Role of Digital Libraries in Supporting E-Learning

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Abstract

In this era of web-enabled technologies, E-learning has emerged as a boon to building knowledge skills amongst learners. Libraries are repositories of knowledge and the tremendous growth in digital/electronic resources has forced library professionals to use various information technology tools to manage and render services. Learners need a single interface where they can find all resources and support for their learning. A digital library can function as an information gateway and link students to library catalogues, online resources, e-resources, digital resources and discussion forums. The paper presents the need and importance of e-learning, how e-resources are included and organised in digital libraries to provide seamless access to information resources in an e-learning environment. It discusses Space Applications Library e-learning platform and various services rendered to e-learners.

Keywords: Content Management, Digital Library, e-Learning

1. Introduction

Recent developments in information technology have changed the concept of the library from the storehouse of print media to a new environment called "Digital Library". Today, students, researchers, information professionals need to directly access information on any Web-enabled device, at any time and from any location. In this changing scenario, libraries are incorporating a large number of digital resources and supporting e-learning by eliminating barriers of distance and time. Information can now be processed, stored and made available in digital formats and can be accessed by users from their desktops. With the tremendous growth in digital resources, users find it difficult to locate the most appropriate resource relevant to their need. Libraries play a vital role by creating a platform by organising resources and developing new

services so that learners can access from remote locations. Due to a steep decline in the cost of IT components, combined with the availability of high bandwidth network distance learning is now affordable. The digital library is a core component of e-learning as it has the capability to provide learning outside physical walls.

2. E-Learning

Electronic learning refers to any learning with the aid of information and communication technology (ICT) such as online learning, webinars, discussion forums, chats, computer-based learning, educational materials on videos. (Wang, 2004) The key advantage of e-learning is flexibility, convenience, and the ability to work at any place at any time where a network connection is available. Also, learners can access enriched digital multimedia resources from anywhere and update their knowledge skills. E-Learning is a term used to refer to a form of learning in which the instructor and the learner are separated

by space or time where the gap between the two is bridged using online technologies. In companies, organisations E-learning is used to deliver training courses to employees to update their knowledge skills. In universities, students can access information through the network from anywhere. Thus, E-learning helps a student in a remote area to access a wide range of information, clear doubts and discuss with the teacher on a topic.

An e-learning platform is a software application that integrates different management, communication, evaluation, monitoring, tools with the aim of providing technological support for teachers and students to optimize the various phases of the teaching-learning process. The educational process may be completely remote, classroom or mixed nature and combine both modes in different proportions.

2.1 Key features of the e-learning platforms (Homero, 2007)

- ❖ Authentication

- ❖ Generating content

- ❖ Viewing content

- ❖ Different media

- ❖ Carrying out activities such as discussion

- ❖ Evaluation tools

E-learning can be delivered in two platforms. (Jayaprasad, 2006) They are:

Scheduled Delivery Platform – Scheduled delivery platform is used when e-learning occurs in real-time with participants actively communicating with each other. It may be conducted by way of a webinar or a tele-video conference over the network, Chat, live web based classes. In this mode of e-learning, there

is an interaction between the presenter and learner, but the drawback is that time and place requirements restrict it.

On Demand Delivery Platform – The information is provided round the clock and at any location and does not occur in real time. It includes web-based training classes, online resources and interactive CD-ROM/DVD-ROM accessible by the learner at their own convenience. As information is available on demand, it offers participants greater control over the learning process.

Figure1: E-learning through various modes

3. Digital Library

Digital libraries have brought profound changes all over the world in delivering the right content to the right person at the right time. A digital library is an organised collection of digital objects including text, images, video and audio along with associated services, where the information is stored in digital formats and accessible over a network. With the availability of free digital library software, the creation and sharing of information through digital library collection have become feasible for library professionals. Digital library allows users to gain online access to and work with electronic versions of full-text documents and their associated image.

