Section 508 Compliance and the World Wide Web

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Michelle S. Berryman and Jeff Gillingham originally wrote this paper in 2001 while they were graduate students at the Georgia Institute of Technology. Since the original publication date, Michelle Berryman has continued to follow developments with accessibility law, technology, economic impact and compliance. This version of the document was updated by Michelle in June 2005 and reflects current thinking on the subject of Section 508 compliance and the World Wide Web.

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Introduction

According to the Bureau of Census statistics for 1994, 54 million Americans have some level of disability or functional limitation. This is a staggering number. While disability is found throughout all demographic groups, it is perhaps more prevalent among the aging population. Currently, there are 34 million Americans over the age of 65. By 2030, this number will grow to over 69 million and to almost 80 million by 2050. In fact, the Bureau of Census statistics predicts that by 2050, adults over age 55 will account for just over 31% of the U.S. population and the Bureau of Labor Statistics estimates that by 2010, more than 50% of the U.S. workforce will be over age 40.

Section 508 of the Rehabilitation Act of 1973 does not address aging directly or indirectly as an issue, but since aging is often linked with disability, the two issues must be considered in tandem. By age 65, most people will have some type of functional limitation or disability. In fact, aging is a major cause of sensory modality changes resulting in disability and functional limitation. These modality changes often include loss of vision and visual acuity, hearing loss and mobility loss due to muscle and bone degeneration. Injury and illness also contribute to the growing number of people with disabilities in this country. Often, people with disabilities will have multiple disabilities as well.

Statistically, adults 55 and over represent the fastest growing group of Internet users in the United States. In 2004 there were an estimated 34 million older Americans online. As the population continues to age and to live independently for longer periods of their lives, older Americans will continue to embrace new technologies and to adapt them to their lifestyles and needs. This population will seek out assistive technologies that will empower them to continue living independently. Older Americans will be using online resources to manage their Social Security, Medicare, veteran's benefits and other Federal accounts.

Commissioned by Microsoft in 2003, a nationwide Forrester Data study, "The Wide Range of Abilities and its Impact on Computer Technology," found that as many as 57% of working age adult computer users may benefit from accessible technology due to functional limitations. As a result of this research, in early 2004, Microsoft kicked off an Aging Workforce campaign to educate individuals and companies about how assistive technologies can help them remain competitive in the workplace. Compliance with Section 508 of the Rehabilitation Act of 1973 for electronic and information technology aligns perfectly with the findings of Forrester Data and the education campaign pursued by Microsoft.

The Rehabilitation Act of 1973

In 1973, Congress passed major civil rights legislation that addressed the needs of disabled persons. The Rehabilitation Act of 1973 prohibits discrimination against disabled people in Federal employment and federally funded programs and services, by Federal contractors and in the availability and use of Federal agencies' electronic and information technology. This was codified in the U.S. Code under Title 29 (Labor) Chapter 16 (Vocational Rehabilitation and Other Rehabilitation). This landmark legislation has provided the framework for more recent legislation such as the Americans with Disabilities Act (Public Law 336 of the 101st Congress, enacted July 26, 1990) and the Rehabilitation Act Amendments.

Sections 501 and 504 of the Rehabilitation Act of 1973 provide for a reasonable accommodation and provision of assistive technologies to persons with disabilities. 'Assistive' technologies are those that do as the name suggests: aid in the access and management of daily living tasks. Within the context of electronic and information technology, some examples would include the following items:

- Refreshable electronic Braille display
- Screen reader software
- Software that magnifies text and imagery on the screen
- Mouth sticks
- Alternative input devices (joysticks, chord keypads, etc.)
- Telephones with hands-free dialing features

These devices all aid in the access, manipulation, display and management of information technology. The primary goal of this legislation is to encourage disabled people to enter or remain in the workforce as productive members of society.

