



# Accessibility Expertise Whitepaper



June 2008



## **Executive Summary**

Today, more than 60 million North Americans live with some degree of disability. Although the term “accessibility” is generally used in relation to the elderly or disabled, this is inaccurate—*everyone* can benefit from the advantages of improved accessibility. No one can escape the aging process. Even if you are healthy today, there is no way of knowing what could happen to negatively impact your health...or when.

While the Internet and technology have rapidly grown to become part of our social infrastructure, more and more web content is produced without enough attention to its accessibility. This has prompted the Federal Government to establish a framework that aims to improve the accessibility and convenience of even the most basic content for a broader spectrum of users. This framework includes accessibility laws and regulations that provide equity for people with disabilities.

Plexus Scientific Corporation realizes the importance of making Information Technology (IT) products accessible for everyone, regardless of physical limitation or disability. Plexus has extensive experience with government agencies and many private industry organizations which has made us aware of the increasing need for accessible IT products within organizations. If adequate accommodation to technology is not provided for people with disabilities, then recourse could follow. Today, the Federal Acquisition Regulation allows disabled employees to file suit if procurement is not 508 compliant. Plexus has found that, by increasing awareness of accessibility, agencies are gradually succeeding in making information technologies accessible. IT specialists view accessibility as an ongoing need for efforts requiring changes to hardware, software, and services.

Plexus provides services to several Federal agencies and private corporations for accessibility of electronic documents and forms and other IT products and services. Our staff has expertise in providing technical assistance to Federal agencies to ensure reasonable accommodation and useable and compliant IT systems for people with disabilities. Our staff has a thorough understanding of Section 508 and 504 of the Rehabilitation Act, and provides Section 255 support for telecommunications access for people with disabilities. This document provides an overview of Plexus’ experience in the accessibility arena and demonstrates our service offerings.

“We live in a time when the words impossible and unsolvable are no longer part of the scientific community's vocabulary. So many of our dreams at first seem impossible, then they seem improbable, and then, when we summon the will, they soon become inevitable.”

-Christopher Reeve

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## **1. DISABILITY CHALLENGES**

Today, there are hundreds of different kinds of disabilities. Some of these are congenital, but most develop later in life. Less than 15 percent of the population is actually born with their disability. Two of the most common are visual impairments and hearing disabilities.

### **1.1 VISUAL IMPAIRMENTS**

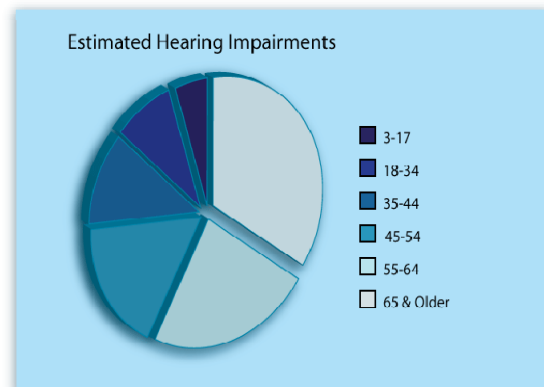
Visual impairments are one of the many disabilities that numerous people experience at some point in their lives. The terms *partially sighted*, *low vision*, *legally blind*, and *totally blind* are used in the educational context to describe people with visual impairments. *Partially sighted* indicates some type of visual problem. *Low vision* generally refers to a severe visual impairment, not necessarily limited to distance vision. It applies to all individuals with sight who are unable to read at a normal viewing distance, even with the aid of eyeglasses or contact lenses. These individuals use a combination of vision and other senses to learn, although they may require adaptations in lighting or size of print and, sometimes, Braille. *Legally blind* indicates that a person has less than 20/200 vision in the better eye or a very limited field of vision (20 degrees at its widest point). Totally blind people generally learn via Braille or other non-visual media.

Every 7 minutes, a person in the United States loses his or her sight, often as part of the aging process. Seventy percent of severely visually impaired persons are age 65 or older and 50 percent of this group is legally blind.

As the baby boomer generation ages, people are living longer while, at the same time, conditions that cause vision loss, such as diabetes, are impacting even the very young. There are 161 million people worldwide who are visually impaired—37 million who are blind and 124 million who have low vision. Without intervention, the number of people with impaired vision could almost double by 2020. In the United States alone, 16.5 million people age 45 or older report some form of vision impairment even when wearing glasses or contacts. By 2010, this figure will increase to 20 million<sup>1</sup>.

