CHAPTER-1

INTRODUCTION

- Electronic resources- Development and background
- Need and Significance of the study
- Statement of the Problem
- Definition of the Key Concepts
- Objectives
- Hypotheses
- Scope and limitations of the study
- Organization of the thesis
CHAPTER-1
ELECTRONIC RESOURCES

1.0 Introduction

Unlike other types of social institutions, libraries have a significant role in preserving and disseminating human culture and civilization. History is witness to the fact, that libraries have played a great role in the interaction of civilizations. Knowledge is power and libraries are the storehouses of this power in the form of books and other reading materials. It provides direct incentives to the development of educational, social and cultural activities. Library is not merely a collection of books but epitome of learning institution, containing wealth of knowledge and well-trained professionals who maintain and organize this treasure of knowledge. A library is a collection of sources, resources, and services, and the organization, in which it is stored and organized for use. An organization or community, an institution, or a private individual maintains it.

A library is an organization that acts as an intermediary between knowledge and its seeker. It manages the intellectual products of society, processes them and makes it available for the individual’s use. Today, in the era of information and communication technology, the functioning and role libraries, has changed because the information is available over internet, which can be accessed anytime and from anywhere in the world. This has made an impact on the collection development of the libraries. Now libraries have acquired or are in the process of acquisition of both printed as well as electronic resources in their collection. This makes the libraries to break its wall and emerge as libraries without walls because the electronic documents managed by libraries may be stored, accessed and delivered to information seeker as and when required. According to Okiki (2012) the services of libraries are not limited within its four walls, but integrated on local and global level. Now a days it is very common to get access to about all scholarly journals, OPAC, grey literature, e-databases, academic journals and various other related academic materials in all the fields of knowledge over internet.

What Is an Electronic Resource? In the view of Davis (2013), electronic resources require computers, which may be PCs, mainframe or other hand-held gadgets
to gain accessibility to it. These resources may be accessed at local as well as on global level through internet. Renwick (2005) discussed that e-resources make research more timeless and make ways to discover and create new dimensions in the field of query.

**Electronic resources** are becoming an important topic among the librarians as technological revolution and information explosion has changed our outlook towards functioning of libraries. In comparison with traditional resources, description of e-resources is considered as a challenging task for libraries. Electronic resources are still evolving as to their nature and content. That is why; librarians are still taking into consideration the conceptual issues associated with e-resources.

E-resources have benefitted the users of information, since e-resources offer extended accessibility, better usability and good effectiveness to its users while searching information. The users have given more value to e-resources as the use of e-resources increased. Skills of users of e-resources greatly influence the use of electronic resources especially by the academicians of various academic institutions. (Okiki, 2012). Electronic media like floppy disk, magnetic tape, CD-ROM, DVDs and online e-resources like e-books and e-journals are slowly replacing the physical hard volumes of books and journals as electronic resources provide rapid and easy access to information.

According to Tamizhchelvan (2012), electronic resources are those resources, which deliver collection of data i.e. e-journals, image collection, numerical databases and other multimedia with assistance of computer. Computer is essential to gain access over e-resources that can be delivered on CD-ROMs, on tape, floppy disks and pen drive etc. collection of universities are greatly influenced by e-resources. Various techniques are now being developed to produce and distribute documents in electronic form.

E-publishing introduced the new era of communication and information sharing. It has created new opportunities for the authors, users and publishers. (Tamizhchelvan, 2012)

In view of Tamizhchelvan (2012) various kinds of e-resources are available on world-wide web among these certain e-resources has got attention which includes: electronic journals, e-standards, technical specifications, e-reports, e-patents, full text articles etc.
**Information technology**- is an invention of the twentieth century and it has entered in every field of human activity. For centuries, libraries have been entrusted with the work of gathering, recording, organizing, disseminating information and knowledge mostly in the form of physical media. However, due to rapid development and application of ICT in libraries, within past few decade libraries are engaged in collection of e-resources largely.

**Organizing e-resources** is the most challenging task to give services to the users of a particular library network or a library system. It has become mandatory in a modern library system that the professionals engaged in library systems should be well equipped with skills like computing, database management, networking and other necessary IT skills. Hence, while organizing e-resources one should kept following points in mind. (Tamizhchelvan, 2012)

1) To include those resources either in OPAC or to make different lists for browsing

2) Organize to get access to the e-resources either by alphabetical or under specific subject headings for browsing.

3) To set up gateway to e-resources for easy access

4) To develop the institutional repositories for the institutional publications journal and proceedings papers.

5) To check the method of access to e-resources, abstracting or full, since most of the users search the resources under subject heading predominantly. Organization of e-resources should be in such a way that the users could be able to retrieve different sets of information records.

**1.1 Definitions**

There is no universally accepted definition of e-resources. Some people call it as paperless resources, some as virtual resources and some say online resources. The experts in these fields gave the definition of electronic resources based on production, distribution etc.
Electronic resources, can be defined as resources that include both document and non-document electronic format that provide information or a pointer to the information. E-resources can be accessed via internet or intranet.

1.1.1 According to AACR2, 2005

An electronic resource is: "Material (data and/or program(s)) encoded for manipulation by a computerized device. This material may require the use of a peripheral directly connected to a computerized device (e.g., CD-ROM drive) or a connection to a computer network (e.g., the Internet)." This definition does not include electronic resources that do not require the use of a computer, for example, music compact discs and videodiscs.

1.1.2 According to IFLA ISBD

"An electronic resource consists of materials that are computer controlled including material that requires the use of a peripheral (e.g. a CD-ROMs player) attached to a computer, the items may or may not be used in interactive mode. There are two types of electronic resources data (information in forms of numbers, letters, graphics, images and sound or a combination of thereof) and programs”. (Haridasan and Khan, 2009).

1.2 Concept of electronic resources

Electronic resources originated from the concept of e-publishing, and since 1985, significant developments have taken place in electronic publishing. The concept of document and paper has now changed to electronic document i.e. electronic resources. It is defined as the documents and resources existing in an electronic form that are accessible by the computer. The electronic resources are the resources in which information is stored electronically and accessible through electronic system and network.

