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OPAC Module in Open Source Library Management Software: A Comparative Study

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ABSTRACT

A variety of open source library management software is (LMS) available in the library arena. However, only a few of them are fully compatible with latest technological changes and support maximum technological features. The work focuses only on those open source LMS packages which are available on the web for download freely and still releasing their updated versions and aims to discuss the OPAC module in those packages to trace the features and characteristics with special reference to searching and online services provided through web interface of the said packages. The comparative study is made from the review of earlier studies, information from the web-pages of the LMS packages and hands-on practice in local installation done. The comparative study will be helpful for library and information professionals who are planning to automate their libraries with open source package and also planning to provide OPAC facility to their users for better use the library documents.

Keywords: Library automation, open source software, OSS, library management software, LMS, OPAC

1. INTRODUCTION

Library management software (LMS) is software that has been developed to handle basic housekeeping functions of a library. An LMS usually comprises a relational database, software to interact with that database, and two graphical user interfaces, i.e., one for administrator/staff and other for patrons. Basically, an LMS has three basic functions to perform inside a library, referred by Koneru[1] 'Housekeeping Operations', 'Public Services', and 'Administrative Planning or Decision Making'. Housekeeping operations include acquisition of documents, technical processing like classification and cataloguing, circulation control, serials control, inter library loan (ILL), etc. Public services include online public access catalogue (OPAC), suggestions for book purchase, etc. Administrative planning or decision making includes formation of transaction policies, customisation of LMS, backup and restore database, etc.

An LMS is also known as integrated library system (ILS) or integrated library management system (ILMS), because it separates software functions into discrete programs called modules, each of them integrated with a unified interface. Acquisitions, circulation, inter-library loan and cataloguing, though separate functions of the library, are interdependent. Library software has evolved by fusing these functions in to integrated library systems.

Webber & Peter[2] explained ILS as 'terms used to describe the software that operates the circulation, cataloguing, public access catalogue, reports, and other modules that do the work of typical library operations'. Modules in a LMS might include:

(a) Acquisitions (ordering, receiving, accessioning, invoicing materials, etc.)

(b) Cataloguing (cataloguing, indexing materials, etc.)

(c) Circulation (patron management, issue materials to patrons, receiving them back, charge overdue, etc.)

(d) Serials control (ordering, receiving, tracking magazine and newspaper holdings, etc.)

(e) OPAC (public interface of users for search and retrieval)

(f) Administration (administrative interface for the administrators)

Library and information centres and open source software (OSS) have a common philosophy, i.e., 'community first'. According to Daniel Chudnov[3], 'The library community is largely made up of not-for-profit, publicly-funded agencies which hardly command a major voice in today's high tech information industry. As such, there is not an enormous market niche for software vendors to fill our small demand for systems'.

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The OSS systems cost nothing or very low cost to use, whether they have one or one thousand users. On the other hand, few people are engaged with a commercial LMS package development, whereas a large pool of community developers are engaged with an open source LMS package. Hence, open source LMS are seen as a solution in the age of, economic global meltdown because many libraries experience with commercial LMS is that they are slow to evolve and expensive to upgrade. Rather than spending lots of money on commercially-licensed software and also for their maintenance, such funds might be reallocated for training, hiring, or support needs, areas where libraries tend toward chronic shortfalls. In the last few years, the development of a number of LMS products in the open source world has increased. One important trend in these kinds of products is the use of web-based client/ server architecture.

2. LITERATURE REVIEW

A good number of studies on OSS application in libraries have been carried out by various scholars all over the world. Chudnov[3] discussed the necessity and use of OSS in the field of library and information science and mentioned that community-based services have made OSS more sophisticated because participants from all over the world used to give support as programmer, tester or user to these kind of software. 'Koha, Evergreen and PMB demonstrate very active developer communities with secure institutional backing' mentioned by Balnaves[4].

