

Your Bridge to Usability



White Paper: Web Eyes™ and Section 508

On June 25, 2001, the US government implemented Section 508 of the Rehabilitation Act specifying accessibility compliance for all federal government (.gov) and military (.mil) websites, as well as sites provided under contract to a federal agency. Websites securing these domain extensions must be accessible to individuals with any sort of physical impairment. Digital content that is easily readable to a large segment of the population is virtually impossible to read by the 4.4 percent of the population with a visual impairment (defined as having difficulty distinguishing letters or words), and the roughly 5-15 percent of the population with dyslexia. Currently, visually-impaired individuals necessarily purchase a \$500 program to make digital information readable. Besides imposing financial hardship, this situation is an infringement upon the civil liberties of disabled individuals by unduly inhibiting access to information. Recognizing this discrepancy, the government began putting together a solution three years ago establishing a policy (the Rehabilitation Act) to bridge the gap. Section 508 is a mandate calling for specific action to resolve the inconsistency. At present, there are no truly tenable solutions on the market to meet the government's directive.

The Internet and Digital Information

In 1994, there were only 3 million people using the Internet. According to a report by the Department of Commerce, Internet access reached 304 million worldwide in 2000, up 80 percent from one year prior. In the US, 56.7 percent of Americans are connected to the Internet – a number that continues to increase remarkably fast.

Juxtapose the rise in Internet connectivity with the dramatic reduction in the cost of personal computers, and one begins to surmise the force behind this trend. Between 1987-94, the average price for a computer declined 12 percent annually. Over the course of the next five years, computer price reductions averaged 26 percent. The continuous drop in prices has led more and more people to purchase a personal computer and, increasingly, to connect the computer to the Internet.

The Internet became a veritable new market, or “New Economy,” as many have labeled. Businesses quickly discovered the value (in terms of efficiency) of connecting to other businesses, as well as the efficacy of integrating traditional company databases to the Internet. This opened the door to a new form of client services, along with a new mode of sales: e-commerce. According to the Census Bureau of the Department of Commerce, fourth quarter e-commerce sales between 1999-2000 increased 67.1 percent. Forrester Research estimates that online business trade will skyrocket to \$2.7B by 2004. The New Economy is emerging, and with it, vast amounts of digital information.

The Internet connects businesses to businesses, businesses to people, and people to people. In the past decade, businesses were not the only entities to tap into the immense potential of the Internet. The government, too, grasped the truism of the Internet's power. An effort to streamline government efficiency and bring government to the people pushed federal, state and local government agencies onto the Web during the Clinton-Gore administration. Virtually every government agency now has a website representing its service and commitment to the people the agency serves. All indications point to an increased reliance on using the Web to communicate with the public.

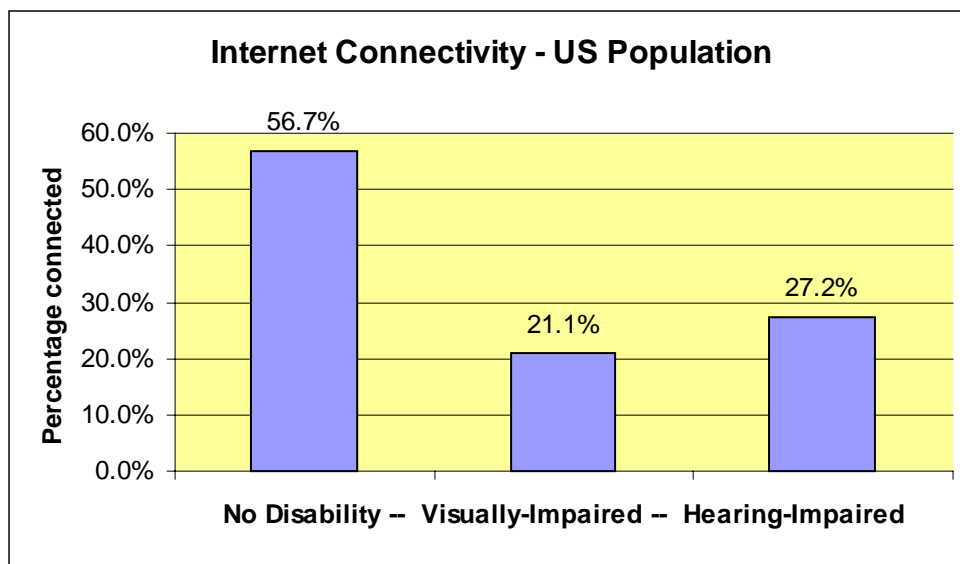
Digital information is growing exponentially. Presently, there are over one billion web pages on the Internet, with approximately three million new pages added each day. Search Engine Watch notes one website that accumulated all the records of every website in production since 1996, amounting to 100 terabytes of data. This is five times more content than that of all combined books held in the US Library of Congress – a library reputed to hold every book ever published.