1.3 Development/growth of e-resources

The use of computer for information storage and retrieval activities began in early 1960s in an offline, batch processing, and tape oriented mode. Vast amount of bibliographic data for printing of indexing and abstracting services were computer processed and then printed. Gradually computers were increasingly used for prototype setting and other operations relating to publishing.
Computerized typesetting and page layout software are now commonly used. Journal articles are now submitted on disk and online. Publishers apply their skills in value management for appearance and layout of stuff already in machine-readable form. The procedure creates data, from which output can be generated for other media such as full text; online journals were available through online hosts like DIALOG for the past several years.

CHIMO is the first prototype journal which was published in 1976 by New Jersey Institute of Technology, the first peer-reviewed electronic, full text e-journal including graphics was OJCCT (Online Journal of Current Clinical Trial). According to Chakraborty, H. K. (2002) many of online journals have been launched recently which have no print version at all. Elsevier Science launched Science Direct to widen web access to its more than 1,100 journals. Many significant journals such as Nature Online, Science Online, New England Journals of Medicine, British Medical Journals (BMJ) etc are accessible online as well.

1.3.1 Background of E-resources

The core values of library science motivated the libraries to hunt for electronic resources. In Ranganathan’s five laws of library science, one can find the motivation that drove libraries to join electronic resources into services and collections. Every technological improvement that happened in library’s electronic resources during the past decades was aimed to enhance more direct, prompt and convenient access to resources for the user. The execution of e-resources made the library a growing organism in real sense because libraries adapted the methods, rules and reorganized staff regularly to cope up with the changes in the use of continuous technological shift. (Hawthorne, 2008)

1.3.1.1. Online Catalogs

The card catalogue that ruled the libraries for a century faced its termination by MARC (Machine-Readable Cataloging). This was most important development, which took place in the 1960s. In the mid-1960s, Electronic resources started to change the approach of clientele to get accessibility to library resources. MARC format of catalogue changed the techniques of processing and accessing library resources. (Hawthorne, 2008)
“The library professionals who created MARC recognized the need for automation and a supporting data standard at a critical juncture in the development of technology, and took the necessary steps and risks to develop one. The flexible and expandable MARC format demonstrated the foresight and vision of those who developed it over 40 years ago.” (Hawthorne, 2008)

1.3.1.2. Machine-Readable cataloging

The Library of Congress created MARC in the 1960’s. The purpose to create a computer-readable format that is usable for bibliographic records, enable libraries to give and share information, download cataloging, and search all parts of a cataloging record gave birth to MARC. The time MARC was developed; libraries were active in shared cataloging, through union catalogs, usually in book or microfilm form. Most of the libraries were not able to bear with union catalogues due to their expensiveness to create, not easy to update and unmanageable nature.

Due to the possibilities shown by the computers, the Library of Congress decided to make use of computers in cataloguing. The goal to create a program that could enable the Library of Congress to encode all the information needed in a catalogue, and make the available information accessible to its clientele has resulted in the formation of MARC. Originally, the Library of Congress program was termed as LC MARC. Later on original MARC format has undergone changes and advancements to replicate changes in newer editions of AACR2, where as in North America during the 1980’s and 1990’s, USMARC and CAN/MARC were in use, which were slightly different from the original MARC format. Soon after 1999, both of these two formats blended into the present layout, sometimes called MARC 21.

1.3.1.3. Shared Cataloging

Frederick G Kilgour established the world’s first computerized library network i.e. Ohio College Library Centre (OCLC) after being called upon by the Ohio College Association in 1967. In 1971, OCLC developed a database for shared cataloguing, which now became WorldCat to give support to more than 50 academic libraries in Ohio. This system of shared cataloguing enabled the libraries to create an online bibliographic record and do cost savings as well. The shared cataloguing system assists the other libraries to
use the same record (created by the other library) to create cards for their print
catalogues. (Librarian…educator…historian…entrepreneur, 2006).

1.3.1.4. Online Public Access Catalog (OPAC)

Ohio State University Libraries installed computer terminals in its lobby, to offer
the patrons accessibility to search library database (library control system) without any
help from the librarian.

Computer Output Microform (COM) catalog, was developed as an alternative to
card catalogue because of shared cataloguing. Before Computer Output Microform
(COM) catalogs library systems available in 1970s had a specific function only that was
circulation. Computer Output Microform (COM) catalog was meant for the libraries that
used these with large collections. Computer Output Microform (COM) became the first
online catalogue. (Hawthorne, 2008)

The online catalogue has replaced the shortcomings of simple searching and
provided more advantages to patrons. These online catalogs were built-in with acquisition
and circulation processing to give information of an order and advanced circulation
(Hawthorne, 2008). “Many card catalog cabinets were discarded or sold. To ease the
transition between card catalogs and online catalogs, online catalogs were designed to
mimic the functionality of the card catalog. Text-based catalogs were available remotely
using the TELNET protocol, but only relatively advanced computer-using library patrons
accessed library catalogs this way. That changed much with the advent of the World
Wide Web.”(Hawthorne, 2008)

1.3.1.5. Web-Based Catalogs

With the passage of time OPAC has been converted to Web Based Catalogs i.e.
Web OPAC by the vendors to cater the needs of the librarians (Hawthorne, 2008). Web-
based catalogs, although presented through a graphical interface, relied on Boolean
searching, which was “still a retrieval technique designed for trained and experienced
users” (Antelman et al., 2006). Gradually libraries started to make catalog records for
web pages and observed that it would be more difficult for librarians to catalog the web
in the traditional way of describing the print resources. By the time librarians could react
to this nascent technology, the first web search engines were developed (Hawthorne,
ELECTRONIC RESOURCES

2008). Libraries started to focus more on e-resources and became very choosy in adding catalog records with links to web resources (Hawthorne, 2008).

1.3.1.6. Bibliographic Databases

When the Library of Congress was developing, the MARC format, the first electronic bibliographic database was being in developed stage on the opposite shore. The prime objective to create these databases was to provide access to scientific and government information sources (Bjorner & Ardito, 2003). Computer-based services revolutionized bibliographic research and consequently sustained its impact on libraries and electronic resources into the modern era of 21st century (Hawthorne, 2008).

“Another driver in the development of these databases was the trend in the publishing industry toward computer-aided production techniques. Techniques such as photocomposition left publishers with a by-product in the form of machine-readable bibliographic data that could be sold to supplement traditional product lines. Finally, the National Science Foundation’s Office of Science Information Service (OSIS) was legally charged with fostering and disseminating scientific and technical information through technological transfer” (Hawthorne, 2008). “OSIS funded the foundation of new information services and regional centers to provide data base services on a not-for-profit basis; the conversion to computer-readable form of a number of substantial files of scientific and technical bibliographic data, and a host of other significant innovations” (Christian, 1978). Convey (1992) defines information retrieval as “the searching for, and the retrieving of, selected information from the data held on a computer”.

