Open Journal Systems: An Example of Open Source Software for Journal Management and Publishing

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Keywords: Academic Libraries, Electronic Publishing, Journals

ABSTRACT

Purpose

To provide an insider's review of the journal management and publishing software, Open Journal Systems (OJS), from the Public Knowledge Project, which the author directs at the University of British Columbia.

Design

The paper outlines the history, development, and features of OJS, including some of the experimental aspects, as well as early research results and work underway on which it is based.

Findings

Open Journal Systems (http://pkp.sfu.ca/ojs) is an open source solution to managing and publishing scholarly journals online, which can reduce publishing costs compared to print and other traditional publishing processes. It is a highly flexible editor-operated journal management and publishing system that can be downloaded for free and installed on a local Web server.

Value

OJS has been designed to reduce the time and energy devoted to the clerical and managerial tasks associated with editing a journal, while improving the record-keeping and efficiency of editorial processes. It seeks to improve the scholarly and public quality of journal publishing through a number of innovations, from making journal policies more transparent to improving indexing.

INTRODUCTION

Open Journal Systems (OJS) was originally developed as part of the research program of the Public Knowledge Project (PKP) which I direct at the University of British Columbia.[1] PKP had its origins during the mid-1990s in research efforts to design and create knowledge management systems that would increase the contribution that educational research made to the lives and work of teachers, administrators, policymakers, and the public. In a series of projects, PKP represented an early effort to take advantage of the initial, heady days of the Internet, when

this brave new World Wide Web promised to open the doors to all of the knowledge that had been previously available only in research libraries.

In the course of developing a number of experimental systems for making research more widely available and for integrating that research into a range of related materials as part of publicly available Web sites, we found that such initiatives were able to secure the cooperation of the media in, for example, conducting demonstration projects that linked press coverage of an educational issue to research on the relevant topics. We were also able to secure government cooperation in setting up policy review sites that were informed by access to the relevant research (Klinger, 2001). What we could not secure was widespread access to the research literature that was needed to make these media and government ventures in public knowledge work. The problem with enhancing the quality of public knowledge was not that educators were too busy with teaching or that policymakers were too caught up in local politics, or that the public was simply indifferent to research in their endless thirst for infotainment. No, the problem lay at the very source of the knowledge in question. The problem was the academic community, and its failure to make what it had learned publicly available. I felt I had little choice, at that point, but to turn my attentions to the whether access to research could be increased and improved.

Soon after I began to direct my work toward the study of how this access could be improved, whether by having authors self-archive their work or by moving journals into open access publishing, I was confronted by the question of what it cost to run a journal online and whether the savings on online management and publishing, if any, could form the basis of running the journal under some form of an open access model. How could I ask my colleagues to consider the open access journal if I had no idea what it might cost? I only had to be asked that question twice in presentations, before I decided that I had to determine an answer to it. I hired Larry Wolfson, a graduate student research assistant with an economics background, to scour the emerging literature on online publishing for costs, as well as run a small survey among editors of online journals on this matter. It was not hard to find answers to the question, although that gave rise to a new problem. There were far too many answers to the question, with huge differences among the answers.

Our inquiry certainly got off to a good start. Larry sent off emails to editors of electronic journals asking about their costs, while he started to scour the literature in search of published figures on online journal costs. However, before he had sent out more than a handful of email queries, he had an answer back from Gene Glass, who had founded *Education Policy Analysis Archives* (EPAA) in 1993 as a "born digital" peer-reviewed journal. Glass was blunt and multilingual about his business model, when it came to describing his operating costs: "Zero, *nada*, no budget, no grad assistant, no secretary" (personal communication, October 21, 2001). EPAA, I should add, is an online peer-reviewed journal that receives some 2,500 unique visitors a day from 70-80 countries (Glass 2003).

As you might imagine, we were greatly encouraged by how easy Glass made it all seem, both in gathering cost figures and then in convincing others what a sensible, viable idea open access is for scholarly publishing. We were still in the early stages of our efforts to determine publishing costs, and, of course, we did not see anything even close to Glass' figure again. And in Glass' case, it turned out that he had institutional support covering a portion of his own time, which is not all that unusual for a journal editor, as well as being able to tap into the university's bandwidth and other infrastructure. But then the most successful of the automated repository models, the arXiv.org Eprint Service, in which authors file their own papers, and there is no

reviewing or editing, operates with expenses that, according to its founder Paul Ginsparg, run to $9 a paper (Glanz 2001).

