An Overview of Electronic Resources in the University Library: An Approach towards Betterment

By
Ms. Divya Singh Rawat
Research Scholar,
Deptt. of Library & Information Science,
University of Rajasthan, Jaipur-302004 (Rajasthan)
&
Dr. Purnima Kaushik
Former Professor & Head,
Deptt. of Library & Information Science,
University of Rajasthan, Jaipur-302004 (Rajasthan)

Abstract: University libraries in the electronic environment cannot facilitate their services without the use of Information and Communication Technology (ICT) and e-resources (electronic resources) tools. The impact of such technologies has significantly changed the attitude of working of the university library professionals to enhance and provide the services to their users. Electronic, digital and virtual libraries are the new developments in the ever-growing ICT era. The main feature of the electronic resources (e-resources) is conveniently accessible within and outside the four walls of any library. This study applies a literature review method by reviewing the related articles. This paper discusses the concept, need, characteristics, types, Electronic Resource Management System (ERMS), and problems and challenges in managing the e-resources in the university libraries. This paper infers that Electronic resources have been developing by information providers and suppliers with new technological tools and techniques. The changing attitude of information seeking behaviour of users towards e-resources has also made an affect on the collection of information sources of the university libraries. E-resources based services in the university libraries should be performed effectively by using a standard Electronic Resources Management System/Procedure/Model.

Keywords: E-resources, Information and Communication Technology (ICT), University library, Electronic Resources Management System (ERMS)

1. Introduction

Electronic information resources is an organized collection of electronic or digitized information and materials available in the digital form which can be accessible by a computer on the network by using any protocol (Hungwa, 2013). E-resources can be considered as a reservoir of a significant aspect of global literature. The role of the library professionals has changed due to the need for a culture of information seeking pattern and behaviour of users towards e-resources. University library professionals are discovering ways to respond to the exponential growth of e-information resources. E-resources have become an integral part of the hybrid library for academicians and researchers. (Kelefa, Emmanuel, & Esther, 2017).

The application of ICT for information storage, processing, access, and communication has also brought several products and services into the landscape of university libraries, consequently, the information seeking patterns and behaviour of users are also being changed simultaneously in recent years.

Scholarly information for the academic community of university education are very significant for further research and investigation, which are available in various types of databases, by the instantaneous development in database technologies. Such information needs can be acceded and retrieved effectively and efficiently through the application of ICT and e-resources. University libraries are progressing towards offline and online e-resources for easy access and retrieval of information. Development in ICT and e-resources technologies has changed how information is acquired, stored, retrieved, disseminated and communicated, along with equally changed the way of rendering information services in university libraries.

As e-resources have overcome the problems of storage and flood of information, print sources are being digitized to promote and produce utility (Jasper, et al 2016), and they noted that users find electronic resources smartly and use them more conveniently than print sources. As a result, libraries in response to the information needs of their users are smoothly building the collection of e-information resources available online through the use of the internet and other offline digital formats.

Many corporate bodies have been producing brands of e-resources tools day by day due to emerging digital society. For the application and use of e-resources in university libraries, library staffs need to learn the new knowledge and skills of such brands required further with the thought of hybrid library settings (Chimah & Nwokocha 2013).

2. Objectives of the Study

The primary objective of this study was to examine the organisation and management of electronic resources in university library with the following consideration:

- To depict the concept, need, characteristics, features and types of electronic resources
- To identify the problems and challenges resisting the organisation and use of electronic information resources in information service in the university library.
- Examine strategies that can be adopted to enhance electronic information resources use for information services in university libraries.

3. Information and Communication Technology (ICT)

The fast developing ICT has showered almost in the various activities of university libraries. ICT has made a wide range of impacts on library and information functions and activities due to transformations from conventional methods to non-conventional methods. The functions and activities by Non-conventional methods with the help of ICT tools can be summarized as follows ((Kumar, 2003,p. 9-12).

