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Open Source Software for Academic Libraries-The Creative Librarian

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Abstract:

The 21st century is called as knowledge era and librarians are the heart of this so called knowledge society. Today's libraries are facing the challenges of integrating the traditional and the emerging information paradigm. The current information environment unequivocally prompts libraries to leverage on the latest digital technologies towards building practical digital libraries and in setting up dynamic electronic information systems. Digital library software, a comprehensive, open-source system for the construction and presentation of information collections. Collections built with Open Software Sources offer effective full-text searching and metadata-based browsing facilities that are attractive and easy to use. Moreover, they are easily maintainable and can be augmented and rebuilt entirely automatically. With many Open Source Software applications now available for library and information management, Organizations have a new option for acquiring and implementing systems, plus new opportunities for participating in OSS projects. While, there are several resources and tools available before us on the internet, choosing the right tool and the authentic resource becomes a herculean task. Libraries today face the unprecedented challenge of managing an array of content spread across a host of publication types and in a rapidly proliferating mix of formats. Software's now-a-days have become the life line of modern day organizations.

Keywords: Digital library, open source software, awareness, OPAC, distribution, license, technology

1. Introduction

Digital libraries enable the creation, organization, maintenance, management, access to, sharing and preservation of digital document collections. Digital libraries are being created today for diverse communities and in different fields: such as education, science, culture, development, health, governance and so on. Library automation has helped to provide easy access to collections through the use of computerized library catalogue such as On-line Public Access Catalog (OPAC). Digital libraries differ significantly from the traditional libraries because they allow users to gain an on-line access to and work with the electronic versions of full text documents and their associated images. The collection becomes searchable, browsable, and maintainable. Each collection, prior to presentation, undergoes a "building" process that, once established, is completely automatic. This process creates all the structures that are used at run-time for accessing the collection. Searching is based on various indexes, while browsing is based on various metadata such as title and author; support structures for both are created during the building operation. Users can search for documents using any combination of words, and receive an ordered list of documents whose full text included those words, along with hyperlinks back to the original documents. There are several ways for users to find information, although they differ between collections depending on the metadata available and the collection design. Rich browsing facilities can be provided by manually linking parts of documents together and building explicit indexes and tables of contents. A home page allows you to select a collection; in addition, each collection's "about" page gives information about how the collection is organized and the principles governing what is included.

2. What Are Digital Libraries?

Digital library refers to a collection that constitutes electronic resources, accessible through the World Wide Web. It often contains electronic versions of books, photographs, videos that are owned by a "physical" library. Open source digital library software presents a system for the construction and presentation of information collections. It helps in building collections with searching and metadata-based browsing facilities

Smith (2001) defined a digital library as an organized and focused collection of digital objects, including text, images, video and audio, with the methods of access and retrieval and for the selection, creation, organization, maintenance and sharing of collection"

"Digital Libraries are organization that provide the resources, including the specialized staff to select, structure, offer intellectual access to interpret, distribute, preserve the integrity of and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities." (DLF2001)

Witten and David (2003) defined Digitization as the process of taking traditional library materials that are in form of books and papers and converting them to the electronic form where they can be stored and manipulated by a computer.

According to Clifford Lynch (1995) “digital library is a system of providing a community to user with coherent access to a large organized repository of information and knowledge.”

Fox (1998) A collection of digital objects, including text, video, and audio, along with methods for access and retrieval, and for selection, organization and maintenance of the collection

(Akscyn and Witten, 1998). Lesk (1998) views digital libraries as “organized collections of digital information,” and wisely recommends that they articulate the principles governing what is included and how the collection is organized

2.1. Why Digitization?

There are three main needs for digitization

- To preserve the Documents: That is to allow people to read older or unique documents without damage to the originals.
- To make the documents more accessible: This is to serve the existing users better; e.g. to allow the users to search the full text of the documents or to serve more users than envisaged in remote locations, example, more than one person at a time.
- To reuse the documents. It means to convert documents into different formats; for example to use images in a slideshow and to adopt the content for a different purpose.

