

## **Open access journals : the global movement and local publishing**

Whether you see open access journals as a challenge to commercial publishing or simply as an alternative that complements more traditional models, there is no question that the open access movement is having a significant impact on how researchers, authors, libraries and publishers perceive journal literature.

Still in its early years, the open access movement holds great potential to enable published research to have a deeper and wider impact on society as a whole. As more people gain access to the world's highest caliber scholarly research, including people in the developing world and those not associated with large institutions, new levels of knowledge transfer can flourish. Research from different places and sectors can more readily inform and influence each other. All indications are that open access is gaining ground both in terms of volume and prestige.

Individual libraries, academic institutions and scholarly societies can contribute to the movement by publishing their own open access journals with relatively little overhead.

This paper will discuss the impact of open access journal publishing. It will also present a detailed review of the leading open source software in the field, Open Journal Systems (OJS) from the Public Knowledge Project.

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Public funds are often used to fund academic research. In the conventional commercial publishing model public institutions must pay again to gain access to the findings of this research. This pay twice model is not sustainable as libraries face serials costs in the form of subscription and site license fees that have increased by about 200% in the last 20 years. Meanwhile, libraries are under increasing pressure to justify or even reduce their acquisitions budgets. Libraries have no choice but to cut back on the journal titles they provide to users. The end result is that the public cannot access the research that they themselves have paid for.

The intention of open access is to liberate research from financial and copyright constraints for the good of society as a whole.

Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge.<sup>1</sup>

- Budapest Open Access Initiative

The guiding principle of the OA movement to scientific literature is the conviction that scientific and technical information is quintessential global public good that should be freely available for the benefit of all.<sup>2</sup>

- Bruce Alberts, president of the National Academy of Sciences

Although there is a practical, financial rationale for open access, proponents are generally motivated by strong ideological convictions such as is evident in the two quotations above. There is also an aspect of zealous promotion evident in the open access movement. In order for open access to flourish, people in all sectors need to recognize its merits. In particular, authors seeking promotion and tenure must be assured that publishing in open access journals will serve their careers as well as if not better than publishing with commercial presses.

The Budapest Open Access Initiative provides a useful definition of open access:

By 'open access' to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, 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. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited. <sup>3</sup>

The Association of Research Libraries (ARL) is more emphatic about the relationship between open access and copyright law:

Open access operates within the current legal framework of copyright law. Authors own the original copyright in their works. In the process of publishing, authors can transfer to publishers the right for publishers to post the work freely on the Web, or authors can retain the right to post their own work on institutional or disciplinary servers. Authors, however, retain control over the integrity of their work and have the right to be properly acknowledged and cited. <sup>4</sup>

Peter Suber, who describes himself as "a policy strategist for open access to scientific and scholarly research literature", provides some additional criteria for open access:

In addition to removing access barriers, OA should be immediate, rather than delayed, and should apply to full-text, not just to abstracts or summaries. <sup>5</sup>

The very term "open access" sums up the primary advantage of this publishing model; it enables readers to learn from scholarly literature without confronting barriers. Readers do not have to pay for access either directly or indirectly by being a member of an institution that has paid for access. An added benefit is that open access literature can be easily retrieved through centralized repositories and finding aids since commercial interests do not dictate a proprietary approach to search and retrieval. And since redundant copies of open access documents exist in repositories there is more assurance that the literature will be preserved for access in the future.

Increasingly, authors are recognizing the benefits of open access. Chief among these is the greater visibility and impact resulting from open access as evidenced by citation analysis. Stevan Harnad and Tim Brody reported compelling results in their oft-cited research of 2004 <sup>6</sup> and 2005 <sup>7</sup>. They studied citation levels of open access articles compared to non-open access articles in the same journals and found “dramatic citation advantages for OA”. As an author’s work increases in prominence so does her/his status and reputation, not to mention the more tangible benefits that come via tenure and performance reviews.

