

The symbiotic relationship between accessible features of information and effective research inquiry

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INTRODUCTION

Assistive technology (AT) is a field that is rapidly growing, developing a rich history of invention and innovation. This leads to a need for historical archives, to both document the profession's evolution and revolution, and boast of present and past achievements. Such an archive can inspire future AT service professionals by showing them the accomplishments of those who came before them. To meet this goal, the Rehabilitation, Research, Design & Disability (R2D2) Center at the University of Wisconsin – Milwaukee created an accessible web archive website called the Fred Sammons Archive in 2017. [1] This archival website preserves the work of Fred Sammons and the AT empire he created in a manner that is easily accessible for all who might want to reference his work.

60 years ago, Fred Sammons noticed the need for mass-produced AT that could be readily available to distribute to health care providers nationwide. In 1958, Sammons started a mail order business in his basement called Button King (BK) Enterprises, which sold AT and adaptive equipment. This small business led to the multi-million dollar national company Patterson Medical, which sells rehabilitative and medical equipment to healthcare professional. Throughout Sammons' 60 year career, his innovative approach to AT has contributed to the development of technology that has enhanced the lives of millions of people.



Figure 1: Photograph of Sammons laughing [2]

The Fred Sammons Archive website contains over 1,000 artifacts, including digitized, typed and hand written documents, photographs of products created by Sammons, and video interviews. The physical materials allow the user to inquire into Sammons' professional and personal life. The 30 hours of video interviews between Sammons and Dr. Roger O. Smith, [3] allow the user to experience numerous stories of Sammons' professional career and personal life, told by Sammons himself. The topics of these stories stretch from the start of his company from his basement in 1958 to deciding what AT products he would put in his catalogs each year.

DESIGNING AN ACCESSIBLE ARCHIVE

In developing the Fred Sammons Archive website, a design criterion was to ensure that everyone could access the resources of the archives regardless of their location or abilities. A web based archive design meant that knowledge about Fred Sammons would not be restricted to a museum or library collection. It also allowed for a multimodal depiction of artifacts such that an individual could find the method of viewing them that was best suited to their needs and abilities. As an example, if an individual wanted to see images of different perspectives of one of Sammons' button hook designs, they could view photographs in past catalogs, studio photos, or read an Equivalent Text Description (EqTD) of the image. These EqTDs are available on the same page as the images, allowing all users access to their description of the context and contents of the picture.

The project team implemented the following universal informational types with associated accessibility components:

1. Illustrations and photographs with Equivalent Text Descriptions (EqTDs) for all non-text items including brief, essential and detailed descriptions of all items.
2. Audio introductions and generic audio descriptions to describe the video context of interviews.
3. Closed captioning for all videos with downloadable transcripts.
4. In-browser rendered PDFs of all the digitized documents to be easily read by screen reading programs.

5. Audio notes from Sammons dictating his handwritten items with supplements as additional personal notes on specific items, referred to as “Fred’s Notes”.

In addition, the website followed the W3C Web Content Accessibility Guidelines (WCAG) universal design standards. [1]

THE ADDED VALUE OF ACCESSIBILITY

We discovered that the site’s research capabilities were greatly augmented by the accessibility information added to the site. Not only did accessibility features make it easier for people with limitations to make a query and find information in their preferred media type, they added new layers of contextual metadata to the website’s documents and photos, making the act of querying more robust. In essence, the accessibility data upgraded the archives from a simple dictionary of events in Fred Sammons’ life, to a enriched research tool for everyone.

Artifact accessibility features yielded several additional sources of searchable data. Our process of creating accessible PDFs with optical character recognition (OCR) led to the creation of plain text files for each document in the archives containing the recognized text for that document. These files were easily loaded into our search engine as additional search metadata for each typed document in the database. Handwritten documents led to the creation of audio files of Fred

discussing the document, and often telling new stories about the document. These audio files, as they presented new information, added new context to documents in the database. Furthermore, the contents of audio files were transcribed to text, allowing for us to make these new stories and descriptions searchable. Generally, the creation of multimodal data resulted in added searchable data in our website... as a result of their accessibility implementations. The EqTDs added contextual information about the image for the user. Audio descriptions provided quick audio context to video files, and video captions were generated as timed text files, allowing us to

Table 1: Types of media found on the FSA website [2], and their counts.

Media Type	Count	Description
Documents	521	Documents in PDF Form
Photos	31	Photographs in PDF form
EqTDs	174	Text descriptions of photographs and some documents.
Fred’s Notes	119	Audio from Fred describing handwritten documents
Transcripts	127	Text transcription of documents.
Captions	372	Text transcriptions of video
Video Descriptions	373	Audio context for videos.
Objects	209	Images of objects. One object will have multiple views: each are counted.

