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Research Paper

A Study of Open Source Softwares Used for Creating a Digital Library

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Abstract

Purpose: The purpose of this study is the study of open source softwares used for creating a digital library. Method: The present research has carried out a conceptual analysis of open source softwares in digital library. Findings:Explosion of information and the continuous necessity for its effective dissemination to the appropriate users at the right time have created a dilemma for the libraries. It's become enormously complicated to competently handle and manage the ever-growing volume of digital information and accommodate to the knowledge needs of the users. To solve these problems, libraries are converting their useful resources into digital form and trying to place it on the websites for information sharing. Digital Libraries help the users to access an organized and coherent repository of knowledge and information regardless of their physical location and time and various remote location. Conclusion: The learners can be networked through computers, laptop, mobile and other devices to make a virtual library. Digital Library Software is an important requirement for the creation of a digital library. Various open source digital library softwares are available today to serve this purpose. An attempt has been made in this article to explain various kinds of Open Source Digital Library Softwares.

Keywords: Virtual Libraries, Open Source Digital Library Software, GNU E-prints Archiving Software, Greenstone Digital Library Software (GSDL)

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Introduction

The explosion of information and the continuous necessity for its effective dissemination to the appropriate users at the right time have created a dilemma for the libraries. In the modern day of data explosion, the urgent need for fast access of the right information to the appropriate user at the right time has posed serious challenges to the normal libraries within the effective management and handling of knowledge and information. The recent developments within the field of information technology have changed the user expectations to such an extent that it's become imperative for the libraries to adopt the fashionable techniques for the management, handling, and dissemination of knowledge and information so as to cope up with the changing scenario. As a result, the libraries have changed with time from mere static storehouses of collection of paper-based documents to dynamic service for a good spectrum of users. This has also transformed the medium of data storage from paper to electronic and optical media like Compact Disk- Read Only Memory (CD-ROM), Digital Video Disk – Read Only Memory (DVD-ROM), and World Wide Web (WWW).

The revolutionary developments, which have happened within the field of computers, communications, and information technology, have significantly changed the design and functioning of libraries today. With the appearance of new technologies, it's has become possible to construct, store, preserve, and reproduce information and knowledge within the digital variety. The technique of digitization has facilitated the design of digital libraries, which have gained enormous recognition among the academic and technical communities all over the place. The creation of a digital library involves the utilization of some suitable digital library softwares. Various types of digital library software are available today of which some are available free under GNU General Public License, while some are incompletely free and remain are priced.

Concept digital library

Digital Libraries are considered to sustain the creation, maintenance, management, access to, and preservation of digital content. Digital library, the standard of data storage has changed from article to electronic figures. Appropriate to large advances in information technology it's become possible to acquire libraries

without limitations of buildings and furniture where information and knowledge are stored and handled in digitized shape. Such libraries are commonly referred to as digital libraries where the library's vast storehouse of information is accessible and available at the user's work place fairly of user's coming to the digital library.

Through a digital library environment, the knowledge resources are in digital form, stored in multimedia repositories, and are made available through Web-based services. The online has become the mainly successful networked hypermedia-based system that permits rapid access to a good arranges of networked information resources. It allows linking among information resources stored on servers, which are isolated geographically on remote locations and may be accessed by any user at any time at anywhere. During this manner, a digital library overcomes the barriers of your time and space. Such digital libraries, which are networked through web-based technologies, also are referred to as Virtual Libraries. Recognition to their tremendous advantages, virtual libraries became enormously popular among the academic and technical community all over the place. They have growing at a high rate during the last decade and their effectiveness has increased by leaps and bounds.

Components for creating digital library

For creating a digital library we need the following

1 Information Resources (content)
2 Metadata
3 Information Storage and Retrieval Systems
4 ICT Infrastructures
5 Manpower (D-librarian) and
6 Users (Kesavan, 2009).

