A Study on the open Source Digital Library Software's: Special Reference to DSpace, E-Granthalaya and Library Management System

Sandeep[1]
[1]Department of Library,
Ganga institute of Technology & Managemen,t Kablana,
Jhajjer, Haryana, INDIA

Abstract: **The richness in knowledge has changed access methods for allstake holders in retrieving knowledge and relevantinformation. This paper presents a study of three open sourcedigital library management software used to assimilate anddisseminate information to world audience. Themethodologyfollowed involves online survey and study of related softwaredocumentation associated technical manuals.**

Keywords: Open source, Digital Library, Digital Library Management Software, Information Dissemination.

I. INTRODUCTION

Open source defines method of software development, thatharnesses the power of distributed peer review andtransparency of progress.

1]. This technique helps to providebetter quality software's having higher reliability, flexibilitywith lower cost, and an end to the traditional vendor lock-in.The source code and rights that where normally reserved forcopyright holders are now being provided under a freesoftware license that permits developers / users to study,change, improve and at times also to distribute the software

[2].Digital library refers to a collection that constitutes electronicresources, accessible through the World Wide Web. It oftencontains electronic versions of books, photographs, videosthat are owned by a "physical" library.

[3]. Open source digitallibrary software presents a system for the construction andpresentation of information collections. It helps in buildingcollections with searching and metadata-bases browsingfacilities. Moreover, they are easily maintained and can beaugmented and rebuilt automatically. With many Open SourceSoftware (OSS) applications now available for library andinformation management, Organizations now have noveloptions for acquiring and implementing systems. The OpenSource Software applications for library and Informationmanagement that will be discussed in this paper are:

- Dspace
- Digital Library Management System
- E-Granthaylaya

Category in Open Source Digital library software

Andro, M., Asselin, E., Maisonneuve, M. (2012). [1] "Digital libraries : comparison of 10 software". Library Collections, Acquisitions, and Technical Services 36(3-4): 79-83

Subcategories

This category has only the following subcategory.

II. DIGITAL LIBRARY MANAGEMENT SYSTEMS

➢ Digital Libraries have greatly evolved during the last fewyears. They are no longer only the digital counter part ofphysical libraries (or physical museums, video achieves, etc.)rather they are intricate networked systems capable ofsupporting communication and collaboration among different,worldwide distributed user communities. Digital Librarymanagement system evolved with the inception of DigitalLibrary [4]. Digital Library management system provides theappropriate framework both for the production andadministration of Digital Library System by incorporatingfunctionality essentially fundamental to Digital Libraries, andalso provides provision for integration of additional softwarethat provides more refined and advanced functionality. DigitalLibrary can thus be established by setting up and deploying aDigital Library Management System and then loading orharvesting content. This approach largely simplifies andeduces the effort required to set up a Digital Library thatpromises a guaranteed better quality of service. These genericsystems have started to appear from the second half of 1990'seven though implementing the devised DLMS features only tosome extent. The major characteristics that distinguish themfrom each other are the class of functionality offered, the typeof object model for information being supported, and theopenness of their architecture's.

The DLMS (Digital LibraryManagement System) available are commercial as well asopen source. But, Open Source DLMS's (Digital LibraryManagement System) are the one that will be studied. Opensource digital library management software's provideextensible features to administrators' and allows anorganization to showcase their digital achieve to worldaudience. With full rights of software available under GPLand source code being

provided with the software,Organization's can extend the functionality of the software asbeing required for the particular operation. The DLMS'(Digital Library Management System) studied are:

2.DSpace

The DSpace is a joint project of the MIT Libraries and HPlabs [5]. It is a digital asset management system that allowsinstitutions, such as libraries to collect, archive, index, anddisseminate the scholarly and intellectual efforts of acommunity. Written with a combination of technologies byMIT, it is primarily used to capture bibliographic informationdescribing articles, papers, theses, and dissertations. DSpaces adaptable to different community needs. Interoperabilitybetween systems is built-in and it adheres to internationalstandards for metadata format. Being an open sourcetechnology platform, DSpace can be customized to extend its International Journal of Computer Applications (0975 – 8887)

