



2-1997

Managing Scientific Journals in a Digital Era

Carol Tenopir
University of Tennessee - Knoxville

Donald W. King

Follow this and additional works at: https://trace.tennessee.edu/utk_infosciepubs



Part of the [Scholarly Publishing Commons](#)

Recommended Citation

Tenopir, Carol and King, Donald W., "Managing Scientific Journals in a Digital Era" (1997). *School of Information Sciences -- Faculty Publications and Other Works*.
https://trace.tennessee.edu/utk_infosciepubs/100

This Article is brought to you for free and open access by the School of Information Sciences at TRACE: Tennessee Research and Creative Exchange. It has been accepted for inclusion in School of Information Sciences -- Faculty Publications and Other Works by an authorized administrator of TRACE: Tennessee Research and Creative Exchange. For more information, please contact trace@utk.edu.

Disclaimer: This is a machine generated PDF of selected content from our databases. This functionality is provided solely for your convenience and is in no way intended to replace original scanned PDF. Neither Cengage Learning nor its licensors make any representations or warranties with respect to the machine generated PDF. The PDF is automatically generated "AS IS" and "AS AVAILABLE" and are not retained in our systems. CENGAGE LEARNING AND ITS LICENSORS SPECIFICALLY DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, ANY WARRANTIES FOR AVAILABILITY, ACCURACY, TIMELINESS, COMPLETENESS, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Your use of the machine generated PDF is subject to all use restrictions contained in The Cengage Learning Subscription and License Agreement and/or the Gale Academic OneFile Terms and Conditions and by using the machine generated PDF functionality you agree to forgo any and all claims against Cengage Learning or its licensors for your use of the machine generated PDF functionality and any output derived therefrom.

Managing scientific journals in the digital era

Authors: Carol Tenopir and Donald W. King

Date: Feb. 1, 1997

From: Information Outlook(Vol. 1, Issue 2.)

Publisher: Special Libraries Association

Document Type: Article

Length: 2,838 words

Abstract:

Special librarians would do well to examine present trends in electronic publishing. This would guide them in the efficient management of electronically published scientific journals and the avoidance of costly mistakes in the pricing and acquisitions of such scholarly studies.

Full Text:

The introduction and subsequent growth of electronic publishing provides special librarians with a challenging new opportunity. Scientific and other scholarly journals - a particularly important resource in organizations served by special libraries - are in a state of flux. New technologies are creating a complex variety of media, sources of access, and pricing options from which organizations must choose. When choosing among these alternative sources, mistakes can be - and indeed sometimes have been - extremely costly. They may also deny readers access to essential information. Special librarians must take a lead role in assisting with difficult decisions concerning access and use of articles throughout their organizations. To assume this role, special librarians should apply their unique knowledge of 1) how information is acquired and used by their community; 2) the availability of alternative media, sources, and pricing options; 3) the economic trade-offs among these alternatives; and 4) what is generally best for the entire organization.

Under a Special Libraries Association Steven I. Goldspiel grant, the authors of this article have produced information that will assist special librarians in assuming this important role. In order to make appropriate decisions in these areas, special librarians must understand the trends in information seeking, the current electronic publishing environment, and how special librarians can contribute to this environment in the future.

Trends in Traditional Scholarly Publishing

To evaluate electronic journal publishing, it helps for special librarians to understand how information seeking and economics are changing with regard to traditional publishing. A look at trends over the past 20 years of scientific scholarly publishing reveals that:

* Scientific journals are essential. Scientists served by special libraries spend over 100 hours per year acquiring and reading scholarly articles (Griffiths, Jose-Marie and Donald W. King. *Special Libraries: Increasing the Information Edge*, Washington, DC: Special Libraries Association, 1993). While time is valuable, they are willing to spend it in this way because the information in these articles achieves far greater savings. This information helps them work more productively and produce higher quality products. For example, five indicators of scientists' productivity are found to be positively correlated with the amount of reading they do. Often, reading scholarly articles results in savings achieved by avoiding unnecessary research, stopping unproductive lines of research, and so on.

