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Low Cost Library Automation And Digitalization: A Brief Study

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Abstract: ***In the 21st century library automation is needed to serve the library user of any kind of library. Library Automation is boon for the LIS professionals and demand of the accordingly and make them competent enough to survive in this era. It helps to reduce job stress and provide fast services to the users ahead the wall also. In this paper I have divided the content into three major parts i.e. Library Management Software, Digital Library Software and Library Website. In this paper I have presents a study on different library automation software and tools which are freely available or at minimum cost.***

Keywords: ICT, Free and Open Source Software (F/OSS), Library Automation, Library Software, Cost effective

I. INTRODUCTION

With the advancement of Information and Communication Technology (ICTs) in the society there is a huge pressure on the Library and Information Science (LIS) professionals to shift or change traditional library into the fully automated library for their survival in present era.

Library automation is the use and implementation of Information and Communication Technology (ICTs) in the library house-keeping operations i.e. Acquisition, Cataloguing, Online Public Access Catalogue **(**OPAC**)** & Web OPAC, Indexing, Abstracting, Circulation, Serials Management, Reference, CAS, SDI, electronic source of library and their dissemination etc. simply it means provide maximum output with minimum effort with the help of Information and Communication Technology.

RELEVANCE OF LIBRARY AUTOMATION

- ✓ It helps to provide its services with the effectively, qualitatively and speedily.
- ✓ Accessible to remote users or distance user.
- ✓ Accessible to round the clock i.e. 24x7x365.
- ✓ Easy and efficient management Information Explosion.
- ✓ Dissemination of information products and services.
- ✓ Better use of library resource sharing among the users.
- ✓ Save the time of its users.
- ✓ Improves the management of physical and financial resources

We all aware that Library is non-profit organization, therefore, to meet the challenges of digital era and to cope up with financial problem in the library and to reduce the cost of library automation the responsibility comes to the shoulder of Library and Information Science professional to automate the library and its services by using and implementation of Free and Open Sources Software. Library automation requires the implementation of hardware and software.

Library software comes in two different models:

- ✓ Proprietary Software: It requires the payment or subscription fee and the sources is restricted and no one is allowed to modify, fix, add or change the code in any form and any changes without permission fall under legal action. The only benefit of the proprietary software is you can customize it as per your requirement with the help of the company of proprietary rights.
- ✓ Free Open Source Software: Open Source Software completely free and source code is open and any one is allowed to modify, fix, add or make change in code in any form as per the needs. The only disadvantage of the open source software is if the library professional does not know how to change and modify the programe or source code than is not possible to customize it as per the need of library.

Definitions of Proprietary and Open Source Library Automation Software's:

According to Techopedia Proprietary Software: Proprietary software is primarily commercial software that can be bought, leased or licensed from its vendor/developer. In general, proprietary software doesn't provide end users or subscribers with access to its source code. It can be purchased or licensed for a fee, but relicensing, distribution or copying is prohibited. Most software is proprietary software and is produced by an independent software vendor (ISV). The restrictions or conditions imposed by the vendor/developer on proprietary software is elaborated within the software's end-user license agreement (EULA), terms of service agreement (TOS) or other related use agreements. The user/organization must accept the agreement prior to installing or using the software. The software developer/vendor can take legal action against the end-user/organization for violating the EULA or TOS.

ACCORDING TO WEBSTER DICTIONARY

Proprietary software is any software that is copyrighted and bears limits against use, distribution and modification that are imposed by its publisher, vendor or developer. Proprietary software remains the property of its owner/creator and is used by end-users/organizations under predefined conditions. Proprietary software may also be called closed-source software or commercial software.

Definitions Open source Software:

According to Sherry Lochhaas (2010), "Open source software is software that provides access to the source code, meaning that users are free to see how the product is made.

Free software is a term coined by Richard Stallman, programmer in MIT Artificial Intelligence Lab. According to him, free in free software means the freedom one can get from using this software. This software could be used, modified, redistributed without any permission required. Free software should satisfy the following criteria in order to be called as free software;

- ✓ The freedom to run the program for any purpose.
- ✓ The freedom to study how the program works and modify it.
- ✓ The freedom to redistribute copies.
- ✓ The freedom to distribute the modified copies so as to help the entire community.

