather dull, unattractive websites

This is unfortunate, as web accessibility need not affect the design of the website in any way whatsoever

Achieving accessibility is not...

- About restricting creativity

Web accessibility actually places very few restrictions on website design

In fact, as with regular websites, you're only really limited by your imagination when creating accessible websites

Achieving accessibility is...

- About addressing it as soon as possible in the development or redesign process

Accessibility is often left for the end of web projects

At the end, it costs more and is burdensome and frustrating

For example, if you wait until the end, you could find that your authoring tool or CMS complicates accessibility, whereas a different one with good accessibility support would have made designing an accessible site much easier

Or you could find that one simple thing you did wrong has been propagated throughout the entire website

If you had done it right from the start, it would have taken almost no effort to go back and fix it will take significant effort.

Achieving accessibility is...

- About understanding what is at stake

When people do finally get to accessibility in their project, most approach it as a checklist to tick off

They dive into standards, they run an evaluation tool and then they are totally overwhelmed

This approach also has problems

If your project uses only accessibility standards, it will take longer, be more frustrating, and produce less effective results

Achieving accessibility is...

- Starting by learning the basics of how people with disabilities use the Web

Involve people with disabilities in Your project

From a little effort to include people with disabilities in your web development, you will get a lot of benefit, including:

Motivation When web developers, managers, and other project stakeholders see people with disabilities use their website, most are highly motivated by a new understanding of accessibility issues.

Efficiency Including users with disabilities early in a project helps web developers be more efficient in addressing accessibility, thus maximizing the results from investment in accessibility. You can more quickly develop accessibility solutions, and spend less time guessing and having to go back and fix things.

Effectiveness The better you understand the issues, the better you can implement more effective accessibility solutions (for example, using "search" for alt text instead of "this image is a line art drawing of a dark green magnifying glass. . .").

- And only them using the Web's accessibility building blocks to achieve a high degree of accessibility

Accessibility building blocks

- Accessibility building blocks can be grouped as technical and human
 - Technical building blocks are
 - Web content
 - Technical specifications
 - Authoring tools
 - Web page editors
 - Word processors and desktop publishing software that save files in web formats
 - Tools that transform documents into web formats,
 - Multimedia tools
 - Content managements systems
 - Websites that let users add content
 - Evaluation tools
 - Web browsers, media players, assistive technologies, and other software that people use to access and interact with web content
 - Assistive technologies

