CHAPTER: TWO

OVERVIEW OF ELECTRONIC INFORMATION RESOURCES

1.1 Introduction

The twentieth century was shaped by sweeping changes in Information and Communication Technologies. Information and communication technology (ICT) generally relates to those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies could include hardware (e.g. computers and other devices); software applications; and connectivity (e.g. access to the Internet, local networking infrastructure, video conferencing). It is a dynamic and unending resource that affects all discipline and all spheres of life. Consequently, the Research and Development community has also undergone tremendous changes during these years, assuming new dimensions influenced by technology-driven applications (Egberongbe, 2011).

Libraries have witnessed a great metamorphosis in recent years, both in their collection development and in their service structures. Libraries are now using technology to improve the management of scholarly information and to provide speedy access to scholarly information. With advances in technology, print medium is increasingly giving way to the electronic form of materials (Sharma, 2009). Tsakonas and Papatheodorou (2006), stated that The transition from print to electronic medium apart from resulting in a growth of electronic information, has provided users with new tools and applications for information seeking and retrieval.

1.2 Origin and Growth of Electronic Information Resources

The early Libraries were defined as an Institution that managed and preserved the intellectual sources of society in print form and made them available in a systematic manner
to the users, who could readily gain access to these resources. Evaluation, growth of Internet and e-publishing industries in the field of information and communication technology has given birth to electronic resources. Societies are transforming from information societies into knowledge societies. E-resources play an important role by providing a convenient medium and fast access to a vast range of information. Beginning in the mid 1990s, several publishers started to explore the possibilities of delivering information to libraries and their users in the electronic form (Wikipedia.org).

1.2.1: Definition of Electronic Information Resources

An "Electronic Resource" is defined as any work encoded and made available for access through the use of a computer. It includes electronic data available by (1) remote access and (2) direct access (fixed media). In other words: Remote access (Electronic Resources) refers to the use of EIRs via Computer Networks. Direct Access (EIRs) refers to the use of electronic resources via carriers (e.g., discs/disks, cassettes, cartridges) designed to be inserted into a computerized device or its auxiliary equipment, AACR2, (2002). Reitz (2005), defined that EIRs are materials consisting of data and/or computer programs encoding for reading and manipulation by a computer by the use of peripheral device directly connected to the computer or remotely via a network such as internet. The category includes software application, electronic text, bibliographic databases etc. Shim et al, (2001) defined EIRs as those resources that users access electronically via a computing network from inside the library or remote to the library.

In present scenario, Electronic Information Resources are becoming more and more important and these are invaluable research tools that complement the print resources in a traditional library setting (Dadzie, 2007). The print resources are being digitized, which has given rise to increases of the availability of E-books and E-journal. These electronic
resources are helpful because of their easy portability and its feature of incorporating more than one resource in a single hand held device. Their other advantages, according to Dadzie (2007), include: access to information that might be restricted to the users due to the geographical limitations, financial constraints, access to more current information and provision of extensive link to additional resources related contents.

1.3: Types of Electronic Information Resources:

Electronic Information Resources (EIRs) are increasingly important to all aspects and all levels of education and research. With the advent of World Wide Web, the EIRs have flourished in unprecedented way and have become the focus of research and academic activities of institution in recent years. These Electronic Information Resources (EIRs) provide quick and comprehensive access information to the users by using best, easier and user-friendly tools and techniques.

Different EIRs are

- Electronic Journals
- Electronic Books
- Databases
- Blogs
- Internet
- OPAC
- Patents
- Standards
- Dictionaries
- Online Theses and Dissertations
- Consortia
In the following paragraphs, an attempt has been made to provide an overview of each of these resources, listed above.

1.3.1: E-Journals:

ICT (Information and Communication Technology) has made a major impact in the field of Library and Information Science. Due to the impact of this innovative technologies faster, reliable, portable and easily accessible mechanism of information was generated and e-journal is one of them (Krubu & Osawaru, 2011). E- Journals are define as any journals, magazines or types of serial publications, which are available electronically and can be accessed through computer and different technologies i.e. CD-ROM, WWW, Email, FTP etc. A Journal may contain Research Paper, articles, Scholarly Communication etc (Wikipedia.com).

