

PLoS - Public Library of Science

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Abstract

The Public Library of Science is a non-profit organization of scientists whose aim is to make the world's scientific and medical literature a public resource. PLoS started life as an advocacy group, based in the US. Last December, the organization reinvented itself as an open access publishing company. PLoS plans to launch open access journals, collaborate with other organizations to convert or launch open access journals, and to continue to lobby for change in the way that scientific publishing is financed, so that all research literature will be available in a free and unrestricted manner.

Introduction

What is open access?

Open access to scientific and medical literature allows anyone, anywhere, with a connection to the Internet to find and read published research articles online, and to use their contents in the course of scholarship, teaching, and personal inquiry. With open access, published material is also archived in a public digital repository (such as PubMed Central [1]), which enhances the utility of all deposited papers by allowing sophisticated searching, manipulation, and mining of the literature, using existing and emerging tools. Storing works in a public repository ensures the long-term preservation of the literature as a freely accessible resource, irrespective of the fate of the depositing entity or of any change in its policies regarding open access [2].

Why is open access important?

The dissemination of scientific discoveries and ideas provides the foundation for progress in science and medicine. The more widely and freely accessible it is, the greater the value of peer-reviewed research. For authors, open-access literature maximizes the potential impact of their work. Anyone can find and access their manuscripts, increasing the likelihood that the works will be read, cited, and used as the basis for future discoveries. For the scientific community, open access unleashes full-text literature into a single information space. Unrestricted access to scientific data, such as genetic and molecular information, has revolutionized life science research over recent years; open access to the treasury of scientific and medical literature will have similarly profound benefits for research. For research libraries, open access will help contain the spiraling costs of subscriptions to scientific serials. Mergers and market concentration within the publishing industry are placing increasing pressures on the budgets of university science libraries and other archives of research, and open access to peer-reviewed journals is a long-term solution to the problem that has become known as the "serials crisis" [3].

Beyond the community of researchers who work in wealthy institutions, open access will make scientific knowledge available to others who cannot afford access to subscription-based journals—physicians and other health professionals, educators,

students, scientists in developing nations and the general public across the world. Open access to the literature will benefit research, education, and health.

How does open access work?

Open access requires a systemic change in the way that scientific publishing is funded. Scientists have historically relied on print as the most effective medium for sharing and promoting their work. When information was encoded as ink on paper and distributed using trains, trucks, and boats, a large part of publishing costs was in printing and distribution, and each additional copy entailed an expense for the publisher. In this context, the subscription-based business model for scientific publication was sensible, relatively efficient, and served science well.

Today, however, the costs involved in scientific publishing are almost entirely in the steps leading to production of the final electronic document, and the costs to produce and distribute each additional copy electronically are infinitesimal. If revenue can be generated to completely cover the costs of producing the electronic document, for example, by charging authors a fee for publication, the document can then be made freely available to anyone with an Internet connection.

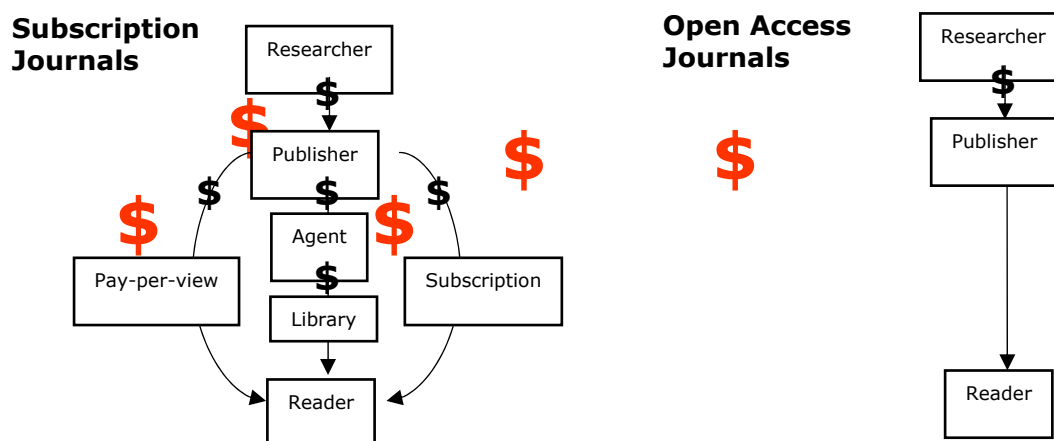


Figure 1. Subscription versus open access journals. In subscription-based journal publishing, financial barriers are imposed that restrict access to those who can afford to pay: for institutional licenses, personal subscriptions, or document delivery. Open access requires that revenue is provided to the publisher to cover the costs of publication. Literature can then be made freely available to any reader.

Challenges to open access

Many agree that open access to research literature is a worthy goal. Furthermore, the introduction of open access journals will increase competition within the marketplace and help to reduce costs. Nevertheless, there are barriers to the adoption of the open access model which affect many stakeholders involved in publishing, and so the transition to open access is likely to require significant investment and resources.

