



# Enterprise-Level PDF Accessibility: Drivers, Challenges and Innovative Solutions



## Abstract

The rapid, ongoing shift of information and services to the internet has made web accessibility a matter of urgency for blind and visually impaired people. To achieve progress on this important issue, advocacy groups and individuals have taken legal and political action.

Facing expensive lawsuits and imminent changes to accessibility legislation, many private organizations and public-sector agencies are now looking for affordable technology solutions to help them deploy accessible websites and web content, including web-delivered customer communications.

Until recently, a large gap existed in overall web accessibility because no technology solution existed for economically generating high-volume, personalized communications such as bank statements, utility bills, and government notices in Accessible PDF format.

This white paper explains the need for customer communications in Accessible PDF format, describes typical industry production methods and limitations, and finally introduces market-available, enterprise-level technology enabling the production of high-volume Accessible PDF documents.

## Introduction

Under pressure from advocacy groups and individuals, organizations such as government agencies, retailers, utilities, telcos, banks, credit card companies, non-profits, and institutions of higher education are now focusing on web and web content accessibility.

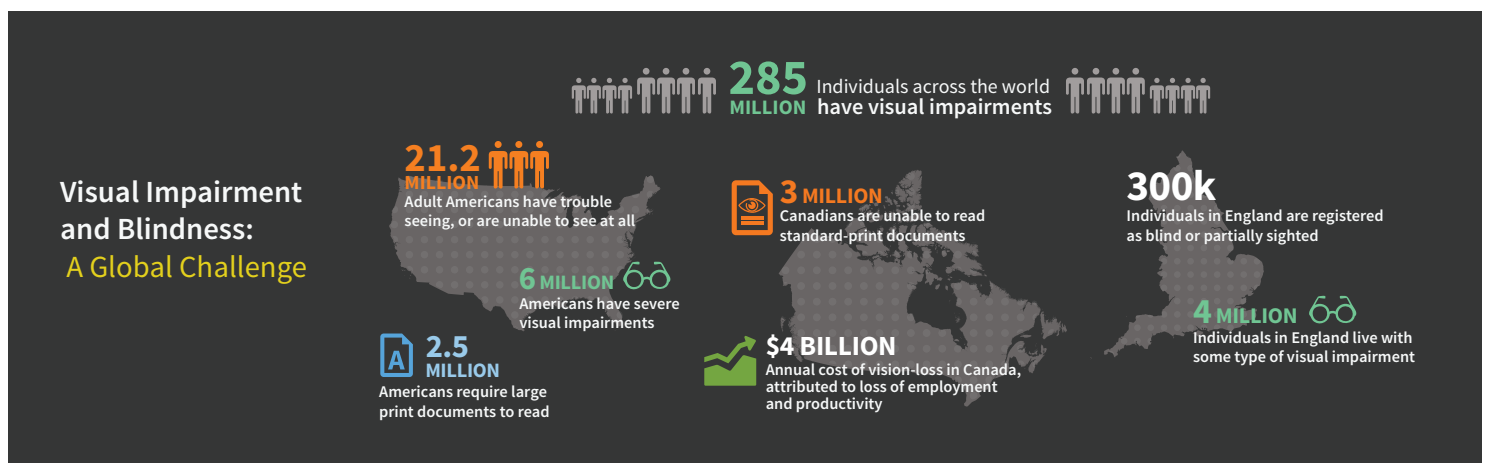
In an effort to satisfy heightened customer expectations and comply with evolving accessibility legislation, they are adopting online technology solutions that feature inclusionary digital design and content delivery. As organizations strive to offer universal accessibility to customers and employees alike, they are increasingly developing web assets with assistive technology (AT) and user experience firmly in mind.

To help them achieve complete web accessibility, organizations require a viable technology solution for automatically generating high-volume (i.e., enterprise-level) personalized customer communications in Accessible PDF format. Such a solution would give blind and visually impaired people immediate and equal access to electronic documents, which they currently do not have.

This white paper explains why demand is increasing for customer communication documents in Accessible PDF format, describes current industry practices for producing these documents, and introduces a new technology option that enables organizations to keep PDF format as their default electronic format for high-volume, web-delivered documents of record while enabling full accessibility and usability of those PDFs for individuals who are blind or visually impaired.