### **1.2 HEARING DISABILITIES**

The number of deaf or hard-of-hearing population is estimated by the National Center for Health Statistics of the U.S. Department of Health and Human Services. According to its 1990 and 1991 Health Interview Surveys, approximately 20 million persons (8.6 percent of the total U.S. population 3 years and older) were reported to have hearing problems.



**Estimate of Hearing Impairments by Age Group United States 1990-91**

<sup>1</sup> Lighthouse National Survey on Vision Loss

Estimate of the Prevalence of Hearing Impairments by Age Group,  
United States, 1990-1991

Age Group	Population	Number of Hearing Impaired	Percent of Population
<b>TOTAL</b>	235,688,000	20,295,000	8.6
<b>3-17 years</b>	53,327,000	968,000	1.8
<b>18-34 years</b>	67,414,000	2,309,000	3.4
<b>35-44 years</b>	38,019,000	2,380,000	6.3
<b>45-54 years</b>	25,668,000	2,634,000	10.3
<b>55-64 years</b>	21,217,000	3,275,000	15.4
<b>65 years &amp; older</b>	30,043,000	8,729,000	29.1

Source: National Center for Health Statistics, Data from the National Health Interview Survey, Series 10, No. 188, 1994

## 2. FOCUS AREAS

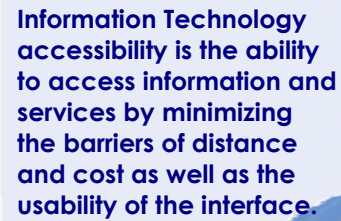
In Plexus' ongoing efforts to help organizations comply with U.S. government accessibility standards, we focus on four types of disability, each with its own varying level of need.

- **Visual**—Generally, variance in degree of visual impairment ranges from people who are blind, to those who suffer from low vision, and to those who are color blind. A blind person would obviously not use a mouse or pointing device due to the hand-eye coordination required to effectively operate such a device. It is also likely that this person would not have a monitor but would instead use a screen reader. People with low vision may also use a screen magnifier to enlarge text.
- **Hearing**—Hearing impairments make it difficult or impossible for individuals to heed various levels of audible cues, such as warning alerts or special audible indicators. People with hearing impairments require visual representations of auditory information provided by computer applications and operating systems. Therefore, it is imperative that audio information be provided in a visual format.
- **Mobility**—Mobility or dexterity impairments often limit a person's movement or fine motor skills. This can affect their ability to type or use a mouse or pointing device. People suffering from mobility impairments may use alternate input devices for interacting with their computer, such as voice dictation software.
- **Cognitive**—Cognitive or learning impairments can take many forms, including perceptual differences and language or learning disabilities. People dealing with cognitive or learning disabilities may benefit from information that is presented in multiple formats simultaneously.

The U.S. Census Bureau research indicates there are 51.2 million known persons with disabilities. They represent 18% of the population. The number of persons who have a severe disability is 32.5 million or 12% of the population in America.

### **3. WHAT IS ACCESSIBILITY?**

Accessibility means that computer hardware and software is usable by everyone, regardless of physical limitation or disability. At Plexus, we strive to ensure that all individuals, including those with disabilities or special needs, have access to products and that they are as easy to use as possible. Due to overwhelming statistics and the needs of millions of individuals who are visually impaired or blind, a number of laws and international standards have been adopted to ensure their right of access—such as Section 508, Section 504, Section 255, WCAG 2.0, Japanese Industrial Standard (Japan), e-Inclusion Act (European Union), Common Look and Feel (Canada), and the Disability Discrimination Act (Australia and UK).



**Information Technology accessibility is the ability to access information and services by minimizing the barriers of distance and cost as well as the usability of the interface.**

#### **3.1 SECTION 508**

Section 508 of the *United States Rehabilitation Act* provides guidelines that will eliminate barriers in information technology (IT) in order to make available new opportunities for people with disabilities and to encourage development of technologies that will help achieve these goals. The law applies to all Federal agencies when they develop, procure, maintain, or use electronic and IT. Plexus is committed to ensuring that products meet these accessibility guidelines through our assessment and remediation services.

#### **3.2 SECTION 504**

Section 504 of the *Rehabilitation Act of 1973* is a national law that protects *qualified* individuals from discrimination based on their disability. The nondiscrimination requirements of the law apply to employers and organizations that receive financial assistance from any Federal department or agency, including the U.S. Department of Health and Human Services. These organizations and employers include numerous hospitals, nursing homes, mental health centers, and human service programs.