Digital library software

The design of a digital library involves the purpose and use of suitable digital library software. Digital library software is essential for creating, organizing, managing and disseminating the digitally stored information. They're crucial for the creation, maintenance and functioning of a digital library. Various type of digital library software is developed during the last decade. Most of the digital library software is the product of Digital Library Projects of various Universities of different countries. A number of this software is out

there free while some are partially free and remaining is priced. Some software is provided commercially from the manufacturers of digital libraries and e-books on various topics (Shrivastava & Siddiqui, 2008). Hence, it's necessary for librarians and knowledge managers to possess working information about the various kinds of digital library softwares, which is out there today and understand the functionality of digital library software.

Open source digital library software

Open Source Digital Library Software is a software used for the system to release modifications for the community. It is a program, during which the ASCII document is out there to the general public to be used and/or modification from its original design free of charge, i.e., opens. Open ASCII document is typically created as a collaborative effort during which programmers improve upon the code and share the changes within the community.

Open Source Digital Library Software is published under a permit which allows the recipient certain rights to the ASCII document including the right to provide and distribute derivative works. More specifically this type of software meets the strategy published by the Open Source Initiative. These are free programs, which are created through the joint efforts of programmers since around the humanity.

Table1.List of digital library software

Row	Software	Developer
1	DSpace	MIT Libraries and Hewlett-Packard Lab
2	E-prints	University of Southampton
3	Fedora	University of Virginia and Cornell University
4	Archimede	Laval University Library, Canada
5	Atrium Digital Exhibits	Dura space
6	CONTENTdm	Dries Buytaert
7	Greenstone	New Zealand Digital Library Project at the University of Waikato
8	MyCoRe	University of Essen
9	Open Library	Internet Archive

Row	Software	Developer
10	Open Harvester Systems	Public Knowledge Project
11	DSpace-CRIS	Cinecas
12	Curate	on an alpha release.
13	Archivematica	Artefactual Systems Inc.
14	DMP Online	Digital Curation Centre

Study of some digital library software

The consequent digital library software is often employed for the creation and functioning of a digital library:

Green Stone Digital Library Software (1998)

Greenstone is a set of software tools for building and distributing digital library collections on the website or CD-ROM. It is open-source software, multilingual software, issued under the terms of the GNU General Public License (Greenstone Developers Guide,2020). Greenstone established by the New Zealand Digital Library Project at the University of Waikato, has been developed and disseminated in cooperation with UNESCO and the Human Info NGO in Belgium (Greenstone overview, 2020). Greenstone software empowers users, particularly in universities, libraries, and other public service institutions, to create their own digital libraries (Bainbridge and Witten, 2004; Witten et al. , 2000).

D-Space (2002)

D-Space is an open source software package typically used for creating open access repositories for scholarly and/or published digital content (Radhakrishnan, 2014). Though D-Space shares some important features overlap with content management systems and document management systems, the D-space software serves a specific need as a digital archives system, focused on the long-term storage, access and preservation of digital content (Dspace overview ,2020).

The first public version of D-Space was released in 2002, as a joint effort between developers from MIT and HP Labs Following the first user group meeting in 2004, a group of interested institutions

formed the D-Space association, which determined the governance of future software development by adopting the Apache Foundation's community development model as well as establishing the D-Space Committer Group.

D-Space is constructed with Java web applications, many programs, and an associated metadata store. The web applications afford interfaces for management, deposit, ingest, search, and access. The advantage store is maintained on a file system or similar storage system. The metadata, including access and configuration information, is stored in a relational database and supports the use of Postgre SQL and Oracle database. D-Space holdings are made available primarily via a web interface. Additional recent versions of D-Space also support faceted search and browse functionality using Apache Solr.

D-Space accepts all types of digital materials including text, images, video, and audio files. Possible content includes the following: Articles and preprints, Technical reports, Working papers, Conference papers, E-theses, Datasets: statistical, geospatial, Mat lab, etc., Images: visual, scientific, etc., Audio files, Video files, Learning objects, Reformatted digital library collections and lots of more. DSpace is meant for ease-of-use, with a web-based interface which will be customized for institutions and individual (Dspace overview, 2020).

