The *EAD Cookbook*: A Survey and Usability Study

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A b s t r a c t

While EAD has been warmly embraced by larger archives and libraries, smaller institutions have hesitated to implement the standard. The *EAD Cookbook* was developed to encourage such acceptance. But does it provide an adequate tool to meet the archival profession's descriptive needs? This paper addresses the question by reporting the results of a survey of *Cookbook* users, reviewing literature related to the usability of archival on-line resources, and evaluating the usability and retrievability of EAD finding aids created by institutions responding to the survey. It includes specific usability recommendations and concludes with a recommended approach for further work to simplify EAD encoding and improve display.

I n the early 1980s, when archivists were engaged in a series of debates over the value of a national information system for exchanging data about archives and manuscript collections, Maynard Brichford noted dryly that "the last chance to become involved in an information enriched acronym may also be the first opportunity to be drawn into a costly mistake."[1] Perhaps few of the archivists who became involved in the acronyms Brichford had in mind (e.g., MARC, RLIN, and OCLC) would characterize their efforts as a mistake, but Brichford's skepticism has not disappeared. Many archivists now approach Encoded Archival Description (EAD) with a similar suspicion. As Daniel Linke asked at a recent Society of American Archivists Annual Meeting session devoted to those who have rejected EAD, "Is EAD dead?"[2]

[1] Maynard Brichford, unpublished paper, "Toward a National Information System for Archives and Manuscripts: Comment," read at SAA Annual Meeting, Berkeley, California, September 1, 1981.

[2] "Is EAD Dead?," <http://www.princeton.edu/~dlinke/EAD.html> (December 4, 2002).

At first glance, Linke's question may seem to fly in the face of reason. Numerous institutions use EAD. The Online Archive of California alone includes over 5,000 finding aids from forty-seven institutions.[3] Other cooperative projects, such as Texas Archival Resources Online, are under way, and many larger archives and manuscript repositories have added EAD finding aids to their websites. Museums are currently adopting the standard, and EAD has also been warmly embraced outside the United States.[4]

Yet in spite of these obvious successes, EAD's reputation is clouded among many archivists, and at least one recent study worked from the plain assumption that "at this time the success of EAD is unclear."[5] It is sometimes faulted for the technical complexity, high implementation costs, and inefficient deployment options that seem to accompany current EAD software packages.[6] In addition, some ask whether EAD as it is currently implemented meets users' information needs. For these and other reasons, a significant number of archivists have not joined the bandwagon. As Tibbo and Meho noted a few years ago, 'it is clear that despite all the hype and fuss, few archives are presently mounting finding aids on the Web at this time, whether in EAD or other formats."[7] Nevertheless, it is also apparent that more users of archival materials are turning to electronic access and that many expect to meet their needs without visiting the archives, whether that need is having access to a finding aid or to actual archival resources.[8]

EAD may provide a feasible means by which some of these access challenges can be addressed. But if EAD is to help archivists meet archival users' needs, it must be archivist-friendly. More archivists must be convinced to use it, and they must implement the standard in a manner that presents finding aids in a fashion that is understandable and helpful to archival users. In this respect, the main issue which EAD proponents must confront may still be the problem Jill Tatem

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[3] <http://www.oac.cdlib.org> (December 4, 2002).

[4] Richard Rinehart, "Cross-Community Applications: The EAD in Museums," *Journal of Internet Cataloging* 4, nos. 3–4 (2001): 169–86; Meg Sweet, Matthew Hillyard, Derek Breeden and Bill Stockting, "EAD and Government Archives," *Journal of Internet Cataloging* 4, nos. 3–4 (2001): 147–68.

[5] James M. Roth, "Serving Up EAD: An Exploratory Study on the Deployment and Utilization of Encoded Archival Description Finding Aids," *American Archivist* 64 (Fall/Winter 2001): 216.

[6] As Roth concluded after studying archivists' EAD deployment methods, some significant problems confront EAD implementors. "These include a steep learning curve for the entire EAD process, not having enough resources in the form of time and staff, and most especially, difficulty with deployment software." One archivist on the Archives and Archivists listserv perhaps spoke for many when she came to the conclusion that "From all accounts, it's an expensive and time-consuming proposition." Rebecca Fitzgerald, message to Archives and Archivists Listserv, November 27, 2001. <http://listserv.muohio.edu/SCRIPTS/WA.EXE?A2=ind0111d&L=archives&F=&S=&P=4276> (December 4, 2002).

[7] Helen Tibbo and Lokman Meho, "Finding Finding Aids on the World Wide Web," *American Archivist* 64 (Spring/Summer 2001):75.

[8] Kristin Martin, "An Analysis of Remote Reference Correspondence at a Large Academic Manuscripts Collection," *American Archivist* 64 (Spring/Summer 2001): 37–41.

identified in 1998: "Improving EAD's ease of use [for archivists] depends largely, though not exclusively, on advances in authoring and browsing software."[9]

In July 2000 Michael Fox attempted to supply some of the components of such software with a gift to the profession: the *EAD Cookbook*.[10] The *Cookbook* includes three main ingredients which are available through *The EAD Help Pages:* 1) A manual providing implementation instructions, outlining tag usage, and providing options on software use, file configuration, and display options; 2) Downloadable template files used to create EAD documents with commercial software products; and 3) Downloadable stylesheets written in the XSLT language. These stylesheets transform marked-up finding aids to HTML or to print copies for posting on the Web or for in-house use. The *Cookbook* was intended to simplify the process of learning about and adopting EAD, to encourage its acceptance by the archival community, and to foster greater consistency in encoding and presentation. It is the simplest approach to EAD implementation now available. Although it is not a "turn-key" solution, it has been used by many institutions over the past two years.