II. METHODOLOGY

During the process of writing this article Authors have study in deep each and every website to who deals with the library automation and organize the relevant information in this article. Authors also visited different websites to search related work done in the past to reduce the duplication of the information and visited various libraries of national and international repute to know the condition of library automation and digitalization and software hardware being used.

This article is deal with the three major parts of library automation and digitization

- ✓ Library automation software.
- ✓ Digital library software.
- ✓ Library websites.

The automation of any library and its services can be divided into three major steps which are;

A. LIBRARY MANAGEMENT SOFTWARE

Integrated Library Management Software (ILMS) helps to manage all the housekeeping job of the library at the single platform. There are too many library management software available in the market which can be selected as per the need and goal of any organization. Here I am trying to mention the detail of library automation software which used specially in India may develop in other country but in India it is being used frequently. The type of mention software's would be open source or commercial.

- ✓ ABCD (Automatización de Bibliotecas y Centros de Documentación) – (Open source Software)
- ✓ DEL-PLUS – (Commercial)
- ✓ e-Granthalaya- (Free Software)
- ✓ Evergreen - (This is an open source Integrated Library System)
- ✓ Koha – (Open Source Software Packages)
- ✓ LibSys 7 – (Completely Commercial)
- ✓ NewGenLib – (Open Source Software under GNU GPL)
- ✓ OpenBiblio – (Software is free)
- ✓ PMB (formerly PhpMyBibli) – (open source integrated library system)
- ✓ SOUL 2.0 – (Software of University Library -Proprietary software)
- ✓ WEBLIS – (WEBLIS is a free of charge Web based Library Integrated system based on CDS/ISIS)

B. DIGITAL LIBRARY SOFTWARE

Digital library management software are those software which help to organized, made accessible the digital collection, resources 24x7x365 and also boundary less with the help of internet, with interactive and user friendly interface. A digital library is a digital collection of real and virtual resources which can be access locally and globally. These are the software packages for the digital library;

- ✓ CDSWare
- ✓ D space : (Open Source Software)
- ✓ E-prints : (Open Source Software)
- ✓ Fedora
- ✓ Greenstone: (The Greenstone digital library software is an open-source system for the construction and presentation of information collections)

C. WEBSITE

Website simply means collection or set of related and systematically organized web pages with home page which can be accessible with the help of internet form anywhere timely and also without boundary restriction. The free and open source software helps to design and develop library websites.

- ✓ Blog by blogger.com
- ✓ Wordpress

Library Management Software with the important features:

a. ABCD (AUTOMATIZACIÓN DE BIBLIOTECAS Y CENTROS DE DOCUMENTACIÓN)

This is web-based integrated library management software comprising the main basic library functions. The main characteristics of ABCD are the coverage of the main library functions, its web centrality and its development and maintenance under the methodology of Free and Open Source Software

Main features

- ✓ Definition of any number of new databases (similar to WINISIS), which includes: FDT, PFT, FST, and worksheets directly on the Web, or copying from existing ones either from the Web or from WINISIS on a local hard disk,
- ✓ Cataloguing of books and serials, independently of the format: MARC, LILACS, AGRIS, etc.
- ✓ End-user searching (OPAC),
- ✓ Library services like SDI, barcode printing, quality control, etc.
- ✓ Compatible with CDS/ISIS database technology for the bibliographic databases, i.e. reading ISIS-databases and making use of ISIS Formatting Language for producing output and indexing of records;
- ✓ Run on both Windows and Linux platforms;
- ✓ Use of MARC-21 cataloguing formats and other current standards or protocols (Dublin Core, METS, Z39.50...).
- ✓ Published as Free and Open Source Software (FOSS) with the accompanying tools for the developer community;
- ✓ Multi-lingual

URL: http://reddes.bvsaude.org/projects/abcd

b. DEL-PLUS

Software designed and developed exclusively to work under all kinds of libraries. This software was designed and developed by Developing Library Network (DELNET), New Delhi exclusively to work under all kinds of libraries. It also has an OPAC end and follows internationally recommended standards and formats such as MARC 21. It is suitable for small and medium size libraries which have collections upto one lakh holdings. It also supports Barcode. This software is easy to work with and comprises the following modules: Acquisition, Cataloguing, Circulation, OPAC, Administration, Export/Import, Authority Control, Article Indexing, Report Generation and Stock Verification.