Section 508

On August 7, 1998 President Clinton signed the Workforce Investment Act, also known as the Rehabilitation Act Amendments, which revised and strengthened Section 508 of the Rehabilitation Act of 1973. Section 508 provides for access to and usability of "electronic and information technology" by Federal employees as well as access to services and information about Federal programs by disabled people. Section 508 does not require that assistive technologies be provided universally or be purchased, but it does require that covered technology be compatible with assistive technologies as necessary. The definition of "electronic and information technology" as applied to Section 508 comes directly from the Information Technology Management Reform Act of 1996, also known as the Clinger-Cohen Act (Section 5002 (3) of 40 U.S.C. 1401(3)):

> "(A) The term 'information technology', with respect to an executive agency means any equipment or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the executive agency. For purposes of the preceding sentence, equipment is used by the executive agency if the equipment is used by the executive agency directly or is used by a contractor under a contract with the executive agency which -
>
> (i) requires the use of such equipment, or
>
> (ii) requires the use, to a significant extent, of such equipment in the performance of a service or the furnishing of a product.
>
> (B) The term 'information technology' includes computers, ancillary equipment, software, firmware and similar procedures, services (including support services), and related sources.
>
> (C) Notwithstanding subparagraphs (A) and (B), the term 'information technology' does not include any equipment that is acquired by a Federal contractor incidental to a Federal contract."

Notable exceptions to the electronic and information technology covered by Section 508 include national security systems as outlined in the Information Technology Management Reform Act of 1996 (Section 5142 of 40 U.S.C. 1452):

> "(a) DEFINITION – In this subtitle, the term 'national security system' means any telecommunications or information system operated by the United States Government, the function, operation, or use of which –
>
> (1) involves intelligence activities;
>
> (2) involves cryptologic activities related to national security;
>
> (3) involves command and control of military forces;
>
> (4) involves equipment that is an integral part of a weapon or weapons system; or
>
> (5) subject to subsection (b), is critical to the direct fulfillment of military or intelligence missions.
>
> (b) LIMITATION – Subsection (a) (5) does not include a system that is to be used for routine administrative and business applications (including payroll, finance, logistics, and personal management applications)."

For example, the Department of Defense is exempt from Section 508 compliance for the systems that would engage missiles but not exempt from compliance for the equipment and material dealing with payroll, inventory, and general office procedures.

Undue Burden

The actual wording of Section 508(a)(1)(A) states that "each Federal department or agency, including the United States Postal Service, shall ensure, unless an *undue burden* would be imposed on the department or agency, that the electronic and information technology . . ." The key terminology in

this passage is “undue burden.” The Americans with Disabilities Act and other civil rights legislation have incorporated similar language. In fact, the Americans with Disabilities Act, defines “undue hardship” as follows:

(10)Undue hardship -

(A) In general - The term "undue hardship" means an action requiring significant difficulty or expense, when considered in light of the factors set forth in subparagraph (B).

(B) Factors to be considered - In determining whether an accommodation would impose an undue hardship on a covered entity, factors to be considered include -

i. the nature and cost of the accommodation needed under this chapter;

ii. the overall financial resources of the facility or facilities involved in the provision of the reasonable accommodation; the number of persons employed at such facility; the effect on expenses and resources, or the impact otherwise of such accommodation upon the operation of the facility;

iii. the overall financial resources of the covered entity; the overall size of the business of a covered entity with respect to the number of its employees; the number, type, and location of its facilities; and

iv. the type of operation or operations of the covered entity, including the composition, structure, and functions of the workforce of such entity; the geographic separateness, administrative, or fiscal relationship of the facility or facilities in question to the covered entity.

The term "undue burden" is based on case law surrounding Section 504 of the Rehabilitation Act (Southeastern Community College v. Davis). Undue burden or hardship as defined and applied to Section 508, the ADA and other legislation, is not intended to be used as a loophole for noncompliance. Rather, it provides the agencies with a reasonable way to meet the technology accessibility standards by providing an alternate access to the data and information that is affected. If an agency determines that meeting the standards would pose an undue burden, it must be stringently documented prior to settling on an alternate access system.

The Access Board

The Access Board is an independent Federal agency established by Section 502 of the Rehabilitation Act of 1973. It is comprised of twenty-five members appointed by the President. Thirteen of these individuals are from the public sector, the majority of whom are required to have a disability. The remaining twelve members are the heads (or their designees) of the following Federal agencies:

- The Department of Health and Human Services,
- The Department of Education,
- The Department of Transportation,
- The Department of Housing and Urban Development,
- The Department of Labor,
- The Department of the Interior,
- The Department of Defense,
- The Department of Justice,
- The Department of Veterans Affairs,
- The Department of Commerce;
- The General Services Administration and
- The United States Postal Service.

