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MANAGING TECHNOLOGY

Applying Open Access to Library Technologies

Geoffrey Little

Concordia University, Montreal, QC, Canada

Much of the discussion about open access (OA) has focused on the economics of scholarly publishing and the roles that libraries and librarians can play in making peer reviewed articles, books and book chapters, data sets, and other kinds of information available for free to anyone with an internet connection or in supporting faculty and students who want to disseminate their scholarly outputs. However, the OA movement also presents significant technological implications, challenges, and opportunities. As part of the *JAL* topical issue on OA, my column this month will describe and discuss some of the technologies and platforms that academic librarians can utilize in support of this movement and to promote free access to scholarly information.

Definitions of OA do not bear repeating given this issue's topical theme, but a basic understanding may be helpful. Peter Suber defines OA literature as "digital, online, free of charge, and free of most copyright and licensing restrictions. What makes it possible is the internet and the consent of the author or copyright-holder" (Suber, 2004). The Budapest Open Access Initiative (BOAI) defines OA as "immediate, free availability on the public internet, permitting any users to read, download, copy, distribute, print, search or link to the full text of these articles, crawl them for indexing, pass them as data to software or use them for any other lawful purpose" Budapest Open Access Initiative (2002). Allied to and congruent with OA are open source technologies that play important roles in achieving the goals of making information available for free. Open source software is free non-proprietary software where anyone can have access to the source code and to the documentation. According to Casey Durfee, a self-described hacker and former web developer at the Seattle Public Library,

> Open source software also embodies the simple but revolutionary idea behind libraries: that information should be open and free for anyone to use. The power of open source makes it possible to create free systems that are as good as or better than the commercial products out there now—systems that can be easily modified and extended by anyone—and allows all libraries, not just the ones with the money, to have the best possible software (Beccaria & Scott, 2007).

Open source software and tools are not just attractive from an ethical or philosophical perspective, but they also potentially provide ways for libraries to avoid having to pay large amounts of money to commercial vendors for new products or ongoing maintenance and access. The ability to play with source codes also means that tools can be customized to meet a library's needs and the specific community of users. So what are some specific ways in which college and university libraries use OA? What are our options and what issues and considerations do we have to take into account before we embrace an open source technology tool?

OPACS AND DISCOVERY LAYERS

Given the prominent role that the online public access catalog (OPAC) has played in the life of an academic library, it is an obvious place to start thinking about OA options. VuFind (http://vufind.org/) was developed at Villanova University and uses PHP and Apache Solr (http://lucene.apache.org/solr/) to display MARC records, while the University of Virginia, Stanford, Johns Hopkins, and WGBH (the Boston PBS affiliate) are working together on Blacklight (http://projectblacklight.org/), a Ruby on Rails (http://rubyonrails.org/) "gem" that also uses Solr. Blacklight markets itself as a discovery layer that "features faceted browsing, relevance based searching (with the ability to locally control the relevancy algorithms), bookmarkable items, permanent URLs for every item, user tagging of items" (Blacklight). Other open source examples include Kochief (https://code.google.com/p/kochief/) and Aristotle (https://github.com/jermnelson/Discover-Aristotle/). In scanning the environment, the number of libraries using open source OPACs and discovery layers is rather small and it does not appear that this technology has reached anything resembling a critical mass. Given the importance of the catalog in our work, its use by our faculty and staff, and the money we have invested over many years in our commercial systems, it may be a long time before the open source OPAC really takes off.

INSTITUTIONAL REPOSITORIES

Institutional repositories (IRs) function as spaces where faculty, students, and staff can deposit published articles, chapters, presentations, and other scholarly resources. Many universities in North America and Europe have also passed OA mandates which oblige faculty to deposit their work in an institutional IR. As well, a number of government and philanthropic funding agencies also now require researchers to make their results and, increasingly, their datasets available in a publically accessible IR with the goal of making sure that publically funded research is freely accessible. Compared to OPACs

E-mail address: Geoffrey.little@concordia.ca.

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and discovery layers, open source IR platforms are very robust and well developed and include:

- DSpace (http://www.dspace.org/),
- Fedora (http://fedoraproject.org/),
- EPrints (http://www.eprints.org/),
- IR+ (http://code.google.com/p/irplus/),
- OCLC Research Software (http://www.oclc.org/research/activities/software.html), and
- Bepress's Digital Commons (http://digitalcommons.bepress.com/).

SPARC (Scholarly Publishing and Academic Resources Coalition, http://www.arl.org/sparc/index.shtml) provides an international home for academic libraries that want to promote OA, with a strong focus on IRs. SPARC was developed by the Association of Research Libraries (ARL) and its steering committee includes academic library directors from the United States and Canada.

SCHOLARLY PUBLISHING PLATFORMS

The OA movement first emerged through the desire of scholars and librarians to develop new freely available tools and platforms outside of the traditional commercial publishing universe by which to disseminate their research. This goal is especially attractive to librarians who have watched serials prices skyrocket while collections budgets have been deeply cut or remained flat. Over the past number of years, new online scholarly journals have been created outside of traditional commercial publishing channels. This means that they may not be published by an academic press or commercial publisher, but instead are hosted independently. Scholarly societies, professional organizations, and libraries are turning to new publishing systems like Open Journal Systems (OJS, http://pkp.sfu.ca/?q=ojs), a journal management and publishing system developed by Simon Fraser University's Public Knowledge Project (http://pkp.sfu.ca/). OJS boasts that there were 11,500 titles using this tool as of December 2011 and it allows authors, editors, and reviewers to upload, edit, and comment on submissions while managing the entire production schedule and process online. A number of scholarly associations and learned societies are also using WordPress (http://wordpress.com/) to produce journals with varying degrees of success, as well as DigitalCommons.