- Generate and Originate: Word Processing, Text editing, Character Recognition,   Voice Recognition
- Preserve and Store: Electronic Publishing, Magnetic Storage, Video text, Teletext. Computer disk, ROM
- Process: Electronic data processing, Artificial intelligence/ Expert systems.
- Retrieval: Database management system, Information retrieval offline, Online.
- Disseminate/ Communicate: Electronic mail, Electronic document delivery, Computer conferencing, Telefacsimile, View data
- Re-use the storage medium: After magnetic erasers and optical erasers, the medium can be re-used.

4. History of Electronic Resources

The advent of the computer created the first database suitable for searching the information that was MEDLARS. The National Library of Medicine (NLM) began publishing Index Medicus evolved over time and then the first on-demand computer-based information retrieval service version called Medical Literature Analysis and Retrieval System (MEDLARS) began in 1963 primarily for the medical profession. In 1971, NLM began providing access to Index Medicus content via the MEDLARS online (MEDLINE) system, which was the first major online dial-up database search service. While the information revolution was clearly underway, the Compact Disc (CD) was introduced in 1982 for digital audio reproduction. As a result, computer industry in the mid-1980s came forward to produce the disc for large computer programmess, graphics, and databases at low-cost storage solutions. Due to the large storage capacity of Compact Disc, it quickly replaced the floppy disk, having less storage capacity than CD. After the production of CD-ROM, electronic resources started to make a major impact on selection practices in libraries (Meadow, 1988). World Wide Web (WWW) is the truly transforming information revolution that had begun and is based on a hypertext technology, along with the techniques of information retrieval. WWW is a major portion of the Internet (Johnson, 1994, p. 75). The Web has provided a tremendous boost to the development of electronic publications of all types.

The development of ICT tools, advent of WWW, and the Internet have increased the speed of publication of electronic versions of print journals whose number has been increasing by the day. E-Resources are very necessary sources of information in the libraries of higher education systems, particularly university libraries, due to information-seeking behaviour and attitude of the users. Another phase of development of e-resources was network and consortia. It is not possible for any library to acquire all the information resources to cater to the information needs of all the users. The concept of sharing the resources of libraries came out, which has been recognised in the 1990s. As a result, libraries and information centres took an interest to create consortia and networks.

The networks and consortia deal with information networking. The main advantage of the library network is to share the data and other information resources between libraries and as such to be provided to the users. In library network, data and other resources should be shared pin-pointed, exhaustively and expeditiously.

Information networking/ library networking terminology took place in the digital age to mean sharing of resources of a library or institution for the users of other libraries or institutions (Umeozor, 2019, p.34).In fact, a library network is nothing but library cooperation, which is accomplished for resource sharing through computers and telecommunications, etc.

5. Need for E-Resources

Due to advancement in ICT tools, the electronic publishing explosion, and users' culture, libraries particularly university libraries are renovating themselves towards the collections of electronic information sources, and online services in digital age. As such, they

have enabled the librarian and library staff to provide better service to the user community within and outside the libraries at the global level. The considerable points for the need for e-resources are mentioned below:

- Access to e-resource can be done by the more than one user.
- Searching process of e-resource can be accomplished quickly.
- Finding the process of e-resource can be performed easily by the users.
- Collection of e-resource can be built up in huge amount.
- Amount of time can be saved by using e-resource.
- Collection of e-resource can be organised and managed in digital form
- Efficient delivery of e-resource can be promoted economically to all the users.
- Co-operative efforts of libraries can be facilitated easily for saving and sharing the investments of organisation and management of e-resources of the libraries.

6. Characteristics and Special Features of E-Resources

E-resources can be characterised by the following qualities, which differentiate them from traditional resources:

- Access: Access to every document by anyone; from anywhere.
- Retrieval: Retrieval of e-resources is rather performed quickly than print resources.
- Guided: The users can be guided to the document by providing a link.
- Easiness: Easy to search the text.
- Media: The collection available in electronic format can be of any media.
- Ownership: Not that important.
- Interaction: In electronic environment, the interaction between user and librarian is frequent.
- User group: No defined user group.
- Software: The software can help the users in retrieving the desired information; hardly intermediate can help users.