E-journals are defined as any serials publications published and distributed nationally and internationally via electronic networks such as Internet. During 1970s, e-journals were distributed on CD-ROMs. In 1987, the first peer-reviewed journal ‘New horizons in a adult Education’ was distributed on internet. It was published by Syracuse University under Kellogg project. It was in ASCII code and it was freely accessible via BITNET list server. The first peer reviewed, electronic full-text including graphics was published in 1992. JSTOR (Journal Storage Project) is the first retrospective electronic archiving project of printed journals established in 1993. The same year, Gopher became ubiquitous but they were quickly replaced by WWW.
Types of E-Journals

- **Classic e-journals:** are available through internet application, such as email, but now these journals are available on web and only alert of new journals are distributed by email.

- **Parallel e-journals:** are available in both print and electronic form. The online version may include the full-text of journal, table of content or selected articles from the print version.

- **Database model and software model:** provides article in a centralized database, maintained by the publisher and subscribers are given permission to locate and access the database.

- **CD-ROM journals:** many commercial publishers made full text journal article available on CD-ROM. Many libraries have often subscribed journals both online and on CD-ROMs.

- **Full text journals:** are completely available journals rather than just summaries or abstracts. Usually the whole of the journals is available online.

- **Electronic only journals:** are those journals that are only available electronically, no counterpart likes print or CD-ROM is available of these types of Journals.

Access to E-Journals:

The access to E-Journals through Internet is gaining prominence due to the inalienable preferences of the internet over the media such as CD-ROMs and advancement in Web technology. The publishers or distributers of E-journals provide the following different types of access mechanisms:
• **Free Access**: Access to the electronic version of a journal is free with the subscription to the print journal.

• **Exclusive Subscription**: Library can have complete access to all the e-journals brought out by the publishers without subscribing to its print counterparts.

• **Selective Access**: Subscribing library chooses a few e-journals from the publishers and pays for them as per agreed terms and conditions

• **Remote Access**: In this type of model, vendor/publisher has their journals at their website. When some institute or library subscribes to the e-journals through that specific publisher, they provide access to these journals to libraries. Depending on how this right is defined, the patrons of the library can have access from set of IP addresses or through library’s LAN or even both. Publishers give the privilege to subscribing library/institution through one of the following strategies like:-

  • **User-ID and password**: Publishers provides user ID and password to subscribers, which can be used from any user terminal in the library.

  • **IP enabled (Intranet)**: This method can be used by the libraries that have intranet based LAN in their libraries or campus. Here publisher’s server site will recognize and validate the IP address of subscriber’s intranet server when each time a user logs into publisher’s website for a subscribed journal. This is a controlled method of access the e-journals and it can be used by only those libraries that have an intranet based LAN in their library or institution. Large publishers like ACS (American Chemical Society) and Elsevier find this method more secured for both themselves and the library (Wikipedia.org).
E- Journals: A Consortia Approach:

Consortia based subscription to electronic resources is now considered to be a plausible strategy to increase the access to e-journals at highly discounted rates of subscription. The Consortia-based subscriptions can be successfully adopted by Research Libraries to meet the pressures such as minimized budget, increased user demands and increasing expenses of journals. The Libraries everywhere throughout the world are forming Consortia with an objective to exploit global network to promote better, faster and most cost-effective ways of providing electronic information resources to the information seekers.

1.3.2: E-Books

Electronic-Book is characterized as any Book, which can be downloaded and read on a computer or personal devices. Sometimes E-Books are the electronic versions of Print Books and it has easy search facility which reader can see visually and it can be saved on a pen drive, CD etc and transferred to CD-ROM. The content is indistinguishable with the exception that there are additional features such as, bookmark and link between issues and solutions. E-books also offers the convenience of portability since, it can be stored on personal library of E-book on Computer, laptop and on other handheld gadgets.

The Electronic Book has the same contents as the original or printed book, but these contents are updated frequently with new updations (Wikipedia.org). Some of the E-books also have built hyperlinks. These hyperlinks allow, with a single click, to move quickly and effortlessly to desired location in the Book. Additionally, E-books also have bookmarks that permit to move quickly to a particular chapter or subsection.

