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The Hybrid Environment: Electronic-Only Versus Print Retention

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ing on one or more of the scenarios above? Each institution will have different situations when they may feel they fall into one of the scenarios, but specific issues to consider for each of the scenarios focus heavily on budgetary concerns, archival responsibilities, and access requirements.

Many libraries may have no choice — budget cuts and serials inflation may dictate that they forego print copies in order to shield the collection from further cancellations. The eventual bottom line of balancing a declining budget and providing continuing access to materials that increase in price by more than 5 times inflation will dictate moving from Scenario 1 to Scenario 4. Libraries may save direct subscription costs of anywhere from 5% to 25% depending on the publisher. In addition, libraries may realize substantial saving on associated costs like sales taxes, postage, or shipping and handling charges.

Furthermore, indirect costs can be significantly reduced if print issues are not purchased or retained. A not unsubstantial amount of our staff time is devoted to making sure print issues get to the shelf. Mail handling, issue check-in, security taping, barcoding, stamping, and shelving the issues are labor intensive activities that absorb entire job descriptions or multiple clerk hours every day. Reducing the material that is receivable and processing heavy will allow a library to devote more staff resources to other tasks, or reduce staff overall. Other indirect costs savings include claims, replacement issues, storage, and binding.

Aside from strictly monetary concerns, the second most important consideration is archival responsibility. Many libraries consider themselves or are considered by a consortia or regional group to be the archive of record for all or a portion of their collective print collection. It will continue to be their responsibility to maintain print issues for those items that are their archival responsibility. Libraries who either determine that they are not archival conservators for print journals or who have cooperative archival agreements with other institutions can safely move to electronic only subscriptions where appropriate. Archival responsibilities may also be shifted to publishers through permanent archiving clauses in site license agreements for electronic journals or through third party providers who can maintain print and electronic archives for other institutions. Furthermore, a library may feel safe enough to discard print issues if they are guaranteed archival electronic files from the publisher and have the technical infrastructure in place to utilize that option. I suspect that large, comprehensive, academic research libraries will continue to archive print issues either individually, through cooperative subject or publisher based agreements, or collectively at regional depositories. Small, specialized, and less well funded institutions will have to choose wisely what journals they wish to retain in print and which ones they can safely assume are needed only electronically.

Closely related to monetary and archival considerations are space considerations. Library

shelves have been packed full for many years and library building proposals are not as well received as in the past. Previously, libraries could alleviate space problems in a few ways — weeding the collection, microfilming, remote storage, or installing compact shelving. The first three methods both reduced access to some degree while the third preserves access but is a finite solution to the problem. Now, libraries can maintain access, albeit in a different format, while conserving the dwindling physical space that they do have or more radically, creating new space by discarding print volumes that are held electronically. Libraries can remove print volumes, especially for journals produced electronically through projects like JSTOR, and convert that space to monographs storage, computer workstation use, or reading space for patrons. We are now at a junction in library science where we can alleviate space constrictions in a thoughtful and positive way while promoting other values like physical space and increased computer locations that our users desire.

Other issues that libraries will have to contemplate include personnel, electronic costs, reputability, and restorability. Undertaking a large de-accession project for removal of print issues requires a large amount of staff time including selecting the items, training for the procedures, and evaluation of the results. Even if a library just chooses to no longer receive print issues for selected items, a not inconsequential amount of time must be committed to new policies and procedures as well as informing the library clientele. Electronic costs can also be a large hurdle to climb — does the library have the infrastructure to serve increased amounts of electronic information in computer equipment, training, patron assistance, and direct subscription costs associated with archival back files. In addition, libraries must have a secure sense that the publisher or the project is reputable and likely to retain their electronic publishing program at a reasonable cost in future years. The purchase of *Academic Press* by *Elsevier* has laid a heavy economic burden on many libraries and future purchases of commercial publishers by others can wreak havoc on the informa-

tion resources for any library. Increasing the library's dependence on electronic journals in general, and specific publishers in particular, can often result in reduced flexibility in regard to new purchases or cancellation decisions.

And finally, and most importantly, a library must weigh its future ability to restore collections that have been cancelled if there is future need for those items. This issue cannot be taken lightly by any library. Each institution must decide on a policy to follow when the electronic journal or site license becomes non-viable in the future. Libraries that long ago cancelled print issues of journals from *Academic Press* in favor of electronic only access are now faced with huge cost increases when renewing these licenses through *Elsevier*. Similar instances will no doubt appear in the future with other publishers. An institution must decide if faced with this situation can they return to print only access, forego some other aspect of the collection to continue the site license, and how they will fill in the print archive that was not retained previously if the need arises.

