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Making Scholarly Communication Accessible: The Budapest Open Access Initiative

The Budapest Open Access Initiative, named for the location of the meeting where it was drafted, was first made public on February 14, 2002, a little over a year ago. It represents a coordination of the efforts of people and organizations who had been working separately on reforming scholarly communication, or “scientific and scholarly journal literature,” to work together to find “the most effective and affordable strategies for serving the interests of research, researchers, and the institutions and societies that support research” (BOAI). Before delving into what the initiative is about, I want to give a little background on what led to its proposal and why it is important.

What has come to be known as the “serials crisis” in libraries is well-documented as academic libraries have been struggling for decades now to pay rapidly rising journal costs and canceling large numbers of serials as well as monographs. Over the last ten years, prices for journals have risen about 7-10% annually (Van Orsdel and Born). The bulk of the increases are for scientific, technical, and medical (STM) journals. The cost of subscribing to an average STM journal rose 471% between 1970 and 1995 (European Science Federation). Publishers have taken advantage of the inelastic demand for STM journals knowing that librarians have little choice but to continue subscribing as faculty need to publish and access the literature of their disciplines (Open Society Institute). Many have noted how the disproportionate costs of STM journals are hurting disciplines

such as the humanities and social sciences which depend on monographs for their research as serials take up larger and larger chunks of library budgets.

Derk Haank of Elsevier attributes skyrocketing prices to increasing publication of research due to greater post-World War II funding for science while library budgets remained static in comparison (Poynder 2002b). Alison Buckholtz of the Scholarly Publication and Academic Resources Coalition (SPARC), an alliance working to reform scholarly communication and make it more accessible, cites research that “argues that publisher mergers and consolidations are directly correlated to journal price rises.” Whoever is ultimately to blame (and it is doubtful that there is a simple answer to that question), the current situation is a spiral where publishers raise prices in response to decreased circulation which in turn causes more libraries and individuals to cancel subscriptions (King and Tenopir). With budget deficits being reported in most states and cuts sure to come in spending for academic libraries, there is little hope for improvement in the near future (Van Orsdel and Born).

In addition to the issue of rapidly rising prices, the ability to access many journals online has added another complication – the issue of licensing and permission. Libraries must now negotiate complex licensing agreements by means of which publishers have a say in who is allowed to access journals, how they are allowed to access them, and what they are allowed to do with what they access. Another downside is that the content of the electronic journals does not belong to the libraries. They are merely leasing it and have no guarantees of being able to access it in the future which brings up concerns about archiving the records of scholarly communication, another aspect of the missions of

academic libraries. This creates another barrier to scholarly and scientific literature in addition to prohibitively expensive pricing. (Suber)

Libraries have been resorting to consortial arrangements where a group of universities have a cooperative licensing agreement with a publisher that allows them electronic access to more journals than they would otherwise be able to afford. However, continuing price increases mean that the savings will make little difference in the long run, and larger libraries are realizing they do not gain much from the agreements (Van Orsdel and Born). Librarians are also beginning to realize that the “Big Deal,” multi-year agreements for multi-journal packages, is not so good for them (Van Orsdel and Born). The agreements usually include journals which the libraries would not otherwise choose because they are not relevant for their users; this is contrary to the instincts of most librarians (European Science Federation; Van Orsdel and Born). The “Big Deal” and consortia are little more than stopgap measures that have saved libraries a little money in the short term, but they are not going to be adequate solutions over the long term.

The state of scholarly publishing has been described as “dysfunctional.” Access to scientific and scholarly research published in journals has been severely limited by barriers created by pricing and licensing agreements and has created a system of haves and have-nots (Suber). Even the wealthiest institutions are being forced to cancel journal subscriptions as there are more journals than any one institution could possibly afford (“Open Access Journals: Will They Fly?”). Developing nations are even worse off as the barriers to access are more difficult to overcome in poorer countries and prevent them from “tak[ing] full advantage of the advances offered by new information and

communication technologies in terms of access to scientific and technological information and learning opportunities” (UNESCO).