URL: http://delnet.nic.in/software-development.htm

c. E-GRANTHALAYA

This is Integrated Library Management commercial Software from National Informatics Centre, (NIC), Ministry of Electronics and Information Technology, Government of India. The software has been developed by a team of experts from software as well as Library and Information Science discipline. The software provides built-in Web OPAC interface to publish the library catalogue over Internet. The software is UNICODE Compliant thus, supports data entry in local languages. Latest version of E-Granthalaya i.e. Ver.4.0 is a 'Cloud Ready Application' and provides a Web-based data entry solution in enterprise mode with a centralized database for cluster of libraries. E-Granthalaya 4.0 uses PostgreSQL - an Open Source DBMS as back-end database solution. E-Granthalaya 4.0 is made available in NIC National Cloud for Government Libraries Only on request basis with free hosting of application and databases for online access.

URL: http://egranthalaya.nic.in/

d. EVERGREEN SOFTWARE

This is an open source Integrated Library System (ILS): The Evergreen community is pleased to announce the beta release of Evergreen 2.12 and the beta release of OpenSRF 2.5. This release includes the implementation of acquisitions and booking in the new web staff client in addition to many web client bug fixes for circulation, cataloguing, administration and reports.

Special features are:

Improvements to the bibliographic fingerprint to prevent the system from grouping different parts of a work together and to better distinguish between the title and author in the fingerprint;

The ability to limit the “Group Formats & Editions” search by format or other limiters;

Improvements to the retrieval of e-resources in a “Group Formats & Editions” search; and the ability to jump to other formats and editions of a work directly from the record summary page.

The removal of advanced search limiters from the basic search box, with a new widget added to the sidebar where users can see and remove those limiters.

A change to topic, geographic and temporal subject browse indexes that will display the entire heading as a unit rather than displaying individual subject terms separately.

Support for right-to-left languages, such as Arabic, in the public catalog. Arabic has also become a new officially-supported language in Evergreen.

A new hold targeting service supporting new targeting options and runtime optimizations to speed up targeting.

In the web staff client, the ability to apply merge profiles in the record bucket merge and Z39.50 interfaces.

The ability to ignore punctuation, such as hyphens and apostrophes, when performing patron searches.

Support for recognition of client time zones, particularly useful for consortia spanning time zones.

With release 2.12, minimum requirements for Evergreen have increased to PostgreSQL 9.3 and OpenSRF 2.5

URL: https://evergreen-ils.org/evergreen-2-12- beta-is-released/

e. KOHA

The first open source integrated library system Originated in New Zealand by Katipo Communications Ltd. and maintained by a team of volunteers from around the globe.

Since the original implementation in 1999, Koha functionality has been adopted by thousands of libraries

worldwide, each adding features and functions, deepening the capability of the system. With the 3.0 release in 2005, and the integration of the powerful Zebra indexing engine, Koha became a viable, scalable solution for libraries of all kinds. LibLime Koha is built on this foundation. With its advanced feature set, LibLime Koha is the most functionally advanced open source ILS on the market today.

Easy-to-use circulation policies, strong patron management, intuitive navigation, and extensive permissions for staff accounts.

Parent-child relationship for patron records, as well as a 'copy' patron feature to quickly add families.

A Clubs and Services feature that allows libraries to manage reading groups, book clubs, and other community outreach programs. This feature is easily managed by library staff.

Extensive support for holds, including an option to 'suspend' and 'reactivate' a hold, an option to place holds from a patron's OPAC account, an option to allow staff to re-organize the holds queue, and an option to place holds at either the title or item level.

