

**Abstract: Purpose** – Aims to provide a broad overview of some of the issues emerging from the growth in Open Access publishing, with specific reference to the use of repositories and Open Access journals.

**Design/methodology/approach** – A viewpoint paper largely based on specific experience with institutional repositories and the internationally run E-LIS archive.

**Findings** – The Open Access Initiative is dramatically transforming the process of scholarly communication bringing great benefits to the academic world with an, as yet, uncertain outcome for commercial publishers.

**Practical implications** – Outlines the benefits of the Open Access movement with reference to repositories and Open Access journals, to authors and readers alike, and gives some food for thought on potential barriers to the complete permeation of the Open Access model, such as copyright restrictions and version control issues. Some illustrative examples of country-specific initiatives and the international E-LIS venture are given.

**Originality/value** – An attempt to introduce general theories and practical implications of the Open Access movement to those largely unfamiliar with the movement.

**Keywords:** Digital libraries, OA, OAI, Open Access, OA Journals, Open Access Movement, Repositories, Scholarly Communication

**Article Type:** Conceptual Paper

## RATIONALE FOR OPEN ACCESS

The Open Access (OA) movement attempts to reassert control over publicly funded research in order to achieve ‘best value’ and to make such research output transparent and freely accessible. It is rapidly transforming established models of scholarly publishing deemed flawed (e.g. Harnad, 1998; Friend, 2002; Johnson, 2004; Prosser, 2004) or imbalanced (e.g. Joseph, 2005) in a number of ways. The traditional subscription-based model for print and electronic scholarly publishing is subject to the ‘pricing crisis’ caused by high rates imposed by publishers, placing financial burden on individuals, libraries and institutions, and effectively resulting in authors paying for access to their own material. An additional limitation with the print-based model is the time-lag between submission and publication, resulting in delayed dissemination of research findings within the community. The growth in electronic publishing has gone some way to minimise such delays in dissemination, although online publishing has its own difficulties. Suber (2003) has defined the key phenomenon impeding electronic access to scholarly material as the “permission crisis”, fuelled by constraints relating to copyright law, licensing agreements, digital rights management, hardware and software.

The OA model has largely arisen as a reaction to both the pricing and permission crises, with the movement being hailed as a potential solution to both (ibid). In contrast to the well established subscription model whereby publishers charge for access to material, the OA model enables authors to retain the right to distribute their work for non-commercial purposes, enabling them to self-archive their publications and making literature published under the OA banner available free of charge at the

point of use. Nicholas et al (2005) elaborates on the value of such activity by stressing that it is possible to “read, download, copy, distribute and print articles and other materials freely”.

## OA VEHICLES AND ASSOCIATED COSTS

OA publishing has to date been made available via 1) institutional and subject-based repositories, often by way of the freely available Eprints software and in line with OAI (Open Archive Initiative) standards, and 2) via OA journals, defined as “peer-reviewed journals whose articles may be accessed online by anyone without charge” (JISC, 2005). Such media make literature freely accessible and more visible to the community, and therefore generates greater impact and subsequent use of research findings by others. Indeed JISC (ibid) have found that “across “most subject areas there is at least a twofold increase in citation rate”, directly as a result of depositing work in a digital repository. A study reported by Antelman (2004) also found that OA publishing created a higher degree of research impact across the disciplines of philosophy, political science, electrical and electronic engineering and mathematics. A second factor dramatically increasing the visibility of archived e-prints is repositories’ compliance with OAI-PMH (Open Archive Initiative Protocol for Metadata Harvesting). This practice affords interoperability with other repositories and search engines such as OAIster (Goodman, 2004), now thought to be searching over 5.5M items held in over 500 repositories (Prosser, 2005). Besides such benefits for individuals, repositories are also a means of showcasing research output at an institutional level. Within the UK, for example, repositories are becoming a valuable tool in the preparation for the next Research Assessment Exercise (RAE) (Day, 2004).

In the case of OA journals a publication process similar to that of the print world is evident, with formal procedures such as peer review being undertaken. The published output is produced far more quickly than is the case with print and with lower production costs. These costs (also known as APCs or Article Processing Charges) are often charged directly to the author. It may become standard in the future to build such publishing costs into research bids or establish an institutional fund to absorb them and it is envisaged that the cost to the institution of supporting individuals’ OA publishing strategies will be considerably lower than those funds currently being committed to print and electronic subscriptions.