Due to the technical nature of the contents of various databases at that time, only academic and special libraries were in possession of such databases. Even though some giant public libraries got access to these databases as well.

1.3.1.7. CD-ROM Databases

Vendors began to distribute electronic databases on compact disc-read only memory (CD-ROM) in the mid 1980’s. CD-ROM technology was touted as the “new papyrus” (Roose, 1988). Vendors created BiblioFile the first commercially available CDROM product for libraries, which includes the records of MARC format developed and designed by the Library of Congress. In January 1985, BiblioFile was on
demonstration at the American Library Association’s midwinter meeting (Eaton, MacDonald, & Saule, 1989). CD-ROM databases gained popularity because of its user-friendly interface, which made the end-user easily carry out online searching. Patrons were no longer being dependent on the librarians to get access to electronic resources. No charge for per search is another advantage of the CD-ROM databases (Hawthorne, 2008). Progresses in the technology led to high-density storage media, i.e. optical discs, which were, admired by the libraries instead of other media such as floppy discs and magnetic tapes at that time (Tenopir, 1986). Apart from the advantages, this new media had disadvantages also. Libraries had to develop infrastructure for these CD-ROM databases that generally included a computer, CD-ROM drive, and printer, to get access to each copy of a database, which was very costly for the libraries to afford at that time. Hence, libraries had to look at the cost effectiveness of CD-ROM databases before getting it purchased. With the passage of time, vendors became familiar with this new medium and felt the need to lower down the prices of subscriptions to CD-ROM databases to increase its subscription.

According to Flanders (1990), libraries got better ability to offer, more than one database at each workstation, due to networked hardware, software and CD-ROM servers regarded as jukeboxes. Nevertheless, these networks were not easy to design and install and generally needed a network administrator to look after it.

1.3.1.8. Electronic Serials

1.3.1.8.1 Internet

Division of Information Science and Technology of the National Science Foundation sponsored the first e-journal in early 1980s through Electronic Information Exchange System (EIES). Turoff and Hiltz (1982) stated that EIES had four prototype e-journals, which included a non-refereed newspaper named “paper fair”, a peer reviewed journal, which was meant to publish the articles ready to be published, and an interactive journal.

E-mail and fax was the only medium to distribute few journals e.g. newsletters in 1980s and early 1990s. However, practically this was for small journals with limited graphics.
1.3.1.8.2 World Wide Web

World Wide Web became the popular platform for the e-journals. In 1995 Hitchcock, Carr, and Hall in a study established that there were 115 e-journals in existence. After three years, the same authors found that the number of e-journals had increased to 1,300 (Hitchcock et al., as cited in Cole, 2004). Up to early 2000s, numerous publishers and vendors were providing free access to online journals along with print subscription. Publishers of the serials were afraid of a loss in terms of profits because of free accessibility to online subscriptions. So many publishers started to charge extra money if a library wanted a subscription to online as well as print journals.

In 2007, Stanford University started to provide accessibility to more than 1000 journals in collaboration with various scholarly societies and publishers. At the same time, many publishers were providing accessibility to their journals with a subscription charge. As a result open access movement aroused and came into existence. BioMed Central and the Public Library of Science are the great examples of early open access publishers at that time. Cole (2004) estimated that there were 30000 e-journals available by 2004. This exponential growth was the indicator of the popularity gained by e-journals. However, open access movement coped up with the increasing cost of e-journals to some extent, but it could not sort the problem of getting higher cost of serials.

1.3.1.9 Electronic Books

“E-books refer to those electronic texts accessed with digital machines as if they were paper books. In their digital form, these books may be read on various types of electronic machines, such as computers, PDA, specialized PCs for e-book, and mobile phones. Libraries tend to purchase e-books in packages rather than in separate volumes because e-book publishers prefer to sell goods in packages and because package purchase is cheaper for libraries. The number of e-books in a package varies from hundreds to thousands” (Noh, 2010).

1.3.1.9.1 Internet

Project Gutenberg began in 1971, at the Materials Research Lab at the University of Illinois by the operators of the Xerox Sigma V mainframe gave Michael Hart. (Hart, 1992)
The philosophy behind Project Gutenberg was to create texts that were simple to use and economical to create. Therefore, Project Gutenberg is available by using volunteers and by creating the files in “plain vanilla ASCII” meaning the low set of the American Standard Code for Information Interchange: i.e. the same kind of character you read on a normal printed page — italics, underlines, and bolds. (Hart, 1992)

1.3.1.9.2 CD-ROM Books

E-books were firstly available in commercial packages about the time when the other CD-ROM products already existed in market. The Library of the Future was one among these products, and it was limited to 300 public domains. Amazon.com listed that the fourth edition of the Library of the Future contained 5000 titles (Mullin, 2002). Reference works like International Dictionary Unabridged on CD-ROM, published by Merriam-Webster Inc. in 2000 is a popular e-book on CD-ROM. This dictionary appears with a thesaurus and includes various multimedia like audio output. In late 1990s, many people predicted that e-books will make a boom in future and will replace the print books. When the e-books came into existence, it made remarkable success but it could not enable the changeover of print books to e-books. It was due to many reasons of which the prominent reason was that people found it difficult to read e-books on a backlit screen.

Gall (2005) wrote, “It is estimated that 10 percent of texts printed each year are turned to pulp, although, fortunately, many are recycled. The BBC reported that more than two million former romance novels were used in the construction of a new toll way.” Gall (2005) told that the ability to carry several e-books at a time in very small space is the peculiar advantage of the e-books, because it requires no space on shelves.

A publisher of mostly science fiction books i.e. Baen books developed the Baen Free Library where the authors are free to upload their books online. It increases the probabilities for the potential readers to search the less famous authors or vice versa (Flint, 2000).

“In 2004, Google entered into partnership with major libraries to digitize their print book collections and make them searchable through Google Book Search http://books.google.com/. Titles that were out of copyright were made available in their
entirety. Titles still under copyright displayed bibliographic information and perhaps the table of contents and a few pages of text” (Google milestones, as cited in Hawthorne, 2008).