As campus authors gain a higher profile through open access, so too do their host institutions. In addition, open access makes it easier for universities to host their own peer-reviewed journals, which also contributes to the prestige of the institution. In a broader, philosophical sense, open access helps universities and colleges to fulfill their mission to share knowledge and advance research.

The cost of commercial online content has been increasing dramatically over the last decade at the same time that libraries have been under greater and greater pressure to justify their expenditures. Open access is highly welcome in this fiscal context as libraries have a wealth of scholarly resources they can offer their users without compromising their other budgetary commitments.

Chris Armbruster writes "Moreover, public and philanthropic funding will flow in the future only if public visibility and academic impact of the research results can be

demonstrated." <sup>8</sup> From this perspective, funding agencies will also welcome open access as it brings increased return on investment in the form of research with higher profile.

Society as a whole benefits from the free exchange of knowledge that is enabled by open access. Innovation and cross-discipline influence can flourish as researchers find access to more than the core journals in their field, resulting in advances in medicine and ecology that benefit people everywhere. In addition, society sees more efficient use of their tax dollars in contrast to the pay twice model of commercial publishing.

Open access is of particular advantage to developing countries. Leslie Chan and Sely Costa published a valuable paper on this topic titled "Participation in the global knowledge commons : challenges and opportunities for research dissemination in developing countries".<sup>9</sup> Commercial academic publishing is dominated by the G8 countries. Chan and Costa cite research by D. King that illustrates this point. "In a recent study of the comparative performance of the world's major science producing countries, King (2004) found that researchers in eight countries - led by the USA, the UK, Germany and Japan - produce almost 85 per cent of the world's most cited publications, while another 163 countries, mostly developing countries, account for less than 2.5 per cent." <sup>10</sup>

Very little research from the south finds its way into mainstream publications.

Consequently, issues of concern to developing countries are underrepresented in the literature. In addition, commercial publications are prohibitively expensive for poorer countries. As a result, developing nations do not have access to much of the world's

scholarly research. Even researchers in the south often publish in the north due to the higher prestige, so their own constituencies are deprived of the benefits of their research. It is true that some commercial publishers offer discounts to countries with struggling economies, but this simply reinforces the dynamic of dependence. These policies of differential pricing are not sustainable.

Open access, on the other hand, empowers developing countries to publish research locally and enables south-south knowledge transfer. Researchers in Brazil, for example, can share their findings with researchers in sub-Saharan Africa.

Knowledge workers in developing countries are now getting access to scholarly and scientific publications and electronic resources at a level that is unmatched historically. [...] The OA movement and the growing number of Open Archive Initiative-compliant institutional repositories promise to provide even greater access to resources and publications that were previously inaccessible. <sup>11</sup>

Lalitha Kumari confirms these observations from the Indian perspective.

[...] the Indian scientific community has noted with great concern that Indian research findings, especially those reported in Indian journals, are underrepresented in the global knowledge base. This is a concern not only of India but of other developing nations as well. A global effort is underway to make scientific information affordable by bypassing the profit-making commercial scientific journal publishers. <sup>12</sup>

Open access alone does not respond to all of the challenges facing researchers in developing countries. Reliable and efficient internet access is still beyond the reach of many countries in the south. In June of 2006 a colleague and I established a small academic library at the University Ghana. I learned how challenging it can be for researchers in Sub-Saharan Africa to access the internet. Much of what we hoped to expose to researchers had to be abandoned due to internet access that was intermittent at best. In many places in the south open access is an attractive concept that is not yet practically beneficial.

Almost everyone other than commercial publishers stands to benefit from open access yet it must be acknowledged that there are concerns and criticisms. Perhaps the most compelling concern is that open access publications do not carry the prestige of traditional journals. Authors seek to publish not for direct financial rewards but for the rewards that are a byproduct of establishing a reputation in their field of study. The most tangible example of this is promotion and tenure. In this context, the prestige of the publication carries a lot of weight. Swan and Brown's research of 2004 revealed that 69% of authors believed open access publications to have low prestige.<sup>13</sup> Having said that, as open access publications mature and gain more prominence their reputations are bound to improve.

