

The Traditional Scholarly Journal Publishers Legitimize the Web

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This article examines the entry of the major academic publishing houses into World Wide Web (Web) publishing. The study identified that during 1997, traditional academic publishers made significant commitments to putting tables of content, abstracts, and the full-text of their print journals on the Web. At the same time, new services and organizations emerged that could ultimately compete with, or eliminate, the need for certain segments of the industry. The authors suggest that these early experiments in Web publishing began unevenly with areas that needed improvement. The article concludes with a discussion about the implications of the traditional academic publisher's presence on the Web.

As debates go, the issue of whether computers should be a vehicle for the distribution of scholarly journals has continued over two decades, the earliest project being the Electronic Information Exchange System (EIES) begun in October 1976 (Hiltz & Turoff, 1993). Although projects and experiments have been undertaken since, the early efforts, before the Web, rarely had an opportunity to reach a "critical mass" which was necessary to allow scholarly electronic journals a realistic chance to succeed. In discussing the TULIP (The University Licensing Program) project, Lynch (1995) argued that "because Elsevier did not completely dominate scholarly publishing in any discipline," (p. 12) . . . TULIP failed to achieve the critical mass of subject-specific information required to make compelling the use of the materials provided by the project to subject specialists.

The early scholarly journals on Bitnet and the pre-Web

Internet struggled not only for submissions by authors but for acceptance by users. In part, the problem the early electronic scholarly journals faced is the problem all new scholarly journals have—that of building a reputation and finding one's place on the academic food-chain (Peek, 1996). Another major issue was the reality that the traditional publishers, those who had published the print journals, were not producing electronic journals beyond experimental models (Peek & Pomerantz, in press). Until the Internet became commercialized, traditional publishers could not have been on electronic networks because they could not charge for services. As we discuss in this article, even after the traditional publishers could have participated in this form of electronic publishing, they held back.

In 1996, Okerson, in the introduction to the *Directory of Electronic Journals, Newsletters and Academic Discussion Lists*, observed that there was a growing number of publications created for the Internet that was still accelerating. However, in the course of a study we are conducting, we found that, even in 1996, the traditional journal publishers were not a strong presence on the Web. In late 1996, and particularly in the summer of 1997, this situation changed and utterly transformed the scholarly journal landscape. We discuss the implications in this article.

Methodology

The purpose of this article is to discuss a subset of a study that is still under way. In the broad study, we are tracking the history and evolution of all electronic "serials" used by the academic community. As we were conducting the study, however, we found that the new entry

of the traditional publishers was significantly altering the presence of electronic serials.

In our study, we used the Web site *NewJour* (<http://gort.ucsd.edu/newjour/>) maintained by Ann Shumelda Okerson, Associate University Librarian at Yale University and James O'Donnell, Professor of Classical Studies, University of Pennsylvania. We elected to use this resource over Association of Research Libraries' *Directory of Electronic Journals, Newsletters and Academic Discussion Lists* because of the timeliness of the information that we sought.

Both the *NewJour* and *Directory of Electronic Journals, Newsletters and Academic Discussion Lists* are based upon voluntary submissions. Neither resource sent software "robots" out into the Internet to search for electronic journal projects. However, either resource is superior to directories such as E-Zines (<http://www.dominis.com/Zines/>) which only lists a mere 22 entries under the category: "academic."

NewJour includes both scholarly and popular listings. On August 1, 1997, when we "locked in" the database there were 4,128 items in the complete archive. This number, however, is a somewhat uncertain representation because we did encounter some entries that pointed to publications that had ceased publishing but still made their archives available. We also found that some publishers would give each journal title its own entry, whereas others would provide only one entry to a site that would actually contain several, if not dozens of links. When we complete the study, we will report on these findings.

At this time, however, *NewJour* is the only practical way to conduct a study such as ours. We recognize that with *NewJour* there will always be projects in existence that do not know about *NewJour*, or whose creators, for whatever reason, have chosen not to announce their existence with *NewJour*. Time-consuming as this project has been, it would be even more so if we had had to search the Internet manually, as it were, employing search engines to hunt for electronic scholarly journals. Some search engines search on the text of Web pages and some on the HTML META tag. Very few journals' Web pages that we saw actually included the words "scholarly journal" in the text; such a search would therefore have missed those journals.

