# MAKING THE CASE FOR ACCESSIBILITY NEW DIRECTIONS, NEW POSSIBILITIES

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**Abstract**: Technology is accessible if it can be used just as effectively by people with disabilities as it can by those without. Many people are surprised to learn just how much of the world's population is affected by a disability, and how valuable accessible design is to government, private industry, and educational institutions.

To understand the impact one has to look no further than the World Health Organization which indicates that people with disabilities are the world's fastest growing minority group. With the world's population aging and the likelihood of developing a disability or other mobility limitations increasing with age, the growth in the number of people with disabilities can be expected to rise dramatically.

An inclusive and universal design approach to technology is critical to organizations wishing to serve the disabled population, and to tap into the many possibilities now made available through advancements in assistive technology.

The purpose of this paper is to review current and pending Worldwide Electronic and Information Technology (E&IT) Accessibility trends, regulation, standards and guidelines and understand their impact on the end user. The objective is to identify and analyze significant issues, risks and opportunities and to develop recommendations to assist E&IT decision makers in planning and positioning so that to take advantage of opportunities.

This paper will provide a baseline for monitoring trends in each of these areas and a repository of legislation, regulation, standards, guidelines and best practices to guide E&IT researchers in making decisions with regard to the accessibility of E&IT products, programs, services and information.

Keywords: Accessibility, usability, assistive technology, best practices, guidelines

## 1. Introduction

Technology is accessible if it can be used just as effectively by people with disabilities as it can by those without.

Yet many people are still surprised to learn just how much of the world's population is affected by a disability, and how valuable accessible design is to private industry, government, and educational institutions.

To understand the impact, one has to look no further than the World Health Organization (WHO) (2003) which indicates that people with disabilities are one of the largest and fastest growing minority groups. It is becoming clear that public and private entities who make their technology accessible can

reach a largely untapped and underserved market, a demographic that represents both spending and voting power, a population that exhibits a strong desire to learn and improve despite facing physical and cognitive challenges (The Solution Marketing Group, 2007).

Approximately 750 million people live with disabilities of various types, says the World Health Organization (2003), and the number is increasing due to the rise of chronic diseases, injuries, war, car crashes, falls, violence and aging.

In recent years the international community has recognized the importance of reliable information on various aspects of disability prevention, rehabilitation and care, and most importantly the need to invest in assistive technology services that can ensure equality of opportunities and good quality of life for persons with disabilities.

As an example, the United Nations' Millennium Declaration; the United Nations' Standard Rules on the Equalization of Opportunities for Persons with Disabilities; International Classification of Functioning, Disability, and Health officially endorsed at the Fifty-fourth World Health Assembly in 2001; the United Nations World Programme of Action concerning Disabled Persons; the African Decade of Disabled Persons, 2000-2009; the Asian and Pacific Decade of Disabled Persons, 1993-2002; the New Asian Pacific Decade of Disabled Persons, 2003-2012; and the European Year of People with Disabilities, 2003 (United Nations Statistics Division, 2007).

An inclusive and universal design approach to technology is critical to both government agencies and private industry wishing to anticipate future needs of this growing population. By recognizing the importance of the protection and promotion of the rights and dignity of persons with disabilities through assistive technology, the world is just beginning to strengthen national policies, strategies, and programmes along with an increase in awareness of the public at large of the importance of the issue of disability and assistive technology.

# 2. Findings

There are many types of disabilities:

- Blindness and visual limitations
- Deafness and hearing limitations
- Speech limitations
- Mobility limitations
- Multiple limitations

A person with any one – or even all – of these disabilities can still enjoy the many benefits of goods, products, business, governmental services, and education when organizations take into consideration a few key points (National Institute on Disability and Rehabilitation Research, 2004).

Often times some of the most simple and cost effective solutions are ignored or overlooked, a mistake that organizations can no longer make when trying to attract, serve, and retain this loyal consumer base.