At this stage in the *Cookbook's* development, one might risk appearing ungrateful to its author by asking whether it can adequately meet the profession's needs. Does it supply easy-to-use encoding options and display tools? Do archivists find it easy to use? Does it allow for the integration of EAD into the normal process of archival work? Can the finding aids it produces be easily found by archival researchers? Can researchers effectively manipulate and use them?

This article addresses these questions in three distinct parts. First, it reports the results of a survey of twenty-seven individuals who have implemented the *Cookbook* at their institutions, including summary statistical data, quotations from the respondents, and an analysis of implementation trends. Second, it provides an overview of the current state of knowledge as it relates to users, information seeking, and the design of archival and library websites—issues that impinge on the success of the *Cookbook* in meeting researchers' and archivists' needs. Finally, the paper analyzes the accessibility and usability of EAD finding aids produced using the *EAD Cookbook* and posted on institutional websites, before closing with a short assessment of future possibilities for simplifying EAD encoding and display.

Survey Background

To measure and understand implementation patterns, successes, and problems among institutions using the *EAD Cookbook,* a survey was placed on the University of Illinois Archives website during the late summer of 2001. Since a

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[9] Jill Tatem, "EAD: Obstacles to Implementation, Opportunity for Understanding," *Archival Issues* 23, no. 2 (1998): 155.

[10] <http://www.iath.virginia.edu/ead/cookbookhelp.html> (December 4, 2002).

full list of *Cookbook* implementers does not exist, a purposive expert sampling technique was used to ensure the widest possible sample. Survey respondents were solicited by placing a notice on the EAD listserv. E-mail messages announcing the survey were also sent to a group of archivists who had previously identified themselves as *Cookbook* users to University of Tulsa Special Collections Librarian Gina Minks.

The survey queried institutional demographic data, uses to which the *Cookbook* has been put, time spent using the *Cookbook* files, attitudes toward EAD and the *Cookbook,* and the importance placed by the institution on EAD.[11] In addition, the author compiled a list of the responding institutions that had placed finding aids online. For each of these institutions, two finding aids were randomly selected. They were examined for the inclusion of metadata such as <title> and <meta> elements in the HTML header, tested for general characteristics relating to the usability of electronic resources, and ranked for ease of retrieval by a popular search engine (Google). Additional finding aids were examined if I encountered problems accessing or using the first two selected.

The *Cookbook* was chosen as a test case for studying the usability of EAD since using it is now the simplest way to encode finding aids and post them on a website. Before the *Cookbook* was available, each repository found it necessary to make its own way through the briar patch of EAD implementation. In May 2000, *Archives and Museum Informatics* published a special issue devoted to EAD applications; taken as a whole the volume demonstrates both the complexity and distinctiveness of the specific technical approaches which institutions have taken in implementing EAD.[12] Each institution developed its own encoding and display tools or modified existing tools such as those listed on the EAD Help Pages.[13] Archives, museums, and libraries used a host of tools to encode EAD documents: Word processors, XML editors, text editors, and programming scripts. Display options were similarly complex. Some used Dynaweb (which is no longer available); others developed their own display, often at considerable expense. Each institution made its own choices in these matters, leading to a wide variety of display options and searching mechanisms. As Matthew Nickerson noted, "choosing a methodology [EAD] was the easy part and a far cry from actually building, distributing and maintaining high quality on-line finding aids."[14]

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[11] A non-functional version of the survey is available for reference at <http:web.library.uiuc.edu/ ahx/survey/intro.html> (December 4, 2002).

[12] *Archives and Museum Informatics* 12, nos. 3–4 (1998), "EAD in Action: Applications of the Encoded Archival Description."

[13] <http:www.iath.Virginia.edu/ead/> (December 4, 2002).

[14] Matthew Nickerson, "Electronic Access to Special Collections Registers in the Gerald R. Sherratt Library, Southern Utah University," *Archives and Musuem Informatics* 12, nos. 3–4 (1998): 236.

The *EAD Cookbook* fills a need to simplify implementation by reducing the number and complexity of choices to be made in implementing an EAD project. As noted on the EAD Help pages, the *Cookbook* is essentially a mark-up protocol that is based on recommendations found in the EAD Application Guidelines and promulgated by several EAD projects. The *Cookbook* includes three ingredients: an implementation manual, encoding templates, and downloadable stylesheets. It explains decisions behind the encoding recommendations and is accompanied by some software tools that incorporate the markup model into pieces of commercial software. The manual outlines administrative and technical decisions to be made in designing an EAD project. It provides an explanation of the encoding protocol used in the software templates, outlines options for element usage, and provides a basis for making encoding decisions. In addition, it includes basic instructions for installing and configuring the encoding software and stylesheets.

The encoding templates and the stylesheets can be downloaded from the EAD Help pages. In order to use the templates and stylesheets, archivists need to buy software (such as Xmetal, WordPerfect, or NoteTab) and make some decisions regarding the encoding protocol, tags, and attributes to be used.[15] In addition, many implementers may wish to develop macros (processing instructions) to make the process of encoding a finding aid easier. Each institution needs to modify the stylesheets to tailor the display to local preferences, and most users will want to develop a workflow for encoding and posting of finding aids in a timely fashion. None of these steps are necessarily simple, but they are less taxing than they would be without the *Cookbook*.

Survey Results

Since the *Cookbook* is aimed at smaller archives or those that might not have the ability to draw on sophisticated technology, it is interesting to note that the survey results provide insight into EAD adoption patterns in the archival community as a whole. Twenty-seven individuals responded to the survey. Nineteen of the respondents were affiliated with universities, six with public libraries or historical societies, and two with museums. A representative of one consortium representing a group of liberal arts colleges also responded. If this response is any indication, EAD, even when implemented in its simplified *Cookbook* form, has made comparatively few inroads among corporate or religious archives. It has had its greatest success among academic and public institutions that have a mission to share their resources and are able to draw upon relatively sophisticated computing resources.

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[15] At the time the survey was conducted, software purchase was required. However, a beta implementation for the free text editor NoteTab Light is now available at <http://web.library.uiuc.edu/ahx/ead/tech/> (December 4, 2002).

