Encoded Archival Description:
Are Finding Aids Boundary Spanners
or Barriers for Users?

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ABSTRACT. The article reports the results of a usability study of an EAD interface. Findings indicate that subjects had trouble understanding archival terminology and how best to search for information in finding aids. Furthermore, they were not familiar with the structure or contents of finding aids. In addition to building interfaces that minimize archival jargon and rely heavily on users' prior understanding of hierarchical finding aids, this study indicates that users require new forms of virtual reference assistance in the online environment. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com> © 2004 by The Haworth Press, Inc. All rights reserved.]*

INTRODUCTION

Encoded Archival Description (EAD) has become part of the archival vocabulary. On most occasions, archivists refer to EAD as a data

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structure for sharing information about collections.[1] Yet, EAD is a boundary object that must not only mediate between archivists and their user communities, but must also facilitate a convergence between the user and the archival content. Susan Leigh Star defines boundary objects as artifacts that are "both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites."[2] Ideally, archival access tools, such as finding aids, should act as boundary objects and spanners–both communicating information and providing an opportunity for convergence. In the words of Geoffrey C. Bowker and Susan Leigh Star:

> Convergence . . . is the double process by which information artifacts and social worlds are fitted to each other and come together. . . . Information artifacts under gird social worlds, and social worlds under gird these same information resources.[3]

If one agrees with Bowker and Star's assertion, the continuing existence and evolution of EAD is dependent on not only broad implementation in the archival profession, but also widespread acceptance and employment by groups of users. In other words, EAD finding aids must become boundary spanners, and not barriers, in the research process.

This article reports on a usability study of an EAD interface. Six subjects were given four tasks to complete using a database of finding aids from the Historic Pittsburgh Project.[4] Demographic information as well as an exit interview was conducted with each participant. The study identified and examined design and content elements that inhibited the convergence of EAD interfaces and the users' worlds and acted as barriers rather than boundary objects between users and archival collections.

LITERATURE REVIEW

Archivists have only recently become exposed to the problem of designing effective information displays in the online environment. The development of MAchine Readable Cataloging (MARC) records for archival materials in the 1980s and the emergence of World Wide Web (WWW) publishing have caused archivists to consider the impact of different interface designs on the effectiveness of the display of archival information. Studies of MARC displays have identified confusion on the part of the user in identifying critical data elements such as creator

and title, in differentiating between archival and other genres of materials represented in the catalog, and in understanding key data presented such as date and extent statements.[5] Articles reviewing archival information on the WWW have concentrated on the type and depth of the information and have paid little attention to interface design.[6]

Most of the published literature on EAD has focused on its development and implementation. Two issues of *American Archivist*, one issue of *Archives and Museum Informatics*, and an issue of the *Journal of Internet Cataloging* have all been devoted to these topics.[7] Since those issues were published, two other journals, *OCLC Systems and Services* and the *Journal of the Society of Archivists*, have printed articles dealing with EAD implementation.[8] These articles are valuable because they raised the overall level of knowledge about EAD and diffused that knowledge into the archival community.

At the same time, it is notable that user evaluation has rarely been mentioned as an integral aspect of implementation, although articles such as Dennis Meissner's evaluation of findings aids based on staff perceptions of users is quite valuable and a step in the right direction.[9] Meissner's findings included the need to organize the presentation of information in finding aids in a more logical manner and to clearly label data elements since these were not transparent to users. The other major examination of the usability of EAD in the archival literature is Anne Gilliland-Swetland's methodological work for an evaluation of the Online Archive of California.[10] Her research encompassed three evaluation components of the Online Archive of California: collaborative and administrative aspects of OAC development, structure, scope, and consistency of encoded finding aids, and use and usability evaluation. Information on the user evaluation component has not yet been published.

While the research looking specifically at EAD is sparse, it is informed by the larger literature on general digital library evaluation and the evaluation of library web sites. User studies of various digital library projects have identified a core set of user variables that are important in the design of these projects. These variables include the computer skills and subject expertise of the user, analysis of common user behaviors–for example: how do users work differently with analog versus digital artifacts, and what information do users need to capture (by copying or printing) from the digital objects.[11] Furthermore, several libraries have conducted usability studies of their web sites.[12] These usability tests revealed problems with labeling and the information architecture of library web sites (e.g., the organization of information and the number of levels in a web site). The success of these library usability

studies in identifying users problems in effectively using web sites with a limited number of subjects led to the selection of a usability study as the method for this research study.

