

The “Open Movement” in research scholarship – What is it and what does it mean? ¹

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I am not going to speak about information technology (IT) today – others will. That is not to say that it is not a key driver of the change in the information environment, a change that will demand that we adapt curricula to meet new educational needs. Instead I want to focus on an important socio-cultural “force” that I believe will, as much as technology, create a transformation in scholarly communications and will have ramifications throughout information organizations, particularly those closely allied to teaching, research and discovery. This force is open access (OA). I believe to ignore OA is to ignore an extremely important and well established movement that is disruptive for much of what information professionals do today as well as what iSchools do to educate for this work. But how do we think about OA and the long-term impact that it might have? My, perhaps, glib answer is that we use scenario thinking. This is relatively easy to do since scenario methodology is designed precisely to target dates as far in the future as 2050 – nearly four decades from now. In simplest terms, we think about a future based on the premise that all of the problems that seem so large today will be solved. That is not to say that there will be no new problems. So, we can frame 2050 by enunciating conditions that will be totally different from those that exist today.

Like others, I am focused on the context within which I work – the academy. This is a quintessentially information-driven enterprise, if there ever was one, for all its core activities – research, teaching, learning, and knowledge creation. Most important, the academy is dependent on a system of scholarly communication that has evolved by accretion since the last quarter of the nineteenth century. I am positing, first, that this system – built on old budget models and print technologies – is broken and that it will be replaced by a completely different system four decades from now – one that springs out of the current OA movement. Furthermore, because the current structure of scholarly communication has so palpably defined what libraries are, it follows that libraries and – more to the point today – education for librarianship and other information professions will be unrecognizable. In this paper, I have attempted to outline evidence for the forces at work that are indicators of the increasing momentum of OA and

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why it will likely become the ascendant characteristic of scholarly communication. It is already having an impact. Thousands of OA journals and the OA textbook movement are evidence.

The full potential for using networked technology and computational power to accelerate scholarship depends on unfettered access to publications and the underlying data. The increasing awareness of the importance of data has caught the eye of commercial interests as well as scholars [2]. Open access is emerging but access, in turn, depends upon the clearly stated rights to both use and re-use. Advocacy for OA is expected from the Association of Research Libraries (ARL), but the clarion call came not from libraries but from the scientific community beginning with Harold Varmus at National Institutes of Health (NIH) and the first Berlin Conference in 2003. Through SPARC, ARL has worked hard to support OA with many other academic library partners.

The full realization of this sort of vision will be dependent on the extent to which the academy embraces open access to create new knowledge, to build on earlier findings, and to translate research for educational and commercial use. Making the case for public access to tax-funded research is a principled stand. There are equally strong cases to be made, however, for the both the economic benefits and the acceleration of research scholarship that results from such access.

The lobbying for the recently proposed legislation like the *Research Works Act* that was aimed at rolling back the NIH posting requirement and preventing other agencies from similar mandates has been based on protection and/or creation of jobs by commercial advocates. That is something that motivates politicians, even when the case is flimsy or merely a bald assertion by special interests. So what is to be said in favor of the economic impact of OA? There is already a strong argument to be made that public access to high-end research results enables a broad array of businesses and industries to nourish their own R&D and to develop new products, thereby, creating jobs. There is a substantial body of research demonstrating that making publicly funded research available to all those who can use it just makes sense from an economic development standpoint. Early studies during the 1990s provided tangible evidence for the economic benefits to product innovation and revenue gains due to public access. Recent confirmation for these studies is to be found in the work of John Houghton, commissioned by SPARC and focused on the *Federal Research Public Access Act (FRPAA)*:

Preliminary modeling suggests that over a transitional period of thirty years from implementation, the potential incremental benefits of the proposed *FRPAA* archiving mandate might be worth around eight times the costs. Perhaps two-thirds of these benefits would accrue within the US, with the remainder spilling over to other countries. Hence, the US national benefits arising from the proposed *FRPAA* archiving mandate might be of the order of five times the costs.

Exploring sensitivities in the model we find that the benefits exceed the costs over a wide range of values. Indeed, it is difficult to imagine any plausible values for the input data and model parameters that would lead to a fundamentally different answer [4].

This is but one of many such studies that make the compelling case for OA policies for all government-funded research – some by Houghton but supported by others.¹ Those who most strongly question these studies are also the sponsors of efforts to eliminate OA policies because it is in their interest to do so. But we should not settle for the economic argument alone when there is an equally powerful case to be made

¹Among the best synopses of research supporting the extraordinary positive impact of OA on economic growth and scientific knowledge is to be found in the Harvard response from Provost Alan M. Garber to the OSTP RFI on open access, <http://search.whitehouse.gov/search?utf8=?&query=+Harvard+response+to+the+White+House+RFI+on+OA+publications&m=&embedded=&affiliate=wh&filter=moderate&commit=Search>.

for the advancement of human knowledge that is perhaps the most important value of the academy. Let me give you the OA talking points developed by ARL:

- Open access to research articles is a critical driver of scientific innovation and productivity. It:
 - increases citations and follow-on research;
 - promotes diversity in follow-on research;
 - increases the pursuit of new research pathways;
 - encourages faster application of research.
- Faster access lets scientists incorporate new findings into their research rapidly.
- Open Access to these articles allows scientists to use new tools (like machine reading, computational tools) to get to and read more information faster.
- Open Access enables machines as a new category of reader.
- Open Access encourages contributions by “unforeseen participants” expanding the potential for new, innovative, interdisciplinary discoveries.

