CHAPTER I

E-RESOURCES

1.1 Introduction

Ever since the proliferation of Information Communication Technology (ICT) in the libraries there is a great change of mentality in user behaviour in information seeking. This forces the libraries to re-orient their researches and techniques to meet the growing needs and expectations of the scholars, researchers and millions of young minds who are entering into colleges and universities and research institutions. In this context of the concept of accessed e-resources has been the great electronic resources providing simultaneous access to many through Internet protocols. Electronic resources or e-resources have become important tools for research publication and developmental activities. The research and developmental activities in any country are measured in terms of international publications. In India at present is facing a challenge of reciprocating the information. The increasing practice of publication of the literature in the electronic format encourages new kinds of publishing ventures that compliment the traditional databases. E-resources have the capability to link information that increases the potentials of scientific results and interpretation. The evolving phase of digital libraries is close to the turning point where scientific publications, especially journals, predominantly only appear in an electronic format.
The use of electronic resources has grown, although this innovation has not yet been fully adopted by scientists even in the developed countries. To be adopted an electronic resources should perform the same functions as its predecessor, the print journal, such as building a collective knowledge base, communicating information, validating the quality of research and building scientific communities.

The importance of studying resource collections comes from their central role in scientific communication, while their acquisition costs simultaneously account for a notable part of library funds. One way to cope up with this problem in digital library solutions and licenses for the e-resources are negotiated at a national level between the national digital library and the publishers. Such a solution which gives large coverage, involves a significant investment, but provides services to a large audience. In this phase of change it is important to study the use and characteristics of digital library material. Digital libraries have been studied quite a lot from the technical viewpoint, as also the use of digital publications.

1.2 Information Communication Technologies in Academic Libraries

With the invention of Information and Communication Technology, libraries now use various types of technologies to aid the services they render. Everyday new technological advances affect the way information is handled in
libraries and information centers. The impacts of new technologies are felt by libraries in every aspect.

Information is a valuable resource in all types of libraries, but the ICT tools that are important to create, collect, consolidate and communicate information are not yet used in majority of libraries. Information can be represented as a vertical and non-interactive structure through which people communicate or rather inform data, information or ideas to a larger number of receivers where the receivers remain passive in this one-way approach, whereas communication is a two-way process in which receiver is also a transmitter or giver and is thus a horizontal process characterized by interaction, which includes exchange of ideas, information, point of view, and experiences between persons and groups. Though information has a priority over communication, it is the technology that makes communication both interactive and a stir (Savio, 1990)\(^1\).

The rapid developments in Information Communication Technologies (ICT) have given a solid foundation for revolutionary changes in the information handling capabilities of academic libraries and information centers all over the database creation and use, in addition to computer technology, digital technology, multimedia technology, network technology, telecommunication technology, barcode technology, web technology, etc.

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One of the most relevant outcomes of ICT is the introduction of advanced communication network or the internet, which has necessitated a major shift in the role of academic libraries from ownership model to access model, from print to electronic media, from libraries as archives to libraries as access points, and from information collection to information analysis and repackaging (Goswami, 2009). The change from print to digital information has a high impact on libraries, information centers and other institutions directly involved in processing information. The ability of computers to perform high volume error-free repetitive tasks at speeds much faster than human beings, along with the emerging developments in the area of computing; telecommunications, networking and resource sharing, has made access to information anytime, anywhere possible (David, 2001). Now Librarian in an academic environment has the role of mediator between the vast network of resources and its users, and library, an access point providing access to different types of information resources.


4. Giles, V. (2003). Single or multiple records for print and electronic serials titles: When less is more (more or less). The Serials Librarian, 45(1), 35-45.
1.2.1 E-resources in LIS

“Information technology” is a generic term with wider implications. In the present context it includes computer and telecommunication technologies used for collecting organizing and disseminating information. According to Rowley (1996)\textsuperscript{5}, information technology includes the following four major areas:

Methods and tools of recording knowledge like computer storage media (Magnetic: Floppy disk, hard disk, tapes and Optical Storage Devices – like CD-ROM, DVD (Digital Versatile Disk) Rewritable CDs and DVDs)

Methods of keeping records (Computer hardware, software, creating databases, etc.)