The responding institutions range greatly in size, with eleven holding 500 or fewer record series or collections, eight holding 500 to 2,000, and seven holding 2,000 or more. In proportion to the number of series held, these institutions have produced a large number of conventional printed finding aids at the box and folder level; ten of the institutions hold from 1 to 250 finding aids; eight hold 250 to 500; ten 500 to 2,000; and two hold over 2,000 finding aids. Findings regarding the types of institutions implementing the *EAD Cookbook* are generally consistent with prior information. It has been reported that as of February 2000, only eight percent of repositories have posted finding aids on the Internet, in any format.[16] It would appear that smaller colleges and universities are beginning to adopt EAD, but large academic archives and public libraries have embraced the standard most strongly. This might be expected since implementing a new technology requires both rigorous training and a funding source. Survey respondents included some of the largest universities in the United States, state historical societies, and two national libraries.

Almost universally, the respondents place a high priority on EAD implementation, with eight institutions seeing it as their highest priority and fifteen as "high on my list of priorities; worth implementing on a limited scale." The remaining five respondents saw it as a high priority or "worth exploring," but noted that they "do not have the resources to implement it properly." The high priority placed on EAD is not surprising since these institutions have already made a decision to implement the standard.

However, one significant surprise did emerge. At the time of the survey, only twelve of the respondents (or 44 percent) actually provided EAD finding aids on the Internet. The other fifteen (or 56 percent) had encoded finding aids, but had not yet made them available. Concomitantly, twenty-three of the twenty-seven institutions (85 percent) had encoded twenty-five or fewer finding aids. Of the twenty-three institutions that had encoded finding aids, eleven (or 48 percent) had not provided them online at the time of the survey. Some of the EAD projects were still in the early stages of development, so the end result may be higher than the statistics imply. Whatever the case, many institutions are undertaking large-scale EAD projects rather than implementing EAD incrementally. Institutions do not seem to be placing finding aids on-line as soon as encoding is completed, indicating that the projects may have little immediate impact in the on-line environment. Although it is possible that recently encoded finding aids are available in-house or in a paper version, the fact that many encoded finding aids are not immediately made available over the Internet would appear to be a conscious decision on the part of implementors.

All respondents saw the *Cookbook* as easing the implementation process, though using it was hardly considered easy. As one respondent noted, the *Cookbook* "is not 'idiot-proof.' It assumes a level of knowledge about software that

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[16] Tibbo and Meho, "Finding Finding Aids," 69–70.

many people don't have, especially those in smaller institutions with limited resources." Another thought that "an archivist without an EXCELLENT handle on technology would have trouble." Respondents most liked the step-by-step implementation guidelines provided by the *Cookbook*. One noted that it was "concise and clear and easy to use. It answered many of the technical questions I was struggling with." Such comments were typical of many respondents. Implementing the *Cookbook* requires technical facility beyond that needed to use typical computer applications such as word processors, spreadsheets, and HTML editors.

Cookbook users by and large displayed a deep curiosity about computers. Many were essentially self-taught in the tasks of developing an encoding protocol, selecting tags, configuring systems, programming stylesheets, and designing workflows. Although the *Cookbook* reduces the complexity of such tasks, it does not eliminate them completely. Of the twenty-seven respondents, eight (30 percent) needed technical assistance to install and configure the encoding software associated with the *Cookbook*. Fourteen were able to install the software in under ten hours; four in under two. Users' attitudes toward the *Cookbook* and, in particular, toward installing and configuring the files seemed to reflect their familiarity with computers. Many users "muddled through the *Cookbook*," as more than one put it. "While the *Cookbook* is step-by-step, there are bugs and quirks that need constant ironing out. The only recourse is the EAD list, or trial and error." Judging by the skills which the respondents listed, it seems fairly clear that the *Cookbook* can be implemented by an advanced, or a "power" computer user, but not by an intermediate user, much less a novice.[17] Even if the Cookbook simplifies matters considerably, its users need large measures of motivation and technical savvy.

Those who were disappointed with their progress in implementing the *Cookbook* tended to blame a lack of programming skills or systems support. For example, one archivist noted that "Learning XSLT [the stylesheet programming language] has been a major block to implementing EAD at our institution . . . I am the only one of the archivists on staff who knows EAD well enough to implement it, but am not very familiar with XSL or XSLT." If a *Cookbook* user encountered difficulties, problems could sometimes escalate rapidly. Two respondents had spent over one hundred hours configuring the encoding software.

One archivist was of the opinion that, "EAD implementation requires a great effort, time, budget, and personnel." Many would agree with this assessment, but another archivist also spoke for many when noting that

> the *EAD Cookbook* was an invaluable tool as we began encoding our finding
> aids. Often it was able to provide concise explanations of aspects of the DTD
> [Document Type Definition] that were not clear. It was especially useful when

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[17] Seven users have made significant modifications to the XSLT stylesheets included with the *Cookbook,* a task that requires some programming skills.

we began exploring XML, XSL stylesheets, and conversion of finding aids
between XML, SGML, and HTML. Basically, it was a reliable and quick ref-
erence source throughout the process.

While the *EAD Cookbook* did not make EAD adoption a simple matter for any
institution, several projects would likely have failed without it. For example, one
archivist saw the *Cookbook* as absolutely essential, since "being able to experiment
with the stylesheets without too much initial investment into XSL . . . gave me
that first 'aha' experience, where I could realize hands-on just how flexible the
delivery [of] our finding aids would be."

