Print vs. Electronic Redux

Maha Kumaran and Dawn Bassett

In his *In Praise of Scribes,* a late 15th Century treatise on the new technology of the printing machine*,* a German monk named Trithemius wrote, "he who gives up copying because of the invention of printing is no genuine friend of holy scripture…..printed books will never be the equivalent of handwritten codices …." He goes on to say that "writing – if it is on parchment – will be capable of lasting a thousand years; but printing – since the material is paper – how long will that last?"[1] After the Gutenberg revolution, these fears and predictions slowly disappeared and few remember that these conflicts even existed. Presently, the enduring presence of the printed word has led information age philosophers such as Michael Heim to assert that a "book defines a certain way in which access to the things in the world is fostered, a certain modeling of the way things are held up to attention."[2] Since the evolution of printing in the 1400's we have come a long way not only in the form, content, typeset, and binding of printed materials, but also in the way we collect, organize, shelve and retrieve them.

But just as it seems that we have accomplished the insurmountable task of organizing the printed word, the publishing world is in the middle another transition. The advent of the World Wide Web has changed the way we interact with information. In the publishing and library world, this next wave of change arrived in the form of the electronic journal. As journal publishers rushed to take advantage of the potential ease of access provided by the web, librarians were left with a number of issues regarding access, storage, retrieval, and cost of the new format. While journals existed electronically in "plain text format" in the 1980's, *Postmodern Culture*, first published in 1990, is recognized as one of the first of the new online journals[.3, 4] Fifteen years later, it is estimated that there are more than 30,000 journals, magazines and newsletters available online.[5] The rapid advance of the electronic journal and the fact that some are less expensive than their print counterparts has meant big changes in the way that libraries provide access to journal content for their patrons. The April 2003 issue of *Against the Grain (ATG)* was dedicated to discussing these challenges. The authors of articles in the April 2003 issue discussed the complexities of copyright and licensing, the pros and cons of electronic vs. print retention and the impact of the transition between the two formats on both libraries and patrons.[6,7,8,9,10]

A review of the literature over the past five years indicates that access, cost, and education are just some of the important issues for libraries as they decide which format they will retain in their collection or whether they will retain both. [11, 12, 13, 14] In the past few years several quantitative studies aimed at examining the differences in cost and usage between print and electronic formats have emerged. These studies provide further evidence that the advantages and disadvantages of electronic vs. print formats continue to be complex and challenging. In order to get a feel for how these issues affect library employees on a day-to-day basis, we drafted an informal survey and submitted it to the following list-serves; LIBREF-L@LISTSERV.KENT.EDU, CHILD LIT@EMAIL.RUTGERS.EDU, ILI-L@ALA.ORG, CANMEDLIB@CLIFFY.UCS.MUN.CA, and SERIALIST@LIST.UVM.EDU.

The survey consisted of a variety of open-ended questions that invited respondents to consider the ways that working with electronic or print materials has affected them, asked them to speculate about the future, and comment on any improvements they would like to see. We had 155 librarians and auxiliary library employees respond to the survey. The majority of the respondents were from the United States and Canada. 69% of the respondents came from Academic Libraries, 11% from Special Libraries, 8% from Public Libraries, 3% from School Libraries and the remaining 9% selected "other" as library type. The respondents were an experienced group, with more than 45% having ten or more years of experience, 30% between six and ten years and the remaining between 3 and 6 years. Although their job titles were incredibly varied, most of the respondents stated that they had responsibility for either some or all of the collection. By using examples from

our survey to elucidate the previously identified challenges, we will reveal that while much has been improved in electronic journal publishing, many unresolved issues continue to exist.

Access

For most patrons, access to an electronic journal has never been easier. As long as the journal they want is subscribed to by their library, they can access the full text of the article directly from any desktop computer. Most libraries provide remote access to journal content and some access to electronic books as well, which, for the patron, means more convenient access to the materials they need. But, for librarians, the process of providing electronic access to those articles is much more complex than providing access to print materials. The workflow process involved in creating both print and electronic collections includes "selection, ordering, cataloging, and providing reference and instructional support."[15] But supporting an electronic collection has additional complexities such as licensing issues, complicated and costly pricing models, and different modes of access to consider.

