

Potential of Electronic Journals to Extend Library Collections

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Introduction

Electronic journals have mushroomed in recent years. Many publishers have the electronic versions produced of their print journals on the Internet, some are even considering to stop their print publications. Electronic journals have created excellent opportunities to access information resources, which were previously beyond the reach of libraries due to financial and geographical factors. The potential of electronic journals to extend library collections and provide convenient access to information has been described in several studies (Guedon, 1995; Stanley, 1995; and Woodward, 1996). Electronic journals have also created serious implications for libraries. Since they are not physically available, e-journals are expected to have profound impact in different functional areas of work in libraries and information centers. Meadows (1996), and Khalil and Jayatilleke (1996) have discussed various influences e-journals are expected to have on funding and other requirements in information institutions. To facilitate access and to manage e-journals effectively, staff in libraries need to be more knowledgeable about the options, play an active role to seek solutions to the issues involved, and be more innovative in changing their way of performing various operations (Chaudhry, 1996).

This paper provides an overview of the systems designed for delivery and access of electronic journals and highlights the possible implications in the various collection development functions that need to be addressed to exploit the potential of e-journals. It also discusses the problems that need to be solved and points to issues that need to be addressed before full advantage of electronic journals can be realized.

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E-journal systems

Electronic journal delivery and access systems developed by publishers and intermediaries have proliferated with the popularity of World Wide Web. They do not only facilitate the dissemination of information carried by electronic journals, but also provide some management functions to help the administration of electronic journals for librarians. These systems include delivery systems developed by publishers, e.g. Academic Press IDEAL, Elsevier ScienceDirect, Johns Hopkins University Press Project Muse, Wiley InterScience and access systems developed by aggregators, e.g. Swets SwetsNet, OCLC Electronic Collection Online, Blackwell Electronic Journal Navigator, etc. All these systems provide a user-friendly interface and the basic functions like browsing, searching, viewing and printing. Details about these systems can be found in articles published by Brown and Duda (1996) and Machovec (1997).

Although the e-journal systems tend to be similar in the facilities provided, there are still variations with regard to the software needed, interface design, and search functions. The pricing policies and license terms are also different. The inconsistencies among systems make the selection and acquisition complicated. If a pricing paradigm, a common interface as well as standard licensing terms could appear with the coordination among publishers, aggregators, and information institutions, it will greatly facilitate the work of information professionals (Zhihong, 1999). In the next section, issues related to identification of journals, selection, acquisition and serials control, cataloguing, and archiving are addressed to provide a broader perspective on journals.

Identification

The usual selection tools (reviews in scholarly journals, national bibliographies, publishers' catalogs, etc.) do not cover electronic resources effectively. There are, however, special directories that can facilitate the electronic journal identification. The following tools have been found particularly useful for identifying electronic journals:

- *ARL the Directory of Electronic Journals, Newsletters and Academic Discussion Lists.* It is the most authoritative and

widely available guide to electronic journals. It offers comprehensive information on electronic journals including listservs .

Internet World's On Internet 94: An International Guide to Electronic Journals, Newsletters, Texts, Discussion Lists, and Other Resources on the Internet (Westport: Mecklermedia), It has useful information on the long-standing journals, It is also a good model of what information we want about an electronic journal: ISSN, Frequency, subject coverage, etc. (<http://www.aber.ac.uk/~tplwww/ej/paper.html>).

- *Ulrich 's International Periodicals Directory*. It contains information on approximately 147,000 active titles from 70,000 publishers. It also has lists of "Serials available on CD-ROM" and "Serials available Online."
- *Fulltext Sources Online* edited by Ruth M. Orenstein. It lists journals available on commercial online services such as DIALOG and LEXIS/NEXIS. The 1997 edition also includes URLs for those titles with a web version.
- *Yahoo Journals* (http://dir.yahoo.com/News_and_Media/Journals/). From Yahoo home page, one can click the Journals link under News and Media to find a list of subject headings, each of which is a link to online journals dealing with that topic.
- *Net. Journal Directory* (<http://www.hermograph.com/njd/>) published by Hermograph Press. It provides a catalog of full text periodicals archived on the World Wide Web.

