



Lecture 2

ACCESSIBILITY ISSUES

Objectives

- To understand the concept of universal access
- To be aware of assistive technology and its use

Types of disabilities

1. Learning/Cognitive
2. Visual
3. Physical/Motor
4. Hearing

Accessible Technology

- Problems caused by disabilities
 - Visual: GUI, visually intensive Web page
 - Hearing: multimedia environment, sound files
 - Motor: mouse and keyboard use, physical access
 - Cognitive: understanding how the system works, learning to use
 - Communication: keyword search on the Internet

Accessible technology

- Accessibility is a set of properties that are built into the product, service or system from the outset, enabling people within the widest range of abilities and circumstances
- Doesn't require user to use 'special device/interface'
- One of the steps to get to universal usability or usability for all

- Why we must help?
 - It is the law in some countries
 - The increased of people with registered disability
 - People are not going to buy products which they cannot operate
- Ways to help?
 - Accessible Technology
 - Assistive Technology

Accessible technology

- Making is possible to find, reach, learn, use the system
- Ability to connect device to alternative external peripherals (e.g. microphone)
- Apply the principle of open systems, i.e. compliance with international and de facto standards.
- Customizable user interface(e.g. mouse operation)

Assistive technology

- Technology designed to be utilized in device or service to increase, maintain, or improve functional capabilities of individuals with disabilities
- Provide user with alternative technology to operate the system
 - Allowing them to operate the system through an alternative interface (e.g. input device)
 - Allowing them to have a way to modify some parts of the system

The differences...

Accessible technology	Assistive technology
Convenient (does not require people to own additional device)	Necessary for people with multiple disabilities
Remove the stigma of special aids	Sometimes more commercially/practically viable

Learning / Cognitive

- Learning disorders: dyslexia, dysgraphia, ADHD
- Cognitive disorders: brain injury, autism, dementia
- Most difficult to adapt for since there is so much variation

Difficulties experienced

- Attention & concentration
- Resolving written words
- Comprehension of written text
- Planning and time management
- Problem-solving

e.g. Dyslexia

One udon a tine, in teh middle of a tbick
 fcrests too a small cotte ge. I taws the home op a
 qretty littl grll kno to e verycn e a s littl e Red
 Ridug Hoog, bce a us e ol the b righly clo o red
 co at she wor e. On e bay, her n other ya ve h er a
 vovenda s ekt full oP gelious foob, aud said :

"Grndma's ill. Tak e her this bas ko t of ca kse,
 but de veyr care fu!. Don t, strag f oim teh dath
 th roug ht h e wo ools."

How to help people with Dyslexia?

- Day planners
- Calculators
- Sticky notes & highlighters
- Spelling & grammar checkers
- Screen reader reads text aloud
- Literacy software aids with pronunciation, highlights current line being read
- Predictive typing helps choose right word
- Time management software, palmtops
- Academic advice & consultation

Note: Assistive tools suitable for people with low vision

Vision

- Most profoundly affected by Web
- Web is extremely visual
- Web developers need to accommodate needs more than for any other group

How to help people with vision impairment?

- Screen reader (JAWS)
- Screen magnifier
- Braille displays

Physical / motor

- Little or no control of hands
- Injury or condition
- Adaptive keyboards & pointing devices
- Built-in accessibility features for Windows and Mac
- Additional software

How to help people with physical/motor impairments?

- Adaptive keyboards (keyguards, mini-keyboards and etc)
- Adaptive pointing devices (trackball, trackpad, graphic tablet)
- Hands-free computing (voice recognition software, on-screen keyboard, head tracking mouse, foot mouse)

Hearing

- Web most beneficial to hearing-impaired
- Obstacles include videos, mp3s, podcasts
- Often not essential to course material
- Closed-captioning, transcripts
- Hearing aids

Essential Components of Web Accessibility

- content - the information in a Web page or Web application, including:
 - natural information such as text, images, and sounds
 - code or markup that defines structure, presentation, etc.
- Web browsers, media players, and other "user agents"
- assistive technology, in some cases - screen readers, alternative keyboards, switches, scanning software, etc.

Essential Components of Web Accessibility

- **users' knowledge**, experiences, and in some cases, adaptive strategies using the Web
- **developers** - designers, coders, authors, etc., including developers with disabilities and users who contribute content
- **authoring tools** - software that creates Web sites
- **evaluation tools** - Web accessibility evaluation tools, HTML validators, CSS validators, etc.

How the components relate?

- Web developers usually use authoring tools and evaluation tools to create Web content.
- People ("users") use Web browsers, media players, assistive technologies, or other "user agents" to get and interact with the content.

Interdependencies Between Components

- There are significant interdependencies between the components; that is, the components must work together in order for the Web to be accessible.
- When accessibility features are effectively implemented in one component, the other components are more likely to implement them.

Guidelines for designers

- The World Wide Web Consortium ([W3C](#))
- Web Accessibility Initiative ([WAI](#)) develops Web accessibility guidelines for the different components.
- [Authoring Tool Accessibility Guidelines \(ATAG\)](#) addresses authoring tools
- [Web Content Accessibility Guidelines \(WCAG\)](#) addresses Web content, and is used by developers, authoring tools, and accessibility evaluation tools
- [User Agent Accessibility Guidelines \(UAAG\)](#) addresses Web browsers and media players, including some aspects of assistive technologies

Tips for Web Designers

- Images & animations: Use the alt attribute to describe the function of each visual.
- Image maps. Use the client-side map and text for hotspots.
- Multimedia. Provide captioning and transcripts of audio, and descriptions of video.
- Hypertext links. Use text that makes sense when read out of context. For example, avoid "click here."
- Page organization. Use headings, lists, and consistent structure. Use CSS for layout and style where possible.
- Graphs & charts. Summarize or use the longdesc attribute.

Tips for Web Designers

- Scripts, applets, & plug-ins. Provide alternative content in case active features are inaccessible or unsupported.
- Frames. Use the noframes element and meaningful titles.
- Tables. Make line-by-line reading sensible. Summarize.
- Check your work. Validate. Use tools, checklist, and guidelines at <http://www.w3.org/TR/WCAG>