David Shulenburg, provost at University of Kansas, and many others have pointed out that a large percentage of research funding is coming from government sources. That is, taxpayers are funding much of the research published in the scholarly literature. Jean-Claude Guédon noted in “Creating Scientific Value with Open Access” that many large research libraries are purchasing the journals where scholarly communication is published on behalf of public universities. According to this way of looking at the “serials crisis,” it does not make sense to spend vast sums of public money to purchase access to the results of the research funded by government grants. Pieter Bolman of Elsevier contends that this line of reasoning “is very university-centric. It's always assumed that government pays everything for research and development, which it doesn't, especially for biomedical research. I think in the U.S., 50 to 55 percent is paid for privately, either by companies or by foundations” (Kaser). Although government money may not fund all research, it still comprises a significant portion.

Shulenburg has argued that the scholarly literature is a “public good,” by which he means that the “use of a good by one individual does not reduce its availability or utility to other individuals.” For public goods such as polio vaccines, it makes little sense to set up economic barriers to their access as that does more harm than good. Rather, it benefits a society to make them freely available or subsidize them. Shulenburg asserts that “since scholarly literature is the building block for new scientific discoveries, a *prima facie* case can easily be made that reduced access to the research literature reduces the potential for scientific progress,” which is contrary to the public interest.

Some scholars are beginning to realize the disastrous consequences of the inability of so many to have full access to scholarly and scientific literature (Kutz). In addition to the detrimental effect on society of limited access to research as described by David Shulenburg, scholars are realizing how it may affect their careers. Publishing by academics is different from other that of other authors in that their goal is impact, that is, how much their contributions affect their fields and other researchers, rather than making a profit (Harnad). Scholars whose work has greater impact are rewarded by those who make decisions about tenure, promotion, grants, and other awards in the academic universe (Harnad). Scholars are beginning to realize that, as libraries are increasingly less able to purchase the journals which publish scientific and scholarly research, the impact that their research can have is decreasing.

The dual concerns for the public good and research impact led to the involvement of scholars and scientists with attempts to reform problems with the current system of scholarly communication such as the Budapest Open Access Initiative. The aim of the Budapest Open Access Initiative is to “promote... the benefits of... [open] access and... to support new ventures” through financing and expertise (Neal). When they refer to “open access,” the creators of the initiative mean the “free availability on the public internet, permitting any users to read, download, copy, distribute, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself” (BOAI).

Making research freely available to all users with internet access would address the concern for how scholarly literature constitutes a public good as well as the barriers to

access in the developing world. A study by Steve Lawrence lends some credence to the assertion of the BOAI proponents that open access to scholarly and scientific literature will increase its impact. The study, originally published in *Nature*, showed a correlation between citation rates of computer science conference articles and how likely it was that articles were online. Although the reasons for greater citation rates for online articles have not been conclusively determined, it is promising for academics who want their work to be as widely disseminated as possible and for advocates of open access (Lawrence; Suber).

On promulgation of the initiative, George Soros of the Open Society Institute, convener of the meeting which created the initiative, announced his commitment of \$1 million a year for three years in support of open access projects (Poynder 2002a). The money has been used to develop guides for planning conversion to and creation of open access journals, fund the creation of the Directory of Open Journals (DOAJ), and to promote open access through workshops and conferences (Crow and Goldstein, 2003a and 2003b; DOAJ; BOAI). Funding is also available to allow researchers and institutions in a list of 67 low- and moderate-income countries to publish research in open access journals (BOAI).

Unlike the Public Library of Science which required signers to boycott all scholarly and scientific journals which do not “grant unrestricted free distribution rights to any and all original research reports that they have published... within 6 months of their initial publication date” and which its creators now admit was not an “effective strategy,” signing the BOAI means doing what one or one’s organization is willing and able to do in support of open access (Kutz; Young; BOAI). There are currently 3030

signatures on the initiative and they include organizations such as the Association of Research Libraries (ARL), the Open Archives Initiative (OAI), Scholarly Publishing and Academic Resources Coalition (SPARC) and the Public Library of Science (PLOS), all of which were instrumental in creating the initiative (BOAI).

The initiative advocates two parallel strategies. The first of these is self-archiving. That is, scholars “deposit their refereed journal articles in open electronic archives” (BOAI). The second strategy is dispensing with print versions of journals and moving to electronic-only open access journals, either by creating new journals or converting existing ones from a subscription model (BOAI).

