

SEPIA Project: Providing Access to Digital Image Content for the Blind and Visually Impaired.

Poster

Jennifer Sweeney
Kent State University, USA
jsween10@kent.edu

Keywords: metadata; semantic annotation; image annotation; blind and visually impaired (BVI); access; accessibility; linked open data; museums; archives; screen reader(s)

Abstract

This paper presents an introduction to the SEPIA project (SEmantic Photographic Image Annotation), which was created by Jennifer Sweeney with Blind and Visually Impaired (BVI) individuals as the designated intended user base. This project embodies a use case methodology and use-case scenario for utilizing a new data model to enhance and optimize metadata to heighten access to digital image content with screen readers.

Background

This study has shown that when a BVI user seeks to access information in a digital image collection, the typical html framework severely restricts their access to display metadata. Acknowledging that digital image content aids in enhancing our comprehension of historical and topical events, the near total lack of access for the BVI community prompted this research project. The objective is to define a methodology to create, transform, curate and enhance pre-existing collections' metadata to enable a screen reader-accessible environment. To facilitate the reconceptualization of metadata, the initial goal of the SEPIA project is to provide one use case scenario for the May 4th Collection at Kent State University. The SEPIA project seeks to create a mediator element option that would circumvent the inaccessibility of content due to access issues that are not addressed by collections software providers and typical HTML framework.

Reasoning

In the summer of 2017 the beginning stages of this project addressed two facets of BVI access issues: the first being how to mediate some of the hurdles of screen readers working with HTML in this content area, and the second being that descriptive metadata pertaining to the visual content of digital objects is not often crafted with the BVI community in mind.

Access problems often occur because website designers mistakenly assume that everyone sees and accesses a web page in the same way (ADA, 2017). The first focus of the SEPIA project is on the identification of elements (tags) within HTML that are problematic for screen readers, locating areas of code that can be transformed. The ADA presents this topic through addressing "Images Without Text Equivalents," and explains that because screen readers can only read text, they cannot interpret any digital images, so images must be annotated to provide description and context. A BVI user visiting the website would be unable to tell if the image is a photo, a logo, a map, a chart, artwork, a link to another page, or even a blank page (ADA, 2017). In Cultural Heritage Collections, it is common to have many digital image types presented on the same page, from collections logos to collections content. The solution is presented the ADA as "Add a Text Equivalent to Every Image" through alternative text embedded in the HTML using "alt" for small amounts of text and "longdesc" for long amounts. This has been the only avenue for providing context to an image object on a website, and the only opportunity to relay the same meaningful information that other users obtain by looking at the image (ADA, 2017). For example, if a BVI user is browsing a collection of Cultural Heritage objects from a civil rights collection and reads a

caption that says “Protesters holding signs” then navigates to the alternative text and is presented with the description “CivilRights0002.jpg,” how is it possible to classify this content as accessible? In practice however, this action is considered in compliance because the descriptive tag is included, but it does not actually facilitate the understanding of the content. It is also important to note that as web-based digital collections shift further towards creating engaging user experiences for the sighted, the phrasing of HTML is altered through the inclusion of CSS and javascript for formatting, rendering many of the tags that screen readers depend on become hidden and create more difficulties for the BVI user.

Methodology

The project began with access to the Kent State May 4th Digital Collection with the goal in mind “that all information is available in a form that can be perceived by all users” (WCAG 2.0, 2017), and found that each of the 30 images in the University News Service photographs: Boxes 28 collection can be accessed on a dedicated page that includes an OMEKA image viewer frame embedded within the text content. This project discovered the specific access issues presented by the OMEKA CMS platform and focused on creating a collection-specific solution.

Phase 1 - The first goal of the project was to create a platform for reconceptualizing the way that descriptive metadata is written about digital objects. Collections data is typically technical rather than descriptive, so writing more effective descriptions for collections material will benefit all users, no matter of their ability. Drawing heavily Panofsky’s and Barthes’s writings on art theory, a full assessment of visual content was created to enable rich narrative descriptions of images, and as well as a data dictionary and term database for future data initiatives.

Phase 2 - Once the new data was created, the project shifted to testing the collection through numerous screen readers to identify specific areas of access issues and investigate where such issues existed within the HTML. After unpacking the OMEKA records and general framework of the greater Kent State site, it was found that for a screen reader, portions of the metadata associated with the images were masked by many layers of HTML. Realizing the need for a mediator element between the sea of HTML and the BVI user the SEPIA project began experimenting with javascripts and modal boxes to pull specific lines of the OMEKA record out of the body of the HTML.