The earliest electronic-books were distributed on floppy disk, but in the mid 90s, e-books were distributed on CD-ROMs. With the advent of WWW, e-books are easily available on
internet. These e-books are self-contained executable files of HTML, which are completely interactive with the Internet. It can contain live links, graphics, search capabilities, JavaScript, embedded video etc and these books can be protected via password/user ID, and more.

**Different format:** E-book files are available in different formats such as

**PDF format:** PDF format is an electronic copy of the printed book. The placement of items on the page are static and will never move. This makes the PDF format ideal for printing, and possibly viewing on computer monitor. A PDF format is more difficult to read on small readers, where the page size of the reader is not as large as the original book because the PDF does not scale easily to be viewed on different sizes.

**E-PUB format:** EPUB files are the most widely accepted e-book format and can be read on the Nook, Sony Reader, Kobo, and I-Pad. It is a long stream of text and images that can be re-flowed easily to different sizes of viewing. Having text that re-flows makes increasing font sizes while maintaining readability much easier.

**MOBI format:** is a Kindle-Friendly eBook format. E-PUB format cannot be read by kindle. This format can only be read on a Kindle, unless some special device which indicates to read MOBI format.

**Advantage of E-Books**

- They are always available for download.
- They cannot be lost or stolen.
- They have hyperlinks which make them easy to navigate.
- Easily download without waiting.
- Less expensive than paper Books.
Electronic Books provide a lot of features that are not possible in print Books. It provides flexibility to the Library and Information Centers such as, these are accessible 24/7 through campus wide intranet and internet, access at the desktop of multiple users at a time, they may prove cost saving in the long term as they cut the cost of physical storage and do not require shelving, they need not be replaced as online books are updated frequently with new content and with relatively little expense by the publishers and they do not wear out. The electronic retrieval of E-book increases staff efficiency. E-books also provide immense help to disabled people like those having impaired vision, as they have adjustable font size and text to speech facilities of E-book readers; and they are also helpful to physically disabled people since E-book readers have the ability to turn the pages with a simple touch of a button.

1.3.3: Databases

A Database is basically a collection of information organized in such a way that computer program can quickly select desired pieces of data (book.google.co.in). It is a regularly updated file of digitized information related to a specific subject of field, consisting of records of uniform format organized for ease and speed of search and retrieval. Web-enabled Databases are easily accessible from user’s desktops through web browser. Database often contain Journal articles, or Reference to such articles, E-books, References Sources, Conferences Papers etc.

Traditional Databases are organized by fields (a field is a single piece of information), records (record is the one complete set of fields) and files (a file is a collection of records) (webopedia.com). In a new database approach, rather than having separate data files, a pool of related data is shared by multiple application programs. Each application uses a collection of data that is either joined or related in the database. It is therefore, convenient to use, widely available and can be accessed from anywhere by many users at the same time. Research
libraries, therefore, spend large amounts of money on these databases to satisfy the teaching, learning and research needs of its users.

**Types of Databases:**

- **Bibliographic Databases:**

  Bibliographic Database provides a descriptive record of an item such as author, title, subject, publisher etc. Rather than complete monograph, bibliographic database generally contain rich description in the form of short summary or abstract and keyword etc.

- **Full-text Database:**

  A full-text Database is a compilation of documents or other information in the form of a database in which the complete text of each referenced documents are available for online viewing, printing and downloading. For instance, IEEE-Xplore, not only provides index, citation and reference to journals articles, but also provides entire text of the article and paper on computer science, electrical, and electronic engineering etc.

**Features of Databases**

- Databases store large quantities of information. The larger the mass of information, the bigger the benefit of using a database.
- Databases make it easy to retrieve information quickly and flexibly.
- Databases help to organize and reorganize information. User can quickly switch between schemes.
- Databases provide facilities to print and distribute information in a variety of ways.
1.3.4: Blogs

Blogs are defined as A Website that contains an online personal journal with reflections, comments, and often hyperlinks provided by the writer (Merriam-Webster dictionary.com). A Blog is a very simple webpage where entries or posts are organized in reverse chronological order (Wikipedia.org). It is a unique form of online publishing that creates opportunities for producing knowledge, sharing research, building social networks, developing professionally, or documenting personal growth. Usually, blogs are open to public and these are free to create. Most of the blogs are interactive in nature and these are allowing visitors to leave comments and even message each other via widgets on the blogs. This interactivity make them distinguish from other static websites.