All of the issues surrounding print retention of journal issues are complex and therefore must eventually be decided at the institutional level. Electronic journals do not come into the library without creating their own problems. In addition to sometimes astronomical costs, journals are not always accessible due to problems associated with the publisher, the customer, or the medium of the Internet. Renewals and subscription management are still poorly performed by publishers and subscription agents, while librarians continue to bring their own technical skills up to a level that can ensure uninterrupted access. Users are getting more and more comfortable with the format but continuation of reference and instruction services will be increasingly important if an institution moves to electronic only subscriptions. And disaster preparedness, in the case of economic hardship, is still being developed on a case by case basis. The decisions will not be easy and most libraries will be navigating uncharted territory when developing a collections policy addressing print retention.

The Hybrid Environment: Electronic-Only Versus Print Retention

by Mark Rowse (Chief Executive, Ingenta)

Introduction

We exist in a hybrid print-electronic environment and will continue to do so for many years to come. However, with libraries purchasing increasing amounts of electronic resources and on-going pressure on acquisition budgets, the feasibility of sustaining duplicate print and electronic collections has come under review. Many institutions are choosing to reduce print budgets in order to sustain and expand electronic purchasing.

The factors influencing decisions about print retention policy and e-only collection development are various and complex. Issues of cost, space and storage are key drivers for change, while new ways of publishing, packaging, and purchasing electronic content are having a decided impact on collection development and print cancellation/retention.

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In addition, the way libraries and their users respectively manage and access information is undergoing change, with more emphasis falling on collaborative resource sharing and multi-site access to centrally held electronic content. The situation is further compounded by the shift in business and distribution models, which mean that libraries tend no longer to "own" content, but to license access to online resources via publishers' or other vendors' servers.

At the same time, print remains an important medium, particularly in those disciplines where a core electronic literature is not yet established. While the advantages of electronic collections are numerous, digital preservation and guarantee of perpetual access will be needed if institutions are to migrate to online-only collections of content in the longer term. The following article looks at some of the factors affecting the ratio of print to electronic holdings within this evolving environment.

Pressure on Print Budgets

Even before the onset of the electronic revolution, the well-documented "serials crisis" — in which journal subscriptions have risen at levels well beyond annual increases in library acquisition budgets — was impacting directly upon the ability of libraries to build comprehensive core collections for current users and long-term archives.

While this does not directly affect print retention policy per se, libraries have to face an increasingly tough challenge in catering for specialist, as well as core, user needs, in the face of budgetary constraints that have at times led to dramatic cuts in book acquisition and journal cancellations.

Print journal subscriptions have been declining at a rate of around 3 to 5% per annum; if decline is sustained at this rate, print journals will have lost 50% of their circulation within 14 to 24 years.

The **U.S. Association of Research Libraries (ARL)** reports that the average ARL library subscribed to 16,312 serials in 1986, but by 2000 that number had fallen to 15,223 serials, despite the fact that more titles are being published and the average library is serving more users. At the same time, ARL statistics show that U.S. research libraries are now spending on average 16% of their acquisition budget on electronic resources, as compared to 4% ten years ago.

New Purchasing Models

In the earlier stages of the electronic environment, electronic publishing models tended to parallel print offerings — with an electronic version of current journals frequently offered free with print, or for a supplement. E-only titles tended not to be dramatically discounted (often offered at 90% of the full subscription price). With no proven preservation and archiving solutions in place, the tendency was to retain both print and electronic collections.

The recent emergence of new purchasing models — in particular, the adoption of consortial site licenses and the advent of the "Big

Deal" — has played a significant part in the rapid uptake of electronic content by users throughout the world, and has had a profound impact on the way libraries provide access to content to their users. Although aggregators have been offering full-text journal databases for many years, it was not until the late 1990s that major academic publishers began to put together packages of current journals for library consortia — often consisting of the publisher's entire list — sold on a one-price, one-size-fits-all basis.

For libraries, it has expanded the amount of content they deliver to their users, but has also meant a move from a print-based "owned" collection of journals, to a licence-based right to access online content. Bundled packages of journals have a lower per title cost than electronic titles purchased individually, and have brought a measure of budgetary stability via price-capped multiple year deals. Where average increases for subscription print holdings were running at between 16% and 22%, consortial licence increases have averaged around 6% to 7%.

The extent of uptake of consortial licenses over the last half decade has been far-reaching: research undertaken for the 2002 **Ingenta Institute** program showed that the proportion of consortia-member libraries' holdings derived from consortium deals averages around 50%-60%. Smaller libraries in particular have been given access to a vastly increased number of electronic titles for relatively little extra cost.