If the *Cookbook* has eased the implementation process for archivists, what
has been the end result for users of archival materials? How are finding aids pre-
sented to the public? Of those institutions that were providing EAD on the Web
at the time of the survey, ten presented their finding aids as HTML produced
from the EAD source. Although none of the respondents indicated that they
had completed formal usability testing, several had received positive feedback,
particularly in regard to the navigation scheme employed by the *Cookbook*.[18] An
archivist at an institution that has mounted a large number of finding aids
noted that he had received "many favorable responses from staff and external
users regarding the ease of use of the EAD inventories." The *Cookbook* includes
a navigation bar down the left hand side of the screen, which "allows the user
to go directly to the information they need," in another archivist's words. Many
respondents echoed these sentiments.

On the other hand, it was unclear whether the *Cookbook* navigation scheme
should be seen as a benefit of EAD per se. One archivist noted:

> I would also like to see more people experiment with display. Most of the
> EAD-encoded finding aids don't look much different than a paper finding
> aid that's been put up on a computer screen. Also, although EAD accommo-
> dates the often elaborate hierarchies that are found in finding aids, I don't
> think that these hierarchies are presented in a way that users can understand
> intuitively. This may be more a stylesheet issue than an EAD issue.

As institutions get more experience with EAD, usability testing may allow for
improved display using the same EAD source file. As Michael Fox likes to put
it, "HTML is a one-trick pony," but EAD can be used and reused in a variety of
other formats, both on and off the Internet.

Perhaps the greatest benefit of encoding a finding aid in EAD is that dis-
play can be changed without recoding the finding aid. As one respondent
noted, "there is considerable flexibility with XSLT to display however is
needed." Anne Gilliland-Swetland has recently laid out some specific ways in

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[18] The *Cookbook* includes stylesheets that transform the finding aid into three different views.
Examples of the views are available at <http://www.mnhs.org/library/findaids/2468a.html>;
<http://www.mnhs.org/library/findaids/2468.html>; and <http://www.mnhs.org/library/findaids/
2468f.html> (December 4, 2002).

which EAD display and searching might be improved, echoing earlier concerns that finding aids structures should be reengineered for conversion to EAD.[19] For example, search capabilities might be enhanced to allow for better name and subject retrieval than is typical of the static finding aid display output by the *Cookbook* stylesheets.

Some respondents were disappointed that the *Cookbook* stylesheets did not support certain EAD elements. In order to index one finding aid, an archivist created a separate HTML index page, even though she thought this work would need to be redone "once browsers can read native XML." Others noted that they had to spend time learning XSLT in order to modify the display to include elements not supported in the default display.

Several respondents thought that the finding aids would become more usable "when XML browsers are available." Yet browsers that can display XML in its native format (e.g., Internet Explorer) were commonly available at the time of the survey. It is difficult to say on what basis this hope for improved usability rests, since XML finding aids would not load into many browsers currently in use at the time of the study (e.g., Netscape ver. 4.7 or earlier). Delivering XML in its native format confers little tangible benefit to the end user since features delivered as native XML styled for display can also be delivered as HTML and therefore viewed on any browser. At least one respondent strongly believed "that all documents must be accessible through HTML for all patrons, even those who don't have a new computer."

Only four respondents (15 percent) planed to make their finding aids searchable. The absence of a search interface can be seen as a rather severe usability impediment. At least some archivists expect that EAD will provide a powerful search function at an undetermined future point. One thought that the "power behind EAD comes from the searchability," but there is no off-the-shelf product available to supply a search engine or interface. When asked what could be done to improve usability, another noted that:

> An effective search engine that would allow specific field searching as well as proximity, boolean, etc. searching would make the staff time spent encoding all the EAD fields well worthwhile. Also, this enhanced searching would be a very easy way to show the administration the benefits of EAD.

Users and Usability Literature Review

The lack of an easy way to implement search mechanism is currently one of the greatest challenges confronting those implementing EAD, but it is far

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[19] Anne J. Gilliland-Swetland, "Popularizing the Finding Aid: Exploiting EAD to Enhance Online Discovery and Retrieval in Archival Information Systems by Diverse User Groups," *Journal of Internet Cataloging* 4, nos. 3–4 (2001): 214–21; Dennis Meissner, "First Things First: Reengineering Finding Aids for Implementation of EAD," *American Archivist* 60 (Fall 1997): 372–87.

from the only one. If we are to gauge the success of the *Cookbook* in helping archivists meet the needs of archival researchers, we must know at least a little about how users seek information and use electronic resources, so that we can begin to evaluate finding aids against a yardstick. Archivists have long complained that relatively little is known about how archival users seek information, interact with finding aids (either paper or electronic), or approach archives and manuscript collections.[20] In addition, few published articles (and no books) appear on the precise subject of user access to archives in an electronic environment. This is particularly true for EAD; as James Roth has noted, "Those works that discuss EAD concentrate more on theory and implementation of the EAD structure, or present various implementation case studies at archival institutions, rather than the delivery of EAD-encoded finding aids to general remote users."[21] This is certainly true for special EAD-focused issues of professional journals, such as the Summer and Fall 1997 issues of *American Archivist* and the Fall/Winter 1998 issue of *Archives and Museum Informatics* (which was actually published in May 2000). More recently, the *Journal of Internet Cataloging* devoted an issue to "Encoded Archival Description on the Internet," but most of the studies focused on assessing the standard and its ability to meet archivists' descriptive needs. The volume focused less attention on evaluating EAD implementations from an archival researcher's point of view, aside from one article on EAD's potential role in transforming reference service.[22]

The relative paucity of user studies, particularly user studies focused on EAD, poses a problem in an electronic environment, because most EAD projects have been conducted with little or no formal feedback from users.[23] Many researchers browse an archives' website without the archivist's knowledge, so it is very difficult, if not impossible, for an archivist to mediate researchers' questions. In addition, patterns of research among academic researchers are changing, and academic researchers—upon whom many past generalizations about user behavior have been based—are far from the only researchers who use online archival resources.