E-resources on the Internet have the inherent special features of the information on the Net itself. The features of e-resources related to information and media stated by Satija (2003) are as follows:

- Compactness: High compact storage.
- Reproduction: The reproduction process can be operated easily.
- Easily detaches: Contents can be very easily detaches from their media or container.
- Migration: Ease of migration of contents from one medium to another.
- Communication: Ease of transmission, communication, and storage.
- Hypertext and multimedia;
- Search approach: Refined and multidimensional searches through keywords, free text, Boolean operators and natural language processing.

7. Types of E-Resources

E-resources can be categorised into two categories: Offline and Online. Some popular e-resources in both categories are discussed below:

- **Electronic books:** A book is an electronic form of a printed book to be viewed on a computer, laptop, smartphone, tablet, or e-book reader (e-reader). As such, it may also be managed on a computer or other convenient electronic device. There are common formats liked by e-readers as Adobe PDF and plain text (TXT).

- **Electronic journal:** There is no tangible definition available for electronic journals. In literature, various terminologies have been used by the authors like virtual journals, paperless journals, online journals, scholarly electronic journals, networked journals in place of electronic Journals. An electronic journal is published periodically in electronic format on the Internet. A library may collect important electronic journals for its digital collection. There are currently two types of e-journals: Offline the CD-ROM version, and Online or Internet-based journals (https://www.lisedunetwork.com).

- **Electronic newspaper:** E-Newspaper is published electronically online in the same format as a normal print publication of the newspapers, which can be accessed through Internet and its tools, along with supplementary content to print publications published exclusively on the World Wide Web.   With web addresses, hypertext, and hyperlinks to extra information, uploaded photographs, etc, e-newspapers follow the format of most print newspapers (https://www.easytechjunkie.com).

- **Electronic magazine:** Electronic magazine (or e-zine, webzine) is a digital magazine that is hosted, distributed, and read online along with some features of online newspapers and blogs. Electronic magazines have the same editorial approach as traditional magazines. There are some magazine publishers in online editions, referred to as digital editions.

- **Indexing and abstracting database:** Both are reference sources. Abstracting service deals with abstracts of publications, while indexing service deals with assigned descriptors and other access points to documents. Both services provide the brief of documents along with descriptors for referencing documents (https://gdl.sempertool.dk/content-development).

- **Database:** Databases are a structured compilation of data on a specific topic or multidisciplinary topic; data can be searched and obtained electronically in digital databases. A Bibliographic database is a descriptive record of an item to provide the information about author, title, subject, publisher, etc. The information provided is called a citation along with an abstract of the item in some database on the Web. A full-text database is concerned with text-based database providing the entire text of the article and the citation to a journal article as well. Metadata is often called structured data about data or information about information to facilitate the discovery of relevant information. Meta-database is a database that allows one to search for content that is indexed by another database.

- **Reference database:** When digital dictionary, almanac, and encyclopedia are accessible over the Internet and through secondary storage devices.

- **Other databases:** There are so many other databases mentioned in literature as Statistical databases, image collection, multimedia products, electronic theses, electronic clipping, electronic patents, and electronic standards.

8. Components of Electronic Resource Management System (ERMS)

ERMS is the process of managing the e-resources which involves the works of acquisition, selection, maintenance, licensing, troubleshooting, protecting the legal rights, promotional activities, etc. It may be applied and used with some changes in its procedures, depending on the nature of various kinds of libraries. However, there are some common following steps that can be followed by any library for collection of e-resources (Jewell, et al., 2004):

- Identifying e-resources.
- Helping in trial access to the identified e-resources.
- Selection of e-resources.
- Subscription/Acquisition processes of e-resources.
- Implementation/ Access facility to e-resources.
- subscription decision continue or cancel

9. Problems and Challenges

In digital era, ICT has made an insightful impact on the availability and accessibility of e-resources. Dawson has rightly stated that digital technology is available for creating and capturing information in various formats, making these available to others (Dawson,2000). The Internet has given rise to the development of electronic information resources. The Internet is a network of networks through which the electronic resources can be accessed on the basis of ownership or access right. Online access is available along with subscription with printed volumes (Sinha, 2014).