Internet: For The People, By The People, Of The People

The federal government contributes immensely to the amount of digital content on the Internet. The US Government Printing Office’s website, for example, handles over 200,000 full-text documents, with an estimated 26 million downloads each month. The government culls information from all across the nation, keeping abreast of the trends, wants and needs of the population, then presents this information in text, tables, and graphics for the public.

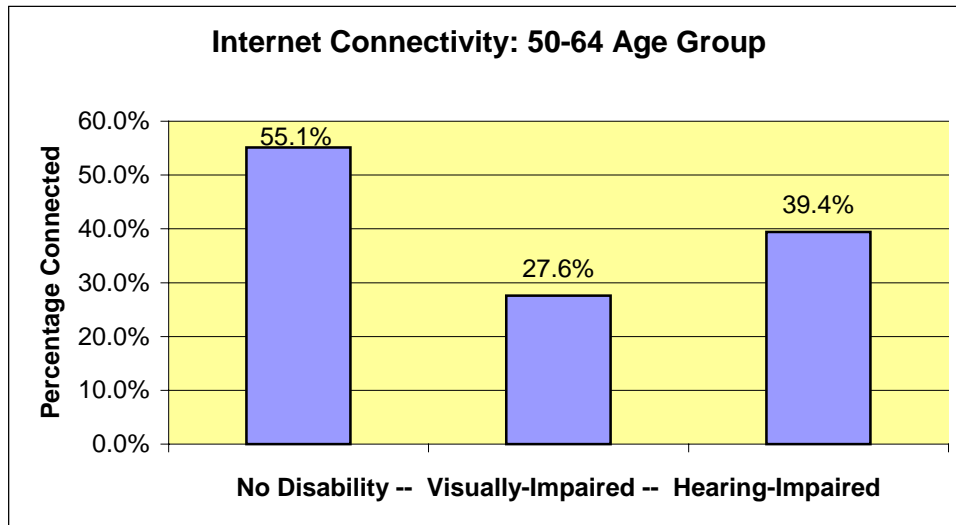
Unfortunately, millions of Americans are unable to access the information gathered by their government, learn about the programs targeted to specific segments of society, or keep up with the ever-changing face of the Information Age. Nearly 8 million Americans possess a vision impairment that inhibits, or prohibits, the reading of digital content. The number of individuals struggling with dyslexia are, conservatively, double this figure.

At the dawn of the Information Age, one can detect a significant divide between the “connected” and the “disconnected” based upon possessing an impairment that inhibits access to information. Whereas the majority of the normally-sighted population in the US accesses the Internet, only 21.1 percent of the visually-impaired population is connected and 27.2 percent of the hearing-impaired population.



When age is factored into these calculations, the picture becomes more disheartening. A report by the Department of Commerce entitled, “Falling Through the Net: Toward Digital Inclusion,”

dated October 2000, notes the specific demographics of Internet connectivity. In the 50-64 year age group, just over 55 percent of the able-bodied population is connected to the Internet. However, only half that figure (27.6 percent) of the visually-impaired population within this age group uses the Internet. The stark drop demonstrates how issues of accessibility directly influence inclusion in the Information Age.