Methods of indexing documents and information (Computerized indexes, Machine readable catalogues, etc.) and

Methods of communicating knowledge (Electronic mail, facsimile, transmission, Electronic resources, teleconferencing and data communication networks)

The application of Information technology in library services and the resultant changes in information activities from conventional practices to the advanced methods can be summarized in the following table:

1.2.2 Developments in Information activities

Table - 1

<table>
<thead>
<tr>
<th>Information Activity</th>
<th>Conventional Method</th>
<th>New Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generate, originate</td>
<td>Writing, Typing</td>
<td>Word Processing, Text editing, voice recognition etc.</td>
</tr>
<tr>
<td>Preserve, Store</td>
<td>Manuscript, Paper, Print Media</td>
<td>Electronic Publishing, Magnetic tape, Video Text, Tele Text, CD ROM</td>
</tr>
<tr>
<td>Process</td>
<td>Cataloguing, classification, Indexing</td>
<td>Electronic Data Processing, Artificial Intelligence/Expert System etc.</td>
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<tr>
<td>Retrieval</td>
<td>Catalogues, Indexes</td>
<td>DBMS, Information Retrieval online/offline etc.</td>
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<tr>
<td>Disseminate, Communicate</td>
<td>Lists, Bibliographies, Abstracts, Hard Copies</td>
<td>E-mail, Electronic Document Delivery, Teleconferencing, Tele Facsimile etc.</td>
</tr>
<tr>
<td>Destroy</td>
<td>Physical weeding</td>
<td>Magnetic Erasers, Optical Erasers, Re use the medium</td>
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</table>

(Source: Kumar, 2003)6

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The computer has evolved from “abacus” which was introduced about 5000 years ago, to aid basic arithmetic to several generations of computers as a mere device to one that is used for information access. Today, advances in CPU speed, Storage capacity and features like low power consumption and multitasking have resulted in the design and development of highly advanced microprocessors\(^7\). Even though new personal computers and notebooks have evolved in the market, the conventional personal computers will remain the main computing device for providing basic services in an academic environment. Early efforts to apply computer technology to library activities took place between 1960 and early 1980s as the first generation of library computing. During this period, development of networks, the first online public access catalogue (OPAC), International protocols, evolution of Internet, etc., made the transfer of information easier across national boundaries. Though the concept of audio and video technologies are said to have initiated in the 1880s it was in mid 1980s many libraries in US started using video technology for recording and displaying visual information (Panda & Gautam, 1999)\(^8\). Libraries have used microfilms, microfiches; aperture cards, etc., from 1920s to develop and manage their collections, reproduce and preserve library materials. Microform collections were the most preferred substitute for printed materials as they saved storage space, binding costs and. Also reduced chances of damage.


Developmental storage technologies had a great impact on library field in the mid-1980s. The late 1980s saw the introduction of a number of new optical storage products, including erasable systems.

CD-ROM, one of the most popular optical medium, can be considered as the modern papyrus used widely in numerous service areas of Library and Information Science. Several reference tools like the 20th edition of DDC, Oxford English Dictionary, etc., were brought out in CD-ROM format. Video disks or read-only optical disks, including Video CD and Digital Video CD (DVD) were used to store digitized data like full-length videos of films and back files of large bibliographic databases. CDROMs and DVDs are popular in the academic community enabling easy access and mass storage of data. Developments in storage media have thus evolved from the traditional data storage media like magnetic tapes, floppy disks, etc., to CD-ROM, DVD Rewritable CDs and DVDs, to hybrid formats of CD and DVD called as Dual disc, Blue ray disc (which allows for five times more storage than on a DVD), USB flash drive, etc. Now USB flash drive is more popular because of its lightweight, and easy to carry options. A USB flash drive consists of a flash memory data storage device integrated with a USB (Universal Serial Bus) 1.1 or 2.0 interfaces. Its memory capacity can vary from 16 MB to 8 GB or even 64 GB.

Communication has evolved from machine codes and punched cards to keyboard, mouse, scanner, bar code readers, graphics tablets, joysticks, touch screen, etc., and output devices like monitor, printer, etc. Keyboards are widely used, as they are a flexible method of data entry and are used in most applications.
Magnetic ink character recognition (MICR), Optical mark readers (OCR) and Optical character recognition (OCR) are faster and cheaper than keyboard entry, but in libraries, the most commonly used input hardware in encoding bibliographic information of books and other materials are keyboards, barcode scanners for reading barcodes and member IDs, and flatbed scanners for images and other documents. In the future, academic libraries will be able to make use of voice recognition software, which is also a powerful tool for assisting disabled users. The common output devices used in academic libraries are printers like Dot-Matrix printers, Ink-jet printers, Laser printers and Monitor. Computer output microform (COM) is a further means of outputting large quantities of data. Voice outputs, which present output in the form of speech and multimedia kiosks with wide applications in advertising, are also different forms of output devices.