Accessibility building blocks

- Accessibility building blocks can be grouped as technical and human

Human building blocks are

Tool developers

Users

Content developers

Accessibility building blocks

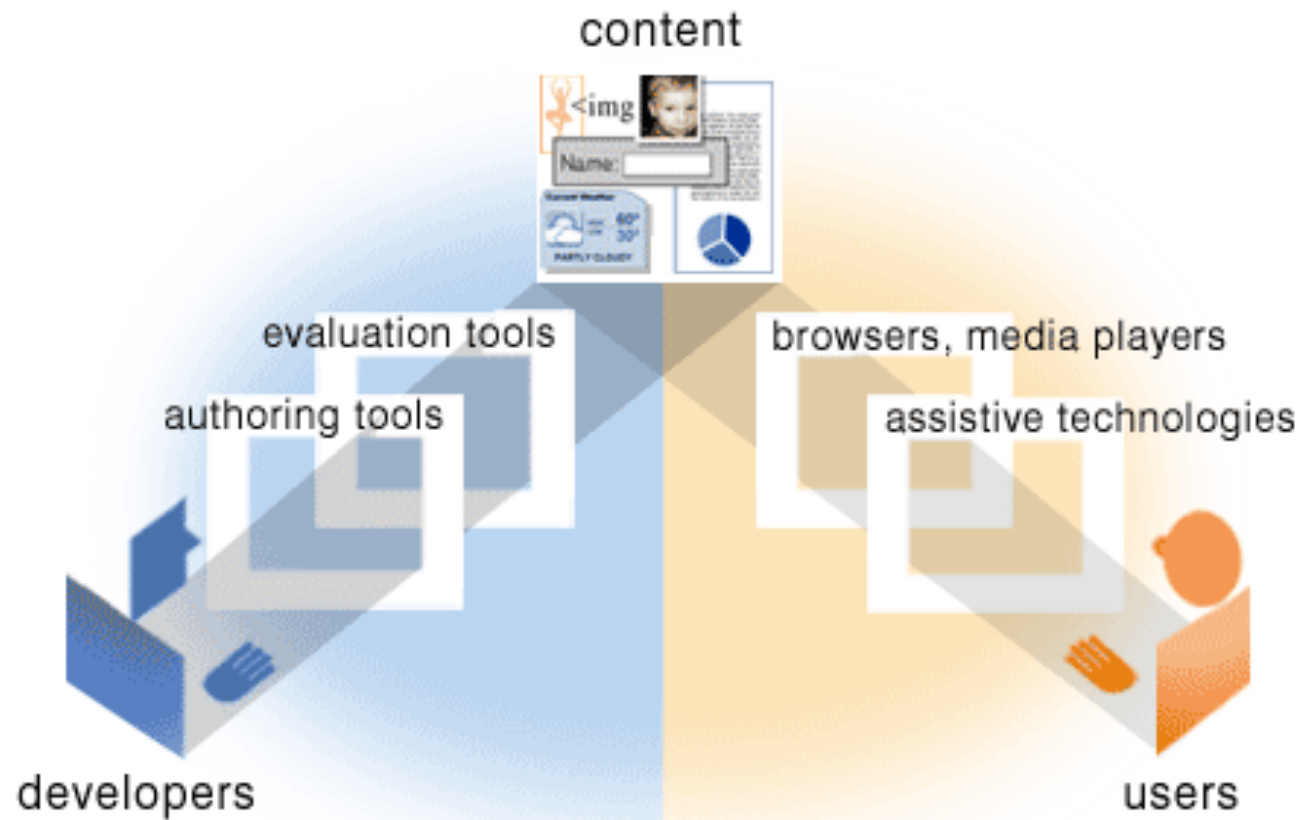


image used with permission from the W3C

Accessibility building blocks

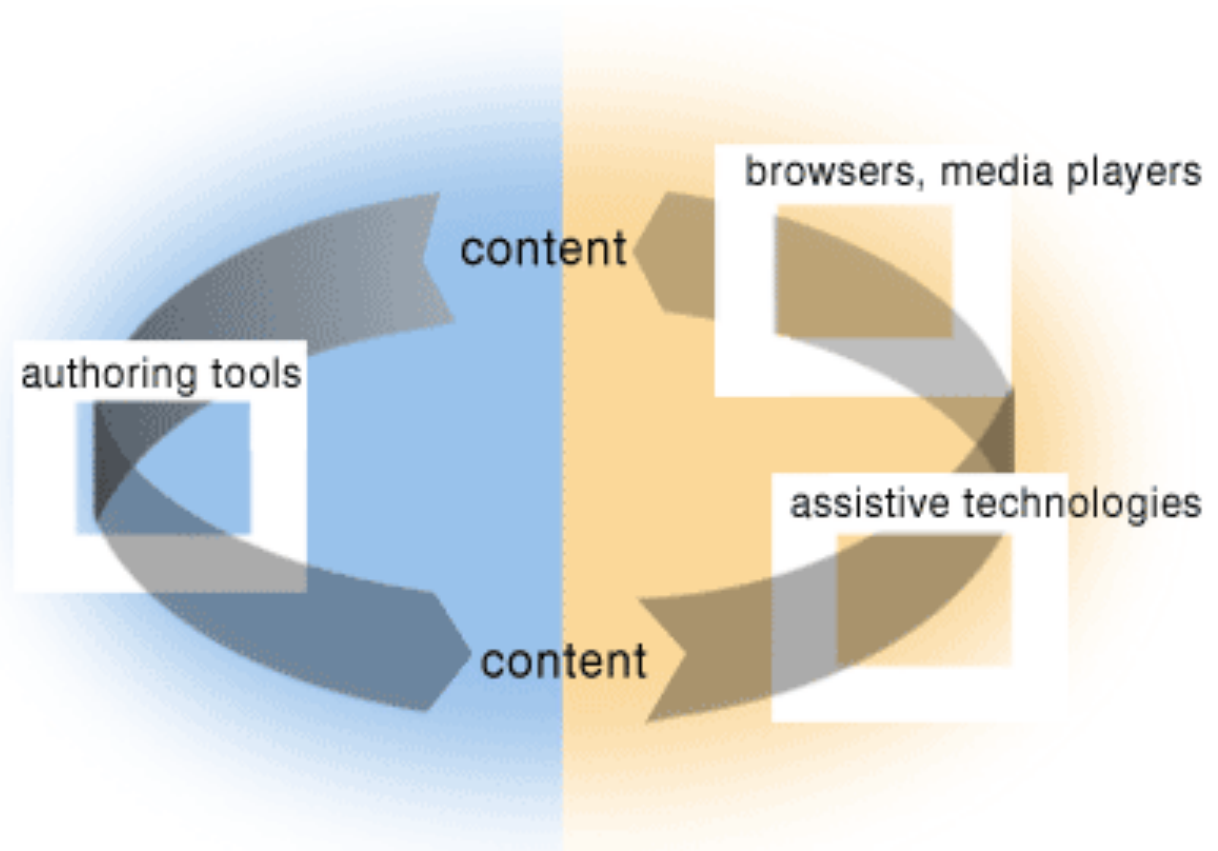


image used with permission from the W3C

Accessibility building blocks

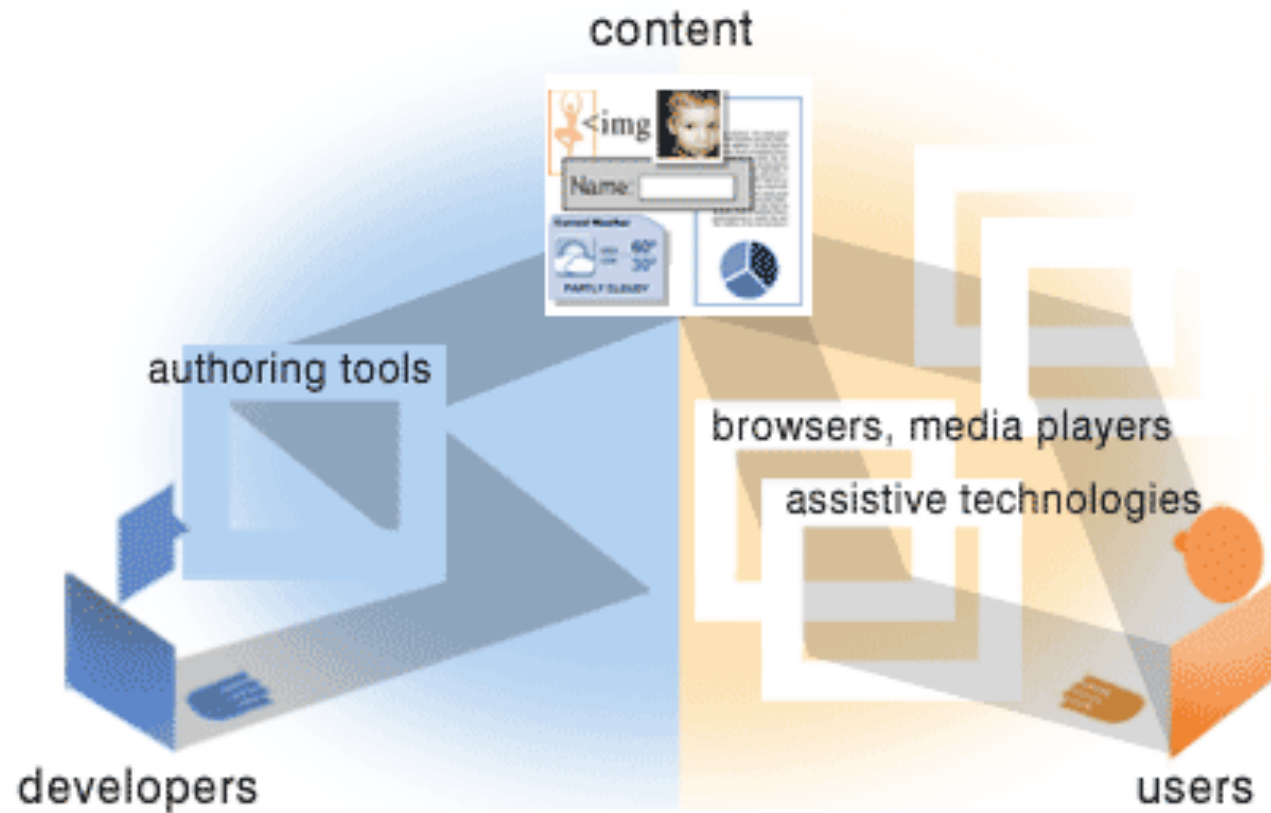


image used with permission from the W3C

Accessibility building blocks

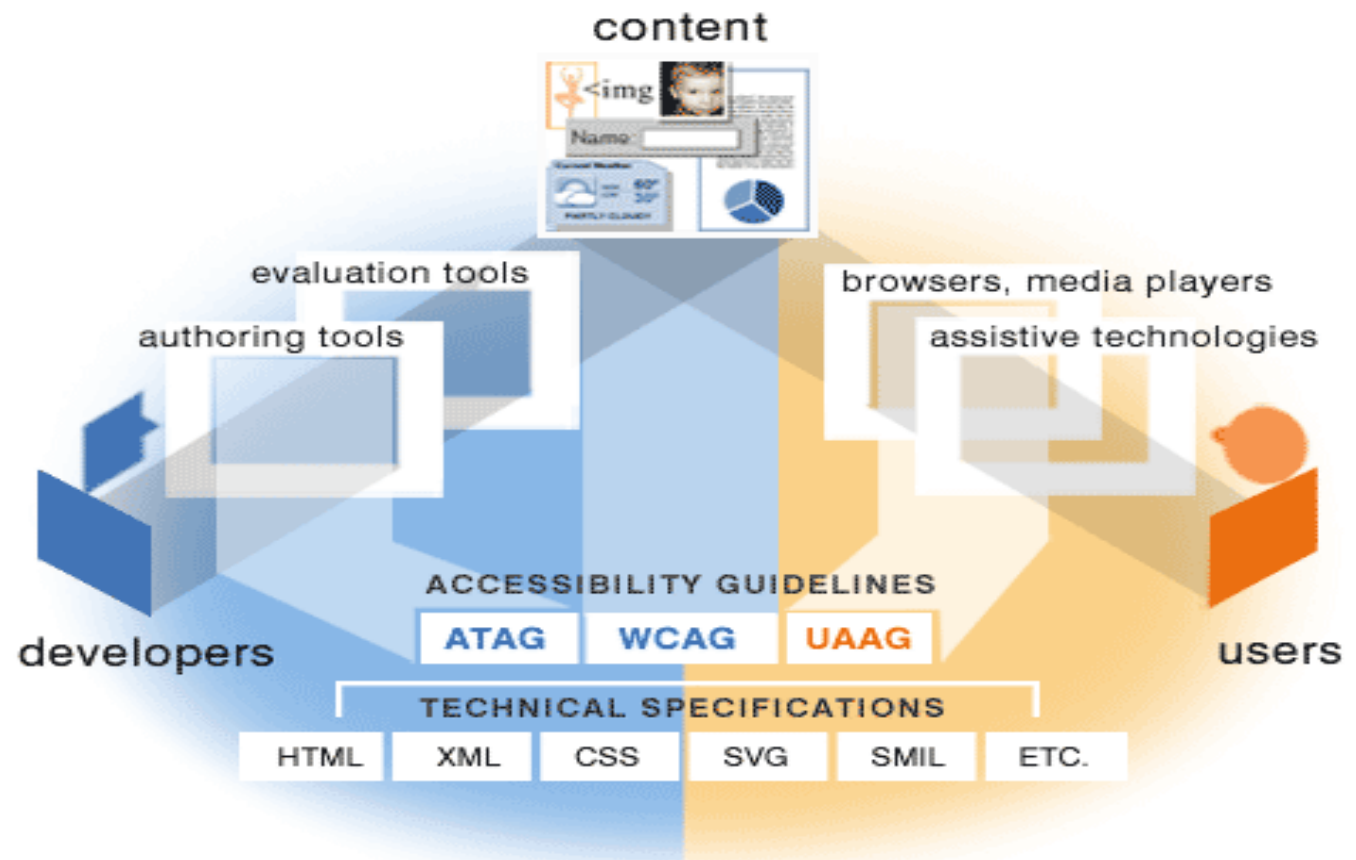


image used with permission from the W3C

Accessibility guidelines

- ATAG
- UUAG
- WCAG 1.0
- WCAG 2.0

Accessibility guidelines

- These guidelines were not created out of thin air
They were developed by consortia and committees
These standards bodies include the perspective of people with disabilities right at the beginning of the formulation of the standards
People with disabilities are increasingly taking responsibility to get involved in setting the design of standards right from the outset
This participation and collaboration helps to ensure that accessibility can be built into a technology or industrial standard at the start, rather than subsequently added on or written into later revisions, which is often less effective and more expensive