Self-archiving can take different forms. SPARC’s Jim Neal has phrased the eventual goal for electronic archives as a “loosely federated array of interoperable institutional and disciplinary repositories, hosted by universities, societies, and consortia.” When he says repositories are “interoperable,” he is referring to those that are compliant with the Open Archives Initiative (OAI) which creates standards for metadata for archived information that allows them to be accessed by search engines whether or not the user knows “which archives exist, where they are located, or what they contain” (OAI; Suber). Cross-archives search engines such as ARC, OAIster, and Scirus can be used to search OAI-compliant archives (McKiernan 2003a).

Institutional repositories, that is “digital collections capturing and preserving the intellectual output of a single or multi-university community,” are currently a hot topic at many universities (Crow). The list of what might be included in an institutional repository is long and could include scholarly materials such as “pre-prints and other works-in-progress, peer-reviewed articles, monographs, enduring teaching materials, data

sets and other ancillary research material, conference papers, electronic theses and dissertations, and gray literature” (Crow). One of the best known is MIT’s recently developed DSpace™ which is organized into communities (e.g., departments or labs) to allow them to “adapt the system to meet their individual needs” (DSpace). The open-source software that it uses was released in November of 2002 and is available to other institutions interested in setting up similar systems (McKiernan 2003b). Other institutional repositories include the University of California’s eScholarship Repository, the University of Glasgow’s Glasgow ePrints Service, and Ohio State’s Knowledge Bank (McKiernan 2003a).

Two well-known subject repositories are CogPrints and arXiv.org. CogPrints is an “e-print archive” that primarily consists of psychology, neuroscience, and linguistics papers as well as some in related areas of computer science, philosophy, biology, medicine, and anthropology; it was founded by Steve Harnad, a professor of Cognitive Science at University of Southampton and long-time advocate of self-archiving (McKiernan 2003a). Another subject preprint server is arXiv.org, which is devoted to physics, mathematics, nonlinear sciences, and computer science. It was founded in 1991 by Paul Ginsparg, another proponent of self-archiving. He was formerly affiliated with Los Alamos National Laboratory and now is at Cornell University (McKiernan 2003a; Poynder 2002a).

Ibironke Lawal published a study in *Issues in Science and Technology Librarianship* that looked at how frequently scientists use free electronic pre-print, or e-print, archives of scientific research, the types of archives advocated by the BOAI. The survey of 240,000 scientists in physics and astronomy, chemistry, mathematics and

computer science, engineering, cognitive science and psychology, and biological sciences found that 82% of the scientists did not ever access any such archives. Of those who did, physicists were most likely to use pre-print servers whereas chemists were least likely. Another study by Irma Dillon and Karla Hahn at the University of Maryland found that only about 10% of their faculty and graduate students made use of pre-print servers.

Lawal found that many scientists did not feel that pre-print servers were relevant for them regardless of other barriers related to technology or publisher policies. Another major reason is what is known as the “Ingelfinger rule,” that is, publishers’ refusal to publish articles that have appeared elsewhere. As might be expected given chemists’ non-use of pre-print servers, major chemistry journals are among the strictest in applying the “Ingelfinger rule.” The fact that the only chemistry pre-print server, creatively named the “Chemistry Preprint Server” (CPS) and owned by Elsevier, is only a few years old and presently contains only about 650 articles is certainly affecting chemists’ use of pre-print servers as well (Lawal; CPS). Compared to the more than 220,000 submissions to arXiv.org and the more than ten years that arXiv.org has had to build its reputation, it is easy to see why chemists have yet to decide CPS is important to their research (McKiernan 2003a). Perhaps other subject-specific pre-print servers have a similar reasons for low usage; they have not yet made available a critical mass of useful amounts of material necessary for scientists to begin using them regularly. Archives and institutional repositories are of little use until people deposit their work in them.

The percentages of scientists and other academics who find e-prints useful for accessing scholarly communication clearly needs to change if strategy is going to be effective. Interestingly, although few chemists make use of preprints, Chemical

Abstracts Service (CAS), an abstracting and indexing service for the chemical literature, recognized the growing importance of preprint servers by announcing in 2000 that they would begin indexing pre-prints posted on servers for chemistry-related fields (Shively).