Multimedia is an interactive education tool providing an environment friendly system to the library, integrating various media like audio, text, graphic and animation into one platform for efficient information handling. (Mohandas & Shet, 1999). Multimedia systems denote computers, which have the capability to handle the audio, video and graphic information in addition to text at the same time. Computer - aided learning using multimedia has assisted researchers at all levels of education. The development of expert systems along with availability of low-cost computers as a means of providing high - level

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intellectual support for the human experts has evolved as an innovation in man-
machine interface. Expert systems are computer-based systems, which use artificial intelligence techniques to provide advice and make judgments to aid in solving complex problems in subject areas requiring the use of specialized knowledge and expertise.

In an Academic institution Library, the most common computer software used are library automation software, database management software, antivirus software and application software like word processing, spread sheet, etc. In most Academic institution Libraries, Microsoft Windows is the popular operating system, including Windows 2003 and Windows XP. In a few libraries, Linux-based operating system is also used where open-source software is used for automation purposes. Linux is used as it has comparatively less virus issues. Word processing tools commonly used are Word 2003 and 2007 and spreadsheet, Microsoft Excel. Microsoft Word 2007 has many advanced features being a powerful tool allowing users to export and save their file in portable document format or PDF and XML format. Ideal Library automation software is the one which can handle all the housekeeping operations of the library such as acquisition, circulation and serial control. The database management systems (DBMS) commonly used in Academic institution Libraries is Oracle, My SQL, Postgre SQL and Microsoft SQL server, etc. My SQL and Postgre SQL are examples of open-source database software popular around the world. For small and medium-sized libraries, My SQL forms one of the components of LAMP (Linux, Apache, My SQL, and PHP/Perl) and it is the database software used in
Koha library software. Microsoft SQL server is the software used for Microsoft Windows operating system.

The free and open-source movement has been one of the most important revolutions taking place in ICT applications worldwide. It was started in 2001 by Richard Tallman and it refers to the software that is developed, released and can be modified by anyone free of cost. Users can access the source code to see how the software works. Open–source software is gaining popularity because of the reduced maintenance cost and ease of customization. It is widely used in academic libraries to design and develop integrated library systems (ILS). Koha, PhpMyLibrary, Open Biblio, etc., are some examples of popular open-source library software. Koha is developed by Katipo communications in New Zealand and the modules include acquisition, Circulation, Cataloging, Online public access catalog, Serials, etc.

1.2.3 ICT Technology in LIS

The progresses in communication technology and media have helped to increase access to educational resources and thereby enhance the quality of education. The use of interactive communication media has facilitated expansion of opportunities for higher education. To meet the increase in demands to access, locate and transform large amounts of data, libraries are struggling to make the best use of available telecommunications technology. A communication network provides interconnection of several computers wherein a user can communicate
with any computer as local user. The system will have facilities to create, transmit and print a message or document electronically (Kawatra, 2000).!

Email or electronic mail is one of the most commonly used communication method by which a person can create and transmit messages electronically to an individual or group of individuals. In an academic institution, email is used effectively for providing better services like Current awareness service, SDI, Alert service for new books, etc. Voice mail is an advanced form of email where a person can dictate or transmit a message over telecommunication lines using modem.

Facsimile transmission or Tele fax is a useful system for communicating data images over telecommunication lines enabling a user to transmit a text or graphics securely. It is used in some academic libraries for document delivery and other scholarly communications. A dedicated telephone line and fax machine is to be installed for this purpose. Video conferencing is another communication technology that uses high-speed telecommunication network to transmit audio and video allowing people to conduct meetings across the world. In an academic institution, this can be applied effectively to link several classrooms to hold debates or discuss topics with an eminent person.

Networking in libraries has been played a major role in information resource sharing and support activities through a network of computer and

databases with the help of telecommunication. Network technology is the backbone of data communication and dissemination in academic libraries. A network can be local within an institution, i.e., local area network, LAN, or it can be national, regional or international, i.e., Wide area network or WAN. Examples of national networks are ERNET, DELNET, and INFLIBNET. International networks include UNISIST, AGRIS, etc. UGC through INFLIBNET has initiated a major project of networking Academic institution libraries all over Ramanathapuram district and recently extended to selected colleges, by providing consortia-based subscription to online journals in collaboration with ERNET. Another initiative of networking library resources is INDEST, a project of Ministry of Human Resources Development (MHRD) and AICTE linking IITs and technical institutions all over India.