We went on to identify a small group of electronic journals that were spending in the area of $20,000 a year. For example, the *Electronic Journal of Comparative Law* had had its books reviewed by the accounting firm PricewaterhouseCoopers, which calculated that the Dutch open access quarterly was costing $20,084 annually (Bot, Burgemeester, and Roes. 1998; also see Fisher 1999; Integration, 2002). A similar annual figure comes up with the BioMed Central journals, as a result of adding up the author fees it collects of $525 per published article (for most of its 100 or so open access journals although a few charge more). Some journals contract out their e-journal edition, and Highwire Press, at Stanford University Library, was initially charging between $35,000-125,000 to set up electronic journals, with ongoing operating fees for the e-journal of several thousand dollars a month (Young 1997). Additional figures are to be found in the report on e-journals from Donald W. King and Carolyn Tenopir, who put the cost of an electronic edition of a journal to be $368 per page or about $175,000 per year for a typical journal (1998). Then, there was the Electronic Publishing Committee at Cornell University which estimated that it would take $2,700,000 to establish an electronic publishing program at the university, serving a number of journals, although a member of the team at Cornell later told me that what had been spent was more like $600,000 (EPESC 2000). Finally, Reed Elsevier estimates that it has spent $360 million developing ScienceDirect, which hosts electronic editions of its 1,800 journals, with a continuing investment of $180 million for "developing new technologies," and that's apart, of course, from the editorial costs of running the journal (Davis 2004).

The different methods of calculation meant that there was no basis for comparing costs, but the breathtaking range to the figures spoke to nothing but the *risks* of moving a journal online. How could we ask editors and scholarly societies to consider open access as a viable option when we could not provide a reliable picture of what it cost to run an online journal? Well, we could tell those skeptical editors that it may cost them nothing, or more likely $20,000 a year, although it may run to more than $100,000, especially if there are a number of journals involved. It seemed to leave the entire open access journal publishing movement with a less than credible case to make with editors, scholarly associations, and funding agencies. The question of what it could end up costing to move a journal online would seem to discourage all but the diehard risk-takers and do-it-yourself adventurers from considering the open access model in making the move from print to online publishing. While Stevan Harnad (2003) has argued more than once that complete open access to the research literature can be achieved by having authors self-archive their published work in institutional repositories, even he acknowledges a place for open access journal publishing in achieving the goal of greater access.

What if, we wondered, we could control one part of publishing's financial model by reducing the journal's software design and development costs to close to zero? After all, Tenopir and King use this software development point to argue that electronic publishing does not lead to great savings: "Electronic access avoids these costs [of printing and distribution], but has a substantial additional fixed cost — putting up full text on the Web, staffing, software and other technology issues including design, functionality, searchability and speed" (2001). If we were going to provide support for open access publishing, and more generally make the case for containing the cost of access, we needed to provide a way to reduce costs. Only by sharply containing costs could journals begin to look at reduced revenues, whether by offering open

access to their online edition or by simply making their back issues free (forsaking reprint revenue).

We could do this by creating open source software that was specifically developed to manage and publish journals online. The software could be designed so that it called for no greater technical skills on the part of journal editors than were commonly found among university faculty today, namely word-processing, emailing, and Web-browsing. This software could also keep publishing costs down by taking advantage of the technical infrastructure and server capacity already in place in most university libraries, which might well be willing to host such a system, given that as more and more libraries undertook this support (whether at a fee to journals or as a public service) would contribute to increased access to the research literature, and ultimately reduce their subscription costs.

The open source model was, after all, proving itself with the software Eprints.org, developed at the University of Southampton, which a good number of institutions has installed for their faculty members to self-archive their research. Open source was proving itself the well-established alternative route with the operating system Linux, otherwise known as "the impossible public good" (Smith and Kollock 1999, 230). The academic community continues to play a vital role in open source software development, following on Linus Torval's beginnings with Linux in his work as a graduate class project in Finland. More recently, the Sakai cooperative has been formed among 44 institutions and is devoted to developing open source course management software, with the support of the Mellon Foundation and Hewlett Foundation (Young 2004).