The number of journals freely available online is growing and includes journals that are published all over the world in many disciplines. They range from the Brazilian journal *Electronic Musicological Review* to the *Annals of Saudi Medicine* to the *Duke Journal of Gender Law & Policy* (Crow and Goldstein 2003a). Open access does not mean that a journal is free, only that it is free to readers. Estimates as to what it costs to publish electronic-only journals vary greatly depending upon who is asked (Willinsky). Costs associated with producing journals include “peer-review, preparation of manuscripts, and server space [, and] of these, peer review is the most significant expense” (Suber). Proponents of open access maintain that costs can be minimized greatly by “by publishing online-only rather than in print, using software to automate common tasks, and providing essentials without inessentials,” but there is no question that peer review will continue to be an important aspect of scholarly communication (BOAI; Suber). It is crucial that researchers trust the academic credentials open access journals if they are to be successful.

Publishers counter the claim that electronic-only access to scholarly literature will be much cheaper without costs of reproduction and distribution by pointing out that “savings are partially offset by electronic storage, software, and typically higher labor costs” (King and Tenopir). Advocates of open access have addressed these concerns in several ways. One popular model described by BOAI advocates aims to shift costs that cannot be reduced primarily to scholars and their institutions by means of dissemination

fees (Suber). David Prosser and others have suggested that fees for publication could be included in grant funding.

David Prosser of SPARC Europe has proposed a way to make the transition to open access whereby authors may choose whether or not to pay a dissemination fee. The papers of those who pay will then be freely available on the web. Otherwise the paper is only available to subscribers. This takes into account those authors who are not able to pay the fees and is meant to prevent a precipitous loss of revenue from the loss of subscriptions. The strategy was originally described by Thomas Walker and was used by two entomology societies, Florida Entomological Society and the Entomological Society of America, both of whom were able to make profits using this model.

BioMed Central is frequently cited as a success story by advocates of open access. It is “an independent publishing house committed to providing immediate free access to peer-reviewed biomedical research” that publishes more than 100 journals (BioMed Central). They utilize a dissemination fee model which requires authors to pay \$500 in order to publish an article unless their institution has purchased membership to cover the costs of publication for their faculty (BioMed). The Open Society Institute has committed to support for 50 institutional BioMed Central memberships to permit greater access in poorer countries (BOAI). It must be pointed out that BioMed Central still is not making a profit, but it is still a relatively new venture (Willinsky).

The Open Society Institute’s “Guides to Business Planning” for creating or converting to open access journals detail additional methods for underwriting the costs of producing the journals such as advertising, co-hosting conferences, publishing the journal in other formats, and seeking grants and contributions. The guides warn that it is best not

to rely on any one funding model and offer other cautions to keep in mind when creating a business model as well as lessons learned by open access journals already in existence such as how they have kept operating costs to a minimum and the value of producing occasional print editions.

Will academics trust journals that are solely available electronically? This is important given the role that publication records play in career advancement in academia. A study conducted on behalf of the Humanities and Social Sciences Federation of Canada (HSSFC) found that, as long as such as peer-review and publisher reputation, the traditional guarantees of quality, were present, electronic and traditional publishing can be of similarly high quality. However, many of those surveyed, a group which included publishers, reviewers, scholars, and university administrators, believed that electronic publications were not as credible and that they were of lower quality than traditional publications. Scholars will certainly not wholeheartedly embrace electronic-only publications if administrators of their institutions and those making tenure and promotion decisions do not value those publications as much as traditional ones. The perception of quality of electronic-only publications is an important issue open access advocates will need to address.

How amenable researchers will be to having scholarly journals available solely on-line? A recent study by Irma Dillon and Karla Hahn at the University of Maryland investigated faculty attitudes toward electronic journals and their concerns about complete conversion to electronic journals. They found that 70% of faculty preferred that important journals in their fields be available in both print and electronic formats. However, for journals of secondary importance in their fields, the majority preferred

electronic-only access. Dillon and Hahn speculate that faculty desire to have continued print access to core journals may relate to concerns about unresolved archiving issues for electronic publications. This suggests a need for continuing dialogue between librarians, faculty, publishers, and others interested in improving the state of scholarly communication. Perhaps core journals could continue to publish print versions for archival purposes. Of course, what constitutes a core journal for a particular field can be an ambiguous issue and getting academics in the same field to agree may be difficult.