Internet is now a common term, which signifies interconnections of multiple networks (both LANs and WANs), located in different parts of the world enabled through the TCP/IP protocol. It is a powerful means of speedy dissemination and retrieval of information in text, graphics, audio or video format. It is a boon for the academic community worldwide, providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications. The “Web” or World Wide Web provides a means of accessing and sharing information on the internet using hypertext transfer protocol or HTTP. The Web now enables the user to access bibliographic databases, full texts of journals, courseware and provide links to other library catalogues through Online Public Access Catalog or OPAC. Internet has helped to integrate all library activities like
email, discussion through list serves, support reference service through remote databases, avail interlibrary loan, ordering journals and books online, etc. (Singh, 2001)\textsuperscript{11}.

There are innumerable applications of Internet and web based services. Some of these are Subject gateways, Portals, Subject directories, Search Engines, etc. includes web searching, news, shopping information, reference tools and communication in the form of chat and email. Examples are consumer portals like Yahoo, MSN, AOL, etc. Subject directories include categories and sub categories of subjects indexed in such a way that users can go through several subject layers to get to an actual web page. It gives a collection of links to resources organized under different subjects. Search engine, one of the most popular internet application widely used around the world is software used to search a database. Search engine is useful to get an idea about a subject or concept. Examples are Google, Bing, etc.

\textbf{1.2.4 Wireless Network Technology}

Though there are a lot of developments in wireless network technology, in most academic libraries in India, cabled computer networks are more common than wireless broadband network. The emerging wireless, mobile and internet technologies may take some more time to have an effect in the Academic

institution Libraries; however, a brief outline of some of the recent developments in wireless, mobile, internet and web technologies are listed below.

Bluetooth is an emerging wireless technology meant for broadband wireless communication between devices like digital cameras, laptops, mobile phones, Personal computers, printers, scanners, etc., within a short range. 3G telecommunication or third-generation wireless communication technology is meant for wide area wireless cellular telephone network. It can process audio, graphics, video, etc., at high speed. Wi MAX (Worldwide Interoperability for Microwave Access) is a broadband wireless access capable of transmitting data over 30 metres of area. It provides data rates up to 70mbps greater than Wi-Fi's 54 mbps. GPRS or General Packet Radio Service is a mobile technology that helps to download web pages and send text messages in cell phones quickly. It helps the users to have uninterrupted access to internet through mobile phones or computer.

VoIP or Voice over Internet Protocol is an internet technology to transfer digitized voice over broadband network. As communication is over internet, the cost of phone call is less than that of regular phone. VoIP can empower academic libraries to promote and expand their distance learning services, virtual reference services and other global collaboration services. RFID or Radio Frequency Identification or electronic tagging is a non contact automatic wireless identification technology to track objects at a distance from a couple of inches to 20 to 30 ft away (Li, 2009)\textsuperscript{12}. It uses microchip, which transmits a stored code to a

reader, which can be fixed or hand-held. Compared to traditional barcode technology RFID has many advantages like quick access, greater storage capacity, resistance to high temperatures, water-resistance, etc. RFID implementation in Academic institution libraries will help to increase efficiency in circulation section, in better security management and can be used for stock verification. Before implementing RFID tags in Academic institution Libraries, the cost involved, the range of frequencies applicable, and other issue-related standards, health issues, etc., are to be solved.

Semantic Web is an intelligent web technology that allows machines to understand the meaning or "semantics" of information on the World Wide Web. World Wide Web Consortium (W3C) director Tim Berners-Lee coined the term. According to W3C, the core of semantic web is the resource description format (RDF), an XML-based mark-up language for defining metadata about web information (Semantic Web, 2010)\textsuperscript{13}. The semantic web is a vision of information that is understandable by computers, so that computers can process the information on the web.

\textbf{1.2.5 Electronic Publishing}

Electronic publishing covers all aspects of traditional publishing, but in a digital environment, it is another major technological development facilitated by the convergence of computer and communication network. Electronic

publishing means the use of electronic publishing can be print-based or non print based. In the non print form, the end products are accessed electronically through traditional medias like CDROMs, or through Internet as Electronic resources, Online databases, E-book, or in the form of OPACs, blogs, wikis, podcasts, etc.

