Research Article

IMPACT OF OPEN SOURCE MOVEMENTS IN THE IMPROVED SERVICES OF MODERN LIBRARIES: A STUDY

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ARTICLE INFO	ABSTRACT
	In this period of transition from the information age to the knowledge society, libraries have much bigger challenges to face. The entire library view has now moved from book collection to a single window knowledge bank. This document discusses the definition and characteristics of open source libraries management software, the selection criteria for the best open source libraries management software, their advantages and limitations. Open source library management software is a solution to reduce these costs. The document briefly describes the functionality of some management software for open source libraries such as Greenstone Digital Library, DSpace, KOHA, E-Prints, NewGenlib, etc., Useful for the development of digital libraries and institutional repositories.

INTRODUCTION

Open source defines method of software development, that harnesses the power of distributed peer review and clearness of progress [1]. This technique helps to provide better quality software's having higher reliability, flexibility with lower cost, and an end to the traditional vendor lock-in. The source code and rights that where normally reserved for copyright holders are now being provided under a free software license that permits developers users to study, change, improve and at times also to distribute the software [2]. There are many different types of open source software solutions nowadays that could be accepted by the library. There is a basic operating system, document processing programs, library management software (LMS) and digital library software.

REVIEW OF LITERATURE

Anjaneya Reddy N M & Lalitha Aswath (2015) [3] this study reveals that Continuous dependence on open source software for Library operations has increased the necessity of managerial skills for managing risks while using the open source software. Here an attempt has been made to identify the risk factors, security measures and strategies for using open source software to manage the library operations effectively. Libraries have to create suitable and adequate environment to deal with risks during selection, implementation and use

thereafter. Morgan (2002) [4] presents definition of open source software and describes the present state of open source software in libraries. He also lists some of the available software for libraries and describes possibilities of use, of open source software in libraries. Reddy & Kumar (2013) [5] describes in brief the features of some of the open source library management software and digital library software like Greenstone Digital Library, DSpace, Fedora, Eprints, Koha, NewGenlib, PhpMyLibrary, OpenBiblio, Avanti, ABCD, Evergreen. Ukachi, Nwachukwu & Onuoha (2014) [6] discuses the relevance of library automation, the characteristic of open source software and issues to be considered in selection of library automation software. They also briefly describe Koha, Evergreen, ABCD, WinISIS, NewGenLib, Emilda, PMB, WEBLIS. Tabusum (2013) [7] stressed on the importance of software in the modern library sevices at her studies. Sivasubramanian [8] examined the access of e-resources through software in libraries and to be ease in retrival.

Objectives

To prepare a comparative study of different library automation software packages.

To find out and rank the more user-friendly OSS based on the comparative study

To compare four digital library software

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To provide a basic idea for selecting a suitable library automation software package

Open Source Movement

In 1998, a group of people claimed that the term "free software" was replaced by open source software (OSS) as a less ambiguous and more comfortable expression for the corporate world. Software developers may want to publish their software with an open source software license, so that anyone can develop the same software or understand how it works. Open source software commonly allows anyone to create a new version of the software, take it to new operating systems and processor architectures, share it with others, or market it. The objective of the open source is to make the product more understandable, editable, duplicable, reliable or simply accessible, as long as it is still marketable. The Free Software Foundation (FSF), which began in 1985, understood the term "free" as "free as in freedom of expression" and not as "free as in free beer". Since a large amount of free software was already (and still is) free, such free software was associated with a zero cost, which seemed anti-commercial. [9]

Library Automation Software

Library automation may be defined as the application of automatic and semiautomatic data processing machines (computers) to perform traditional library housekeeping activities such as acquisition, circulation, cataloguing and reference and serials control. At present, library automation is by far the most commonly used term to explain the automation of library activities using computers. [10].

Many library automation software packages are available, but four most popular software packages only selected for the study evaluation.

Koha

Koha was the first integrated open source library (ILS) system developed in 1999 by Chris Cormack, who works at the computer consulting firm Katipo Communications, for Horowhenua Library Trust (HLT) of New Zealand. KOHA has the distinction of being the first open source integrated library management system, which includes all the main functions related to library administration. It is open source software based on the web and distributed under the general public license. Koha is compatible with Windows and the Linux platform. The first version was launched in 2000. The "KOHA Development Team" offers web hosting for the KOHA library system on your server. KOHA also has the ability to manage digital libraries and electronic resources online and offline. [11]

Evergreen

The Evergreen project develops an integrated open source library system used by more than 1000 libraries around the world. The software, also called Evergreen, is used by libraries to offer their public catalog interface, as well as to manage internal operations, such as circulation, the acquisition of library materials and the exchange of resources between libraries. The Evergreen Project initiated by the Georgia Public Library System in 2006. After the release of Evergreen, it was adopted by several library consortiums in the United States and Canada, as well as in some individual libraries outside of North America. Evergreen is a metadata search engine, Evergreen is a transaction processing engine.