Breeding[5'] provided detailed information regarding four open source LMS products, namely, Koha, Evergreen, NewGenLib and OPALS and stated that these LMS products have emerged as the most widely implemented and serve as good examples of the current state of the art of the open source LMS.Madhusudhan & Aggarwal[6] examined the various features and components of web-based online public access catalogues (OPACs) of IIT libraries in India with the help of a specially designed evaluation checklist. The study explored different features of web-based OPACs in six IIT libraries in India.

The quality of OSS in the field of LIS is rising day by day, because they go through an informal review process by a strong user community and LIS specialists. Open source digital library software, e-learning management and content management software have already dominating upon commercial software. Salve, Lihitkar & Lihitkar[7] focused on the general and specific features of the some popular OSS packages used in library activities'.

Singh & Sanaman[8] provided a detailed comparative analysis both qualitatively and quantitatively of Koha and NewGenLib open source LMS.Yang & Hofmann[9] discussed advanced features of the OPACs of two open source LMS packages (Koha and Evergreen) and one proprietary LMS package (Voyager). The purpose of the study was to determine which OPAC of the three LMS packages offers more in terms of services and is more comparable to the next-generation library catalogue.

3. SCOPE

Avanti, Emlida, Evergreen, Koha, Newgenlib, OpenBiblio, OPALS-NA, PhpMyBibli, PhpMyLibrary, etc. are some examples of open source LMS packages[7]. Among all these packages, some are available freely in the web, and releases updated versions regularly. Update and modification has become stagnant in case of some packages like Avanti, Emlida, PhpMyLibrary, etc. It is not uncommon for OSS projects to last only a few years and falter, either because of lack of ongoing patronage or lack of take-up; this is certainly evident in the case of LMS open source projects[4]. Again OPALS-NA charges money for the package, though it is not for the license fee, hence OPALS-NA is not freely downloadable from the web. So, those open source LMS are discussed here on the basis of availability on their own website with no cost.

The packages are mentioned in Table 1 and are found online through their own websites and they are still releasing updated versions. The purpose of the study is to determine which OPAC of the LMS packages offer more in terms of services and is more compatible with the recent technological advancements. As the sample only includes five open source LMS packages, the study is limited in scope, and the findings cannot be extrapolated to all open source packages.

Table 1. Open source LMS packages

Software and web address	Developer	Licence	Latest Release
Evergreen (http://evergreen-ils.org)	Georgia Public Library Service	GNU GPL	2.8.3 in Aug, 2015
Koha (http://koha-community.org)	Horowhenua Library Trust	GNU GPL	3.20.3 in Aug, 2015
NewGenLib (www.verussolutions.biz)	KIIMP & Verus Solution	GNU GPL	3.0.4 in Mar, 2013
OpenBiblio (http://obiblio.sourceforge.net)	OpenBiblio Development Team	GNU GPL	0.7.2 in Aug, 2014
PhpMyBibli (www.pmbservices.fr)	PMB Services	GNU GPL & CECILL Licence	4.1.2 in July, 2014

4. METHODOLOGY

Comparison in context to OPAC module of open source LMS packages means finding how the software packages provide sophisticated search facility to its users along with maximum user services. The following comparison is made from the review of earlier studies; information obtained from the web pages of the LMS packages and hands-on practice in locally installed systems. All the packages other than Evergreen have been installed locally for the study. On the other hand demo site is used by only installing client application of Evergreen.

5. RESULTS AND DISCUSSIONS

5.1 Development Information of Open Source LMS

The LMS packages are distributed applications, i.e., programs that run on more than one computer and communicate through a network or server. Table 2 gives the development information of open source LMS packages. The frequency of releasing updated version is very rapid in case of Evergreen and Koha.

Evergreen server installation is done only in Linux platform but client application is platform-independent. Koha stopped developing windows binaries, hence server installation is done only in Linux platform but client application can be opened through web browser so it is platform-independent. Openbiblio and PhpMyBibli server installation is platform-independent and client application can be opened through web browser so it is platform independent. NewGenLib server and client installation both are platform-independent.