Some predict that library and institutional budgets will suffer further. Stern, (2005) suggests that if the OA publishing model is widely adopted, the current revenue yielded from commercial organisations, academic institutions and other journal subscribers will be sought from the fewer parties who continue to pay for access to non OA material. This will result in inflated prices for the reduced number of subscribers, which are likely to include academic consumers.

Furthermore, the author-charge model has been deemed flawed on the basis that publishing opportunities may be diminished in the developing world (Baum, 2004). Suber (2005) refutes this claim by highlighting that many successful OA ventures, such as Bioline International, SciELO and African Journals Online are prevalent in the developing world. Suber also points out that OA publishers, such as BioMed Central and the Public Library of Science, waive author fees in countries where GDP is considered low.

Where charges do apply, BioMed Central's APCs vary from 330GBP to 950GBP (BioMed Central, 2006), depending on the journal, which "may well be higher than the subscription price to purchase many commercial journals" (Joint, 2006). A comparison is therefore required between the level of article use experienced by representative subscription-based and OA journals, in order to assess whether or not real budgetary savings will be made. Cost benefit analyses should also be undertaken to consider the comparable worth of longer term dividends arising from increased visibility and accreditation. Prosser (2005) highlights the hybrid model adopted by 'Limnology and Oceanography', where authors can opt to pay to make their publications available via OA. Usage figures show that for 2003-published material "199 of the 200 most downloaded papers were open access", while download figures for 2004-published material quadrupled for those papers made available on an OA basis.

The long-term effect of OA on publishers' business models remains to be seen. ALPSP (2005), investigated the 'financial and non-financial effects of alternative business models for scholarly journals' and concluded that "it is too early to tell whether Full Open Access is a viable business model". However, such findings will not deter progress in the area. One recent development has seen SPARC (the Scholarly Publishing and Academic Resources Coalition) (2006) collaborating with Theoretical Economics (<http://econtheory.org>), a peer reviewed OA journal produced by the Society for Economic Theory. This journal is considered a direct competitor to subscription-based top-ranking publications in the field; namely the 'Journal of Economic Theory and Games' and 'Economic Behavior', two publications issued by Elsevier, making it clear that commercial publishers are facing a serious challenge.

## BARRIERS TO OA

The key benefits of OA publishing have already been widely discussed (e.g. Harnad et al, 2001; Prosser, 2005). These are numerous and potentially include dividends for scholars, researchers, readers, libraries and institutions alike. As is generally the case with all initiatives going against the grain of tried and tested models, the OA framework is not devoid of problems or critics; indeed, this has already been alluded to here by discussing the current uncertainty of OA publisher business models and costs. The complete permeation of OA requires widespread acceptance of the suitability of the model for developing and improving scholarly communication in line with today's digital technologies.

There seems to be marked variation among authors in terms of their knowledge of OA and, in turn, their judgement of its intrinsic value and, hence, acceptance. For example, a study reported by Nicholas et al (2005) claimed that authors who had published in OA journals and who also claimed to be committed to the OA movement felt that OA journals published high-quality articles, which were both well indexed and archived, and cutting edge. Conversely, those authors studied by Nicholas et al who had published in OA journals but were uncommitted to the OA movement, saw OA journals as an ephemeral form of publishing with poor indexing, high costs and few career benefits. This same study highlighted differences in opinion on the value and acceptance of the OA movement as a result of geographical and subject variables.

This suggests that a concentrated advocacy programme in specific communities may dissipate such misconceptions, resulting in more uniform acceptance of the initiative.

The more concrete issue of copyright legislation has long been a recognised obstacle to the dissemination of information within the print arena and it continues to present difficulty in the digital world. In order to submit an article to a repository, authors must first ensure they are entitled to self-archive and do not breach copyright restrictions imposed by the original publisher of the work (Eprints.org, 2005). The policies of individual publishers can be consulted via the SHERPA/RoMEO project (<http://www.sherpa.ac.uk/romeo.php>), which encodes publishers' extent of cooperation with the OA movement as green, white and blue.

Although guidelines seem clear, Goodman (2004) explains that restrictions imposed by publishers are not always so straightforward due to associated conditions. For example, he explains that “Many publishers who do not permit postprints in an IR [institutional repository] do permit them on individual pages; there remain publishers, some of the highest quality, who permit postprints only on pages not accessible outside the university, or who do not permit even that”.