Accelerated development of electronic collections was actively encouraged at institutional, state and national levels with, in many cases, extra funding made available to enable libraries to participate in "big deal" offers. However, where no external financing was forthcoming, money had to be found from existing budgets, often via cuts in book purchasing, ILL activity or cancellation of non-Big Deal journal subscriptions.

As consortial licenses come up for renewal, however, it is widely anticipated that extra funds will no longer be available, and that there will be a relative reduction in purchasing power within the market. With some librarians already concerned about the impact of all-inclusive big deal packages of e-journals on their ability to select specialist and niche titles, it remains to be seen whether the market will cut back still further on print subscriptions and book acquisition to finance new consortial deals, or whether publishers will be prompted to consider unbundling some content from whole-list electronic packages and experimenting with new pricing models which enable their customers to customize purchases to actual user needs.

Cost Considerations

A number of studies into the comparative cost of print and electronic material have shown that electronic content is often more cost effective on a per use basis. A study recently undertaken by **Drexel University**, for example, reported that while certain costs associated with an online collection are higher — including staff and administration costs, collection development and acquisition costs — electronic purchasing would nevertheless appear to be more cost effective.

Drexel's study of its own collections found that the cost per use of bound print titles was as high as \$30 (80% of which is accounted for by space costs); print subscriptions averaged \$8.50 per use, while individually acquired electronic journals averaged approximately \$4 per use. Journals that formed part of publishers' collected or bundled packages ranged from around \$3 to \$2 per use, while those that were included in full-text databases averaged less than \$1.

Collaborative Networked Environments

While cost is clearly an important consideration, there are many other factors influencing the development of electronic collections and the retention — or otherwise — of print, not least of which is the potential to supply an expanded set of services around online material to a greatly expanded user base.

In part due to budgetary pressures and the cost and efficiency benefits of resource sharing, and in part driven by developments in technology that have led to increased potential for resource exposure and sharing, collaboration between research libraries has been moving in recent years to a more formalized and co-ordinated footing, with strong emphasis placed on shared access to distributed digital resources.

Collaborative agreements between libraries and information networks have also enabled the library to open up access to its services to a greatly expanded user base, including users from other institutions, distance learners, part time students, and members beyond the academic and university community.

These are real advantages, and the commitment to offering quality and comprehensive electronic resources to a broader user base is illustrated not only by the increases in the purchase of online content, but also by the numerous digitization projects being undertaken within the research library community. The new emphasis on networked information has impacted on the library as a physical place or space, holding physical material. Libraries now are developing into technological centers where users may come to access networks and online resources (not necessarily held on the library's server).

Eliminating Duplication

In their incessant search for savings in costs with which to plug the holes in their declining budgets, or fund price rises or new resources, librarians are beginning to understand that in many cases they are paying several times for the same content. Whether this means print version versus electronic version, or e-journal plus aggregated database from a vendor, or institutional subscription plus consortial access rights, librarians are increasingly able to harness the power of their networked environment to identify this duplication, and the cost-saving decisions. These decisions beg many questions that go to the heart of librarianship: is an unbroken sequence of a journal collection worth paying for when many of the issues are available through aggregators? Does learning online access replace traditional collection development? How should usage and value for money be evaluated where one hardly-used resource may

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nevertheless be critical for a small, specialist department? Solutions to these issues are driving librarians further towards an online-only environment.

These changes will increasingly rebound onto the business models of the publishing community, who will need to have a much clearer focus on the implications of signing consortial deals, or deals with aggregators, which may undermine their existing revenues.

New Publishing Models

In addition to the pressure put on print acquisition by the consortial site licence and the benefits of bundled e-only extra titles, the shift in the print-electronic ratio has also to take into account the growing body of born-digital information — both commercially and non-commercially produced — which is now available to the library.

The steady launch of new e-only titles by commercial publishers, scholarly societies, alternative publishers, and other bodies, has produced a significant body of purely digital content, with e-only titles often exploiting the speed and flexibility of the electronic medium, through the inclusion of multimedia components, and by the immediate posting of articles on acceptance for example.

The number and quality of e-only journals and e-print repositories varies by discipline. It is also the case that the broader scholarly communication system will take time to integrate this literature more fully into the information services that support the discovery of and access to research literature, including the abstracting and indexing services, citation analyses, online catalogs, and other resources. Nevertheless, there has recently been a discernible increase in the number of e-only journals being indexed by major indexing services.

Moreover, collection development has extended beyond the formally published literature. The "informal" literature, such as open access publications and e-print repositories, has become increasingly important within certain disciplines, and there are now in place a number of nationally co-ordinated initiatives making seed-funding available to support the development of a new information infrastructure amongst research libraries, universities, museums and other scholarly and research bodies.

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Bangladesh, did a big interview with him. . Go to <http://www.dailystar.com/magazine>. Look up "interview."