Choosing the right type of access for patrons is just the beginning though. Electronic journal licensing is a much more time consuming exercise than purchasing a book or a print journal. When a print book or journal is purchased by a library, it owns the physical entity and its content. In the electronic world, however, libraries often purchase rights to access the material, rather than own it. Consequently, once the subscription expires, access to the content expires along with it. Due to this complexity, some librarians comment that the process of acquiring access to an online title can often take much longer than providing access to a print title.[16, 17]

While many patrons enjoy the ability to link directly to the full-text of an article or book chapter while using electronic formats, linking brings its own set of potential disadvantages. For example, some journal publishers or database aggregators allow the patron to link directly to the article they wish to view or print, while others simply link the patron to the publisher of the content. If the patron is lucky, the publisher will recognize their proxy IP and allow them access. If not, they may be forced to search for the paper again in the new site, register, and possibly pay for full-text of the article they are interested in.[18] Other barriers to access for patrons include lack of proper software installed on their home desktop, expired or improperly processed user cards, or lack of knowledge about how to properly access a particular database.[19]

Respondents in our survey indicated that there are still many improvements that could be made to electronic access (*see Table 1*), and were typically in agreement with the written literature above. The largest concern among this group appears to be the lack of consistency in interfaces between the various publishers. Many felt that a seamless interface for both initial access and searching would be a considerable improvement over the current model. There was also a strong preference for standardization across many areas of electronic journal publishing including linking, controlled vocabularies, search terms, and indexing. It was interesting to note that while most of our respondents from academic libraries were in favor of IP access, special and other small libraries desired the ability to choose an access type based on their needs/budgets and felt that publishers were not being flexible enough. URL and linking problems were number three on the list, and again, many of our respondents called for greater standardization, and more stability.

The dilemma of ensuring future access to electronic material continues to challenge information managers, librarians, archivists, and the computer science community.[20] In the meantime, librarians are left wondering, whether the electronic books, journals and information on CD, DVD or other storage media will last as long as printed paper or microfiche. Therefore, many continue to have hybrid collections of print and electronic materials just in case an adequate answer to this problem is never found. Many of our respondents commented that lack of permanence, and access to archival content were still major barriers to an electronic only library.

Education & Training

The complexities in granting and gaining access to electronic books and journals have also changed the skill sets needed to process and maintain these collections. This is true for both library employees and library users. While library patrons are expected to be information literates [21] and cultivated critical thinkers,[22] most do not need additional education to access the text of a print book or journal (unless it is a large reference book with a complex index). They just need to pick up a book and read it. Similarly, library employees have had centuries of experience providing access to print material. With an electronic book or journal, however, some new skill sets are required of all library employees, so they can ensure that their patrons understand how to retrieve the content of a particular book or journal. Library employees have embraced their roles as educators in order to help patrons strengthen these skills so that they have better access to information. Unfortunately, if the patron is accessing the content remotely, they must rely either on their own skills, documents created by the library to guide them through the process, or in some cases online chat reference service. As mentioned before, since there is no standardization in access, indexing or controlled vocabulary in databases, patrons who use these services need training in these areas as well. This may account for the large percentage of comments made by our respondents that many users still prefer print materials. For new students or for people who are use to print, whether they are technologically savvy or not, they want the quickest most efficient access to the material they can get. Grabbing that reference book or journal off the shelf is less of a learning curve. This is an area where, as our respondents suggest, a standard interface would help. If patrons only need to know one mode of access, it would be easier for them to learn how to efficiently use a particular electronic resource.

Advances in electronic access and the need to negotiate complicated licensing agreements are two areas where library employees may need new skill sets to perform their job efficiently. Library managers and administrators must look for new employees who already have these skills or provide additional training to existing employees on how to use, maintain, license and update these complex systems.[23, 24] In most cases both technical and public services library employees need to understand the issues involved in electronic access so that they can properly troubleshoot problems and provide reference services to their patrons.[25] Although many library employees enjoy the challenges and opportunities of continuing education, the rapid change in technology also demands much of their already limited time and resources. Training for both library staff and users was another area that the librarians we surveyed thought could still be improved (*see Table 1*). They indicated that locating articles within aggregator databases is still a concern due to prevailing inconsistencies between publishers and commented that if standardization is not possible, more training and support must be provided, so that they in turn can pass this knowledge on to their patrons. With declining budgets and staff, many library employees have to pay for this continuing education themselves so the more, free or low-cost training available to them, the better.

