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Dr Kaladhar Arnepalli
Shri Vishnu Engineering College for Women (Autonomous), librarian@svecw.edu.in

Somasekhara Rao Kalepuss Dr.
Andhra University, kpuss.office@gmail.com

The Pace of Digital Libraries: Academic libraries perspective

Dr. Kaladhar Arnepalli[1], Dr. K. Somasekhara Rao[2]*

[1]Librarian, Shri Vishnu Engineering College for Women (Autonomous), Bhimavaram (A.P.)
[2]Professor(Retd), Department of Library and Information Science, Andhra University, Visakhapatnam

Abstract

Digital libraries are playing a prominent role in information services in general and information retrieval in particular. Users are giving more preference to digital than print resources. The metamorphosis of libraries from traditional to digital, information services to access providers, Document custodians to Knowledge managers forced library professionals to evolve themselves as information providers. The topics like a user-centric digital library system, leverage of social media in digital library services and other aspects are discussed in detail.

*****Author for Correspondence** E-mail:librarian@svecw.edu.in Tel:9849413698

INTRODUCTION

The collection of information that is in the electronic form stored and accessed randomly is called a digital library. The unique feature of a digital library is a user interface to provide information to its users even from remote places also. The digital library is an information retrieval system rather than an information service. The terms like Digital Library, Electronic Library, and virtual library are often used in the hypertext environment. The services and digital material will be served through computer networks.

The information and communication technology paved the way for digital libraries to provide library users with the right information at the right time. Digital libraries solved problems like space, infrastructure and material cost. It reduced the budgetary estimations towards the procurement of study materials to its users, particularly in academic institutions. The factors mostly influencing the libraries to change its mode into digital is as follows.

1. **Ease of Access:** The same information can be accessed simultaneously by multiple users. It serves the user round the clock.
2. **Search strategies**: Searching for relevant information is easier by using Boolean operators.
3. **Cost-effectiveness**: The amount spent on traditional libraries is more than digital libraries but we don't find the cost-effectiveness whereas the amount spent on the digital library serves the cost-effectiveness.
4. **4th and 5th laws of library science:** Digital libraries grow in terms of terabytes and gigabytes and saves the time of the user in serving user needs in a very short period.
5. **Technological developments**: Exploitation of Technology is human nature. Service to the user is the character of the library profession. The result is the origin of digital libraries.

1. ROLE OF ACADEMIC LIBRARIES

Academic libraries have a great responsibility of satisfying the quests of its users in information requirements by incorporating the innovative technical changes to provide nascent information to its users. Drastic changes in knowledge management compelled the library professionals to come out from traditional practices and to adopt versatile technologies that are inevitable for a present digital environment. The current user trend is like users are not to the library but libraries are to the users[1]. The intensive use of digital resources from home or workplace enabled the users to access their required information by 24x7. The information explosion posed academic libraries big challenges in rendering the latest and cutting edge information services. The role of academic libraries in a digital environment can be seen as.

1.1 Digital library as Information Gateway: The Functional aspects like utilization of digital resources via computer networks, databases, apps, platforms and systems changed the cover page of digital libraries as information gateways.

1.2 e-Learning Centre: Generally, academic library user's requirements deal with teacher assignments, mini projects, paper presentations in seminars, article publications, trend reports, etc. A digital library professional has to provide their information services by providing the latest information by using infrastructural facilities.

1.3 Faculty Training Centre: Academic institutions keep on changing their academic curriculum as per current trends and industry requirements so the faculty ought to bring changes while designing the courses to be taught. It is the responsibility of an academic library to provide the best digital resources, facilities to support faculty to train themselves in the implementation of teaching courses.

2. ROLE OF SOCIAL MEDIA IN DIGITAL ENVIRONMENT

After going through a vast literature confirmed social networking sites playing a beneficial role in serving the library users. The form of communication is different in social media compare with traditional library communication. Social networking sites allow libraries to reach out to patrons in the world of Web 2.0[12].

2.1 Advantages of social media[4]:
- Social media enables to establish better communication between librarian and user
- The flow of information takes place among its users.
- Possibility of answering reference queries and information can be delivered through social media.
- Social media can deliver digital resources to users.
- Social networking sites help in the distance and continuing education students.
- Social media enables Digital libraries to compete with technologies and developed world effectively
- Social networking sites help in improving the information literacy rate among its users.
- Social media as a tool does not require any special equipment except computers, Internet connectivity and a trained professional to manage[16].

Apart from the above advantages, social networking sites provide a way for librarians to develop a rapport with users, general awareness of the digital collection, and establish the digital library as a knowledge hub among its users in accessing authoritative information of a given subject area.