Many related laws, regulations and standards (LRS) for accessibility of electronic and information technology (E&IT) currently exist and are gaining significant recognition.

## Most notably:

- World Wide Web Consortium (W3C) Web Guidelines
- Section 508 of the Rehabilitation Act of 1973, as amended
- Section 255 of the Telecommunications Act of 1996
- o Americans with Disabilities Act of 1990

- The Disability Discrimination Act (DDA) of the United Kingdom
- The Federal Disability Discrimination Act of Australia (1992)
- o Canadian Human Rights Act of 1977
- o World Wide Web Consortium (W3C) Web Guidelines.
- There is an increase of new accessibility laws, regulations, and standards being developed across
  most geographic regions of the world, in particular EMEA and Japan. However, it is widely
  publicized that these efforts are not being developed in a unified and consistent manner and
  therefore reports of fragmentation of these standards has become a major issue (United Nations
  Statistics Division, 2007).
- Fragmentation of accessible E&IT laws, regulations, and standards is prevalent across all geographic regions, countries, and states. As a result, fragmentation has driven up costs due to E&IT vendors needing to develop and test their products to multiple standards, creating longer lead times for industry and consumers, and establishing a need for global standards harmonization.
- Formalization of standards or efforts to create a "certification of compliance" vs. a "self declaration
  of conformance" for accessible E&IT products and services may continue to guide standards
  towards fragmentation. Risks associated with formalization of certification include; restricted
  innovation, increased costs, and delayed time to market.
- Individuals and consumer groups are using non-E&IT legislation; Americans with Disabilities Act of 1990, the Disability Discrimination Act (DDA) of the United Kingdom and the Federal Disability Discrimination Act of Australia (1992), to satisfy E&IT accessibility-related grievances. These initiatives drive the momentum of E&IT accessibility standards.
- Identification of key "players" to monitor, for example, governments and organizations whose
  efforts may realize the greatest impact on the adoption of common E&IT accessibility laws and
  standards.
- Where environmental and privacy issues are more homogenous, issues around E&IT tend to be more disparate. Due to the many types of disabilities and age-related impairments, one size accessible product solution does not fit all.
- Providing accessible E&IT products and services also benefits the growing population affected by age related impairments in addition to people with disabilities.

## 3. Opportunities

Demand for accessible technology and services will continue to rise as governments move to meet the needs of citizens. According to Forrester Research (2003), there are several notable opportunities currently available for those successfully involved in this endeavour:

- Provide and market accessible E&IT products and services as a market differentiator.
- Leverage the growing global population of aging users of technology E&IT as a separate market segment by providing accessible products and solutions.
- Leverage accessibility solutions for the growing needs of mobile computing, i.e. PDAs, cell phones, low-bandwidth areas.
- Sale of third party Assistive Technology products.

- Gain loyalty of users of accessible products and features.
- Working with enterprises that need to provide accommodations for their employees.
- Web and Software Accessibility consulting opportunities which include provisions for design, remediation and services with specific public sectors.
- Accessibility consulting opportunities which include provisions for design, remediation and services.
- Partner with other 3<sup>rd</sup> party web consulting services.
- Provide an all inclusive E&IT/Web Accessibility "solution package" to include standard products bundled with assistive technology products, and provides for installation, training, and support.
- Improve efficiency and ease of use for all end users.

## 4. Defining the Market

Now that accessibility is evolving into a sound organizational practice for private industry and an efficient method of service delivery for governments, it is critical to be able define the growing market, and most important – understand how to reach this untapped consumer base.

Around the world more than 750 million people with disabilities are gaining recognition as a significant and growing market for products and services, and they are making their needs and expectations known. Using information and communication technology that is accessible is the fastest way in which to reach people with disabilities and the elderly.