## Web Accessibility Drivers

Currently, over 285 million individuals across the world have visual impairments, including more than 20 million Americans with some form of vision loss, ranging from low vision to blindness. These individuals are valued customers—consumers with buying power—and employees, who have been swept along with everyone else on the internet wave that is revolutionizing how we live, work, play, and communicate.



It is now a fact of daily life that organizations of all shapes and sizes urge and incentivize people to interact with them online through self-service websites (which are far less costly than traditional live customer service operations).

To thrive and survive in the 24/7 on-demand digital world, blind and visually impaired people have embraced assistive technologies such as screen reader software to help them gain access to electronic, web, and mobile content. With an aging population, adoption and use of these technologies is exploding, driving demand for an online user experience comparable to that enjoyed by sighted customers.

Laborious *exception processes*, in which blind and visually impaired customers request documents in traditional formats such as Braille (and then wait for them to be reproduced and delivered in the mail), are falling into disfavor as consumers become increasingly tech savvy, wanting (and expecting) instant access to both their personal account information and widely available digital content.

Caught off guard by this sudden technology-induced shift in customer expectations, a large segment of the private and public sectors have yet to offer websites and web content in a format that is universally accessible to all customers, with or without vision loss.

Responding to public pressure, **lawmakers are amending legislation and regulatory standards to address web accessibility issues**. Also, a mounting number of successful lawsuits and settlements related to inaccessible websites and web content, including web-delivered personal communications, is helping to establish a “new normal” for accessibility on the internet.

## Accessibility Legislation and Standards

### Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) states that government agencies, public accommodations, commercial facilities, and transportation organizations must take reasonable steps to provide access to services. Enacted in 1990, before the internet revolution, the ADA currently contains no specific provisions for websites and web content but an amendment has been proposed.

The imminent Title III Amendment to the Act explicitly defines the internet and many places on the web as public accommodations, requiring affected organizations to provide accessible websites and web content, including web-delivered documents.

### Section 508 of U.S. Rehabilitation Act

Section 508 of the Rehabilitation Act mandates how the U.S. Federal Government procures, develops, uses, and maintains Electronic and Information Technology (EIT). Private-sector federal contractors and vendors must also comply with Section 508 in order to do business with federal agencies, or to deliver federally funded programs or services (such as Medicare/Medicaid). Since the U.S. Federal Government is the largest consumer of EIT products, Section 508 is having a significant impact on the private sector.

Most U.S. states have also adopted Section 508 or created similar laws.

### Section 255 of U.S. Telecommunications Act

Section 255 of the Telecommunications Act requires telecommunication providers to make products and services, including billing services, accessible.

### Anticipated Updates: Rehabilitation Act and Telecommunications Act

A refresh of the Telecommunications Act and Section 508 of the Rehabilitation Act is on the horizon. For Section 508, the goal is to broaden the scope to include Information and Communication Technology (ICT) such as mobile technology, establish a clear standard for accessible content, and achieve a stronger harmonization with other standards.

Updates to the Telecommunications Act are anticipated to provide inclusion of modern communication technologies such as the internet.

## Addressing Web Accessibility Issues



**Americans with Disabilities Act (ADA)**



**Section 508 of U.S. Rehabilitation Act**



**Section 255 of U.S. Telecommunications Act**

**Anticipated Updates: Rehabilitation Act & Telecommunications Act**



**Web Content Accessibility Guidelines (WCAG)**



**Twenty-First Century Communications and Video Accessibility Act (CVAA)**

## Twenty-First Century Communications and Video Accessibility Act (CVAA)

Signed into law in 2010, the Twenty-First Century Communications and Video Accessibility Act (CVAA) is intended to help people with disabilities access broadband, digital, and mobile innovations such as the internet, television programming, mobile content, and emergency information (e.g., next-generation 911 services). Title I of the Act specifically addresses broadband access, with the goal of making products and services fully accessible to people with disabilities, while Title II is concerned with video programming issues.

## Web Content Accessibility Guidelines (WCAG)

Created by non-profit organization World Wide Web Consortium (W3C), the Web Content Accessibility Guidelines (WCAG) help organizations and individuals develop truly accessible web content. This globally relevant set of standards and practices has been adopted by many countries, providing a solid foundation for web accessibility legislation.

All new accessible web content, including web-delivered communications and documents, should comply with WCAG 2.0, Level AA or higher.