So the Public Knowledge Project gradually switched gears, away from developing knowledge management Web sites that increased and enhanced public access to educational and policy research. It moved into developing an open source, easily configurable, easily installable, software for managing and publishing journals. It sought new grants to do this, hired three undergraduate computer science students, and cut its teeth in the year 2000 on developing an open source conference system that would create an open access archive of the proceedings, as well as manage the conference Web site.

In November of 2002, 18 months after software development began on the journal software, Open Journal Systems (1.0) was launched in St. John's, Newfoundland. OJS was built with support from the Social Sciences and Humanities Research Council of Canada and the Pacific Press Endowment at the University of British Columbia, with further support coming from the Max Bell Foundation, and the Catherine and John D. MacArthur Foundation. The funding was provided in the context of *research* and *development*, with the software development following a range of related research projects, from policymakers' use of open access research to the potential of open access to contribute to the research capacities of universities in developing countries (Willinsky, in press).[2]

In January, 2005, UBC's Public Knowledge Project entered into a parternship with the Canadian Centre for Studies in Publishing, led by Rowland Lorimer, and the Simon Fraser University Library, directed by Lynne Copeland, with the aim of providing ongoing support for OJS, as well as Open Conference Systems and the PKP Harvester. Simon Fraser University Library is providing a hosting and publishing support facility for journals wishing to subscribe to such services, while the Canadian Centre for Studies in Publishing will provide editorial training for systems such as OJS. While this is unlikely to make the ongoing development of OJS self-sustaining – at roughly $50,000 a year – the ongoing funding from institutions and grants has to be weighed against the benefits of this public good (as well as its ability to reduce publishing

costs across all users at a net saving to journals and thus to libraries, in principle, which are well ahead of OJS's ongoing costs).

The development costs serve as a reminder that open source software is not free. The better part of that expense has gone into creating a system that was more than user friendly. It was designed to offer journal editors all of the necessary options required by the varying editorial standards followed by different disciplines, from journals in which authors select the editor to whom they wish to submit, to journals where multiple rounds of review by the same reviewers are standard. OJS is also carefully set up to assist those who have little enough experience with journal publishing. Establishing a new journal or helping a fledging one find its feet can, after all, support the development of local research and review capacities in areas of higher education where that has not been part of the academic culture, because of a lack of opportunities to participate. Too often, universities foster the attitude that work must appear in the highest ranked journals to count for anything. But without a series of intermediary steps up that steep academic ladder, and without journal experience with reviewing and editing, scholarly publishing can become an all-or-nothing career game that does little to foster opportunities for a new order in the global circulation of knowledge. The easy portability and use of OJS is intended to serve that larger global goal.

Now that OJS has been in use for over two years, we have drawn on the experiences of many editors to continue to increase the flexibility and possible configurations of the system. It is currently being used, in whole or in part, in its original or modified form (it is open source), by over 250 journals to manage and publish online. OJS is also supported by contributions coming in from around the world, in the form of bug fixes, translated files for OJS (it is now available in five languages), and a subscription module, with an active Support Forum with close to a hundred registered members. There are journals using OJS to reduce the expenses for subscription journals and open access journals in the humanities, for example, that follow Gene Glass' zero- budget tradition of scholarly publishing by relying on skilled volunteers for all of the critical roles in the publishing process (like editor, copyeditors, layout editors, and proofreaders) which are not about to be automated by systems like OJS.

INSTALLATION

OJS is designed to cover all aspects of online journal publishing, including the setting up of a journal Web site; the handling of the author's submission through peer review, and editing; the management of issues and archives; the indexing and search capacities of the journal. The software can be downloaded from the Public Knowledge Web site and installed on a Web server with a Linux, Windows, or Unix operating system, running Apache, PHP and the MySQL database. This download-and-install approach is intended to enable local control of journal publishing, while still operating within a distributed system for indexing and system development. Most journal management systems provide a centralized hosting as part of their service contract, adding to the cost of operating the journal. More than a few of the journals using OJS have the software hosted on a university library or other institutional machine, in light of the benefits it gains from the growth of open access to research and scholarship. In the case of Africa, for example, UNESCO has agreed to host African journals using OJS as part of its African Network of Scientific and Technological Institutions program located in Nairobi.