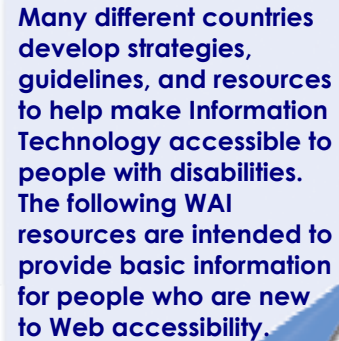
Section 504 forbids organizations and employers from excluding or denying individuals with disabilities an equal opportunity to receive program benefits and services. It defines the rights of individuals with disabilities to participate in, and have access to, program benefits and services.

For purposes of employment, *qualified individuals with disabilities* are persons who, with reasonable accommodation, can perform the essential functions of the job for which they have applied or have been hired to perform. (Complaints alleging employment discrimination on the basis of disability against a single individual will be referred to the U. S. Equal Employment Opportunity Commission for processing.) *Reasonable accommodation* means an employer is required to take reasonable steps to accommodate an employee's disability unless it would cause the employer undue hardship. Plexus is

able to assist organizations with fulfilling the need for workplace accommodation and preventing potential complaints for discrimination against employees with disabilities.

### **3.3 SECTION 255**

The Federal Communications Commission (FCC) has rules requiring telecommunications equipment manufacturers and service providers to make their products and services accessible to people with disabilities, if such access is readily achievable. These rules implement Section 255 of the Communications Act. Where access is not readily achievable, Section 255 requires manufacturers and service providers to make their devices and services compatible with peripheral devices and specialized customer premises equipment that are commonly used by people with disabilities, if such compatibility is readily achievable. The FCC has determined that interconnected Voice over Internet Protocol (VoIP) providers must comply with Section 255.



Many different countries develop strategies, guidelines, and resources to help make Information Technology accessible to people with disabilities. The following WAI resources are intended to provide basic information for people who are new to Web accessibility.

### **3.4 WEB CONTENT ACCESSIBILITY GUIDELINES (WCAG)**

Web Content Accessibility Guidelines 2.0 (WCAG 2.0) covers a wide range of recommendations for making web content more accessible. Adhering to these guidelines will make content accessible to a wider range of people with disabilities, including blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, limited movement, speech difficulties, photosensitivity, and combinations of these. Compliance with these guidelines will also often make web content more usable to users in general.

### **3.5 JAPANESE INDUSTRIAL STANDARDS**

The outcome of Japan's long life expectancy and declining birthrate is that today, the country has become the world's most rapidly aging nation. Providing access to web content is a matter of urgency for the public, while private enterprises are wasting no time in enhancing their web site accessibility to fulfill their social responsibility and to minimize lost business opportunities. On June 21, 2004, the Japanese Industrial Standard for Web accessibility—commonly referred to as the Web Content JIS—was released. Although the Web Content JIS is not legally binding like the provisions of the U.S. Rehabilitation Act, it has attracted attention as Japan's first public web accessibility guidelines. At the current time, the JIS is updating its accessibility standards to harmonize with Web Content Accessibility Guidelines of W3C/WAI and other guidelines around the world.

### **3.6 E-INCLUSION ACT**

The current law in the European Union requires organizations to ensure barrier-free access to public web sites for all. By January 1, 2008, the design of such online services has to conform to international standards of accessibility—both the Federal Disability Equality Act, which prohibits discrimination for reasons of disability in public administration and consumer affairs, and the Disability Employment Act, which concerns life in the workplace.

**Assistive Technologies promote greater independence for people with disabilities, enabling them to perform and accomplish tasks. According to disability advocates, technology is often created without regard to people with disabilities, creating unnecessary barriers to hundreds of millions of people.**

### **3.7 COMMON LOOK AND FEEL (CANADA)**

Canadians have the right to obtain information and services from Government of Canada web sites regardless of the technologies they use. The key to effective implementation of universal accessibility lies in designing sites to serve the widest possible audience and the broadest possible range of hardware and software platforms, from adaptive technologies to emerging technologies.

### **3.8 DISABILITY DISCRIMINATION ACT (AUSTRALIA & UK)**

The Disability Discrimination Act 1995(DDA) was introduced with the intention of comprehensively tackling the discrimination which many disabled people face. The main part of the DDA that applies to web sites and requires them to be accessible came into force on October 1, 1999. Further changes were made to the act in 2005, requiring certain employers and service providers previously exempt from the act (such as the police and small employers) to comply with the act and make their web sites accessible. Changes to the act in 2005 also brought in a duty on public authorities to promote disability equality.

## **4. PLEXUS' COMMITMENT TO ACCESSIBILITY**

We pride ourselves on meeting IT accessibility requirements to promote quality of life, employability, and independence for people coping with disabilities. We are striving to enhance organizations' products to ensure that all individuals can work easily and efficiently with IT.