Discussion groups are also a good source of information about new electronic journals in particular fields. Information on electronic journals can also be found from the home pages of libraries and relevant organizations. The following are some examples of such resources:

- *BUBL* (Bulletin Board for Libraries, <http://bubl.ac.uk>)

- *CIC Libraries Electronic Journal Collection (CICLEJC)* (<http://eijournals.cic.net/>)
- The National Library of Australia (<http://www.nla.gov.au>)
- CARL Electronic Journal Access (<http://www.coalliance.org/ejournal>)
- WWW Virtual Library
(<http://www.w3.org/hypertext/DataSources/bySubject/Overview.html>)
- Serials in Cyberspace (<http://www.uvm.edu/~bmaclemm/#ejour>)
- *EJournal SiteGuide* (<http://weewannie.library.ubc.ca/ejour/>)

Selection

Several studies have discussed the selection of electronic resources including e-journals and various selection criteria have been presented. These include Davis, 1997; Johnson 1996; Mouw, 1998; and Nisonger, 1996. It is generally agreed that selection process of electronic journals is similar to that of traditional journals and most criteria relevant to print journals also apply to electronic journals. It is recognized that librarians should put emphasis on the content of information rather than the form. The fundamental criteria used for selecting print publications, e.g. content, relevance, usefulness, costs, publisher's reputation, language, accuracy and currency can therefore also be used for electronic journals.

A number of factors unique to electronic media should also be considered. Johnson (1997) stated that the following aspects are crucial in the selection criteria:

- Network, hardware and software compatibility
- Technical and maintenance requirements
- Cost implications and continuing costs
- Quality of interface
- Training needs and service implications
- Levels of staff support needed
- Potential use
- Reliability of vendor and availability of vendor support
- Licensing considerations
- Archiving.

Johnson (1996) provided a matrix model for selecting electronic resources. The model contains two segments. The first is a vehicle for

evaluating non-cost criteria. It answers the questions "Do we want this information resource for our library?" and "Is it the right resource for our users?" The second segment of the matrix is offered as an approach to conducting a cost comparison of various delivery formats

Some libraries have stated their selection criteria for electronic journals in their collection development policies. A good example is Bowling Green State University (Rabine and Rich, 1997). Purdue University Library and Pennsylvania State University Library both use the criteria similar to those used in subscribing to journals in paper for selecting electronic journals (Simpson and Seeds, 1998).

Acquisition and Serials Control

E-journals require an entirely new workflow, one that is no longer a series of linear and standardized steps. It is rather a complex, cyclical, labor-intensive, variable, and team-based process. Kaag (1998) described guidelines for selecting, processing and accessing online serials. The guidelines showed that more people are involved, more steps need to be taken, and more factors need to be considered in the processing of electronic serials. Simpson and Seeds (1998) reported that a task force was formed to develop procedures for ordering and cataloguing electronic journals in Pennsylvania State University Libraries and a procedure consisting of seven steps was considered necessary. Acquiring and processing electronic journals involve more staff than acquiring print journals, e.g. locating and selecting electronic journals, maintaining up-to-date passwords; and negotiating license agreements. Team approach has become important for handling e-journals with technical expertise from different functional areas including acquisition, reference and collection development. (Dickerson and Lamborn, 1998).

The licensing issue is identified as the most complicated and time consuming part of acquisition of electronic journals. It requires the acquisition librarians to have negotiation skills and ability to develop and understand contracts. However, librarians are not educated in contract negotiation and the implications of that for patrons (Dickerson and Lamborn, 1998). Davis and Reilly (1998) and Duranceau and Harper (1997) have highlighted the Key issues in license agreements.

Recommendations on handling licensing agreement include developing common template, common principles, a process for license review, and third party brokering of licensed products (Bosch, 1998; Dickerson and Lamborn, 1998; Ogbum, 1998; Ray, 1998). Various licensing guidelines have been developed to assist librarians to negotiate agreements, e.g. the guidelines prepared by Electronic Publishing Licensing Agreements Subcommittee of the Publisher/Vendor-Library Relations Committee of ALA's Association for Library Collection & Technical Services (Schottlaender, 1998). A group of librarians and publishers in UK has also tried to work toward an agreement for a model license (Mckay, 1998).

Aggregators are taking the role of subscription agent for electronic journals. They facilitate the process of acquiring electronic journals by handling subscription, contacting with publisher, registering IP address, which will greatly reduce librarians' work. They also advise libraries on licensing terms. A potential new role may be to negotiate license agreements for librarians who lack legal and technical expertise. To take maximum advantage of these services, however, librarians need to understand what value-added service aggregators can provide to the library for electronic journals.