The moderators of *NewJour* are to be credited, however, for maintaining a good archival site. Even if a link to a resource is ultimately found to be invalid and the moderators are unable to locate where the publication has gone, the efforts are noted and the listing remains. While a directory's editor would typically expunge such a listing, the moderators let it remain. As the social history of the evolution of publishing unfurls before us at a rapid rate, it is useful for researchers to know not only what publications live, but also to know which die.

However, one of the authors who was trained as a social historian points out that most Web sites—including the ones we have examined—fail to identify when the

site was begun. From a strictly historical point of view, this is not only frustrating but can lead to a false historical representation. The only Web-available "dating" may come from the messages sent to the *NewJour* archive that posts the date the message was received. However, this could be sent a week or a year after a site was mounted. The problem is compounded by the different amounts of information that the sites are mounting. Some of the electronic versions of traditional print publications begin with the first issue made in electronic form. Other publishers are mounting previous years of the print version on the Web site. Typically, we found that such publishers are not including the entire run of a publication title, only a selected number of years. We were fortunate to be collecting this data at a time when many of the traditional publishers headed toward the World Wide Web in 1996 and 1997.

In the course of our broad study, we are examining specific quantitative attributes of the publications that conform to our specifications. As we were completing a large section of our data analysis, we began to notice a significant trend, in summer 1997, that many new entries were generated from the traditional academic publishing houses. For this article, we decided to extract, from our existing data, the activities of only the traditional publishers and augment this data with observations of projects that came online after we locked in the *NewJour* database. Furthermore, small electronic journal projects exist that we have not included due to a lack of space. Included were descriptions of major multi-journal electronic publishing projects. The publishers of these projects produce predominantly print publications, exclusively or predominantly scholarly journals, that are migrating into electronic formats.

Growing Pains

Most publishers brought up their respective Web sites before the sites were "fully formed." For example, **Springer-Verlag** (link.springer.de) has launched one of the more extensive projects in the simultaneous electronic publication of print journals. This project, LINK Information Service, is anticipated to be completed by 1999. LINK ultimately plans to include all 400 print journals published by Springer-Verlag. As of April 1998, approximately half of the journals (over 200) were available.

Carfax (www.carfax.co.uk) is owned by Routledge Publishing Holdings which specializes in publications in the social sciences, humanities, education, and healthcare. Carfax is only beginning to put its journals online, with a stated goal of having 40 journals online by the end of 1998. Only the 1998 volumes will be available initially. A large number of journals are already represented on this site, but most have only tables of content with no abstracts. A small number of the journal contents are online and are subscription-based.

Because many of these sites could be considered a

work in progress, this may excuse some of the flaws we encountered with these sites. We had, however, expected that the sites being brought up from within the publishing industry would have a higher standard than those without such a history.

We found it disconcerting that it was often difficult, if not impossible in some cases, to locate information about such basic data as the relationship of the mounting of the Web version with a print counterpart, and the date at which the web site was started. Some sites provide this information, some do not, and others do so inconsistently. This is particularly a problem with the sites that freely offer the facility to search a table of contents (and frequently abstracts) to the Web public, but keep its full text behind closed (subscription-required) doors.

The sites we explored assumed considerable knowledge about what the end user knows. By not making it clear that the electronic collection does have earlier years in print, a novice scholar using the electronic version may believe that he or she is using the entire run of the journal's title.

The New Collections

We found several sites that are serving as virtual hosts for collections of publications. The most ambitious of these is the **FirstSearch Electronic Collections Online** (www.oclc.org/oclc/menu/eco.htm): OCLC's entry into online journal storage had, at the end of October 1997, 100 full-text journals from seven different publishers, with a goal of having 500 journals online by the end of 1997.

ECO is library-oriented, and offers itself as a complement to FirstSearch and as an alternative to the archiving of paper journals. It also offers the possibility of one-stop shopping for subscriptions for libraries who prefer to keep some or all of their periodical collection electronic, thus avoiding paper altogether.

Despite OCLC's traditional role in organizing, we found some flaws in this site as well. Most notably was the statement that descriptors were attached to the documents. The site failed, however, to inform us which controlled vocabulary language was being used. Lacking any form of browsable index, there was no way in which to make even calculated guesses.