This participation and collaboration also fosters sound and valid standards

WCAG 1.0

- The first version of the Web Content Accessibility Guidelines 1.0 is now over 10 years old
Its latest version is dated May 5th, 2009
It provides
 - 14 guidelines and numerous checkpoints that could be used to determine the accessibility of a web page
 - 3 priorities or levels of conformance
 - Priority 1 or Level A conformance is a basic requirement for some groups to be able to use web documents
 - Priority 2 or Level AA conformance indicated better accessibility and removal of significant barriers to accessing the content
 - Priority 3 or Level AAA checkpoints provided improvements to web content accessibility

WCAG 1.0

- Guidelines walkthrough
<http://www.w3.org/TR/WAI-WEBCONTENT/>

WCAG 1.0

- Unfortunately, WCAG 1.0 is HTML specific and does not provide sound guidance for contemporary web development practice

It is, nevertheless, the current *de facto* standard and has definitely contributed to improve overall Web accessibility

WCAG 2.0

- The first version of the Web Accessibility Guidelines 2.0 was just published on December 11th 2008
- The new WCAG 2.0 has 12 guidelines organized under 4 principles
perceivable
operable
understandable, and
robust
- For each guideline, there are testable success criteria rates, as was the case with WCAG 1.0
A
AA
AAA

- The four principles

- perceivable

- Overview

- Sight

- Hearing

- Touch

- Transformability

- Content vs. Style and Presentation

- operable

- Input Methods

- Interaction Methods

- User Control Over Timing and Time Limits

- Error Recovery

- understandable, and

- Meaning

- Language

- Alternative or supplemental representations

- Functionality

- robust

- Functionality Across Current and Future Technologies

- Using Technologies According to Specification

WCAG 2.0

- It builds upon the foundation of WCAG 1.0 but also introduces some significant changes

On one hand, some of the changes are subtle

For example, forms still require labels, data tables still require headers, and images still require alternative text

Web developers who currently design accessible web sites will not have to change their habits much

On the other hand it represents a substantial shift in philosophy

The significant changes involve making the guidelines principle-centered rather than technique-centered

This allows the guidelines to be relevant even as technology changes

While measuring true conformance can be difficult, the guidelines are structured to allow less interpretation of what true conformance means.

WCAG 2.0

- Guidelines walkthrough
<http://www.w3.org/TR/WCAG20/>

Meeting Web 2.0

ARIA

- ARIA, W3C's Accessible Rich Internet Applications suit, defines a way to make Web 2.0 content and Web 2.0 applications more accessible to people with disabilities
It especially helps with dynamic content and advanced user interface controls developed with Ajax, HTML, JavaScript, and related technologies

ARIA

- Technically

ARIA provides a framework for adding attributes to identify features for user interaction how they relate to each other, and their current state

ARIA describes new navigation techniques to mark regions and common Web structures as

menus

primary content

secondary content

banner information, etc...

For example, with ARIA, developers can identify regions of pages and enable keyboard users to easily move among regions, rather than having to press Tab many times

ARIA

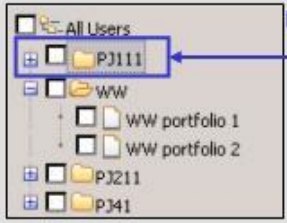
- ARIA also includes technologies to map controls
Ajax live regions, and
events to accessibility application programming interfaces
including custom controls used for rich Internet applications
- ARIA techniques apply to widgets such as
buttons
drop-down lists
calendar functions
tree controls, etc...