Types of Blogs

There are many different types of Blogs, differing not only in the type of content, but also in the way that content is delivered or written.

Personal Blogs: The personal blog is an ongoing diary or commentary written by an individual.

Collaborative Blogs or Group Blogs: In this type of Blog, posts are written and published by more than one author. Majority of groups or collaborative blogs are based on single uniting theme, such as Technology or Health.

Micro-Blogging: Micro-Blogging is the act of posting small pieces of digital content which could be a text, pictures, links or other media on the internet. It offers a portable communication mode to share useful resources.
Organizational blogs: These types of blogs are used to enhance the communication and culture in research institutes mostly they update news, upcoming events, technology etc. for research.

1.3.5: Internet:

Internet is generally defined as a global network connecting millions and trillions of computers. Internet works as a means to send and receive all kinds of information such as text, graphics, voice, video, and computer programs to other computers at anytime and anywhere in the world via dedicated routers and servers (businessdictionary.com). This allows the users to browse the information available at an unimaginable number of sites across the world. Some of them give conditional access i.e. the user has to be a member to be able to access the information. But most of them allow free access.

The growth of Internet usage has shown a phenomenal growth. According to internet live stats, Statistics obtained from www.InternetWorldStats.com, an internet site devoted to continuously monitoring internet usage in most countries, shows that as of August 12, 2016, there was an estimated 3,432809100 internet users worldwide. The largest internet users are from China, followed by United States and India.

The Internet (called ARPANET) was established by US, Department of defense in 1960 in collaboration with military research (Wikipedia.org). Later, Universities and other US institutions were connected to it. In the early 1980s, TCP and IP, the current versions of the core Internet protocols were introduced across the network. As a result, most traditional communications media, including telephony, radio, letters, books, journal articles and newspapers are being reshaped by internet, giving birth to new services such as Email, E-paper, Websites, E-books, E-journals and print publishing.
Internet is considered as a great electronic information resource by the research community and also as a great tool by library and information centers to supplement their information support offered to the user community. Users of one particular country can browse information resources though internet from anywhere in the globe. Apart from the faster access to information resources, it provides instant access to millions of information resources, which includes e-journals, e-books, databases, video films, sound recordings and wide variety of other e-resources.

1.3.6: OPAC

OPAC (Online Public Access Catalog) is an online database of materials held by a Library or group of Libraries. Users can search a Library Catalog to locate books and other materials available at a library. In other word, OPAC is an electronic version of the Card Catalogue. It is also called as a Gateway to Library's collection. The ALA Glossary of Library and Information Science (1983), define OPAC as a “Computer-based and supported Library Catalogue”. It is designed to be accessible via terminals, so that library users may directly and effectively search and retrieve bibliographic records without the assistance of a human intermediary (Fabunmi & Asubiojo, 2013). OPAC is an online catalogue of the library collection which includes prints and non-prints resources such as books, journals, magazines, newspapers, audio-visuals, government publications, theses and dissertations, etc. Therefore, by using the library OPAC, users can access bibliographical records of a variety of available information resources independently.

Traditionally, OPAC was concerned with searching for and retrieving bibliographic records of information resources instead of full-text of the content of resources. It has made searching and retrieval of bibliographic records of materials easier and faster.
It acts as an information retrieval tool for the user. It has revolutionized way of searching bibliographic information by providing search capabilities such as keyword searching, Boolean searching, truncation, proximity searching, and item identity number searching. These were not possible in the traditional catalogue.

**Ways to search:** There are a number of ways to search an item.

- Author search
- Title search
- Subject search
- Advanced search

**Advantages of OPAC**

- **Automated** - Automated testing saves valuable staff time, since the OPAC System tests are self-administered and automatically scored,

- **Easy to use:** It is easy to use since the users just need to enter access point in army to locate any materials in the library.

- **Flexible Test Selection** - The Test Administrator module allows to choose any combination of tests and time limits, so that you can individualize your test administrations can be individualized.

