Accessible Documents Pre and Post Composition Workflow Considerations

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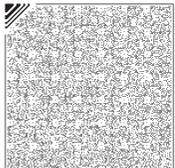
The topic of Document Accessibility is one that is getting a lot of attention these days…and for good reason. Upwards of 285 million people worldwide are blind or partially sighted. Over 30 million people in North America live with a visual impairment and, according to the National Eye Institute, that number is expected to double by 2020 due to the aging of the baby boomer generation.

For these people, the ability to access bills, statements and other transactional documents means greater independence and customer satisfaction. For companies, accommodating customers who are blind, partially sighted, or cognitively disabled is not just good business, it's required by federal legislation. To accommodate compliance and support forward-thinking corporate initiatives, many organizations are looking for workable solutions for the delivery of billing statements and other transactional customer correspondence for these customers.

Accessibility is Required

For companies today, accommodating customers who are blind or partially sighted is required. For instance, the US Rehabilitation Act Section 508 requires businesses to make adjustments to the way they deliver their services so that disabled people can use them. Other examples of international legislation include the UK Equality Act, and the Accessibility for Ontarians with Disabilities Act (AODA) in Canada and EN-301-549 in the European Union. And tighter legislation that puts more onus on organizations to make documents more widely accessible is underway in many other countries as well.

Universal Accessibility

How can you provide accessible documents? Formats range from traditional braille to large print, audio and e-text for physical delivery. For digital delivery, the most prominent method for transactional documents is Accessible PDF with variants PDF/UA and WCAG 2.0 AA Accessible PDF. We will refer to them collectively in this paper as PDF/UA; a "Universal Accessibility" document format developed for people with disabilities who require assistive technology to communicate. Through tags, metadata and special instructions, the PDF/UA standard provides accessibility for people with disabilities who use Assistive Technologies such as screen readers, screen magnifiers, joysticks and other devices to navigate and read electronic content. With PDF/UA, blind or partially sighted individuals who use assistive technology are guaranteed equal access to information.

Another requirement that many organizations need to meet is to display some of their documents in HTML, and for this, accessibility can be built into the documents when the HTML is created. While Accessible HTML is far more difficult for enterprises to use for paper document replacement, however, it is the preferred format by most recipients, especially as mobile device usage grows.

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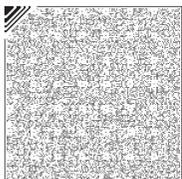
Contrasting Approaches to Accessibility Workflows

There are two prevailing approaches to provide reasonable accommodations for accessible invoices, statements, policies and other customer correspondence: 1) at document composition time and 2) using a post composition process.

At Composition

Some composition tools simply do not create accessible documents, so for these systems, a post-composition approach needs to be used. Other document composition tools like OpenText Exstream, CSF, DOC1 and GMC Inspire have varying capabilities when it comes to creating assessable documents, but none are great at creating PDF/UA. Each application formats data and content elements for common transactional documents like invoices, statements and policies. These document composition tools are driven by templates that induct data as well as static information so that they get merged together to create the final output; typically in a production print format such as AFP or PostScript.

By extension, organizations can increase the scope of their document composition efforts to include the creation of accessible documents concurrently with those being created for printing and archiving. With the expanded workflow, programmers create the needed templates and include the necessary tags to create and add accessible capability in the design structure. The composition software adds the tagged information to the critical headings, tables, images and paragraphs prior to emitting the documents for output.

Some applications need to create documents in HTML instead of PDF. When these documents are created with an interactive composition tool, then having accessibility capabilities in the tool is desired. If they are going to be created in a batch process, then a post composition method will most likely be required. This is because it is not a good idea to archive documents in HTML for any length of time due to future browser compatibility concerns, so HTML creation will be best done during retrieval from the repository.

'Accessibility' should not be just an afterthought

One of the advantages of using an at-composition approach is that accessibility is built into the standard composition process. This makes 'accessibility' not just an afterthought, but part of the primary design of every document. The organization also benefits from extending the value of their existing software investment.

The additional effort to include accessibility during document composition does, however, add significant scope, expense, time and resource requirements to the process. Depending on the volume demand and workflow, additional staff may be needed. Programmers will also need additional training and ongoing education regarding the evolving requirements and technologies associated with accessibility.

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Workflow Considerations

There are two types of document workflows to consider for accessibility: structured and unstructured. Structured documents are normally created by composition software based on templates that contain formatting and business rules. After creation, they are delivered to customers by mail or electronically. The electronic delivery normally involves placing the document in a repository for customers to retrieve and view them over the internet. Unstructured documents come from a variety of sources, often created by office tools such as MS Word, or output from purpose-built applications.