There is also a concern about the fiscal sustainability of open access. Some small publishers and scholarly societies rely on subscription revenues for their survival. This



revenue can be somewhat offset by submission fees but this is unlikely to cover the cost of managing journal publication let alone sustain other marketing and outreach activities. A report from the Association of Learned and Professional Society Publishers states that over 40% of open access journals are not covering their costs.<sup>14</sup> With a diminished budget there will be less money to pay editors and reviewers which may result in lower editorial standards for open access publications.

John Lorinc draws attention to the concerns for funding bodies.<sup>15</sup> He points out that Canada's Social Sciences and Humanities Research Council funds both scholarly journals and researchers, and their grants to journals are tied to impact as revealed through subscription numbers. Without subscriptions in the open access model it becomes much more challenging to gage impact.

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Peter Suber has compiled a very useful timeline of the open access movement beginning in 1963 and regularly updated with new developments.<sup>16</sup> Some of the milestones from that history are cited in the following paragraphs.

Suber's earliest reference to a "free online peer-reviewed journal" is Syracuse University's New Horizons in Adult Education which was launched in 1987. The journal is now being published by Florida National University

In 1994 Stevan Harnad first proposed the practice of self archiving in a discussion paper titled “Scholarly Journals at the Crossroads: a Subversive Proposal for Electronic Publishing”.

The Open Archives Initiative was launched in 1999 initially focused on preprint repositories in the field of physics.

The same year, BioMed Central announced that it would offer free online access to its journals, its first free online article appearing a year later. BioMed Central hosts about 100 journals. Their economic model is summarized in this quote from their web site: “[...] BioMed Central's open access publishing model treats publication as the last phase of the research process. Article-processing charges (APCs) cover the cost of the publication process to allow free and immediate access to the research articles.”<sup>17</sup>

The Public Library of Science was born in 2001 with the mission to provide public access to the world’s scientific and medical literature. In more recent years, commercial publishers have begun offering open access along with their paid subscriptions. Notable examples are Springer and Oxford University Press.

Over the last few years there have been a number of landmark declarations in support of open access. Generally, these declarations confirm that open access to scholarly research is beneficial for society as a whole. They provide a definition of what is meant by open

access. Most importantly, they call for more literature to adopt open access through the publishing of open access journals and/or through self-archiving of research papers.

The first and perhaps most important of these came from the *Budapest Open Access Initiative*. Jean-Claude Guédon, who was one of the people who drafted the declaration, explained that they were motivated by a realization that the way to coalesce views on an issue is to produce a text.<sup>18</sup> It was for this reason that the declaration was crafted and has since been signed by over 350 organizations including the Canadian Library Association and the Association of Research Libraries.

The next major declaration was the *Bethesda Statement on Open Access Publishing* which has a focus on the biomedical research community. One of the dominant voices in that initiative was the Public Library of Science. Completing the trio known as the three Bs is the *Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities*. Over 150 organizations have signed the Berlin Declaration including the Canadian Library Association.

The OECD (Organisation for Economic Co-operation and Development) *Declaration on Access to Research Data from Public Funding* followed in 2004 and was signed by 34 countries including Canada and the USA. That same year IFLA (the International Federation of Library Associations and Institutions) produced its *Statement on Open Access to Scholarly Literature and Research Documentation*. From the International

Seminar on Open Access 2005 came the *Salvador Declaration on Open Access: The Developing World Perspective*.

Canada's Social Science and Humanities Research Council (SSHRC), which is a major federal granting agency, has committed to providing open access to all the research it supports. A significant development in the USA is the proposed *Federal Research Public Access Act of 2006 (S.2695)* which would require agencies with large research budgets to implement policies that would ensure that their published research is available online. This bill has been strongly endorsed by universities across the country.