Check-in process also becomes more complicated with the second-generation e-journals, which have variable file structures and internal hyper links to other network resources (Duranceau, Snowden, Manoff and Lippert, 1996). The check-in process developed for print publications are no longer compatible. The check-in takes on a new meaning in the Web publishing environment. The confirmation of access has become a major problem. Sometimes, libraries receive notification that payment had been processed and access was arranged, only to find that in fact they still couldn't access the item (Simpson and Seeds, 1998).

Rosenberg (1997) suggested that for electronic files not maintained by the library, new identifying and tracking mechanism should be developed for monitoring the file location, content, and possible changes in access methods. Mouw (1998) agreed with Rosenberg. He stated that the challenge is not to receive the individual issues but to ensure that the library continues to have access to the page and to keep track of URLs as

they change with time. So the check-in here means to ensure the integrity of the links and checking the accessibility of the holdings of remote sites.

Cataloguing

It is considered essential that e-journals should be catalogued in order to provide access to the information and instructions for effective retrieval. With some modifications the cataloguing rules and the USMARC format can be successfully used for the cataloguing and coding of Internet resources including electronic journals. Changes have been made in the USMARC format including the definition of a new field, the 856, for "Electronic Access and Location". It includes data elements for type of access, host name, path name, file name, and similar information necessary to access or retrieve a data resource over the network (Caplan, 1993).

Nancy Olson's *Cataloguing Internet Resources: A manual and practical guide* and *CONSER, the Cooperative Online Serials Program*, provide detailed guidelines on cataloguing electronic journals. Module 31 of the *CONSER Cataloging Manual* is accessible via the Internet (Caplan and Guenther, 1996). OCLC has also developed guidelines for cataloging Internet resources as part of its Internet Resources and InterCat projects (Dickerson and Lamborn, 1998). International Standard Bibliographic Description for Electronic Resources (ISBD-ER) was also issued by IFLA to take account of rapid changes in this area (Sandberg-Fox and Byrum, 1998).

Several libraries have taken initiatives in cataloguing e-journals, e.g. the University of Virginia, University College London, and the North Carolina State University Libraries. But there are still problems that need to be solved in describing e-journals. The most significant problem identified is that the electronic location information is very unstable (Caplan, 1994; Martin, 1996; Soper, 1996; and Strutt, 1997). Some other difficulties include variations in presentation of bibliographic information, different bibliographic information about various version formats, and identification of the chief source. (Hawkins, 1998 and Shadle, 1998).

Other means of creating access to electronic resources, metadata for example, have been proposed. Metadata, the "data about data" is

additional to or embedded within the electronic resources themselves. Various efforts have been made to develop standards for the creation and sharing of metadata. Dublin Core, a set of 15 elements, was developed as the result of the Metadata Workshop convened by OCLC in 1995 (Strutt, 1996).

Whether or not to create another record for electronic version of the print journal is an issue unsettled. Some favor finding a way to use the existing print record to notify patrons of the online version. They support one record approach because it will not increase workload (Hirons, 1997; and Holmes, 1998). Others feel strongly that electronic version of a resource often differs from the print version. They think that a separate record is essential in order to convey important information about those differences to the users like the holdings, content, etc. (Burnett and TerHaar, 1998; Simpson and Seeds, 1998). The current CONSER policy requires separate records at the national level in the U.S. but allows individual member institutions to use the one-record approach on an interim period. It gives libraries options to choose the method that is most appropriate to their circumstances (Hirons, 1998). Both methods have pros and cons. Burnett and TerHaar (1998) proposed an ideal solution to one-record approach by linking the records with full description of each format include holdings and access information.

Another question is whether cataloguing record should include holdings information of e-journals, which are accessed not owned by libraries. Most libraries have reported only on making records for electronic serials mounted on their systems. For example, the University of Virginia only shows holdings for e-journals owned. For e-journals not owned but accessed, a note is added to the copy holdings record asking the users to check the WWW for holdings (Soper, 1996).

Archiving

Archiving e-journals is a major concern for libraries. There appears to be strong differences of opinion on the issue of who should do the archiving. Neavill and Sheble (1995) stated that library's role of mediating access to current information as well as the preservation of information is unique and they see little change in the importance of the library for the long- term preservation of information. They feel that there is little assurance that the files of electronic journals will be

available permanently, as publishers may discontinue individual titles or go out of business. They do not think that libraries should abandon archiving and preserving functions, at least in the transitory period, before alternatives become quite stable. Their views are in line with the thinking of several other authors (Malinconico, 1996; and Meadows, 1997).