In 2006, Sony launched a new e-book reader, which based on e-ink technology. These new e-book readers supported the multimedia as well as various file formats like .pdf and .doc files. Consequently, these e-books and readers were booming more in academic libraries than the public libraries.

1.3.1.10 Types of e-resources

The types of electronic resources are:

- Online databases/ E-Database
- Online reference sources
- E-journals
- E-books
- E-theses
- E-newspaper
- E-encyclopedia
- Listserves
- E-images
- E-music and sound collection
- Subject gateways
- Web search tools e.g. Google, Yahoo, and Bing etc.

1.3.1.10.1 Online databases

“A large, regularly updated file of digitized information (bibliographic records, abstracts, full-text documents, directory entries, images, statistics, etc.) related to a specific subject or field, consisting of records of uniform format organized for ease, speed of search and retrieval, and managed with the aid of database management system (DBMS) software. Content is created by the database producer (i.e. Thomson Reuters), which usually publishes a print version (Biological Abstracts) and leases the content to one or more database vendors (EBSCO, OVID, etc.) that provide electronic access to the
data after it has been converted to machine-readable form (BIOSIS), usually on CD-ROM or online via the Internet, using proprietary search software”. (Naqvi, 2012)

An electronic database is that, in which the contents is revised usually on a regular basis, to provide current information or to add recently published sources and designs to provide information about a very specific topic, as opposed to a range of topics, usually for a limited audience. There are many different types of electronic databases in the world today, including statistical databases, image databases, and others. These databases are becoming very important these days as they are more up-to-date, and can be accessed anywhere, crossing all geographical boundaries. Such electronic databases are very valuable and useful for timesaving while conducting R&D activities.

Online databases are organized set of data stored in a computer that can be search automatically. More and more e-databases in bibliographic as well as full text sources are available and also added up frequently up with the demands of the users, some databases are web enabled and some are networked solutions. Web enabled databases are easily accessible through computers via the web browser while the networked solution may require special installation at client side. E-databases are of following types:

*Bibliographic databases*  
*Full text databases*  
*Statistical databases*

**1.3.1.10.1.1 Bibliographic databases**

In bibliographic databases, all those databases are counted in which the information related with document such as books periodicals, encyclopedias etc. is contained and users use them for access to information. Bibliographic database contains a file of document description that is record, and one can use for deciding whether to search for the document itself. Document may be Journal Articles, Reports, and Patents. Books etc

Examples:  
*Asiatic Society Journal Index.*
*ERIC database on education*
National Library of Medicine (NLM) database provides a wide range of resources related to the biomedical and health science. Important resources are MEDLINE text net biomedical information clinical alerts etc.

INDMED–Index to Indian biomedical journal developed and designed by Indian MEDLARS center.

1.3.1.10.1.2 Full Text Database

This category contains not only full text of the documents but tells story also; hence, one can get primary information along with full text.

Example

- Economic History Encyclopedia Index
- Scientific Electronic Library Online
- Searchable Ornithological Research Archive

1.3.1.10.1.3 Statistical Text Database

Statistical/Numeric databases are those that contain numeric statistical or survey type of information to give answer of numeric queries.

Examples:

- Census Information
- Database on Indian economy
- Reserve Rank of India

1.3.1.10.2 Online Reference Sources

The e-reference source is an electronic version of traditional library reference sources held in hard copy. For example- Dictionaries, Handbooks, Encyclopedias, Citation Analyses Guide, Maps, Atlases. Bibliographic Sources and Translation Services mostly are 3-D objects so that a complex topic becomes comprehensive even to common and unsophisticated readers. The e-reference source offers online access to thousands of information sources both licensed and free.

1.3.1.10.3 E-Journals

Generally, an e-journal is acknowledged as, an expanded version of long-established printed journals in electronic appearance. According to the Online Dictionary for Library and Information Science, “A digital version of a print journal, or a journal-
like electronic publication with no print counterpart (example: EJournal), made available via the Web, e-mail, or other means of Internet access. Some Web-based electronic journals are graphically modeled on the print version. The rising cost of print journal subscriptions has led many academic libraries to explore electronic alternatives. Directories of electronic journals are available online (example: Ejournal SiteGuide: a MetaSource maintained by the University of British Columbia Library).” (Reitz, 2012)

“The important point here is that e-journals can only be used through online access, highlighting that they possess a relatively low persistency and are a permanent maintenance form of information” (Noh, 2010).

An E-Journal is processed, published and distributed all over the world by electronic network. Electronic Journals are available on the on-line as well as in CD-ROM form. The first E-Journal appeared in 1980 (DIALOG in 1980 started full text database) and they become common in the 1990s.

Initially, publishing an electronic serial meant that the text of the print serial was made available electronically. While that is still a major part of the process, electronic serials now frequently include supplemental materials such as the statistical data used in the research audio and video materials, links to articles cited in bibliography, or commentary about the article. An e-journal may include a more information than was available in the print version if the author and publisher have the capabilities to produce the expanded version. An increasing number of e-journals created as e-publications without ever having existed in print version. These new journals included scholarly previewed journals and newsletters. Some of these titles were free, whereas others charged subscription fees. If the libraries or users do not subscribe a journal, they can purchase individual articles from the publishers or database producer.

E-Journal can be browsed and searched by

• Keywords
• Title of Article
• Abstract
• Author's name
• Journal Title
• Natural Language searching

1.3.10.4 E-Books

E-books have been slower to develop than e-journals for a number of reasons, most of which involve the current technology. E-Books are available in many ways: books that are readable and accessed on a personal computer screen, books that are readable on PDAs (Personal Digital Assistant). The hand-held readers designed to read electronic books are somewhat expensive, belongs to different brands and are incompatible. These electronics readers and books are described as "dead or arrival", and "unwieldy and unreadable."

Since 1970s, the development of electronic versions of printed books (E-Book) has been part of a completely e-publishing phenomenon. An e-book is a representation of a book, usually a parallel publication of a print copy, but occasionally born digital.

