OPEN SOURCE SOFTWARE: WHAT IT IS AND WHAT IT CAN DO FOR YOUR LIBRARY

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Abstract: In the difficult economic climate in which we find ourselves in 2009, open source software has been adopted by many libraries because it is free to use, reuse, modify, and distribute. From office productivity suites to library-specific applications such as an integrated library system, open source software has a lot to offer libraries. This paper illustrates the wide range of open source applications that are currently in use on the IAMSLIC website and at one IAMSLIC member library. A selective resource guide is included that other libraries can use to locate and obtain open source software for their own use.

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What is Open Source Software?

In attempting to define open source software (OSS), also referred to as free/libre open source software (FLOSS), it is helpful to clarify what it is not:

- OSS is not the same as "open access," which is a publishing model for making scholarly literature freely available.
- OSS is not the same as "open archives" or OAI, the Open Archives Initiative, which provides a platform for the creation of institutional repositories into which authors may deposit publications, along with the ability to automatically harvest metadata from such repositories. However, most of the software platforms underlying institutional repositories do consist of open source software programs.
- OSS is not the same as web services and utilities that are offered for use free of charge, such as Flickr.

OSS is software that has been developed under a licensing agreement that allows/requires that the source programming code be available for modification

and use by others (Open Source Initiative, n.d.). The definition of open source also means that:

- The software code may be freely redistributed
- Derived works are allowed
- Licensing may not discriminate against any persons or groups
- Licensing may not discriminate against any field of endeavor
- Rights under the license automatically transfer

In addition to the Open Source Initiative (http://www.opensource.org), the Free Software Foundation (http://www.fsf.org/) serves as an authoritative body to coordinate the guidelines, licensing terms and definitions of open source software. The FLOSS Foundation Directory (http://flossfoundations.org/foundation-directory) lists numerous national and regional groups that have been formed to manage and promote OSS worldwide.

Factors to Consider with "Free" OSS Applications

Open source software is normally available for download and use free of charge, but libraries should be aware of the potential need to devote in-house resources to the customization and support of OSS applications. OSS has come to be known to be "free as in kittens," meaning that one can obtain the software for free, but it may require care and feeding for its useful lifetime. On the other hand, many open source applications are fully configured and ready to use "out of the box" and may not require any local modification or support. One advantage of OSS is the ability to download and test an application at no cost before deciding whether it will be the best solution to meet the library's needs.

Other factors to consider when weighing the potential costs of open source software are the extent to which the package has been installed elsewhere and the size and activity of the software development community for the application. Some applications have a large installed base and an active group of developers, in which case assistance is likely to be easy to obtain and one can have confidence that software upgrades and refinements will be forthcoming. Other applications may be the work of a creative individual and, while the application may be a perfect match for the library's current needs, the library will need to be prepared to take a more active role in configuring and extending the software's capabilities.

The licensing model for OSS does not explicitly prohibit software developers from attempting to sell value-added services based upon it. In fact, a new model has developed in recent years for some of the full-blown open source integrated library systems whereby the software itself is available free of charge, but

libraries may purchase support services from affiliated commercial companies, including fully-hosted solutions that do not require the library to own its own server.

Wide Range of OSS Applications
Almost any imaginable software application has an open source package that can serve as an alternative to commercial software, and most applications have numerous open source options. One can use OSS for:

- Fun and games. There are large numbers of open source games and recreational applications for a variety of operating systems.
- Music and entertainment. Open source tools are available to organize and listen to music in MP3 or other formats and to download or view streaming video.
- Create and edit videos, audio, photos. In addition to listening and viewing tools, applications for creating and editing media content are available, with features ranging from rather simple to very sophisticated.
- Communicate. There are open source email packages, chat software, and even voice/video applications that run over the Internet.
- Read news. RSS news readers and aggregators are available as open source packages.
- Replace everything on your personal computer. It's entirely possible to have a complete and fully functional suite of software for a personal computer that has no commercial packages. Combining a free version of the Linux operating system with productivity software such as OpenOffice and various packages from the above categories can easily form the basis of a perfectly usable and reasonably secure personal computer.
- Create and manage websites, blogs, etc. In fact, according to Netcraft, Ltd., the most widely deployed web server software is from the Apache Foundation (http://www.apache.org), which is a long-time key, player in the OSS arena. Website design/authoring packages, content management systems, and blogging software are readily available and many of them have large and active developer communities.