Duranceau and her colleagues in MIT libraries got similar results in their study. They believed that the electronic environment demands a new role for the library as gateway and filter for scholarly material as e-journals do not lend themselves to traditional archiving. It is suggested that e-journals should not be archived if stable, complete, accessible, well-supported archives exist elsewhere. Choices could be made among publisher, an intermediary organisation, or another university depending on the requirements of libraries. Chaudhry and Zhihong (1999) reported that majority of Singapore libraries they surveyed were not in favor of libraries taking responsibility for archiving.

Publishers have started placing electronic copies of their e-journals in escrow at different places to ensure their continued availability. Project Muse (<http://muse.jhu.edu/>); Elsevier Press (<http://www.elsevier.com>); Blackwell Science (<http://www.blackwell-science.com>); Springer-Verlag (<http://www.springer.co.uk>); and Academic Press IDEAL (<http://www.idealibrary.com>) are some examples. Project Muse promises archival files on CD-ROM, containing "all of the issues published online during the subscription term" and supplies a CD-ROM archival disk to its individual subscribers annually through out their subscription period.

Libraries in collaboration with consortia have also begun to selectively archive e-journals. Two examples of such consortia are CICNET (<http://ejournals.cic.net>) and JSTOR (<http://jstor.umdl.umich.edu/>).

Aggregators have taken periodicals from a wide variety of publishers and put them online in a common library. Some of them have also committed to provide permanent archive to libraries. For example, OCLC has made a full commitment both to archiving digital material for future scholars, and to providing subscribers with access to the material they have purchased. *Net. Journal Directory* provides a listing of aggregator archival web services. Commercial document delivery and subscription

services are also beginning to perform an archival role in addition to their traditional services. Lujendijk (1996) reported that EBSCO has already begun the process of archiving the electronic full text of journal articles that are available on their electronic reference products. Information Access Company, CARL Corporation, and University Microfilms International have also initiated such services. Considering these alternatives, Chaudhry and Zhihong (1998) have suggested that libraries should have a critical look at their mission statements and make changes accordingly.

Management of Electronic Journals

Although a number of articles have discussed the possible ways to handle e-journals and have mentioned the experiments that are being undertaken by libraries, not much has been done to address the issues related to access and management of scientific journals in the electronic environment. A survey conducted by the Association of Research Libraries (ARL) in early 1994 addressed some policy issues. Questionnaires were sent to ARL members to survey the policies and practices of ARL libraries. The results reported that libraries were considering major changes in their policies and procedures. Most of the responding libraries were following traditional methods for selection, acquisition, cataloguing, and other related functions. The survey reports include model policies and procedures developed by ARL libraries. These may serve as useful guidelines for other libraries in their decision making for handling electronic journals (Parang and Saunders, 1994 and 1999). However, since the technology has changed dramatically during this period, some results are no longer appropriate in the current situation. For example, most of the electronic journals at that time were delivered either by email, or through Gopher. But now most journals are provided on the Web. So the original subscription procedures, like develop e-mail address, use the account to subscribe or receive e-journals are no more relevant.

Zhihong (1999) conducted a survey of practice of handling of electronic serials in 22 libraries located in different countries. She reported that a number of problems were identified by participating libraries and need to address certain issues was emphasized. It was expressed by librarians that electronic journals make library work more complicated to handle and many practices need to be altered due to the dynamic nature of e-journals. Most of them have made adjustments in their practices of

selecting, cataloguing, serials control, access and services to accommodate this new media. The respondents of her study felt that due to the changing nature of e-journals, they needed to keep themselves updated in IT development so that they could handle electronic resources and network information more efficiently. It was pleasing to know that these libraries did consider that all this was worth it as returns were great in terms of extending library collections and facilitating the access to information through the new features made available by e-journals

Conclusion

Electronic journals have created unprecedented opportunities for libraries. At the same time, they have brought profound impact on the library work. As Chaudhry (1999) has rightly alerted, to be able to take full advantage of the potential of this new resource information institutions will have to be willing to make fundamental changes to overcome the implications created by electronic journals. Their staff has to update their knowledge about the options and alternative and upgrade their skills to be able to handle e-journals effectively. These changes will include review of mission statements, redefinition of role and relationships of various sections, department, and divisions, patterns of communication among professional staff at various levels, developing alliances with other information institutions and partnerships with vendors.

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