Digital Library is a virtual library providing access to information based on resources, including text, images, audio, video and other scholarly library materials that have been electronically converted or in electronic formats. There are many different kinds of digital libraries creating, delivering and preserving digital objects from many different formats of data. It is a managed collection of digital objects, created or collected according to principles of collection development (Deegan & Tanner, 2002). 14 A digital library provides instant access to digitized information and offers a solution to the problems of storage and maintenance. It can provide access to simultaneous users from multiple locations. Another example of electronic publishing is electronic resources, which is a full text journal published electronically, and can be accessed on the web. Either electronic resources can be free or subscription based. Advantages of electronic resources are its ease of access and regular updating, ease of downloading articles, etc. Many publishers now offer electronic resources along with print version with sometimes free access to the electronic resources on subscribing to the print version.

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An increasing number of journals are now available only electronically whereas online databases are large amounts of information stored in a search tool’s website. It refers to information transferred to hard disks, magnetic tape, etc., are which accessed through communication network (Mutula & Wamukoya, 2007). Libraries subscribe various types of online database depending on the subject requirements of the academic community. Most of the online databases have a user-friendly search interface to search the database and save the required results for future use. Examples are EBSCO, (Humanities and social sciences), Web of science, Library and Information Science Abstracts (LISA), Manupatra (Legal studies), etc. E-books are the latest addition in the world of electronic publishing. E-books are designed to use with E-book readers. Though they can save a lot of space, due to the high cost, E-books are not very popular in academic libraries. With the progress in electronic publishing, a number of academic institutions are making available their collection of doctoral thesis and dissertations online. NDTLD digital thesis and in India, Vidyanidhi digital thesis, Shodhganga of INFLIBNET, Electronic thesis collection of Mahatma Gandhi University and Cochin University of Science and Technology (Dyuthi), etc., are examples.

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1.2.6 Steps in Electronic Publishing

The following are the few important steps in electronic publishing:

Preparing and submitting manuscripts

Peer reviewing to ensure scientific quality: It is to be noted that there is a clear difference between unreferred conference proceedings and peer-reviewed journals.

Copyediting, typesetting, page make-up: Many authors do not adequately appreciate the importance of these steps in improving the accuracy and usefulness of the journal. They say that clarity of writing and readability are the characteristics of a good journal.

Database preparation: The database is a crucial element of the electronic information dissemination system. Preparation includes the maintenance of effective search and retrieval tools.

Production and dissemination in multiple formats: The final step in the delivery system is the provision of the information in a format suitable to the delivery medium and the user’s needs.

Archiving: Permanent storage of published papers for future use is a continuing task. This will become a growing task for publishers and librarians.

1.2.7 Web 2.0 in Libraries

Technological innovations together with the influence of Internet and WWW have transformed the methods of communication, entertainment, teaching, and learning in the academic community and society as a whole. The
developments in web applications and services are now termed as the Social Web or Read/Write Web or Web 2.0. There are different definitions for Web 2.0. It is a user-centric web, including various web tools like Blogs, Podcast, Wikis, RSS feeds, Social networks, social bookmarking, Mash ups, etc.

An individual with regular entries, events or materials such as graphics or video usually maintains Weblogs or Blogs. It is a kind of web portal containing chronological web publication for personal or professional purposes. There are different types of blogs defined by the method in which content is written, by type of media, device like mobile phone, by type of subject, etc. Blogs are created using blogging software available on the net. E.g., Blogger (free), Web logger (fee based). Its application in library setting is to organize a library’s activities, news, notices, reports, etc., in a chronological order. It can be used to announce new services of library and publish web pages easily without depending on hardware and HTML skills. Librarians can get current information on different subjects, e.g., forthcoming conferences through blogs and provide this current information to users through library blogs. Using blogs library staff can directly communicate with the users (Majumdar and Roy, 2008)\(^\text{16}\).

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Podcast is a pre-recorded piece of audio and sometimes video, available online. It is usually downloaded and saved for future listening. Librarians have to explore this method of content delivery as users can access different types of content from media and other service-oriented institutions. Libraries can experiment by sharing audio content and, including book reviews, interviews with authors, etc.

Podcasts also enable researchers to share information, and teachers may create podcasts to be used as a preparation tool for researchers.