This paper focuses on the challenges in delivering the structured documents, often called transactional documents in accessible format for electronic delivery. Knowing which documents need tagging is often difficult to determine without an extended preference management system in place, so many organizations find it necessary to tag all documents they create to be sure that no customers are missed. Even with a preference management system in place, it might be necessary to tag for all formats,since the gap between composition and viewing usage can be months or years, and the recipients' needs may have changed over that period of time.

In a post-composition workflow, the accessibility tagging step needs to be placed somewhere between the composition step and the delivery to the customer. If the documents are being placed in a repository for customers to access, then the tagging can take place before the documents are stored in the repository or done dynamically when a customer retrieves the documents.

For documents that are delivered by email or simply plugged into a web site, then the tagging needs to take place before they are sent in the email or stored in the web site folders.

An area where the composition approach fails is when multiple composition systems are used to create a single document. This happens when marketing or educational messages are created by an external product such as MessagePoint and then embedded in documents created in another composition system. It also occurs when multiple documents or document segments are combine during delivery to the recipient.

Storage Considerations

Another consideration is that using an at-composition approach can often result in a significant increase in storage demand. Emitters found in most document composition software are great at creating production print files in protocols like AFP, but have never been very efficient in creating individual document PDFs. Indeed, a jump in typical file size from 800K or so to over a gigabyte is not uncommon.

Consider also that organizations can no longer simply store their legacy documents in highly compressed AFP files that have templates, fonts and resources that are stored separately. Instead, a PDF/UA document must be stored that has all of that information and metadata buried inside of each file. For large enterprise organizations this can result in many terabytes of increased storage and the additional expense for hardware, management and backup quickly becomes a major concern.
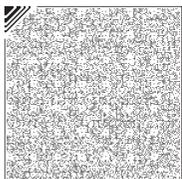
Day-forward or back-file?

An at-composition approach may work for a day-forward approach, but making older documents compliant can be problematic. In this case, you could consider the effort a "re-composition" approach with multiple files and composition templates that will require modification and update. And even after that back file of legacy documents has been reengineered, there is no guarantee the entire process will never be required again. Indeed, there are a number of changes to legislation pending currently (from a potential "WCAG 3.0" to and level AAA in the future) that could require organizations to once again go back and remediate those documents all over again and republish them. This is a real possibility that organizations can face. We know of a government organization that built their accessibility architecture around WCAG 1.0, and when S508 was upgraded to WCAG 2.0 level AA, it necessitated a tremendous amount of rework.

Post-Composition Approach

Another approach to accessible document creation is done using a post-composition approach that adds the required tags and features after the document has been created. Document reengineering tools (like those from CrawfordTech) do the modification after the fact, using production print files (like AFP, PDF, Metacode or PCL) as the source. A template is created that includes intelligent rules-based tagging of all the elements that can be in the document. In much the same manner as sighted people, the system programmatically 'looks' for elements like logos, headings, paragraphs and images, and then sets anchors and triggers to the information located in the file itself. Once identified, appropriate action is taken to present that information in an accessible format.
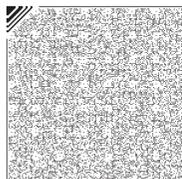
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Automatic Structured Document Tagging

How does it work? The system ingests a production print file and automatically identifies key elements in the document; for example, the first heading, the second heading, paragraphs, graphics, and so forth.

Consider a typical telephone bill. Most likely there will be a logo at the top, then a heading that says "this is a bill," perhaps some other sub-headings, some paragraph text, and perhaps an infographic. All of these elements are identified from the original print file, and once determined, triggers an appropriate event to happen based on predefined rules. That event could be to tag it as a heading, or a paragraph, or an image, and so on.

In short, a post-composition approach interrogates the document file, scans the information, tags each element, adds alternative text to images and sets the reading sequence. Once completed, the system then creates an accessible PDF or HTML. When a recipient invokes assistive technology, the reader will know the location, content and context of each heading, paragraph, table, list element and image. The markers inside the PDF or HTML drive the assistive technology to identify the context of the information. This makes it possible for the recipient to utilize Assistive Technology to fully understand the document.

Before or after archive

This post-composition process can be done before documents are stored in a repository, or it can be done dynamically when the documents are being retrieved for viewing and repurposing. In essence, this creates accessible documents on demand; creating documents when you need them as opposed to creating every document in an accessible format without knowing whether or not you will eventually need it that way.

This is an important advantage over an at-composition approach, especially when meeting ever-evolving regulatory requirements on accessibility. For example, there are a number of changes pending that will affect the level of requirements for WCAG compliance. Accommodating those potential changes and updates would be time-consuming and expensive using an at-composition approach. Using post-composition, all the changes can be done globally in lieu of making changes to every single template and recreating the documents.

Best Practices

One example of an organization using a post-composition process to accommodate the creation of accessible documents is Canada Post. When the Canadian Federal Government passed legislation, (Omnibus Bill C-78) which added requirements to provide document accessibility accommodations, Canada Post was chosen to provide secure delivery of Government of Canada Pensioner documents, including direct deposit statements, newsletters, and tax forms.