The organization of data modal in DSpace is intended tomirror the structure of the organization using the DSpace.Each DSpace site is divided into communities, which can befurther divided into sub-communities reflecting the typicaluniversity structure of college, department, research centre, orlaboratory [6]. Communities contain collections, which aregroupings of related content. A collection may appear in morethan one community. Each collection is composed of items,which are the basic archival elements of the archive. Eacitem is owned by one collection. Additionally, an item mayappear in additional collections; however every item has oneand only one owning collection. Items are further subdividedinto named bundles of bitstreams. Bitstreams are, as the namesuggests, streams of bits, usually ordinary computer files.Bitstreams that are somehow closely related (for exampleHTML files and images that compose a single HTMLdocument) are organized into bundles.As specified by Robert Tansley

DSpace service, it is important to capture the specific formatsof files that users submit The bitstreamis aunique and provides a coherent way to sort out a particularfile format. The implicit or explicit notion of a bitstreamformat is to provide means how material in that format can benterpreted. For example, the bitstream interpretation for stillmages compression encoded in the JPEG standard idefinedexplicitly in the Standard ISO/IEC10918-1. [8].In DSpace data modal each item has one qualified DublinCore metadata record. An item may have other metadatastored in as serialized bitstream, but for every time DublinCore is used to provide interoperability and ease of discovery.The Dublin Core may be entered by end-users as they submitcontent, or it might be derived from other metadata as part ofan ingest process. The removal of items in DSpace is done intwo ways: They may be 'withdrawn', which means theyemain in the archive but are completely hidden from view. Inthis case, if an end-user attempts to access the withdrawnitem, they are presented with a 'tombstone,' that indicates theitem has been removed. For whatever reason, an item mayalso be 'expunged' if

necessary, in which case all traces of itare removed from the archive [9]. The features of DSpace as

Digital Management Software are as follows:a) Authentication: DSpace allows contributors to limitaccess to items in DSpace, at both the collection and theindividual item level [10]. The mechanism whereby thesystem securely identifies its users. DSpace Digital repository Modal International Journal of Computer Applications (0975 – 8887)Authorization: The mechanism by which a DSpacedetermines what level of access a particular authenticateduser should have to secure resources controlled by thesystem is done by keeping access control policies thatallow it to understand what credentials are required (ifany) to undertake particular actions upon particularresources . Authentication is provided through userpasswords, X509 certificates or LDAP. Access controlscan be administered by only authorized users. The accesscontrols specify default distribution policy for all items,specify users to submit to collection and specifyreviewers, approvers, and metadata editors for aollection's submission process. There are two built-ingroups: 'Administrators', who can do anything in a site,and 'Anonymous', which is a list that contains all users.Assigning a policy for an action on an object toanonymous means giving everyone permission to do thatction. (For example, most objects in DSpace sites havea policy of 'anonymous' Permissions

III. E-GRANTHAYALYA

E-Granthalaya is a library automation software from Centre,Department of Electronics & Information Technology, Ministry of Communications and Information Technology, Government of India. The software has been designed by a team of experts from software as well as Library and Information Science discipline. Using this software the libraries can automate in-house activities as well as user services. The software can be implemented either in stand-alone or in client-server mode where database and WebOPAC are installed on the server PC while the data entry program is installed on client PCs. The software provides LOCAL/LAN/WAN based data entry solutions for a cluster of libraries where a centralized database can be created with Union Catalog output. The software provides Web OPAC interface to publish the library catalog over Internet/Intranet. The current version of e-granthalaya i.e. 3.0 runs on Windows paltform Only, UNICODE Compliant ,thus, supports data entry in local language. e-Granthalaya 3.0 uses MS SQL Server (any edition) as back-end solution where express edition of this SQL Server is provied FREE along with e-Granthalaya Software. Next higher version of the e-Granthalaya i.e. Ver.4.0 is under development and will be released during last quarter of 2014. e-Granthalaya Ver.4.0 will provide a Web-based solution with enterprise mode where a centralized database will be used for a cluster of libraries. e-Granthalaya 4.0 will use MS SQL Server as well as PostgreSQLas back-end database solutions and will also

Special Issue - 2015

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
NCETEMS-2015 Conference Proceedings

be available in NIC cloud computing environment with hosting facility to Government libraries.