Creating further confusion, the terminology used does not seem to enjoy standardised meaning and interpretation. For example, as SHERPA highlights, authors and publishers tend to have a different stance on what constitutes a preprint. This lack of an agreed definition may discourage or even deter authors from self-archiving for fear they may infringe copyright. (For those experiencing doubt a comprehensive guide to self-archiving is available at <http://www.eprints.org/documentation/handbook/>)

A further problem yet to be satisfactorily addressed in the field of OA is version control. A fundamental problem exists whereby the author of a paper rarely holds possession of the final published form of his/her work. It is usual for further changes to be made to content during the final stages of the publishing process, making the most recent version held by the author inaccurate or obsolete. It follows that the deposit of such author versions could only accurately be submitted as preprints. The only way, therefore, to enable authors to submit accurate postprints to a repository is for the publisher to issue a copy of the final published version of their work or, alternatively, especially in the case of OA journals, to permit authors to download final versions from their websites (devoid of journal style attributes) for submission to institutional or subject-based repositories.

## INTERNATIONAL ARENA

Despite the aforementioned barriers, whether potential or actual, there is growing evidence to suggest that acceptance of the OA model is escalating, not least by the rapid emergence of institutional repositories and OA journals (<http://www.doaj.org/>). Looking at the move towards OA in individual countries, progress varies widely. Nicholas et al (2005) found that among those studied “authors based in Asia, Africa, Eastern Europe and South America were about twice as likely to publish in OA journals compared to those based in Australia, US and Western Europe.”

The Declaration of the Budapest Open Archive Initiative (2002), the Charter of ECHO (2002), the Berlin Declaration (2003), the Bethesda Statement on Open Access Publishing (2003) and the Open Access Team for Scotland Declaration (2004) are some examples of country-specific and European agreements and policies in support of the OA movement. This level of joint thinking and action, together with the adoption of shared standards, has enabled international work to develop. One example of an internationally-run digital repository, specific to the field of Library and Information Science (LIS) and Technology is E-LIS (<http://eprints.rclis.org/>). Established with initial funding from the Spanish government, the archive has harnessed the participation of over 40 countries in advocacy and editorial roles. Madeiros (2004) promotes E-LIS as “a timely supplement to traditional library and information research tools such as Library Literature and Library and Information Science Abstracts.” With the purpose of promoting scholarly communication, collaboration and the transfer of ideas, authors self-archive their papers with corresponding metadata, to be approved by a country-specific editor, enabling users to subsequently access papers by searching the full text or specific fields including e-print type, language of item, references, status (unpublished, in press or published) and whether or not it has been refereed, in addition to the more usual bibliographic record fields such as title, author, year, subject, and so on. Users can also browse according to conference title, book/journal title, author/editor, country and year of publication, or via a subject listed within the JITA classification scheme (see <http://eprints.rclis.org/view/subjects/>). The repository holds multilingual material, although accompanying English abstracts and keywords are mandatory. E-LIS is under constant development and is continuously experiencing improvement in terms of expanding the range of languages accepted, enhancing search facilities and so on.

LIS colleagues are encouraged to deposit pre- and postprints in the E-LIS archive where permitted. In the author's experience, it has greatly increased the visibility and citation of, and linking to, personally written works.

## WAY FORWARD

Enormous progress has been made over the last six or so years in the quest to widen access to scholarly literature, although aforementioned barriers yet to be fully tackled remain. This column has largely dealt with the world of academia but it should not be forgotten that beyond the academic environment a range of issues may impede society's adoption of the OA publishing model. For example, Goodman (2004) suggests that “computer availability, computer literacy, the knowledge of how to use search engines effectively, the expectation of privacy, and the absence of censorship” are among the issues to be addressed. In order to attain the broadest possible access to information, and to achieve social inclusion, the OA agenda must therefore be extended to cover a greater range of information aimed at a variety of audiences.

The growth of OA repositories and journals to date is encouraging and they have proven successful in increasing the visibility of scholarly literature and research impact. Lack of cooperation from publishers in terms of freeing up copyright restriction on work (or becoming ‘green’ in SHERPA/RoMEO terms) and an apparent unwillingness to provide authors with final published versions suited to self-archiving is proving difficult to resolve, and publishers' pricing models and agendas remain largely unclear. This disparity between the author/scholarly community and the

commercial world of publishing is likely to continue for some time until accepted OA business models are devised for publishers. Otherwise, scholars may become less inclined to publish in subscription-based journals since they may consider the benefits of OA publishing to outweigh those created by the traditional publishing model as limited visibility (hence citation, hence impact) and high-access prices become increasingly less attractive.