## Legal Activity around Web Accessibility

With accessibility legislation lagging behind the needs of blind and visually impaired people, national advocacy groups have brought web accessibility to the fore by suing highly visible organizations for failing to provide accessible websites and web content to their customers.

Many judges have agreed with the interpretation of the ADA's definition of a "place of public accommodation" to include websites. As a result, organizations have been compelled to retrofit their websites (and all electronic content, including PDF documents) with accessibility features.

## PDF Accessibility

*Web accessibility* is a blanket term covering every file format and content type on the internet, including PDF documents. Millions of Americans now receive web-delivered PDF versions of bank statements, government notices, utility and telecom bills, and other communications in lieu of mailed hardcopies. Until recently, none of these high-volume PDF documents have been accessible, so blind and visually impaired people could not independently manage their affairs online, requiring sighted assistance from family, friends, or support workers.

To maintain their independence, blind and visually impaired people have continued to participate in exception processes that replace paper (or PDF) with traditional alternate formats (e.g., Braille versions of their documents). Since alternate hardcopy formats can be labor-intensive to produce, blind and visually impaired people often receive important documents several weeks or months later than other customers. At best, an exception process delivers an inferior customer experience and, at worse, undermines human dignity and prevents people from making timely decisions about their finances, health, and other important affairs.

For organizations, **exception processes can be costly** to set up and maintain.

Clearly, customers and organizations alike would appreciate an affordable technology solution for producing high-volume, personalized communications in Accessible PDF format. This would allow tech-savvy customers to opt out of cumbersome exception processes and gain instant access to their documents, while organizations would simultaneously save money, meet regulatory standards, adhere to accessibility legislation, and serve their customers better.

## Why PDF?

There are several compelling reasons why the PDF format is (and will continue to be) the de facto electronic document standard for high-volume customer communications such as statements, notices, and bills.

These reasons are:

- PDFs provide an unchanging snapshot**  
 Organizations require a *document of record*, or a single, reliable visual presentation of business documents, including customer communications, at the time they are authored. In other words, a PDF document is the digital equivalent of a hardcopy.
- PDFs are portable**  
 PDFs offer secure multi-platform support for viewing and managing documents on desktops, laptops, tablets, and smartphones, using Windows, iOS, Android, Linux, UNIX, and other operating systems.
- PDF is an open standard**  
 Specifications for the PDF format were made freely available in 1993, and PDF was officially released as an open standard in 2008 (ISO 32000-1).
- PDF is commonly used as a regulatory standard for archives**  
 In some industries, such as financial and insurance, regulatory statutes require official electronic archive records to be in PDF format.
- PDF is already supported by extensive IT infrastructure**  
 By all indications, PDF is not going away anytime soon. Government agencies and big companies have massive investments in IT infrastructure that produces millions of recurring PDF documents such as personalized monthly notices and bills. The financial industry, an early adopter, has also invested heavily in IT technology that enables online presentation of PDF statements.

For these reasons (and others, no doubt), PDF is the format of choice for organizations that need to generate and distribute business communication documents to their customers.

## PDF versus HTML

Closely tied to the question “Why PDF?” is the question “Why not HTML?”

While HTML is ideal for delivering live accessible web and mobile content, such as on-demand, customizable summaries of financial, telecom, or health data, it does not provide a single, reliable visual presentation of a document at the time it was authored. HTML supports the structure and semantics of content, but not its presentation.

Also, HTML does not support archiving or portability, meaning HTML files are not “official” documents (i.e., documents of record) that can be stored and distributed as fixed entities, such as when a person provides documents to prove residence or creditworthiness. In industries such as health, finance, and insurance, some data contained on a customer statement often does not appear in the HTML presentation.

HTML, when designed accessibly, is best suited for dynamic web transactions and visual presentations such as expense or timekeeping submissions, job or credit applications, summarized data trends, and marketing web pages (optimized for search engines).