- It provides unlimited space and time for searches of any documents. Users can search any type of documents of not only their libraries but also from any networked library.
Web OPAC:

Web OPAC is provided on the Web with the help of Internet. Users can access it from anywhere at any time. It is a program which facilitates the users to access the OPAC through their search, instead of searching through Card Catalogue. In addition, users can request for the information which is not available in library.

1.3.7: Patents

Patent is defined as a means for protecting the physical embodiments of certain classes of new and useful inventions (Wikipedia.org). Patents are the broadest form of Intellectual Property Protection, encompassing not only the precise machine or process invented, but also variant machines or processes that may employ the underlying concept of the invention (Jeffrey, 2006). Patent provides protection to the owner for his invention, generally for 20 years.

Patent protection for invention cannot be commercially made, used, distributed or sold without the owner’s consent. Usually, patent rights are enforced in a court, which provide facilities to hold the authority to stop patent infringement. Conversely, a court can also declare a patent invalid upon a successful challenge by third party.

The owner of a patent has the right to decide about who may or may not use the invention. Owner may give permission or license to other parties to use inventions on mutually agreed terms or may also sell the right to other parties, who will then, become a new owner of the patent. But, once a patent expires, the invention will enter the public domain. It means the owner cannot hold exclusive right to the invention for longer time.

There are three kinds of patents according to USA patent office:
- **Utility patents:** Utility patents are employed to protect functional attributes of an invention. It may be granted to anyone who invents or discovers any new and useful process, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof. Utility patent can stop others from making, using, selling and importing the invention (en.wikiversity.org). A utility patent provides protection for 20 years from the date that the patent application is filed.

- **Design patent:** Design patents are granted to protect ornamental aspects of an invention. In other words, a design patent is granted for product designs. The criteria for obtaining design patent are same as utility patents, but it is issued for only 14 years from the date that the patent application is filed.

- **Plant patents:** may be granted to anyone who invents or discovers and asexually reproduces any distinct and new variety of plant (USPTO, 2015). This patent may be granted to cultivating different types of plants i.e. mutants or hybrid plants etc. This patent protects the owner for 20 years from the date of the application.

Once a patent is granted, the owner may enforce it by bringing a patent infringement action (lawsuit) against anyone who makes, uses, or sells the invention without the patent owner’s permission (coursehero.com). An invention is not patentable if it is a discovery, a scientific theory or mathematical method, an aesthetic creation, literary, dramatic or artistic work, a scheme or method for performing a mental act, playing a game or doing business, the presentation of information or a computer program. In addition, it is not possible to get a patent for plant variety, a method of treatment of the human or animal body by surgery or therapy or a method of diagnosis.
1.3.8: Standards

A standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose (www.iso.org). Standards are based on industrial, scientific and consumer experience and they cover everything from consumer product to energy, environment, water and many more. Standards are regularly reviewed to keep pace with advance technologies.

There are three kinds of standards: international, regional, and national.

- **International standards**: are developed by ISO, IEC (International Electro-technical Commission), and ITU (International Telecommunication Union). Countries can adopt these standards directly for their national use.

- **Regional Standards**: are prepared by a specific region, such as the European Union, which develops EN standards. Similarly, joint Australian/New Zealand standards can be considered Regional Standards.

- **National Standards**: can be developed by a National Standards body (like Standards India) or other accredited bodies

Standards help in overcoming technical barriers in inter-local or inter-regional commerce, caused by differences among technical regulations. Standards can be developed independently and separately by each local standards organization, or local company.

**Need for Standard**

Standards are used every day, in all aspects of our daily lives i.e. in communications, media, healthcare, food, transport, construction, furniture, energy etc
➢ **Safety and reliability** – Adherence to standards help ensure safety, reliability and environmental care. As a result, users perceive standardized products and services as more dependable – this in turn raises user confidence, increasing sales and the take-up of new technologies.

➢ **Support of government policies and legislation** – Standards are frequently referenced by regulators and legislators for protecting user and business interests, and to support government policies.

➢ **Interoperability** – the ability of devices to work together relies on products and services complying with standards.

➢ **Business benefits** – standardization provides a solid foundation upon which to develop new technologies and to enhance existing practices. Specifically standards:

   i. Open up market access

   ii. Provide economies of scale

   iii. Encourage innovation

   iv. Increase awareness of technical developments and initiatives

Standards are reviewed, revised and updated on a regular basis. It may be developed privately or unilaterally and these can also be developed by groups such as trade unions, and trade associations.