3. Characteristics of Open Source Software

OSS has many characteristics the important ones are:

- It is generally acquired freely
- Manufacturer or developer has no right to claim royalties on the distribution or use
- Source code is accessible to the user and distributed with the software
- No denial to an individual or to a group to access source code of the software
- It has provision of modifications and derivations under the programme’s original name
- Rights of facilities attached to the programme must not depend on the programme’s being part of a particular software distribution
- Licensed software cannot place restriction on other software that is distributed with it
- Distribution of License should not be specific to a product and License should be technology neutral,

4. Key Points of Successful Adaption of OSS in Libraries

Libraries are adapting Open Source Software as a way to minimize the huge costs of commercial products and as a viable alternative to the proprietary library automation/digitization software. Open Source Software certainly appears to give libraries more control over technological choices and an ability to facilitate their users in multiple means. Reasons for the success of open source software’s

- Accessibility - The OSS are available freely and either can be downloaded from the Web or from the organization. The many people use established communication channels and co- operation methods and make the OSS available to the community.
- Flexibility -Many OSS projects integrate a large number of updatation with very different emphasis and background. This facilitates the understanding for special requirements and, at the same time, offers the potential to quickly implement needed adjustments.
- Speed - The speed by which there is reaction to problems, errors or security leaks of the software is legendary. A large group of people that want to make a product successful immediately undertake the tasks and test new versions, is significantly faster and more successful than the proprietary competitors.
- Motivation-OSS developers are (experience themselves) part of a community that works on a collaborative success (- product). Often they are, by the way, no part-time hobby developers but professional developers that create OSS full-time. Also, the standard for governmental financed projects to provide the resulting software cost-free for others (that does not necessarily mean OSS or free software), supports the motivation

5. Features of Open Source Software

- Unrestricted distribution-Users can distribute or sell the software without paying royalties
- Source code distribution- The source code of the entire open source product must be easily modifiable.
- Modifications-The license allows modifications and its term remain unchanged for distribution of improved version
- Author’s source code integrity-If the license allows patch file distribution along with the original source code a user cannot modify the code and distribute it except by giving new version a new name
- No personal discrimination-No person or group shall be discriminated against open source product distribution
- No restriction on application-open source software can be used in any field and for any purpose
- License distribution- The privileges attached to the original program extend to all who receive the program
- License must not be product specific- the rights associated with a license extend to products extracted from a larger software aggregate

- No restriction on other software-No restrictions are allowed on distribution of open source products bundled with products developed on other software platforms
- Technology neutrality-License should not be issued on the basis of the specific technology involved.

6. Criteria for Selection and Evaluation of OSS

Important points should be taken into consideration while choosing an OSS are:

- Reputation of the software
- Monitor ongoing efforts and local usability
- Support for Standards and Interoperability
- User support
- Discussion Forums
- Check versions, documentation available for the software
- Skills of the workers
- Availability and conditions of the license and the hidden cost involve
- Commercial support for operability, etc.

7. Distinctiveness of Open Sources Software

Open sources software has much Distinctiveness are

- It is normally acquired liberally
- Developer has no right to state royalties on the distribution or use
- Source code is easy to get to the user and distributed with the software
- No dissent to an individual or to a group to access source code of the software. It has stipulation of modifications and derivations under the programme's original name
- Rights of facilities attached to the programme must not depend on the programme's being part of a scrupulous software distribution
- Licensed software cannot place limit on other software that is distributed with it
- Distribution of License should not be precise to a product and License should be technology neutral, etc.

8. Tips for Successful Implementation

- If you are adapting the OSS first time then maintain both for few months so that your library can run smoothly. But if you are switching from proprietary software to OSS, then take the back-up regularly, work with the OSS in back-end. After successful testing for every aspect, you can quit the last one and make the OSS full-functional.
- If you're interested for completely switching operating systems, you can start by simply using open source applications that work for Windows.
- See how the new solution impact on the user community.
- Re-check frequently to see if more open source applications have been adapted for Windows (if you haven't yet switched to Linux).
- Educate your staff! Select a few programs your library wishes to host or promote and familiarize the library staff with them, so that they will be able to answer user queries.
- Be mindful that you're downloading the latest version of a product. Older versions are likely to have bugs in them or might not work properly. Older versions are kept around to monitor the changes that have been made to the open source software, but often have old errors that cause problems, which have been fixed in newer
- Be aware of OSS limitations. "There are three major issues in using or re-using open-source software; quality, documentation, and licensing terms." Read more on this here.
- Check activity level: When was this software last released? Do developers keep a current forum about changes?
- Teach patrons do patrons bother asking how to use it? Do patrons seem interested? Look out for opportunities! Listen to what patrons want, not what brand names they use.
- Advertise within the library! Hold events like lectures or hands-on tutorials to teach patrons about various software options.