	PDF	HTML
Regulatory standard for archiving	Yes	No
Permanent record of official documents	Yes	No
Portable	Yes	No
Best for dynamic / mobile presentation	No	Yes

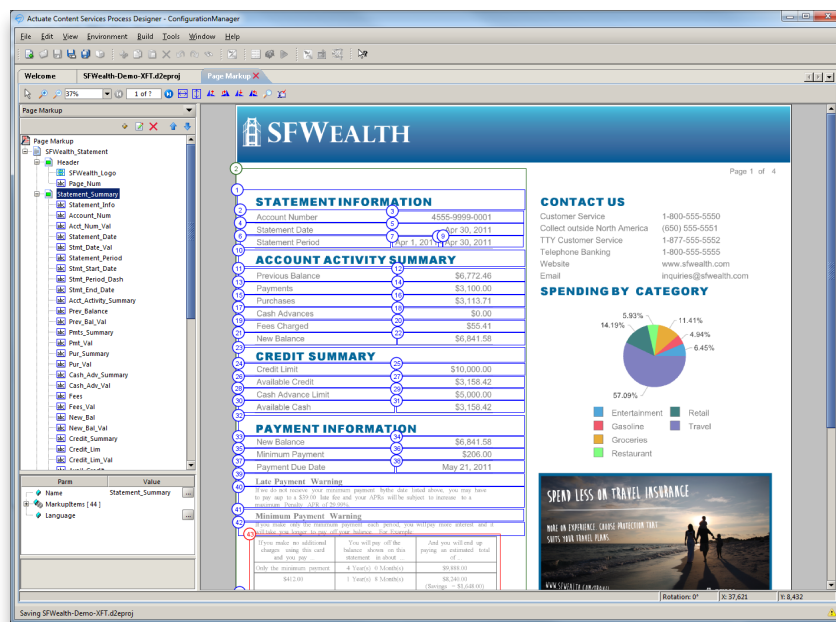
## The Difference between PDF and Accessible PDF

Unlike regular PDFs, Accessible PDF documents are designed to be barrier-free, universally accessible, and usable by people with or without disabilities. Although the top image layer of an Accessible PDF document is identical to that of a regular PDF, meaning the files are visually indistinguishable, the associated metadata inside the PDF is different.

Accessible PDF documents contain distinct tagging, markup, and structure that enables assistive technologies such as screen reader programs to read the documents in the correct order, facilitate navigation, and provide complete information about visual elements such as images and graphs.

Accessible PDFs include mark-up that defines:

- Logical read and tab order
- Text and headings
- Tables
- Non-text elements (e.g., images, graphs, figures)
- Lists
- Properties, fonts, and contrast
- Language
- Bookmarks
- Links (internal and external)



Actuate Patented Technology

To meet a functional standard of accessibility, PDF documents should be designed to comply with WCAG 2.0, Level AA or higher. Ideally, documents are created in PDF/UA (Universal Accessibility) format, as defined by ISO 14289-1<sup>1</sup>.

## How PDFs are Generated

PDF documents are either created individually at the *desktop level* by human operators or in large batches at the *enterprise level* by sophisticated software applications.