The **Association of Research Libraries** has published its **Annual Salary Survey**. The report analyzes salary data for all professional staff working in the 124 ARL member libraries during 2002-03. Data were reported for 9,469 professional staff in the 114 ARL university libraries and for 3,804 professional staff members at

Currently, there are now over 120 "data providers" or e-print repositories registered on the **Open Archive Initiative** site, and service providers, which harvest and aggregate records from these repositories, estimate that they regularly harvest over one million records from distributed e-print archives and other repositories, with many additional projects being undertaken by libraries, laboratories, faculty, museums and heritage institutions.

Libraries are now in a position where they are looking to provide access to material and resources they may not actually have purchased and which they may not host locally. It is also the case that some will be taking on a new role, running and maintaining a research repository on behalf of their institution, and taking responsibility for the curation of the digital research and educational output of its members.

User Preferences

This is not to say that there is no demand on the user's part for print. On the contrary, the pace of change is highly variable: while we have seen some highly sophisticated electronic resources becoming established in certain disciplines, other subject areas have seen much lower levels of development, with corresponding differences in expectations and preferences amongst user groups.

Recently, the **Digital Library Federation (DLF)** and **Council on Library and Information Resources (CLIR)** commissioned **Outsell, Inc.**, to undertake a study of some 3,000 undergraduates, graduate students, and faculty members from a range of academic institutions.

They found that at the current time, "most faculty, graduate students and undergraduates seem to prefer a hybrid information environment in which information in electronic form does not supplant information in print but adds to the range of equipment, resources, and services available to teachers and students." (Source: **Amy Friedlander**, *Dimensions and Use of the Scholarly Information Environment: Introduction to a Data Set Assembled by the Digital Library Federation and Outsell, Inc.* Washington, D.C.: Council on Library and Information Resources, 2002, <http://www.clir.org/pubs/abstract/pub110abst.html>.)

While respondents may make use of a mixture of print and electronic materials in their reading, it has become apparent that they have become fully accustomed to discovering and locating that content online. The individual user

the 10 non-university **ARL** institutions. The university population is generally treated as three distinct groups: staff in the general library system, staff in the university medical libraries, and staff in the university law libraries. The 2002-03 data show that ARL librarians' salaries are barely keeping up with inflation. The combined median salary for U.S. and Canadian ARL universities was \$51,636, an increase of only 1.8% over last year. The Consumer Price Index in the U.S. increased by 1.5% last year and in Canada by 2.1%. The **ARL Annual Salary Survey**

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has assumed more responsibility for article discovery and retrieval in recent years, and is making use of a wide range of automated search engines and navigational tools including links from citations in journals, A&I databases, online library catalogs, Web directories, subject-related Web pages, and Internet search engines. Nearly all respondents in the survey answered "online," when asked how they set about discovering relevant information.

Evidence shows however, that in the vast majority of cases the user prefers to actually read the content on paper: over 90% of the respondents to the **UK's 2000 Super Journal** project printed out electronic articles locally for subsequent review. Maybe the electronic environment is merely moving the print function from the publisher to the library or institution.

Shift in the Print-Electronic Ratio

While e-collections have many advantages associated with them, there is still concern within the community about the absence of a solution to the problem of archiving. Digital preservation and guarantee of perpetual access will be needed if libraries are to migrate to online-only collections of content in the longer term, but the costs involved are beyond the resources of almost all individual libraries.

The area of archiving is being addressed, within the library community itself, by publishers and intermediaries, and by central public or national libraries. With a number of pilot projects and programs in place, there is growing confidence that solutions will be found in the course of time that will enable a more widespread development of electronic-only collections.

The library's role is evolving. Traditionally, to satisfy current and future user demand, libraries have maintained core collections, and title selection, collection and archiving have been fundamental to the role of the librarian. More recently, however, print has become an element of a broader spectrum of resources, both owned and licensed, both hosted and accessed remotely, some of which may be purchased, some of which may be available for free, but for which the library nevertheless takes on managerial responsibility for its users.

While print will always have a place within the library's collection, there are, in conclusion, a number of factors that are impacting directly on the ratio of print to electronic resources. With increases in electronic purchasing looking set to continue, and solutions to archiving and preservation under development, it is likely that more and more libraries will start to cut down on duplicate print/electronic collections, in favor of online-only collections.

In part, this will be to ensure access to holdings is maximized for an increasingly dispersed user-base. However, it is also a priority for many institutions to make savings by eliminating duplication and reducing storage, binding and space costs. Lastly, libraries need to ensure they are in a position to service their users' requirements for the growing body of born-digital research by developing core capabilities in the management, integration and presentation of online information.