Enhanced matching policy rules for the 001 and 035 tags, allowing libraries to update older records with a newer version.

Libraries to 'undo' entire import batches from the catalog in a single click, rather than having to delete on a one-by-one basis.

SIP2 configuration for a wide variety of vendors and their products, including ITG, 3M, EnvisionWare, Talking Tech, Overdrive, TechLogic, and Librarica. LibLime Koha also works with EzProxy as a dual authentication source for remote database access.

OPAC, staff, administrative features and self-checkout interfaces are all based on standards-compliant World Wide Web technologies--XHTML, CSS and Javascript--making LibLime Koha a completely Web-based solution.

URL:http://www.koha.org/about:
http://katipo.co.nz/software/koha.html

f. LIBSYS 7

A true realization of Lib 2.0, LIBSYS7 delivers satisfaction for both patrons and library staff. It gives end to end manageability of the library operations through its comprehensive modules. As a Web based solution, it provides platform independence. The interactive features in the industry‟s most advanced OPAC makes LIBSYS7 most rewarding choice for all the Librarians. LIBSYS7 is a product aiming most convenient and pleasing library experience through its value added features.

LIBSYS7 competency:

GWT based GUI with multitasking feature

Unicode Support

Federated Searching with customizable look & feel

User notification through E-mail and SMS

RSS feeds and integration with Google Books, Book Finder, etc.

Interactive features like online reviews, ratings, renewals, reservations etc. to deliver patron satisfaction.

Standards Compliance: MARC21, Unicode, SRU/SRW, Z39.50, NCIP (NISO), SICI Barcode

URL: http://www.libsys.co.in/offerings-libsys7.html

g. NEWGENLIB (NGL)

NGL is an outcome of collaboration between Verus and Kesavan Institute of Information and Knowledge management. On 9th January 2008, NewGenLib was declared as Open Source Software under GNU GPL Licence by Verus Solutions. It is estimated that 2,500 libraries across 58 countries are using NewGenLib as their Primary integrated library management system

Special Features:

Functional modules are completely web based. Uses Java Web Start™ Technology

Compatibility - Complies with international metadata and interoperability standards: MARC- 21, MARC-XML, z39.50, SRU/W, OAI-PMH

z39.50 Client for federated searching

Internationalized application (I18N) Unicode 4.0 complaint

Easily extensible to support other languages

Data entry, storage, retrieval in any (Unicode 3.0) language

RFID integration

Networking – Hierarchical and Distributed networks

Automated email/instant messaging integrated into different functions of the software

Form letters are configurable and use XML-based Open Office templates

Extensive use of set up parameters enabling easy configuration of the software to suit specific needs, e.g., in defining patron privileges

Supports multi-user and multiple security levels

Allows digital attachments to metadata

URL:http://www.verussolutions.biz/web/content /features

h. OPEN BIBLIO

This is an easy to use, automated library system written in PHP containing OPAC, circulation, cataloguing, and staff administration functionality.

The software is free. (OpenBiblio is available: http://sourceforge.net/projects/obiblio/files/ OpenBiblio/0.7.2

Key Feature of OpenBiblio 0.7.1

Updated to be compatible with MySQL 5.5.

Updated for PHP 5.3.x deprecated features.

Updated for PHP 5.4.0 backward incompatible changes.

Fixes for bugs in OpenBiblio features.

New and changed features: Check In shows hyperlinked member name (with Days Late and outstanding Account Balance), Override Due Date, Renew All, Offline Circulation, Bibliography Checkout History, Custom Copy Fields, Copy Barcode Number validation less restrictive and optional, new search types Call Number and Keyword, OPAC search and view exclude nonpublic fields, new parameters for reports Copy Search and Popular Bibliographies, new reports, new layouts for media labels and member cards.

URL: http://obiblio.sourceforge.net/

i. PMB 4.2 (FORMERLY PHPMYBIBLI)

An entirely free and constantly evolving SIGB. PMB, the free tool that capitalizes knowledge and makes it accessible.