Millions of people with disabilities regularly travel, shop, go to school, and eat out with family and friends. A study by the U.S. Department of Education found that one in five households in the U.S. is affected by a disability (US Census Bureau, 2003). The 2000 U.S. Census (nd) reported that almost 42% of older adults (65+ years) have one or more disabilities. In fact, in the US the percentage of people with disabilities is larger than any single ethnic, racial, or cultural group. At 19.3%, the number of people with disabilities exceeds the next largest group -- Hispanic people (14.9%) -- by a fairly wide margin (U.S. Department of Justice, 2005).

In the UK, CSR Europe (undated) estimates that 8.6 million people (aged 16 and over) self-indentify as having a disability, which translates into 15% of the population. By the year 2010, 40% of the UK population will be over 45 – the age at which incidence of disability increases. Those over 50 years of age currently account for one fifth of the UK population, and they own more than 80 percent of the country's asset wealth and are the group most likely to vote in general elections. Surprising to some, 33% of 50-60 year olds now have a disability.

In all of Europe it is estimated that at least 39 million people have a disability. It is also estimated that in every country 10 to 20 percent of the population has some form of disability, a number that is expected to grow (CSR, undated).

As pointed out by the U.S. Department of Justice (2005), as these numbers continue to grow, so does the spending and voting power of persons with disabilities. Examples of the global spending power of people with disabilities include:

- United Kingdom: The Institute of Employment Studies reported that in 1999, Britons with disabilities had a disposable income total of £80 billion.
- United States: The President's Executive Committee on Employment of People with Disabilities says individuals with disabilities control well over \$220 billion in discretionary income.

- Australia: The Australian Bureau of Statistics estimated that Australians with disabilities have a discretionary income of at least AUS \$26 billion.
- Canada: The Conference Board of Canada reported that the combined annual disposable income
  of working-aged Canadians with disabilities was a minimum CAN \$25 billion.

This growing demographic now represents additional business and profit for private enterprise, and a swelling consumer base for government agencies. Accessibility attracts not only people with disabilities, but also their families and friends. Like anyone else, people with disabilities often visit stores, restaurants, movie theaters, and other businesses accompanied by family or friends. This expands the potential market exponentially (The Solutions Marketing Group, 2007).

Recent trends demonstrate that everyone – people with and without disabilities -- benefit when businesses give customers with disabilities an equal opportunity to obtain their goods, and governments provide equal access to services. By positively recognizing people of all ability levels -- businesses, schools, and government agencies can make it easier for people with disabilities, as well as others, to more easily access and purchase the services or products they have to offer. In other words, accessibility pays dividends and makes good business and organizational sense.

Making it possible for customers with disabilities to access your goods and services is not only an important part of complying with international accessibility standards, but is also an important part of any organizational management plan.

A historical perspective of the advancements in accessibility shows that in the past we have built ramps and elevators in lieu of stairs for people with disabilities to better access goods and services. As the online landscape becomes a more critical aspect of daily life, it is now time that we build ramps to technology as well.

## 5. Perspectives from the Field

TecAccess, an international accessibility consultancy, recently conducted a brief survey to sample the opinions of people with disabilities when working with businesses, government agencies, and schools.

A sample of the responses included:

- "There is a general lack of awareness about how people with disabilities function," was the most common statement.
- "There is little knowledge about how to write and speak with and about people with disabilities" was another.
- "Most people are deficient in knowledge about assistive technologies."
- "There is a lack of patience in interacting with people with disabilities."
- "People don't listen" or are "Too quick to try to reach a solution without understanding the problem."
- "No assistance for on-hand staff to answer questions and walk you to a specific area."
- "There are typically a lack of shopper assistants, mobility devices, and bar code scanners for people who are blind."
- "There is a deficiency in employee training with regard to disability awareness."
- "Some organizations don't accept relay calls for people who are deaf or hard of hearing."
- "There is a lack of knowledgeable about accessibility features and devices."

Moving forward, it is important to understand such responses in order to truly comprehend this audience. A key element to this critical step is to know the basic functionality of standard assistive technologies used by people with disabilities.