NewGenLib

NewGenLib was developed by Verus Solutions Private Limited based in Hyderabad, India. Verus Solutions is a limited liability company registered with the Ministry of Corporate Affairs of the Indian government. The company was initiated in May 2003.

KIIKM has provided proficiency in the domain for the development of NewGenLib.

The software has the important features. Compatibility with international metadata and interoperability standards. MARC21, MARC-XML, z39.50, SRU / W, OAI-PMH, independent operating system: versions of Windows and Linux available Unicode declaration 4.0, It is easily extensible to support other languages Data, file and restore in any language, Unicode 3.0, RFID integration networks: hierarchical and distributed networks Automatic messaging / instant messaging integrated in various software functions. The letters in the form are configurable and use XML-based Open Office models. Wide use of pattern parameters that allow a simple software configuration to meet specific needs. Multi-user and multiple levels of security, allows digital attachments to metadata [12].

Table 1 General information of Library automation Software

Software	Developer	Licence	Site
Koha	Katipo Communication for Horowhenua Library Trust	GNUGPL	http://koha-community.org/
Evergreen	Georgia Public Library System	GNUGPL	evergreen-ils.org
NewGenLib	Verus Solutions, Hyderabad, India	GNUGPL	http://www.verussolutions.biz

This table reveals that general information about Library automation Software. Koha Developed by Katipo Communication for Horowhenua Library Trust, Evergreen developed by Georgia Public Library System and NewGenLib developed by Verus Solution.

Table 2 Features of Library Automation Software

Softwares	Written in Language	Platform	Useful for	Supported Metadata Standards	Managing various types of Materials (Books, Serials, CD, Audio,Vedio, etc,.
Koha	Perl	Window, Linux, Unix	Small and big libraries	MARC 21 and UNIMARC	Yes
Evergreen	C,Perl, XUL, JS	Linux	Small and Big Libraries	MARC 21, Atom Syndication Format, CSDGM, MODS, Dublin Core, and RSS 2.0.	Yes
NewGenLib	Perl	Window, Linux	Small and big libraries	All metadata Standards	Yes

This table reveals that language of software, platform, useful for big libraries or small libraries, supported metadata standards and managing various types of materials. Koha and Newgenlib software for written in Perl language. And

Evergreen for C, Perl, XUL and JS. This software useful for big libraries and small libraries.

Digital library software

Digital libraries (DLs)/institutional repositories (IRs)/ digital archives are been discussed heavily since 2000. Much Digital library software is available in the world. But three software are selected for this study.

DSpace

Dspace is a common project of MIT libraries and HP laboratories. DSpace is a digital asset management system. It helps to create, index and retrieve various forms of digital content. Dspace is adaptable to the different needs of the community. Interoperability between systems is incorporated and complies with international standards for metadata format. Dspace is an open source technology platform that can be customized or extended.

The institutional repository is a set of services that a research university, institution, and organization offer to its the world members for the management and dissemination of digital materials created by the institution and its community members.

E-Prints

EPrints is free software developed by the University of Southampton, England. The ePrints @ IISc repository collects and distributes the search result created by the IISc search community in digital format. It allows the Institute community to deposit their preprints; publish impressions and other academic publications using a web interface and organize. [13]

Greenstone

The GSDL software is open source software available at the New Zealand Digital Library under the terms of GNU, general public library license. The Greenstone CD-ROMs have been published by the United Nations and other distribution agencies in developing countries. It fits Windows (3.1 / 3.11, 95/98 / me, NT / 2000) and UNIX (Linux Sun OS). Each of these systems can be used as a web server. The collection can be updated and the new one can be put online at any time without closing the system. [14]

Open source digital library software's Comparison

Table 3 Object Model

S.NO	Software	Object Model
1	Dspace	The basic entity in DSpace is the aspect, which contains both metadata and digital content. The Dublin Core (DC) qualified metadata fields are stored in the article, while other sets of metadata and digital content are defined as bit streams and classified as item packages.[15]
2	Greenstone	The basic entity in Greenstone is the document, which is expressed in XML format. The documents are linked to one or more resources that represent the digital content of the object. Each document contains a unique document identifier, but there is no support for persistent resource identifiers.
3	Eprints	The basic entity in EPrints is the data object, which is a record that contains metadata. One or more documents (files) can be linked to the data object. Each data object has a unique identifier.

Table 4 Metadata and digital content storage

S.NO	Software	Metadata and digital content storage
1	Dspace	Dspace stores qualified DC metadata in a relational database (PostgreSQL or Oracle). Other sets of metadata and digital content are represented as bit streams and stored in the file system. Each bit stream is associated with a specific bistream format. A support level is defined for each bistream format, which indicates the retention level for the specified file format.
2	Greenstone	Both documents and resources are stored in the file system. The metadata is defined by the user and stored in documents using an internal XML format. The metadata fields in EPrints are user-defined.
3	Eprints	The data object, which contains metadata, is stored in a MySQL database and the documents (digital content) are stored in the file system.