How it Works

Files provided by the Government of Canada need to be composed, processed and distributed to pensioners within 24 hours; this includes the requirement to make all the documents accessible. In order to meet the requirements, thousands of documents are converted as a post-process to PDF/UA. Manual accommodation upon request is not possible because of the volumes of documents that must be sent. As the target recipients are aging pensioners, there is a higher chance of vision loss or vision disability. Therefore, all documents to be presented need to be in an accessible format to meet reasonable accommodation requirements.

Canada Post used the Crawford Technologies' Professional Services team to provide a solution and assist in the implementation of the post-composition process. A variety of tools were used, including our PRO Designer Accessible PDF GUI, to tag documents with read order, set up key headers, paragraphs and tables, and add alternative text to images so the content can be easily navigable when using an assistive technology.

Content with personal and private information is now easily accessible. This means that blind and partially sighted individuals, or those with cognitive disabilities will no longer need to depend on another person to read or review these communications. Accessible documents are created at hundreds of pages per second, allowing Canada Post to take structured system output files and make them accessible quickly and seamlessly.
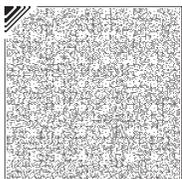
Post-Composition Advantages

In summary, the use of a post-composition approach to converting documents into accessible formats include the following:

- Storage costs are kept to a minimum

- Documents currently in archives can be easily supported

- Accessibility strategies can be future-proofed against technology and regulation changes

- Structured and unstructured documents can use the same approach

- Documents created by any composition software can be supported

- Compound documents can be easily supported

- All accessible formats can be generated, based on recipients' needs

- Customer preferences can be honored when creating accessible documents

- Both Accessible PDF and Accessible HTML documents can be created from a single stored document

The MasterONE Approach

One proven post-composition approach is MasterONE, the Crawford Technologies accessibility architecture. MasterONE is an architecture comprised of several CrawfordTech tools that ingest, interrogate, tag and present documents in a variety of accessible formats, including PDF/UA and Accessible HTML. Until now, there has never been a universal accessibility workflow and architecture that allows the conversion of any document type into any accessible format.

The MasterONE architecture allows the accessibility design work for structured documents to be done once for all your past and future documents. A GUI tool is used to create the accessibility rules. Then when required, those rules are used for conversion into formats like PDF/UA, Accessible HTML5, braille, large print, e-text and audio. MasterONE accepts all standard print stream formats (including AFP, PDF, PostScript, Metacode, PCL, and others) so there's no need to recompose the output or go back to originating applications. The approach supports batch and interactive processing, and has many workflow and integration options that allows the components to be plugged into any workflow process in any environment, regardless of the platform you are using.

In June of 2017, MasterONE was extended to support the automated tagging of unstructured documents quickly and cost-effectively with the Auto Tagging for Accessibility technology. This will be the topic of another white paper, however it is important to know that this architecture can now efficiently handle virtually all documents created in an organization.

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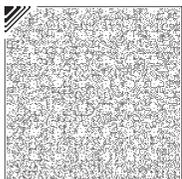
Inclusive by Design

Using MasterONE establishes a system and workflow where accessibility is inclusive by design, rather than on exception basis. Accessibility is now business-as-usual and anyone can read your documents. The result is a much more simplified document accessibility process that ensures compliance, improves customer experience and reduces costs. You simply choose the format that works best for you. It can take normal PDF files, or print files in virtually any format and, using tagging rules, convert it to the accessible formats that you need. This can be done before documents are stored in your repository, web site, email system or files system, or it can be done dynamically when the documents are being retrieved for viewing.

Moving Forward

It has become a critical requirement for organizations around the world to make bills, statements and other transactional documents accessible for people who have visual and cognitive challenges. And while including these provisions can certainly be achieved using an at-composition approach, organizations find it can be costly, complex, time-consuming and risky to do so. A post-composition approach using CrawfordTech's MasterONE architecture meets the demands of compliance and accommodation without the need to setup each document in each accommodation format.
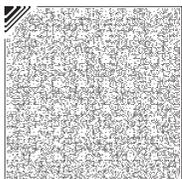
To find out more information on our one-step workflow accessibility solutions visit www.crawfordtech.com.

CrawfordTech Solutions

Crawford Technologies develops software and solutions to help enterprises optimize and improve the secure and accessible delivery, storage and presentment of their customer communications.

With over 1,800 customers on six continents, CrawfordTech solutions and know-how enable the largest banks, insurers, healthcare providers, utilities and print services companies to use their existing technologies, documents and data in new ways. We help them navigate the challenges in leveraging legacy applications in the platforms and applications of the future.

CrawfordTech's products, services and domain expertise reside at the nexus of content, data, and output management and are essential components of our customers' digital transformation, output management and document accessibility strategies.

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