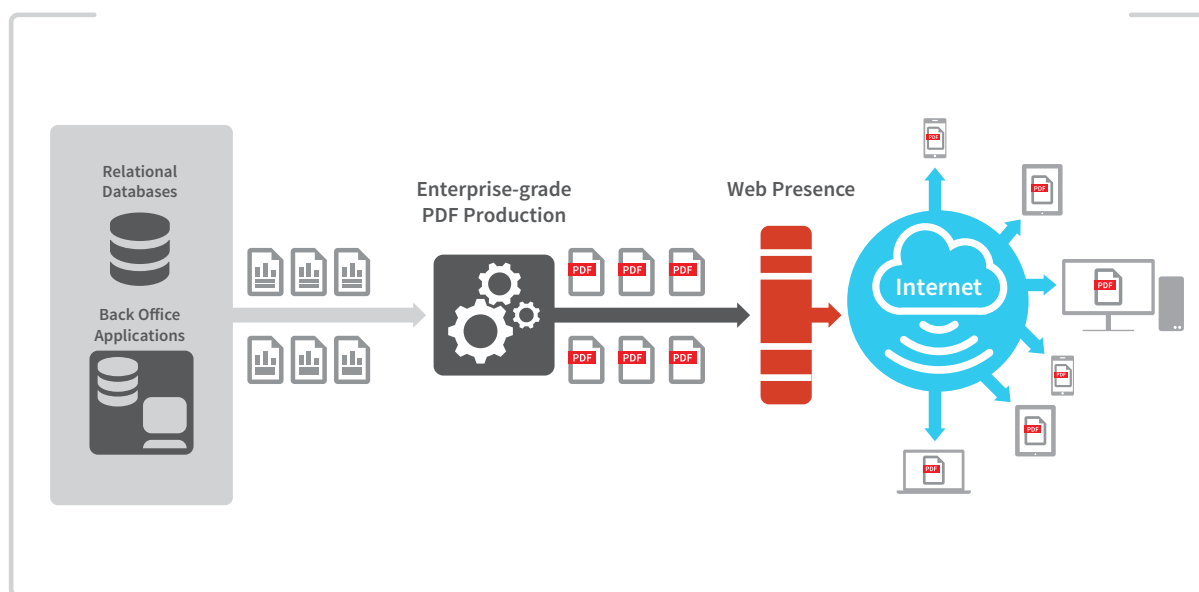
### Desktop Level

At the desktop level, PDF documents are manually created by individuals using word processors such as Microsoft Word, graphic design programs such as Adobe Creative Suite, or other software applications. These low-volume ad hoc documents typically include annual reports, newsletters, marketing collateral, training manuals, program support material, and other public-facing documents. PDF versions of scanned hardcopy documents may also be created at the desktop level.



## Enterprise Level

At the enterprise level, PDF documents are automatically created in large volumes by powerful software applications (e.g., document composition engines) supported by enterprise-grade IT infrastructure such as relational databases, high-speed servers, and large-capacity storage devices. These high-volume documents are typically customer communications such as notices, statements, bills, and invoices that are personalized with customer account data for individual recipients. Because they contain confidential information, customers usually access such documents through secure, password-protected web portals.



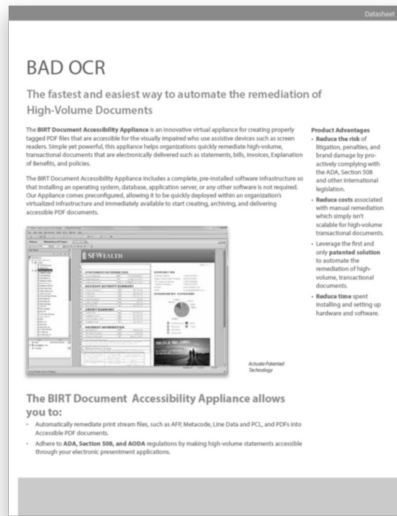
## Reasons Why PDFs are Inaccessible by Default

At the desktop level, PDF documents are typically produced by converting existing native documents (e.g., Microsoft Office documents, Adobe Creative Suite documents) into PDF format. During the conversion process, the software application attempts to formulate a tag structure based on the contents of the native document.

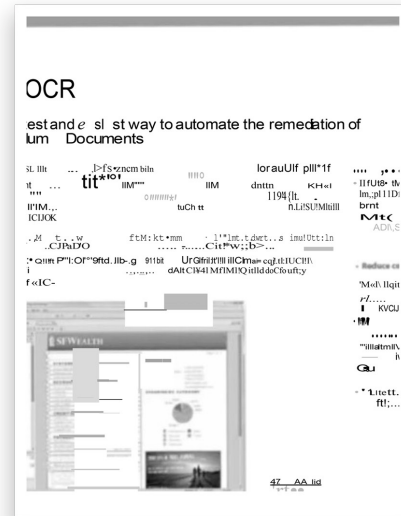
If the author of the native document has not followed *accessibility guidelines*, explicitly identifying elements, such as headings, and properly formatting lists, tables, and other items, the software simply assigns a tag structure based on its best algorithmic guess about the document, often resulting in errors.

While software applications that generate Accessible PDF output are able to faithfully reproduce the *appearance* of a native document, they cannot infer a logical reading order or produce meaningful alternative text for graphical elements. When alternative text for images is missing from the native document, the PDF conversion engine assigns generic identifiers, e.g. "Image 54", which are meaningless when read aloud by a screen reader program. Unfortunately, the automated conversion process itself is error-prone so even when native documents have been designed with accessibility in mind, Accessible PDFs require post-conversion inspection and adjustment by a knowledgeable technician to make their contents and tag structure 100% compliant with the specified accessibility standard (e.g., WCAG 2.0, Level AA). For example, during conversion, tables may be incorrectly tagged as graphics, or table data may become dissociated from its corresponding column or row header. Similarly, text headings may not be detected and lists without active and meaningful destinations may only be recognized as plain text.

When optical character recognition (OCR) software is applied to image-only or scanned documents, the resulting PDF document may contain garbled text, punctuation, case, and spacing. For example, "Statement Information" could be converted to "Stat ementln forma tion" in the PDF document and thus sound like gibberish in a screen reader program. Also, the tag structure of a PDF document generated with OCR technology will always need to be manually adjusted by an accessibility technician using specialized software.