GNU E-prints Archiving Software

The GNU E-Prints software is meant to permit people to line up all purposes archives on the online, which are OAI compliant. It aimed toward research papers but might be used for love or money. It uses the available technologies like OAI, XML and Citation Linking to form the system as useful as possible 9 (Barve, 2012).

E-Prints were created to facilitate authors self-archiving their work. E-Prints also make the info about records within the archives available for harvesting by the OAI-PMH interface. E-Prints are written in PERL and runs as an apache module (using Mod Perl). This means that the configuration doesn't need to be reloaded to serve each request. There also are a variety of instruction tools to create and maintain an archive. Quite one E-Prints Archive are often served from one installation of GNU E-Prints but this increases the quantity of RAM required (GNU EPrints, 2020; EPrints Services, 2006)

E-Prints use My-SQL to store the metadata about records and users. The particular files within the archive are stored within the UNIX file-system. A script allows the SQL database to be exported during a more meaningful XML structure. The configuration files are a mixture of XML and PERL. The core PERL modules of E-Prints are written in such a way as to make it possible to write down new command - line and CGI scripts without having to directly affect the SQL back-end (Beazley, 2011).

Ganesha Digital Library Software (2000):

Ganesha Digital Library or GDL may be a tool for managing and distributing digital collections using web-based technology. It was developed by KMRG ITB, since 2000 and has been widely used for Indonesia DLN network. The amount is predicted to be increased since the releasing of GDL 4.0 version. This version supports the Network of Networks (NeONs) topology model. The last version of GDL is GDL4.2. The event was supported by funding from INHERENT-DIKTI. And now, KMRG has got to keep it usable and maintainable.

GDL is often used for University's digital library: to arrange ETD (electronic theses and dissertations), scholars' papers, journal, article, research reports, etc. GDL can manage any sort of digital resources, such as text, image, audio, video, software. Unfortunately, it doesn't touch the resources. It only receives and stores them during a filing system, and makes a link from their associated metadata. GDL will create metadata for every resource, and begin to figure on this metadata - index, search, disseminate, display, and so on.

GDL4.2 is developed using the standard of application development (analysis, design, implement, testing). The code adopts the thing-oriented concept, so other developers can reuse the classes to develop their application with their own environment. The opposite thing in GDL4.2 is support to vary the theme easily. The features are presumably the same. The most different is that GDL 4.2 attempt to adopt Web2.0 standard, they're RSS and Folksonomy.

University of Michigan DLXS-XPAT

The XPAT engine is an SGML/XML-aware program that the University of Michigan has deployed with a particularly diverse set of digital library resources. XPAT is predicated on the program

previously marketed by Open Text as PAT and OT5(TM). The University of Michigan has licensed the code so as to undertake distribution and support, also on additional functionality.

XPAT provides excellent support for word and phrase searching, indexing of SGML elements and attributes, a baseline of support for valid and well-formed XML including Unicode UTF-8 support, fast retrieval, and open systems integration. As a part of the UM DLXS, the University of Michigan Digital Library Production Service has launched an endless development process during which we hope to feature a variety of features to XPAT (DLX website, 2020).

Libraonix Digital Library System:

It was built with the understanding that while many users today have access to the web, Everyone doesn't have an always-on broadband-connection so this technique is meant to figure well when the user is offline, at his desktop or on a laptop, but to require advantage of the web once you are connected. The system is often installed from CD-ROM, DVD-ROM, or over the web, and once installed can detect and install new components and resources whether or not they arrive on other discs or are found over the web.

The Libraonix DLS Supports Localized user Interfaces and Electronic Books in many Languages: The web powers many other features of the Libraonix DLS, including collaborative annotation, with which you'll share your highlighting and notes on electronic texts with others within the same church, class, or group, and automatic headline downloading, which keeps you recent on new features and resources for the system. This powerful system allows users to assist us to provide support to smaller language groups -- groups which may otherwise haven't any thanks to getting Bible software in their own language.