Nevertheless, a large enough body of knowledge now exists to allow some preliminary generalizations about researcher behavior in the electronic environment. The literature provides some principles that can be used in evaluat-

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[20] Maher notes that most archives do not put user data to very good use. Duff and Johnson argue that archivists have only recently begun to consider the user's point of view, and Altman and Nemmers were recently unable to find any literature on the usability of archival websites. William Maher, "The Use of User Studies," *Midwestern Archivist* 11, no. 1 (1986): 15; Wendy Duff and Catherine Johnson, "A Virtual Expression of Need: An Analysis of E-mail Reference Questions," *American Archivist* 64 (Spring/Summer 2001): 43–60; Burt Altman and John Nemmers, "The Usability of On-line Archival Resources: The Polaris Project Finding Aid," *American Archivist* 64 (Spring/Summer 2001): 122.

[21] Roth, "Serving Up EAD," 218.

[22] Richard V. Szary, "Encoded Finding Aids as a Transforming Technology in Archival Reference Service," *Journal of Internet Cataloging* 4, nos. 3–4 (2001):197.

[23] Roth, "Serving Up EAD," 230–31, 234.

ing online resources such as archival finding aids. Some useful studies of archival users were published in the 1980s and early 1990s.[24] Other articles provide insight on library users, although they do not focus specifically on archival users. For example, the information-seeking patterns of humanities scholars, graduate students or other groups have attracted interest.[25] Literature about information-seeking behavior in academic libraries can help in the design of more usable archival electronic resources.[26] A series of articles on archival users and the usability of electronic resources appeared in the Spring/Summer 2001 issue of *American Archivist.*[27] Finally, Anne Gilliland-Swetland has recently developed some important strategies for EAD finding aid implementation which potentially can be used to facilitate information discovery and retrieval by diverse researcher groups.[28]

At the risk of oversimplifying the debates represented by this literature, one can say that researchers bring a variety of perspectives and research styles to archives.[29] For finding aids, this raises the possibility that researchers should be given multiple access points and possibly even multiple interfaces. For example, it has been known for quite some time that historians and other scholars comprise a very small percentage of total users.[30] How would our electronic

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[24] Significant studies include Jacqueline Goggin, "The Indirect Approach: A Study of Scholarly Users of Black and Women's Organization Records in the Library of Congress Manuscript Division," *Midwestern Archivist* 11, no. 1 (1986): 57–67; David Bearman, "User Presentation Language In Archives," *Archives & Museum Informatics* 3 (Winter 1989/90): 3–7; Lawrence Dowler, "The Role of Use in Defining Archival Practice and Principles: a Research Agenda for the Availability and Use of Records," *American Archivist* 51 (Winter/Spring 1988): 74–95; Robert Spindler and Richard Pearce-Moses, "Does AMC Mean Archives Made Confusing?," *American Archivist* 56 (Spring 1993): 330–41; and Paul Conway, *Partners In Research: Improving Access to the Nation's Archives* (Pittsburgh: Archives & Museum Informatics, 1994).

[25] These include Frederick Miller, "Use, Appraisal, and Research: A Case Study of Social Historians," *American Archivist* 49 (Fall 1986): 371–92; N. P. Thomas, "Information-Seeking and the Nature of Relevance: Ph.D. Student Orientation as an Exercise in Information Retrieval," in Susan Bonzi, ed, *Proceedings of the 56th Annual Meeting of the American Society for Information Science* (Medford, N.J.: Learned Information, Inc, 1993); and Charles Cole, "Name collection by Ph.D. History Students: Inducing Expertise," *Journal of the American Society for Information Science* 51:5 (2000): 444–55.

[26] Useful studies include Sandra Payette and Oya Reiger, "Supporting Scholarly Inquiry: Incorporating Users in the Design of the Digital Library," *Journal of Academic Librarianship* 24 (March 1998): 121–29; J. K. Nims and L. Rich, "How Successfully Do Users Search the Web?," *College and Research Libraries News* 59 (March 1998); Harry Bruce, "Perceptions of the Internet: What People Think When They Search the Internet for Information," *Internet Research: Electronic Networking Applications and Policy* 9, no. 3 (1999): 187–99; A. Dalgleish and R. Hall, "Uses and Perceptions of the World Wide Web in an Information-Seeking Environment," *Journal of Librarianship and Information Science* 32, no. 3 (2000): 104–13; and Ingrid Hsieh-Yee, "Research on Web Search Behavior," *Library & Information Science Research* 23 (Summer 2001): 167–185.

[27] Martin, "Remote Reference Correspondence,"7–42; Tibbo and Meho, "Finding Finding Aids," 61–77; Duff and Johnson, "A Virtual Expression of Need," 43–60; Altman, "On-line Archival Resources," 121–31.

[28] Gilliland-Swetland, "Popularizing the Finding Aid," 199–225.

[29] Hsieh-Yee, "Research on Web Search Behavior," 169, 172–74.

[30] Dowler, "The Role of Use in Defining Archival Practice and Principles," 76–7; Conway, *Partners In Research,* cited in Kristin Martin, "An Analysis of Remote Reference Correspondence," 21.

finding aids differ if presented for social scientists, administrators, lawyers, K-12 students or genealogists? Numerous opportunities for research exist, but the lack of literature should not dissuade us from trying new options.

At the very least, on-line finding aids should be presented in an understandable context. After archives began producing AMC records, Spindler noted that mixing AMC catalog records into bibliographic databases led many library users to misinterpret their search results.[31] Such confusion is also likely for electronic finding aids and digitized archival resources. For example, it has been noted that undergraduate students view the Web as a place where they will be able to access the final document, not a simple abstract or folder title as is typically presented in a finding aid.[32] In addition, online archival resources should enable archival users to search and retrieve information using proper names, places, and events, preferably using an authority control system.[33]

Archival users should be consulted when designing an on-line access system. The University of Florida successfully employed surveys and focus groups to help design an electronic finding aid system. Users have pointed out that it is easy to get lost when browsing finding aids, particularly when approaching the site from an external link. As a consequence, finding aids should be designed to provide non-hierarchical access points (e.g., keyword searching, or subject/name indices) or at least to make the hierarchical arrangement of collections more shallow and self-apparent.[34]

Although different types of researchers use different methods to search for archival materials, some simple principles would help all users find information more quickly and easily. For example, we cannot assume that all users' information needs will be met without an archivist. Though it is possible that fewer researchers will want to visit the archives as more items are digitized, researchers have always valued personal service.[35] If digital facsimiles of archives are not available through links, the finding aid should guide users to an archivist, perhaps through an e-mail link embedded in the finding aid. Such an approach meshes well with Conway's findings that archivists and researchers are really partners in research.[36]

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[31] Spindler and Pearce-Moses, "Does AMC Mean Archives Made Confusing?" 333.