Individuals 50 and older are the least likely demographic group to be Internet users. Yet, this is the group experiencing the fastest growth in Internet connectivity. These individuals can afford computers and Internet connection rates, desire to stay on top of current events and issues affecting society, are the most politically and societally active segment of society, and stand to benefit most from government programs.

Bringing government to the people – all people – is the impetus behind Section 508. As President George W. Bush noted last June, “...Section 508 of the Rehabilitation Act... will [provide]... more opportunities for people of all abilities to access government information. Increasingly, Americans use information technology to interact with their government. They rely on thousands of government web pages to download forms, learn about federal programs, find out where to turn for government assistance, and communicate with elected officials... And because of Section 508, government web sites will be more accessible for millions of Americans who have disabilities.”

Fulfilling the Spirit and Letter of Section 508

The specific guidelines of Section 508 stipulate that all web-based content must be viewable by a person with low vision (defined as visual acuity between 20/70 to 20/200), “...without relying on audio input since many people with low vision may also have a hearing loss.” To meet these requirements, it is necessary to design a web page set at a default font size of 32 points (allowing an individual user’s browser setting to increase the font up to 96 points). For a person with visual acuity of 20/200, a font size of 24 points (the normal font on a web page is 10-12 points) reads the same as a 4 point font to a person with 20/20 vision. Setting the font size at 32 points

is an absolute minimum to meet low vision requirements. However, a default setting of 32 points necessitates a complete redesign of any page containing a table or an inclusive graphic, as well as several other page elements, because increasing the font of tables and other elements completely undermines the structure and logical flow of information contained within.

Redesigning the textual content of a web page – and an entire web site – carries with it two immediate problems. First, a normally-sighted individual will not want to view a web page at a default setting of 32 points; the font is too large, and therefore, uncomfortable to handle. This means that an organization will need to maintain its regular web site, with a 10-12 point font, and a second, duplicate web site with a default font of 32 points. Second, the need for a duplicate web site that is 508-compliant carries with it a significant financial encumbrance in terms of the money allotted to web developers to redesign pages. The magazine “B to B” issued its web price index in May 2001, listing the low, high, and median prices for small, medium and large web sites. The median price for a small web site development project listed at \$65,000; the median price for a large site totaled \$250,000. Creating a second, 508-compliant web site will be expensive.

Redesigning the textual content of all the pages within a web site does not make that site functional to a low-vision user, nor to a dyslexic or scotopically-sensitive user (scotopic sensitivity refers to the reading challenges caused by color contrasts and light sensitivities). The low-vision user still must grapple with the problem of reading menu items (all the function commands listed on top of the screen) and dialogue boxes, which cannot be enlarged by redesigning a page. Without the ability to use menu items, the web site is inoperable to a low-vision user. Likewise, redesigning a page to increase the font size of textual information is ineffective for dyslexic and scotopically-sensitive individuals, who require varied background color schemes or contrast settings in order to read digital content.

Finally, graphic elements, also falling under the 508 mandate, cannot be increased by altering one’s browser setting. Instead, to adhere to the compliancy mandate, it is necessary to upload and link several larger versions of each graphic element to a page. Recreating enlarged graphics carries a significant price tag, as does storing increasing megabytes of data on a server (graphics are high-memory items).

Prior to the government’s Section 508 accessibility mandate, a visually-impaired individual relied upon a \$500 software program to zoom in on text and make it readable. Section 508 asserts that this is an unacceptable solution. Instead, web sites must be fully accessible to all users without imposing any financial burden on the user. The only foreseeable solution to the government’s mandate is an expensive one, both in time and money: redesign duplicate, 508-compliant web pages.

A Viable Alternative

There is a viable, cost-effective solution – new to the market – that meets and exceeds the guidelines stipulated in Section 508. The software product is called Web Eyes™, and it is developed by ION Systems, Inc. – a company with ten years experience creating innovative user interfaces for reading digital content.