Again, we find a body of research literature that proves the productivity gains for scientific research (see, e.g., [5]). But the most compelling case is that made by the scholars who directly participate in the benefits of openness and can speak to the real-life impact it has. The Berlin9 Conference, “The impact of open access in research and scholarship”, held November 2011, in Washington, DC (<http://www.berlin9.org>) brought together an international audience and research scholars who express, in no uncertain terms, how indispensable OA is to the accomplishment of their work and the future of their disciplines, from the humanities to the hard sciences. Their emphasis is not on advocacy; for them, OA is a fact of everyday professional life. It is integral to the way they think about their work – from initial research and experimentation to collaboration and final publication of the research results. Do not tell them that their works published by large commercial firms need the protection of federal legislation from open posting and should forever be behind a pay wall that prevents large scale access. For them, the principle of “openness” is essential and inviolate. One gets the feeling when listening to these scholars that the attempts, however real, to reverse the trend toward OA will inevitably fail.

Even in the commercial STM camp, we begin to see the first glimmers of recognition that the future is with open access. For instance, at the 2011 STM meeting in Frankfurt, Steven Hall (managing director, Institute of Physics Publishing in London) posed a critical issue to his audience: “There is unease and even strong resistance in the publishing community to the imposition of mandates by funding agencies which force researchers to use a particular model of dissemination and restrict their choice of publication. So how should publishers respond to the growing demands for open access: by engaging or opposing?” He described the reaction of publishers to OA as going through something like the five stages of grief – denial, anger, bargaining, depression and finally acceptance. He observed that OA will not be the only business model, but it will play a very large role. He laid out a set of “principles of constructive engagement”, arguing strongly for gold over green OA. To his great credit, he urged that when OA gold publication fees are taken, publishers must avoid the cynical intention to not take them into account in pricing. His conclusion was that the size of the profits may well decline [3]. The willingness of a commercial STM publisher to suggest taking an economic haircut is a sign of a pretty profound shift in thinking.

Research institutions already have vigorously initiated one important part of the path forward that emphasizes a key value of sharing – that is open access strategies. OA is really being led by our universities. What is the evidence?

- Worldwide, over 300 research and higher education institutions have a variety of mandates, both institutional and sub-institutional. In the United States and Canada, 49 colleges and universities have one or more OA mandates, and 31 of these are members of ARL [6].
- These mandates are supported by the recent founding of the Coalition of Open Access Policy Institutions. It will “collaborate and share implementation strategies and advocate on a national level” [7]. This is not a large proportion of institutions, and it is important that such OA policies become characteristic. For those who have not, it is time to engage faculties in a discussion about a deposit mandate on your campuses.
- The academy must strongly support passage of the *Federal Research Public Access Act* – almost half of AAU institutions and numerous others already have endorsed the *FRPAA*, which will extend the NIH posting policy to other federal agencies and has the potential to enable the maximum downstream use of the investment in research. At the beginning of February, the *FRPAA* legislation was simultaneously re-introduced in both houses of Congress – in today’s political climate that is an extraordinary example of bicameral bipartisanship. The White House is considering an executive order to accomplish the same thing. However, continued support for the passage of *FRPAA* is essential because of its permanence.
- There are today over 1700 OA repositories on campuses worldwide that provide the infrastructure investment that allows widespread posting of research results. Supporting them is vital.

The OA movement is but 10 years old, yet it has gained enormous momentum within the academy. It has grown to include a broader vision of what it means to be “open”, embracing not just the end products of research – those things that used to appear in print articles and books – but the full life cycle of research from data to publication. The federal agency mandates for data curation plans in research proposals is indicative of the emerging sense that data must be preserved for future re-use and data-mining. Moreover, data are not, I repeat *not*, copyrightable and so do not create the immense roadblock to broad use and re-use that is posed by copyrighted materials.

Some investment risk management researchers now flatly assert that the large STM publishers have an unsustainable business model and are in great jeopardy from OA [1,8]. I have tried to describe the emerging trends that I believe make it reasonable to believe that, in no more than 30 years, something fundamentally different will replace them and dramatically alter the other elements of the scholarly communication landscape. This leads to three closing questions. What will a librarian, archivist, or any information professional do in a world in which the resources that used to march across the shelves of libraries and archives are freely accessible on the Internet? What will a library or an archive become in such an environment? And, what will the iSchool curriculum to educate for this work look like?

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