Once OJS is installed on a local server, it can be used to generate any number of journals from that site. Once a journal is created on the server, it is ready to be configured by the journal manager or editor who can do this by simply filling in a series of templates in the Setup section

of the journal. The templates cover the journal's basic details (title of the journal; principal contact; sections of the journal, etc.), as well as providing a place to post and manage journal policies, processes, and guidelines. Through this process, OJS creates a customized Web site for managing and publishing the journal. With the Web site in place, authors can submit their work directly to the Web site; editors can drop in to journal's workspace at the airport, using their laptops to oversee the review process; reviewers can pick up assigned papers and post their reviews; accepted papers are edited, laid out, published, and indexed all on the site. OJS is designed to enable a single editor to manage a journal and the journal's Web site. It can also support an international team of editors, with shared responsibilities for a journal's multiple sections.

The Web site that OJS sets up serves as an editorial office for the journal, while the system sees to the labeling, filing, and tracking of all submissions, provides a work space for editors, reviewers, copyeditors, layout editors and proofreaders, as well as a workflow process for submissions that moves them through each of the necessary steps, ensuring that they each land on the right desktop at the right time in the editorial process. So when it comes to calculating the savings from using such a system, one can begin with real estate, and the prospect of not having to maintain an editorial office, with all of the associated furniture and overhead. Or if one already has such an office, there is the prospect of a sub-let revenue. There may be no bottle of wine in the OJS cupboard, but the virtual online editorial office is always open, always available with a complete set of records and materials, and can be reached from any computer that can form an Internet connection.

THE EDITORIAL PROCESS

OJS is intended not only to assist with journal publishing, but is also designed to demonstrate to editors how the cost of journal publishing can be reduced to the point where providing readers with "open access" to the contents of the journal may be a viable option. OJS reduces the clerical, management, and publishing costs of journals (see Table 1). This was a necessary first step, of course, if there was to be any hope of journals being able to make their contents free for readers through some form of open access.

TAKE IN: Table 1
CAPTION: E-journal management systems savings (in relation to print journals) based on Open Journal Systems.

OJS management systems are structured around the traditional journal workflow required to move a submission through reviewing, and if accepted, editing and publishing, with records maintained of who is doing what and when (see Figure 1). OJS uses a prepared set of emails to contact the necessary people at each step, whether author, editors (managing, section and layout), reviewer, copyeditor, or proofreader. These emails, which are used to coordinate processes among editors, authors, reviewers, etc., contain the necessary information for each submission which is automatically filled in. The email can be personalized by an editor prior to sending, except in such cases as automated reminders.

TAKE IN: Figure 1
CAPTION: Editorial workflow process for Open Journal Systems.

To take an example of how a journal management system such as OJS works in action, consider the most common task of an editor, namely, assigning two or more reviewers to evaluate a manuscript for possible publication. The editor logs onto OJS through her Internet browser, whether at the office, home, or airport (a cell-phone version of the program has yet to be created). On entering the journal's Web site, the editor first comes to a table that sets out the current state of her assignments, with some submissions awaiting an overdue peer review, and others that have just arrived and need to have peer reviewers assigned to them. With the new submissions, the system has already notified the authors with a standard email indicating that the manuscript was successfully uploaded to the journal, and inviting them to log in to check the progress of their submission.

The editor goes to the Submission Review page for one of the new submissions and takes a look at the paper by downloading it to see if it is suitable for the journal and ready for review. Once satisfied on that count, the editor then clicks a Select Reviewer button. This takes the editor to a list of reviewers that indicates their areas of interest, the date their last review was assigned and completed, as well as how many reviews have been completed. The editor scrolls or searches for a suitable reviewer, or decides to enter a new name, before clicking the Assign button. The Assign button causes a window to appear, containing a prepared email, addressed to the reviewer from the editor. This email presents the paper's title and abstract and invites the reviewer to visit the site and download the paper (or if the editor chooses, the submission is sent out as an email attachment).