**1.3.9: Dictionaries**

The Oxford English Dictionary defines a Dictionary as a "Book dealing with the individual words of a language (or certain specified class of them) so as to set forth their
orthography, pronunciation, signification and use, their synonyms, derivation and history, or at least some of these facts, for convenience of reference the words are arranged in some stated order, now in most languages, alphabetical, and in larger dictionaries the information given in illustrated by quotations from literature" (OED, 2017).

Types of Dictionaries

General Dictionary: It contains words from all spheres of human activities and all areas of the life of the speakers of the language. The General Dictionaries are of two types:

(a) Academic or Normative Dictionary,

(b) Referential or overall Descriptive Dictionary.

The Academic Dictionary gives the lexical stock of the standard language. The aim of this dictionary is to present the language as it is expected to be and stop it from decay. It has an eye on the future usage of the language. The selection of entries is done from the works of the creative writers, may be both earlier and contemporary, literature of science, arts etc., newspapers, magazines and other materials which are considered representative of the standard language.

The referential or Overall Descriptive Dictionary does not have any normative aim. The word stock of this dictionary is selected from different heterogeneous speech groups. The corpus includes not only literary texts but also oral literature. It contains words of Regional, Social and Stylistic variations

Special Dictionaries:

The Special Dictionaries may be classed into the following groups on the basis of the nature of their word lists:-
(1) Covering special Geographical regions, Social Dialects or Special Spheres of human activity,

(2) These are in formal shape,

(3) Special language units and others.

- **Dialect Dictionaries**: dialect dictionaries deal with the word stock of a particular geographical region or social group. The dictionaries usually contain words not found in the standard language i.e. words which are variations of the standard form, or words whose meanings are restricted to a particular area or social group. The preparation of these dictionaries is generally associated with dialect surveys. The entries are selected form the data collected on the basis of extensive field work, preparation of linguistic atlases, recording of all the regional variations of the lexical units etc.

- The dictionary of technical terms deals with technical terms in a language. Terminology is a major and vital part of the vocabulary of any language. These dictionaries are generally prepared by special bodies and commissions formed specially for the purpose. They contain either terms peculiar to a particular subject field or general words with special meanings for special fields.

- **Closely related to the dictionaries of technical terms** are those of different professions, trades, crafts, sports etc. These dictionaries present words peculiar to a particular profession e.g. Dictionary of fishing terms etc. Many dictionaries of agriculture terms have been compiled in India. E.g. Grieson's Behar Peasant Life is a good example of professional dictionary.
- Not very far removed from these dictionaries are the dictionaries of slangs, jargons, argot etc. These dictionaries contain closed set of words used by a particular class of people. These words are either newly coined words or general words with some new special and secret meaning attached to them. In both cases the secrecy of the word is strictly maintained and is considered a taken of group solidarity. Any violations in the norms results in the disowning of the person in the group.

- An online dictionary is a dictionary that is accessible via the Internet through a web browser. They can be made available in a number of ways: free, free with a paid subscription for extended or more professional content, or a paid-only service.

### 1.3.10: Online Theses and Dissertations

A Thesis or Dissertation is a document, submitted in support of candidature for an academic degree or professional qualification presenting the author's research and findings. These are known to be the rich and unique source of information, often the only source of research work that does not find its way into various publication channels. The Oxford English Dictionary defines a thesis as “a long essay or dissertation involving personal research, written as part of a university degree” (OED). Merriam-Webster Dictionary defines a thesis as “a position or proposition that a person (as a candidate for scholastic honors) advances and offers to maintain by argument” as well as “a dissertation embodying results of original research and especially substantiating a specific view; especially one written by a candidate for an academic degree.”