The success of the open access movement can be measured by the number of authors who opt for the open access model as well as by the number of open access journals in existence. As of this writing, the Directory of Open Access Journals was approaching 2,500 journals. Open J-Gate, a directory launched in India in 2006, has indexed over 3,000 open access journals.

Suber cites a significant development in 2002 when the Public Knowledge Project released its first version of Open Journal Systems, their open-source software used by many publishers of open access journals. OJS will be the focus of the remainder of this paper.

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Open Journal Systems is open source software from the Public Knowledge Project. The Public Knowledge Project is dedicated to improving the quality and accessibility of scholarly research primarily by developing software that addresses the publishing process. OJS was originally developed at the University of British Columbia but in May of 2005 it was rewritten and has been maintained since by Simon Fraser University. As stated on their web site “OJS is open source software made freely available to journals worldwide for the purpose of making open access publishing a viable option for more journals, as open access can increase a journal's readership as well as its contribution to the public good on a global scale.”<sup>19</sup> There are currently over 700 journals published with OJS.

The strength of OJS is how it makes the entire publishing cycle easy to manage, from author submission, peer review, editing, proofreading, and online publication in multiple formats. Users involved in the editorial workflow can quickly see the outstanding tasks awaiting their attention. Communication between authors, reviewers and editors is facilitated and recorded for future reference. Development of metadata is incorporated into the workflow and articles are thoroughly indexed to enable effective retrieval. The reader's experience is enhanced through a wide-range of value added services. And being well-written open source code, site managers can customize the software to whatever degree they choose.

Central to OJS is the set of editorial roles and the workflow that determines when an article passes to each role for the appropriate action. While the overview is fairly

complex the beauty of the design is that each user's responsibility at any given time is clear and discreet.

Users involved in the editorial process may have one or more of the following roles: author, editor, section editor, reviewer, copyeditor, layout editor, proofreader and journal manager. Also important to the journal is the editorial and/or advisory board but they are not involved in the publication workflow other than developing the policies that govern many aspects of the workflow.

The workflow is initiated when an author opts to submit a paper to the journal. The author is first presented with a submission checklist to confirm that the submission adheres to the journal's policies with respect to both style and substance. For example, the author may be asked to confirm that the paper has not been previously published.

Upon submission, the editor is alerted. The editor then assigns the submission to the appropriate section editor. This is primarily an issue of workload balancing to ensure that no one section editor is overburdened.

Assuming the section editor feels the submission warrants consideration, it is then her/his job to solicit reviewers. Depending on the journal's policies and the nature of the submission, there may be any number of reviews required. The section editor will select reviewers by matching the submission's topic to the interest profile of reviewers in the

journal's roster. Each reviewer will then be contacted by email asking if she/he will accept the assignment.

If the reviewer accepts the assignment, she/he will then read the submission and provide comments either by annotating the submission itself or by entering them directly into OJS. Either way, the reviewer can opt to restrict her/his comments for consideration by the section editor or enable the author to view the comments directly. The reviewer will also submit a recommendation as to whether the submission should be accepted for publication, rejected, or returned to the author for revisions.

Correspondence between author, section editor and reviewers is maintained in OJS for future reference. Once all reviews and recommendations have been submitted the section editor must make a final decision on whether to publish the submission. Throughout this process, the author can monitor the progress of her/his submission and see some or all of the comments from the reviewers and the section editor.

Submissions that are not accepted are archived for future reference along with the rationale for the rejection. Submissions that are accepted for publication advance to the editing stage.

The editing stage involves three distinct processes which require different skills from the editorial team. The first is copyediting which involves checking the grammar and clarity of the text and adherence to the journal's editorial style. This process typically involves a

lot of interaction with the author to ensure that proposed changes do not distort the author's intended meaning. The second process is layout which typically involves converting a working document (e.g. Word) into a format suitable for presentation to readers (e.g. HTML and/or PDF). Finally, proofreaders are called in to ensure that no typographic or formatting errors appear in the document.