Digital resources are available in various forms such as databases, journals, books, pre-print archives, working papers, etc. Libraries need to devise a mechanism to identify resources required for their users and provide access to them through a platform. This will enable learners to access these resources remotely in the present e-learning environment.

3.1 Benefits of Digital Libraries

❖ Digital libraries are accessed through the web from anywhere at any time.

❖ Availability of full-text documents enables digital libraries to support advanced search, better display features, and relevance ranking.

❖ Provides simultaneous access requests for the same electronic document.

❖ Provides access to content in different formats including animation, graphics, audio and video.

❖ Through appropriate metadata and information exchange protocols, digital libraries can easily share information with similar digital libraries and provide enhanced access to users.

❖ Digital libraries facilitate preservation of documents.

4. Digital Libraries Supporting E-Learning

Digital libraries play a significant role in assisting effective e-learning process as it can store and manage large amounts of digital content such as full-text materials, bibliographic databases, library catalogues, image and audio clips, etc. Better network and storage technology, search engines at affordable costs are the other reasons for developing a digital library. The advantage of digital libraries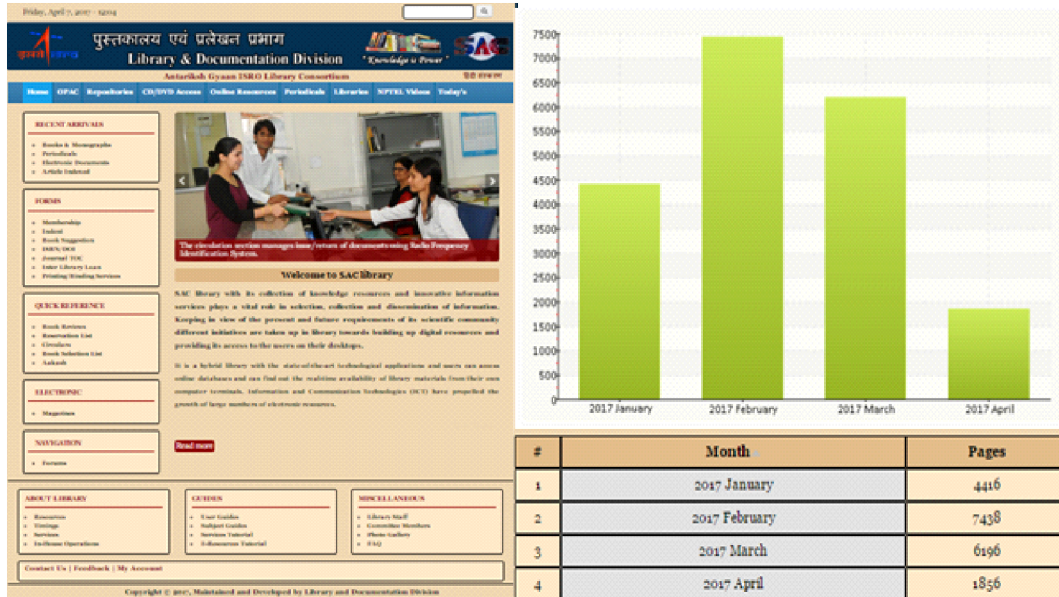 in E-learning is that it allows learners to use electronic resources from anywhere without even knowing where it is geographically stored.

To achieve greater efficiency in the rapidly changing environment, libraries are increasingly looking for new paradigms to deliver services to users on their desktops. Libraries are designing their web portals and assisting their learners in searching and retrieving information. It not only offers services, but enhances scholarly communication and research among the patrons of the library.

The content management system provides a platform for managing scattered online information resources, which is growing at a phenomenal rate. Many open source content management system is available, and to provide library services on a single platform, the Space Applications Centre's (SAC) library designed its portal using Drupal: A Content Management System (CMS). The portal provides information about library activities, functions, resources, and services as shown in fig. 2, and brings together its resources and services on a single platform for the convenience of its users. A CMS is a software application used to create, customize and manage information and provide an e-learning platform for the e-learners.