The primary responsibilities of the Access Board include the following items:

- Developing and maintaining accessibility requirements for the built environment, transit vehicles, telecommunications equipment, and for electronic and information technology
- Providing technical assistance and training on these guidelines and standards
- Enforcing accessibility standards for federally-funded facilities

After President Clinton signed the Rehabilitation Act Amendments (Section 508) into law in 1998, the Access Board established an advisory committee, the Electronic and Information Technology Access

Advisory Committee (EITAAC), to develop the Rules and Regulations for the law. The EITAAC completed this task in May of 1999. In March of 2000, the Access Board published their proposed Electronic and Information Technology Standards in the *Federal Register* where the public was invited to review them for sixty days and provide feedback and commentary to the Access Board. Over 100 individuals and organizations offered feedback and the Access Board used this to develop the final Rules and Regulations.

On December 21, 2000 the Access Board issued 36 CFR Part 1194 [Docket No. 2000-01] RIN 3014-AA25, Electronic and Information Technology Accessibility Standards. These guidelines, considered the final Rules and Regulations for Section 508, outline issues required for compliance and became effective for enforcement on June 21, 2001.

Compliance and Enforcement

All Federal agencies, programs and contractors that aren't exempt or overly burdened to do so must purchase and utilize compliant products (which can include software and websites created under contract). This means that private companies that are unwilling to meet Section 508 compliance with their products are removing themselves from the $40 billion annual market generated by the government in electronic and information technology.

Section 508 provides for an agency evaluation and reporting procedure that identifies the extent to which all electronic and information technology within each of the departments is accessible to and usable by individuals with disabilities. The initial report on compliance was prepared and submitted to the Attorney General prior to December 21st, 2001 (six months after the effective date of enactment of the legislation). The Attorney General synthesized a report for the President containing information and recommendations regarding the compliance of all Federal agencies at the conclusion of 2001. Inherent in the dynamic nature of electronic and information technology is the risk that a Website could be compliant today, but content changes could render it non-compliant in the future if care is not taken to maintain accessibility. This is the rationale behind the agency evaluation and reporting procedures. Every two years, it is incumbent upon the Attorney General to prepare an updated report advising the President of the current status of compliance for all Federal agencies. This report must include any outstanding issues and recommendations regarding compliance. Although the delivery date has not been set at this time (as of 6/6/2005), the third report will be completed later this year. The General Services Administration will administer the survey to the affected government agencies, but the Justice Department's Civil Rights Division will be in charge of insuring delivery of a completed report.

Additionally, Federal agencies that are not compliant open themselves to legal issues; there is an administrative process under which disabled individuals can file a complaint regarding a non-compliant agency, in the same procedure established under Section 504 of the Rehabilitation Act of 1973. However, this only provides injunctive relief and attorney's fees to the victor of the complaint. Compensatory and punitive damages are not provided. Nevertheless, individuals can bring civil action against agencies if they wish to pursue compensatory damages.

Interestingly, due to the separation of powers provided by the U.S. Constitution, the Legislative Branch of our government is not subject to many of the laws administered by the Executive Branch including the Americans with Disabilities Act. Currently, Section 508 compliance is voluntary for Congress just as it is for the private sector, although the Congressional Accountability Office of Compliance strongly recommends that all Legislative entities voluntarily comply – especially with their Websites.

Economic Impact

The final Rules and Regulations for Section 508 compliance as set forth by the Access Board make it a significant regulatory action under Executive Order 12866: Regulatory Planning and Review, as well as a major rule under the Congressional Review Act. The Office of Management and Budget (OMB) has reviewed the rules and has issued a regulatory assessment of Section 508 compliance issues. OMB figures indicate that the Federal government expenditures for information technology products during fiscal 1999 were $37.6 billion. As might be expected, the Department of Defense agencies accounted for the largest percentage of this spending. Using figures supplied by the General Services Administration (GSA), OMB estimates that the Federal government spends nearly $12.4 billion annually on products and services covered by the final Rules and Regulations for Section 508. It is statistically

significant to note that GSA figures are projections only. Federal agencies are not required to make purchases through the GSA supply service.