Key Features:

Import / export in UNIMARC, XML, import BnF by Z3950

Custom cataloging grids

Management of periodicals

Advanced membership and loan management

Selective Dissemination of Information and RSS Feeds

Fund statistics and usage

OPAC 2.0

URL: http://www.sigb.net/

j. SOUL 2.0

Software for University Libraries (SOUL) is the state-of-the-art integrated library management software designed and developed by the INFLIBNET Centre based on requirements of college and university libraries. It is user-friendly software developed to work under client-server environment. The first version of software i.e. SOUL 1.0 was released during CALIBER 2000. The latest version of the software i.e. SOUL 2.0 was released in January 2009. The database for new version of SOUL is designed for latest versions of MS-SQL and MySQL (or any other popular RDBMS). SOUL 2.0 is compliant to international standards such as MARC 21 bibliographic format, Unicode based Universal Character Sets for multilingual bibliographic records and NCIP 2.0 and SIP 2 based protocols for electronic surveillance and control.

Major Features and Functionalities

UNICODE based multilingual support for Indian and foreign languages;

Compliant to International Standards such as MARC21, AACR-2, MARCXML;

Compliant to NCIP 2.0 protocol for RFID and other related applications especially for electronic surveillance and self check-out & check-in;

Client-server based architecture, user-friendly interface that does not require extensive training;

Supports multi-platform for bibliographic database such as My SQL, MS-SQL or any other RDBMS;

Support online copy cataloguing from MARC21 supported bibliographic database;

Provides default templates for data entry of different type of documents. User can also customize their own data entry templates for different type of documents Supports ground-level practical requirements of the libraries such as stock verification, book bank, vigorous maintenance functions, transaction level enhanced security, etc.;

Supports authority files of personal name, corporate body, subject headings and series name;

Supports data exchange through ISO-2709 standard;

Strong online and offline support by e-mail, chat and through dedicated telephone line during office hours; and

Available at an affordable cost with strong institutional support.

URL: http://www.inflibnet.ac.in/soul/

k. WEBLIS

WEBLIS is a free-of-charge Web based Library Integrated System based on CDS/ISIS.The system has been developed by the Institute for Computer and Information Engineering (ICIE), Poland, based on their experience in building library systems for international organizations such as FAO, IFAD and GTZ. WEBLIS runs through the WWW-ISIS engine, also developed by ICIE. The current version of WEBLIS, available in English, with following modules:

Cataloguing system

OPAC (search)

LOAN module

Statistical module

URL: http://portal.unesco.org/ci/fr/ev.php

III. DIGITAL LIBRARY SOFTWARE/ INSTITUTIONAL REPOSITORY SOFTWARE PACKAGES

- ✓ CDSWare (CERN Document Server Software: the integrated digital library): In 1993, the CERN Preprint Server started its life on the Web, and mostly used as an institutional repository", with two original collections, the CERN preprints and a SCAN series that was composed of physics papers received from the whole world and scanned by the CERN library. In 1996, it became the CERN Library server (weblib), using the same software to provide access to periodicals, books and most of the material kept in the library. In 2000, multimedia data, like photos, posters, brochures and videos produced at CERN were integrated in a new version of the application, called the CERN Document Server Software: CDSware. This package was made OAI-compliant and distributed in many places. It also started to be used in 2004 as a document management system by the CERN Directorate to handle all the incoming and outgoing documents passing by directorate offices. Presently, the CDSware package can be used either as a general document management solution, a library system or an institutional repository. New developments are carried out through a partnership between CERN and EPFL (École Polytechnique Fédérale de Lausanne), and the software is regularly enriched with patches received from external contributors.
  Source: https://cds.cern.ch/record/853565/files/open-2005-018.pdf
- ✓ DSpace (Open Source Digital Library System) This software of choice for academic, non-profit and commercial organizations building open digital repositories. It is free and easy to install "out of the box" and completely customizable to fit the needs of any organization. DSpace preserves and enables easy and open access to all types of digital content and data sets.
  URL: http://www.dspace.org/introducing
- ✓ E-prints Archive Software (EAS) As the first professional software platform for building high quality OAI-compliant repositories, E-Prints is already established as the easiest and fastest way to set up repositories of open

access research literature, scientific data, theses, reports and multimedia. E-Prints 3 is a major leap forward in functionality, giving even more control and flexibility to repository managers, depositors, researchers and technical administrators.
URL: http://www.eprints.org/uk/index.php/eprints-software/