* Authorship and readership remain high. The number of articles authored by U.S. scientists increased from 312,000 in 1975 (King, Donald W., Dennis D. McDonald and Nancy K. Roderer. *Scientific Journals in the United States: Their Production, Use, and Economics*. Stroudsburg, PA: Hutchinson Ross Publishing Company, 1981) to about 577,000 in 1995. These results show a slight decrease in the average number of articles written by scientists, although scientists with access to special libraries appear to write about as much now as in 1975 and the overall number of articles is greater because there are more scientists (Tenopir, Carol, and Donald W. King. "Trends in Scientific Scholarly Journal Publishing in the U.S." *Journal of Scholarly Publishing*. Forthcoming April 1997. Von Seggern, Marilyn, and Janet M. Jourdain. "Technical Communications in Engineering and Science: The Practices within a Government Defense Laboratory" *Special Libraries*, vol. 87, no. 2: 98119. Spring 1996). Scientists served by special librarians read about as much now as they did in 1975 (about 90 to 100 readings per person per year).

* Information seeking patterns are changing. In 1977, scientists served by special librarians relied on special libraries for only about 10 percent of the articles they read. This increased to 21 percent in 1984 and is currently at about 37 percent. This increase in proportion is not surprising because the average number of personal subscriptions per person in these organizations has decreased

from 6.2 personal subscriptions per person to 2.6 subscriptions in recent years. Just as individuals are shifting from personal subscriptions to the use of library journals and other sources, libraries are shifting from institutional subscriptions to greater use of document delivery services. However, this shift has not been nearly as dramatic.

* Journal prices have escalated beyond inflation. Library journal prices have increased more than seven fold since 1975. While it's true that journals have also increased in size, inflation and costs due to increased sizes account for only about one-half of the increase in subscription prices. A plausible explanation for the remaining 50 percent increase is that the drop in personal subscriptions has resulted in escalated prices that libraries alone have had to bear. Due to the decrease in personal subscriptions, each year the publishers collectively lose nearly \$1.8 billion in revenue - or about \$270,000 per journal.

* Price increases have consequences. Higher prices affect the number of both library and personal subscriptions, although library subscriptions are not as affected by these price changes. To demonstrate this, assume that there are 2,500 library or personal subscribers prior to a price change. Our study shows that increasing a price from \$150 to \$250 would reduce the number of personal subscriptions from 2,500 to 719 (a loss of 1,781 subscribers). Library subscriptions would drop from 2,500 to 2,284 (a loss of only 216 subscriptions).

* Special librarians must deal with these consequences. As prices go up, library copies should be - and are - used more often. One of the most important roles of special librarians is to ensure that professionals in their organizations have optimal access to information through a combination of the library, shared collections, personal subscriptions, or external sources. To do this, special librarians must inform scientists (and others) of the economic trade-offs involved and how the parent organizations can best be served by adhering to rational economic choices. More specifically, when faced with high journal prices, special librarians must consider the economic trade-offs between purchasing versus using an alternative source, such as document delivery. The best practice generally is to subscribe to frequently read journals and rely on document delivery for infrequently read ones. There is a break-even point based on the amount of reading that is done. An amount of reading above this point makes it less expensive to subscribe to the journal and an amount below this point makes document delivery the better choice (Tenopir and King, 1997. Kingma, B.R. "Economics of Access Versus Ownership: The Costs and Benefits of Access to Scholarly Articles via Inter-library Loan and Journal Subscriptions," Report to the Council on Library Resources. Albany, NY: State University of New York at Albany, 1995). A mistake in choosing whether or not to subscribe can be costly to a parent organization. A special library can have a significant impact on costs to their parent organization by understanding and applying economic analysis in collection development and access. This will become even more important as electronic publishing becomes more prominent. However, the economic principles developed in our study should apply.

The Complex Nature of E-Journals

The emergence of electronic publishing and communication technology has resulted in a variety of available media, sources of access to these media, and pricing options offered by these sources. When selecting scientific journals, organizations must choose from among this complex array of alternatives. The optimum choice may actually be a mix of these alternatives (including traditional print-on-paper), directed toward groups of individuals and the library. To make such decisions, one must consider the alternatives available and their economic implications. Below, we describe current alternative media, sources, and pricing options.