METHODOLOGY

Usability studies are particularly important at this time when interface design for EAD finding aid collections is still fluid. As Brenda Battleson, Austin Booth and Jane Weintrop suggest "there is a fundamental need for usability in library web sites and usability testing is an invaluable tool for evaluating interfaces in terms of their effectiveness and ease of use."[13] Usability testing has been going on the in the systems engineering and Human-Computer Interaction (HCI) field for years. Jakob Nielsen, an expert in HCI, argues that usability testing is an essential component of the design process.[14]

The methodology for the present study was designed to approach the problem of EAD users and interface design through a controlled laboratory study. Subjects went through a three-part protocol consisting of: (1) a survey inquiring about demographic information and assessing computer and archival expertise, (2) a 45 minute usability test protocol where subjects were asked to perform four retrieval tasks using the EAD site, and (3) an exit interview discussing the interface. The second part of this protocol was pre-tested in a pilot study. Data were generated from each part of the protocol. The initial part generated survey forms. Part two, the actual usability test, resulted in transaction logs and a videotape of the session that captured the screen movements and each subjects verbalizations throughout the session. The third part of the protocol–the exit interview–was also recorded on videotape.

The usability test was constructed to simulate different types of tasks that archival users might conduct during the research process. These tasks included the location of common information elements in an EAD finding aid, the location of descriptions for two items that were known to exist in the database, a task involving interpretation of the finding aid, and an open-ended search. Specifically, the tasks were:

1. EAD Structure query:

    a. Locate the category where you would find an abstract for a collection.

2. Known item searches:

    a. Find the letter from Cosgrove to Schwab, copy the description into Notepad (a text editor), and transcribe the series, box, and folder in which this item would be found.
    b. Identify the series, box, and folder in which material regarding the Coal Incline would be found.

3. Finding aid interpretation question:

    a. Locate: "Steel, Its Manufacture and Sale" and write down where it is located (series, box, folder).

4. Open-ended search:

    a. Identify two (2) collections containing records on any Pittsburgh neighborhoods.

Usability testing can be useful even with low numbers of subjects. Nielsen notes that usability studies with as few as five participants can provide sufficient accuracy for many projects.[15] This study had six subjects. The initial demographic survey provided a profile of subjects, all graduate students at the University of Pittsburgh School of Information Sciences. Students in the archives and records management specialization were screened out. The average age of the subjects was 29. Three were Master's students and 3 were in doctoral programs. Four women and 2 men participated and all were judged to be computer literate. Half of the subjects had used primary sources in the past, but only two had used finding aids. Interestingly, only one of the subjects who had used primary sources had used a finding aid and one of the subjects who had not used archival materials claimed to have used a finding aid. This indicates that there may have been some terminological problems with these questions. Because the database of finding aids concerned Pittsburgh History, subjects were also asked how long they had lived in Pittsburgh. With the exception of one outlier who had lived in Pittsburgh for 20+ years, the average length of residence in Pittsburgh was 2.9 years.

FINDINGS

The results of this study were disappointing. Users not only had trouble with the specific tasks, but the general level of success was low for

three of the four tasks. The reasons for this were both content, particularly terminological difficulties, and design related issues. While this was a study focused on a single interface, many of the problems encountered by users are present in many other EAD interfaces and therefore the findings do have larger implications. Figure 1 shows the overall success rate by question.

Where Is the Abstract?

The element is not universally used in EAD encoding, but, when used, it does provide a quick summarization of the collection. In fact, the Research Libraries Group (RLG) used the abstract element as a pop up description in its Archival Resources database. Subjects encountered several problems in identifying the abstract. The first was terminological. Subjects experienced difficulty in differentiating among related phrases such as abstract, scope and content note, and historical sketch. All of these words implied some type of content summarization to study participants. In searching for the abstract, subjects also got lost in the hierarchy of the finding aid. The Historic Pittsburgh Project display did not feature frames or the left side navigational menu common among many EAD interfaces. Most of the subjects honed in on the Scope and Content note in the outline view and assumed all content information would be there (see Figure 2).