- ✓ FEDORA 4.0 (Flexible Extensible Digital Object Repository Architecture) Fedora is a robust, modular, open source repository system for the management and dissemination of digital content. It is especially suited for digital libraries and archives, both for access and preservation. It is also used to provide specialized access to very large and complex digital collections of historic and cultural materials as well as scientific data. Fedora has a worldwide installed user base that includes academic and cultural heritage organizations, universities, research institutions, university libraries, national libraries, and government agencies.
URL: http://fedorarepository.org/about
- ✓ Greenstone Digital Library Software: Greenstone is produced by the New Zealand Digital Library Project at the University of Waikato, and developed and distributed in cooperation with UNESCO and the Human Info NGO. It is open-source, multilingual software, issued under the terms of the GNU General Public License. The latest version of Greenstone 3.07 released September 9th, 2015. Aim of the Greenstone software is to empower users, particularly in universities, libraries, and other public service institutions, to build their own digital libraries. Digital libraries are radically reforming how information is disseminated and acquired in UNESCO's partner communities and institutions in the fields of education, science and culture around the world, and particularly in developing countries.
URL: http://www.greenstone.org/

IV. WEBSITE

Website simply means is collection of pages which is accessible with the help of internet form anywhere. Website plays a very important role in marketing of LIS products and services. LIS professionals able to provide the numbers of services with the help of websites such as OPAC (within campus) WebOPAC (on internet), SDI, Alerts services etc. Designing, developing and maintaining of website is also a costly venture and time taking job. LIS professional must have a sound knowledge of designing software such as coral draw, Photoshop, illustrator, Dreamweaver, FrontPage, Joomla etc and some programming language such HTML, Java, JavaScript, etc There are also free and open source (F/OOS) available which is very easy to run and required basic knowledge of computer to run such type of software such as use of Blog by blogger.com and wordpress etc

- ✓ Blog (free publishing) A blog is a discussion or informational website published on the World Wide Web consisting of discrete, often informal diary-style text entries posts are typically displayed in reverse chronological order, so that the most recent post appears first, at the top of the web page. Information is stored in reverse chronological order. 3.2
- ✓ Blogger is a blog-publishing service that allows multi-user blogs with time-stamped entries. It was developed by Pyra Labs, which was bought by Google in 2003. Generally, the blogs are hosted by Google at a sub-domain of www.blogspot.com. Blogs can also be hosted in the registered custom domain of the blogge. The person who keeps the blog is known as blogger (Wikipedia)
- ✓ Wordpress 4.7.3: Wordpress is a free publishing software and content management system (CMS) that is popular in America. The software is open-source allowing developers to create a wide array of plug-ins, themes and widgets. Wordpress is widely considered easy to use and is the CMS of choice for almost 75 million websites. WordPress 4.7.3 is now available. There are two versions of the software. One version is hosted on a cloud and accessed via the Wordpress.com site. The other (ww.wordpress.org) is available for download onto a private server or host. Technical and community support is provided by Wordpress and the Wordpress forums.
URL: http://www.investopedia.com/terms/w/wordpress-cms.asp

V. CONCLUSION/ RECOMMENDATIONS

This paper explains how library professional can automate the library with free and open sources software (F/OSS) which are available in the market freely or at very low cost. From the above article the conclusion can be drawn that F/OSS are secured, low cost and customizable as per the need and goal of the organization. F/OSS software has same feature compared to proprietary software and wider use in making the world less dependent on commercial software so LIS professionals should come forward to use and implementation of F/OSS to perform its various housekeeping activities of library. F/OSS will help to overcome the finance problem and reduce the level of stress of the staff and make library available 24x7x365 locally and globally.

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