The UGC Notification (Minimum Standards & Procedure for Award of M.Phil/Ph.D Degree, Regulation, 2009) dated 1st June 2009, mandates submission of electronic version of
theses and dissertations by the researchers in Universities with an aim to facilitate open access to Indian Theses and Dissertations to the Academic community World-Wide. Online availability of electronic Theses through centrally-maintained digital Repositories, not only ensure easy access and archiving of Indian Doctoral Theses but will also help in raising the standard and quality of research. This would overcome serious problem of duplication of research and poor quality resulting from the "poor visibility" and the "unseen" factor in research output. As per the Regulation, the responsibility of hosting, maintaining and making the digital repository of Indian Electronic Theses and Dissertation (called "Shodhganga"), accessible to all Institutions and Universities, is assigned to the INFLIBNET Centre.

Earlier, University quality was linked to its library. But now university quality is linked with the digital library of Theses and Dissertations, which are easily available over the Internet. The opportunity to participate in creating and disseminating ETDs could attract top candidates from anywhere and it will raise the standards for higher study.

1.4: Library Consortia

The Library environment is currently undergoing a rapid and dynamic revolution leading to new generation of Libraries with the emphasis on e-resources (Bajpai, n.d.). In the age of this information explosion, the most challenging tasks for the Information Professionals and Information Centers all over the world is to supervise the huge information that are being produced and developed in the world (Singh & Rao, 2008). Therefore, it is impossible for a single library to monitor the explosion of knowledge in all fields and accumulate information for the users. To cope up with this situation, the phenomenon of consortia has become very important in the last few years (Islam & Islam,)

A Consortium could be described as a “group of organizations who come together to fulfill a combined objective that usefully requires co-operation and the sharing of resources
and need to have a clear mutual goal in order to ensure their success. The aim should be to deliver “more than the sum of the individual parts”. A library Consortium formation can be Inter- Institutional, Local, Regional, State, National and International level (Yernagula, & Kelkar, 2011).

Library consortium is a group of two or more libraries which have agreed to co-operate with one another in order to fulfill certain similar needs, usually resource sharing (Inflibnet.ac.in). It usually, refers to co-operation, Co-ordination and collaboration between, and amongst libraries for the purpose of sharing information. Consortia are basically, evolving a form of cooperation among the libraries which come together to share resources electronically (Bajpai, 2009). A consortium has gained momentum even in developing countries like India. Some of the successful library consortia which are used by research institutes of Punjab are:

1.4.1: INDEST- AICTE Consortium

The “Indian National Digital Library in Engineering Sciences and Technology (INDEST) Consortium” was set-up in 2003 by the Ministry of Human Resources Development (MHRD). Under this, the Ministry provides funds required for the subscription of electronic resources for 38 core institutions including the Indian Institute of Science (IIScs), the Indian Institutes of Technology (IITs), the National Institute of Technology (NITs), Regional Engineering Colleges (RECs), Indian Institutes of Management (IIMs) and a few other centrally funded government institutions through the consortium (http://paniit.iitd.ac.in). Besides that, 60 Government or Government-aided engineering colleges and technical departments in Universities have also joined the consortium with the financial support from the All India Council for Technical Education (Mogademm & Talawar, 2009). In addition, a
total of 26 other engineering colleges and institutions have also joined the consortium on a payment basis. The electronic resources subscribed by the INDEST are as follows:

- ASCE (American Society of Civil Engineering) journals.
- ASME (American Society of Mechanical Engineers) journals.
- Elsevier’s Science Direct.
- IEEE/IEE Electronic Library Online (IEL).
- ProQuest Science.
- Springer Verlag’s Link.
- Indian Standards.
- Nature.
- COMPENDEX on EI Village.
- INSPEC on EI Village.
- J-Gate Custom Content for Consortia (JCCC).
- MathSciNet.
- SciFinder Scholar.
- Web of Science.

Members of the INDEST consortium generally have a networked infrastructure of computers available at their campuses. The library users are provided with a secured and hassle free log-on procedure. The users can access all the e-resources through the Institute’s IP Ranges. This arrangement helps the users to access the resources immediately and provides a foolproof system of security. They are free from memorizing user ID, password, publishers’ URLs, etc. (Moghaddam & Talawar, 2009). Members of the INDEST consortium generally have a networked infrastructure of computers available at their
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1.4.2: ERMED-India Electronic Journal Consortium:

Recognizing the need for sharing of information in Bio-medical research and development in India through Online Networking, the ICMR, New Delhi has taken keen interest in establishing ERMED-India Consortium. 39 centrally funded Government Institutions including 10 Director General of Health Services libraries and 28 ICMR Libraries and AIIMS library are selected at the initial stage as its core members (ermed.in). The consortium will be coordinated though its headquarter set up at the NML. JCCC (Journal Custom Content for Consortia) has been launched by ICMR Head Quarters.
High quality online e-journals are presently purchased from 5 leading publishers:

- British Medical Journal Publishing (23 journals)
- Cambridge University Press (35 journals)
- Lippincott Williams & Wilkins (95 journals)
- Oxford University Press (37 journals)
- John Wiley (53 journals)

Benefits of ERMED Consortium

- Consortia provide broader access to quality content from high impact factor quality journals.
- No restrictions on downloads and Printing. Unlimited, concurrent user access
- ERMED facilitates COUNTER-compliant usage data and perpetual access rights.
- Consortia provide Customer support, training and marketing resources for your library
- No hassle of archiving and management of print resources (ermed.in).

1.4.3: CeRA: E-Journal Consortium:

Consortium for e-resources in Agriculture (CeRA) was established in November 2007 for facilitating accessibility of scientific journals to all researchers / teachers in the National Agricultural Research System by providing access to information, specially access to journals online which is crucial for having excellence in research and teaching. It covers about 3000 scholarly journals (comprising consortium subscribed, Library-subscribed and open access journals) from seven major publishers. Currently 147 institutions in NARS have 24x7 online access to important journals in CeRA platform through IP authentication. Thomson Web of Science for Science Citation Index (SCI) has been made available to the Lead Institute (IARI), but the facility is available to all members of CeRA (http://cera.iari.res.in).
List of journals in CeRA:

- American Association for the Advancement of Science
- American Society for Microbiology
- American Society of Agronomy
- Annual Reviews
- BioOnBe
- CABI
- CSIRO
- Elsevier
- International Society for Horticultural Science
- International water association
- Indian Journals
- Nature Publishing Group
- Springer
- Taylor and Francis

Benefits of CeRA

- CeRA provides Online accessibility of all important journals related to agriculture and biotechnology to researchers and students of the Consortium members
- Quick access to world R & D information as available worldwide
- Permanent archive of the subscribed e-databases.
- Improvement in the quality of scientific publications, and teaching and research guidance (http://cera.iari.res.in).
1.4.4: DST-NKRC Consortium

The National Knowledge Resource Consortium (NKRC), established in year of 2009. It is a network of Libraries and Information centres including 43 CSIR and 26 DST institutes. NKRC's origin goes back to the year 2001, when the CSIR set up the Electronic Journals Consortium to provide access to 1200 odd journals of Elsevier Science to all its users. Over a period of time, the Consortium not only grew in terms of the number of resources but also in terms of the number of users as more like-minded institutes evinced interest to join the Consortium (http://nkrc.niscair.res.in)

Today, NKRC facilitates access to 10,000+ online e-journals of 28 publishers, patents, standards, citation and bibliographic databases. Apart from licensed resources, NKRC is also a single point entity that provides its users with access to a multitude of open access resources (niscair.res.in). The main envisions of Consortium is to emerge as a leader to serve the R&D sector with much needed information to strengthen the research and development system in the country. Today the NKRC platform is the backbone for knowledge resources for all the CSIR and DST laboratories (Guruprasad, at al, 2012). The total list of global publishers/database providers listed in the NKRC platform for consortia access is as follows:

- ACS
- CAS
- AIP/APS
- Elsevier (Science Direct)
- Taylor and Francis
- NPG
- Thomson (ISI Web of Science and Delphion Database)
• Cambridge University Press
• World Scientific
• IEEE
• Annual Reviews
• American Association for the Advancement of Science (AAAS)
• CSIRO Publications, Australia

Optical Society of America Indian Journals.Com
• Sage Publishing
• Wiley-VCH
• IOP (Institute of Physics), UK
• RSC
• Springer

Apart from above mentioned journals NKRC also provide access to:
• Pre-prints
• Electronic theses and dissertations (ETD)
• Technical reports
• Annual reports/progress reports
• Special lectures/special publications
• Patents and standards
• In-house journals (Desgupta, 2013)
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