5.2 Functional Modules

An LMS package has different management modules to perform different functions used within the library. The modules are considered by the workflow in a typical library. Looking at the different functional modules (Table 3), Koha provides a total solution for all of its functional modules. On the other hand, Evergreen and NewGenLib also support most of the functional modules, but Evergreen does not support inter library loan functionality and in NewGenLib. one cannot manage multiple libraries from a single server. In Koha and Evergreen, multiple libraries can be added and hence, one can manage more than one library with a single server installation.

5.3 OPAC Module

The OPAC of the LMS enables users to search the library's collection and take advantage of online services. Basic functionality of the module includes the ability for users to perform searches to view the information and status of any given item. Most LMS packages have the facility of patron login, book suggestion, book reserve or hold, and other similar services in their OPAC functionality.

5.3.1 State-of-the-Art Web Interfaces of OPAC

All the five OPAC interfaces have the Google-like simplicity in presentation. All of the user interfaces

Table 3. Functional modules in open source LMS packages

Functional modules	Ever-green	Koha	New-GenLib	Open-Biblio	PhpMy-Bibli
Administration	Yes	Yes	Yes	Yes	Yes
Acquisition	Yes	Yes	Yes	No	No
Cataloguing	Yes	Yes	Yes	Yes	Yes
Circulation	Yes	Yes	Yes	Yes	Yes
Authorities	Yes	Yes	Yes	No	Yes
Reports gen-eration	Yes	Yes	Yes	Yes	Yes
Serial control	Yes	Yes	Yes	No	Yes
Inter library loan	No	Yes	Yes	No	No
OPAC and We-bOPAC	Yes	Yes	Yes	Yes	Yes
Manage mul-tiple libraries	Yes	Yes	No	No	No

Table 2. Development information of open source LMS packages

Development information	Evergreen	Koha	NewGenLib	OpenBiblio	PhpMyBibli
1st release year	2006	2000	2005	2002	2003
Latest release year	2015	2015	2013	2014	2014
Operating Platform (Server)	Linux	Linux	Cross Platform	Cross Platform	Cross Platform
Operating Platform (Client)	Cross Platform	Cross Platform	Cross Platform	Cross Platform	Cross Platform
Architecture in latest release	N-tier	2-tier	N-tier	2-tier	2-tier
Backend database	Postgre SQL	MySQL	Postgre SQL	MySQL	MySQL
Web server	Apache	Apache	Apache	Apache	Apache
Application server/middle layaer	OpenSRF	No	JBoss	No	No
Written in language	Perl, C, XULRunner	Perl	Java, JDOM	PHP	PHP
Work in cloud computing	Yes	Yes	Yes	Yes	Yes

are customisable. It largely depends on the library to make the user interface appealing and welcoming to users. Figures 1-5 show snapshots from each OPAC modules of the LMS packages. However, there are a few differences, for example, navigation between screens relies solely on the browser's Forward and Back buttons in case of Koha, NewGenLib, OpenBiblio and PhpMyBibli, while Evergreen has internal navigation buttons that more efficiently take the user between title lists, headings lists, and record displays, and between records in a result set. Four OPACs offer an advanced search page with multiple boxes for entering search terms; they are Evergreen, Koha, NewGenLib, and PhpMyBibli.

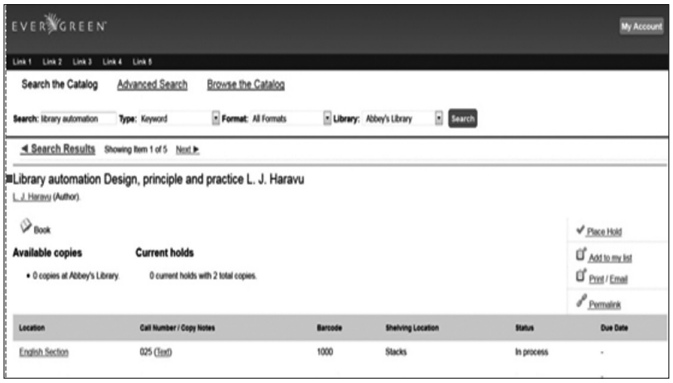

Figure 1. User interface of Evergreen.