The consortia approach has been progressing in India to subscribe the e-journals and databases. Some models are working successfully. Such consortia are UGC-INFONET E-Journals / Digital Library Consortium, INDEST Consortium, FORSA Consortium, CSIR Consortium, IIM Consortium, and major activities of INFLIBNET for electronic resources, and etc. However, in spite of innumerable advantages and merit of e-resources, there are certain problems and issues for managing the e-resources to be reviewed below:

- **User Behaviour**

E-resources have also affected user behavior and attitude toward research environment. Internet facilities have been increasing the usability of e-resources. Users' behaviour and attitude in the present electronic environment are highly impatient and time conscious to want information just now or never (Torma and Vakkari, 2004). Consequently, university libraries are forced to change their attitude from physical to virtual environments through tools and techniques for the flow and use of information in a simple and effective way. Since printed material cannot be replaced completely by e-resources, university libraries have to continue functioning in a hybrid environment. Publication of e-books is increasing, but their acquisition represents only a small proportion of the collection (Newman, 2010).

Keeping in view of users' behavior and attitude towards e-resources in digital era, university libraries are bound to shift from print resources to e-resources to cope with the preferred approach of users.

- **Collection Development**

The collection development of e-resources is more complex than the printed resources. Some specialists dealing with e-resources have worked out following parameters to evaluate the e-resources for their selection : • Content • Conditions of access • Updatability • Convenience of cataloguing • Longevity • Convenience of use • Statistics of use Technical characteristics and quality of service • Factors of value added • Structure of price formation (Lutsik, 2009). Important elements of collection development stated by Kaplan

are budgeting, type of material, selection, acquisition and evaluation to be taken into account by all university libraries (Kaplan, 1975). Access to subscribed resources is denied after the expiry of the subscription period unless perpetual access is agreed upon. In view of this challenge, university libraries need to develop separate collection development policies for e-resources.

In fact, collection development policies for printed and electronic resources of university libraries in hybrid environment are integrated to meet diverse needs of communities. University libraries should change themselves and adapt the digital environment to cope with the future needs of users. It is to be mentioned here that the range of purchase, availability of pricing models and determination for meeting the needs of the university libraries in terms of access and archival and value for money should be considered so that right choice in selection of resources could be made (Nicholas and Huntington, 2006).

- **Consortia**

The cooperative purchasing of electronic resources through consortia can be seen as a surviving hope for the profession. Electronic resources seem to be the least utility due to the limitation of consortia purchase. Convenient and proper solutions for consortia purchases can be sought through both ends of publishers and the university library professionals. However, Kaplan has summarized the advantages of consortia purchase as under (Kaplan, 1975):
- To hold on to rising cost
- To win additional support from local, state, and federal Govt.
- To introduce non-conventional (computerized services)
- To widen the scope to the national level
- To control the gap between best and worst readers served.

The consortia changed the scenario of acquisition policies of e-resources. Due to wide accessibility at minimum cost of resources through consortia, e-resources are being purchased more through consortia. So far big deals are concerned, such deals are negotiated by the university library with the consortia provider where many thousands of journals and e-books are made available to access and use. A group of skeptics believe that in big deal, there is a wastage of money and the availability of such huge digital resources to the user go unused or are little used (Nicholas and Huntington, 2006). Hence, a concerned consortium has become almost essential for every university library pertaining to such consortium.

- **Pricing of E-Resources**

The greatest problem of e-resources is pricing. As fixed prices and subscription rates for printed books and printed journals etc. but there are no standard pricing models for e-resources due to the different policies of the publishers. Some publishers and vendors may deal with e-journals only or both e-books and e-journals and together with the additional benefits of accessing open sources.

Many pricing models are based on different matrixes. These matrixes are potential users under a local network, concurrent users, nature of the institution, subscription for a specific period, and different renewal policy; long-term/short-term subscription, access to back files, access through IP addresses/Proxy server, archival license, site restriction, pay-per-view, the offer of open access sources with a subscribed package, length of time of access (five years access may be concessional) (Ables, 1996). There is a trend of bundle pricing offered by publishers for all their publications. The bundle pricing model gives access to a wide range of collections, but the usability of all the resources contained therein cannot be ensured in advance. Hence, the pricing model is being popular for the acquisition of e-resources.