E-Books have electronic text, which readers can see visually. Electronic text, downloaded from the internet, can be saved into a floppy disk, transferred into a CD-ROM, and palm sized digital reader. The new concise Oxford English Dictionary (2001) defines an e-book as “an electronic version of a printed book which can be read on a personal computer or handheld device designed specifically for this purpose. A good number of e-books are available in most of the subject area online which can be accessed from the net either free or on payment”. There are two types of e-books:

1. Those, which represent an electronic-version of a whole book (Print)
2. Those that are effectively database of linked materials. Some online e-books publishers and e-book seller are as
   • Bartelby.com- offers full text online access to reference, literature and various books.
   • Books-online.com- include both free and priced book in its collection, books are available on all subjects.
   • Ebrary- offers online free access to e-book on various subjects. To browse these books one has to download their plug in.
   • Netlibrary (http://www.netlibrary.com/gateway.aspx)
   • Kluweronline (http://www.kluweronline.com/ebooks/sales)
   • Cyberread (http://www.cyberread.com)
**ELECTRONIC RESOURCES**

- Questia (http://www.questio.con)

**1.3.1.10.5 E-Theses/Dissertation**

The Electronic theses and dissertations are popularly known as ETDs. ETDs are digitized version of conventional theses and dissertation. Resources for graduate students, who are writing theses and dissertation, which are jointly published online, are known as e-theses and e-dissertation. Faculty, research scholars and graduate students consult it. It is especially for academic researchers, yet anyone interested in research and e-publishing will enjoy this resource. There are good numbers of ETD submission websites. IT administrators at universities take initiative for ETD programs. Network Digital Library of theses and Dissertation (NDLTD) is a nonprofit Organization trying to develop accessible digital libraries of theses and dissertation.

**1.3.1.10.6 Electronic Newspapers**

It is a self contained, reusable and refreshable version of traditional newspaper, which acquires and holds information electronically. Information can be downloaded through from internet via internet connection. The challenge still in creating a feasible electronic newspaper is to develop a device that had the desired characteristics of traditional paper in addition to its own inherent benefits (such as being automatically refreshable).

**1.3.1.10.7 E-Encyclopedia**

E-Encyclopedia combines the best of a traditional encyclopedia with an extra digital dimension. The e-encyclopedia thematically grouped in nine subject areas: space, earth, nature, human body, science and technology, people and places society and beliefs, art and entertainment history.

**1.3.1.10.8 List serves**

It provides a means for informal communication many list server are lists that allow discussion to take place on a variety of topics and some others provide access to electronic titles, such as newsletters or serials, pricing issues is equipage.

**1.3.1.10.9 E-Images**

Due to advent of electronic image facility, the image databases are in use specifically in subjects such as history, geography, medical sciences etc. The libraries
developed in-house digital image collections and provided access to such selected external databases to their clientele.

1.3.1.10.10 E-Music and Sound collections

E-music and sound collections are creating their niche within multimedia libraries. Libraries are facilitating the digital sound recording collections.

1.3.1.10.11 Subject Gateways

Subject gateways are guides that provide links to free information and resources available on the web. It had chosen carefully and checked by the subject experts. The subject gateways provided access to the reliable and up-to-date web resources for all subjects.

1.3.1.10.12 Web search tools

Internet search tools like search engines, Ask, Yahoo, Live search, Google are inevitable as well as significant components of library.

1.3.1.11. Some of other e-resources are as follows:

i. Abstracting & Indexing Databases

The collection and acquisition of abstracting & indexing databases depend on the need of the users. In addition, library has to choose the required data from a large number of such databases available in the market.

ii. E-Content Pages

The idea behind it is to provide desktop access to the digitized content pages of books, conferences proceedings, journals etc. To represent e-content pages, many files format are available on sites such as PDF, JPEG, GIF, TIF etc among which PDF is faster and economical for online viewing and archiving.

iii. E-Clipping

The main objective of e-clipping is retrospective search and comprehensive analyses of news items. It also facilitates users to retrieve news clips.

iv. E-Report

E-reports are now a day is considered an important e-resource of a library, which contains reports, published by scientists, research scholar etc.
1.3.1.12 Advantage of e-resources

Every coin has two different faces likewise the electronic resources has also some advantages and limitations. Digital media takes a very little space and can hold great deal of information. Users neither have to worry about limits, which they have in their physical space as well as about losing, or misplacing their document. The following are the major advantages of e-resources:

1.3.1.12.1 Speed

The speed of publication and diversity of each issue of electronic resources (e-journal, article is much faster than the print. Today many publishers put articles on their website as soon as publishable that can be up to some weeks before print. This all means that the information is much more up to date than can be achieved with paper.

1.3.1.12.2 Easy To Search

Easy to search is one of the nucleus advantages of digital format. Hitchcock et al. (1998) have argued that if it is easier to find research, fewer will be duplicated experiments, and it will waste less time. On the other hand, Missingham (1999) raises the difficulty of information overload, easy search ability of information to find and keep abreast of knowledge.

1.3.1.12.3 Distribution

The major advantage of e-resources is their global distribution, hypertext link, and the ability to access from different sites.

1.3.1.12.4 Printing and Downloading

E-resources provide the facilities of downloading and printing of the appropriate resources at end user workstations.

1.3.1.12.5 Saving Space

With the introduction of e-resources facilities of downloading appropriate resources is possible, which are very small in terms of memory, thus helps in saving space.
1.3.1.12.6 Searching & Retrieval

A number of search engines available to access and retrieve the appropriate e-resources from the web. It also provides the facility of keywords search, author search, and subject search etc.

1.3.1.12.7 Accessible

It is far cheaper for the researchers to get accessibility to one computer within time than to have subscription to many journals that is why e-resources will be a means for further breaking down the barriers to autonomous research. (Olajumoke Williams, 2013)

1.3.1.12.8 Round the clock availability

A major advantage of e-resources is that user can gain access to the information at any time. It is available 24 hours round the week.

1.3.1.12.9 Archiving

There are very small incremental costs to store longer documents so it is easy to include data sets, images, detailed analyzers, simulation etc. that can improve scientific communication. Some of the publishers provide complete volume on CD-ROM at the end of the year.

1.3.1.12.10 Manageable

One can easily manage e-Information with the facility of adding bookmarks and personal notes to the private files or databases for copying and editing.

1.3.1.12.11 Interactive

“The rapid turnaround time means that readers can read articles and can make comments, which may be taken under consideration much more quickly than print resources. The ease with which e-mail can be sent or forms filled, it means that there can be much greater feedback through the web.” (Olajumoke Williams, 2013)

1.3.1.12.12 Links

Links are foundation of the hypertext format. Electronic resources not only can link papers to those have cited, but also with a little attempt, they can be linked to those that cite item. (Olajumoke Williams, 2013)
1.3.1.12.13 Inexpensive

In view of Steven Harnad (1996) the electronic resources can save more than 70% cost in comparison to print costs. While Whisler (1997) has an opinion that distribution cost are low in proportion to the final price of journal still only 20% saving can be made because saving will be eaten up by extra cost caused by new feature.