INSTRUCTION AND REFERENCE

Open source tools can also be used in the classroom and at reference desks. We hear a great deal about embedded librarianship and open source course management systems (CMS) being used to help professors manage their courses and to make library content like instruction videos or slide presentations available outside of library instruction sessions or reference transactions. Many of us already work with an open source CMS like Moodle (https://moodle.org/) or Sakai (http://www.sakaiproject.org/), which was developed when Indiana, Stanford, and Michigan realized that they had each spent time and money creating their own course management systems and decided to work together to collaborate on a resource that could be made available to all schools. Zotero (http://www.zotero.org/) is a free bibliographic citation tool developed at George Mason University that lets users collect, organize, and cite sources and an alternative to commercial tool like RefWorks (http://www.refworks.com/).

DATA TOOLS

Academic librarians are also embracing the cause of open data, something that Alex Howard has called "data for the public good" (Howard, 2012). The open data movement holds that data should be publically accessible to anyone who wants to reuse it, scrutinize it, and manipulate it. Many of us find it encouraging that governments like those in the US, the UK, and Canada have all created open data portals (Government of Canada Open Data). Librarians who manage IRs or who work with science or social science faculty are also seeing an increase in the amount of data they have to manage in order to help their faculty fulfill deposit requirements. To assist data librarians, the University of Washington has developed OpenDataKit (http://opendatakit.org/), an "open-source suite of tools that helps organizations author, field, and manage mobile data collection solutions." OpenROSA is a consortium trying to coordinate open data standards (http://openrosa.org/) while Open Data Commons (http://opendatacommons.org/), a project run by the Open Knowledge Foundation (http://okfn.org/) is another great resource for librarians who want to utilize open source tools to take advantage of publically available data.

SPECIAL COLLECTIONS

Open source technologies are being utilized in special collections and archives. Archival management software that allows archivists to manage processing and the creation of finding aids include Archon (http://www.archon.org/), created by the University of Illinois at Urbana Champaign, and Archivists' Toolkit (http://www.archiviststoolkit.org/), a project initially funded by the Mellon Foundation and developed by academic libraries in New York and California. It is currently being used by the University of Vermont, Rice, NYU, and the University of Pittsburgh among others, while the University of British Columbia is using Archivematica (https://www.archivematica.org/wiki/Main_Page), a locally developed open source technology. Special collection libraries at Columbia, Minnesota, and Missouri—Kansas City are also using Omeka (http://omeka.org/), another open source tool developed at George Mason, to create online exhibitions or repositories for oral history, archival photographs, and digitized manuscript collections.

Open access also offers a number of opportunities and an exciting array of choices, but there are also a number of factors and considerations that come into play when considering the adoption of an open source technology. Philosophically, we should recognize that there will always be a need for commercial tools and platforms. It would be impossible for us to offer collections and services to users otherwise. We cannot abandon our current Innovative, Ex Libris, or Sirsi Dynix integrated library system (ILS) simply because it is not open source or in response to an institutional OA mandate. We will always be working with commercial publishers and vendors. Instead we should be talking about OA and open source technologies as an exciting and useful toolkit from which to pick and choose those resources that work for us, while leaving aside those that will not.

What kinds of questions do we need to keep in mind when making decisions about which tools to adopt? First, there are practical questions related to staff time, resources, and funding. An open source IR and discovery layer might be free, yes, but will their maintenance and management be added to your workload or that of your colleagues? Are there funds to hire a scholarly communications librarian? Can you call upon support staff to help out? What kind of technology training will be required in order to implement an open source OPAC? Building infrastructure and support is also essential to ensure sustainability of the long-term future of OA projects and initiatives. This means making sure that there is the capability to support and maintain a technology if a staff person leaves or retires, but it also means that librarians need to be advocates with administrators and funders to ensure that institutional support does not evaporate after a few years or once an OA-friendly provost or library dean is no longer on the scene. Can you offer advice, support, or technological infrastructure to faculty who want to start up or host OA journals or publish OA monographs? What kinds of partnerships do you need to develop with your campus' information technology department or with your scholarly press? Can you

draw on a local, national, or international community of expert users who also use an open source technology that you might want to adopt?

Many of us have heard the phrase often attributed to Stewart Brand, "information wants to be free," and every day academic librarians direct our time, effort, skills, and passion toward helping our users and faculty access resources that will enable them to write their papers, craft their survey instruments, and conduct their lab experiments. Thinking about our work through a lens of OA and utilizing open source technologies where and when they make sense can help us in our mission to support the scholarly enterprise. Open access is an audacious and evolving enterprise and one that presents us with a unique set of opportunities and challenges. We should not be afraid to experiment, investigate, and be bold in our thinking about the ways that we can incorporate OA into our work and mission.

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