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Open Access and Scholarly Communication

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Abstract

The open access movement is increasingly guiding the publishing practices of scholarly research. This paper will look at developments in the open access movement, how open access affects scholarly communication, and what eventual role librarians will play in its progress.

Introduction

The ways in which we use the internet continue to evolve. We have noted the way it has changed how we perform research. We must also note the way it has changed how we publish research. The inclusive qualities of Web 2.0 technologies allow for more voices to be heard, more ideas to be shared. Publishing now takes place through blogs, social networks, and social media sites. Included in this evolution is the way we think about scholarly communication. The open access movement is increasingly guiding the publishing practices of scholarly research. Publishing can now be an immediate process accessible by anyone in the world with an internet connection. This information has been made free not only to read but also to sample and remix, to create something new without fear of reprisal. New forms of scholarly communication are beginning to impact the way the publishing industry operates, a trend which may have lasting effects. This paper will look at developments in the open access movement, how open access affects scholarly communication, and what eventual role librarians will play in its progress.

Rising costs and diminishing budgets

In the not-so-long-ago days of the print model, scholarly communication publishing was accomplished through the mutualistic relationship between scholars and publishers. University scholars seeking to attain retention, tenure and/or promotion sent their scholarly writings free of charge to journals publishers. Other scholars gave their time to edit and review articles. Publishers prepared and packaged journals to sell back to the institutions for a reasonable price. Academic library budgets assumed these costs. Although scholars still provide free articles in order to improve status in their fields of discipline, the fees for journal subscriptions have increased dramatically. Prices have continued to rise ten percent a year for the last thirty years (Lewis, 2008). Library Journal's Periodical Price Survey of 2008 shows that the average cost of U.S. subscriptions from 2004-2008 has risen 39 percent. Comparing the Library Journal surveys from 2006 and 2008 we note the greater increase in science journals in which the annual cost of a physics subscription rose from $1,868 in 2002 to $3,103 in 2008, a 66 percent increase. The average cost of a chemistry journal jumped from $1,974 in 2002 to $3,490 in 2008, an increase of over 77 percent. Libraries and their users bear the brunt of these expenditures. In the meantime, library budgets have increased at a much less disproportionate rate, necessitating the cancellation of smaller periodical titles and depleting allocations for monographs and other types of materials. While journal subscription prices continue to increase, the move towards open access publishing on the part of some large universities and governmental institutions is beginning to show an impact.

The road to open access

In addition to the practical reality of increased costs, there are intangible factors that influence circumstances, giving rise to the argument for open access. Basic philosophical differences underlying the missions of libraries and publishers may account for part of the dichotomy. Libraries have always advocated the free sharing of information. Whether through print or digital format, libraries view the widest possible distribution of information as enhancing creativity and innovation. Publishers'

livelihood, on the other hand, comes from the sale of information. Profit margins are important in advancing the business model and increase with broader proprietary rights. Restrictive copyright laws and licensing practices have prompted academic libraries to look to the collaborative spirit of the internet, and open access publishing in particular, to gain back some control.

Open Source Influence and Creative Licenses

With the advent of the internet came a global sharing of ideas. The Open Source Movement came about when those working on software projects were easily able to communicate and share important code online. A variety of innovative improvements were made to the code, stretching its use in ways that no one person alone could have foreseen. It was in this spirit of competitive teamwork that advances to open source software increased. To ensure that the code remained free for all, licenses like the GNU General Public License were created. These licenses, also known as copyleft licenses, stipulated that although the developer could use the code to make derivative works, they must apply the same type of license to their own design so the next person would have the same privilege of use. Open source software was, and is, successful, in both the commercial and non-commercial realms, and continues to proliferate.