Individual organisations and nations will of course develop their own agendas and policies; one related danger is that the rapidly increasing number of repositories will confuse authors who may become less inclined to self-archive as it becomes less clear where they should deposit their work. They may feel they have to deposit in multiple repositories - a time consuming process - in order to maximise the visibility of their research. It is crucial therefore that interoperability remains a primary concern, on an international basis, to enable subsequent harvesting and re-use of content. Continued OAI-PMH compliance should therefore be encouraged and authors and researchers must be made aware of this capability. Where subject-based, E-LIS illustrates that a distributed and collaboratively run repository has great merit in improving the dissemination of, and access to, research material within a field. It is also encouraging that such a venture is being pioneered by the librarianship field, whose core values and skills, including their understanding of information retrieval and experience in advocating new technologies and services are central to the success of the OA model (Law et al, 2005). Although individual institutions and countries will continue to pursue their own agendas, there can be no harm in additionally contributing material to the international arena. Indeed, there is potential for the existence of repositories and OA journals to contribute to the development of core areas of the digital library field such as international metadata standards and digital preservation.

## References

ALPSP: The Association of Learned and Professional Society Publishers. (2005), *The facts about Open Access: A study of the financial and non-financial effects of alternative business models for scholarly journals*. Available at: <http://www.alpsp.org/publications/pub11.htm> Accessed 17th March 2006.

Antelman, K. (2004), "Do Open Access Articles Have a Greater Research Impact?", *College & Research Libraries News*, Vol. 65 No. 5, pp. 372-382. Available at: [http://eprints.rclis.org/archive/00002309/01/do\\_open\\_access\\_CRL.pdf](http://eprints.rclis.org/archive/00002309/01/do_open_access_CRL.pdf) Accessed 17th March 2006.

Baum, R. (2004), Cited in: "Open Access News: News from the open access movement", Originally published in "The Open-Access Myth", *Chemical and Engineering News*, Vol. 82, No. 8, February 23, 2004. Available at [http://www.earlham.edu/~peters/fos/2004\\_02\\_22\\_fosblogarchive.html](http://www.earlham.edu/~peters/fos/2004_02_22_fosblogarchive.html) Accessed 17th March 2006.

Berlin Declaration (2003), Available at: [http://www.zim.mpg.de/openaccess-berlin/berlin\\_declaration.pdf](http://www.zim.mpg.de/openaccess-berlin/berlin_declaration.pdf) Accessed 17th March 2006.

Bethesda Statement on Open Access Publishing (2003), Available at: <http://www.earlham.edu/~peters/fos/bethesda.htm> Accessed 17th March 2006.

BioMed Central (2005), Available at:  
<http://www.biomedcentral.com/info/about/apcfaq#howmuch> Accessed 17th March 2006.

Budapest Open Archive Initiative (2002), Available at:  
<http://www.soros.org/openaccess/read.shtml> Accessed 17th March 2006.

Charter of ECHO (2002), [http://echo.mpiwg-berlin.mpg.de/heritage/oa\\_basics/charter](http://echo.mpiwg-berlin.mpg.de/heritage/oa_basics/charter)  
Accessed 17th March 2006.

Day, M. (2004), "Institutional repositories and research assessment", ePrints UK Supporting Study 4. Available at: <http://www.rdn.ac.uk/projects/eprints-uk/docs/studies/rae/rae-study.pdf> Accessed 17th March 2006.

Friend, F., J. (2002), Creating Change in Europe: SPARC Europe and Scholarly Publishing, *Partnerships, Consortia, and 21st Century Library Service*. 23<sup>rd</sup> Annual IATUL Conference, Kansas City, USA. 2<sup>nd</sup> -6<sup>th</sup> June 2002. Available at: <http://www.iatul.org/conference/proceedings/vol12/papers/friend.pdf> Accessed 17th March 2006.

Eprints.org (2005), *Eprints Handbook*. Available at:  
<http://www.eprints.org/documentation/handbook/overview.php> Accessed 17th March 2006.

Goodman, D. (2004), "The Criteria for Open Access", *Serials Review* Vol. 30 No. 4, pp. 258-270. Available at  
[http://eprints.rclis.org/archive/00003542/02/SR30\\_4\\_Goodman.pdf](http://eprints.rclis.org/archive/00003542/02/SR30_4_Goodman.pdf) Accessed 17th March 2006.