Libraries are the social institutions as they provide various kinds of services to the users and citizen of the city / country. They have been the essential part of the education system in the society since early days. In the modern India, libraries have become the integral part of not only educational institutions but also other government setup like ministries, departments, district centres, etc. Keeping in view the large number of Public and Government libraries in India and also the high cost of commercial software, it becomes imperative to provide zero cost software along with free support, training and services.NIC has been a pioneer source todesign, develop and support ICT tools and services for the Indian Libraries since its existence as the latter are integral part / divisions of theministries, departments and other Government organizations. From1994 to 2000, NIC distributed the Techlib Plus / Bassis Plus software to Indian libraries. During 2002 it was found that NIC had developed over 30 different library automation software Government departments. All such software were designed by various NIC groups for their respective ministries without following the standards, rules and practicesprevalent in Indian libraries. Later it was decided by the Committee constituted under the chairmanship.

HISTORY-

e-Granthalaya was started as an in-house project at 'Karnataka State CentreNIC,Bangalore' and first version of the software was designed for the Public Libraries in the State. Later, NIC HQs 'Library and Informatics Services Division' took over the designing of the software where library professionals were involved in the designing process and, thus, improved the software with enhanced user interface and simplify the work-flow of library functions so that it can suit to all kinds of libraries. Following table shows the release of various versions of the software:Technology/Platform used Visual Basic 6/ASP/HTML 1.0 2003 MS SQL Server 7 Visual Basic 6/ASP/HTML 2.0 2005 MS SQL Server 2.0 3.0 2007 MS SQL Server VB.NET/ASP.NET Versio Yean r DBMS 2000 2005 ASP.NET 4.0/AJAX/SilverLight(*Under Development) 4.0 2014 MS SQL Server/PostGreSQL

IV.   SYSTEM REQUIREMENTS

For Stand-Alone Mode (All the Components to be installed on a Single PC): Hardware: P IV or above with backup device, Min 1 GB RAM, 40GB HDD OS: Windows XP(SP2)/Vista/win 7/8 DBMS: MS SQL Server 2005/2008/R2/2012 (any Edition/express Edition is FREE and given with e-Granthalaya CD) Connectivity: LAN/Internet ConnectivityFor Clietn-Server Mode: Server PC:Hardware: A Server Pc with Min 4GB RAM, 80GB HDDOS: Windows Client OS (Win 7/8) or Windows Server 2008/R2/2012Standard/Enterprise Edition)RDBMS: MS SQL Server 2005/2008/R2/2012 (Express Edition/Standard Edition/Any

Other Edition

Connectivity: LAN/Internet Connectivity BarCode Printer (Any Model/Make) with Barcode Reader

V.   SOFTWARE COMPONENTS

e-Granthalaya 3.0 contains following components, some of these are installed in the Server PC while rest of these are installed in the Client PCs:

1. Database (MS SQL Server 2005/2008/R2/2012) - on Server PC (Windows xp/7/8/Server 2003/Server 2008/Latest)

2. Web OPAC - on Server PC

3. Data entry program (eG3 Client)- on client PCs

Distribution Policy The software is provided at zero cost to the Government and Government Funded Organizations. The support is given by email/phone/vc/remote access, etc. The on-site training, Data Entry, Maintenance, Migration, and dedicated support, etc are provided onPayment basis by the NICSI Emapnelment Agency. Government Libraries Hosting may also be done in NIC Server as per NIC hosting policy.

VI.   HOW TO GET THE SOFTWARE

The e-Granthalaya software can be get from any District/State Centres of NIC or from NIC Hqs, New Delhi by sending one official letter on letter head duly signed by Authority along with duly filled request form. The Request Form can be downloaded from here...