The Office of Management and Budget has identified three major cost centers surrounding Section 508:

- The costs of modifying electronic and information technology to meet the requirements of the final rule.
- Education and training for Federal government employees and manufacturers to market, support and utilize the compliant technology.
- The cost of translating existing documentation and instructions into an alternate format.

Further, OMB projects that the annual cost of compliance to society will be between $177 million and $1.07 billion with the Federal government paying from $85 million to $691 million. It is expected that manufacturers will pass the additional costs along to consumers who will, in turn, benefit from the added accessibility features of the products they are purchasing. The cost of compliance can be further broken down in terms of software expenditures. Roughly 80% of the Federal government's software expenditures are for general office applications with the remaining 20% dedicated to mission-specific applications. OMB estimates that it will be quite expensive to bring the mission-specific software into compliance because of its limited distribution outside the government and the lack of a consumer base. Fortunately, 56% (or 70% of the 80%) of the general office application software is predicted to require only minor enhancements and minimal costs to become Section 508 compliant.

Website Compliance Guidelines & Tools

The final Rules and Regulations for Section 508 compliance provide extensive details for bringing a website into compliance. These guidelines were developed in conjunction with the Center for Applied Special Technology (CAST) and the World Wide Web Consortium (W3C).

CAST's mission is "To expand learning opportunities for all individuals, especially those with disabilities, through the research and development of innovative, technology-based educational resources and strategies". CAST has developed a desktop tool called Bobby™ that will perform a diagnostic check for the accessibility of a website and will guide designers to make accessible improvements. Bobby™ is currently produced and distributed by Watchfire.

W3C "develops interoperable technologies (specifications, guidelines, software, and tools) to lead the Web to its full potential as a forum for information, commerce, communication, and collective understanding." W3C sponsors the Web Accessibility Initiative (WAI) that in turn publishes the User Agent Accessibility Guidelines (UAAG) that were instrumental in framing the final Rules and Regulations for Section 508. W3C will certify a website as "accessible." This does not necessarily mean that the site is fully compliant with Section 508, however. W3C maintains logos that can be applied to sites that meet their accessibility standards.

Appendix I contains a checklist of the requirements for Section 508 compliance. It also contains a list of additional accessibility features required for W3C certification.

Conclusions

There are expected to be many ongoing benefits from Section 508 within the Federal government and throughout society. The improved access to electronic and information technology should increase the number of employable persons with disabilities and should allow those individuals to be more productive throughout their lifetimes. Section 508 should also prevent disabled persons within the Federal government from 'underemployment'. According to Beth B. Buehlmann, executive director of the Center for Workforce Preparation, U.S. Chamber of Commerce, the most successful 21st century companies will be those that employ and develop assistive technologies in order to retain older workers and assist older consumers.

Although it's been nearly seven years since the Workforce Investment Act updated Section 508, the economic impact of this legislation remains largely unreported. The federal government continues to

support accessibility work with large grants and many companies are aggressively working to bring their product offerings into compliance, although there is little publicity about this work. Research into accessibility issues remains a hot topic at leading universities across the country as well, and much of this work is only just beginning to filter into mainstream America. As this trend continues, more and more companies will embrace assistive and accessible technologies and solutions.

While the World Wide Web seems to have only become richer in media content over the last four years, great strides have been made in accessibility. Companies like Macromedia (creators of Web development tools such as Flash and Dreamweaver) have embraced the challenge of increasing usability by incorporating easy-to-deploy accessibility tool kits within their applications. This has enabled even very unskilled Web developers to achieve accessible solutions with their rich media content with little extra effort or knowledge. Browser technologies and options have also improved for users over the last few years.

Slowly but surely, changes are occurring and the benefits of Section 508 compliance extend far beyond the population of disabled people the legislation was intended to support. Time will tell the full extent of this legislation and its impact on employment, technology, innovation and the American economy.