The larger concept of freely sharing ideas and materials has taken hold in other ways as well. Many in the education world wanted to extend the use of their learning materials to others. But aside from the GNU General Public License, which was originally created for software, authors had to only the basic copyright laws for their protection. For many the copyright laws were too restrictive. The choice was either to maintain all rights or waive all rights by placing their work in the public domain. Encouraged by the GNU license, Creative Commons (CC) (with their signature takeoff phrase “Some rights reserved”) began to offer licenses that could be matched appropriately to the author’s needs. These licenses provide optional combinations of attribution, non-commercial use, or the copyleft requirement called ShareAlike (Creative Commons, 2007).

Although there is disagreement about the compatibility of CC licenses, they have become widely accepted in a short time. Since Creative Commons’ inception in 2001 until June of 2006, 140 million such licenses had been adopted. The licenses can be used for anything that would fall under the normal copyright laws and could include such things as lesson plans, blogs, photos and other images, recordings and videos. Creative Commons licenses help pave the way for Open Access venues.

Gold Journals

Open access publishing has evolved in two separate directions. Self-archiving in institutional and subject repositories is known as the “green” method while the “gold” version of OA publishing refers to the distribution of open access articles in online journals. The journals, freely accessible on the internet, can be “read, downloaded, copied, distributed, printed, searched, or linked to, crawled to index, or used for any other lawful purpose” (BOAI, 2008). Authors have the right to be credited and cited for their work. Two examples of “gold” publications are The Public Library of Science (PloS) and BioMed Central (BMC). PLoS is a non-profit open access publisher publishing seven peer-reviewed journals in the areas of science and medicine. Articles are immediately published along with tools to compute impact

advantage rates. In addition, PLoS offers Web 2.0 means for community dialoging. BioMed Central, on the other hand, is a for-profit open access company which publishes 195 peer-reviewed journals. It offers additional products and services which can only be accessed through a subscription fee. Another supporter of the "gold" model includes the Directory of Open Access Journals (DOAJ) hosted by Lund University Libraries in Sweden. An aggregate of quality controlled scholarly articles, the DOAJ boasts a listing of over 3700 journals and almost 22,000 articles.

In April 2008, the Scholarly Publishing and Academic Resources Coalition (SPARC) in Europe announced a new program to reward journals using Creative Commons By (CC-BY) licenses with the "SPARC Europe Seal for Open Access." The seal was created in hopes to ensure proper copyright statements are being used. A second requirement for earning the seal is to make journal metadata available to the DOAJ in order to assure its OAI compliance. This seal serves not only to provide validation of journals that receive it, but also to bring about more visibility through standardized metadata harvesting (Peek, R., 2008).

In the past, the "gold" model has been viewed as less viable with the issue of sustainability playing a large role. The distribution process for OA publishing is far less costly than for traditional subscription models, made possible by the use of affordable open source software, the elimination of subscription tracking and authentication and dedicated volunteers performing peer reviewing and editing. The Budapest Open Access Initiative (2008) finds that an average cost for per article for a traditional print publishing is about $4,000 whereas the cost of an open access article costs about $400. Open access journals do not charge the reader or the producer (BOAI, 2008). So where do the needed resources for sustainability come from? Government and foundations monies may fund journals as well as institutional, organizational, or for profit publishers offering value added products or services.

New pricing models for open access journals however, are increasing as the impact of open access publishing is realized. "Author pays" models, that charge the author for each article published, are becoming more prevalent. These fees can be passed on to the research institution or organization while prepaid membership fees act as a debit card offsetting article processing fees. Oxford Journals, a division of Oxford University Press, now offer what they call "hybrid" open access. This provides the authors of accepted papers with the choice of paying the publishing fee up front for immediate inclusion in an open journal or to submit their article for standard publication. Journals will have a mixture of both open and standard published articles. Van Orsdel and Born (2008) point out that Oxford University Press has actually lowered their journal subscription prices two years in a row by using income from authors' fees.