Scanned Document



(OCR) software

In short, desktop PDF conversion technology is far from perfect. Regardless of the quality of the native source document, PDFs created on the desktop must always be manually remediated and inspected (page by page) to ensure compliance with the accessibility standards required by assistive technologies. Traditionally, this is an expensive, labor-intensive, time-consuming process.

## Traditional Approaches to Generating Accessible PDFs

### Desktop Level

Existing low-volume, ad hoc PDF documents that need to be made accessible are manually remediated by human operators using specialized desktop software applications such as Adobe Acrobat Professional, CommonLook, Abbyy, and others. To lower costs and achieve faster turnaround times, many organizations contract out manual remediation to specialized third-party service providers that operate more efficiently than smaller in-house teams.

To facilitate new document creation and improve quality, organizations develop standard accessible templates for individual document types (e.g., Microsoft Office) and enforce their use by employees, vendors, and contractors. Once converted to PDF, every page of a new document is subjected to automated and manual accessibility/usability testing and remediation to ensure that it conforms to accessibility standards such as WCAG 2.0, Level AA.

### Enterprise Level

At the enterprise level, organizations use powerful software applications to dynamically generate high-volume PDF communications for online presentation to customers.

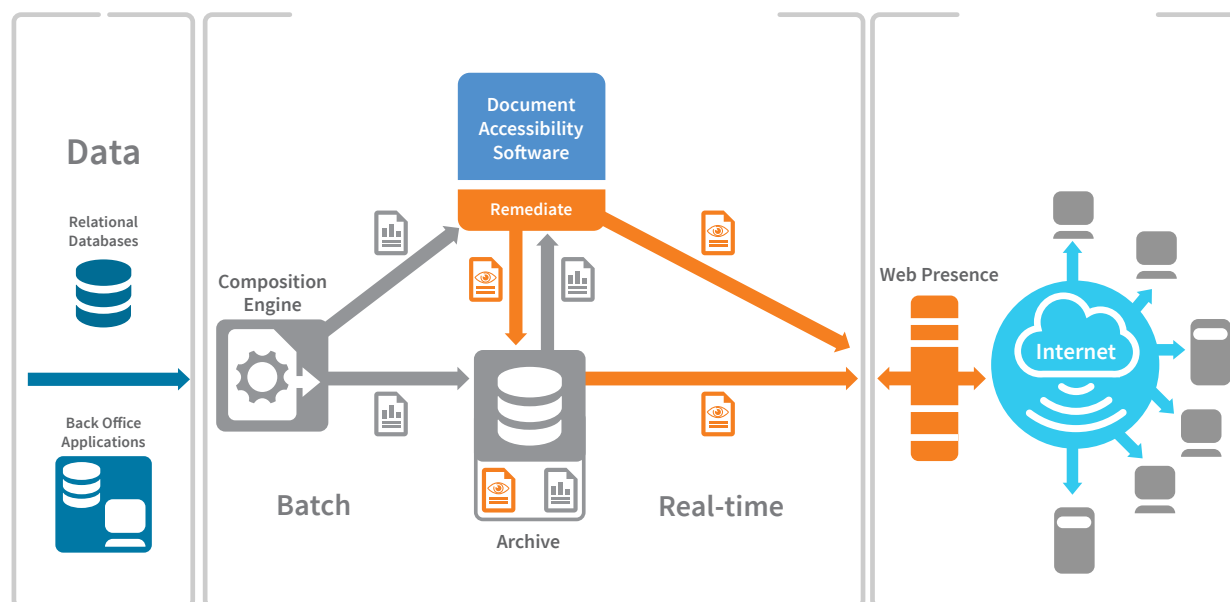
However, **manual remediation does not scale for enterprise production of Accessible PDFs**. The large number of documents created every month—thousands, millions, tens of millions, or more—precludes manual remediation as a viable option, if only as an accommodation to the percentage of customers requiring the accessible electronic format. Due to sheer volume, manual remediation is cost and time prohibitive.

Until recently, there was no automated technology solution either. Organizations simply had no way to produce high volumes of personalized customer communications in Accessible PDF format. That has now changed.