Catchword (www.catchword.co.uk) is a non-library, Internet Service Provider for academic and scholarly publishers; it hosts materials, such as Carfax, from publishing houses in various countries. Catchword maintains relationships with publishers, and all subscriptions are made through the publishers or subscription agents. Catchword is also unique in that it produces RealPage software, an application that is necessary in order to read the online journals. Like most viewers, the RealPage viewer is free, but is currently available for PCs only. The company has an alpha version of Java RealPage under development for

other platforms, but it lacks important features such as the ability to print.

Looks like a Journal

We were surprised to the extent that the traditional publishers have embraced the Portable Document Format (PDF) as the distribution mechanism of choice. No other genre of the publishing industry has yet elected to use this format over HTML.

Project IDEAL (www.idealibrary.com): (International Digital Electronic Access Library) is an electronic adjunct to Academic Press (www.apnet.com) and was one of the first traditional publishers to bring all of its journals to a Web-based form of distribution. Tables of content and usually abstracts are available in HTML. The full texts are available in PDF to subscribers. Some of the journals feature only the current tables of content, and others feature tables of content for all the back issues, through 1996, and some through 1995. The pricing schemes for access are fairly complex, and explanations are available at the IDEAL site.

The PDF format has particular advantages for publishers. The software can create a PDF document from the applications that have produced the paper copy. Thus the file largely maintains the "look and feel" of a printed page, even down to the proportions of the height and width of the page image on screen. The use of this format may contribute to allowing paper-oriented users to feel comfortable with the electronic version of the journal by continuing a familiarity with the image.

It is not clear if the publishers have embraced PDF for these reasons, if they perceive a long-range commitment to the product, or if this is the extent of their vision of an electronic journal.

The use of PDF by these traditional publishers has been essentially to make a mirror image of the paper version. The end result can, if the publisher so elects, speed delivery time to the reader by a few weeks and, with a Web-based distribution system, eliminate the need to fire up the photocopier.

However, the PDF format is not being used to its full potential. Adobe Acrobat allows objects to be imbedded into PDF formatted documents. These objects can include those common on the World Wide Web: Pop-up lists, radio buttons, dynamic and interactive control objects that trigger sound and movie files, as well as the most familiar object on the Web—the hypertext link.¹ However, these objects are rarely to be seen in the PDF documents that we observed. Rather, these publishers are producing PDF files that entirely emulate the printed page, down to its static nature. The PDF document therefore becomes the end of the line. The promise of electronic publishing is one of a fully interactive and hyperlinked environment.

¹ <http://www.adobe.com/prodindex/acrobat/details.html>

PDF, as it is currently being used with these publishers, reduces the benefits promised for electronic publishing.

However, there is one advantage regarding the use of PDF which is of particular use in the academic community: How to cite the document. With the image essentially a mirror of print with traditional page numbers, etc., scholars can use the conventional means of citation. And given the difficulties that many citation manuals have had in arriving at a standard, PDF could be a useful bridge until standards are achieved.

The adoption of PDF is not universal. **Elsevier** (www.elsevier.com) produces a variety of paper and print publications in 13 areas of the sciences and social sciences. It is part of Reed-Elsevier, now the parent company of Lexis-Nexis. Some of the journals have special electronic features such as search facilities or abstract services, but they are primarily available in HTML. This is in keeping with Elsevier's goal of producing information in "media-neutral" form.

One of the collection sites, **JSTOR** (www.jstor.org), has rejected both PDF and HTML as the distribution format. JSTOR is scanning journal issues using OCR software, and the resulting files are made searchable. Once a user chooses to view an article, however, the individual pages are downloaded as a high-resolution (600 dpi) bit-mapped image. Two reasons are given by JSTOR for using this method: OCR software will inevitably yield some errors in translating the text, and images are more faithful to the original print journal. Thus, it can be argued that the image may be accurate but that the database contains flaws.

JSTOR also requires the use of a helper application, JPRINT, which may be configured to work with Netscape, Mosaic, and Internet Explorer. Postscript versions of the files are also available for Unix users. Given the format used by JSTOR, the concerns about a proprietary format, such as PDF, are probably less of an issue. Much like the concerns about static PDF files, JSTOR assumes a flat and traditional journal presentation.