1.3.1.13 Disadvantage of e-resources

The following are the major disadvantage of resources.

1.3.1.13.1 Difficult to read on computer screen

The main disadvantage of digital information is the limitation of computer monitor.

1.3.1.13.2 Technical problems

Degradation and obsolescence of the media used for storing digital information as well as software used for manipulation of the stored digital information are the two major issues related to digitalization.

1.3.1.13.3 Lack of standards

There is a lack of standards, as the guidelines and best practices for producing and maintaining digital objects for the long term are in the developmental stage.

1.3.1.13.4 Authenticity

It is difficult to ascertain the authenticity and integrity of an image or text when it is in digital form, as it is very easy to manipulate and tamper with data in digital form.

1.3.1.14 Features of e-resources

There are many features of e-resources

• Preservability
• Readability
• Comprehensibility in respect of linked information
• Evidentiary value in terms of authenticity and integrity
• Supporting multimedia content
• Network accessibility
• User friendly interfaces
• Unique referencing of digital objects
• Multi user and refer various areas in same time
• Current information services
• Advanced search and retrieval
• Supporting both formal and e-learning
• Remote access
• Online discussion and commands
• Accessibility from anyone, anywhere, anytime, during travel etc.

1.3.1.15. Where to purchase e-resources

Librarian can purchase or lease e-resources from publishers, vendors, or consortia. Most of the larger subscription services and some of the larger book vendors can supply electronic serials and books, just as they supply print materials to library. In addition to the publishers and vendors that have supplied materials to libraries for many years, group of affiliated libraries, known as consortia, now play a major role in the acquisition of large and expensive e-resources.

Consortia allow libraries to purchase access to electronics resources for all members of the group, which make it possible for libraries to acquire resources they could not afford separately. Each method of purchasing electronic materials has advantages and disadvantages. For example, consortia purchasing can often allow libraries to acquire more resources at a lower price than an individual library could obtain, but it can reduce the libraries’ control over the nature of the content and materials added to the collection when consortia purchase large collection of materials.

1.3.1.16. Role of consortia

Library consortia have existed for many years, providing expedited inter library loan for members and doing limited cooperative collection development. Libraries that have electronic resources discovered that sharing electronic resources that are prohibitively expensive for individual libraries become affordable when several libraries work together and share the costs.

Some consortia are funded by special state allocations; many are funded by membership contribution from the individual libraries. The consortia negotiate with publishers on behalf of their members, offering an expanded number of customers, and a
stable level of funding to the publishers, in exchange for increased access to electronics resources or for lower prices.

Consortia may have a formal governing board that coordinates all purchases, paying the publishers and billing its members. Some consortia negotiate the price and arrange for publishers to bill the members directly. Most consortia have legal documents describing their structure and the obligations of members; librarian must learn that who has the authority to sign such documents for their institutions. Some consortia have full time staff members who handle all negotiations; others depend on staff from the consortia members to do all the work of the group.

1.3.1.17. Preservation of e-resources

According to Collin Webb (in Kennedy, 2006) director of preservation services, National Library of Australia, the phrase, "Digital Preservation denotes . . . the process of keeping collections and the information they contain, available for use as long as they are needed." "Digital preservation" or digital archiving", therefore means taking steps to ensure the longevity of e-documents. It applies to document, that are both “born digital” and stored online (or on CD/DVD ROM diskettes, or other physical carriers) or to the products of analog to digital conversion, if long term access in intended.

1.3.1.17.1 Digital Preservation v/s Digital Archiving

Digital Preservation (DP) Primarily connotes that a record or document, which is created electronically using computer system is made available for the use, as and when needed and ensure its survival for future use too.

Digital Archiving (DA) on the other hand denotes the long-term storage, preservation and access to information that is 'born digital' (i.e. created and disseminated primarily in electronic form or for which the digital version is considered to be the primary archive.

1.3.1.17.2 Digital Archiving Cycle

The process of digital archiving cycle in the framework of information life-cycle management, from creation to access, passes through different stages.
1.3.1.17.3 The format of preserved E-Documents

At the specific format level, there are several approaches used to save the 'look and feel' of material. For journal articles, the majority of the projects reviewed used the image files TIFF, PDF or HTML. TIFF is the most prevalent for those organizations that are involved in any way with the conversion of paperback files. For purely e-document, PDF is the most prevalent format. Both formal publication and grey literature used PDF.

1.3.1.18. Principles of Good E-Resources Collection

“An e-resources collection consists of objects that are selected and organized to facilitate their discovery, access, and use. Objects, metadata and the user interface together create the user experience of a collection”. (Sukula, 2010)

1.3.1.18.1 Building of e-resources and explicit collection development policy

Libraries create a collection of e-resources according to an explicit policy. Development of e-resources is closely tied to an organization’s goals and constituencies. The decision makers should be able to refer the mission statement of their organization and articulate how a proposed collection supports that mission. “The institution should be able to identify the target audience(s) for the collection but also think about the unexpected users. If the institution collects print, artifacts or other non-electric materials, the choice of e-resource should fit in with the organization’s overall collection policy”. (Group, 2007)

1.3.1.18.2 Describing collection in the context of user

Description of the collection should be there, so that the user can discover characteristics of a collection, including scope, format, restrictions on access, ownership, and any information significant for determining the collection’s authenticity, integrity and interpretation. Collection description serves two purposes: it helps people to discover the existence of a collection, and it helps users of the collection to understand what they are viewing.

1.3.1.18.3 Curated collection

“A collection is curated, which is to say, its resources are actively managed during their entire life cycle. E-resource curation is concerned with the life cycle
management of a resource from the time it is created or obtained until it is purposely disposed off”. (Peggy Garvin, 2012)

1.3.1.18.4 Broad Availability of Electronic Collection

This principle encompasses three attributes: availability, usability and accessibility

a) “Availability means that the collection is accessible and usable upon demand by an authorized person. This implies that the collection should be accessible through the web, using technologies that are well known among the target user community. Availability does not require that use of all materials be free and unrestricted. Charging for use and limiting access may be appropriate and even necessary in some circumstances. Library must make the materials as widely available as possible within any required constraints”. (Group, 2007)

b) Usability refers to ease of use. There is often a tradeoff between functionality and general usability.

c) Accessibility - for general access collections, items such as web pages and search forms providing access to the collection, as well as the metadata and digital object displays, should be tested.