## New Technology for Generating Enterprise-Level Accessible PDFs

A first-to-market, enterprise-level technology for automatically producing personalized customer communications in Accessible PDF format is now market available. The new technology converts print streams, documents, and data into Accessible PDFs, either in high-volume batches (i.e., thousands, millions) or individually on demand (dynamically in real time).





Organizations can use this type of innovative technology to simultaneously improve customer experience for people with visual disabilities and comply with relevant accessibility legislation such as the ADA, Section 508 of the Rehabilitation Act, Section 255 of the Telecommunications Act, and the CVAA.

### Accessibility Rules

Unlike manual remediation, this automated technology leverages a sophisticated, inherently flexible rules model, ensuring that each source document, whether in PDF or print stream format, completely incorporates the specified accessibility rules. Accessibility templates can be easily edited to ensure production continuity of recurring (e.g., monthly) high-volume transactional documents.

Organizations may need to secure accessibility expertise (at least initially) to define PDF accessibility rules for each document type, although the various document authors and creators require no specialized accessibility knowledge because the automated technology includes a highly intelligent graphical user interface.

### Quality Control

Visual PDF tag inspection and usability testing is not required on every page, as it is with manual remediation. Instead, quality control can be maintained with automated and manual accessibility/usability testing on small batches of documents.

This patented technology utilizes PDF/UA format (ISO 14289-1)<sup>1</sup> and incorporates the Matterhorn Protocol<sup>2</sup> to generate Accessible PDF output that has been independently tested and found to conform to WCAG 2.0, Level AA, by nationally and internationally recognized prominent advocacy organizations and well respected worldwide accessibility firms.

### Deployment

This innovative technology can be deployed as a traditional *on-premise* traditional or virtual software installation, or as a *cloud-based* solution.

### Observed Effect on Traditional Format Production

Recent cloud deployments of this new technology are having an unexpected, positive effect on the production of traditional alternate formats such as Braille, large print, and audio. These traditional formats, like manual PDF remediation, can be time and cost intensive to produce, and can delay the delivery of customer communications.

The rich, structured output from this automated technology has allowed for automation of the production of traditional formats, including Braille, large print, and audio, lessening the labor resources needed for manual processing. Each personalized communication statement or notice can be produced more efficiently, reducing cost and delivery time for alternate hardcopy formats.

### ePresentment Options

With the advent of affordable, scalable technology for automatically producing high-volume Accessible PDF documents, private organizations and government agencies suddenly have a number of new options for presenting online customer communications.

For example, organizations can **provide Accessible PDF communications by default**, creating an inclusionary document environment while meeting legislative mandates.

This delivery scenario enables blind and visually impaired people to access their personal information at the same time as other customers, without the delays associated with requesting alternate hardcopy formats.

Or, instead of producing Accessible PDFs by default, organizations with existing systems for online presentation of PDF documents may choose to **provide customers with on-demand conversion to Accessible PDF format**, both for current PDFs and archived documents. For online users, this would mean replacing an inconvenient exception process with merely a few button clicks.

## Implications for Organizations and Individuals

This innovative technology solution for enterprise-level PDF accessibility offers blind and visually impaired people equal (and instant) access to electronic documents, empowering them to be more independent, make more timely financial and other critical decisions, and participate more fully in the 24/7 digital world. Imagine, individuals who prefer digital technology can finally say “No, thanks” to exception processes, accommodations, late-arriving hardcopies in alternate formats, and other such hassles.

For blind and visually impaired people who do not currently request documents in alternate formats, and instead rely on family, friends, and support workers to help them manage their affairs, this technology gives them another avenue for becoming more independent.

With the arrival of this groundbreaking automated technology and its ready availability to organizations producing customer communication PDFs, 20+ million blind and visually impaired Americans have an opportunity to use their buying power to affect meaningful change. They can achieve this by patronizing service providers that offer instant online access to Accessible PDF versions of bank and credit card statements, phone bills, insurance documents, and other routine (yet vital) communications. Likewise, they can demand a comparable level of service from government agencies, non-profits, and institutions of higher education.

This type of technology is a game changer for industry, for government, and most importantly for blind and visually impaired people who deserve equal access to the entire internet, including websites, web content, and web-delivered documents.

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## End Notes

1. Association for Information and Image Management (AIIM), <http://www.aiim.org/Research-and-Publications/Standards/Committees/PDFUA/Technical-Implementation-Guide>, accessed on October 3, 2014.



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