The Letter from Cosgrove to Schwab

In the second exercise, subjects were directed to go to the "Guide to the Correspondence of Charles M. Schwab" and asked to find a letter from Cosgrove to Schwab. All but one successfully identified the letter

FIGURE 1. Answers for Individual Usability Tasks

	Abstract	Letter from Cosgrove to Schwab	Steel, Its Manufacture and Sale	Pittsburgh Neighborhoods
Correct Answers	1	5	1	5
Incorrect Answers	5	1	5	1

FIGURE 2. Outline (Left) and Full-Text (Right) Views of a Finding Aid
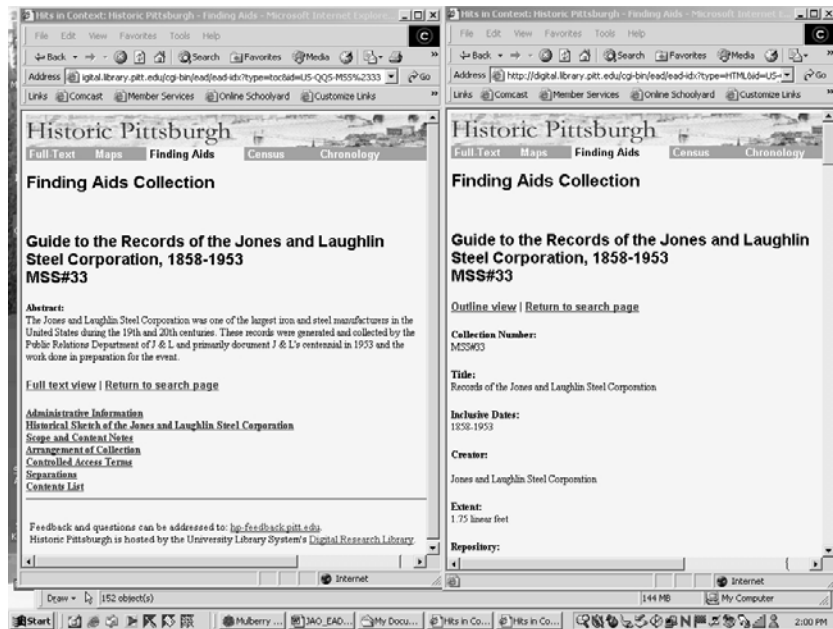
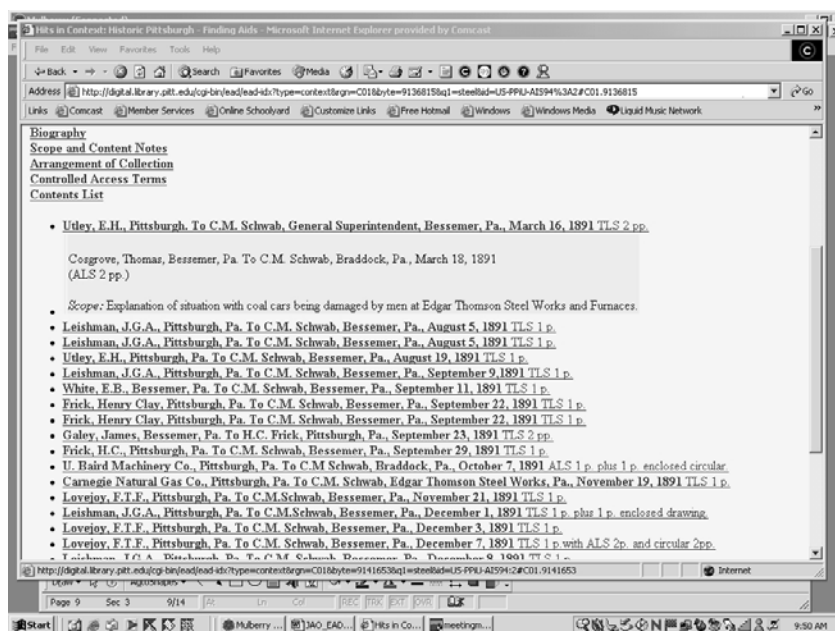Screen captured in July 2001. Used with permission.

and copied the information into a text editor. However, only one subject began to search directly by typing in Schwab to Cosgrove.