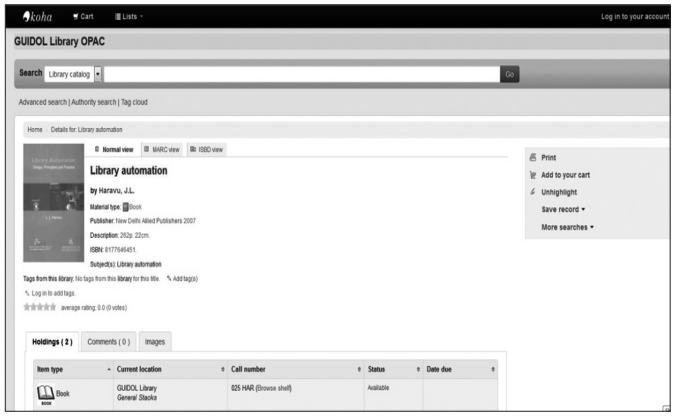

Figure 2. User interface of Koha.

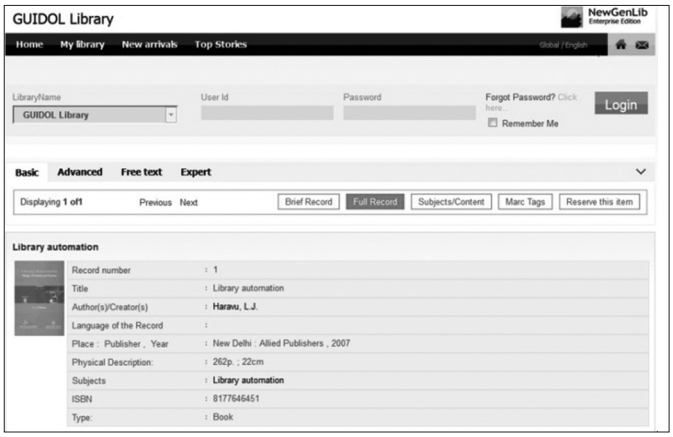

Figure 3. User interface of NewGenLib.

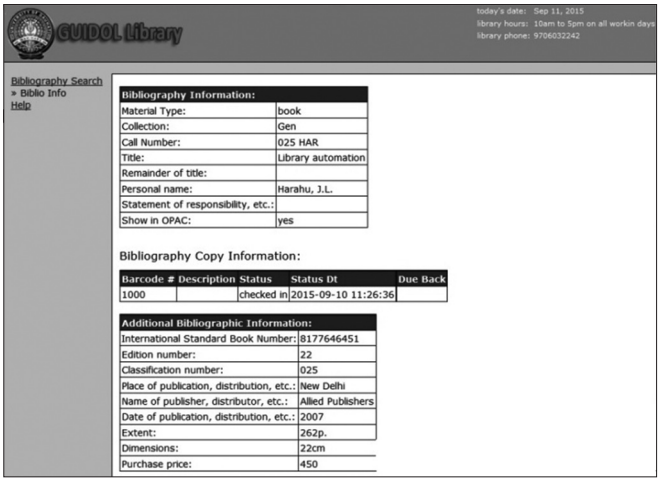

Figure 4. User interface of OpenBiblio.

Figure 5. User interface of PhpMyBibli.

5.3.2 Searching Facility

The present day OPAC exposes their search functionality through two broad approaches—basic search or simple search and advanced search or guided search. The basic search option should allow user to place the search string without defining the field of search or the system should allow the user to browse through filed of choices like title, author, subject, call number, etc.

The advanced search usually enhances search features. The combining of terms from one or more fields with one or more boolean operators, phrase search, global search (any of the words placed in a search string), narrow search (all the words placed in a search string), etc., are the key features expected in advanced search.