ARIA

- ARIA is still a W3C draft but is already supported in several browsers and assistive technologies
some JavaScript toolkits already have ARIA support built in and others are adding it
- ARIA coding methods have no effect on how Web content renders in older browsers
In browsers that do not support ARIA, Web content that adds ARIA attributes will simply continue to work as it currently does in those browsers

ARIA

WCAG 1.0 Style Accessibility

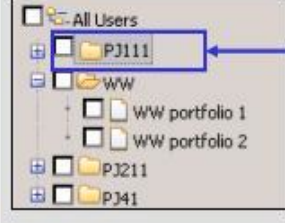


Anchor tells is a link
Name=PJ11
img alt="folder"

document
"tabbing"

“link folder PJ111”

WCAG 2.0 Style Accessibility with ARIA



role = "treeitem"
aria-expanded="false"
aria-level="2"
aria-posinset="1"
aria-setsize="4"
Name="PJ111"
img alt="folder"

Keyboard like desktop
Tree widget

“Closed Folder PJ111”
“Closed Folder one of four
Depth 2”
“unchecked”

image used with permission from the W3C

AxsJAX

- AJAX techniques have helped Web developers create live applications within Web browsers
- The AxsJAX framework helps inject accessibility features into these applications so that users of adaptive technologies such as screen readers and self-voicing browsers experience the same level of interactivity that is now taken for granted by users of Web 2.0 applications

AxsJAX

- AxsJAX implements accessibility enhancements as defined W3C's ARIA

The prerequisites for experiencing its benefits include:

A modern Web browser like Firefox 2.0 or later that supports W3C's ARIA

Adaptive technologies that respond correctly to the accessibility enhancements introduced by W3C ARIA

In particular, many of the enhancements enabled by AxsJAX depend on support for live regions a feature that enables adaptive technologies like screen readers and self-voicing browsers deal correctly with asynchronous updates to portions of a Web page.

AxsJAX

- AxsJAX adds accessibility enhancements into existing Web 2.0 applications using any of several standard Web techniques
 - As a bookmarklet
 - Using Greasemonkey
 - Using Fire Vox
 - Fire Vox, an open source talking browser extension for Firefox

All information on AxsJAX was extracted from <http://google-axsjax.googlecode.com/svn/trunk/docs/tutorial/tutorial.html>

But technical accessibility...

- ...is not real accessibility
- Complying with accessibility checklists, adopting accessibility standards and using accessibility enabled technology does not guarantee that a website will be useful to those using assistive devices

There is a great difference between technical accessibility and the ability for people with disabilities to use a website easily

Just consider the problems that users without any disabilities have using many regular websites

These sites are *accessible* for these users in the sense that they can see everything

That doesn't mean that the design makes sense or that people can find their way around

Ben Schneiderman

But technical accessibility...

- ...is not real accessibility
- Complying may even be misleading

One of the most common things I encounter is a site where the designer has included alt text for all images, but hasn't really understood the impact of what they are doing

Spacer images that have been given an alt="spacer" attribute are one example

You may find as many as 20 or 30 spacer images on a page and if each one is announced as *spacer* it quickly becomes annoying

In this particular instance, a null alt text would render the spacer images as invisible to a blind person as they are to a sighted one. Using null alt attributes steps beyond the guidelines to true user centred design

Léonie Watson

Further...

- Accessibility is frequently overstated

Website accessibility statements are mostly inaccurate and accessibility logos frequently appear on sites that don't deserve them

Helen Petrie

In 2006, out of 500 e-commerce and financial websites from English speaking countries

Although as few as 8% claimed to be accessible websites

A random sample of 20 websites revealed that only six were found to be accurately stating their accessibility