In its most general form, "assistive technologies" refers to variety of technology used by people with disabilities such as screen readers, speech recognition, and Telecommunication Devices for the Deaf (TDD) or TTY. By becoming familiar with these devices organizations can better understand how people with disabilities access and use programs, products, and services.

There are many types of assistive technology used by people with disabilities.

Examples include:

# **Augmented Output Devices**

Screen readers (JAWS, Window Eyes) Screen Magnification (MAGic, ZoomTEXT) Braille displays

Visual representation of auditory information for people who are deaf or hard of hearing

#### **Augmented Input Devices**

Voice recognition (Dragon Naturally Speaking) Alternative keyboards Alternative pointing devices

There are as many accommodations and assistive devices as there are forms of disabilities. It is therefore important not to forget that limitations come in many forms and organizations should be prepared to confront the many possibilities.

It is assistive technology examples such as these that demonstrate how services, programs, and products are not truly accessible until they are usable by everyone—this includes people with and without disabilities, many of whom use assistive devices. Best of all, accessibility aids more than those with disabilities.

## It also aids:

- an active aging population
- people who speak another language
- people with low vision
- people with learning disabilities
- people with low bandwidth

In other words, accessibility assists everyone.

It is therefore critical for businesses, government agencies, and schools to understand the common problems encountered by people with disabilities. For example, if an organization is web-based or uses an IT component as part of sales management and customer outreach, then they should integrate all systems by configuring requirements and issues between assistive technologies used by consumers with disabilities (National Telecommunications and Information Administration, 2000).

This is actually much simpler than it sounds. There are numerous easy-to-implement and cost effective solutions that allow people with disabilities to easily navigate IT systems. This holds true naturally for all manners of communicating with individuals with disabilities – whether it is over the phone, in person, by mail or onsite. Most, if not all of potential issues, can be eliminated or improved upon by proper training of employees and staff that interact with people with disabilities, as well as marketing and sales teams that address consumers. This goes back to simply knowing your audience, their needs, and their challenges (NCI, nd).

## 6. Who's Doing it Right?

## Best Practice Examples:

Hewlett Packard is a "Best Practice" example

Hewlett Packard's goal is to develop technology that can meet the growing demand and expectations of consumers worldwide, including people with disabilities and age-related issues.

HP provides extensive Executive Support:

- For example, accessibility has become "proceduralized" at all levels of HP from management to marketing - which maximizes the company's potential to develop truly accessible electronic and information technology products.
- HP uses what they call the "Total Customer Experience" or TCE. HP looks at all of the touch points, from how a customer selects their product, to how the customer will use their product.
- HP also stresses Self Conformance though not required by law, HP designs all products and websites towards Section 508 and W3C guidelines.
- HP provides detailed VPATs/Supports the Buy Accessible Wizard HP provides summary-level and detailed VPATs for all products through an online VPAT Database, and provides accessibility/VPAT information for all products through the GSA Buy Accessible Wizard (BAW).
- HP's AT Partner Program HP partners with over 50 AT vendors to develop assistive technology on HP technology (desktops, notebooks, handhelds, printers, scanners, etc). HP tests AT products and includes those results in their VPATs, and HP supports Microsoft and AT vendors in reporting their applications to next generation operating systems.

Similar to HP, IBM has also invested years in research to better understand the needs of people who experience a wide range of physical impairments or other difficulties that can affect their computer use and they continue to do so.

IBM is an industry leader, serving as a best practice example:

- IBM's slogan Innovation for everyone. Enough Talk. Let's Make it Happen. IBM has demonstrated an understanding of the wide range of differences and abilities of computer users, and has turned questions of accessibility upside down. "Instead of creating a world of ideal forms to which we then find ways for people to adapt themselves," IBM asks, "Shouldn't we be adapting the world to the people."
- IBM has pioneered the cause to open the world of information technology (IT) to more people, regardless of ability or disability. IBM's long-standing commitment to people with disabilities began in 1914 when IBM hired its first employee with a disability, 76-years before the Americans with Disabilities Act (ADA). From its fair hiring practices, to its dedication to making products and services accessible, to its commitment to research, IBM has been an industry leader in the accessibility arena for more than 50 years.
- For these efforts, IBM is the winner of the 21<sup>st</sup> Century Business Partner Award by Goodwill International. In addition, IBM is the winner of the Helen Keller Award, and countless Disability Employment Awareness Awards and Business Awards for Partnership Programs with People with Disabilities. Employees such as IBM's Sr. Project Manager have received such distinctions as the National People with Disabilities Professional Achievers Award from the President of India.
- What began early on as a philanthropic effort has evolved into a business transformation effort for IBM and its clients. IBM, along with all of private industry, is now seeing both the public and private sectors driving accessibility adoption.
- In 2000, IBM merged existing accessibility groups to form a worldwide Accessibility Center with locations in the United States, Europe, Japan and Australia. The Accessibility Center fosters product accessibility, works toward the harmonization of worldwide standards, applies

- research technologies to solve problems experienced by people with disabilities, creates industry-focused solutions and generates accessibility awareness.
- Helping people with disabilities access IT requires innovative technology. As part of the IBM Research organization, the Accessibility Center has a direct line to the scientists developing new technology. After promising ideas emerge from IBM Research, the Accessibility Center works with influencers, advocacy groups and clients to pilot these technologies. Successful pilot programs are turned into offerings that help more people access IT - regardless of ability or disability.
- As accessibility has evolved into a business transformation effort, IBM has remained dedicated to recruiting and hiring people with disabilities and helping them to be successful in the workplace. IBM advocates for people who have disabilities by instituting and maintaining favorable hiring practices and sponsoring education and employment programs.

Similar to the success of IBM and HP, there are plenty of other best practices to be found within the U.S. Federal Government. The U.S. Patent and Trademark Office is one such accessibility success story. In fact, the USPTO has hired over 60 federal employees with disabilities due to their success.

The USPTO and its skilled employees today train vendors that do business with the government so that they too can "procedualrize" Section 508 and other accessibility law into their agency or business.

To assist in this process, the USPTO hosts hundreds of free training courses each year.

- In 2005, over 2,000 participants government employees as well as private contractors received training in everything from accessible software and web development, to telecommunications and PDAs.
- As a result, the contractors and vendors that participated in the accessibility trainings
  produced products faster, better, and cheaper than those that did not learn the benefits of
  accessible design.
- The end result accessibility is the law; but it also saves money, increases productivity, and improves the quality of the end product.
- USPTO believes that the accessibility process should start from DAY 1. As a vendor begins to create their product, the USPTO will evaluate the progress so that there are no surprises when the product is finally tested.
- The "evaluation team" keeps vendors on schedule, saving them time and money, so that the product is compliant before testing opposed to other federal agencies that evaluate after testing, causing vendors to have to retrofit later.
- Because of the USPTO's standardized approach, private industry and government are more productive and fiscally efficient.
- In fact, because of their ability to "standardize" Section 508 compliancy, the USPTO saves \$19,000 per person a year, proving that it pays to make reasonable accommodations.
- The USPTO calculates their cost savings now that they are building compliance up front and don't have to pay for remediation and retrofitting. They have embraced Section 508 and other accessibility law from the beginning.
- For these efforts, the USPTO earned the "Federal Government Best Practice for Outstanding Individual Federal Team," and its E&IT Coordinator received the "Change Agent" Award by the Office of Civil Rights.

#### 7. Results

 By implementing some of these very simple and cost effective strategies, organizations can anticipate setting themselves apart – creating a market differentiator.

- Organizations can increase government services and sales by demonstrating and documenting product accessibility.
- Organizations can leverage a new market segment by demonstrating their leadership in the growing accessibility movement, and therefore capture a valuable consumer base that is currently up for grabs.
- Organizations can increase their public image and socially conscious standing by demonstrating their embrace of all people – those with disabilities, those without disabilities, as well as those who may be aging and acquiring a disability for the first time in their lives.
- Enables organizations to use accessible products to recruit and hire from an untapped, qualified labor pool.
- Organizations will also gain loyalty of users and positive brand recognition from those who rely
  on their accessible products and services.