A related issue that may seem minor is the difficulty of reading on electronic displays. Walt Crawford pointed it out in “The Death of Print, Xanadu and Other Nightmares, or, Brother, Can You Paradigm,” originally written in 1992. Over a decade later, many still find it easier to print out long documents than read them on a screen. Perhaps that distaste for reading electronic documents will not matter so much as surveys of scholars and scientists have shown that their journal reading now is more likely to take the form of an “online search and browse method” rather than reading journals in their entirety (Willinsky). I do wonder, though, what might be lost as scholars change their reading habits. Will connections to research that seems unrelated based on just a title or abstract be lost? Will it lead to researchers becoming even more narrowly focused in their interests if they are not reading what does not seem to pertain directly to them?

The BOAI proposal brings up many other questions. One criticism quickly raised is the issue of copyright. In traditional publishing, scholars generally sign over copyright of their articles to publishers which allows them exclusive rights to control the work such as determining who may access it. BOAI advocates recommend that academics to retain copyright to work that they publish. However, even if they don't, proponents of the

initiative assert that open access is acceptable under current copyright law for both strategies. For self-archived pre-prints, according to the BOAI FAQ, “authors... hold the copyright to them and may post them to open access archives with no copyright problems whatever. If... [it] is later accepted for publication in a journal that requires authors to transfer copyright to the publisher, then the journal may or may not give permission for the refereed post-print to be posted to an open access archive. If permission is granted, then again there is no copyright problem. If permission is denied, then the preprint may remain in the open access archive because it is a different work from the post-print and the author never transferred the copyright on the preprint. Moreover, the author may post to the archive a list of corrigenda, or differences between the preprint and post-print.” I am not entirely convinced by their argument that preprints and post-prints are sufficiently different to have separate copyrights. However, I am not enough of an expert on copyright law to have a definitive answer to that question. The issue is simpler in the case of open access journals. Regardless of who holds the copyright (publisher or author), there is *de facto* consent to open access (Suber; BOAI)

Many other questions come to mind that have not yet been fully addressed. What will happen after the first three years of funding from the Open Society Institute ends? How will publishers react to efforts to compete with them? Can it really work?

There is certainly a sense that publishers are on the defensive. One notable development on the publishers’ part so far occurred in November of 2002. The Association of American Publisher’s scholarly-publishing division announced plans to “quash a newfound enthusiasm among some librarians for self-publishing research results online” by highlighting how publishers bring value to the process of publication

(Carlson). The publishers' campaign will emphasize the prestige and marketing and editorial expertise that subscribers benefit from (Carlson). The campaign will not address pricing issues. Ted Nardin of McGraw-Hill said he didn't "see it as the key issue," and Pieter Bolman of Elsevier felt "that's a thing of the past" and that the campaign was focusing on more constructive issues (Carlson; Kaser). For librarians regularly forced to make difficult decisions about what monographs and serials they can do without, though, costs are what have motivated many of them to advocate for open access.

Martin Richardson of Oxford University Press has suggested that open access is not a viable solution for all types of research or for the humanities and social sciences ("Open Access Journals: Will They Fly?"). If this is so, perhaps open access is not the only solution and there are others that have not yet been attempted. Keeping scientific and scholarly literature widely accessible is too important to do nothing.

A cultural change is necessary in order to shift the current paradigm. Scholars and publishers won't change their current practices for altruistic reasons as they have a lot at stake in the current system. As John Maxymuk states, for scholars "there is the inert power of the established framework to overcome. In order to best advance their work and themselves, researchers try to publish their findings in the most prestigious place possible, and the most sanctioned journals generally are printed ones with the longest history." For publishers, they make their living by means of the current system of disseminating scholarly communication.

There is currently a lot of momentum behind the movement for open access. As I was working on this paper, I constantly found new articles on the subject (quite often freely available online, as one might expect). The movement is a work-in-progress, and

it remains to be seen what effect the Budapest Open Access Initiative will have. David Shulenburger referred to “letting a thousand flowers bloom” in the hope that enough of them will be successful to make a change when he spoke on the subject of open access at the 2003 ACRL Conference in Charlotte, NC. As Herbert Van de Sompel, co-founder of the Open Archives Initiative said, “Many initiatives will still have to emerge (and fail) before real change will penetrate the scholarly communication system,... but we are learning from all these experiences, and eventually we will get it right” (Poynder 2002a).

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