9. Various Open Source Softwares Used in Various Academic Libraries

9.1. Koha: Integrated Library System

Koha is a promising full featured open source ILS (integrated library system) currently being used by libraries all over the world. It is a system of keeping track of the various operations of a library - payroll, expenses, purchases, and most importantly, keeping track of the various media being checked out by the librarians patrons.. Koha is built using library ILS standards and uses the OPAC (open public access catalog) interface. In addition, Koha has no vendor-lock in, so libraries can receive tech support from any party they choose. Following are the key features

Features of Koha

- Library standards compliant
- Web based interfaces
- Free software (Licensed under GNU General Public License)
- No Vendor Lock in
- Active development process
- Community decides what they want
- Frequent software releases

9.2. *New GenLib*

NewGenLib (New Generation Library) is an Integrated Library Automation and Networking Solution Developed by Verus Solutions Pvt Ltd and The Kesavan Institute of Information and Knowledge Management, India. In March 2005, NewGenLib version 1.0 was released and versions 2.0 and 2.1 have come up later. On 9th January 2008, NewGenLib has been declared Open Source Software under GNU GPL License by the Verus Solutions Pvt Ltd, Hyderabad, India

9.3. *Evergreen*

Evergreen ILS is another option when researching open source ILS options. Developed by Equinox Software, Evergreen is a robust, enterprise level ILS solution developed to be capable of supporting the workload of large libraries in a fault-tolerant system. It too is standards compliant and uses the OPAC interface, and offers many features including flexible administration, work-flow customization, adaptable programming interfaces, and because its open source, cannot be locked away and can benefit from any community contributions.

Features of evergreen

- Evergreen's circulation features are customizable, allowing libraries to give privileges based on the library, patron, item, and bibliographic information.
- Major notable circulation features include the ability to send patrons courtesy notices of due items; to access all relevant patron information in a single window; to define arbitrary fields when entering patron information; to create an unlimited number of notes about a patron; to replace patrons' cards without needing to re-register or clone them; to link patron accounts into family groups; to circulate non-cataloged and pre-cataloged materials; to customize template-based receipt printing; to continue circulation when Internet access is down; to give front-desk staff access to billing and financial information; to show patrons their accrued late fines in real time; and to allow patrons to pay their fines in whole or in part.

9.4. *Greenstone Digital Library Software*

The Greenstone digital library software is an open-source system for the construction and presentation of information collections. It builds collections with effective full-text searching and metadata-based browsing facilities that are attractive and easy to use. Moreover, they are easily maintained and can be augmented and rebuilt entirely automatically. The system is extensible: software "plugins" accommodate different document and metadata types. The aim of the Greenstone software is to empower users, particularly in universities, libraries, and other public service institutions, to build their own digital libraries. It is a tool for creating, building, managing and distributing digital library collections. It provides a new way of organizing information and publishing it on the Internet, means to easily create searchable and browsable interfaces to digital library collections via the Web, etc.

Greenstone features include:

- Browser-based access
- Both full-text and field-specific searching
- Browse able lists of authors, titles, dates, classification numbers, etc.
- Use of Dublin Core and other metadata schema
- Advanced data compression techniques that lower response times when searching large collections
- A customizable interface based on a configuration file
- Multilingual interface, available in Arabic, Chinese, Dutch, French, German, Maori, Portuguese, and Spanish, as well as English
- Extensive use of plug-ins to convert documents in different formats such as MS Word, PDF, HTML, or email
- Administrative features that support access control and user activity logs