Harnad, S. (2001), "For Whom the Gate Tolls? How and Why to Free the Refereed Research Literature Online Through Author/Institution Self-Archiving, Now". Available at: <http://cogprints.org/1639/> Accessed 17th March 2006.

Harnad, S., Carr, L. and Brody, T. (2001), "How and Why To Free All Refereed Research From Access- and Impact-Barriers Online, Now", *HEP Libraries Webzine*, No. 4. Available at: <http://library.cern.ch/HEPLW/4/papers/1/> Accessed 17th March 2006.

JISC: Joint Information Systems Committee. (2005), *Open Access Briefing Paper*. Available: [http://www.jisc.ac.uk/index.cfm?name=pub\\_openaccess](http://www.jisc.ac.uk/index.cfm?name=pub_openaccess) Accessed 17th March 2006.

Johnson, R. K. (2004), "Open Access: Unlocking the Value of Scientific Research", *Journal of Library Administration*, Vol. 42, No. 2, pp. 107-124. Available at: [http://eprints.rclis.org/archive/00005089/01/OA-Oklahoma\\_article.pdf](http://eprints.rclis.org/archive/00005089/01/OA-Oklahoma_article.pdf) Accessed 17th March 2006.

Joint, N (2006), Head of Reference and Information , Andersonian Library, and Senior Research Fellow, CDLR (Centre for Digital Library Research), University of Strathclyde, Personal email correspondence, 16th March 2006.

Joseph, H. (2005), "The Scholarly Publishing and Academic Resources Coalition: An evolving agenda", *College & Research Libraries News*, Vol. 67, No. 2. Available at: <http://www.ala.org/ala/acrl/acrlpubs/crlnews/backissues2006/february06/evolvingparc.htm> Accessed 17th March 2006.

Law, D., Macgregor, G., McCulloch, E. and Wallis, J. (2005), "Developing a National Information Strategy in Scotland", *Cadernos BAD*, No. 1, 2005, pp. 49-63.

Madeiros, N. (2004), "On the Dublin Core Front. A repository of our own: the E-LIS e-prints archive", *OCLC Systems and Services*, Vol. 20, No. 2, pp. 58-60.

Nicholas, D., Huntington, P. and Rowlands, I. (2005), "Open access journal publishing: the views of some of the world's senior authors", *Journal of Documentation*, Vol. 61, No. 4, pp. 497-519.

Open Access Team for Scotland Declaration. (2004), Available at: <http://scuri.ac.uk/WG/OATS/declaration.htm> Accessed 17th March 2006.

Prosser, D. C. (2004), "Fulfilling the Promise of Scholarly Communication – A Comparison Between Old and New Access Models", in Nielsen, Erland Kolding and Saur, Klaus G and Ceynowa, Klaus, (Eds.), *Scholarly Journal Prices: Selected Trends and Comparisons*, K G Saur, Germany, pp.95-106. Available at: [http://eprints.rclis.org/archive/00003918/01/mittler\\_Paper.doc](http://eprints.rclis.org/archive/00003918/01/mittler_Paper.doc) Accessed 17th March 2006.

Prosser, D. C. (2005), "Open Access: the future of scholarly communication", *Cadernos BAD*, No. 1, 2005, pp. 6-20.

SPARC (2006), "SPARC Partners with Theoretical Economics to Provide Top-Quality Open Access Research: New Journal an Alternative to Two High-Priced Commercial Publications", *SPARC News*, 15<sup>th</sup> March 2006. Available at: <http://www.arl.org/sparc/announce/060315.html> Accessed 17th March 2006.

Stern, D. (2005), "Open Access or Differential Pricing for Journals: The Road Best Traveled?", *Information Today*. Vol. 29 No. 2. Available at <http://www.infotoday.com/online/mar05/Stern.shtml> Accessed 17th March 2006.

Suber, P. (2003), "Removing the Barriers to Research: An Introduction to Open Access for Librarians", *College & Research Libraries News*, No. 64. pp. 92-94. Available at <http://eprints.rclis.org/archive/00001027.01/acrl.htm> Accessed 17th March 2006.

Suber, P. and Arunachalam, S. (2005), "Open Access to Science in the Developing World" *World-Information City*, October 17, 2005 Available at: <http://www.earlham.edu/~peters/writing/wsis2.htm> Accessed 17th March 2006.