Once the editor sends the email, the name of the reviewer, along with the date the invitation was issued and the deadline date for the review are recorded on that submission's Review page. All this can be accomplished in the time it might otherwise take to ask an editorial assistant to check when a certain colleague had last reviewed for the journal. The editor then moves on to select a second and possibly a third reviewer for the submission. And while the editor will devote whatever time saved, and then some, to assessing the reviews and providing helpful advice to the authors, the process outlined here needs to be compared to Fytton Rowland's determination that the current average cost of peer review process for journals is $400 per published paper (2003).

In the example presented in Figure 2, which is drawn from a demonstration journal we have set up, the section editor (Rory Hansen) is conducting the peer review of a submission entitled, "Understanding in the Absence of Meaning: Coming of Age Narratives of the Holocaust." In this case, Reviewer A (Simon Casey) has pasted in a Review and submitted a Recommendation for the section editor to consider (in a rather unrealistic turn around time). The section editor has just selected a Reviewer B (Eunice Yung), but has yet to send out the Request email inviting Reviewer B to enter the journal Web site and conduct the review. When both Reviews and Recommendations are in, the section editor can import the Reviews into the Editor/Author Correspondence box, edit them and add an explanation of the editorial decision arrived at for this submission. If revisions are invited from the section editor, the author is able to upload a revised version of the paper, which could be entered into a second round of reviews, if the Section Editor has decided that the submission should be resubmitted for review. OJS maintains a log of all emails sent, reviews filed, and selections made as part of its record of the editorial process.

TAKE IN: Figure 2
CAPTION: A screenshot of a Submission Review page with Open Journal Systems.

The publishing options for the journal using OJS include the full range of article formats, including PDF, HTML, and Postscript. The careful formatting and layout of these articles is not something, as noted above, that OJS has automated. The preparation of the galleys in one or more publishing formats must be done by someone who has the appropriate skills and access to the software (e.g., Adobe Acrobat). As with copyediting and proofreading, there are no shortcuts for these steps when it comes to producing quality copy for the journal. What OJS does, however, is allow resources to be concentrated on such tasks, by taking good care of the ordering, alerting, and organizing of these processes.

OJS can publish the contents of the journal in a standard issue format, with 10-12 items, or the editors can decide to publish each article as soon as it has completed the editorial and layout process. This continuous publishing approach is something which journals are doing more often now, taking advantage of the new technology, rather than slavishly following what are becoming the anachronisms of the earlier form (when it made economic sense to bind articles together and *issue* them in a set).

We are also addressing the issue of journal preservation through the use of Stanford University Library's LOCKSS (Lots of Copies Keep Stuff Safe) system, which provides "a persistent access preservation system" involving a number of cooperating libraries. This also speaks to the approach, mentioned above, of research libraries cooperating on the distribution of journal hosting and publishing responsibilities, an idea which needs to be explored further in terms of its potential ability to reduce overall costs to the libraries.[3]

JOURNAL INDEXING

On submitting a paper to the journal's Web site, the author is asked to provide the appropriate indexing information or metadata. This does mean additional work for the author, but compared to the old days of just a few years ago when an author making such a submission had to make multiple copies, prepare a letter, and post it to the journal, it results in a saving in time, energy and cost (if somewhat offset in developing countries by the price of using an Internet café which faculty members often have to do). The principle at issue is again one of moving energy from clerical tasks to those that contribute to the quality of the published work. Thinking about the indexing of one's work does that, compared to photocopying it, as it gets authors to think about how they position their work within the larger field. Of course, professional indexers and cataloguers would do a far better job of classifying a work than most authors. However, increasing access to the research literature entails increasing access to indexes and in light of how much indexing services charge libraries, there exists a need for an alternative to professional indexing, especially for universities in the developing world (Willinsky, in press).