Librarians should negotiate with the publishers or the vendors to arrive at mutually agreed prices if no standard pricing model exists, along with the terms and conditions of accessing the resources. But trial and demonstration for evaluation of the package would be necessary to take the opinion of the users about the usefulness of the product.

- **Archival Problem**

As online resources are remotely located under the ownership of the publishers or vendors, university libraries do access these resources under the terms and conditions of the agreement and licensing policy. This poses serious archival problems for back files after the expiry of the subscription and outright purchase of the package by libraries. So archiving of back files is also a challenge. Hence, the decision has to be taken whether archival responsibility would remain with the publishers or the library will make its own arrangement. Archiving back issues in the local server for the certainty of all-time availability should be given preference. Timely care in its maintenance and migration from the old platform to the new one is important from time to time (Chepesiuk, 2000).

- **Management Issues**

In the beginning of the 21st century, university libraries were feeling about existing library software was incapable of handling e-resources due to a lack of library software, open software, and the ERMS (Electronic Resources Management System). In fact, ERMS enables the Users to access e-resources by multiple approaches, and also the requirements of the library staff in maintaining the e-resources. ERMS should enable to meet the following users' approaches:

- Specific topic or title from all available sources.
- Subject approach under a particular author may also be sought.
- Users prefer a specific electronic source of information.
- Integrated approach for search from printed as well as e-resources.
- Easiness in downloading and printing information from the database
- Arrangement of e-resources by title (A-Z) grouping them under subject categories to be searchable under general and specific categories.
- In addition to the approaches of the users, librarians have their own requirement of providing computer-generated services, usage, log and download statistics, compliance to terms and conditions of publishers, agencies, supplier, etc.

In view of such problems, many organisations, institutions and library professionals, etc. have been developing various kinds of library software for the management of e-resources with the participation of professionals, individual libraries, vendors and consortia groups, etc. To overcome the problems that occurred during the operation of library software, they have been organizing several seminars/meets and forming various groups/committees for the purpose of working out solutions and improvement for the management of e-resources (Vakkari, 2008).

- **Matter of License**

Before the beginning of the 21st century, there was a lack of consistency in license negotiation at the library/department level. In 1999, the survey report of ARL SPEC Kit, "Managing the Licensing of Electronic Products" pointed out that sixty percent of libraries responding to the survey had one employee who was responsive to managing license negotiations (Soete, 1999).

In larger organisation, the final approval of the negotiated version of the license was disposed of at the level of organization than the organizational unit. The license-negotiating staff member of a department follows the selection of a title and goes ahead with the ordering of the resource. The first work that might be considered was to determine the choices being the publisher's license, the consortium's license, or the library's license.

A general understanding and attention should be clear about license negotiation. In the negotiation process, the responsible person within the university library and the publisher's appropriate representative should discuss in an informal way and both can agree upon each other's attention. As such, the problem needs to be constantly monitored. Some libraries appoint a legal representative within the larger organisation to approve or sign the final license.

10. Conclusion

ICT has provided a series of electronic tools for doing various tasks like storage, dissemination, transformation, archiving, and preservation of both information and document and various types of services performed in a university library. In fact, the real product of ICT is e-resource. Most university libraries and their professionals have not currently developed themselves for digital libraries due to many reasons, issues and challenges pointed out in the above texts. To organise and manage e-resources efficiently and effectively the university library, university library professionals should design a new system that is "Electronic Resources Management System" so that collection of e-resources and services could be made in a proper and systematic manner for the end users.

Electronic resources are being developed with new brands day by day and changing the attitude of information-seeking behaviour of users towards e-resources, university library professionals of higher education institutions have to take on new roles, tasks, and accountability for managing e-resources.