Library-Specific OSS Applications
While many of the general purpose applications described above could also be good candidates for implementation on public or staff computers in libraries, there are a number of applications that are aimed more directly at library processes and services. In your library you can:

- Set up your website so that all staff and librarians can edit content. An open source content management system can be customized with a library's own graphics and look-and-feel. Authoring privileges and workflow can be managed as necessary, including the option to allow users to add content in selected areas of the website if the library so desires.
- Create local databases. Open source database management systems such as MySQL (http://www.mysql.com) and PostgreSQL (http://www.postgresql.org) are full-featured and extremely powerful. The library may need to invest some time and expertise in the scripting of web-based front ends to these databases.
- Set up news feeds for your users. News, announcements, and new acquisition lists are types of content that lend themselves to display and dissemination via RSS feeds.
- Do online scheduling and management of resources. OSS packages are available for scheduling everything from meeting rooms to public computer stations.
- Create a digital library collection. A number of sophisticated packages are available for digital collections, including Greenstone (http://www.greenstone.org) and Collective Access (http://www.collectiveaccess.org), among others.
- Manage personal bibliographies. The Zotero plug-in for the Firefox browser (http://www.zotero.org) is an example of a robust application for capturing, storing and formatting bibliographic citations and data.
- Enhance your public catalog interface. In recent years, a variety of tools have emerged that can enhance or replace the OPAC interface of many commercial library systems (see resource list in Appendix A). Some of the more sophisticated ones enable features such as faceted browsing of search results that may not be offered in the commercial vendor's OPAC interface.
- Replace your entire integrated library system. Growing out of early projects such as Koha's origin in New Zealand, several full-blown open source integrated library systems are available as competitive alternatives to a commercial ILS (see Appendix A).
- And much more. Almost any library service or function that is supported by technology may be able to be implemented using open source solutions. In many instances, an open source package that was designed for a similar function in a different setting can be adapted to serve the needs of the library's service.

Open Source and IAMSLIC

The entire IAMSLIC website and web-based services run on open source software, with the exception of the RegOnline service that is used for online registration and payments. When the IAMSLIC website was migrated and redesigned in 2005, the decision was made to base it on an open-source content management system called Exponent (http://www.exponentcms.org). The IAMSLIC server itself runs on the suite of open source components that are known as LAMP: Linux, Apache, MySQL and PHP or Perl. Linux is the operating system, Apache is the web server, MySQL is the database management system, and PHP and Perl are two scripting/programming languages that are used to build and manage interactive web content. The Exponent content management system is written in PHP and uses the underlying MySQL database to store the content of the various web pages on the IAMSLIC site. In April 2008, the open source WordPress blog software (http://wordpress.org) was added to the server to create the IAMSLIC News & Events blog. The RSS feed from the WordPress blog is then fed to and displayed on the IAMSLIC home page.

The IAMSLIC Z39.50 Distributed Library and the Union List of Marine and Aquatic Serials are entirely built upon open source software. The Distributed Library uses the YAZ toolkit and PHP/YAZ from IndexData (http://www.indexdata.com) to implement the broadcast searching of multiple library catalogs. The Union List is a MySQL database with a set of PHP and Perl scripts providing access to it. A Perl script is used to export the entire set of records from the database in XML format and then the open source MARCXML extensions to Perl are used to convert the records to MARC format. The Zebra indexing package from IndexData is then used to index those MARC records so that they are searchable via Z39.50 as part of the Distributed Library.

