Emerging trends and technologies for digital transformation of libraries

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Abstract

Libraries are non-profit social institutions and every community and users are dependent on library for their information need. The impact of ICT has changed traditional library concept by adopting the changes and opportunities of a mix of digital technologies and their accelerating impact on services in a strategic way. Emerging trends and technologies and the use of certain digital library software brought out transition from Print to Digital, resulting transformation in process of digitization, documentation and communication. Transformation of Libraries includes skill needs, skill trends for the implementation of open source software packages. Present study is based upon the methodology involving online evaluation and study of related open source digital library software that can change our traditional library systems.

Keywords: Open source, Digital Library, Digital Transformation, Software Packages, Internet.

Introduction

Digital transformation is the kind of change management incorporation of activities, processes, competencies and models to fully leverage the changes and opportunities of a mix of digital technologies and their accelerating impact across society in a strategic way, with present and future shifts in mind, while digital library transformation has predominantly have impacts on several types of libraries such as governments, public sector libraries and Institutional repositories, which are involved in tackling ICT challenges. The Libraries have dramatically changed with the pace of digital transformation and thus have changed the face of librarianship with the goals of digital transformation. Since people don't want 'digital' for everything and do value human and face-to-face interactions there will always be an 'offline' element, depending on the resources and usage.

Days are gone when traditional library system worked as manual, present scenario digital change in library products and services. There are many open source software for development of Digital library, Open source is a techniques where source code is given for free and can be further customised, this is to provide better quality software packages featuring reliability, flexibility with least cost, and an end to the traditional vendor processes. The source code and rights that where normally reserved for copyright holders are now being provided under a free software license that permits developers / users to study, change, improve and at times also to distribute the software as and when needed.

Digital Library

A digital library is a collection of digital documents, available for access on the Internet using digital library software or on CD-ROM (compact-disk read-only memory) disks. Digital library can also be a repository of Journals/ magazine articles, e-books, e-papers, images, audio files, and videos etc. and allow library users to access its collection 24x7 on the web. This is created with the help of certain digital library software also called as software package.

Digital Transformation of Libraries in India

The beginning if digital library begins since Paul Otlet and Henri La Fontaine's made an attempt in 1895. He started systematic cataloguing of the world's knowledge, however, the growth of the digital library was parallel with the progress of the internet. The main feature of digital library is the accessibility to the digital collection by millions of individuals on the World Wide Web at a time. Digital Library development in India is considered with preservation of art culture and heritage since mid-1990s. India became de-facto signatory of the UNESCO Universal Declaration on Cultural Diversity, adopted unanimously by the UNESCO General Conference at its 31st session held on 2 November 2001 to strengthen the access to diverse cultural resources available across the country.

Early projects were based on the creation of an electronic card catalogue known as Online Public Access Catalogue (OPAC) by the 1980s. OPAC gradually replaced the traditional card catalogue in academic, public and special libraries. This permitted libraries to support resource sharing and expand access to library materials beyond the boundaries of traditional libraries.

National Digital Library of India (NDLI)

National Digital Library of India (NDLI) is a National Mission on Education through Information and Communication Technology (NMEICT) Project developed by the Indian Institute of Technology Kharagpur (IIT KGP), under the aegis of the Ministry of Human Resource Development (MHRD), Govt. of India. It is a single window platform providing learning resources that make e-Learning and education accessible to all, bringing to users of all demographics, digital repositories from India and the world.

The Library project was launched in pilot form in May 2016. The National Digital Library of India was dedicated to the nation by Hon'ble Minister of HRD, Prakash

Javadekar on 19th June 2018 marked a milestone in the history of education in India.

NDLI is an integrated platform of Metadata standards of a resource, which can make finding and working with particular resource easier and provide single window access to a wide variety of digital resources. NDLI metadata standard has been developed to draw up this uniform schema and is an envelope of several well established global standards. NDLI, as of April 2019, hosts 25,000,000+ items in its repository, with over 150,000 volumes in English.

Digital Library software packages

With the advent of Open Source Software (OSS) applications, there are many platforms available for digital library and information management, These Open Source Software are set of applications for management of library and Information centre. In this paper we will have brief discussion on the certain digital library software which are as follows:

1. DSpace
2. Greenstone
3. EPrints

DSpace

DSpace is an open source repository software package particularly used for creating open access repositories or the digital library for scholarly and/or published digital asset. The DSpace is a joint project of the MIT Libraries and HP labs. DSpace repository software serves as digital asset management system that allows institutions, such as libraries to collect, archive, index, preserve and disseminate the scholarly communations. DSpace has Interoperability between systems and it adheres to international standards for metadata format and as it is an open source technology platform, therefore, DSpace can be customized according to the user's need.

DSpace preserves, archives and provide open access to all types of digital content including text, images, moving images, mpegs and metadata. It is continuously expanding and improving software. DSpace software is usefull for academic, non-profit, and commercial organizations for building digital Library or open access repositories. It is free and easy to install and completely customizable to fulfil the needs of any library.