RSS or Really Simple Syndication is a service that transfers contents from blog or other syndicated content to an aggregator. It facilitates users to keep track of new updates on selected web sites. All blogging software create an RSS feed as back end of HTML web pages (Stephens, 2007). RSS feeds is a family of web feed format used to publish frequently updated works such as blog entries, news headlines, audio, and video in a standardized format. Librarians can place RSS feeds of content on their web sites to build awareness about their new services, forthcoming books, etc.

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Wiki is innovative server software, which permits any user or specified users to create and edit web contents via web browser or build knowledge management application. To enhance intranet communication, a library can use Wiki as an information gateway to access, create and edit information guides, resources, services, tutorials etc. Wikipedia is an example of Wiki.

Instant Messaging or IM service or „Chat” enables real time conversation between two or more people on the internet platform. Google talk, Meebo, MSN and Yahoo messenger are leading free IM applications commonly used. In Libraries, it can be used for online reference service and real time consulting service.

Social Networks are websites that encourage interaction among users. These contain user-generated contents focusing on community where users get a chance to make connections, post pictures and share various types of information. Libraries can create a forum through social networking sites to discuss about library related issues, services and resources. Popular social networking sites are Orkut, My space, Linked In, Face book, Twitter a micro blogging service, Flicker an image hosting community, LastFm a music-sharing site, YouTube a video sharing, and hosting community. Social bookmarking is a service for internet users to store, manage and organize web pages. Delicious is an example of Social bookmarking site. Yet another Web tool is Mash up, a hybrid application of the web, which combines two or three internet-based applications, or all applications of web 2.0 in one platform. It thus combines data or functionality from two or
more external sources to create a new service. For instance, pictures uploaded on Flicker can be combined with Google Map to show correct location.

Librarians have started using Web 2.0 tools finding that their users are actively living and playing online. As new web tools are added, Librarians have to be alert to familiarize these tools from a user’s perspective and use their experience to devise new strategies and apply these developing tools to provide innovative library services.

1.2.8 ICT skills and competencies for library professionals

The dynamic environment of the library and information sector stresses the need for academic library professionals to remain flexible and adaptable to change. Effective organization of resources in the web and managing internet tools and services requires certain skills and knowledge for Library professionals, to meet the different information needs of faculty. They have to assist the academic community in getting relevant information using innovative methods. For this the mere enhancement of the present skills of traditional librarian may not be enough. It might require a total transformation of the skills and the way library professionals think and act. Using the platform of Internet and WWW, Academic institution Libraries have to expand their resources and services by devising strategies to attract more users to the library when the users are now inclined to access the information they need outside the walls of the library.

A number of competency studies have been conducted in the field of library and information studies during the last few years in the wake of
developments in information technology. Most of these studies were generally concerned with the common competencies needed by LIS professionals. The Special Libraries Association (SLA) undertook one of the major studies on competencies entitled Competencies for Special Librarians of the 21st Century, revised edition, June 2003. The SLA identified two main types of competency. These are two core competencies very essential for every library or information professional.

1) Professional competencies related to the special librarians’ knowledge in the areas of information resources, information access, technology, management and research and the ability to use these areas of knowledge as a basis for providing library and information services. Professional competencies further include four major competencies, each supported with specific skills:

Managing Information Organizations
Managing Information Resources
Managing Information Services
Applying Information Tools and Technologies

2) Personal competencies comprise a set of skills, attitudes and values that enable librarians to work efficiently, be good communicators; focus on continuing learning throughout their careers; demonstrate the value-added nature of their contributions; and survive in the new field of work.
Web Junction supported in part by OCLC has made a compilation of competency statements that deal with a broad range of library practice and service. This includes Library Management, Technology (Core Skills and Systems & IT skills) and Personal/Interpersonal competencies.

Successful running of an organization require certain leadership skills and careful management techniques. It is important that academic librarians acquire the skills that will enable them to operate effectively in large and increasingly competitive organizations.

1.2.9 A. Important library management competencies

Effective financial management using sound business and financial judgment.

Use appropriate business and management approaches to communicate the library's value to university administrators.

Promote the library as a center of lifelong learning for the community.

Maintain good public relations through communication and promotion of library's services and needs to all stakeholders.

Maintain a user friendly and safe physical environment to encourage library use by the academic community.

Maintain an awareness of current law and policy that may impact library services, administration and up-to-date policies/procedures for staff communication.