Conclusions

A very significant portion of the research for this paper was conducted online without the use of assistive technology or compliant websites.

http://www.usdoj.gov/crt/508/web.htm

http://www.section508.gov/

http://www.access-board.gov/about/Rehab%20Act%20Amend-508.htm

http://www.access-board.gov/links/communication.htm

http://www.access-board.gov/sec508/commrept/eitaacrpt.htm

http://www.access-board.gov/enforcement/Rehab%20Act%20-%20508.htm

http://www.access-board.gov/sec508/summary.htm

http://trace.wisc.edu/world/web/

http://www.cast.org/bobby/

http://www.w3.org/

http://www.w3.org/TR/WAI-WEBCONTENT/full-checklist

http://www.digitalgrit.com/

http://www.businessweek.com/bwdaily/dnflash/jun2000/nf00607a.htm

http://trace.wisc.edu/

http://www.cmpinc.net/section508/

http://www.accessiblesociety.org/topics/webaccess/sect508.htm

http://www.usablenet.com/accessibility_usability/what_is_accessi.htm

http://www.loislaw.com

http://todaysseniorsnetwork.com/microsoft_campaign.htm

http://www.microsoft.com/enable/aging/

http://www.microsoft.com/enable/research/

http://www.aapd-dc.org/News/reports/ncdtechnology.html

http://appserv.gcn.com/22_24/accessibility/23226-1.html

http://www.compliance.gov/specialfeature/feature_sec508.html

Appendix I

Website Compliance Guidelines

Website compliance checkpoints as REQUIRED by Section 508

In General	Yes	No	N/A
Provide a text equivalent for every non-text element (e.g., via "alt", "longdesc", or in element content). *This includes*: images, graphical representations of text (including symbols), image map regions, animations (e.g., animated GIFs), applets and programmatic objects, ASCII art, frames, scripts, images used as list bullets, spacers, graphical buttons, sounds (played with or without user interaction), stand-alone audio files, audio tracks of video, and video.			
Ensure that all information conveyed with color is also available without color, for example from context or markup.			
Organize documents so they may be read without style sheets. For example, when an HTML document is rendered without associated style sheets, it must still be possible to read the document.			
Ensure that equivalents for dynamic content are updated when the dynamic content changes.			
Until user agents allow users to control flickering, avoid causing the screen to flicker.			
Have a text-only page, with equivalent information and/or functionality as the main page that is updated when the main page is updated.			
Provide a method that permits users to skip repetitive navigation links			
If you use images and image maps	**Yes**	**No**	**N/A**
Provide redundant text links for each active region of a server-side image map.			
Provide client-side image maps instead of server-side image maps except where the regions cannot be defined with an available geometric shape.			
If you use tables	**Yes**	**No**	**N/A**
For data tables, identify row and column headers.			
For data tables that have two or more logical levels of row or column headers, use markup to associate data cells and header cells.			
If you use electronic forms (designed to be completed on-line)	**Yes**	**No**	**N/A**
Assure that the form allows people using assistive technology to access the information, field elements and functionality required for completion and submission of the form.			
If you use frames	**Yes**	**No**	**N/A**
Title each frame to facilitate frame identification and navigation.			

If you use scripts	Yes	No	N/A
Assure that the information provided by the script is identified with functional text that can be read by assistive technology.			
If you use applets, plug-ins or other applications	**Yes**	**No**	**N/A**
Provides links to where the applet or plug-in may be accessed			
If you use timed responses	**Yes**	**No**	**N/A**
Offer user alerts and give sufficient time to indicate if more time is needed.			

Additional Checkpoints Suggested by W3C

In General	Yes	No	N/A
Ensure that foreground and background color combinations provide sufficient contrast when viewed by someone having color deficits or when viewed on a black and white screen.			
When an appropriate markup language exists, use markup rather than images to convey information.			
Create documents that validate to published formal grammars.			
Use style sheets to control layout and presentation.			
Use relative rather than absolute units in markup language attribute values and style sheet property values.			
Use header elements to convey document structure and use them according to specification.			
Mark up lists and list items properly.			
Mark up quotations. Do not use quotation markup for formatting effects such as indentation.			
Ensure that dynamic content is accessible or provide an alternative presentation or page.			
Until user agents allow users to control blinking, avoid causing content to blink (i.e., change presentation at a regular rate, such as turning on and off).			
Until user agents provide the ability to stop the refresh, do not create periodically auto-refreshing pages.			
Until user agents provide the ability to stop auto-redirect, do not use markup to redirect pages automatically. Instead, configure the server to perform redirects.			
Until user agents allow users to turn off spawned windows, do not cause pop-ups or other windows to appear and do not change the current window without informing the user.			
Use W3C technologies when they are available and appropriate for a task and use the latest versions when supported.			
Avoid deprecated features of W3C technologies.			
Divide large blocks of information into more manageable groups where natural and appropriate.			
Clearly identify the target of each link.			
Provide metadata to add semantic information to pages and sites.			
Provide information about the general layout of a site (e.g., a site map or table of contents).			
Use navigation mechanisms in a consistent manner.			
If you use tables	**Yes**	**No**	**N/A**
Do not use tables for layout unless the table makes sense when linearized. Otherwise, if the table does not make			