The actual extent of author indexing is a somewhat experimental aspect of OJS. The editors can determine which indexing elements or metadata to include in their journal, and they can provide authors with relevant examples from their own field (with links to classification systems or a thesaurus) to guide the indexing process. The indexing in OJS adheres to the Open Archives Initiative Harvesting Protocol, which is based, in turn, on the Dublin Core Metadata Initiative that utilizes 15 elements. OJS supports an extended form of the Dublin Core, allowing journals to have authors index, for example, characteristics of research subjects (such as age and gender), as well as index the research methodology or method of analysis used by the work (see Table 2). As the Web grows and the research literature along with it, greater precision of indexing can provide some protection against the threat of sheer information overload. One

reason for thinking that research libraries are good places to have journal systems like OJS hosted is that the library is also the home of indexing and information science expertise which could contribute to this aspect of publishing, if only by occasionally reviewing authors' indexing patterns, and providing useful advice and guidance. The goal is to afford more readers accurate searching among electronic research resources, without completely eliminating serendipity. It is also a way to create more inclusive and immediate indexing than is otherwise available from commercial indexing services (Willinsky and Wolfson, 2001).

TAKE IN Table 2
CAPTION: The use of the Dublin Core metadata in the indexing of materials published in journals using Open Journal Systems (OJS).

READING TOOLS

A second experimental aspect of OJS has been focused on improving the design of the reading environment which online journals create for the content they publish. It is true that the most common way of reading articles found online is still to slide the cursor over the print button. However, readers are slowly discovering the advantages of reading online, even as the quality of screens and the portability of the machines improve. Our goal is to take advantage of online resources and tools to improve the quality of critical engagement with this literature while it is online. These improvements have to be made, however, without adding significantly to the journal's costs or the editor's workload – given the exigencies of open access publishing and archiving – and they cannot get in the way of the primary readership of the journal, the researchers themselves, even as these tools provide additional support for less experienced readers of this research (which was the original impetus of the Public Knowledge Project).

In seeking to improve the reading environment, we have turned to the research on learning how to read. And we set out to build on the excellent model established by Highwire Press, PubMed and others sources, by extending the typical set of links which these systems provide for each article with the aim of creating a richer context for reading journal articles. The Highwire journals, for example, provide support for expert readers, whether with links to related articles in the same journal or to works by the same authors. We set out to build Reading Tools, as we call them, that would assist the wider range of readers who will follow on the heels of open access. [4]

The Reading Tools sit just beyond the margins of the article, looking much like a traditional paper bookmark (see Figure 3). At this point, we have developed 20 sets of Reading Tools to cover as many of the academic disciplines and broad fields as possible, depending on the availability of open access resources and databases. Each set typically provides readers with 10-15 links to other open access sites and databases. The journal's editors can reconfigure the Reading Tools to direct readers to further relevant sources. Figure 3 presents one of the current prototypes for the Reading Tools, using the article introduced earlier from the field of education as its example.

TAKE IN: Figure 3
CAPTION: Reading Tools for use with OJS journals in the field of education.

While we have only begun testing whether such tools can help a wide range of readers read research, the initial responses to the tools from readers in the design phase have been

positive (Willinsky 2004). Our studies are focusing on whether the tools can contribute to comprehension, evaluation, and utilization of research among the public, related professions (such as teachers and physicians), policymakers, and researchers.

The Reading Tools in the design shown here start off by answering a question that troubles many readers of information online, as it identifies whether the article being read is *peer-reviewed* or not, with a hyperlink to an explanation of what the peer-review process is about. Also close to the top of the Reading Tools is a link that reads *View the item's metadata*. A click on it reveals the study's indexing information, including as discussed above, its discipline, keywords, coverage, method, and sponsor. This addresses another concern identified in the research on reading, namely that inexperienced readers have difficulties identifying the significant concepts – separating core ideas from the noise – around which to associate related points and arguments (Alexander, Kulikowich, and Jetton, 1994). Then, moving down the Reading Tools, with *To look up a word*, readers can double click on any word and send it to one of two free online dictionary services.

There is also a set of links for finding items that are related or relevant to the article being read. These include *Author's Other Works*, *Research Studies*, and *Online Forums*. To click on one of these presents the reader with a choice of relevant open access databases. With *Author's Other Works*, for example, the author's or authors' names are fed into an open access database, such as ERIC (the U.S. federal government's Education Resources Information Center) in the field of education, with abstracts or articles and lists these other works in a window for the reader to consider consulting. With *Research Studies*, and *Discussions and Forums*, the relevant open access databases that we have identified in advance are searched using the first two keywords provided by the author of the article to ensure relevant materials come up. Before any search, the reader can change the key words provided by the author to further focus the search. The reader can then use the articles that come up from search for related studies or author's other works as points of comparison or studies to pursue in themselves. Through the *Press and Media Reports* and *Government Web Sites* links, readers are also led to see that the context for reading research is not always other research, but can be other relevant public materials that give a contemporary and applied context to the work being read.