The JSTOR database resides at the University of Michigan, with a mirror site at Princeton University. JSTOR is an independent not-for-profit organization that was established in August 1995 with initial support from the Mellon Foundation. JSTOR is expected to become self-sustaining.

The database is unique in that the electronic version offered comes *after*, not *before* the print, with price reduction being one of its main goals. Prices are based on the type of institution subscribing, with large research institutions paying the highest prices. JSTOR contains only back issues, so that the journals can maintain their revenue stream from current issues, and the amount of lag time varies from journal to journal. The site features a large amount of information about the JSTOR project, including an outline of plans to gradually phase in larger numbers of journals and subscribing institutions.

Cost Reduction

We encountered a few sites where the cost of electronic access was significantly less than with other publishers. **The Institute of Physics** (www.ioppublishing.com) launched its Electronic Journals project in January 1996. It consisted of 33 journals, all of which have print counterparts, though the electronic version is advertised to be available "weeks before print publication."² Each journal has its own suite of Web pages included in which are the tables of content for all issues back to the start of the project, as well as abstracts for the articles featured in the latest issue, though the full text is available only to subscribing individuals or institutions. Institutions that are already subscribers to the print version of a journal can gain access to that journal, using a password, at no additional cost. Additionally, institutional subscriptions include access to a 5-year archive of issues back to 1993. Articles are available in both PDF and PostScript formats.

One of the most ambitious projects is the Association for Computing Machinery's (ACM) Digital Library which is part of an aggressive publishing plan outlined in 1995 by the ACM (http://www.acm.org/pubs/epub_plan.html). ACM has 17 print periodicals. The 79,000 members currently maintain 55,000 journal subscriptions (13,000 subscriptions to non-members) from these 17 journal titles.

While still under construction, the association plans to have full-text articles from all ACM journals, magazines, and conference proceedings from 1991 forward in electronic form. A Table of Contents database will contain citations from 1985 forward.

ACM plans to offer full access to ACM members who also purchase the digital library option for an additional \$86. Society membership is \$89. Members may elect to purchase only individual subscriptions instead of the whole digital library. In comparison to subscribing to the print journals, the \$86 digital library option is quite affordable given that a subscription to the print journal "Computing Reviews" is \$43. ACM also plans on providing a members-only profiling facility that will support automated notification on articles.

Project **MUSE** (muse.jhu.edu/muse.html), an early and ambitious project was established by a consortium of the Johns Hopkins University Press, the Eisenhower Library, and the National Endowment of the Humanities. Begun in 1995, MUSE was one of the earliest projects in which a traditional publisher sought to mount all of a publishing house's titles on the Web. The project now provides electronic access to all of the more than 40 scholarly print journals published by the consortium. In addition to their print-analog journals, however, Project MUSE contains two exclusively electronic journals: *Theory & Event*, and *Postmodern Culture*, the latter of which is, in fact, an earlier example of a scholarly journal

² <http://www.ioppublishing.com/Journals>

launched in 1990 without a print equivalent or a traditional publisher.

On the tables of content pages, under every article title, is a list of two or three subject headings, though no abstract is available, nor is it made clear from what vocabulary these subject headings are derived, though they look to be Library of Congress. Project MUSE is one of the few projects that offers its articles in HTML format; this allows for the extremely convenient feature that every footnote notation in the text of the article is a hyperlink to the footnote itself, and vice versa.

Some publishers are offering different electronic flavors of the same print journals. The University of Chicago Press is offering HTML with graphics, HTML without graphics, PDF, and Postscript files for a few of its journals such as *The Astrophysical Journal*.

New Publishers, New Relationships

Thus far, we have observed a rather conservative entry into the electronic arena by many traditional publishers. New services, without an apparently direct linkage to a traditional publishing house, have emerged that could effectively challenge the publishers efforts. Two such services are BioMedNet and Bioline, both exclusively online publishers. BioMedNet, describes itself as a "World Wide Net Club for the Biological and Medical Community" (<http://biomednet.com/about.htm>). This free "club" requires registration and acts as a clearinghouse for a number of traditional print publishers and includes access to "Evaluated Medline." This evaluated version of Medline uses the BiblioteKTM 2 search engine and includes items that have been cited and evaluated by reviewers in the "Current Opinion" journals. These items are then tagged for items of special or outstanding interest and include annotations given by the review author. BioMedNet indicates that this version of Medline is trademarked, but it does not say by whom. BioMedNet also offers free access to an apparently active magazine called the HMS Beagle, which is put out by BioMedNet Ltd.