Features of DSpace

Some most important features of DSpace are as follows

1. Free open source software
2. Optimized for Google Scholar indexing
3. Can manage and preserve all types of digital content
4. Completely customizable according to user needs and purpose
5. Manage and preserve all format of digital content (PDF, Word, JPEG, MPEG, TIFF files)
6. Apache SOLR based search for metadata and full text contents
7. UTF-8 Support
8. Interface available in 22 languages
9. Granular group based access control, allowing setting permissions down to the level of individual files

Greenstone

Greenstone is an open source software for building and distributing digital library collections. It provides a way of organizing information and publishing it on the web or on removable media such as DVD and USB flash drives. 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. Read the Greenstone Factsheet for more information.

Greenstone software aims to empower library 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. We hope that this software will encourage the effective deployment of digital libraries to share information and place it in the public domain. Further information can be found in the book How to build a digital library, authored by three of the group's members.

EPrints

Eprints is an open source software package for building open access repositories that are compliant with the Open Archives Initiative Protocol for Metadata Harvesting. EPrints was created in 2000, Version 3 of this software was released on 24 January 2007 at the Open Repositories 2007 Conference and was described by its developers as "a major leap forward in functionality, giving even more control and flexibility to repository managers, depositors, researchers and technical administrators.". It provides many of the features commonly seen in Document Management systems, but is primarily used for institutional repositories and scientific journals. EPrints has been developed at the University of Southampton School of Electronics and Computer Science and released under a GPL license.

Technical Requirements

EPrints uses traditional technologies and runs on pure Open Source Systems. It uses MySQL, Apache database and web server. MySQL is the world's most popular open source database, recognized for its speed and reliability and Apache has been the most popular web server on the Internet since April of 1996. Eprints is programmed by using the script language "Perl", that is low level but powerful.

Special Features

Following are the special features of EPrints

1. Web Accessibility: EPrints provides web based accessobility that makes its interface easy to use and administer.

2. Full Text Search: EPrints allows Searching through scanning each of the metadata field types in the database by using simple or advanced search. Any metadata field can be searched on the grounds of SQL query processing the database.

3. Administrative function: EPrints archive can use any metadata schema as being provided by the administrator. The administrator decides what metadata fields are held about each EPrints item.

Comparative Evaluation of DLMS

On grounds of above discussion a features comparison table for DSpace, Eprints & Greenstone is given as under: table 1

Table 1: Representing the comparison of features of significant digital library software

S.No.	General Feature	Greenstone	Eprints	Dspace
1	Year of creation	1997	2000	2002
2	Origin	New Zealand	England	USA
3	License Cost	Free of cost	Free of cost	Free of cost
4	Product Type	Software	Software	Software
5	Updating Cost	Free of cost	Free of cost	Free of cost
6	Resource Identifier	OAI Identifier	No	CNRI Handles
7	OAI-PMH	Yes	Yes	Yes
	Technical Feature	**Greenstone**	**EPrints**	**DSpace**
8	Supported Format	Support and manage all types of formats	Support and manage all types of formats	Support and manage all types of formats
9	Metadata Standards	Dublin Core, Qualified DC, METS, NZGLS AGLS	Dublin Core, METS	Dublin Core, Qualified DC, METS
10	Thumbnail Preview	Images, Audio, Video	Images, Audio, Video	Images
11	Searching Criteria	Field Specific, Boolean Logic,	Field Specific, Sorting options	Field Specific, Boolean Logic, Sorting options
12	Browsing Options	Browsing Can be done using any field.	Browsing can be done using any field.	By Author, Title, Subject and collection
13	Syndication	---	RSS, ATOM	RSS, ATOM
14	Operating System	Linux, Unix, Windows, Mac-OS	Linux, Unix, Windows	Linux or Unix, Windows
15	DBMS	Its Own	MySQL, Oracle, PostgreSQ L,	Oracle, PostgreSQL
16	Programming Language	C++, Perl, Java	Perl	Java and JSP
17	Web Server	Apache/I IS	Apache	Apache and Tomcat
18	Associated Software	Apache, PERL, GNU C++ Compiler, JAVA, GNU Database manager	Linux or Unix, Apache, Perl	Jave, Apache, PostgreSQL, or Oracle
19	Machine-to-Machine Interoperability.	Z39.50, OAI-MHP	OAI-MHP,OAI-ORE, SWORD, SWAP,RD F	OAI-MHP,OAI-ORE, SWORD, SWAP
20	License/ Agreement	GNU	BSD	GNU

Conclusion

Digital transformation in the libraries refers to the adoption of digital processes and tools to achieve strategic organizational goals. It's a complex, multifaceted process that represents a change in the workplace that affect product, process and services of traditional library. The Digital Library software in present scenario has made possible to create online digital libraries. The Libraries can create their own repository of digital resources for preservation and dissemination on all over the web. On the grounds of above discussion on certain technical features and services we are able to propose emerging platforms for setting up a digital library in our Institution/organisation. This study can be used as a reference guide to decide the ideal package for creating and display of the digital collection as per our need and purpose.

Conflict of Interest
None.

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