Library Hi Tech News

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LIBRARY HI TECH NEWS

VOLUME 33 NUMBER 5 2016
JUNE

AN EMERALD PUBLICATION

incorporating Online and CD Notes

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Library Link

www.emeraldinsight.com/librarylink

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This literature review goes ten years back to see what has been and is going on in the open source world. Effort has been made to be as comprehensive as possible, but the review has been limited again to internet sources and what can be garnered from the internet cybersphere.

What is open source? This issue has been treated by scholars interested in the topic. Different types of open source have been discussed and comparisons between open source integrated library systems (ILS) done. Open source software (OSS) is software source code that is available free of cost on the internet. Once downloaded, the software can be enhanced and customized. The software is managed through a licensing process that protects the rights of the creators and collaborators (Jaffe and Careaga, 2007, p. 2). Open source describes a broad general type of software license that makes source code available to the general public with relaxed or non-existent copyright restrictions. It is free to use, free to change, free to distribute and an alternative to commercial software. More information can be found at: http://pln.palinet.org/wiki/index.php/Why_look_at_open_source_now%3F#What_is_meant_by_open_source

Some examples of open source are: Evergreen, Koha, OpenBiblio, and OPALS. According to http://pln.palinet.org, Evergreen is an enterprise-class library automation system that helps library patrons find library materials and helps libraries manage, catalog and circulate those materials, no matter how large or complex the libraries are. Evergreen ILS was begun by the Georgia Public Library system in 2006 so that a library catalog could be shared by a consortium of over 270 libraries (the Public Information Network for electronic services or PINES) all over the state. It was built to provide scalability for large systems and has been adopted by libraries across the USA, Canada and the rest of the world. In 2007, Evergreen formed a commercial company called Equinox Software (www.esilibrary.com/esi/) to provide support for migration and development. Some of Evergreen's main features include circulation, cataloging, acquisitions and online public access catalogs (OPACs).

Koha is a full-featured open-source ILS. It was developed initially in New Zealand by Katipo Communications Ltd. and first deployed in January 2000 for Horowhenua Library Trust. It is maintained by a team of software providers and library technology staff

from around the globe. Support options are available primarily through the commercial vendors LibLime (whose source code has diverged from that of the Koha community) and ByWater Solutions. Some of Koha's useful features include a simple interface, web 2.0 capabilities and customizable search. It is generally used in smaller libraries.

OpenBiblio (http://obiblio.sourceforge.net/) is an easy to use, automated library system written in PHP containing OPAC, circulation, cataloging and staff administration functionality. OpenBiblio library administration offers an intuitive interface with broad category tabs and sidebar. In addition, OPALS (Open-source automated library system), found at http://opals-na.org/opals-fac.html, is a web-based open source program that is cooperatively developed, which provides internet access to information databases and library collections. It needs no installation software or purchase of expensive computer hardware for it to function.

Kinner and Rigda (2009) noted that the increase in electronic resources and the rising expectations of library users are changing the nature of the ILS. They detailed the evolving role of the ILS and discussed where it could and should be headed. In their opinion, it is clear that ILS vendors "need to continue to observe the trends in delivering content to patrons, but should not lose sight of their core modules as they are vital to libraries".

Zou and Guoying (2009) looked into issues of, and various solutions to, indexing, searching and sorting in the Chinese language in Evergreen, an ILS. Evergreen is still a new ILS in comparison to other commercial systems. It was originally developed in North America and best supports English. The localization for other languages is a key project for its promotion to non-English speaking countries or libraries with non-English collections. So far, three languages other than English are under development including French, Spanish and Simplified Chinese versions. The first Chinese version was released in 2008 and has received vast interest from many libraries all over the world, including the Sitka consortium in British Columbia, Canada, and the China Evergreen Rural Library Service (CERLS), a nationwide program in mainland China built by Evergreen Education Foundation (www.evergreeneducation.org/). These issues and the solutions may be applicable to other digital library systems such as institutional repositories.

