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Accessible Information Technology

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SSB BART Group

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Todays session

- In today's world, electronic communication is a way of life. This session will explore ways to insure that documents, websites and other forms of electronic communication are accessible to all.

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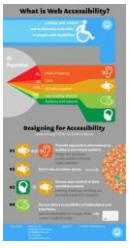
Introduction to SSB BART Group

- Founded in 1997, SSB BART Group helps companies implement accessibility throughout their Information Communication Technology (ICT) systems - including Web sites, Web applications, software, hardware, and IT services - making them accessible to everyone, including people with disabilities.
- Our team includes industry leading accessibility experts who have the experience and expertise to provide the guidance necessary to meet organizations Accessibility compliance goals.
- Our diverse team of engineers, programmers, and consultants, many of whom have disabilities themselves, provide a real edge in identifying needs and issues, and effectively testing and creating products and services with accessibility and usability in mind.



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Becoming SSB BART Group

- In 2005, SSB Technologies merged with the BART Group to form SSB BART Group combining the strengths and experience of the two organizations in both the public and private sectors. This strategic partnership secured SSB BART Group as a leader in the IT accessibility marketplace.

- Early in 2011, SSB BART Group SSB developed a strategic partnership with and acquired the right to use certain portions of TecAccess, LLC. This partnership enhances the SSB service offerings to include diversity programs to support organizations enterprise infrastructure and management services.

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Ramps to Technology

Scenarios in which people with disabilities may be unable to utilize technology if it is not accessible:

- Blindness
- Low Vision
- Deaf/Hard of Hearing
- Color Blind
- Communications Issues

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What's Around the Corner?

- People with disabilities are gaining recognition as a significant and growing market for products and services. This will only strengthen as we turn the corner.
- By using accessible technology, people with disabilities can make their needs and expectations known.
- Now that people with disabilities have emerged as an untapped force, we are directly positioned to lead the future development of accessible technology.

Pace of Innovation

Meanwhile, the overall population also continues to depend increasingly on computer technology:

- Sharing data between systems, departments & companies
- Powerful search capabilities are simplifying info retrieval
- Becoming easier to build and manage teams that span the globe
- Improved mobility allows business to happen almost anywhere

However, there is increasing difficulty for companies and workers, with and without disabilities, to keep up:

- Email, instant messaging, text messaging
- Audio/video conferencing, online virtual meeting places
- Internet vs. Intranet sites
- RSS Feeds
- Blogging
- Etc.

No Sign the Pace will Slow

There is no sign the rate of change will slow:

- Convergence of technologies enable new scenarios.
- New technologies replace existing solutions.
- Increased storage capacity & speed delivered in smaller form factors creates new possibilities.

U.S. consumers age 50+ are helping fan the flames:

- 32% of computer, and 31% of digital camera purchases in 2007 were made by consumers age 50+ (NPD Group).
- More than 77% of people age 55 to 64 have mobile phones, as compared to 86% of the entire U.S. population (M: Metrics).
- In 2007, there were more Internet users age 55+ than age 18 to 34 (Nielsen Online).

Market Drivers

- The increasing availability of accessible technology coupled with size / power of disability community.
- Accessibility aids more than those with disabilities.
- Forrester Research Inc. (2003) studied the effect of accessible technology for the general population (those with and without disabilities):
- *"In the U.S. 60% (101.4 million) of working-age adults 18 to 64 are likely or very likely to benefit from the use of accessible technology."*

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Evolution of Accessible Technology

- What was once philanthropic in nature moved to a legislative tone at the turn of the millennium.
- In the public sector, government technology regulations were adopted by state & local government agencies and education.
- Now, however, the marketplace is driving accessibility.