Although the number and availability of electronic journals are increasing dramatically, there is still far less scholarly scientific material available in various electronic forms than there is in print. Of the electronic materials that are available, some are still merely imperfect electronic equivalents of print journals, used mainly for document delivery purposes. Others are unique electronic journals available only in electronic form.

Scientific and other scholarly journals are now available in several media including print, online, CD-ROM, listservs, World Wide Web, and hybrid versions. However, no single medium will solve all of the information needs of today's scientists, and no scientific field is covered by a single medium. Electronic equivalents of print titles may be distributed by traditional text online services such as LEXIS-NEXIS, OVID, and DIALOG; distributed on CD-ROM or magnetic tape for local loading; or made available on so-called "desktop filtering" services such as Hoover or Lotus Newsstand tied to local area networks (LANs). Most of these electronic versions do not include extensive archives, nor do they include much of the peripheral material, letters-to-the-editor, or short articles found in the print equivalents. Many are ASCII-text only, excluding charts, graphs, and special characters, although image article collections are becoming more common. Whether electronic versions of print journals are made up of ASCII or image files, they tend to be of articles rather than full journals. They are most often used for document delivery purposes or to supplement print collections.

Other scientific journals are created for electronic distribution only, often with no print equivalent. The Internet is the main source for electronic-only scientific journals. Many of these are also text-only, particularly Internet listservs or newsgroups. These provide a way of communicating current information, however some lack the peer reviewing and quality controls found in print scholarly journals.

Although it does not solve the archiving problems, the World Wide Web offers the most promising possibilities for true electronic journals to replace print because it combines multimedia capabilities, interactivity, and ubiquity of availability. Web journals are typically complete entities, rather than mere collections of articles. They may include extensive editorial and subscription information, instructions to authors and readers, and copyright and use restriction information. The articles in these journals usually include multimedia, complete graphical and tabular information, and links to related or cited material. They also typically include an online forum for discussion - whether it be directly between readers and authors, or in the form of letters to the editor.

Sources for accessing electronic journals are also more complex than print sources. In the past, scientific journals were available from publishers and libraries. In the electronic world, these are only some of the sources providing access. Now, access can also be obtained from second party distributors, such as document delivery services; third party distributors, such as online or CD-ROM vendors; gateway organizations, which provide hardware, software and telecommunication links only; subscription agents;

information brokers; and multi-type library cooperative networks. The title you're looking for may be available from many different sources.

In addition, pricing policies for these include not only traditional subscriptions, but also payment for article separates, site licenses based on simultaneous users, site licenses based on potential users, online fees, and a combination of all of the above. Site licenses based on likely readership are becoming the most common option and offer advantages to special libraries in that they can be based on a unit cost per reading.

There is a Small But Growing Number of E-Journals

To adequately describe electronic publishing, each type of electronic journal must be counted separately. There are several directories that can assist with identifying and counting electronic versions. According to Fulltext Sources Online (1996), there are currently 2,107 scientific, technical, or medical full text sources available from commercial online vendors.

Almost all of these are text-only versions or image and text versions of articles which are also distributed in print journals. Based on an examination of titles, about 220 of these are scholarly journals. That means that of 6,771 scientific scholarly journals published in the U.S. in 1995, only about three percent of those were available as full text databases from traditional text-based online services.

According to the Directory of Electronic Journals, Newsletters and Academic Discussion Lists, published annually since 1991 by the Association of Research Libraries, the number of scholarly electronic listservs, newsgroups, and discussion forums in the sciences grew from 175 titles in 1991, to 853 in 1995, and then to more than 2,375 in 1996. Several scientific disciplines - specifically high energy physics and mathematics - have transferred much of their scholarly communication to an electronic environment, though archives may be awkward to access, if available at all. In the 1996 edition of the directory, 352 scholarly scientific Web journals are listed. An estimated 84 percent of these are refereed. Of these, many are Web versions of print journals, although the number of electronic-only journals is growing. Of a sample of 83 Web journals studied by Hitchcock et al. between the years 1990 to 1995, 35 were electronic-only journals (Hitchcock, Steve, Leslie Carr and Wendy Hall "A Survey of STM Online Journals 1990-95: The Calm Before the Storm." In Directory of Electronic Journals, Newsletters and Academic Discussion Lists, 6th edition, ed. Dru Mogge. Washington, DC: Association of Research Libraries, 1996, 7-32). Many of these 35 electronic-only journals were free of charge. Of those that did require payment, most personal subscriptions were priced under \$100.