Table 5 Search and browse

S.NO	Software	Search and Browse
1	Dspace	Provides indexing for the base metadata set (qualified DC) by default, using the relational database. Indexing of other defined metadata sets is also provided using the Jakarta Lucene API. Lucene admits field investigation, detention and interruption of words. The research may be limited to one collection or community. In addition, navigation is offered by default in the fields of title, author and date.
2	Greenstone	Indexing is offered for text documents and specific metadata fields. Search functionality provided for the sections defined in a document (Title, Chapter, and Paragraph) or throughout the document. The search for distortion and sensitivity of uppercase and lowercase is also available. Open source application management Gigabyte (MG) is used to support indexing and searching. Navigation catalogs can be defined for specific fields using a hierarchical structure.
3	Eprints	The indexing is compatible for each metadata field, using the MySQL database. The indexing of the complete text is compatible with the selected fields. Combined field research and free text search are provided to the end user. Navigation is provided using the specified fields (for example, title, author and subject).

Table 6 User interfaces

S.NO	Software	User Interfaces
1	Dspace	A default web user interface is provided for the end user to explore a collection, view the qualified DC metadata of an item, and navigate to its scalpels. Navigation through an element is supported by structural metadata that can determine the order of complex content (such as book pages or web pages). By default, a search interface is provided that allows the user to search using keywords.
2	Greenstone	The default Web user interface provides navigation and search in collections, navigating hierarchical objects (such as books) using the table of contents. Submission of documents or search results may vary depending on the specified XSLT.
3	Eprints	The web user interface provides the scan based on the selected metadata fields (usually subject, title or date). Navigation can be hierarchical for object fields. The search environment allows the user to limit the search query by using multiple fields and select values from the lists.

Table 7 Access control

S.NO	Software	Access Control
1	Dspace	It admits users (electronic people) and groups that have different rights. Authentication is provided by the user's password, X509 or LDAP certificates. The access control rights are maintained for each element and define the actions that a user can perform. These actions are: read / write the bit streams of an object, add / remove packages of an object, read / write an element, add / delete an object in a collection. The rights are based on a default denial policy.
2	Greenstone	A Greenstone user belongs to one of two predefined user groups: an administrator or a collection generator. The first group of users has the right to create and delete users, while the second group creates and updates collections. End users have access to all collections and documents.
3	Eprints	Registered users in EPrints can create and edit objects. Users logged in using the username and password pair.

Table 8 Level of customization

S.NO	Software	Level of customization
1	Dspace	Although DSpace has a flexible object model, it is not as open in constructing very different objects with independent metadata sets because of its database-oriented architecture. The user interface is fixed and only provides minor submissions. Another disadvantage is the complete support of only specific file formats such as digital content.
2	Greenstone	It provides customization for the presentation of a collection based on XSLT and agents that monitor specific DL actions. The architecture of Greenstone provides (i) a back-end that contains collections and documents whenever the services administer them and (ii) a web-based front-end that is responsible for presenting collections, documents and their environment.
3	Eprints	The data objects in EPrints contain user-defined metadata. You can write additional components to export data objects in different text formats. A Perl core API is provided for developers who prefer to access the basic functionality of DL.

Table 8 General information of Digital Library Software

Software	URL	Developed by	Downloaded
GSDL	http://www.GSDL.org 3	New Zealand Digital Library GSDL-users@list. scms Project with UNESCO and the waikato.ac.nz Human Info NGO	Free
Dspace	http://www.dspace.org/ 3	Massachusetts Institute of sales@dspace.com.au Technology (MIT) Libraries and Hewlett-Packard	Free
E-prints	http://software.eprints.org 3	University of Southampton	Free

Table 9 Searching parameters provided by selected open source software

Software	Title	Author	Subject	Keyword	Format	Class no	Newspaper cliping	Manuscript/Rare collection	Points gained
GSDL	✓	✓	✓	✓	✓	✓	✓	✓	14
Dspace	✓	✓	✓	✓	X	x	✓	✓	10
E-prints	✓	✓	✓	X	X	x	x	x	7

CONCLUSION

Koha is frequently used and developed during last few years, has better support. Evergreen is still a young software and its community will grow in time, Even NewGenLib is also just equal to Koha while it is also developed very soon in India. Digital Library software Dspace and Greenstone were mostly used in the Digital Libraries. Librarians must understand the open source license to promote the use of open source software. This is the only way to face the challenges of commercial software in the market. In addition, it will increase the autonomy and professional control over software solutions. In conclusion, the advent of open source library software has revolutionized the field of book resource management and information, and has become a popular choice for most librarians and information professionals due to its many advantage and useful functions.

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