Cost

Regardless of the format, access, education, storage and preservation all have their particular influence on a library budget. While much was written in the late 1990's that discussed the high subscription price of electronic journals compared to print, in 2000, Carol Hansen Montgomery began to assess other costs involved. The Drexel University study aimed to analyze the "operational costs associated with shifts in staffing, resources, materials, space and equipment." The preliminary results of this study concluded that the "per title subscription costs for electronic journals" was lower than the "per title charge" for print journals. Montgomery predicted that although electronic journals were "substantially more expensive to maintain;" as the industry matured, the processes involved would "become easier, and thereby less costly for libraries."[26] In 2002, Montgomery released a more thorough analysis of the study which demonstrated that "although an electronic journal collection results in increased costs of some activities, the advantages and decreased costs in other areas

outweigh the increases." Montgomery warned, however, that the Drexel study was specific to her academic library and further study was warranted before any wide-scale conclusions could be drawn.[27] Library employees in our survey largely responded that electronic subscriptions were still too costly. When asked if their budgets adequately served their collection needs, 56% responded "No" and 44% responded "Yes" (though many of these said they could always use more). Several respondents indicated that they supplement the cost of electronic journals and databases with their book budget. The responses also seem to indicate that not all libraries are finding the transition to electronic access affordable. This may be because many libraries are still faced with keeping both print and electronic and true operational efficiencies and cost savings are yet to be accomplished, since keeping both is likely the most expensive of the three options.[28]

More detailed studies need to be done in this area to determine the cost differences between print and electronic books, but likely the same issues will apply. For example, print book costs include the expense of purchasing, shipping and handling, and the operational costs of processing the books. Since no equipment or digital infrastructure is required to access a print book, it is less expensive and less time consuming than electronic access. However, storing print materials can be quite expensive. As with electronic journals, it remains to be seen if the electronic book will prove to be more, less or just as costly as the print version. Especially since the soaring popularity of the second hand book market has made print books even less costly than their electronic counterparts.[29] When asked if there was a future for the print versions of either books or journals, many of our survey respondents commented, that they thought that although the electronic journal was likely to surpass the print in the near future, they were not as sure about the electronic book. Many remarked that the sectional quality of textbooks or reference books lends itself nicely to digitization because small sections can be searched or printed off for easy reading. But they felt that the electronic book still doesn't work well for books in the humanities, or for fiction, because it is difficult and somewhat challenging to "cuddle up" with a nice computer screen and a cup of cocoa. Still other respondents commented that with the rapid advances we have seen in technology over the past decade, something new may be introduced into the mix that will set us off on yet another transition. Only time, of course, will tell.

Conclusions

The fears that existed in Trithemius and his contemporaries during the onset of the print revolution still exist in some of us today about the electronic medium. We, the authors of this paper, do not want to be today's Trithemius and declare the death of print and or the future of electronic publishing. It is difficult, from where we stand today, to predict if one medium will obviate the other. Our survey respondents were asked if they believed that electronic books and journals were the future. Approximately 50% said yes, approximately 25% commented that electronic journals were already taking over print versions and expected the latter to be obsolete within the next 10 years. The same group also believed that the electronic book would take much longer to catch on. The remaining 25% indicated that they didn't think that print would become obsolete until access and preservation issues are resolved. For now, it seems that it is still necessary for some libraries to keep hybrid collections, and necessary for others to adapt to an "electronic only" model, but these decisions should be based on your library's needs, your user base, your funding and your administrative support. Procure all information possible about either format - its publishers, licensing agreements, user fees, archival access, your user preference and any thing else that might be appropriate to your library's needs. No one knows for sure whether electronic formats, as we know them today, will endure the test of time. But again, librarians also have to keep up with the changing needs of their patrons or run the risk of becoming irrelevant to their users. There are studies showing that different scholars have different preferences when it comes to formats. Siebenberg et al concluded in their research that "the popular lore/common wisdom that people are changing from using print journals to electronic journals is not true across the board."[30] Their study suggested that

users' migration between formats varied depending on the subject area. This echoes the responses we received that many users still prefer print and that just as many would be happy to move to electronic only. Simply stated, until library patrons can agree on one format, it will be necessary to continue to provide some kind of access to both.

Table 1: How can access to electronic journals be improved?	
Answer	**No. of Respondents**
Seamless access between databases from different publishers and aggregators	45
More affordable or free content	33
Stability of URLs/Better link resolvers	14
Standardized indexing between aggregators and publishers	11
Better training or educational materials for staff and patrons	9
Guaranteed access to past issues/archival content	7
More full-text content, including access to historical content	5

Notes/References

1. Trimethius, Johannes. 1977. *In Praise of Scribes*. Vancouver: The Alcuin Society.

2. Heim, Michael. 1987. Electric *Language: A Philosophical Study of Word Processing*. New Haven: Yale University Press.

3. Cole, Louise. 2004. "Back to Basics: What is the E-Journal?" *The Serials Librarian*. 47(1/2): 77-87.

4. O'Donohue, Kate. "The Accessing and Archiving of Electronic Journals: Challenges and Implications Within the Library World." *The Serials Librarian* 49(1/2): 35-87.