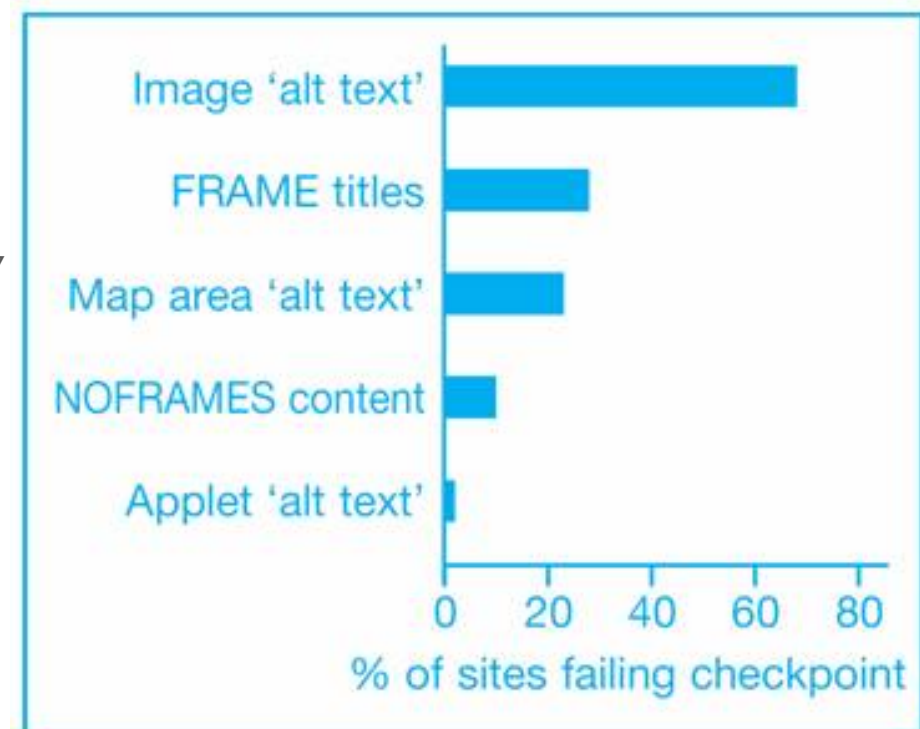
Further...

- As late as 2007

These were the main reasons not to comply with level A criteria

Data collected among European public services websites from 2005 to 2007

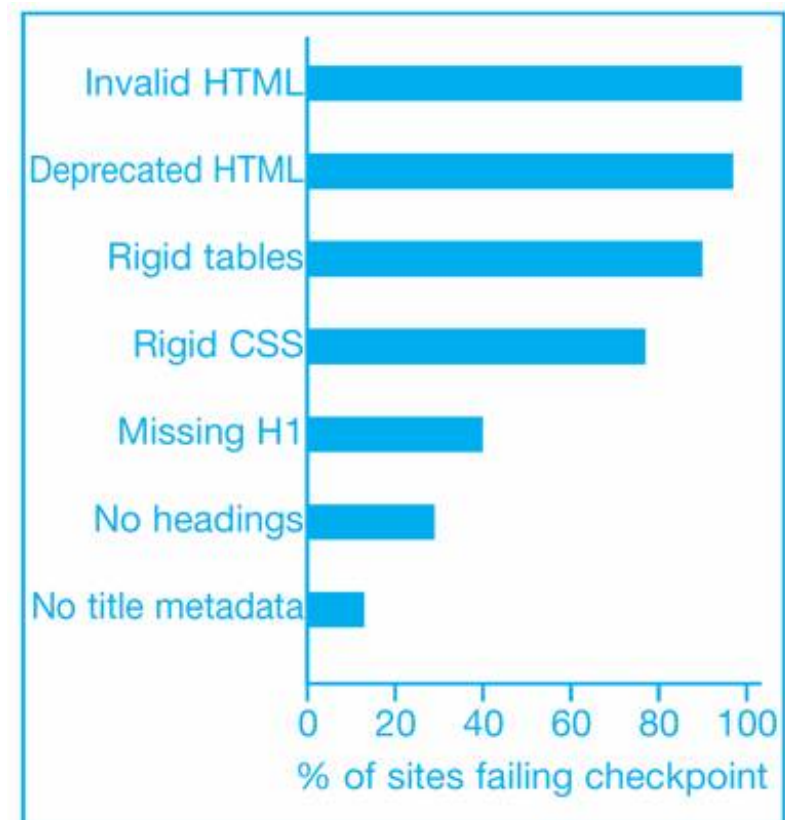
http://archive.cabinetoffice.gov.uk/e-government/resources/eaccessibility/exec_brief/index.asp



Further...