[32] Dalgleish, "Uses and Perceptions," 108, 109–11.

[33] Duff and Johnson, "A Virtual Expression of Need," 59.

[34] Altman and Nemmers, "On-line Archival Resources," 121–31; Gilliland-Swetland, "Popularizing the Finding Aid," 217–18; Gary Marchionini, Catherine Plaisant, and Anita Komlodi, "Interfaces and Tools for the Library of Congress National Digital Library Program," *Information Processing and Management,* 34 (September 1998): 538–39.

[35] Goggin, Jacqueline, commentary on Lawrence Dowler, "The Role of Use," *American Archivist* 51 (Winter/Spring 1988): 88–89.

[36] Conway, *Partners In Research,* cited in Martin, "Remote Reference Correspondence," 21–22.

Although surveys of user preferences are useful, one should not rely on them too much. As Jakob Neilsen points out, it is much better to focus on what computer users do than on what they say.[37] Accordingly, some relatively simple principles of usability can be used to evaluate any project, EAD or non-EAD.[38] For example, Neilsen recommends that site designers should not change the default hyperlink color (blue), break the browser's back button, force users to download non-standard plug-ins, or wait more than a few seconds for a page to load. Others recommend that the interface should also anchor users in a stable context and use a consistent layout.[39] To allow for better search and retrieval, on-line archival resources should also supply appropriate metadata which can be exploited by current technologies. Many users, students in particular, turn first to the open Web, to search engines like Google.[40] Others may find the source through a library catalog, a national database such as Archives USA, or through the institution's website. In this environment, perhaps the best we can do is provide multiple access points and good metadata in the finding aid. Adequate metadata on HTML pages generated from EAD allows search engines to index the pages we create. It is important to provide live hyperlinks to each finding aid (so that Web crawlers find the finding aid) and to properly code the <title> tag to supply information which can be indexed by search engines.[41] Finally, institutions should use frames judiciously since they can cause indexing and retrieval problems when not properly coded.

Usability of EAD Finding Aid Websites

The literature on archival users and Web usability indicates that EAD resides in a complex world filled with diffuse and, in many cases, unknown information-seeking and access behaviors. Nevertheless, the factors discussed above affect finding aid usability and retrieval for all users, whatever their precise information-seeking behaviors may be. Do EAD and the *Cookbook* adequately meet usability guidelines as we currently understand them? Can users find the finding aids?

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[37] "The First Rule of Usability: Don't Listen to Users," <http://www.useit.com/alertbox/20010805.html> (December 4, 2002).

[38] <http://www.useit.com> (December 4, 2002); Jakob Neilsen, *Designing Web Usability: The Practice of Simplicity* (Indianapolis: New Riders Publishing, 2000); Jakob Neilsen and Marie Tahir, *Homepage Usability: 50 Websites Deconstructed* (Indianapolis: New Riders Publishing, 2001).

[39] Hsieh-Yee, "Research on Web Search Behavior," 174; Marchionini, "Interfaces and Tools," 539.

[40] Dalgleish, "Uses and Perceptions," 110.

[41] For information on how search engines index pages, see <http://searchenginewatch.com/webmasters/work.html> (December 4, 2002). It is important to note that some search engines (e.g., Google) do not index <meta> tags.

To examine these questions in more detail, finding aids for ten of the twelve institutions that responded to the *EAD Cookbook* survey and provided on-line finding aids were examined. For the eleventh respondent with on-line finding aids, the server was repeatedly unavailable, and for the twelfth, the author was unable to locate any EAD finding aids using the tools available on the website. The remaining ten sites were analyzed for several factors related to the usability of electronic resources (EAD or non-EAD), including browser compliance, effective use of hyperlinking, the existence and style of frames, handicapped accessibility, and the inclusion of appropriate metadata such as <title> and <meta> elements in the HTML header. The criteria employed were largely those discussed above.

Some finding aids were much easier to use than others, and *Cookbook* implementers generally fell into two groups: those who had done little to change the overall structure of the HTML output produced by the *Cookbook* stylesheets, and those who had substantially modified the display. Those who made the fewest changes tended to have the most usable finding aids.

For example, finding aids provided by one institution included simple styling changes (e.g., different fonts and colors) to reflect the institutional style. These changes had obviously been well thought out, but for the most part the structural presentation mimicked the *Cookbook's* templates. On the other hand, some institutions wrote their own stylesheet or heavily altered the *Cookbook* stylesheets to include javascript or graphics-based navigation bars. These institutions justified such changes by noting that they didn't like the basic stylesheet display. One cutting-edge institution provided EAD in its native XML format directly through the browser, styled for presentation. Although this particular finding aid looked extremely attractive, users with older versions of Netscape could not access its content, shutting out about 20 percent of users at the time of the survey.[42] This finding aid also included link colors that were very similar to the default text color, potentially misleading users. Other institutions had made extensive modifications to the *Cookbook* stylesheets, including javascript in the webpages. These modifications increased the attractiveness of the finding aid in a superficial sense but tended to undermine usability. For example, a javascript error caused one institution's finding aids to be unavailable, a problem that was quickly corrected when brought to the institution's attention.