5. See Ref. 3.

6. Alan, Robert, and Butkovich, Nan. 2003. "Libraries in Transition: Impact of Print and Electronic Journal Access." *Against the Grain* (April): 32-34.

7. Jaeger, Don. 2003. "The Future of the Hardcopy Journal." *Against the Grain* (April): p. 30.

8. McDonald, John. 2003. "No one uses them so why should we keep them? Scenarios for Print Issue Retention." *Against the Grain* (April): 22-24.

9. Plutchak, T. Scott. 2003. "Vanishing Act." *Against the Grain* (April): 36-38.

10. Rowse, Mark. 2003. "The Hybrid Environment: Electronic-only versus print retention." *Against the Grain* (April): 24-27.

11. Wittenbach, Stefanie; and Hughes, John. 2003. "Everything You Always Wanted to Know About Electronic Journals But Were Afraid to Ask." *The Serials Librarian* 44(1/2): 11-24.

12. See Ref. 2, 4, 5 and 7

13. Hawkins, Les. 2002. "E-serial Titles That Disappear." *Serials Review* 28(3): 222-224.

14. Thompson, Lora L.; Toedter Lori J.; and D'Agostino, Frank J. 2005. "Zero-based Print Journal Collection Development in a Community Teaching Hospital." *Journal of the Medical Library Association* 93(4): 427-430.

15. Horner-Button, Leslie, and Sheffield, Rebecca. 2005. "But isn't it All Available for Free on the \ Web?" *The Serials Librarian* 48(3-4): 271-276.

16. See Ref. 15

17. Jewell, Timothy D., and Mitchell, Anne. 2005. "Electronic Resource management: The Quest for Systems and Standards." *The Serials Librarian* 48 (1/2): 137-163.

18. See Ref. 11

19. Markwith, Michael et al. 2005. "Where Did That E-Journal Go? E-Journal Access Problems." *The Serials Librarian* 48 (3/4): 243-245.

20. Waters, Donald J. ed. 2005. "Urgent Action Needed to Preserve Scholarly Electronic Journals." Report from the Digital Libraries Federation. September 13, 2005. Accessed October 29, 2005. Available online at http://www.diglib.org/pubs/waters051015.pdf

21. Information literates have the skill "to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." American Library Association. (1989). The presidential Committee on Information Literacy: Final Report. Available at http://www.ala.org/ala/acrl/acrlpubs/whitepapers/presidential.htm

22. Critical thinkers have the ability to think "about any subject, content, or problem - in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them. Critical Thinking Community. 2004. Defining Critical Thinking. Available at http://www.criticalthinking.org/aboutCT/definingCT.shtml

23. See Ref. 11

24. Kara, Bill; Stamison, Christine; and George, Sarah E. 2004. "Keeping the Connection: Maintaining E-Journal Subscriptions." *The Serials Librarian* 46(3/4): 309-313.

25. See Ref. 11

26. Montgomery, Carol H. 2000. "Measuring the Impact of an Electronic Journals Collection on Library Costs: A framework and Preliminary Observations" *D-Lib Magazine* 6(10). Accessed October 15, 2005. Available at: http://www.dlib.org/dlib/october00/montgomery/10montgomery.html.

27. Montgomery, Carol H., and King, Donald. 2002. "Comparing Library and User Related Costs of Print and Electronic Journal Collections: A First Step Toward a Comprehensive Analysis." *D-Lib Magazine* 8(10). Accessed October 15. Available at: http://www.dlib.org/dlib/october02/montgomery/10montgomery.html#Montgomery-2000

28. Turner, Rollo. 2005. "Hidden Costs of E-Journals." *The Serials Librarian.* 48 (1/2): 215-228.

29. Italie, Hillel. 2005. "The Story of Used Books is a Real Page Turner." Accessed on October 17, 2005. Available at http://www.chron.com/cs/CDA/ssistory.mpl/tech/news/3389146 .

30. Siebenberg, Tammy R.; Galbraith, Betty, and Brady, Eileen E. 2004. "Print Versus Electronic Journal Use in Three Sci/Tech Disciplines: What's Going On Here?" *College & Research Libraries.* 65(5): 427-38.