The IAMSLIC Membership Database is also stored in MySQL, while administrative functions and member access are supported via PHP and Perl scripts. The interlibrary loan module of the Distributed Library uses PHP and Perl scripts to query the Membership Database to extract contact information for ILL transactions and it stores statistical records for each transaction in another MySQL database. Finally, the electronic voting system employs a similar combination of PHP scripts and a MySQL database.

In addition to the main IAMSLIC website, it should be noted that IAMSLIC Newsletters and Conference Proceedings are archived in the WHOAS institutional repository at Woods Hole (https://darchive.mblwhoilibrary.org/), which uses the open source DSpace software (http://www.dspace.org). The OceanDocs repository projects at IOC/IODE also use DSpace as their software

platform. The complementary Aquatic Commons repository is based on another open source platform call EPrints(http://www.eprints.org/).

Open Source Implementation at a Member Library

The library at California State University, Monterey Bay (CSUMB) has made extensive use of open source software to provide services and resources to its users. A tour of the library home page at http://library.csumb.edu reveals a range of OSS packages running alongside commercial applications, all integrated into the library website in as transparent a manner as possible. As with the IAMSLIC website, the open source portions of the CSUMB Library website run on a LAMP platform. In keeping with the spirit of the open source community, the library is glad to share the locally customized code for most of these applications with other libraries who wish to implement them.

The library's Journals List of some 30,000 titles is housed in a MySQL database with a series of PHP scripts for the front end interface. The quick search box that appears on every library web page uses PHP and Perl scripts to pass a user's search terms off to either the Voyager library catalog, the library's Journals List, the Academic Search Elite database, or the campus Google site-search appliance. Similarly, the Find Books link presents a simplified interface to the library catalog that takes user input and passes it through a Perl script to be executed in the commercial Voyager OPAC. Within the Voyager OPAC interface itself, the library has added a New Items display option based on open source Perl scripts developed by Michael Doran at the University of Texas, Arlington (http://rocky.uta.edu/doran/). The CSUMB Library modified similar scripts developed by Andy Kohler at UCLA to generate RSS feeds by subject area for the New Items listings. The RSS feeds can either be displayed within the context of the Voyager OPAC itself or can be pulled into external web pages, such as the library's research guides by subject. The library recently implemented Library ala Carte from Oregon State University (http://alacarte.library.oregonstate.edu/) as the platform for its research guides.

Another popular feature incorporated into the library's Voyager OPAC interface is the capability to send call numbers, shelf locations and circulation status of books to a user's cell phone via text messaging. This was implemented by capturing the unique accession number for the bibliographic record in a link in the OPAC display. Clicking that link sends it to a PHP script that prompts for the user's cell phone number and service provider, then uses the same open source YAZ and PHP/YAZ software as the IAMSLIC Distributed Library to do a Z39.50 query of the Voyager system to retrieve the call number and item data. The information is packaged by a Perl script and emailed to the email-to-SMS

gateway at the service provider, who turns it into a text message and delivers it to the user's phone.

In order to display library hours in a calendar format rather than a simple list, the CSUMB Library uses the open source WebCal package (http://bulldog.tzo.org/webcal/webcal.html). While the package is no longer being developed or supported, it works well for the simple purpose of displaying a public calendar of the library hours. A similar package was implemented in 2008 to offer a self-reservation booking system for group study rooms in the library's new facility. The Meeting Room Booking System (http://mrbs.sourceforge.net) is capable of serving as a full-fledged reservation system for multiple facilities and with flexible scheduling options, repeating meetings, etc. However, the library locked down or eliminated many of the advanced features because we wanted it to be a tamper-proof, self-service system for use by our students. Group study rooms may now be reserved only up to one week in advance and no individual may reserve more than two hours in a given day, but students may view and use the system from anywhere with Internet accessibility. The MRBS software is also used at other libraries to reserve public computers as well as meeting rooms.