Open access publishing is gaining recognition as demonstrated by the founding of a new association. The Open Access Scholarly Publishers Association (OASPA) launched on the first ever Open Access day in October, 2008, defines its mission as one of support and representation for the interests of open access journals. Membership is open to both scholarly and professional publishers who have demonstrated their concern for OA publishing by having signed either the Berlin or Budapest Initiatives. In addition they must publish at least one full OA journal. Founding members include, BioMed Central (recently attained by Springer) PloS, SAGE, SPARC, and a list of others (EurekAlert!, 2008). The addition

of the large scientific commercial publishers, such a Springer and SAGE, denote their understanding of the changes that are taking place in the industry.

Green Repositories

In an effort to reclaim some control over library budgets and offer alternate publication means for faculty communications, universities began to advance the use of institutional repositories (IR). In addition to disseminating information, scholarly repositories serve as a way to market the institution by showcasing its intellectual output. Often built with open source software, the IR is able to store digital copies of peer reviewed faculty publications as well as other institutional data. The ability to aggregate materials in one place replaces old disjointed models of individual or departmental websites which are often incomplete and out-of-date (Swan, A. and Carr, L., 2008). Experiencing a renewed support among universities, IRs, deemed as the "green" arm of the Open Access movement, have met with some resistance in the past.

One major concern in using IRs is the matter of interoperability. How can articles located in any one repository be easily located and used by any one researcher, wherever that researcher is located? In 1999, the Open Access Initiative (OAI) was established to address such issues. As an organization, the OAI is committed to the development and promotion of standards that enable interoperability across a wide range of digital environments. Such standards like the OAI Protocol for Metadata Harvesting (OAI-PMH) enable cross-archive searching and access of registered repository records. Extensible Markup Language (XML) is used to describe document metadata which can then be read by third-party service provider harvesters, facilitating document retrieval (Yiotis, K., 2005). One such harvester, OAIster, is a union catalog of digital sources hosted at the University of Michigan. E-prints, Dspace, Fedora, and BEPress are just some examples of OAI compliant archives with over ten million items held. http://maps.repository66.org/

Another problem posed with IRs, is the reality that faculty often show a reluctance to post their works in these local repositories. While research notes this tendency may vary by discipline, several reasons appear to contribute to the obstacle. One such complaint is that faculty members are already overburdened with teaching duties and administrative obligations (Xia, 2007). Lack of time to learn new systems and to add metadata to records, turns IR self-publishing into a low priority. Concerns about copyright are also troublesome as faculty might not understand copyright laws (Oppenhiem, 2008) especially as they pertain to their pre-print and post-print articles and .pdfs of fully published journal articles. In addition, faculty may feel that IR publishing holds no rewards as related to the retention, tenure, and promotion process. Assuming a lower citation rate, and therefore lower research impact for IR publishing, they prefer to publish in the traditional manner, targeting journals of high prestige with a traditional peer reviewing process.

Many of these worries can be alleviated by librarians. Librarians have recently adopted liaison programs forming closer partnerships with department faculty to personally assist them in their research, help with copyright questions, and inform them of library services and materials. Librarians can direct faculty to sites such as OpenDOAR and the Scholarly Publishing and Academic Resources

Coalition (SPARC) so they can learn more about OA repositories and their supporting communities. Generally possessing a better understanding of metadata schemes, librarians can assume maintenance of the IR including preparing and performing uploads for faculty. Collaborating with teaching staff can create greater understanding between the library and the campus as a whole.

Assuring faculty of the benefits of IR publishing, librarians can also point to research that confirms higher impact for OA journal articles over toll access articles (Norris, M., Oppenhiem, C. and Rowland, F., 2008). Although reasons for greater research impact are unclear, findings clearly demonstrate citation advantage for open access articles. From sample searches of 4,633 articles using OAIster, OpenDOAR, Google, and Google Scholar, 49 percent had a mean citation of 9.4 while toll access articles had a mean citation rate of 5.76. Variation was uncovered among disciplines. Sociology demonstrated the highest citation ratings with the lowest amount of OA articles while ecology had the lowest citations ratings with the fewest OA articles. This article, in addition to previous findings, should indicate the advantage of using IR for self-archiving.