REFERENCES
1. Ables, E.G, (1996), Pricing of electronic resources: Interviews with three Vendors. *Journal of the American Society for Information Science*, 47(3), 235.
2. Chepesiuk R, (2000). JSTOR and electronic archiving. *American Libraries*, 31(11), 48.
3. Chimah, J.N., and Nwokocha, U. (2013). Empirical study of motivation, challenges and strategies in the use of electronic information resources by postgraduate library users in south-east Nigerian universities. *International Journal of Library and Information Science*, 5(11), 468-473.
4. Dawson, R. (2000). Knowledge capabilities as the focus of organizational development and strategy. *Journal of Knowledge Management*, 4(4), 1-9.
5. https://gdl.sempertool.dk/content-development
6. https://www.easytechjunkie.com/what-are-e-newspapers.htm
7. https://www.lisedunetwork.com/electronic-journal-e-journal/
8. Hungwa, S. (2013). The significance of electronic resources and digital library theories for skills development of library staff in Nigeria. *Library Philosophy and Practice (e-journal)*. (http://diditalcommons.unl.edu/libphilprac/1001).
9. Jasper, M.M, et al. (2016). Strategies to enhance access and use of eresources by postgraduate students in selected university libraries in kisii county, Kenya. *International Journal of Academic Library and Information Science*, 4(8), 203-207.
10. Jewell, Timothy D., et al. (2004). Electronic Resource Management: Report of the DLF Electronic Resources Management Initiative. Washington, D.C.: Digital Library Federation. (Retrieved from http://old.diglib.org/pubs/dlf102)

11. Johnson, P. (1994). "Collection development and the Internet. **In** P.Johnson & B. MacEwan (Eds.), Collection management and development: Issues in an electronic age: Proceedings of the Advanced Collection Management and Development Institute, Chicago, IL, March 26-28, 1993, pp. 63-79). Chicago: American Library Association.

12. Kaplan, L. (1975). Library cooperation in United States. **In** Encyclopedia of Library & Information Science, edited by Allen Kent, et al. New York: Dekker. 13,260.

13. Kelefa, M., Emmanuel, E., and Esther, N. S. (2017). Utilization of e-resources to support teaching and research in higher learning institutions. *University of Dares Salaam Library Journal*, 12(2), 98-123.

14. Kumar, P.S.G.(2003). Information technology: Basic concepts. New Delhi: BR publishing Corporations, p9-17.

15. Lutsik, Y. N. (2009), Creating the electronic collection of a University: Criteria for selecting online access resources. *Scientific and Technical Information Processing*, 36(2), 93.

16. Meadow, C. T. (1988). Back to the future: Making and interpreting the database industry timeline. *Databaes*, 11(5), 14-16.

17. Newman, Michael. (2010). *Highwire press 2009: Librarian ebook survey.* Palo Alto, CA: HighWire   Press,   Stanford University.

18. Nicholas, D. & Huntington, P. (2006). journals: are they really used? *Interlending & Document Supply*, 34(2), 48. 10. (Retrieved from http://highwire.stanford.edu/PR/HighWireEBookSurvey2010.pdf)

19. Satija, M. P. (2003). The five laws in information society and virtual   libraries era. *SRELS Journal of Information Management*, 40(2),   93–104.

20. Sinha, Manoj Kumar (2014). Managing Collection Development of Electronic Resources in digital and Networked Environment: An Overview. **In**: Charaibeti: Golden Jubilee Commemorative Volume (Eds: Goutam Maitey et.al. Department of Library and Information Science , Jadavpur University , Kolkata , Pp.188-210. (ISBN: 978-81- 929886-0-3).

21. Soete, George. (1999), Managing the Licensing of Electronic Products: SPEC Kit. Washington,D.C.: Association of Research Libraries *248*. Aug (www.arl.org/spec/248fly.html)

22. Torma, S. & Vakkari, P. (2004). Discipline, availability of electronic resources and use of Finnish National Electronic Library-FinElib. *Information Research*, 10 (1). (Retrived from https://informationr.net/ir/10-1/paper204.html).

23. Umeozor, Susan Nnadozie. (2019). Information Networking and its Application in the Digital Era with Illustration from the University of Port Harcourt Library. *International Journal of Knowledge Content Development & Technology*, 9(2), 34.

24. Vakkari, Petti, (2008). Perceived influence of the use of electronic information resources on scholarly work and publication productivity. *Journal of The American Society for Information Science and Technolog*y, 59(4), 602-612.