5.3.3 Display of Items

It is expected that the search features, irrespective of layout, should lead the user to the appropriate documents of his/her interest among the open source LMS packages. The content of each record varies with the kind of display and the availability of features

like MARC (MAchine-Readable Cataloging) display, ISBD (International Standard Bibliographic Description) display, AACR2 (Anglo-American Cataloguing Rules, Second Edition) display, etc. However, a common feature of all the OPAC is that brief records are displayed showing the title, author, call number, library and location, and circulation status, etc. In some the OPAC it is seen that the displayed fields are hyperlinked to either the full record or related records(s). Author, subject, class number, publisher name, etc are the example of such fields.

5.3.4 Download and Print Record

The features of the OPAC are not limited only to the display of the holding and status of library documents. It is expected to support the processing of the search results according to the need of the user or the library staff. Some of the users may expect the collection list in print form. This leads software packages to incorporate the printing option of the search result in the OPAC.

Most of the open source LMS packages enable options for download of bibliographic records in machine-readable form freely in the OPAC module. Those downloaded records can be imported to another LMS easily and this can reduce human errors, costs and time associated with cataloguing, and the records can be created in a standardised way.

5.3.5 Patron Login

From the OPAC, patrons can log in and access their account from where the patron gets some facilities like reservation or hold library documents, pay fines, suggest a new document to the library for purchase, view and change the personal details, view the checked items, etc.

5.3.6 Web 2.0 Facility

Some open source LMS packages incorporate few web 2.0 features in their OPAC module. RSS (Rich Site Summary, originally RDF Site Summary, often called Really Simple Syndication) is one of such features which are allowed in the OPAC to alert patrons with any updates and additions for items of interest. Search results can be shared in social networking sites like Twitter or Facebook which is also one of the new functionality in the OPAC module of few LMS packages.

5.3.7 Linking Record to External Databases

Search results which can be hyperlinked to the preview of the Google Books, Amazon Books etc. are also a new functionality of the OPAC module. Linking to the Google Books preview helps the patrons to show the book reviews and content summaries of the search results before they enter the stacks.

5.3.8 Comparison of OPAC Functionalities

Key functionalities in OPAC are identified, comparison of the open source LMS packages is done and shown in Table 4.

Table 4. OPAC functionality in open source LMS packages

OPAC functionalities	Evergreen	Koha	NewGenLib	OpenBiblio	PhpMyBibli
Basic search	1	1	1	1	1
Advanced search	1	1	1	1	1
MARC display	1	1	1	0	0
ISBD display	0	1	0	0	1
AACR2 display	0	0	0	0	0
Book jacket display	1	1	1	0	0
Download/save records	1	1	1	0	1
Print records	1	1	1	0	1
Patron login	1	1	1	0	1
Patrons suggestions via OPAC	0	1	1	0	0
Hold/Reserve via OPAC	1	1	1	0	0
RSS delivery of search results	0	1	1	0	1
Share in Social networking sites	0	1	0	0	0
Google books preview	0	1	0	0	0
Link to Amazon books	0	1	0	0	0
Score (out of 15)	**8**	**14**	**10**	**2**	**7**

6. CONCLUSIONS

Table 4 provides the summary of the comparisons in this paper. These comparisons show that the Koha has fourteen out of the fifteen compared functionalities and comes in the top. Its full-fledged functionalities include a simple keyword search box, advance search, user contribution through login, and RSS feeds, linking search results with social networking sites and external databases like Google Books and Amazon Books, etc. NewGenLib falls into second place, providing ten out of the fifteen compared functionalities including a simple keyword search box, advance search, user contribution through login, and RSS feeds, etc. Evergreen and PhpMyBibli, come in third and fourth, providing eight out of the fifteen functionalities and seven out of the fifteen functionalities respectively. OpenBiblio supports only two functionalities out of fifteen and comes in last.

As seen in the comparative study, Koha is a true market leader among the open source LMS products, as in the words of Haravu[10] 'Koha's presence with support services both in the west and increasingly in developing countries will be a serious challenge' for the other open source LMS packages.

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