Mandates

Despite the proof of higher citation rates, the problem of sparsely populated IRs and faculty members' reluctance to submit articles, continues. This has prompted some universities to issue mandate policies. Swan and Carr (2008) liken it to an empty shop window display. "They are not only *not* enhancing their institution's online visibility, they are also actively projecting a very poor image of their institutions to the world." It has been noted that while faculty are very willing to comply with funder or administrative mandates, only 15% will deposit articles spontaneously if not mandated.

The first to issue such a mandate policy was the Department of Electronics and Computer Science at Southhampton University in the United Kingdom. The mandate precipitated a marked increase of deposits the department repository. However, gaining even more attention was the Queensland University of Technology in Australia, the first university ever to, as a whole, require deposits from faculty in an institutional repository. The policy, passed by the administration in September 2003, took some time to implement due to researchers' continued concerns. Although more than willing to comply, the faculty found some difficulties in doing so. The results from QUT's case study recommend creating advocacy initiatives and scaffolding the depositing process. They also suggest rewarding early adopters as they can provide the best form of support (Cochrane, T. and Callan, P., 2007).

Other institutions followed suit enacting mandates of various strengths: European Research Council, CERN in Switzerland; Minho University in Portugal. One mandate of great importance for the United States was from a bill signed into law by President George Bush in December 2007. The law states that the National Institutes of Health (NIH) must mandate open access for all research articles funded by the NIH. Peer-reviewed articles for publication are to be submitted to PubMed Central, the open access archive of the NIH (National Institutes of Health Public Access [NIH], 2008). Authors are responsible for determining whether or not commercial publishers allow parallel publishing although researchers are allowed an embargo period up to 12-months, after which they are required to submit

the article to PubMed. Commercial publishers were, not surprisingly, dismayed by the law, claiming it interferes with copyright and will undermine the peer-review process. Although threats of a lawsuit were heard the law stands as is. From an open access stance, researchers will hopefully choose the shortest appropriate time period to submit in order to ensure the public the fastest possible access to vital information. This mandate will affect an estimated 80,000 papers each year.

By far one of the most important mandates to transpire this year was the mandate signed by the Faculty of Arts and Sciences (FAS) at Harvard University. The significance of the mandate lies in that the FAS voluntarily and unanimously voted to adopt a policy that requires faculty members to deposit a copy of their scholarly articles in the university's repository. Similar to a publication agreement, it also requires faculty to grant permission to the institution to distribute their scholarly articles. This permission grants the university "a nonexclusive, irrevocable, paid-up, worldwide license to exercise any and all rights under copyright relating to each of his or her scholarly articles, in any medium, and to authorize others to do the same, provided that the articles are not sold for a profit" (Nguyen, T., 2008). Faculty can opt out by filing a waiver. To enjoy the widest distribution a faculty member may also want to publish with commercial publisher. If the publisher's agreement calls for exclusive rights to the article, Harvard has created a web-based addendum form which can be filled out with amendments and attached to the publisher's publication agreement. When either an addendum or a waiver is filled out online metadata for the article is collected facilitating deposit in the repository. Making a collective statement about the importance of open access, the prestigious Harvard University has opened the way for many others to follow.

Role of Librarians

Swan and Carr (2008) state that, "It will soon be rare for research based institutions not to have a digital repository." But IRs may experience even wider success as smaller campuses realize their advantages. As open access practices advance the creation of these institutional repositories (which seems likely after the Harvard mandate) how will the role of the librarian change? Librarians have always been entrusted with keeping and preserving the human record. Until recently, they have been seen as passive gatekeepers of information. The internet, however, has changed this role and librarians are becoming active collaborators and creators of new knowledge. Repositories offer librarians an even more pronounced role central to the mission of the university.