1.3.1.18.5 Dealing with Intellectual Property Rights

The collection development policy should incorporate copyright policy. IPR must be taken into considerations from several points of view:

- What rights the owners of the original source materials retain in their materials;
- What rights or permissions the collection developers have to digitize content and/or make it available; and
- What rights or permissions the users of the electronic collection are given, to make subsequent use of the materials?

1.3.1.18.6 Risk Assessments

Libraries will be equipped to make sensible and secure choices in a collection of uncertain provenance by the facilitation of risk assessment. (Group, 2007)
1.3.1.18.7 Mechanism to supply required data

A good collection has mechanisms to supply usage data, and other data to allow standardized measures of usefulness. Evaluation of electronic collection be done periodically to monitor its usage, access, service, effectiveness, demonstrate, return or investments, inform collection development, inform strategic planning, and support funding requests.

1.3.1.18.8 Interoperable Collection

Interoperability is a feature of a good collection. Developers of collection while designing their services should keep in their minds the issue of interoperability. (Group, 2007)

1.3.1.18.9 Sustainability

A good collection is sustainable over time. E-resources containing resources of long-term value must be sustained. Moreover, they must be archived permanently to ensure accessibility to it. Sustainability needs to be addressed from an organizational, financial and technical perspective. There must be a clear understanding of the long-term obligations necessary to ensure sustained electronic resources.

In particular, electronic resource built with special funding should have a plan for their continued availability, maintenance and support beyond the funded period.

1.3.1.19. Education and training of e-resources

Acquisition staff gathers considerable information about electronic resources during the ordering process and must share that information with staff who maintains the resources and those who teach the library's patrons how to use the resources effectively. Acquisitions personnel should help inform library staff in other areas about the electronic resources being added and about the contractual and legal issues related to the use of these resources.

“Acquisitions personnel must be trained in how to acquire electronic resources. Librarians can attend workshops about negotiation licensing agreements and then train their colleagues. Electronic resources and tools change rapidly: training must be a regular component of the jobs of all acquisitions personnel”. (Group, 2007)
1.3.1.20. Traditional resources versus e-resources

E-resources play a vital role in the electronic environment but the tradition resources have their own importance. There is some importance of the e-resources over the traditional resources.

1.3.1.20.1 Human Aspect

Information professionals no longer required, but being library science graduates it is always desirable. The professionals managing these resources should have knowledge about the various search engines, E-mailing and basic knowledge about computer. This is the trick to manage the resources as all these are technology ridden. User should be knowledgeable about the technology, to maintain these databases.

1.3.1.20.2 Currency

There is no time lag as soon as anything is published it is available. Earlier libraries had to wait for a long time to have access to the updated information. Therefore, by the time this information is used it is already absolute.

1.3.1.20.3 Financial aspect

With increasingly shrinking budget and rise in the costs of subscribing, it is becoming difficult to subscribe to new publication and managing with few resources. Online resources have the advantage of having access to a large number of publications with less cost. There is no need for paying more and getting the up to date information.

1.3.1.20.4 Accessibility

The online resource is boundary less. Everyone can access it anywhere whether at home or at office. Traditional resources are not easily accessible, as you need to travel to the library in search of a document having information.

1.3.1.21. Problems in application of the e-resources in libraries

1.3.1.21.1 The following problems associated with various aspects of electronic sources:
1. It is difficult to Integrate of electronic resources with traditional type of print resources.
2. Acquisition of e-resources is costly affair.
3. It is not to find out the real sense of collection development policy for resources in electronic atmosphere.
4. Electronic resources do not have adequately controlled bibliographically; they are not easy to identify and they are not well reviews.
5. Non availability of selection tools is one of the prominent issues.
6. Inadequate system of publication and distribution of e-resources is a drawback.

1.3.1.21.2 Promotion of E-resources

All too often organization purchase e-resources and are unable to promote the material sufficiently. With an average library having over 300 resources, this is quite a problem. Use of virtual learning environment portal or library website can ease this problem, by targeting resources at groups of individuals, perhaps by way of course specific materials.

1.3.1.21.3 Need In improve access controls

E-resources are not always free of cost; sometimes it cost a subscription fee. Authorized users get the accessibility to the e-resources due to this restriction sometimes make impediments in the way to authorized users too. There is a need to give more emphasis to provide better accessibility for authorized users. (Millawithanachchi & Jayasundara, 2010)

1.3.1.21.4 Access to the computer network

Access to vast majority of e-resources that held by the special library is available via the institution's computer networks. Access to this network is limited to ‘authorized user’ that is the user who can be registered and issued with a user name and password. Authorized users will be usually from the staff and students of the institute/university, and registration will usually require a student card or some other forms of ID. Members from the public could not be able to log on the computers and would not be able to register to as an authorized user.

1.3.1.21.5 Copyright law

Copyright law is the major issue confronted by electronic information. The copyright protection is a difficult task here. By the use of digital technology, it is easy to create electronic copies of the texts photography's etc. However, illegal copying and copyright violations may result in losses to electronic information publishers.

1.3.1.21.6 Electronic Information Security in Libraries

Hardware, library management software, computer programs, database, data etc comes under the umbrella of electronic environment. Libraries are now making use of web technology and handling information in electronic format. However, this electronic
format of information and access to it needs to be protecting from any sort of misuse or harm, but library professionals are incompetent in realizing the issue of security measures in library. Electronic information of a library must not disclose to any unauthorized users and it should be stored, retrieved and disseminated in certified manner. Permission should be required to control access to electronic information and access tools.

1.3.1.21.7 Security policy and procedures

It is a very important to establish well-formulated policies and procedures to protect electronic information and access tools from security threats. A security policy defines the resources and services to be protected, discusses the technologies to be used for protecting the resources and explains how these tools should be deployed. The policy should include the purpose, scope, rules, standards and specific activities. It should cover the use of ICT resources, marking of sensitive information, movement of computing resources, disposal of sensitive wastes and security incident reporting. Enforcement of these policies is very essential to their effectiveness. (Kumar & M, 2005)

1.3.1.21.8 Installation of computer

It is consider that installation of computers in libraries as a costly affair.