In the post-test interview, participants did have a number of comments to make about the display of the Cosgrove to Schwab letter description. Principally, subjects indicated that the use of highlighting (underlining) was confusing or in the words of one subject, "overwhelming."[16] When selected, the item in which they were interested actually became less visible as it was neither underlined or in bold face type. The design featured in Figure 3 contradicts interface design principles derived from cognitive psychology. Pop-out features should be used to accentuate the useful items and the items on which the designer intends for the user to focus.

Steel, Its Manufacture and Sale

Searching and display problems collided in the hunt for the training manual, *Steel, Its Manufacture and Sale.* Despite being guided to the

FIGURE 3. Description of the Letter from Cosgrove to Schwab, March 18, 1891

Screen captured in July 2001. Used with permission.

correct finding aid, the *Guide to the Records of the Jones and Laughlin Steel*, five subjects had trouble locating the series, box, and folders in which this item was located. Four of them were actually looking at the correct answer at some point during their search. This task involved interpretation of the finding aid. Participants had to read the series description and then translate that into the folder level descriptions.

The Historic Pittsburgh Finding Aids featured browsing as well as Boolean search capabilities. If one opted to search the finding aids, users were presented with a screen on which they could enter single or multiple search terms, as well as select all or discrete parts of the finding aid to narrow a search. The parts of the finding aid to search were described as: "anywhere," "collection level description," "contents list," and "controlled access terms." With the exception of "anywhere," these designations had little meaning to participants. In searching for *Steel, Its Manufacture and Sale* subjects selected a variety of search delimiters including "anywhere," "collection level description," and "contents

list." In the debriefing interview, one participant also noted that another difficulty with the search function was not being able to revise and build on previous searches. Every time one returned to the search screen it had been cleared and there was no memory assistance provided (see Figure 4).[17]

The major issue in locating *Steel, Its Manufacture and Sale* was a classic human-computer interaction display problem. Of the five subjects who were unable to identify the series, box, and folder, three were completely stymied and two people incorrectly identified Series II, Box 1, Folder 2 as the location. Figure 5 presents the series description and contents listing. We can see that the training manual, *Steel, Its Manufacture and Sale* is in Series II, Box 3, Folders 6-9. In the folder listing, it is identified only as the "Training Manual, 1920." Two of the subjects misidentified the location as Series II, Box 1, Folder 2. Each assumed that the description applied to the information above, rather than below, it. This is also how card catalogs and now online catalogs display infor-

FIGURE 4. Search Screen
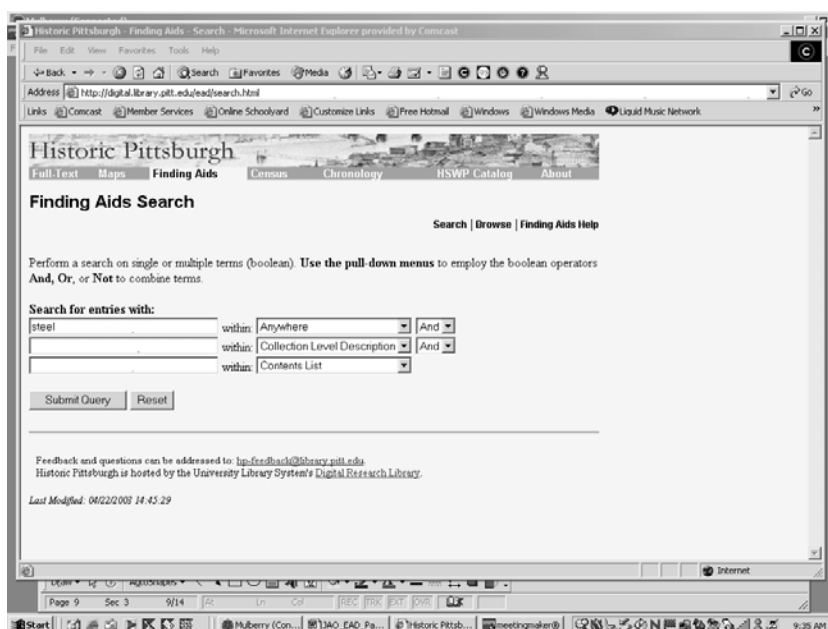
Screen captured in July 2001. Used with permission.