As stated earlier, librarians have become library liaisons, initiating closer ties with department faculty. It is through these relationships with faculty that they can now assume the role of advocate for the open access movement. While faculty have been slow to embrace a move away from publishing in established journals, they can understand the ever increasing costs in purchasing licenses for online journals and the library's subsequent budget constraints. As partners in the dissemination of knowledge, librarians will propose the implementation of IRs to house faculty's open access peer-reviewed scholarly articles, as well as other types of educational and administrative resources.

Librarians structure information in ways that facilitate its access. Adding OAI compliant metadata to records helps to ensure the information's retrieval. Librarians may insert controlled

vocabulary, construct thesauri, or add folk tagging mechanisms to the repository. While print materials make up the majority of items, librarians must support the dissemination of new formats of faculty expression. Staying informed of new technologies will be required to keep deposits viable.

Librarians at QUT (Cochrane, T. and Callan, P. , 2007) noted two areas of IR publishing that elicited the faculty's concerns. One was their skepticism about citation reference. Librarians can reassure them of the advantages of open access with tangible evidence of increased citation and download counts. Open access articles generally receives higher counts and these can be recorded by embedding metrics into the repository. Metrics will provide a variety of statistical information for assessment purposes (Norris, M., Oppenhiem, C. and Rowland, F., 2008). Another area of apprehension was copyright management. Librarians, familiar with vendor licenses and copyright laws through interlibrary loan and e-reserves, are better equipped to administer licensing and in doing will ease faculty's reticence. Classes for those wishing to learn more about these subjects or general information about the repository and depositing could be offered and taught by instructional librarians.

Bringing awareness to the campus and larger community is vital for the acceptance and use of the IR. Conversations with faculty and administration should include ways to publicize IR efforts. Course management systems like Blackboard, Web CT and Angel could have embedded links, not only to the library's catalog but also to the repository. Information literacy instruction could include how to search online repositories and open access journals in the same manner that they currently instruct searching in commercial databases. Positive experiences and success stories should be publicized.

Librarians excel in creating interesting add-on materials. Complementary bibliographies, webliographies, or images could be linked to deposit sites. Articles featuring faculty, their research, and classes could be offered as supplements.

In addition to advocating for implementation of IRs, eventually more libraries may offer to pay author submission fees for open access journals as has recently been approved in Canada (Morrison, H. and Waller, A., 2008). In September 2008, the University of Calgary instituted the "University of Calgary Open Access Authors Fund." The $100,000 annual fund will provide faculty and graduate students the means with which to pay submission fees for accepted articles headed for publication in open access journals. Calgary's Vice President for Research, Dr. Rose Goldstein expressed her pride, stating, "The Open Access movement is a significant initiative in bringing our research activity more quickly and broadly to the awareness of the scholarly community and to the public at large. The establishment of this fund by Libraries and Cultural Resources is a crucial development for our faculty and graduate students" (University of Calgary, 2008).

Future

Andrew Keen, "journalist, author, and self-proclaimed hater of all things free," offers an interesting, albeit negative point (Synder, 2008). He states that the "current economic downturn in the economy will pop the open source, Web 2.0 bubble and sites that depend on the kindness of strangers." He goes on to say, "The basic point is that free labor is fine when everyone's got a lot of money and they're employed, but when they start getting laid off, I think people's attitude toward money changes."

His logic makes some sense. Does this portend the demise of open access publishing of scholarly communication? It would seem unlikely. First of all, the movement, which has gained momentum and prestige from participation by esteemed universities like Harvard, is, itself, a response to exceedingly high prices. The collaborative effort of open access is working to better those who have less. In addition, the open access model is proving itself sustainable despite the opposition of powerful publishing conglomerates. Secondly, scholars are paid to perform research and publish findings. That is one of the reasons they are able provide their services non-gratis. When scholars start charging publishers for their intellectual property, we will see a difference. Until then, new open access models of publication are providing librarians with the opportunity to present themselves in a leadership role in the academy, as well as assist faculty and students, and offer free, high quality scholarly research.

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