sense, provide an alternative equivalent (which may be a linearized version).			
If a table is used for layout, do not use any structural markup for the purpose of visual formatting.			
If you use frames	**Yes**	**No**	**N/A**
Describe the purpose of frames and how the frames relate to each other if it is not obvious by frame titles alone.			
If you use forms	**Yes**	**No**	**N/A**
Until user agents support explicit associations between labels and form controls, for all form controls with implicitly associated labels, ensure that the label is properly positioned.			
Associate labels explicitly with their controls.			
If you use applets and scripts	**Yes**	**No**	**N/A**
Ensure that event handlers are input device-independent.			
Until user agents allow users to freeze moving content, avoid movement in pages.			
Make programmatic elements such as scripts and applets directly accessible or compatible with assistive technologies.			
Ensure that pages are usable when scripts, applets or other programmatic objects are turned off or not supported. If this is not possible, provide equivalent information on an alternative accessible page.			
Ensure that any element that has its own interface can be operated in a device-independent manner.			
For scripts, specify logical event handlers rather than device-dependent event handlers.			
If you use multimedia	**Yes**	**No**	**N/A**
Until user agents can automatically read aloud the text equivalent of a visual track, provide an auditory description of the important information of the visual track of a multimedia presentation.			
For any time-based multimedia presentation (e.g., a movie or animation), synchronize equivalent alternatives (e.g., captions or auditory descriptions of the visual track) with the presentation.			
If all else fails	**Yes**	**No**	**N/A**
If, after best efforts, you cannot create an accessible page, provide a link to an alternative page that uses W3C technologies, is accessible, has equivalent information (or functionality), and is updated as often as the inaccessible (original) page.			

Less important checkpoints (suggested by W3C)

In General	Yes	No	N/A
Specify the expansion of each abbreviation or acronym in a document where it first occurs.			
Identify the primary natural language of a document.			
Create a logical tab order through links, form controls and objects.			
Provide keyboard shortcuts to important links (including those in client-side image maps), form controls and groups of form controls.			
Until user agents (including assistive technologies) render adjacent links distinctly, include non-link, printable characters (surrounded by spaces) between adjacent links.			
Provide information so that users may receive documents according to their preferences (e.g., language, content type, etc.)			
Provide navigation bars to highlight and give access to the navigation mechanism.			
Group related links, identify the group (for user agents), and, until user agents do so, provide a way to bypass the group.			
If search functions are provided, enable different types of searches for different skill levels and preferences.			
Place distinguishing information at the beginning of headings, paragraphs, lists, etc.			
Provide information about document collections (i.e., documents comprising multiple pages.).			
Provide a means to skip over multi-line ASCII art.			
Supplement text with graphic or auditory presentations where they will facilitate comprehension of the page.			
Create a style of presentation that is consistent across pages.			
If you use images and image maps	**Yes**	**No**	**N/A**
Until user agents render text equivalents for client-side image map links, provide redundant text links for each active region of a client-side image map.			
If you use tables	**Yes**	**No**	**N/A**
Provide summaries for tables.			
Provide abbreviations for header labels.			
Until user agents (including assistive technologies) render side-by-side text correctly, provide a linear text alternative (on the current page or some other) for all tables that lay out text in parallel, word-wrapped columns.			
If you use forms	**Yes**	**No**	**N/A**
Until user agents handle empty controls correctly, include default, place-holding characters in edit boxes and text areas.			