Once all submissions are ready for publication the editor must create a new issue of the journal and organize the table of contents by verifying the various sections (e.g. articles, reviews, editorials) and sorting the articles within the sections. The issue can then be published at which point it is publicly accessible.

When OJS passed hands from UBC to Simon Fraser it was rewritten in object-oriented PHP which resulted in far superior code making it easier for users to do local customization. Much like the editorial workflow described above the overall schema is complex but each component has a role and, once you understand how the roles interact with each other, you appreciate the simplicity of the constituent parts. The approach reflects the model-view-controller (MVC) paradigm in which the data, the interface and the business logic are separated from each other resulting in code that is much easier to maintain and extend.

In the OJS code the major players are the page classes, the action classes, the model classes, the data access objects and the templates. The page classes receive requests from the user's browser and delegate processing to the appropriate action class. The model



classes implement PHP objects representing the OJS entities (e.g. users, articles, journals) and define the object's properties and methods. The data access objects retrieve database content via SQL calls and return populated objects. They also carry out update, insert and delete operations on the database. Finally, the page class invokes the appropriate template to present the content to the user.

OJS takes advantage of the Smarty template system for user interface abstraction. Java developers would find Smarty to be comparable to the Velocity template engine. The templates are mostly HTML with the inclusion of variables, basic logic and references to the properties and methods of the objects that have been returned.

OJS sites wishing to do local customization will find that most of what they need to accomplish can be done through journal-specific stylesheets and, in some cases, modifying the templates. Modifying the PHP code and/or the database structure is easy to do but the real cost is in the subsequent complications when it comes time to upgrade the site to a new release of OJS.

Version 2.1 of OJS introduced a plugin infrastructure that enables developers to extend and modify the way the system behaves without making any changes to the PHP files themselves. This will make it much easier to customize OJS without jeopardizing future upgrades. It will also enable the user community to share plugins with each other.

The McLaughlin Library at the University of Guelph has been running OJS for two years. Apart from the obvious benefits of publishing highly-respected, peer reviewed journals in a variety of fields the library has recognized a number of softer gains. By partnering with different faculties on campus we are raising the profile of the library and building appreciation for the library. Hosting OJS has also enabled us to build relationships with other organizations and academic institutions.

We currently support three journals with several more on the immediate horizon. *Critical Studies in Improvisation / Études critiques en improvisation* is published by the College of Arts and focuses on musical improvisation, community and social practice; *Guelph Ichthyology Reviews* presents lengthy papers in the field of ichthyology and is a project of the Axelrod Institute of Ichthyology; and *Partnership : the Journal of Library and Information Practice and Research*, a new journal produced by the Ontario Library Association, presents research on best practices in libraries. Among our forthcoming journals is an interdisciplinary journal of undergraduate research.

Although OJS facilitates the process of managing a journal it is still critical to have a core editorial contingent who are committed to the project. Faculty members are typically engaged with forming an editorial board, developing policies for the journal, and recruiting authors and reviewers. A critical role is that of the Managing Editor.

Although OJS does a great job of generating email messages to appropriate people throughout the editorial workflow, there is still a lot of work the Managing Editor must do liaising with authors, editors and reviewers. She/he may also play the multiple roles

of copy editor, layout editor and proofreader. It is also very helpful to have an up-front contribution from a graphic designer so that the journal will be visually engaging.

*CSI/ECI* is a journal we are very proud of because of the high caliber of the writing but also because of its graphical presentation and use of multimedia.

In our case, the library supports these journals by providing a number of services. We supply a server and install and maintain the software. We offer technical support and do any customizations required by each journal. We also work to promote the journals, raising their profiles within the academic community.

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Open access is changing journal publishing forever and bringing substantial benefits to researchers around the world, including those in developing countries. Academic libraries can contribute to this movement by encouraging faculty to publish in open access journals but also by adding to the body of open access literature by sponsoring high-quality, peer-reviewed journals on our own campuses.

## Endnotes

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