Bioline (<http://www.bdt.org.br/bioline/>) is a service offered in conjunction with The Base de Dados Tropical (Tropical Data Base—BDT) a department within the Fundação Tropical de Pesquisas e Tecnologia "André Tosello," a Brazilian not-for-profit, private foundation. This service also provides a clearinghouse of access to electronic information, but offers its own databases, not Medline's. It also offers software files and links to other related sites. Like BioMedNet, the Web site provides little information about the company Bioline. Similarly, neither service states that either is involved in any form of archiving.

And What about JASIS?

You might be reading this article in print or you might be viewing it online. The latter was impossible to do a

year ago. John Wiley & Sons, the publisher of this journal, launched **Wiley InterScience** (www.interscience.wiley.com) in October 1997 with plans ultimately to deliver all of their more than 400 print journals electronically. InterScience has more features than many sites, such as the creation of a Personal Home Page on which one can create customized pull-down lists of Hot Journals, Hot Articles, Persistent Queries, and Annotations. The tables of content and abstracts are in HTML, but the full text of articles are in PDF format. The InterScience project is unique among projects we have viewed in that it addresses the issue of dropped subscriptions: "Users will continue to have access to the full text files for which they have paid, even if they stop subscribing to the journal."³

The Authority in All of This

While many electronic journals have emerged before the large publishers entered the field, there is an unsettling feeling that can occur when the traditional "standard" journals enter the electronic arena. The discussion shifts now from "should we make this change and when should we do it?" to the question of "what do we do now that we have made the change?" There is little doubt that it will take several years before these issues are resolved to the satisfaction of the various constituencies of the academic community.

One of the most vexing, and perhaps more disconcerting question, is what will be the authoritative copy. For the time being, at least, we still have the print version. Because the electronic versions are still, in essence, mirror images of the print versions, there is similarity, if not exact replication, between the two. Yet it is unlikely that once scholars have an opportunity to do more with their work than the print version allows, and assuming that the publishers successfully migrate to dynamic versions, as John Wiley & Sons intends to do, then the matter is going to become far more complicated.

At the time of this writing more than 175 software plug-ins are available that can be attached to the current Web browsers. Plug-ins add functionality to the browsers and permit the playback of audio, sound, interactivity software applications, graphics, virtual reality, and more. A scholar could elect to create an internal link with his or her article to an object that uses any of these plug-in applications. Let us say that the author has elected to create a virtual reality object that represents a three-dimensional mathematical model and that this object is considered to be an important part of the article itself.

The first issue is the need for the editor and the reviewers to be able to review and evaluate the object. Then, if the document is accepted, the next decision will be how to represent the object in the print format. Is a single screen shot an adequate representation or will multiple

³ <http://www.interscience.wiley.com/moreinfo/welcome.htm>

angles be necessary? The next decision needs to be “where will the object reside on a permanent basis.” The object cannot be trusted to remain merely as an object that resides in the account of the author because the author could move to another institution, rendering the uniform resource locator potentially useless (given the current means of locating information on the Web). In addition, if the object resides with the author, there is no means of knowing if the author has altered the object in any way that could potentially violate the integrity of the article as originally accepted by the reviewers and the publishers. Alternatively, the author could die and the account be wiped out by a system administrator.

If the object then resides with the publisher, the questions still remains “who is responsible for the object over time.” Let us say that the author has elected to create an object using VRML 2.0 (Virtual Reality Modeling Language Standard 2.0). Despite the fact that there is a stated standard with VRML, it has not played out in practice. The different flavors of VRML produced by software developers such as Microsoft, Silicon Graphics, etc. tend to require the precise plug-in that corresponds with the software used to create the object. So, for the publisher to insure that the object will be viewable, the publisher would have to insure that the plug-in was not merely pointed to, but maintained with the object in question. There are no assurances that the software producer will keep a particular version of the software on the Web site. Or, for that matter, that the producer stays in business.