Figure 2: SAC Library portal and its usage

The various services which are provided to users on Drupal CMS are as below:

4.1 Web based Online Public Access Catalogue (Web OPAC)

Web-based OPAC is the library's main tool for locating resources. Users can perform on-line routine searches from bibliographical databases from their desktops and search according to author, title, subject, keyword, publisher, place, etc. Using OPAC status like charging, reserved, on-shelf documents etc. can also be known. Users can request for materials online through OPAC and can receive email response when requested material is available. They also receive e-mail communication regarding overdue materials.

4.2 CD/DVD Access

The library has a collection of CD/DVDs which are mapped on Network Attached Storage (NAS) which is an efficient way to distribute valuable content among multiple users. Due to the availability of better network hardware and bandwidth users can get reasonably fast access to information from the comfort of their desktop.
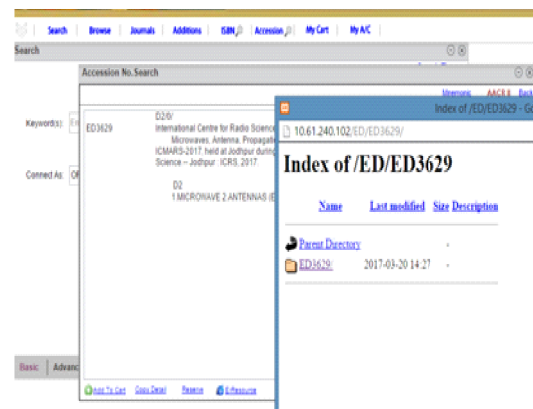

Figure 3. Accessing CD/DVD from WebOPAC

4.3 NPTEL Videos

National Programme on Technology Enhanced Learning (NPTEL) is an initiative of Indian Institute of Technology (IIT) and Indian Institute of Science (IISC) for creating course contents in engineering and science. It contains videos and web courses covering five major engineering branches i.e. Civil, Computer Science, Electrical, Electronics and Communication and Mechanical and core science programmes. The library has procured NPTEL videos and are mapped on NAS that can be accessed through the portal as shown in fig. 4.
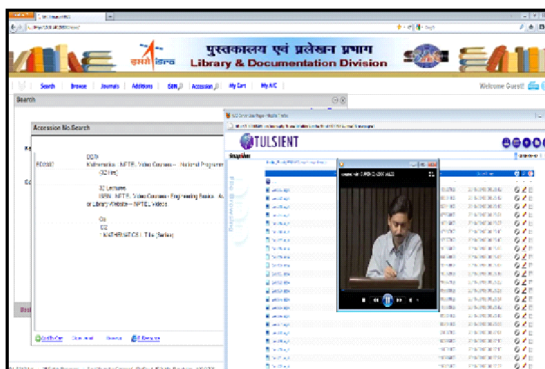
Figure 4: Accessing NPTEL videos

4.4 Institutional Repository

Institutional Repository plays a significant role in managing digital resources and serves the purpose of preservation, archiving, and dissemination of information for knowledge sharing amongst scholars in an organization. Akeroyd (2004) It is used in providing seamless access to the research of our scientific community in digital format. The Institutional Repository of SAC library uses DSpace, open source software to capture, store, index, preserve and disseminate the intellectual output in digital format. It consists of original research in digital form, including technical reports