Phase 3 - The final phase of the project consisted of building a mock copy of the Kent State Collection site and supplying it with a locally hosted data store that included the reconceptualized metadata. After placing the new code into the mock site, a small icon was created at the top of the page that created a mediator window linking directly to the descriptive metadata. Testing with two different screen readers in both Safari and Chrome browsers on Mac and Windows operating systems, the screen readers proved that the content was more easily accessible, provided a better user experience, and aided in the information-seeking procedure

Example of enhanced metadata entry	
<p>OMEKA XML export from site,</p> <pre> <element elementId="41"> <name>Description</name> <description/> <elementTextContainer> <elementText elementTextId="19213"> <text>Close-up of man addressing the crowd at the Victory Bell (W.H.O.R.E. event, burying the Constitution)</text> </elementText> </elementTextContainer> </element> </pre>	<p>Rewritten XML</p> <pre> <element elementId="41"> <name>Description</name> <description/> <elementTextContainer> <elementText elementTextId="19213"> <text> Black and white photograph captured on May 1, 1970 during the W.H.O.R.E. event when organizers were burying a copy of the U.S. Constitution in protest of American troops invading Cambodia. The main subject is three male students addressing the crowd while standing on a small brick wall adjacent to the Victory Bell. The Victory Bell and the crowd are not seen in the photograph as it is taken from the perspective of the crowd. There is one man holding a microphone attached to a loudspeaker up to the face of another man who is holding a stack of papers. </text> </elementText> </elementTextContainer> </element> </pre>

FIG. 1. Phase 1

Adding the SEPIA modal box to the HTML
<pre> <style> #next-item {float: right !important;} </style> <!--<p>Sepia Test</p> <--> <!-- Trigger/Open The Modal --> <button id="myBtn">SEPIA</button> <!-- The Modal --> <div id="myModal" class="modal"> <!-- Modal content --> <div class="modal-content"> &times; Description:Black and white photograph captured on May 1, 1970 during the W.H.O.R.E. event when organizers were burying a copy of the U.S. Constitution in protest of American troops invading Cambodia. The main subject is three male students addressing the crowd while standing on a small brick wall adjacent to the Victory Bell. The Victory Bell and the crowd are not seen in the photograph as it is taken from the perspective of the crowd. There is one man holding a microphone attached to a loudspeaker up to the face of another man who is holding a stack of papers. </div> </div>
 </pre>

FIG. 2. Phase 2

Limitations

This project was presented as a MLIS research paper and project with a time construct of eight weeks. In the true nature of research and development, every week presented a new hurdle and solution to test and consider. The SEPIA use case was created by mirroring data from the Kent State collection, rather than building upon it. Due to the inability to parse actual metadata records through the code to the HTML, this use case does not present a final project, but rather a working model.

Future

The project is currently in the testing and application state. With a strong belief in the data model and the utilization of HTML alterations, the extent of the capabilities that the SEPIA tool presents is unknown.

Future goals are to identify, research and work with collections that want to utilize tools in the digital space that allow for regional markup and annotation of visual image content. This project imagines a future when even the most dynamic web content can be translated to the BVI user group, providing comparable access to the content. This research has shown that with a mindful and conceptual approach to this problem of access, the Library Archive and Museum community can not only create better information resources on the web, but also enable a path for reconceptualizing an inclusive user experience. When the SEPIA project is poised for deployment to the public, it will be a remarkable tool to aid in ending the designation that BVI users are the "second-class citizens of the information society" (Jaeger, 2008).

Where can this go in the long run? Cultural Heritage Institutions can utilize this model across a range of collections and access platforms. From including the SEPIA markup on websites and smartphone apps, to adding similar narrative elements to audio tours of physical exhibitions, the data model can be applied for virtually all avenues of access, opening collections to a previously underserved audience.

References

- DCMI. (1998). Dublin Core Metadata Element Set, version 1.0: Reference description. Retrieved January 10, 2007, from <http://www.dublincore.org/documents/1998/09/dces/>.
- Heery, Rachel. (2004). Metadata futures: Steps toward semantic interoperability. In Diane I. Hillmann & Elaine L. Westbrooks (Eds.), *Metadata in practice* (pp. 257-271). Chicago: American Library Association.
- Hillmann, Diane I., Stuart A. Sutton, Jon Phipps, and Ryan J. Laundry. (2006). A metadata registry from vocabularies up: The NSDL registry project. *Proceedings of the International Conference on Dublin Core and Metadata Applications, 2006*, 65-75.
- Lagoze, Carl, Dean Krafft, Sandy Payette, and Susan Jesuroga. (2005, November). What is a digital library anyway, anymore? Beyond search and access in the NSDL. *D-Lib Magazine*, 11(11). Retrieved, January 10, 2007, from <http://www.dlib.org/dlib/november05/lagoze/11lagoze.html>.
- ADA (2017). ADA Tool Kit: Website Accessibility Under Title II of the ADA. ADA Tool Kit: Website Accessibility Under Title II of the ADA. [Ada.gov](https://www.ada.gov/pcatoolkit/chap5toolkit.htm). Retrieved from <https://www.ada.gov/pcatoolkit/chap5toolkit.htm>
- Jaeger, P. (2008). Developing Online Community Accessibility Guidelines for Persons With Disabilities and Older Adults. *Journal Of Disability Policy Studies*, 20(1), 55-63. <http://dx.doi.org/10.1177/1044207308325997>
- WCAG 2.1. (2017). Working Draft for Success Criteria. Web Content Accessibility GuidelinesW3.org. Retrieved from <https://www.w3.org/TR/WCAG21/>