Features

- Runs on Windows Platform Only (Win XP/vista/7/8/Server 2003/2008/2012)
- Provides Local/LAN/WAN based Data Entry Solution
- UNICODE Compliant, supports data entry in local language
- Module - Wise Permission to the software Users
- Work-flow as per Indian Libraries
- Retro-Conversion as well as Full Cataloging Modes of Data Entry
- Authority Files/ Master tables for Authors, Publishers, Subjects, etc
- Multi-Vol, Multi-Copy and Child-Parent Relationship pattern
- Download Catalog Records from Internet
- Z39.50 Client Search Built-in
- Exhaustive Reports for Print
- Export Records in CSV/Text File/MARC 21/MARC XML/ISO:2709/MS ACCESS/EXCEL

Formats

- Merger databases of eG3 into Single Database Common/Centralized Database for All libraries under One Organization, minimize data
- Entry
- Main/Branch Libraries Acquisition/Cataloging

- Print Accession Register
- Search Module built-in with basic/advance/boolean parameters
- Library Statistics Reports
- CAS/SDI Services and Documentation Bulletin
- Updated Regulalry with enhanced Features
- Compact/Summary/Detailed Reports Option
- Generate Bibliography in AACR2
- Data Entry Statistics Built-In
- Full Text News Clipping Services Built-in
- Digital Library integration with uploading / downloading of pdf/html/Tiff, etc
- Documents
- Micro-Documents Manger (Articles/Chapter Indexing)
- SERIALS Control System for Subscription with Auto-Generate Schedule
- Budget Modules with Bill Register Generation, manages Multi-Budget Head
- Import Data from any structured Source (MARC21/EXCEL)
- Well exhaustive Web Based OPAC Interface with separate Membership module
- Multi-copies of Accession No can be accessioned in bulk with single click with Auto-
- Accession Number.
- Manages e-Books with digital files in pdf or other formats, provides facilities of e-

Book Viewer

- Photo Gallery available for uploading photo and pictures of the organizations -
- published on the Library Web site.
- Manages Meta data for Non-Book Materialas also. Includes database fields for Legal documents thus equally suitable to Law Libraries also.

REFERENCES

1. O'Mahony, S. (2003). Guarding the commons: howcommunity managed software projects protect theirwork. Research Policy, 32(7), 1179-1198.
2. Open Source Initiative (OSI). 2012. Retrieved from
3. New Zealand Digital Library. 2012. Retrieved fromw_to_build_Preface.pdf
4. Digital Libraries. 2012. Retrieved from http://ftp.cordis.europa.eu/pub/ist/docs/rn/castelli.pdf
5. Madalli, D. P. (2003). A digital library of library and information science using DSpace.
6. DSpace 1.8 System Documentation. (2012) .Retrieved from: http://www.dspace.org/.
7. Tansley, R., Bass, M., Stuve, D., Branschofsky, M.,Chudnov, D., McClellan, G., & Smith, M. (2003, May). The DSpace institutional digital repository system:current functionality. In Proceedings of the 3rdCM/IEEE-CS joint conference on Digital libraries (pp. (7). IEEE Computer Society.
8. INFORMATION TECHNOLOGY –DIGITAL COMPRESSION AND CODING OF CONTINUOUSTONESTILL IMAGES –REQUIREMENTS ANDGUIDELINES. 1992. Retrieved from http://www.w3.org/Graphics/JPEG/
9. Edmund, B. (2012). DSpace 1.8 Documentation.Retreived from: https://docs.prosentient.com.au/prosentientjspui/handle/1/74?mode=full&submit_simple=Show+full+item+record
10. Bass, M.J. et al. (n.d). DSpace –A Sustainable Solutionfor Institutional Digital Asset Services-Spanning the nformation Asset Value Chain: Ingest:Manage,Preserve, Disseminate: Internal Reference SpecificationFunctionality, version 2002-03-01