### **4.1 ASSISTIVE TECHNOLOGIES**

To develop accessible software, it is important to understand how people with disabilities interact with IT. Many people will customize their computers with additional hardware (such as Braille readers for the blind) and software (such as speech recognition technology for those with limited mobility). It is critical that software and hardware support these assistive technologies and that we understand how people will use those technologies with software or hardware.

## **4.2 ACCESSIBILITY SERVICES**

Accessibility involves two key issues—how users with disabilities access electronic information and how web content designers and developers enable web pages to function with assistive technology used by individuals with disabilities. Our consortium of accessibility organizations offers the largest array of accessibility services available on the market today for your organization’s accessibility needs. We do not rely solely on evaluation with tools—neglecting to perform a "manual" check of certain accessibility aspects can result in circumstances that may exclude some portions of the public from a site, software, or hardware. A list of our services, including manual testing, is provided below. We also conduct testing with blind users to ensure optimal compliance and usability.

**"The chief handicap of the blind is not blindness, but the attitude of seeing people towards them."**

**- Helen Keller, 1925**

<b>Assessments:</b> <ul style="list-style-type: none"><li>➤ PDF Assessment and Remediation</li><li>➤ Talking PDF Forms</li><li>➤ Web Site Assessment</li><li>➤ Web Application Assessment</li><li>➤ Hardware Assessment</li><li>➤ Software Assessment</li></ul>	<b>Implementation Support:</b> <ul style="list-style-type: none"><li>➤ Accessibility Management Platform</li><li>➤ Best Practice Implementation</li><li>➤ Accessibility Certification</li></ul>
<b>E-Learning:</b> <ul style="list-style-type: none"><li>➤ Pre-developed</li><li>➤ Customized</li></ul>	<b>Alternative Format Development:</b> <ul style="list-style-type: none"><li>➤ Braille (Hardcopy)</li><li>➤ BRF</li><li>➤ Large Print</li><li>➤ Digital Books</li><li>➤ Accessible PDF Files</li></ul>

## **4.3 ASSESSMENT PROCESS**

Accessibility compliance is an important requirement for Federal government agencies. Section 508 requires that all information technology systems, including web sites, web applications, software, publicly accessible forms and documents, and hardware used, developed, procured, and maintained by Federal government agencies be accessible to people with disabilities. Failing to comply with Section 508 requirements can result in formal complaints being brought against non-compliant agencies. Plexus can assess and offer remediation for web sites, web applications, hardware, software, and PDF files, and offers training for accessibility needs within an organization. Plexus can help your company to create an effective accessibility strategy, guide your organization's decision-making processes, and provide insights on how to easily and effectively integrate accessibility into your business.

Our accessibility assessment process is described below:

**NEEDS ASSESSMENT**—Plexus will first conduct an accessibility needs assessment for your organization to identify problems or deficits.

**ANALYZE CURRENT ACCESSIBILITY BEST PRACTICES**—Next, we will examine the types and functions of your organization’s IT systems that are maintained internally (such as web sites, web applications, PDFs, software and hardware) and internal processes to determine overall accessibility risk. We will list opportunities where accessibility can become a competitive advantage and enhancements to existing best practices that can help your organization achieve and maintain accessibility.



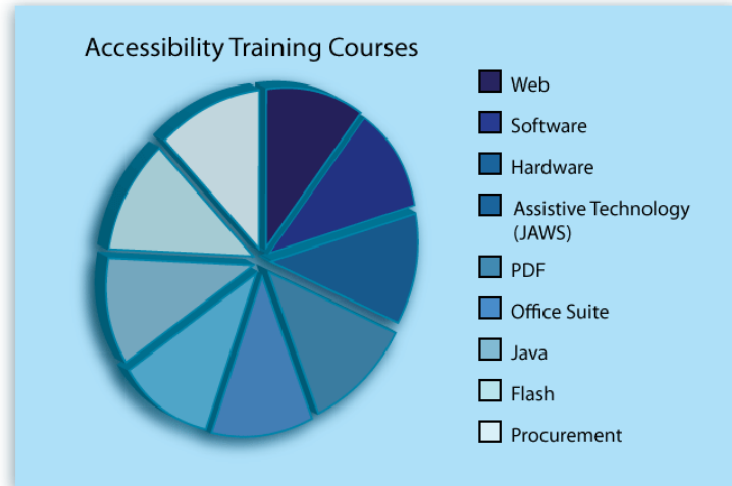
**IDENTIFY ORGANIZATION’S HIGHEST RISK AREAS**—This analysis will assist in developing a prioritized plan to help achieve accessibility initiatives. Once the analysis is performed, the results enable all relevant functional groups within your organization, including management, legal, marketing, sales, and engineering teams, to appropriately address accessibility.