2.2 Useful social networking sites for digital library services[5]:

- PBwiki: Mostly this tool is used for educational wikis. Students can display their creative work. It works as an integrated point for information sharing. The feature of this tool is access control so editing privileges can be given only to authorized persons and others can only read the content.
- YouTube: Video lectures delivered by eminent professors from various national importance institutions sponsored by NPTEL and some of the universities offering video lectures through the 'Massive Open Online Course' (MOOC) can be webcast through youtube[6].
- Flickr: This is an image collection tool through which photo collection of various activities taking place in the institute like workshops, conferences and other activities can be shared among library users[11].
- TeacherTube: It is a video-sharing website. specially meant for teachers to share academic resources like video, audio, photos, groups, and blogs.
- Wikipedia: It is an online encyclopedia for users. This tool can be used for sharing your knowledge by editing it. You can also guide the users in searching for the right information.
- SlideShare: The research and developmental activities can be shared by students, faculty and research scholars through the slide show presentation by which a greater amount of information dissemination is possible among the academic community[9].
- Footnote: The unique feature of this tool is to get access to original historical documents one can update them with his content. You can find one's own experiences and tales which you don't find in the reference books[13].
- StumbleUpon: Though this service is shut down in June 2018, it is a web search engine, it pushes web content recommendations to its users basing on user interest

2.3 Categorization of Social networking sites for digital library environment[8]:

Table 1: Categorization of Social Networking Sites.

Information Communication	Information Distribution	Information Organization
MySpace	Flickr	aNobii
Facebook	Youtube	Del.icio.us
Ning	Teacher tube	Netvibes
Blog	Second Life	Connotea
Meebo	Wikipedia	LibraryThing
LinkedIn	PBWiki	lib.rario.us
Twitter	Footnote	
	Community Walk	
	SlideShare	
	Digg	
	StumbleUpon	
	Daft Doggy	

2.4 Some more social networking websites at glance[7]:

Table 2: *Social Networking Sites at a Glance*

Social Media	Technology	Description
Google, Yahoo Answers, IMDB	Customized search engines	Targeted searches
Myspace, Facebook, Xanga	Social Networking	Connect single user with hub of friends
Podcast Maker, Procast, Odeo	Podcasting	Multimedia authoring and syndication
Joomla, Drupal	CMS	Web design and management
Delicious, Blinklist, Stumbleupon	Social Tagging	Democratic website ranking
Digg, Newsvine, Gabbr	Peer Producing News	User decide what is news
MediaWiki	Collaborative Authoring	Open editing and tagging
YouTube, Google, Video, Metacafe	Video collections	Video Uploads
Blogger, WordPress	Blogging	Personal authoring and Publishing
Google Docs, Rallypoint	Collaborative Writing	Online word processing
Wayfaring, Frappr, HouseMaps	Mapping	Sharing personal maps
Flicker, Slide, Zoto	Photo and Image Management	Open image access and tagging

3. DIGITAL RESOURCES MAINTENANCE[18]:

The fragile nature of digital resources and the threat of durability posed a big challenge to digital libraries. Libraries spending phenomenally on the acquisition of e-resources, e-journals, e-books online databases, etc. The use of these resources in the future depends on ever-changing technolog [2].

3.1 Infrastructure requirement of a Digital Library [3]:
- A server of a basic configuration, UPS, P.C. with multimedia
- Network connections like LAN, MAN, WAN
- Digital library software like dSpace, eprints, etc.
- High configured Scanner, Digital camera, etc
- Laser printer.
- Audio and Visual equipment like VGA monitor, DVD, Sound system.
- Storage Devices like Optical storage device, CD-ROM, Flash Drive, etc.
- Open communication protocols (client-sever, e.g. z39.50for IR)

- Information access tools to browse, display and search
- Meta database
- Electronic publishing tools (personal, institutional, publisher)
- Data compression
- Digital storage
- Multi-media technology
- Advanced retrieval, indexing, natural language processing, routing and filtering
- Document description and representation standards
- Interoperability with other digital libraries
- Privacy, authentication, and security.

3.2 Strategies for Preservation of digital materials[15]:

The following are a few strategies for preserving digital resources for future generations:
- Rejuvenate the storage of Medium periodically: Copying digital material from one storage medium to another medium.
- Data relocation: Shifting from one set of configuration to another in terms of software/hardware helps to preserve digital materials for a long period.
- Technology preservation: As per updated versions of hardware/software the digital materials also should cope up with revised versions[17].
- Software support: The materials preserved in digital software should support the same material to run on another software.

3.3 Digital library Services[14]:
The basic job of a digital library is to gather, distribute, and preserve digital materials of institutional requirements. The digital content includes article publications by faculty, students and research scholars, pre-prints, post-prints, student projects, conference papers, presentations, and other born-digital or digitized materials. The service aspect of its community is as follows.