CONTENTdm software

It is a versatile, multifunctional software package. CONTENTdm provides tools for all aspects of digital collection management. It’s the most powerful and versatile digital collection management package on the market today, CONTENTdm handles it all documents, PDFs, images, video, and audio files. CONTENTdm is employed by libraries, universities, government agencies, museums, corporations,

historical societies, and a number of other organizations to support many diverse digital collections.

CONTENTdm meets the requirements of a good range of users. It's currently employed by the schools, public libraries, museums, commercial and government entities, and nonprofit organizations. The gathering items include newspapers, maps, photographs, yearbooks, transcribed diaries, rare books, oral histories, audio and video clips, poster art, and more. CONTENTdm functionality allows creating collections quickly and simply employing a simple point and click on interface (Shrivastava and Siddiqui, 2008).

IVia software

IVia may be a complete Portal or Virtual Library Software package written by IVia Research and Development Group of the library of the University of California, Riverside. The INFOMINE Scholarly Internet Resource Collection was the first user. IVia is an open-source Internet subject portal or virtual library system. As a hybrid expert and machine built collection creation and management system, it supports a primary, expert-created, first-tier collection that's augmented by an outsized, second-tier collection of serious Internet resources that are automatically gathered and described. IVia has been developed by and is that the platform for INFOMINE, a scholarly virtual library collection of over 26,000 librarian-created and 80,000 plus machine-created records describing and linking to academic Internet resources (Dlib overview, 2020).

This software enables institutions to figure cooperatively or individually to supply well-organized, virtual library collections of metadata descriptions of the Internet and other resources, also as rich full-text harvested from these resources. IVia is powerful, flexible and customizable to the requirements of single or multiple institutions. It's designed to assist virtual libraries scale (Steve et al., 2003).

Dienst software

Dienst maybe a project of the CDLRG - Cornell Digital Library Research Group. Work on Dienst sponsored by the Defense Advanced Research Projects Agency (DARPA) on behalf of the Digital Libraries Initiative under Grant No. N66001-98-1-8908. The distributed Dienst software is configured to handle textual resources (documents) during a sort of formats. However, Dienst architecture

includes a classy document model that accommodates a good sort of digital resources. Using the Dienst software for these other resources would require some programming.

The Dienst protocol and software is copyrighted but is out there for free of charge and may be used and redistributed for non-commercial uses. The ways in which Dienst is employed are Organizations that wish to hitch an existing digital library built using Dienst, Organizations that wish to make a replacement distributed digital library with Dienst and Organizations that wish to undertake research in digital libraries using an existing Dienst digital library or by experimenting with the software. The modular nature of the software encourages researchers who wish to explore mechanisms for enhancing existing services or using the interfaces to existing services to build other services (Disent overview, 2020).

Fedora software

Fedora is a Linux distribution developed by the community-supported Fedora Project which is sponsored primarily by Red Hat, a subsidiary of IBM, with additional support from other companies. Fedora contains software distributed under various free and open-source licenses and aims to be on the leading edge of free technologies. Fedora is the upstream source of the commercial Red Hat Enterprise Linux distribution, and subsequently CentOS as well (Fedora overview, 2020).

The default desktop environment in Fedora is GNOME and the default user interface is the GNOME Shell. Other desktop environments, including KDE Plasma, Xfce, LXDE, MATE, Deepin and Cinnamo, are available and can be installed.

Conclusion

The digital technology has revolutionized the usual concepts of conservation, management and access to information and knowledge in library and archives community. Digital technology is a driving might in many of the changes that are happening within the education and research sectors. Many challenges, which are being face by the libraries recently recognition to the changing scenario, are often effectively met by utilizing the digital technology for enhanced access, better storage and conservation facilities.

The development and achievement of a digital library can't be done without a deep insight into the various types of digital library softwares, which are available now. It’s imperative on the planners to possess a reasonably good knowledge about the supply and functioning of Open Source Digital Library Software, which is an important requirement for the creation of a digital library. A correct option to use a specific sort of Digital Library Software is often made only there's awareness about their features and modalities. However, it's suggested that Green Stone Digital Library Software is best fitted to Indian conditions.

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