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Disability Types

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Disability Types

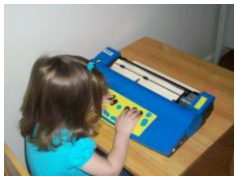
Section Goals | Knowledge Objectives

- Section Goal
  - Understand the various different types of disabilities and user impact due to accessibility issues
- Knowledge Objectives
  - General understanding of disability types
  - Understanding of challenges different disability types face with ICT systems

Disability Types

Overview

- Define: Accessibility
  - Accessibility is the degree of which information, services, or the physical environment is available to people with different types of disabilities
- Common disability types
  - Visual
    - Blindness
    - Low Vision
  - Auditory/Hearing
    - Deaf
    - Hard of hearing
  - Mobility
  - Speech
  - Cognitive

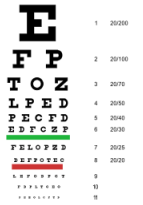


Blindness

- Example Challenges
  - Telecommunication Accessibility
    - Images, lights and text on the phone displays cannot be read
    - Solution – Provide text to speech alternative to access this information
  - Web Accessibility - Images on web pages must be described
    - Solution - Provide alternative text for images
- Assistive Technologies
  - Screen readers
    - JAWS, NVDA, VoiceOver
    - Window-Eyes, System Access
  - Refreshable Braille Displays
  - Binaural headsets

Low Vision

- Definition of legal blindness (low vision)
  - Some degree of visual perception with visual acuity less than 20/200 (20/70 acuity or less is considered visually impaired but not legally blind)
- Example Challenges
  - Hardware Accessibility - Device display text may be to small to read
    - Solution – Provide the ability to magnify touch screen content
  - Software Accessibility - Foreground and background colors may not provide sufficient contrast
    - Solution – Provide foreground and background color that provide good contrast
    - Solution – Provide users the ability to control screen contrast
- Assistive Technologies
  - Screen magnifiers, i.e. ZoomText, MAGic or iOS device



A typical Snellen Chart used to measure acuity.

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Mobility

- Example Challenges
  - Web Accessibility - Closely spaced controls may be difficult to activate
    - Solution – Provide layouts with sufficient spacing between controls
  - Software Accessibility - Requirements to press multiple keys simultaneously
    - Solution – Ensure software does not require multiple controls to be pressed at the same time
- Assistive Technologies
  - Head Pointers
    - Allow individuals without fine motor limitations to control a pointer on the screen
  - Voice Recognition Software
    - Allows individuals without fine motor control to control a computer and dictate using the voice
  - Onscreen keyboards
    - Allow for alternate methods of entering keystrokes

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Speech

- Definition
  - Individuals with speech disabilities may lack the ability or have a difficultly producing speech
- Example Challenges
  - Telecommunication Accessibility - Voice enabled IVR systems will not be accessible
  - Solution – Provide alternative navigation methods for IVR trees
- Assistive Technologies
  - Speech Completion Devices
  - Voice communications may be facilitated through a TTY or video relay device

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Auditory

- Definition
  - Individuals with hearing disabilities may lack the ability or have a difficultly hearing
- Example Challenges
  - Telecommunication Accessibility – Phone systems with prompts will not be accessible
    - Solution – Provide alternative navigation methods for prompt trees to work with TTY/TDD devices
  - Software and web – multimedia with no captions
    - Solution – provide closed captioning
- Assistive Technologies
  - Show sounds tools
  - Voice communications may be facilitated through a TTY or video device

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Cognitive

- Definition
  - Individuals with cognitive disabilities have some form of impairment of the cognitive process
  - Cognitive disabilities span a wide variety of disability types including
    - Developmental Disabilities
    - Dyslexia
- Example Challenges
  - Web Accessibility - Foreground and background color combinations can make reading controls, displays and printed instructions difficult
    - Solution – Provide users with a variety of contrast settings
  - Software Accessibility - Animation can distract users and hinder reading
    - Solution – Avoid the use of animation within applications
  - Documentation Accessibility - Prompts and instructions written with complex or unclear language can be difficult to understand
    - Solution – Utilize the simplest language possible to describe a given issue
- Assistive Technologies
  - Reading Systems
    - Combination of text to speech and visual page tracking, line spacing
    - Used by individuals with dyslexia to ease process of reading

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Age Related Disabilities

- The incidence rates for disabilities increase as people grow older
- At least *37% of people 65 and older have one disability
- Web use and computer penetration in the 65 and older population is growing
- The aging baby boomer population makes heavy use of ICT including the Web

*Information provided by *U.S. Census Bureau* - Published: 2011-07-26

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Laws and Regulations

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Standards and Guidelines

WCAG (International)

- The World Wide Web Consortium (W3C) publishes the Web Content Accessibility Guidelines (WCAG)
- The WCAG has two versions 1.0 (1999) and 2.0 (2009)
- These form the basis of most Web accessibility standards including Section 508

Section 508 (U.S.)