Now the risk with such reading tools is that the reader will be overwhelmed or at least sufficiently distracted that the value of access to this research will be diminished. This may be all the more so for those with little experience reading this material, while the expert will see it as no more than another nuisance associated with online reading. Our preliminary investigations with policymakers and complementary healthcare workers suggest that it provides them with a greater sense of the research's value and contribution to their understanding. Still, as we say in this business, more research is needed on the reading of research, especially in light of this new openness. What should be clear is that reducing publishing costs and enhancing publishing efficiencies is only part of the case for a system such as OJS, just as toll-free access should be only part of the case for open access to research and scholarship. What is no less important in both cases is using what we know about reading and publishing, about access and learning, to extend the circulation of this knowledge.

CONCLUSION

In terms of where Open Journal Systems is headed, development of the program continues apace, with the 11th upgrade, version 2.0.1, released in July 2005. OJS can now support multiple journals from a single site, as well as offer PDF searching, a complete Help

manual, multiple rounds of reviewing, automated reminders, reviewer ratings, and a host of other features. The community of journals deploying OJS continues to grow, with over 140 registered users on the PKP Support Forum, and further translations of OJS are underway within that community.

While Simon Fraser University Library has taken over the technical development and support of OJS, in conjunction with its journal hosting service, we remain committed to Open Journal Systems and the related Open Conference Systems as open source software for use world wide. Our attention continues to be focused on ways of improving the contribution of such systems to university research capacities and research cultures in developing countries, as well as supporting the public quality of open access. To that end, we are working with universities and organizations in Ghana, South Africa, India, and Pakistan on publishing initiatives.

We are also looking into ways for increasing the use of XML in the publishing process, in collaboration with our user community, for layout, citation checking, and multiple output formats, as well as improving compatibility with related systems, such as institutional repositories. We hope to see our work with the open access Reading Tools move beyond OJS, by exploring how they might work as part of a general browser or a library application. Finally, this work has led us to explore, in association with Mikhail Gronas at Dartmouth College, new possibilities for the increasingly popular blog, as a dynamic and responsive space for faculty and graduate students to develop rough research ideas and working papers, prior to formal submission to peer-reviewed journals.

At every point, the goal of this continuing program of research and development is to increase the scholarly and public quality of research. Certainly, the Public Knowledge Project's own research program will remain focused on the impact and contribution of increased access to knowledge, in its efforts to better understand the potential of this new publishing medium.

NOTES

[1] The Public Knowledge Project (http://pkp.ubc.ca) developed Open Journal Systems (http://pkp.sfu.ca/ojs) is one of a number of open source journal management and publishing software available today, and much of the functionality described below applies to other open source systems such as Hyperjournal (http://www.hjournal.org/) and eFirst XML (http://www.openly.com/efirst/), as well as to proprietary systems, such as AllenTrack (http://www.allentrack.net) and Bench>Mark (benchpress.highwire.org).

[2] The programming of OJS was supported as a part of the larger research program and was conducted by part-time undergraduate computer science students over an initial 18-month period resulting in the delivery of OJS 1.0 in November 2002 at a cost of $45,000, with another $110,000 over the next 31 months leading up to the release OJS 2.0, in May 2005. (These figures supersede, thanks to better accounting techniques, previous figures presented on OJS costs).

[3] Elsewhere, I present the closely related case for libraries and scholarly associations entering into open access publishing cooperative, while the publishing cooperative idea is also being investigated by Raym Crow on behalf of SPARC (Willinsky, in press).

[4] For a working version of the current Reading Tools, integrated into our conference and journal publishing systems, see the Open Journal Systems Demo Journal (http://pkp.sfu.ca/ojs/demo/present/index.php/demojournal/issue/current). Note that the design of the Reading Tools on the Web site may differ from the Tools described here, as research and development continues on their design and functionality.

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