CIS 443/543
User Interfaces

Lecture 3: Universal usability and accessibility (chapter 1.4)

How do we get usability into a system?

- Previous Lecture #2
  - 1.2 Usability Requirements
  - 1.3 Usability Measures

- 1.4 Universal Usability

Chapter 1.5 Universal Usability

- **There is no average user**
  - Each person has unique differences
    - Physical abilities and physical workplaces
    - Perceptual abilities
    - Cognitive and perceptual abilities
    - Personality differences
    - Cultural and international diversity
    - Users with disabilities
    - Age differences

DEFINITIONS

- *Universal usability* attempts to accommodate many different users
- *Accessibility* attempts to accommodate disabled users
  - Note: Accessibility is included within universal usability.

Types of Differences

- Cultural and international diversity
  - Characters, numerals, special characters, and diacriticals
  - Left-to-right versus right-to-left versus vertical input and reading
  - Date and time formats
  - Numeric and currency formats
  - Weights and measures
  - Telephone numbers and addresses
  - Names and titles (Mr., Ms., Mme.)
  - Social-security, national identification, and passport numbers
  - Capitalization and punctuation
  - Sorting sequences
  - Icons, buttons, colors
  - Pluralization, grammar, spelling
  - Etiquette, policies, tone, formality, metaphors

Types of Differences

- Users with disabilities
  - Designers must plan early to accommodate users with disabilities
  - Early planning is more cost efficient than adding on later
  - Businesses must comply with the "Americans With Disabilities" Act for some applications
- Elderly Users and Children
  - Physical and cognitive differences

Solutions

- Stereotypes
  - Compromise
  - Multiple versions of a system for different users
    - Learners (point and click menus)
    - Experienced users (command keys)
- Allow user to customize
- Follow standards (W3C, ISO) for accessibility

Accessibility

- Use of word *accessibility* means *technical availability* of Web technology to disabled users
  - Required by federal law for federal websites (Section 508 of the Rehabilitation Act)
  - Americans for Disability Act (ADA) requires accommodating all disabilities in public functions
    Lawsuit against Target's website www.target.com brought 2/6/2007
    See also jimthatcher.com/law-target.htm
    Settled 10/2/2007 for $6 million blind Californians & Target compliance
    www.dralegal.org/cases/private_business/nfb_v_target.php
- *Assistive technology* is more general term
- CAUTION: Accessibility ≠ Usability for disabled users (Reading #1)

Accessibility Tools for Vision

- Window-Eyes (Windows screen reader)
  - Uses an integrated voice synthesizer and computer's sound card to output the content of computer screen to speakers
  - Also outputs to refreshable Braille displays.
  - Reads the underlying HTML code
  - In use by more than 40,000 people worldwide
  - translated into Spanish, Danish, Dutch, German, French, Italian, Norwegian and Swedish
  - Windows9X/2000/Me/XP/2003 $825; NT/2000 Pro/XP $1025
  - www.synapseadaptive.com/gw/wineyes.htm
- JAWS
  www.freedomscientific.com/fs_products/software_jaws.asp
- Mac's "VoiceOver" in OS X 10.4
  www.apple.com/accessibility/voiceover/
- MAGic (Screen Magnification)
  www.freedomscientific.com/products/lv/magic-bl-product-page.asp

Web Accessibility Initiative (WAI)

- www.w3.org/WAI/
- "WAI, in coordination with organizations around the world, pursues accessibility of the Web through five primary areas of work: technology, guidelines, tools, education and outreach, and research and development."

10 Quick Tips for Web Accessibility (WAI)

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

10 Quick Tips for Web Accessibility (WAI) cont.

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

Tools for checking accessibility

- HiSoftware CynthiaSays (section 508 & WAI/WCAG) *Free*
  www.contentquality.com
- Usablenet Assistive end-to-end WebXACT IBM/Watchfire *Consulting Fee*
  www-03.ibm.com/able/accessibility_services/diag_assess.html
- web accessibility platform *Consulting Fee*
  www.usablenet.com/usablenet_assistive.html
- Adobe Acrobat Professional Accessibility for pdf file