Rawan *et al.* (2006), in a poster session presented at Living the Future Conference held in April, 2006, analyzed the OSS journey in Afghanistan and projected an overview of ILS. They claimed that the market at that time was dominated by commercial ILS vendors, that open source systems offered a viable solution and that the characteristics of open source systems were that they were undeveloped, with few products available and that they did not provide full features. They explained how Afghanistan libraries arrived at adopting Koha though they face challenges like Arabic/Persian Languages Support and that Koha generates web-based graphic user interface (GUI) via Perl-included templates, which used HTML "meta" tag with western character set (ISO-8559-1) to encode characters among others.

Pratheepan (2009) looked at the merits and demerits of open source software and commercial library software. The comparison was between Koha, Evergreen, NewGenLib, Libsys, Voyager and SOUL. The open source and commercial software were observed from the business, development, licensing and technical perspectives, and thereafter recommended that "an organization procuring software should state in clear and objective terms the functionality and requirements that it needs fulfilled and allow all vendors, including both open source and commercial software vendors, to submit their proposals to the organization for consideration. The specifications should contain criteria such as the functionality, security requirements and performance characteristics that the user needs".

Breeding (2009) focused on questions regarding to what extent open source ILS products could be considered viable alternatives. He looked at open source ILS viability from four perspectives: market acceptance, support options, product development and functionality and risk factors. It was found that as far as market acceptance went, in the USA and Canada, three open source ILS products dominated – Koha, OPALS and Evergreen. While Evergreen and OPALS had not yet found wide adoption outside the USA and Canada, Koha found use in libraries worldwide. The companies offered support for open source ILS and they offer support contracts for installation, data conversion, system maintenance and hosting options. These companies include LibLime, providing services related to Koha; Equinox Software, Inc., providing services related to Evergreen; and Media Flex, providing services related to OPALS. Each of the ILS products has cultivated a community of supporters highly motivated to help them succeed. The free and open source software movement has found fertile ground in the library community.

Jaffe and Careaga (2007) described open source, its merits and demerits and advised on strategies to use in supporting open access ILS. They concluded that "Open source, though it does not solve all our problems, makes a good start in addressing some of the big ones. Open source software returns local control of crucial systems, allows us to decide which features to change and when, gives us access to the inner workings of our systems and our data and promotes interoperability with other tools. Open access publication frees the written word, letting us focus once again on access rather than control and its format independence opens yet other doors. Adopting open source will let us be librarians again."

Many years later, Singh (2013) described the results of a research study analyzing the challenges of the adoption of open source integrated library systems (OSS ILSs) among US libraries. The research team surveyed 73 libraries of all types using proprietary ILSs about their satisfaction

with their ILS, whether they have considered migrating to an OSS ILS and some of the changes that would need to occur inside and outside of the libraries to facilitate migration to OSS ILSs. The results showed that most of the libraries surveyed had considered migrating to OSS ILSs. The most common reason for considering migration was the cost savings of OSS ILSs compared to proprietary ILSs. The most common issues libraries cited as reasons not to migrate to OSS ILSs included the lack of in-house technical staff and expertise and perceived lack of OSS ILS technical support.

Brooke (2013) also examined the use of free and open source software in public libraries and made a strong case for them by showing clear financial, functional and operational benefits. Brooke gave examples of recent successful implementations: the argument for use of open source software supported by the library world has increased adoption of OSSs. Some success stories can be cited such as that discussed by Akpokodje and Akpokodje (2015) who highlighted the University of Jos automation processes using Koha ILS, efficient and effective migration strategies from Integrated Technical Services (ITS) for Windows and VIRTUA ILS's to Koha ILS. The experiences of 24 library staff who were involved in the 2014/2015 registration exercise were enumerated in using the software. Koha was selected at the library out of necessity and for the ease of use of online library registration at the library but it was not fully planned for. The prospects and challenges of the staff in using it were described. Open Source ILSs were found to be more cost effective than proprietary ILSs. Open access ILS proved to be more cost effective and aided ease of access to information.

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