- Digitization of required material if the material is in print form that is of highly demanded by the scholarly community.
- Organizing the Information literacy programs to its users i.e. faculty, researchers, and students in using the digital content effectively
- In support of academics of users, digital libraries provide possible access to subject digital content.
- Keeping readily available, the study material in digital format for both the faculty and students, compatible with current trends
- Guiding its user community in managing their required information as well as providing access to various datasets
- Helping its users in navigational aspects of digital content and suggesting tools for easy access
- The digital library has to provide a scalable, and sustainable platform for the delivery of digital content.
- Preservation of digital content for future generations

4 CHALLENGES IN BUILDING DIGITAL RESOURCES:

4.1 Competing with technology[10]:

Digitization of analog material is emergent and forcing the library professionals to compete with the ever-changing technology in the conversion of analog material into digital material. The standards or best practices to be adopted to maintain the quality reproduction of digital material for best usage is necessitated.

4.2 Search strategies and information retrieval tools:
To retrieve any information user mainly depends on the various search strategies like simple, advanced search or keyword search but the accuracy depends on the tools and techniques the user uses. There are tools like Boolean logic i.e. and, or, not, Bibliographical tools and various indexing techniques to retrieve the required information. Now the problems are that the search engine software is not free of cost nowadays, which is causing financial constraints to the digital libraries.

4.3 Interoperability of digital resources:
Sharing of digital material among pooled digital libraries gives a chance to have access to a variety of digital materials to the users at large but the digital material which we are using for this purpose should have adhered to protocols and standards. There are standards like Z39.50 (for distributed search) to facilitate the pooled digital libraries. So here the coherence of standards and protocols is essential among the digital libraries sharing the digital material.

4.4 Issues on Intellectual Property Rights (IPR):
Serious concern over intellectual property rights relating to digital material crippling the access mechanism. The motto of the digital library is to give access to more and more digital materials this often conflicts with archives management that may be subject to IPR

4.5 Effective Access:
Digital library services are disconnected from traditional library services. Appropriate catalog records in traditional libraries used to connect the user required information but whereas in the digital library the concept of guiding the user in his information need is failing because individual items in digital collections cannot be accessed directly.

5. ADVANTAGES & DISADVANTAGES OF DIGITAL RESOURCES:

5.1 Advantages:

The unique features of accessibility, affordability, usability, and readability of digital resources over the print material are added advantages to digital resources. The following are the advantages of digital resources

a) Multiuser accessibility: A single object can be accessed by multiple users through the computer network simultaneously round the clock.

b) Speed: A digital resource is easy to search and browse quickly and it is also easy to retrieve information from, and to incorporate retrieved information into other digital material and to locate required information from the different sources.

c) Searchability: Digital resources will allow the user to analyze required information from different digital resources using Boolean logic by just clicking the mouse on the search option.

d) Information in Variety of Formats: Accessing information in a different format is possible only in digital resources which consist of images, video, audio, animation materials, etc. which could not be possible in print.

5.2 Disadvantages:

a) Digital resources require a personal computer or a special device like kindles, iPods, etc. that can be looked at as a disadvantage. Some of the digital resources are compatible only with certain software and hardware which may be expensive. Technological developments demand developed versions of existing digital material and infrastructure which may result in outdated information. The damage to the hardware/software is inevitable.

b) PC Screen glare may affect the eyesight of the many potential users. The display resolution of computer screens and electronic devices is considerably less than the print material.

c) Reading comfort is more in printed material than digital material. Navigation from one page to another is more difficult in the digital material compare with printed material.

d) A paper life span is much more than digital resources, the existence of digital resources for a long period is not reliable. Exclusive preservation methods are to be followed for digital documents. To replace printed books, a high degree of reliability of electronic devices is a must to maintain long-lasting digital content.

e) There are several titles available in traditional print formats when compare with digital content in the form of e-books.

f) New technologies always demand time, experience, and money to provide digital services to its users and to take full advantage of its competence.

CONCLUSION

Academic institutions are looking forward to offering better information services to all its users which is possible only by adopting digital technology to keep pace with changing the digital environment. Basing on the research needs of the academic institution, library professionals depending on the digital library consortia i.e. interconnecting with other institution's digital libraries to cut down the expenditure and to provide more number of digital resources without any duplication during the material procurement.

Digital materials preservation, usage, copyright, sustainability, etc. pose serious challenges. Though the academic community would have various interpretations of fair use by faculty, researchers and students. In this generation of the digital environment, there has been a drastic growth of information resources facilitating and bringing developments in teaching-learning and research. The use of web technologies like web 2.0 and social networking software in the library has a great success in information dissemination and other core activities in the library services. The task of proper planning, organizing and implementing social networks in the digital environment gives an absolute shape to the digital libraries.

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