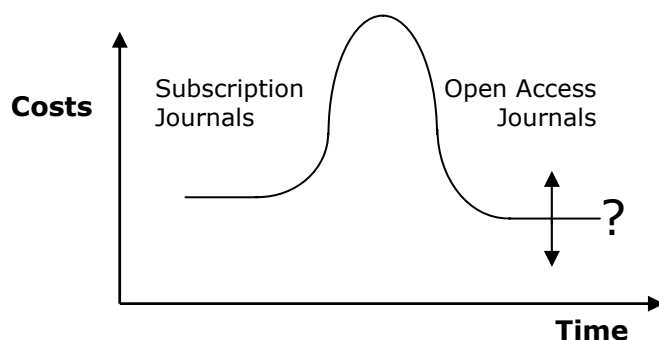


Figure 2. The economics of transition. Although it is likely that open access publishing will be less expensive overall than subscription-based publishing, a challenging transition must be negotiated if open access is to become the dominant mode of scientific publishing.

Scientific, technical and medical publishing has been a great commercial success [4]. Many commercial publishers have enjoyed substantial profit margins, although it has been suggested by several commentators, including the Office of Fair Trading in the UK, that the STM publishing market is not working well, and that journal prices are high at the expense of research and education [5]. It is likely that market forces will tend to operate more effectively within the context of open access publishing, and so a clear obstacle to open access for commercial publishers is that it might be harder to achieve the level of profit to which they have become accustomed.

Many society and nonprofit publishers also make significant revenue from subscription-based publishing. They are also concerned about potential loss of revenue and membership as a result of the change to open access publishing, although open access also provides a powerful way to fulfill their goals of disseminating and communicating the science of their members to the broadest possible audience [6].

Potential barriers to open access for authors include having to pay for publishing, when their grants might not include any allowance for this, as well as concerns about submitting to new journals with no established reputation.

Funding agencies are being asked to include publication fees in grants, which might place a new burden on them.

Finally, institutions and libraries might be concerned about the long-term effects of open access on their existing budgets, which currently include funds for the purchase of subscription-based journals.

In light of these concerns, any organization promoting open access has to pay attention to all stakeholders in publishing, to facilitate and encourage change. Many organizations are now working to catalyze this transition: the publisher BioMed Central is aiming to demonstrate that open access can be a commercial success [7]; the Public Library of Science is developing community-based open access journals [8]; funding agencies, such as the Howard Hughes Medical Institute, are providing funds to support open access journals; and many organizations, including libraries, institutions, and agencies such as SPARC [9] and JISC [10] are promoting open access. Although there

are many obstacles, the overwhelming benefits of open access will drive the transition forward.

The Public Library of Science

Prompted by the promise of the Internet to deliver open access to research literature, The Public Library of Science was founded in October 2000. Their first action was to encourage scientific publishers to make scientific research literature available for distribution through free online public libraries of science. An open letter was circulated calling on scientific publishers to make the primary research articles they publish available through online repositories such as PubMed Central. The open letter was signed by over 30,000 scientists from 180 countries. This initiative prompted some significant and welcome steps by many scientific publishers towards freer access to published research, but in general the publishers' responses fell short of the policies advocated by PLoS.

In the summer of 2001, PLoS concluded that the only way forward was to begin developing plans for launching its own open access journals. On December 17, 2002, PLoS announced the award of a \$9 million grant from the Gordon and Betty Moore Foundation to launch a nonprofit scientific publishing venture, controlled and operated by scientists for the benefit of science and the public. Using this grant, an outstanding editorial board and an experienced team of staff have been assembled.

The immediate goals are to launch two open access journals that will provide credible alternatives to the existing top-tier subscription-based journals. *PLoS Biology* launches in October, 2003 and *PLoS Medicine* in 2004. Subsequently, PLoS plans to launch further open access journals, in some cases, as a collaboration with other organizations and publishers.

The aims of PLoS over the coming few years are to demonstrate that open access publishing is a sustainable business model that other organizations can adopt so that it becomes possible for every scientific paper to be published in an open access journal. PLoS is also committed to developing the tools and resources to make the most out of full text literature. This will help to demonstrate the benefits of open access to all users, both within the scientific community and beyond.

References

- [1] PubMed Central (PMC) is the U.S. National Library of Medicine's digital archive of life sciences journal literature. <http://www.pubmedcentral.nih.gov/>
- [2] For a more thorough definition of open access, see <http://www.plos.org/news/OpenAccessPublishingMtg.pdf>
- [3] Open Society Institute, "Guide to Business Planning for Launching a New Open Access Journal" (2003) <http://www.soros.org/openaccess/oajguides/index.shtml>
- [4] Morgan Stanley report. "Scientific publishing: knowledge is power." (2002) Available at <http://www.econ.ucsb.edu/~tedb/Journals/morganstanley.pdf> and to members of ALPSP at <http://www.alpsp.org/memnews.htm>
- [5] The Office of Fair Trading, "The market for scientific, technical and medical journals" (2002), also available at www.offt.gov.uk/news/publications/leaflet+ordering.htm
- [6] Willinsky, J. "Scholarly Associations and the Economic Viability of Open Access Publishing," (2003) *Journal of Digital Information* Vol. 4, <http://jodi.ecs.soton.ac.uk/Articles/v04/i02/Willinsky/#Crow03>.
- [7] <http://www.biomedcentral.com/>
- [8] <http://www.plos.org>
- [9] <http://www.arl.org/sparc/>
- [10] <http://www.jisc.ac.uk/>