(unclassified), publications, theses, eBooks, in-house publications, etc. generated by the Institute. The Institutional Repository is limited to, digital research products and materials for which the copyright is owned by the author or the institution. Users are requested to submit the various collections in the proper format and metadata is provided for smooth searching from the repository. The repository provides access to and manages materials in a professionally maintained archive giving users an increased visibility and accessibility over the Intranet, as shown in fig. 5. DSpace server is linked with portal so that users can access the content from a single platform.
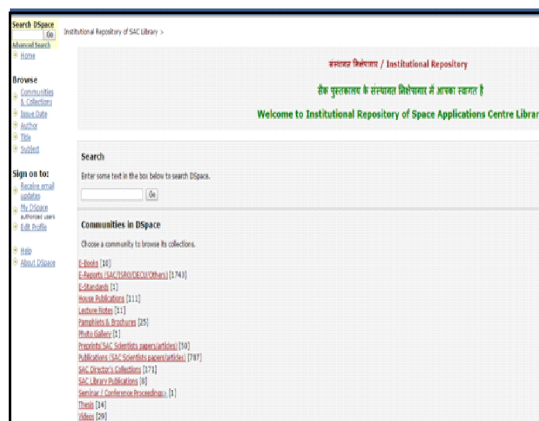

Figure 5: Institutional Repository

4.5 E – Resources

The libraryy subscribes to about 120 printed journals and 605 online journals. The online journals are IP authenticated and are accessible over the Internet. Instructions for using the e-journals through the Internet are provided on library portal. From time to time, many flashes, notices, and circulars are uploaded for users to get information regarding the new addition of e-resources. A

complete list of E-resources along with instructions on usage is provided on library portal.

Figure 6: E-Resources Tutorial

4.6 E-Books

The library has a collection of about 340 e-books from SPIE, CRC Press, Cambridge, Wiley, etc. The library has opted for perpetual access rather than subscription based access to titles. These e-books are IP authenticated and are accessible from remote locations. To adhere to metadata standards, all the e-books purchased come with MARC records and the MARC records are integrated into the library Integrated management software and are accessible from OPAC just like rest of the materials.
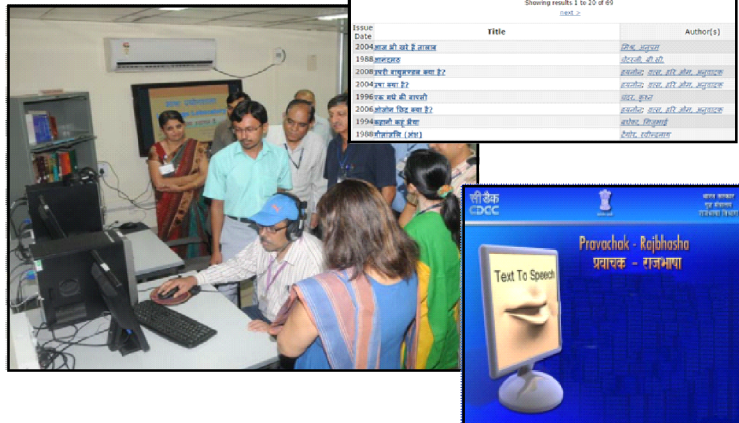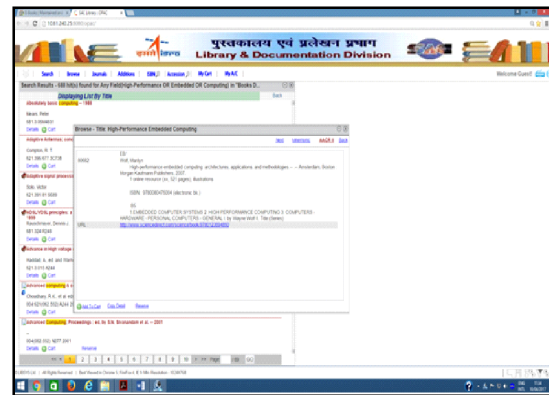

Figure 7: E-Books MARC Records

4.7 Hindi Learning Laboratory

A language laboratory is implemented in a library for learning the Hindi language. The content available in this laboratory is audio materials, Hindi e-books, and software tools for learning Hindi.