Five institutions used HTML frames to present their EAD finding aids; three of these used the *Cookbook's* HTML frames presentation to provide a static navigation bar in the left quarter of the page and the finding aid content in the right three quarters. The other two used the Dynaweb server. If properly implemented, frames can provide some usability advantages. In particular, they can provide a static navigation bar, facilitating user browsing. But they can pre-

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[42] Browser use statistics are available at <http://www.w3schools.com/browsers/browsers_stats.asp> (December 4, 2002).

sent problems for usability and handicapped accessibility. For example, it is important to include a <title> tag and adequate <meta> tags in the HTML frameset. For certain finding aids, it may be necessary to prevent webcrawlers from indexing the body of the finding aid by including a <meta name = "robots" content = "noindex"> element in the HTML header. Frames are sometimes shunned because they can undermine usability and accessibility. For EAD finding aids, this was often—but not always—true. Of the three institutions that used the standard *Cookbook* frames, only one of the institutions provided metadata about the finding aid in the top level frame (i.e., the frameset).[43] Without such metadata, it is very difficult for search crawlers to effectively index the page. None of the institutions prevented Web crawlers from indexing the subframes. This means that search engines may provide direct access to the body of the finding aid or digitized images, but not to the entire finding aid—an almost certain usability impediment.

Two institutions used a frames presentation that is produced by the Dynaweb SGML browsing package. Dynaweb is no longer available, but its default view presents three frames, including a table of contents to the left and a navigation bar at the bottom. The navigation bar presents several icons whose meanings are not explained, although one institution wisely replaced some of the icons with text. This institution also presented a "No Frames" option, but it did not work. Usability in each case was comparable to the default *Cookbook* frames, but in some instances the browser's back button did not work correctly.

While usability can present problems once a user has located a finding aid, it is probably more important to know whether finding aids can be located in the first place. To find out how easily EAD finding aids, particularly those presented using *Cookbook* display, can be found on the Internet, the finding aids selected for each institution were subjected to "the Google test": could a user find the URL for a known finding aid using Google?[44] To see how easily a collection might be found on the open Web, Google was queried using keywords from the collection or series title (such as the name of the creator of a manuscript collection), as well as the exact title of the collection as it appears in the finding aid. Although this test may seem rudimentary, it provides a working measure of how easily a user might find a collection under the most favorable of circumstances (using keywords or exact titles). Use of Internet search engines is a strategy we know many researchers are employing when seeking information.[45] The Google test therefore provides insight into how well

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[43] This was the institution that also provided a default non-frames view of the finding aid.

[44] Tibbo and Meho found Google to be one of the best search engines to use for title searching. Google provides the default search for Yahoo, which is currently the most popular search engine. <http://www.searchenginewatch.com/reports/index.html> (December 4, 2002).

[45] A more complete report of search engine success in locating finding aids is contained in Tibbo and Meho, "Finding Finding Aids," 61–77.

institutions use EAD to provide metadata as it is currently exploited by search engines and made available to users.

Grades on the Google test included one A, two Bs, two Cs, one D, three Fs and one deferred (for a new finding aid that Google had not yet indexed). Although ranking institutions in this way may seem arbitrary (if not mean-spirited) it should be regarded only as a shorthand basis for comparison. An "A" means the site was listed first or second in Google's results page when conducting a keyword or exact title search.[46] An "F" means Google could not find any of the collections searched for, even when using the exact title of the collection. The intermediary grades indicate that the Web engine was only partially successful at finding the site using an exact title search. Assigning grades to the institutions should not be taken to imply anything about the overall quality of the EAD projects I examined. But it does show that we have a long way to go before EAD metadata is put to a useful purpose by current search engine technologies.

An analysis of the source code for the finding aid webpages helps explain why Google found some institutions' finding aids more consistently than others. A few patterns emerged from this analysis. First, those institutions that had made the most extensive modifications to the *Cookbook* stylesheets or written their own stylesheets tended to fare the worst. Close inspection of the HTML code for one finding aid that could not be found revealed that no metadata about the collection was being supplied, except for a very abbreviated title tag. Similarly, the finding aids delivered in XML format were not found. The institution with XML finding aids managed to earn a grade of C only because Google found a lead-in HTML page which listed all of the institution's electronic finding aids. In another case where the institution presented the finding aid using frames, Google returned the body frame without the table of contents, severely restricting usability and robbing the user of important context such as the table of contents.

While institutions that modified the stylesheets extensively tended to restrict the ability of Google to find the finding aid, institutions that had done little to modify the stylesheets fared much better. For instance, the finding aids of a large public museum consistently placed high in the ranking list. These finding aids included very descriptive HTML title headers as well as <meta> tags. In one curious exception, none of the numerous finding aids belonging to one institution were found by Google, in spite of very deep metadata and useful title tagging in the HTML header. As subsequently confirmed by staff, this page had not been indexed by Google since the finding aids were available only

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[46] In an attempt to maintain some pretense of impartiality (and humility), the author subjected five of his own EAD finding aids to the Google test, with less than perfect results.

through database links. The lesson: if you decide to implement EAD, provide a hyperlinked list of all finding aids on a lead-in HTML page.

Assessment

It is difficult to cover all the bases when implementing an EAD project. Nevertheless, the *Cookbook* has proven to be an effective way to meet many of the minimum requirements for usability, to streamline the encoding process, and to design a workflow. One can hope that the presentation of EAD standardizes loosely around the *Cookbook* model, if only so that users are provided with a fairly consistent and recognizable interface as they do research at multiple institutions. This is not to suggest that archivists should simply adopt the *Cookbook* without modification. In fact, the *EAD Cookbook* can and must be extended in order to achieve its full benefits.[47] Similarly, usability testing should be undertaken so that the *Cookbook* stylesheet model can be refined further.