Currently, Web journals represent the smallest group of scholarly electronic journals because they are the newest. However, this category will continue to grow. Examples of Web journals include: Physics Review Letters Online, Journal of Artificial Intelligence Research, Electronic Journal of Differential Equations, and Electronic Research Announcements of the American Mathematical Society.

Traditional publishers are beginning to use the Web to distribute redesigned versions of print titles as well. Elsevier, Current Science, The Johns Hopkins University Press, and others have major Web initiatives. Pricing policies are still being refined for most of these early Web journals, but pricing will most likely involve site licenses based on potential users within an organization.

The Responsibility of Special Librarians

Our intent for this study was to provide concrete decision rules concerning acquisition of electronic publications in the future. However, examination of emerging electronic publishing and communication revealed a much more complex picture than we had anticipated. This picture, which is merely a snapshot of a rapidly changing environment, shows an array of newly available media and sources of articles embedded in a historically entrenched traditional print journal system. The picture is muddied by indecisiveness in pricing policies, licensing agreements, and copyright arrangements. We have attempted instead to provide some insights and guidance for special librarians and other participants for their future decision making.

Over the years there has been a shift in the role played by special libraries in providing access to scholarly journal articles. There is sound economic rationale behind acquiring and using journals from a variety of sources, depending on how often subscription copies are used and the comparative cost per reading from each source. From the parent organization's standpoint, the overall costs of readers' time, payment for subscriptions, and library operations can be substantially reduced through proper allocation of these resources. In fact, special librarians have recently become more involved in such resource allocation.

At one time, special librarians devoted most of their efforts to developing a centralized collection. Now, many special librarians order personal subscriptions (and desk copies of books) because they can do so less expensively than individuals. They help maintain unit or department collections and manage branch libraries in addition to their centralized collections. Special librarians also provide journal routing systems, current periodical rooms or space, and access through central CD-ROM collections that are sometimes distributed through LANs. They are also much more active in providing access to external collections through document delivery services and multi-type library resource sharing. Special librarians should broaden their perspective and responsibility to include all such aspects of electronic publications as well.

To do this, special librarians must know how publishing and access are changing. Another essential issue which must be addressed is the economic implications of journal article access and use throughout their organization, including the price paid, the cost of processing and maintenance, and the cost to readers. These costs must be considered for all media and sources of articles. Our final report (a book) will provide examples of these costs. Armed with this information, special librarians can help make rational decisions concerning any of the multitude of electronic alternatives they will confront in the future. Monitoring all of the options, selecting the best form and format for each title, negotiating site licenses, and optimizing information use throughout the organization are all essential roles for the special librarian. Access to scholarly scientific and other journals remains vitally important to researchers and others in organizations. Providing the best and most cost-effective way to access these resources is more complex than ever and

requires someone who can weigh all of the alternatives for every tide and every potential user.

Carol Tenopir is professor, School of Information Sciences, University of Tennessee, Knoxville. She may be reached via the Internet at: tenopirzzutkux.utk.edu. Donald W. King is consultant with the Center for Information Studies, University of Tennessee, Knoxville, and the Center for Library Research, University of Illinois, Champaign-Urbana. Special thanks go to Genevieve Innes, Carol Ann Morgan, and Lucy Park for their contributions to the study discussed in this article.

Copyright: COPYRIGHT 1997 Special Libraries Association

<http://www.sla.org.proxy.lib.utk.edu:90/io/>

Source Citation (MLA 8th Edition)

Tenopir, Carol, and Donald W. King. "Managing scientific journals in the digital era." *Information Outlook*, Feb. 1997, p. 14+. *Gale Academic Onefile*, https://link.gale.com/apps/doc/A19579691/AONE?u=tel_a_utl&sid=AONE&xid=84369f0c. Accessed 9 Nov. 2019.

Gale Document Number: GALE|A19579691