9.5. *D Space*

Dspace is a groundbreaking digital institutional repository that captures, stores, indexes, preserves, and redistributes the intellectual output of a university's research faculty in digital formats. It manages and distributes digital items, made up of digital files and allows for the creation, indexing, and searching of associated metadata to locate and retrieve the items .DSpace was designed as an open source application that institutions and organizations could run with relatively few resources. It is to support the long-term preservation of the digital material stored in the repository. DSpace supports submission, management, and access of digital content. DSpace preserves and enables easy and open access to all types of digital contents including text, images, moving images, mpegs, data sets, etc. It is a groundbreaking digital repository system that captures, stores, indexes, preserves and distributes digital research material

Some of its characteristics as shown in DSpace documentation are as:

- It is a service model for open access and/or digital archiving for perennial access.
- Provides a platform to frame an Institutional Repository and the collections are searchable and retrievable by the Web.
- Helps to make available institution-based scholarly material in digital formats. The collections will be open and interoperable.

9.6. E Prints

Eprints is an open source software package for building open access repositories that are compliant with the Open Archives Initiative Protocol for Metadata Harvesting. It shares many of the features commonly seen in Document Management systems, but is primarily used for institutional repositories and scientific journals. It is intended to create a highly configurable web-based archive and is a platform for building repositories of research literature, scientific data, student theses, project reports, multimedia arte facts, teaching materials, scholarly collections, digitized records, images, audio, exhibitions and performances, anything that can be stored digitally, etc. and offers integrating advance search, extended metadata and other features such as Archive Documents, Multimedia and Data

9.7. Fedora

Fedora open source software gives organizations a flexible service-oriented architecture for managing and delivering their digital content. As it is a core is a powerful digital object model that supports multiple views of each digital object and the relationships among digital objects. Digital objects can encapsulate locally managed content or make reference to remote content. Dynamic views are possible by associating web services with objects. Digital objects exist within a repository architecture that supports a variety of management functions. All functions of Fedora, both at the object and repository level, are exposed as web services. These functions can be protected with fine-grained access control policies. This unique combination of features makes Fedora an attractive solution in a variety of domains. Some examples of applications that are built upon Fedora include library collections management, multimedia authoring systems, archival repositories, institutional repositories, and digital libraries for education. It can be used to develop institutional repositories and other interoperable web-based digital libraries and the system implements the Fedora architecture, adding utilities that facilitate repository management.

9.7.1. Ganesha

Ganesha Digital Library (GDL) enables institutions or personals to share their knowledge as well as simultaneously access and utilize knowledge. GDL is a tool for managing and distributing digital collection using web-based technology. Ganesha Digital Library or GDL is a tool for managing and distributing digital collection using web-based technology.

9.8. Features of Ganesha Digital Library

- Managing scholar resources: theses, dissertations, research reports, journal, publication, etc.
- Promoting the SME's products: E-Mall (currently the e-transaction is not supported).
- Managing the art work and heritage resources: pictures, songs, videos, etc.
- Managing the expertise directory of people and organizations.
- Extend the metadata schema for other purposes easily.
- And the most important, develop distributed knowledge repository network.

10. Selection Criteria for Open Source Software

Evaluation of open source software is different from proprietary programs. A key difference for evaluation is that the information available for open source programs is usually different than for proprietary programs; source code, analysis by others of the program design, discussion between users and developers on how well it is working, and so on. Often proprietary programs always hide all information from users and only allow running the software. Following criteria's can be adopted for open source software selection:

- Open Source Software's on the WWW-Most convenient option to identify particular software for your library need is to ask professional friends who have experience in using open source software's. You can directly contact other libraries in your locality or post a message in any popular email discussion forum of librarians. Librarians can select the software without much effort, if more popular software's are available for various library purposes.
- Open source licenses- Open source licenses assure users freedom to use, copy, improve and distribution of software. They are free and open source software and provides feasible terms of use. If you have decided to choose the software with non General Public License, check the license if it contains any un-acceptable clauses.
- Functional modules-Certain features or modules essential for day to day work may not be available with the initial development stages of open source software's. In such cases, libraries have to purchase additional modules from open source service providers or make use the in-house expertise to build the required features. Functional modules essential for library management systems (ILS) are cataloguing, circulation, OPAC, serial control and acquisition. It is essential to read release notes of latest version and to know which features are already available and are expected in future. Ensure the availability of standards like MARC, Z39.50, and Dublin Core which are essential for exchange of bibliographic information in library software's.
- Stable releases- Stable release of open source software shows its developer's ability to fix and correct bugs along with new features. Version history of open source software is often available from project websites or any other project repositories

like Source Forge (www.sourceforge.net), Savannah (savannah.net) and Free Software Foundations software directory (www.fsf.org). These services help users to check their formation regarding software origin, releasing history, version numbering scheme, developers details etc. Actively maintained open source projects mention even the releasing dates of forthcoming versions.