- As late as 2007
These were the main reasons
not to comply with level
AA criteria
Data collected among
European public services
websites from 2005 to 2007

http://archive.cabinetoffice.gov.uk/e-government/resources/eaccessibility/exec_brief/index.asp



Real accessibility

- To account for *real* accessibility, one should combines
Screening techniques
 - www.uiaccess.com/accessucd/screening.html
 - www.w3.org/WAI/eval/preliminaryAccessibility expert reviews
 - Evaluation with people with disabilities
 - Expert accessibility reviews tend to find more problems compared to evaluation with people with disabilities but practitioners regard it as quality over quantity
 - There is also an average 41% overlap between expert reviews' results and end user evaluation's resultsEvaluation tools
- Not just tools!
- A sample accessibility testing protocol is available at <http://www.indiana.edu/~iuadapts/services/web-accessibility/testing.html>

Accessibility excellence

- Hampshire Museums Service

<http://www.hants.gov.uk/museums>

This website does not really follow Web accessibility recommendations but aces enabling access to a wide range of users



Accessibility excellence

- Tate Modern i-Map

<http://www.tate.org.uk/imap/>

Again, this website goes beyond Web accessibility recommendations acting on accessibility



Accessibility excellence

- In the light of these two examples, it should be noted that accessibility is strongly related to *universal design* when the approach involves *direct access*

This is about making things accessible to all people

Whether they have a disability or not

The alternative is to provide *indirect access* by supporting the usage of a person's assistive technologies to achieve access

For instance, screen readers and Braille displays

Contents

- Why accessibility?
- Assistive technologies and adaptive strategies
- Designing and developing

Suggested listening and viewing

- Innovation for everyone
<http://www.ibm.com/ibm/ideasfromibm/us/accessibility/012907/>
- Enhancing Web 2.0 Accessibility Via AxsJAX
<http://www.youtube.com/watch?v=nF3yhZrtLRw>
- Clark, A. 2009, **Designing Web Accessibility for a Beautiful Web**, New Riders, DVD

Elective readings

- Shneiderman, B. 2000. **Universal usability**. Commun. ACM 43, 5 (May. 2000), 84-91.
- Loiacono, E. T., Romano, N. C., and McCoy, S. 2009. **The state of corporate website accessibility**. Commun. ACM 52, 9 (Sep. 2009), 128-132
- Hailpern, J., Guarino-Reid, L., Boardman, R., and Annam, S. 2009. **Web 2.0: blind to an accessible new world**. In Proceedings of the 18th international Conference on World Wide Web (Madrid, Spain, April 20 - 24, 2009). WWW '09. ACM, New York, NY, 821-830
- Obrenovic, Z., Abascal, J., and Starcevic, D. 2007. **Universal accessibility as a multimodal design issue**. Commun. ACM 50, 5 (May. 2007), 83-88
- Vigo, M., Kobsa, A., Arrue, M., and Abascal, J. 2007. **User-tailored web accessibility evaluations**. In Proceedings of the Eighteenth Conference on Hypertext and Hypermedia (Manchester, UK, September 10 - 12, 2007). HT '07. ACM, New York, NY, 95-104
- Freire, A. P., Goularte, R., and de Mattos Fortes, R. P. 2007. **Techniques for developing more accessible web applications: a survey towards a process classification**. In Proceedings of the 25th Annual ACM international Conference on Design of Communication (El Paso, Texas, USA, October 22 - 24, 2007). SIGDOC '07. ACM, New York, NY, 162-169
- Freire, A. P., Fortes, R. P., Turine, M. A., and Paiva, D. M. 2008. **An evaluation of web accessibility metrics based on their attributes**. In Proceedings of the 26th Annual ACM international Conference on Design of Communication (Lisbon, Portugal, September 22 - 24, 2008). SIGDOC '08. ACM, New York, NY, 73-80
- Bigham, J. P. 2007. **Accessmonkey: enabling and sharing end user accessibility improvements**. SIGACCESS Access. Comput. , 89 (Sep. 2007), 3-6.

Further readings

- Slatin, J. and Rush, S. 2003. **Maximum accessibility: making your Web site more usable for everyone**, Addison Wesley
- Thatcher et al. 2006. **Web accessibility: web standards and regulatory compliance**, friends of ED

Relevant links

- W3C Web Accessibility Initiative
<http://www.w3.org/WAI/>
- Web AIM
<http://www.webaim.org/>