1.3.1.21.9 Lack of trained library professional

There is lack of sufficiently trained library professionals to plan and operate automation in libraries. Libraries do not provide the adequate knowledge that the user wants. Moreover, sometimes there is discord, which arises between the staff that have adequate knowledge of computer and digitization and staff, which do not have such knowledge.

1.3.1.21.10 Lack of Training

Before acquiring e-resources within a library, a proper training is necessary. Only a few agencies/institutions provide training programmes for proper utilization of information available on e-resources. However, these training programmes are not adequate for the proper usage of online databases.

1.3.1.21.11 High Cost

There is a high cost involved, especially for accessing the remote databases and its installation.
1.3.1.21.12 Lack of long-term approach

There is lack of long-term approach towards the automation in libraries.

1.3.1.21.13 Difficulty of update frequently

It is difficult to update frequently changed and advancing technology.

1.4. Need and Significance of the Study

The value of the study relates to the understanding of the usage of electronic resources by research scholars of the central universities in Uttar Pradesh and Delhi. This study will identify which of the variables presented; play a significant role in the research scholars’ use of electronic resources. It will also x-ray the problems associated with the use of electronic resources and as such, the result of the findings of this study will contribute to the body of knowledge on research scholars’ use of electronic resources. Moreover, it will be beneficial to academics, researchers, students and professionals interested in this area of study. Generally, if one can say that the use of electronic resources for sourcing information by students of higher institution is necessary then this study is imperative.

Based on the study the investigator can identify the various e-resources that is being used by the users of the selected central university libraries and investigator can depicts the problems faced by the users of the selected central universities in accessing e-resources

1.5 Statement of the Problem

The study is entitled as “Use of electronic resources in central university libraries in Uttar Pradesh and Delhi: A comparative study”

1.6 Definition of the Key Concepts

Use: The Oxford dictionary defines use as “Take, hold, or deploy (something) as a means of accomplishing or achieving something; employ”. (University, 2014)

Electronic Resources: According to US Naional Library of Medicine “Works which are encoded and made accessible through a computer, online or in a physical format. This category includes an ever-growing array of electronic journals, monographs, reports, articles, databases, digital collections, still and moving images, sound, and interactive resources” (Medicine, 2012)
University Libraries: According to (Reitz, 2012) a “University library” is a library or library system established, administered, and funded by a university to meet the information, research, and curriculum needs of its students, faculty, and staff.

Uttar Pradesh: According to Encyclopedia Britanica “Uttar Pradesh”, is the most populous state of India. Lying in north-central India, it is bordered by the state of Uttarakhand and the country of Nepal to the north, the state of Bihar to the east, the states of Jharkhand and Chhattisgarh to the southeast, the state of Madhya Pradesh to the south, and the states of Rajasthan and Haryana and the national capital territory of Delhi to the west. On Jan. 26, 1950, when India became a republic, the state was given its present name, Uttar Pradesh (literally, “Northern State”). Its capital is Lucknow. Area 93,933 square miles (243,286 square km). Pop. (2011) 199,581,477.

Delhi: According to Encyclopedia Britanica “Delhi”, city and national capital territory, north-central India. The city of Delhi actually consists of two components: Old Delhi, in the north, the historic city; and New Delhi, in the south, since 1947 the capital of India, built in the first part of the 20th century as the capital of British India. One of the country’s largest urban agglomerations, Delhi sits astride (but primarily on the west bank of) the Yamuna River, a tributary of the Ganges (Ganga) River, about 100 miles (160 km) south of the Himalayas. The national capital territory embraces Old and New Delhi and the surrounding metropolitan region, as well as adjacent rural areas. To the east the territory is bounded by the state of Uttar Pradesh, and to the north, west, and south it is bounded by the state of Haryana.

Comparative: Oxford Dictionary defines comparative as “Measured or judged by estimating the similarity or dissimilarity between one thing and another; relative”

Study: means acquire knowledge by memorization, research, or an experiment.

1.7 Objectives of the Study

The main objective of this study is to analyze dependency of the research scholars on e-resources, the perceived impact of the e-resources on their academic efficiency and problems faced by them while using the e-resources. Some of the major objectives are to:
1. know the different types of electronic resources and services available in the selected central university libraries of Uttar Pradesh and Delhi.
2. study the different types of electronic resources used by the users in the selected central university libraries of Uttar Pradesh and Delhi.
3. study the purpose and frequency of using the electronic resources available in the in the selected central university libraries of Uttar Pradesh and Delhi.
4. locate the impediments faced by the research scholars while accessing and using the electronic resources in the library.
5. study the impact of electronic resources and services on the academic work of the users in the selected central university libraries of Uttar Pradesh and Delhi.
6. know the productivity and quality of information retrieved through e-resources
7. know the benefits of the e-resources over conventional sources of information.

1.8 Hypotheses
1. There is significant difference between the users with the use and type of electronic resources in central universities in UP and Delhi.
2. Electronic resources available in central libraries in central universities in UP and Delhi are used by the majority of users of these universities.
3. Use of electronic resources for the academic activities is high in central universities in Delhi than the central universities in UP.
4. Users in central universities in UP seek more help while using electronic resources as they are less familiar and face problem than the users in central universities in Delhi.
5. Majority of users in central universities in UP trust information if they pay for it while majority of users in central universities in Delhi do not trust information even if they pay for it.

1.9 Scope and Limitations of the Study
The scope of the study has been limited by following construction.
1. The study is limited to the Research Scholars of JMI, JNU, DU, AU, AMU, and BHU.
2. For this study two different sets of questionnaire were framed, one for librarian and second for users.

3. It includes aspects like purpose of visiting the library and which type of e-resources and e-services provided by the library and users satisfaction level of these libraries

1.10 Organization of the thesis

The report is presented in five chapters.

The Chapter 1 comprises introduction, problem of the study, definition of key terms, objectives and hypotheses, need and significance of the study, scope and limitations of the study and organization of the report.

The Chapter 2 reviews related literature of the problem under the study.

The chapter 3 describes the methodology of the study. It consists of the variable of the study, sample used for the study, sources of data, tools used for the study, data collection procedure and data analysis techniques.

The Chapter 4 confined to analysis and interpretation of data.

The Chapter 5 is devoted to summery of findings and suggestions. This chapter covers summary of findings of analysis, tenability of hypothesis, suggestions for the improvement and further research.
References:


http://www.ohiolink.edu