Such a solution may work only in the short-term, however. The particular plug-in may not keep up with the changing VRML standards. Already much of VRML 1.0 is unusable by the VRML 2.0 applications. The particular plug-in may not “step up” with developments either with the browsers or in the operating system. Therefore, should the object be brought up to a more modern version? If so, who should author the revision? The author may be several years away from the work and have little interest in re-authoring the object. Should the publisher be responsible? And, in either case, does the article need to be returned to the editorial process to insure that the object is, in fact, a fair representation of the earlier document?

One possible solution to this problem is for the publisher to arrive at a standard for the possible add-ons that will be supported. Unfortunately, the arrived standard might, like Adobe’s PDF, be a proprietary standard. Many would argue that it is premature to arrive at such standards, particularly when there is no standard about the browser platform of choice.

The issue is made more complicated by the external pointers a document may maintain. If an author points to a video that is available at a particular site, does that author or the publisher have the obligation to make arrangements to incorporate and archive the information to insure that the integrity holds up over time. Already these arrangements are not unknown to us in the print world where an author may seek permission to reuse an element

such as a table that has already been published. However, the scale and the expenses could differ significantly from that which we have known in the past. To demonstrate an extreme case, what if the author examines information retrieval measures using the Library of Congress’s database? Would the author be required to seek permission for the part of the database that was used, or access to the entire database? Similarly, the necessity of archiving such a large file could be cumbersome, to say the least. But if the database is not captured at the time that the article is authored, would someone returning to the article 10 years hence and attempting to perform the same experiment on this potentially and wholly new database generate entirely different findings that could erroneously invalidate the findings of the original article?

Yet, if the print version lacked these elements mentioned, would it carry the same “authority” as the electronic version, assuming all other elements, specifically the text, remained the same? Would the document that contained the VRML object have greater authority than the version that merely represented an element or a few elements of the VRML object?

The issue of authority increasingly becomes a problem if the print version is considered the authoritative version but the version used most frequently is the electronic one. If the electronic version precedes the print version in terms of speed of delivery, and if the scholarly community’s complaint about the speed of access to published works is true, then the likelihood of the electronic version being more used than the print could quickly become apparent. The question extends even further that if the electronic version becomes the “de facto” standard, will people actually check the print version to insure the authority of a particular work?

Methods of archiving, such as used by JSTOR, will not work in such a dynamic environment. In this sense, the rather modest entry of the traditional publishers into the arena of electronic scholarly journals is not surprising. Static PDF looks particularly appealing when there are such complex issues to resolve.

There are other matters to contend with as well, more than can be considered in any depth in this article. Archival services like JSTOR and similar consortiums have a limited track record, thus our collective comfort level has not yet been established. New publishers and service providers, such as Catchword, BioMedNet, and Bioline, are also unknown to us. They have no extensive track records. In addition, as contentious as relations have been among publishers, scholars, and libraries in recent years, there is the dilemma of working with a “known” devil over an unknown organization that could create its own share of headaches.

We found that the vast majority of sites are relying on the use of author-generated abstracts and possibly author-generated keywords. The sites do not inform the user what it is that he or she is searching. If controlled vocabulary is used, rarely is it offered as a point of reference for search-

ers. Will end users really care about this now that they can go directly to a source and search? Will meta-indexes that could incorporate all known search engines from the publishing houses and other entities supporting journals supplant the traditional indexing and abstracting services? Will it become necessary for indexing and abstracting services to attach the information at the document level or will we need these services at all? Will scholars have to learn the art of writing a good abstract and selecting good keywords to insure that his or her work will be found again? Or, when a time comes when full-text searching of a journal article is normal, will indexing and abstracting of these publications become extinct.

Academia, which shares characteristics of being both conservative and revolutionary is now, for the first time, really having to confront how the future of electronic scholarly journals will be molded. No longer can the electronic alternative be ignored by those who have felt that the medium was not legitimate. As time has passed, the electronic journal has come to be more widely accepted by the scholarly community. Indeed, some studies even indicate that there is virtually no

resistance to electronic publishing in the scholarly community (Butler, 1995). Now that John Wiley & Sons and *JASIS* has entered the electronic medium, we, like the other journals and publishers birthed in print, should shape the destiny of the genre. After so many years of discussing electronic journals, it is finally time to set the course.

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