FIGURE 5. Contents Listing Featuring, "Steel, Its Manufacture and Sale"

Box 1

Folder 1 Pamphlets and Brochures, 1930-1950

Folder 2 Miscellaneous

Series II General Material 1858-1970
(18 folders)

Scope: Material in this series includes stray items produced in a time span of over 110 years from various capacities of the company. Original working records include an account book from 1919-1920, a letter book, 1887-1901, 19th century advertisements, Liberty Loan material issued during World War I, and material documenting J & L's coal mining activities. Of note is the 1920 training manual written by the Bureau of Instruction, "Steel, Its Manufacture and Sale," issued for the training of new sales agents. The manual contains an overview of the J & L corporate structure and technical information about their products. Through these items, episodes in the company's history may be found but these items are by no means comprehensive and provide little information on the decision making process at the company or the day to day affairs.
Arrangement: The General Records are arranged alphabetically by folder and include publications, official documents, partnership and owner records and miscellaneous material.

Folder 3 Account Book, 1919-1920

Folder 4 Advertisements, 1858-1900

Folder 5 Coal Incline, 1895

Folder 6 Correspondence Records (J & Lauth Receipt), 1858-1923

Folder 7 Correspondence, 1887-1901

Folder 8 Corporate Statement Announcements, 1861-1902

Folder 9 Court Materials (J & L v. U.S.), 1905

Box 3

Folder 1 Liberty Loans, 1916-1919

Folder 2 Management Dinner Program, 1969

Folder 3 Military Specifications, 1965-1970

Folder 4 Pittsburgh Song (sheet music), n.d.

Folder 5 Strip Mill Service Sheet, 1944-1945

Training Manual, 1920

Folder 6 Part I

Folder 7 Part II

Folder 8 Part III

Folder 9 Part IV

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mation. The other display issue is that visually, the "Training Manual, 1920" heading is associated with Box 3, Folder 5, "Strip Mill Service Sheet, 1944-1945." There is no visual indication that "Training Manual, 1920" is actually the heading for the following four folders. Several design heuristics are being violated in this display. First, the hierarchy of the information has been violated. As in any outline, indented information is seen as a part of the non-indented information above it. Therefore, series information should be left most in this display and in larger type than the box information. Interestingly, the series scope note is in larger type. Some type of visual break might also be placed after Box 1, Folder 2 to signify an organizational as well as a conceptual break point. Second, gestalt rules for human perception were violated because the design enforces incorrect groupings of information. "[T]hings are seen as belonging together, as a group, or as a unit, if they are close together, or look alike with respect to shape, color, size, or typography."[18]

Pittsburgh Neighborhoods

The fourth task was an open-ended search for information about any two Pittsburgh neighborhoods. Pittsburgh is laden with named neighborhoods that have distinct characters. Several people literally searched for "Pittsburgh" and "neighborhoods" appearing anywhere in the finding aid. The subject who searched "Pittsburgh" and "Oakland" using the contents listing function performed the most efficient search. Even though all the subjects but one were eventually successful, the other participants had to wade through numerous hits and many in parts of the finding aid, such as the biography or administrative history, which did not retrieve actual content information.

DISCUSSION

The results of this usability test raise a number of issues about both analog and online finding aids. Unfamiliarity with finding aids is not going to go away in the digital environment and neither finding aids nor how they are best used is transparent. In a physical repository, a reference archivist can visually spot someone mulling over finding aids in confusion. In the online environment, users having problems with finding aids can be masked, particularly if there is no opportunity for feed-

back. The three major problems discovered in this study concerned terminology, search functions, and contents display issues.