#### 8. Recommendations

In carrying forward this message; there are key factors in <u>developing a successful plan to promote</u> your <u>dedicated accessibility efforts</u>.

- First, you must promote your accessibility solution up front. Use it to set your organization apart, leverage the steps that you've taken, be proud of them, and make sure others are aware of your efforts.
- Get the "right" people involved. Create an accessibility team, or host of experts on the topic.
  Partner with experts in the field, and whenever possible, ask a person with a disability how
  you're doing using a person with a disability to test the accessibility and usability of your
  product will allow your organization to use a firsthand perspective as to what does and does
  not work.
- Become a trusted advisor, set yourself apart as experts on this topic, and leverage this knowledge to attract new customers, new employees, and new partners.
- Understand the end user's motivations and requirements. Understand that this market is no different from the rest of us.

There is also an increasing need to educate everyone from front line staff up to top level management in disability awareness and in some of the difficulties people with disabilities might encounter with your program, products, and services. It is important to educate these employees with such information so that they become more efficient, more comfortable, and more sympathetic to the concerns of people with disabilities.

Many issues relating to disability awareness and accessible technology can be fixed by properly training your employees and staff that interface with consumers. Topics should include:

- Understanding the different types of disabilities and common issues relating to each area.
- Be aware of hardware and software used to support these disabilities.
- Understand system requirements and configuration issues between assistive technology and IT
- Present troubleshooting tips, checklists, and process for problem escalation.
- Provide disability awareness training for example, disability awareness training that uses simulation exercises works best, (such as putting people in wheelchairs or blindfolding them) in order to allow non-disabled people to have an idea of what having a specific disability may be like.

Lastly, it is important to remember that an organization's accessibility efforts represent a unique selling proposition and proof point. It is therefore beneficial to promote your "disability-friendly story" based on your successful accessibility history and commitments. Promote your knowledge regarding disabilities and accessibility, emphasize your awareness of international disability movements, and publicize your accessible product knowledge.

## 9. Summary

In order to improve services and interaction with people with disabilities, it critical to understand and have the data in place that is representative of today's market. The changing landscape of our current marketplace has resulted in a dramatic increase in the number of people who have disabilities and those acquiring disabilities for the first time in their lives as our population ages (Siegel, 1996).

It is now imperative that organizations understand and utilize assistive technologies while providing disability-friendly services, accessible solutions, and universally designed options for consumers and potential new consumers with disabilities and those with age-related limitations.

The advantages of effectively reaching people with disabilities are clear. If your goods and services prove to be functional and adaptable, and your support staff are familiar with and able to work with people with disabilities, then your organization stands to gain a tremendous marketplace advantage as this population continues to boom. In turn, organizations will increase loyalty to their goods and services, and ultimately their brand. Investing in relationships increasingly requires understanding of how to connect to consumers - with and without disabilities, as well as those who self-identify with having a disability, and those who do not. The benefits of attracting and maintaining consumers with disabilities extends beyond a niche audience, and moves firmly into supporting the needs of all people.

As people with disabilities drive the creation of new communities, they are forever changing the way we live, learn, work, and play. Increasingly, organizations are expanding their presence into emerging markets. Organizations are now serving populations that they have never before served. Every consumer is different. No two people have the same exact set of learning-styles, abilities, experiences, or educational background.

Good organizational management practices dictate that schools, businesses, and governments avoid unintentionally excluding large groups of consumers from accessing and using their product and service. Therefore, designing your goods and services with people with disabilities in mind can significantly increase the size of your audience, as well as the way in which you treat and manage your audience.

In conclusion, it is recommended that the reader remember and implement these examples and success stories, and to look within their respective organizational environments. Think about what you can do to better reach people with disabilities, and find creative ways to make it happen through accessible technology.

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