The library implemented a blog via a local installation of WordPress in 2008 as a means of delivering news and announcements to the campus community and to add more dynamic content to the library home page. The library has also been using WordPress as part of its private intranet as a way for librarians and library staff to share announcements, information about technical problems, new or changing databases, and class assignments that might impact reference services. The rest of the library intranet runs in an open source content management system called CMSMadeSimple (http://www.cmsmadesimple.org/). As the name implies, this is a comparatively simple and easy-to-use content management system that libraries may wish to consider for their public websites as well.

Summary

Open source software is widely available and can in many instances be seriously considered as an alternative to similar commercial packages for applications in libraries. A library might identify the need for a new service for which no commercial software exists, but for which an open source application might be able to be adapted. Some open source applications will require that in-house technical expertise be available in the library or from its parent organization, but other applications may be run "as is" without the need for customization or specialized support. Both IAMSLIC and many of its member libraries are making effective use of appropriate open source solutions as part of their services and resources.

References

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APPENDIX A: Selected Sources for Open Source Software

Primary Organizations behind the Open Source Movement:

Open Source Initiative
http://www.opensource.org

Free Software Foundation
http://www.fsf.org
And their directory of free software: http://directory.fsf.org

FLOSS Foundation Directory
http://flossfoundations.org/foundation-directory
The directory lists numerous open-source groups around the world

Definitions and FAQs:

A **definition of open source** from Liblime
http://liblime.com/open-source

Frequently asked questions about open source from Evergreen
http://evergreen-ils.org/dokuwiki/doku.php?id=faqs:evergreen_faq_3

Open Source Integrated Library Systems:

Evergreen ILS (an open source ILS originally developed in Georgia)
http://evergreen-ils.org

Equinox Software (a primary provider of support services for Evergreen)
http://esilibrary.com

Koha (an open source ILS originally developed in New Zealand)
http://www.koha.org

Liblime (a primary provider of support services for Koha)
http://liblime.com

Open Library Environment Project (defining a next-generation library platform)
http://oleproject.org

Open Source Alternate Library Catalog Interfaces:

VuFind (search portal for academic OPACs and other digital content)
http://www.vufind.org

Scriblio (open source OPAC based on WordPress blog software)
http://about.scriblio.net

LibraryFind (a metasearch tool for library catalogs and databases from Oregon State)
http://libraryfind.org

Drupal MARC Plugin (enables content management system to serve as an OPAC)
http://drupal.org/project/marc
See also the **Drupal in Libraries** group
http://groups.drupal.org/libraries

Open Source Catalog Records:

‡**biblios.net** (free repository of over 25 million bibliographic records)
http://biblios.net

Where to Find and Download Open Source Applications:

Open Source Software for Libraries
http://oss4lib.org

EU Open Source Observatory and Repository
http://www.osor.eu

Source Forge (thousands of open source packages for every imaginable application)
http://sourceforge.net

Open Source CMS (content management/website management systems)
http://opensourcecms.com

Handy Applications for your Desktop or Browser:

Open Office (a full replacement suite for Microsoft Office)
http://www.openoffice.org

CC-PDF Converter (create PDFs from nearly any file; Mac, Windows & Linux)
http://www.cogniview.com/cc-pdf-converter.php

PDFCreator (create PDFs from nearly any Windows application)
http://www.pdfforge.org/products/pdfcreator

GIMP (a full-featured photo and image editor)
http://www.gimp.org

Audacity (record and edit sound files; Mac, Windows & Linux)
http://audacity.sourceforge.net

Zotero (personal bibliography & citation software; a Firefox browser plug-in)
http://www.zotero.org

Wink (create tutorials and presentations, capture screen sequences)
http://www.debugmode.com/wink/

Pidgin (instant messaging/chat interface, integrates multiple IM protocols and services)
http://www.pidgin.im