- Developers and user community- The development and maintenance of open source software is a social collaborative activity. Open source software is actively developed on a 24-hour basis by a large number of programmers from all over the world. Depending on the success of a certain open source software project, this results in a development process that out paces that of many competitors. Another aspect of open source software is that, many different people and organizations look at the software from a different perspective. This leads to invaluable discussions on what direction the development should be taken. Many IT experts claim that, it is this multi-cultural and multi-organizational influence that, combined with the global spreading and fast development pace, makes open source software more innovative than closed software. Active projects usually have regularly updated web pages and busy development email lists. They usually encourage the participation of those who use the software in its further development. If everything is quiet on the development front, it might be that work has been suspended or even stopped.
 - User interface-Most of the open source library software's are available with web interface. Software with web interfaces easier to learn and use. Graphical templates of open source software's are possible to customize and users can add new design. Through redesigning the templates and style sheets open source software can easily integrate with library/institutional websites. Separate administrative and user interface is essential for remote access and maintaining security.
 - Documentation-So users are mainly responsible for the deployment of open source software; detailed and up-to-date documentation is a prerequisite for successful installation and maintenance. Open source software documentation is available through project websites, wikis, blogs and email lists. They give information of software installation in various operating systems, software architecture, database structure, history of bug fixes, changes in new release, road map (wish list) of future releases etc. Installation details and information for users are also available with installation package. Individual documentation for developers, administrator and user is another advantage of open source software documentation. Software community incessantly updates the online documentation
- Benefits of Digital Libraries-Digital libraries bring significant benefits to the users through the following features:
- Improved access-Digital libraries are typically accessed through the Internet and Compact Disc-Read Only Memory (CD-ROM). They can be accessed virtually from anywhere and at anytime. They are not tied to the physical location and operating hours of traditional library.
 - Wider access-A digital library can meet simultaneous access requests for a document by easily creating multiple instances or copies of the requested document. It can also meet the requirements of a larger population of users easily.
 - Improved information sharing-Through the appropriate metadata and information exchange protocols, the digital libraries can easily share information with other similar digital libraries and provide enhanced access to users
 - Improved preservation-Since the electronic documents are not prone to physical wear and tear, their exact copies can easily be made, the digital libraries facilitate preservation of special and rare documents and artifacts by providing access to digital versions of these entities

11. Conclusion

Collections may be built and served locally from the user's own web server, or remotely on a shared digital library host. End users can easily build new collections styled after existing ones from material on the web or from their local files (or both), and collections can be updated and new ones brought on-line at any time It incorporates an interface that makes it easy for people to create their own library collections. Collections may be built and served locally from the user's own web server, or (given appropriate permissions) remotely on a shared digital library host. End users can easily build new collections styled after existing ones from material on the Web or from their local files (or both), and collections can be updated and new ones brought on-line at any time. To cope with the all modern technologies coming up for the benefit of users and librarians, to cope up with the shrinking library budget, to cope up with online and offline resources, and to fulfill users demands, some open source software's are offering an excellent solution for all types of libraries along with other free open source software's. The Digital Library Management software's (DLMS) present an easy to use, customizable architecture to create online digital libraries. With these institutions/organizations can disseminate their research work, manuscripts, or any other digital media for preservations and world over dissemination of digital items. The open source model offers librarians, the capability to create the software that we have always wanted - standards compliant, interoperable, extensible and scalable software that does what we want it to do: help customers find information quickly, conveniently, no matter where that information resides. The aim of open source is to let the product be more understandable, modifiable, duplicable, reliable or simply accessible, while it is still marketable. Libraries are adapting Open Source Software as a way to minimize the huge costs of commercial products and as a viable alternative to the proprietary library automation/digitization software. Open Source Software certainly appears to give libraries more control over technological choices and an ability to facilitate their users in multiple means. Reasons for the success of open source software's

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