Although archivists who have implemented EAD support it as a standard, some of them feel unease over whether the results to date have been worth the effort. They wonder whether alternate routes that would require less technical expertise, such as posting finding aids in HTML or PDF format, would yield similar benefits. In this respect, the comments of several respondents hint at challenges facing the profession. As one person noted, "EAD seems to have a lot of promise, but I often feel like our efforts won't pay off for a few years." Another respondent hoped that, "After all the effort . . . I just hope it doesn't disappear when the next greatest thing since sliced bread comes along. There is a substantial investment here and any new system or gadget will need to be able to take what we are creating now and do something with it—I don't want to have to start over again." Several respondents felt that the EAD provided little added value beyond doing HTML. This is particularly true for those who are struggling to make EAD searchable:

> EAD also gives researchers the false impression that collections don't have what they are looking for. He/she will do a few keyword searches, nothing pops up, and they think the collection has nothing. Good researchers will look through an entire finding aid to see what the collection offers, so why EAD and not just HTML?

In defense of EAD, other archivists tended to argue that its limitations have less to do with the standard itself than with external factors. For example, several respondents seemed to think that EAD is "not capable of delivering . . . content richness until XML-based browsers are commonly available." Another

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[47] Christopher J. Prom, "Extending the Capabilities of the *EAD Cookbook*," *OCLC Systems and Services,* 17, no.2 (2001): 89–95.

pointed out that its strengths lie in "standardizing the structure of finding aids, simplifying data migration, facilitating user access . . . and making it possible to exchange data on a global scale."

Although these benefits are possible, they are currently far from being realized on a large scale. They will probably never be realized without significant planning within the archival profession. It is tempting to blame problems in implementing EAD and the *Cookbook* on a lack of archival education or the paucity of institutional resources available to archives, such as the lack of systems support. But at the same time, it must be realized that as effective as EAD may be in delivering finding aid text, it is not easily adopted, and for many archives it requires the diversion of resources from other important activities.

For better or worse, the *EAD Cookbook* is being used as an effective but limited piece of middleware. The successes that some institutions have found in using it, as well as the failures experienced by others, point to a pressing need. As one archivist has noted in an email to the author of this paper, "EAD as it exists today is nothing more than a glorified HTML- only used to deliver finding aid text over the Web." Sounding a similar note, Liz Shaw has recently suggested that sophisticated data exchange via EAD will never be realized unless specific encoding guidelines for EAD are developed by the profession and followed by as many institutions as possible.[48]

Achieving broader acceptance of EAD and better implementation of the standard is more of a political than a technological issue. In order for the profession to achieve these goals, SAA's Technical Subcommittee on Descriptive Standards or another body would first need to formulate a common set of encoding standards specifically tailored to EAD. Perhaps existing data structure standards such as the Online Archives of California's Best Practice Guidelines or the RLG Recommended Application Guidelines could be adapted to this purpose.[49] Such a standard, if formally adopted by SAA, would define a minimal benchmark for EAD interoperability by (for instance) banning certain tagging practices, mandating others, and standardizing the treatment of names, places, and dates.[50] Calls for better data structure standards have been made before, most notably in an editorial prefacing the special *Archives and Museum Informatics* issue on EAD and in an article describing EAD projects at the Duke

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[48] Elizabeth J. Shaw, "Rethinking EAD: Balancing Flexibility and Interoperability," *New Review of Information Networking* 7 (2001): 117–31.

[49] The RLG Application Guidelines are available at <http://www.rlg.org/rlgead/guidelines.html> (December 4, 2002). The OAC best practice guidelines are available at <http://www.cdlib.org/about/publications/oacbpg2001-08-23.pdf> (December 4, 2002).

[50] Such data structure standards could be used in conjunction with the descriptive content standards currently being formulated by the participants in the CUSTARD project. A statement of principles for the CUSTARD Project is available at <http://www.archivists.org/news/custardproject.asp> (December 4, 2002).

University and the University of California at Berkeley.[51] But simply developing encoding standards or best practice guidelines will have little effect if archivists are expected to implement them without adequate technical support. While some may feel compelled to force institutions to adopt a specific encoding protocol, compulsion would not be in keeping with traditions of archival independence nor would it fit institutional realities. On the other hand, the promulgation of encoding standards would allow for the development of software specifically tailored to EAD markup and permit more consistent search and display mechanisms. Such software would need to be easy enough to implement without special training or high-level computer skills.

Those who have struggled with EAD (even in its simplified *Cookbook* form), with authoring software such as Xmetal, or with modifying a stylesheet to display a finding aid on the Internet, know that the need for such an application exists.[52] A piece of computer software specifically oriented toward EAD authoring and publication would allow for the creation and distribution of finding aids that are consistently structured, tailored for the Web environment, and are, ideally, able to be searched in a freely-available union database.[53]

The acceptance of EAD by all archivists—not just the tech-savvy ones— depends on the ability of the profession or the marketplace to supply such an application. As an archivist at a smaller institution noted, "We need to spread the technological wealth, if we want EAD to become something more than a technology used by elite, large institutions."

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[51] Richard Reinhart and Anne Gilliland-Swetland, "Editorial," *Archives and Museum Informatics* 12, nos. 3–4 (1998): 174; Timothy P. Hoyer, Stephen Miller, and Alvin Pollack, "Consortial Approaches to the Implementation of Encoded Archival Description (EAD): The American Heritage Virtual Archive Project and the Online Archive of California (OAC)," *Journal of Internet Cataloging* 4, nos. 3–4 (2001): 136.

[52] The EAD listserv archives is replete with such problems and questions. See <http://listserv.loc.gov/ listarch/ead.html> (December 4, 2002).

[53] Efforts such as the *Archivist's Workbench* hold significant promise in this respect. The project is charged with developing tools to simplify EAD adoption. No products have yet been developed, but a workspace, including some public items, is available at <https://worktools.si.umich.edu/workspaces/ EYakel/002.nsf> (December 4, 2002).