**IDENTIFY USE CASES AND MODULES**—A walk-through will be performed at this stage, where modules and use cases can be identified for testing.

**TEST FOR COMPLIANCE AND USABILITY**—Testing for compliance and usability of the technology will be completed by experts in the IT accessibility field.

**DELIVER REPORT AND RECOMMENDED BEST PRACTICES**—Delivery of a report of findings and recommended best practices will follow testing. Our time box for services is a modular approach, with delivery updates ranging from weekly to every 90 days. We will offer a prioritized schedule of the assessment and remediation process. Our assessment report will identify any accessibility problems, where those problems are located, and how they can be resolved. The format of the report will vary depending on your preferences and according to the size and extent of the accessibility problems. For assessments, our report will clearly identify and prioritize all accessibility errors in your IT arena and provide the information necessary to implement corrections. An assessment will enable your organization to accurately represent its current accessibility status, successfully allocate time and budget for implementing corrections, and demonstrate its commitment to providing accessible technology systems. With our report, the findings will define the issues using both non-compliant code and compliant code examples. The report will be of value to managers, executives, quality assurance, designers, and developers. The findings can be discussed via conference call or onsite.

**TRAINING**—After the report and any discussions about its findings, investing time in web accessibility training for your web development staff and managers can be of great value. Accessibility training is a crucial part of the process for an organization’s accessibility initiatives. The Accessibility E-learning courses offered through Plexus are standard predeveloped training courses or courses that can be customized according to the organization’s needs. The standard training courses are web accessibility, software accessibility, hardware accessibility, assistive technology applications (JAWS, Window-Eyes, etc.), PDF accessibility, office suite accessibility, java accessibility, flash accessibility, and procurement training (used for management, sales staff, and procurement officers).



**REGRESSION ASSESSMENT**—Accessibility is an ongoing effort for many organizations. Regression assessments can also be completed to assist with further remediation of noncompliant issues.

Widely recognized for our expertise in worldwide accessibility solutions, Plexus Scientific is developing and executing strategies for leading government, education, and business entities. We can provide assistance maintaining the accessibility of an organization’s IT systems over time. Accessibility initiatives are an ongoing process for all organizations due to assistive technologies, IT systems, and continually changing laws. Furthermore, satisfying the overall requirements will require the overall operational flow of technology to be revised. As content is constantly being updated and refreshed, it is essential that it be continuously checked and improved so as to maintain a certain level of accessibility. Plexus offers solutions for follow-up assessments and development of internal best practices to assist with these universal challenges.

### **ABOUT PLEXUS**

*Plexus offers top-notch expertise in authoring interactive PDF forms and documents for accessibility in large volumes. We can conduct an assessment to test for accessibility and Section 508 compliance, and remediate the documents, if needed, for your organization. Plexus has authored thousands of accessible PDF forms and documents. Examples of our accessible forms can be located at:*

*<http://www.irs.gov/formspubs/article/0,,id=98135,00.html>.*

*Founded in 1985, Plexus Scientific Corporation is an employee-owned consulting firm offering information technology and business solutions services to the Federal government and industry clients. The firm's operations are structured along distinct lines of business that correlate with our clients' diverse and complex needs to include, accessibility expertise, application integration, performance management, Government Performance and Results Act (GPRA) and Program Assessment Rating Tool (PART) reporting, knowledge management, web portal development, business process management, project management, blended learning and software development. Plexus has been delivering the highest quality professional services to government clients for over fifteen years. We are recognized as a leader in providing innovative solutions to our clients.*

*The company features staff members who are experts in accessibility, accessibility remediation, program and project management, and information technology. We also have highly qualified software and web development teams and experienced management consultants. This team of highly qualified professionals and technicians—coupled with our certifications, corporate processes, and quality program—helps ensure client satisfaction and success. Our clients are Federal managers responsible for program implementation, business leaders who are responsible for program design and oversight, and the military. We support all branches of the U.S. military, DoD agencies, the intelligence community, the U.S. Department of Homeland Security, Department of Treasury, Internal Revenue Service, Department of Education, Health Human Services, United States Office of Government Ethics, and clients in selected industry markets. Plexus is both CMMI Level 3 and ISO 9001:2000 certified.*

For additional information about Accessibility and Plexus' services, contact Christy Sanders at [csanders@plexsci.com](mailto:csanders@plexsci.com), 571.527.1613 or Leonard Newman at [lnewman@plexsci.com](mailto:lnewman@plexsci.com), 571.527.1217.