- The current Section 508 standards are based on the WCAG 1.0 standards but are structured around technical, functional and support requirements
- The Section 508 refresh standards, projected to be out in 2014, will update that relationship to WCAG 2.0

Application

- US public sector organizations generally require Section 508 compliance
- US private sector organizations generally require ADA compliance – likely standards are WCAG 2.0 Level A and AA conformance

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Auditing Requirements

Requirements for Compliance Auditing

Technical Requirements (§ 1194.21 | § 1194.22)

- Requires a system to have a conformant technical implementation
- Testing requirements are split between those that can be tested Automatically (24.8%), Manually (48.3%) and Globally (26.9%)
- Automatic testing is the cheapest and most common testing but covers only a small fraction of legal requirements

Functional Requirements (§ 1194.31)

- Requires a system to be usable to people with disabilities using current assistive technologies
- Functional testing coverage for sensory and mobility impairments is generally required

Support Requirements (§ 1194.41)

- Requires a system to be accessible in deployment

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Auditing Myths

Automatic Testing Coverage is Enough

The largest issue we encounter at SSB is the sole reliance on automatic testing tools to determine compliance. There are a variety of reasons for this:

- **It is cheap** – buy a license and you are done
- **It is easy** – put in a URL and your are done
- **It is fast** – five minutes after putting in the URL you get a pretty report
- **It is understandable** – I buy this tool my problem is solved

….but it doesn't work. Automatic testing validates a sub-set of accessible requirements and **can not provide a validation of accessibility**.

A thought exercise…

- Assuming you can buy a tool to test code for accessibility is the same as assuming you can buy a tool to bug check systems. So…
- …if we could buy a tool to test accessibility we could buy a tool to test code automatically
- …and we could get rid of our QA team entirely
- …and we could automatically validate we produced bug free code

Which is, of course, absurd but may help illustrate why accessibility testing requires more than buying a tool.

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Auditing Myths (cont.)

This will be cheap

There has been little enforcement to date of Section 508 outside of a few key agencies

- Since the adoption of the Section 508 standards in 2001 there has been limited enforcement across the Federal government
- Section 508 standards had an effective date of February 21, 2001
- In early 2001 we saw strong interest in implementing the standards
- After September 11, 2001, however, virtually all Federal government attention turn to security
- Accessibility was largely left by the wayside outside of a few key agencies

- A low level of enforcement implies a low price point for a solution and little budget for testing conformance
- Many testing budgets do not include Section 508 compliance because many organizations don't enforce the Section 508 requirements
- The current administration and private parties under ADA and 508 are actively working to change this
- So, thankfully, this is changing

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Auditing Myths (cont.)

No Complaints = Compliance

Current logic among Federal agencies:

We have had this site up for a few years and received no complaints. It must be compliant.

Current logic among vendors:

We sold this to Agency X and they bought it. It must be compliant.

- A lack of complaints doesn't demonstrate compliance. It demonstrates a lack of complaints.
- Successful sales don't demonstrate compliance. It demonstrates you haven't had the legal requirements enforced.

Only testing can show conformance to the law.

Section 508 doesn't apply since blind people don't use our site.

- You don't know that
- Having a non-compliant site will ensure this remains the case
- Section 508 has to do with more than people that are blind
- You should be very careful about choosing for people that are blind – or any person for that matter – what they can and can't do
- User access is not the sole focus of Section 508

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Auditing Constraints (cont.)