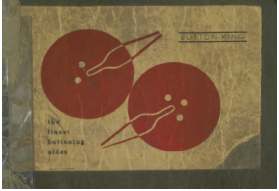
add the entirety of a conversation between Fred Sammons and Dr. Smith to our searchable data.

Table 2: New metadata added for primary artifacts for accessibility purposes, and whether it is searchable on the website.

Primary Artifact	Accessibility Information	Searchable
Documents	Text files and Fred’s notes (audio and text)	Yes
Photos	EqTDs	Yes
Videos	Captions and audio descriptions.	Yes (Captions)
Objects	EqTDs	Yes

By ensuring that videos, photography, and documents are accessible, we enhanced the availability of the data relayed through these media items. Searchable key words, titles and descriptions were joined by captions, transcripts, text files, and EqTDs. Transcripts and captions became available for users who might not want or be able to listen to a full video, or who needed a faster route to pertinent information. Text files increased the number of items returned as a result of text searches, by allowing the contents of conversations and the text of documents to be searched. In this way, we can say a symbiosis exists between research and accessibility: augmenting the accessible features of media improve how searchable that media item is, in addition to improving media availability.

Table 3: Comparison of image metadata and accessibility metadata for an image. [2] Original data included the image, description (DS) and keywords (KW) – data added for accessibility includes the EqTD’s Brief Description (BD) and Essential Description.

Image and Metadata	Accessibility Data
 <p data-bbox="159 680 493 871">Artifact #34 - Original Button King Logo (Picture) <u>DS</u>: Original Logo for Button King Enterprises <u>KW</u>: button king, logo, original</p>	<p data-bbox="516 428 850 457"><u>Equivalent Text Description</u></p> <p data-bbox="516 464 850 548"><u>BD</u>: A photo of the first Button-King Enterprises Logo.</p> <p data-bbox="516 554 850 835"><u>ED</u>: This photo shows two red button hooks and a logo that states "the finest buttoning aides". Button hooks are one of Fred Sammons' first products that he manufactured himself during the early stages of his business.</p>

link to a video interview. After watching the video, the student decides she want to use a direct quote from Sammons and Smith’s conversation but does not want to re-watch the entire video. The student downloads the video transcript from the interview and scans the document until the student finds the quote to use in her paper.

Case #2: Man with a Disability

A man with glaucoma and severe low vision is a long time user of Sammons-Preston adaptive equipment and wants to learn more about Sammons. With the screen reading program on his personal computer, the man is able to navigate the website with ease. The man comes across an early photograph of Sammons. At first he is unable to understand the context of the photograph, however since the picture has EqTDs, the man is able to know that the photograph was for an advertisement. The man next searches for handwritten documents of Sammons. Since the man's computer could not decipher Fred's cursive hand writing, the computer could not read the document accurately. On the artifact page, there is a section called 'Fred's Notes'. After listening to the mp3 recording of Sammons reading the artifact, the man received all the information ab out the document that he needed.

In all of these cases, ease of use of the site and ease of research capability are a direct result of accessibility implementations created for the site. Features designed for accessibility (such as video captions) can aid researchers short on time, or wishing to pull direct quotes from spoken conversations – this could also be applicable for a researcher who wants to directly quote a document. However, our accessibility implementations also help users with disabilities learn more about Fred Sammons, by making media that might not be accessible (i.e. handwritten documents) accessible, via transcription or audio description. Thus, by focusing on universal design for our archives, we boosted the usefulness of the archives in their entirety, for users of all backgrounds.

CONCLUSIONS

Fred Sammons provided millions of people with affordable and innovative adaptive technology. The Fred Sammons Archives exemplifies his dedication and innovation in helping modern AT grow and prosper over the past 60 years. Through our efforts to develop an accessible home for the work of Fred Sammons, we have created a power

EXPLORING USE CASES FOR THE FRED SAMMONS ARCHIVE

The following case studies illustrate the different ways the website can utilized by a variety of people from different backgrounds. [2]

Case #1: Graduate Student

An occupational therapy student is completing a research paper on the history of adaptive equipment to assist people with dressing in the morning. The student decides to use the Fred Sammons Archive website knowing that Sammons was a pioneer in developing and distributing assistive devices.

In the search bar on the home page, the student types ‘button AND hook’. Since the website searches for these words in keywords, video and audio transcriptions, documents, and titles, the student has several results from her search. The student selects an artifact titled ‘Original Button Hook’. On the artifact page there is a photograph of the button hook and a



Figure 2: Photograph of Original Button Hook [2]

research tool that utilizes accessibility features for the metadata and additional context they bring to media. It only makes sense that the archives stand as both a template for accessible websites, and a testament to the power of universal design.

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