Figure 8: Language Laboratory

4.8 Virtual Reference Service

A virtual reference service is a reference service initiated electronically, where patrons employ computers or other Internet technology to

communicate with reference staff, without being physically present usually through e-mail, instant messaging (chatting) or discussion forums. The library has incorporated an Electronic discussion forum in the portal which creates an environment to discuss, exchange views, expertise on a topic.
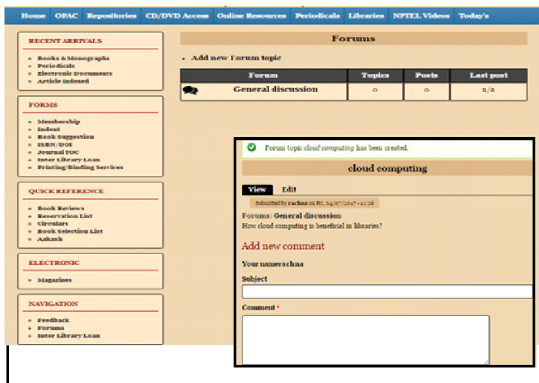
4.10 Current Contents Service

The current content pages of books and journals are downloaded /scanned and linked to the library database. These can be accessed by the users from Web OPAC through the network.

Figure 9: Discussion Forum

4.9 Current Awareness Service

Current Awareness Services are important means of keeping the users up-to-the-date in their areas of interest. List of recent arrivals of books, periodicals, electronic documents, reservation of documents, etc. is generated and are available through the portal.
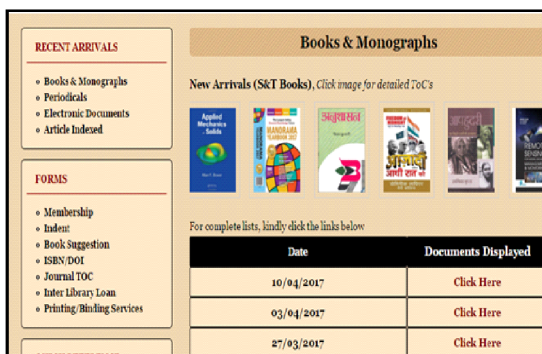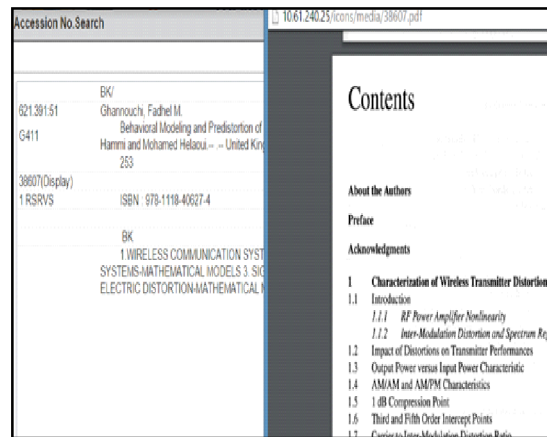

Figure 10: Current Awareness Service

Figure 11: Content Pages of Books/Journals

5. Conclusion

Digital Library has already made some proactive initiatives in support of E-learning using emerging cutting-edge technologies and are capable enough to provide an information-rich platform to both instructors and students to teach, learn and share knowledge. The library should encourage and build a culture of knowledge sharing, trust and willing collaboration, and maintain an atmosphere that is fair and supportive. The e-learning environment has ushered new avenues for libraries to blend their traditional resources with digital ones to meet the information needs of learners. E-learning is one of the most promising and growing applications in an information society. The role of libraries does not end by simply providing access to the traditional or digital resources, but the library has to ensure that they have proper infrastructure, i.e. hardware and

software and has the capability to provide and effectively maintain access to resources on an ongoing and viable basis. They have to gear up for this challenge by developing new mechanisms such as portals, digital library, courseware, etc. to provide access to resources and efficient services to users. It lays greater responsibility on library professionals to develop their skills to meet challenges posed by e-learning environment.

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