Functional Testing

Different versions of assistive technologies, drastically different results

- Assistive technology support for web technologies changes drastically from version to version
- Determining if the issue is an issue in JAWS or the AT or an issue of operator error is significant
- Signal to noise for false positive and negatives is significant – often exceeding the actual count of valid bugs
- Accurate testing results requires intimate knowledge of AT support and control

Accurate functional testing requires a user with disabilities

- To execute functional tests a user must have a high degree of familiarity with assistive technology
- Testing accurately with screen readers requires that the user
  - Never see the page
  - Never use the mouse
  - Only control page elements through the screen reader and relevant reading modes
- In practice SSB has never seen users without disabilities effectively test in a fashion that provides a meaningful simulation of the experience of a user with a disability

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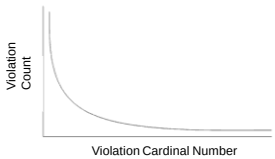
Rollout Requirements

Violation Distribution

- The set of all best practices that apply to an organization based on relevant standards, technology and assistive technology requirements is huge
- In practice, accessibility issues present in systems tend to conform to a power law distribution
- A small set of the potential violations account for the vast majority of issues
- The same issues tend to recur across (a) development teams and (b) industries
  - Development team commonality is driven by style guide conformance and widget reuse
  - Industry commonality generally driven by design and UI interaction paradigms

Power Law Distribution



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Tiered Testing Model (cont.)

Responsibility Division

General Approach

- General teams are responsible for small, targeted sub-set of requirements
- Internal expert teams are responsible for the full set of requirements
- SSB supports the internal experts who support the rest of the organization
- SSB provides AMP, formal testing, training course development and help desk support as needed
- Over time organization learns more about accessibility organically versus in one disruptive and expensive push

Approach Considerations

- General approach requires specific internal resources to be earmarked for accessibility
- For internal experts to be active they need to only be doing accessibility
- Approach requires a large amount of education and knowledge transfer for internal experts which takes a large amount of time
- Organizations may find it more effective to outsource some or all of the internal expert work
- The amount of work done internally by an organization versus externally varies widely and has cost, time and budget impacts

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Tiered Testing Model (cont.)

QA Approach

Internal Accessibility Testing

- Define test set based on accessibility policy
- Develop short list for testing set at 90% coverage point
  - ~15-20 items
- Quick list is validated every sprint or development cycle on limited set of pages
  - Page test set is traffic ordered pages and high risk transaction paths
  - Test most common pages first
  - Basic smoke test
- Shared client and external team would test full list every three sprints or major release per product
- Full testing by internal expert team between projects

Automatic Testing

- Early and often
- Automatic tests integrated into functional testing system and build environment
- Addresses many of the low hanging fruit
- Gold standard of accessibility validation every check-in
- Good enough standard is validation of accessibility as part of regression functional test script execution
- As manual testing identifies automatically testable cases add to test definition for future automatic regression

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Tiered Testing Model (cont.)

QA Approach

Functional Testing

- Limit functional testing to end cycle acceptance testing
- Link limited functional testing to full review of products
- Provide functional testing via users with disabilities on-demand

External Accessibility Testing Team

- Develop accessibility testing team for in-depth accessibility testing
- Tests every three to four sprints or major release per project
- Accessibility testing team would rotate coverage per sprint across projects
- Perform ad-hoc testing on new templates, wireframes and widgets being developed
- Consult with development team on questions

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Roles and Responsibilities

Designer

- Access to design specification for accessibility
- Creation of accessible wireframes, palettes and templates

Developer

- Access to implementation specification and sample source
- Ability to be trained and certified on accessibility requirements
- Ability to review reports created by Quality Assurance or accessibility consultant and take action to fix open issues
- Ability to perform regression and unit testing on systems

Quality Assurance

- Perform in process testing for compliance of systems
- Report compliance results in a standard, cost effective fashion across teams, time zones and countries

Internal Experts

- Specify standards relevant to an organization
- Modify and update accessibility best practices as requirements and technology changes
- Track compliance across multiple systems and releases
- Define and deploy organization policies for accessibility

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QUESTIONS ???

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Next Steps

- Schedule some time to speak with an SSB expert in your industry
- Sign-up for an online AMP training session
- Sign-up for a webinar covering further topics on Web Accessibility
- Take one of our online courses covering core Web Accessibility knowledge

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