Archival jargon is a major issue for users of primary sources.[19] In addition to the terminology of the finding aid itself (e.g., abstract, scope and content notes, historical sketch), subjects identified several other terminological problems. The abbreviations "ALS" and "TLS" for "autograph letter signed" and "typewritten letter signed" were unfamiliar. Collection and manuscript numbers were perplexing and unlike other call numbers that subjects had encountered in the past. Even commonly used terminology can be confusing if used in a different way. The use of the phrase "full text" was one example. In Figure 2, "full text" refers to the full text of the finding aid. As one subject noted, "I am not sure what full text means in this case."[20] Subjects were unsure exactly what "full text" meant and several said they wondered if they would eventually reach an image of an actual item. This is a confusing phrase, particularly in the virtual world as archives and manuscript repositories begin to publish actual images of primary sources, e.g., "full text."

Subjects did not use the search functions in a very sophisticated manner. The reliance on the search parameter "anywhere" may have been a result of this interface's use of EAD jargon to describe the search parameters. This indicates that EAD sites should use search parameters that have more general intelligibility and meaning, rather than labels that originate in archival parlance. Although two of the search parameters, contents listing and controlled access terms, were repeated as labels in the outline view of the finding aid, this association did not register with participants. Reliance on more common search terms, such as name or place, may be a better parameter term than "controlled access terms." How to accurately differentiate between searching contextual information ("collection level description") and content information ("contents listing") is another issue that requires further investigation. The issue of teaching users how to better search for primary sources also needs to be addressed in archival user education.

In the final task to identify Pittsburgh neighborhoods, subjects who searched using the "anywhere" option not only had to wade through a longer results list, but also had to work through negative results. Many finding aids specifically note when material that is expected to be in a collection is not present. This practice helps users to rule out collections. In the electronic environment, this practice needs to be studied since it has new consequences. As more finding aids are published online and as more union databases of finding aids emerge, accentuating

the negative will result in longer and more burdensome results lists. This will make it more difficult for users to differentiate real content from false drops.

Display issues are the final area of concern. The design of the Historic Pittsburgh Project was done fairly early in the era of EAD interfaces. The lack of any navigation menu on the left side was definitely a problem for users in this study. In the debriefing interviews, several subjects specifically stated that they had gotten lost in the finding aid and were not exactly sure where they were, particularly when they were in the full text view. The need for navigational aids is supported by cognitive science research. As George Furnas argues, these underlying structures "provide a balance of local detail and global context by trading off *a priori* importance against distance."[21] This indicates that something between the full text and outline view may be needed. In the contents listing area, for example two subjects suggested that the ability to have boxes explode into folders when selected would alleviate information overload and create less confusion.[22]

CONCLUSION

Are finding aids barriers or boundary spanners? This study found that finding aids act as both barriers and boundary spanners. Subjects were able to span the divide and make connections between the solutions to the designated tasks and the representations of the primary sources (e.g., the finding aids). At times this process could have been made easier. Helping users navigate and utilize finding aids definitely requires more support than online systems currently provide and the development of virtual reference services directly tied to EAD systems is needed. Yet, the finding aids also acted as barriers. EAD interfaces need to minimize archival jargon and diminish the reliance on users' prior understanding of hierarchical finding aids. Furthermore, archivists need to incorporate design principles from human, computer interaction and cognitive psychology into EAD interfaces. This would help to eliminate barriers and make finding aids more transparent. The goal would be designing an interface that anyone could walk up to and use.

Until now, there has been little user input into the design of EAD interfaces. The proliferation of different EAD interface designs demonstrates that little consistency exists concerning EAD interface design and few design principles have emerged. Whether one views this as

planned diversity or chaos, the multiplicity of designs and design elements provides a good opportunity to involve users in usability tests to identify successful and unsuccessful design features. It is only then that finding aids can truly act as boundary spanners linking users to primary sources.

NOTES

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15. Nielsen, *Usability Engineering*, 165-173.

16. Subject P6R1, Debriefing Interview.

16. Subject P5R1, Debriefing Interview.

18. Nielsen, 117.

19. Elizabeth Yakel, "Listening to Users," *Archival Issues* 26/2 (2002): 53-68.

20. Subject P3R1, Debriefing Interview.

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22. Subjects P6R1 and P1R1, Debriefing Interviews.