Web Eyes™ is an Internet Explorer browser plug-in that takes existing Web content designed for normal-sighted users and reflows the content, on-the-fly, into a separate, but synchronized, window. The resulting text is rendered using ION's patented technology, placing text in (optional) columns in user-defined font sizes, thus making the content accessible in multiple renderings for sighted, low-vision, dyslexic, and blind users. Addressing Section 508 of the Rehabilitation Act, and written following the World Wide Web Consortium (W3C) guidelines, Web Eyes brings accessibility features to the Internet and the Web. Written in C++, Web Eyes 2.0 incorporates accessibility functions, enabling the product to be accessible to a greater number of visually and physically challenged individuals.

Web Eyes™ is not a browser replacement; it is an adjunct reading interface that extends and enhances the reading experience from a browser for electronically delivered content to all customers – sighted, low-vision, dyslexic, scotopically-sensitive, and blind.

Web Eyes™ is designed to meet the emerging usability needs of digital content (accessibility and consumption), delivering a solution that enables access to content on demand and automatically renders the content in multiple formats for sighted, low-vision, dyslexic, and blind users. Web Eyes is based on ION's unique patented interface and biomechanical solutions that make reading digital content easy and logical, while enhancing the user's immersive reading experience:

- Logical reflowing of text, before and after resizing increases usability of web site information by visually challenged users or blind screen reader applications as well as maintains the content's sequential ordering.
- The browser and Web Eyes stay in constant synchronization, regardless of which one is currently in the forefront, thus providing maximum usability.
- Graphics and columns can be enabled or disabled with a click of a button.
- User-driven font sizing (4 point to 144 points), providing comfort at any reading distance (for most users this is 18 points).
- Font resizing of text and menu items, dialog boxes, tables, forms, graphics.
- Non-scrolling text prevents Optokenetic Nystagmus, the reflex that causes eye fatigue when the eye "jumps" to follow scrolling line movement.
- Keyboard and mouse independent navigation supporting all disability-compliance standards, allowing users who are dependent on one operational modality to use the software.
- Optional columns widths can automatically adjust according to selected font size, preventing the user's eyes from skipping lines during reading.

- Shaded background reduces reflectivity, extending reading capabilities for longer periods of time without fatigue. This is a particularly important function for addressing the needs of low vision users, dyslexic readers and scotopically-sensitive readers (readers who are sensitive to light and color).

In summary, Web Eyes™ meets and exceeds Section 508 standards, extending accessibility to content as well as to menus, dialogs, color schemes, contrast settings and keyboard navigation. No other product like it exists on the market. More importantly, the Web Eyes™ software solution exceeds all compliancy guidelines and is far more cost-effective than redesigning web pages.

Cost Analysis

Compared to the tens, or hundreds, of thousands of dollars necessary to redesign an entire web site, Web Eyes™ is available to any of the 834,000 federal government web sites and 1.8 million military web sites (and counting) at one low annual fee.

The pricing structure for Web Eyes™ is categorized into three, tiered levels per web site domain: a) less than 25 pages; b) 25 – 500 pages; c) 501 – 1000; d) 100+ or dynamically-generated pages. Single year licenses are \$600, \$1,600, \$3,800, or \$5,500 respectively. A five-year license can be purchased for the price of four single-year licenses. Entire site licenses, for corporations or government entities that have multiple domains, are negotiated separately.

Summary

The Rehabilitation Act has been a policy-in-progress since 1973, evolving to meet the changing needs of the disabled community. The Information Age introduces a new requisite: the need to make digital content accessible to all users regardless of impairment.

As is sometimes common with new policy initiatives, there are few market solutions to satisfy the government's directive. Section 508 created a new market demand, a demand for a cost-effective, digital interface solution that serves the needs of all visually-impaired users equally: low-vision, dyslexic, scotopically-sensitive and blind. Redesigning millions of web pages is an inadequate solution because it only partially fulfills the accessibility guidelines. Web Eyes™ exceeds those guidelines. It is a cost-effective, fully-accessible software solution whose time has arrived.