Understand the basic principles of marketing and how they apply to library services.
The librarian has to assist the professional and personal development of people working within the information organization by creating development plans for staff to gain necessary competencies (knowledge, skills, abilities, behavior, and attitudes).

Management of human resources effectively to increase productivity, which is highly important to achieve the library’s mission and goals.

1.2.9.1 B. Personal and Interpersonal competencies

The library professionals have to develop good communication skills to help build good relations with co-workers and users. Librarian must anticipate and maintain awareness of users' needs and wants through user surveys, complaint logs and other means.

Developing interpersonal competencies helps to maintain effective relationship with other staff in the library and achieve common goals.

Library professionals must understand the importance of lifelong learning for all levels of library work and actively pursue personal and professional growth through continuing education.

In an academic library environment, the librarian must be alert to the importance of library in the context of higher education (its purpose and goals) and the needs of faculty members and seek to provide services that will enhance these endeavors. Librarian must be familiar with the structure, organization, creation, management, dissemination, use, and preservation of information resources, new and existing, in all formats. The subject knowledge to support
collection development within the library and research and teaching within the university will come under the competencies of technical services. Now the collection development of E-resources has assumed much prominence in the world of information. Academic institutions and librarians will continue to allocate more resources towards technology. Academic libraries will have a crucial role in not only providing technology for users but also in creating new information systems for managing, disseminating, and preserving information regardless of format. At the same time, traditional library collections books, serials, sound recordings, maps, videos, films, photographs, archives, manuscripts, etc., will still need to be acquired, made accessible, and preserved (Shaping The Future: ASERL's Competencies For Research Librarians)\textsuperscript{18}.

\subsection*{1.2.9.2 C. Technology competencies}

As technology has saturated all levels of library’s operations and services, the library professional in an academic institution has to anticipate the changing expectations of users, and be flexible in adapting and adopting new skills and levels of awareness.

Listed below are some of the basic technology competencies important for an academic librarian.

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Knowledge about relevant developments in information technology like e-mail, internet, and web search strategies.

Skills in basic computer hardware, troubleshooting and networking

Knowledge about software applications and operating systems

Automation of library services and its management

Familiar with web tools like blogs, social networking, RSS feeds, etc.

In addition to the core technology competencies, there are other technology systems that control the operations in a library about which the librarian must have sufficient information. As lot of library’s resources may be in digital format, especially in large academic libraries, a number of new skills and knowledge are involved in creating, selecting, organizing, managing and providing access to these digital resources. The academic librarian’s skills have to be developed for designing and developing web based materials and documents for online use. Self-archiving in Open access repositories, metadata harvesting, electronic document management, etc., are presenting a new dimension of the information landscape.

To understand the design and development of webpage, E-resource management, working knowledge of programming languages, network security, Intellectual property rights, and copyright issues, etc. are some other competencies required for a library professional in the current digital age.

Even though librarians are facing challenges for new and emerging skills, the most important aspect of this change is to be able to adapt the existing skills, many of which are traditional librarianship skills and the ability to remain flexible
in a working environment that is constantly changing. The rapidly changing environment of academic libraries needs attention of the authorities that manage LIS education in the country. Information technology competencies demanded by most of the institutions require particular emphasis in LIS curriculum.

1.2.10 Platform of E-resources

Instructions are available via a platform that provides both browsing and searching functions. The library users can access e-resources on the Library websites, within the campus network. E-resources are electronic versions of paper journal (Sometimes called periodicals or serials). It is a good point to reflect on where the e-resources has come from, the position it is at now, and where it might be going in the immediate and long-term future. Concern within this article is to look backwards and forwards and consider this revolution in serials publishing, and the impact it has had on different user groups from the traditional academic audience to the general internet-savvy population. The e-learning provides perspectives on topics relevant to the study, implementation and management of e learning initiatives. The e-resources contribute the development of both theory and practice in the field of e-learning. The journal helps the student academically to prepare their papers, topical articles and case studies to contribute to their research in e-learning.
1.2.10.1 Evolution of e-resources

Electronic resources may be defined very broadly as any journal, magazine, e-zine, webzine, newsletter, or type of electronic serial publication which is available over the Internet. Within this broad definition, the titles can be electronically accessed using different search engines.

The OED (Oxford English Dictionary) defines a journal as “any periodical publication containing news or dealing with matters of current interest”, and that the prefix e- means “exchange of information in an electronic format, to be displayed on a computer screen or a hand-held device”. With this as a basis, an e-resources can be just about anything – in addition to the Colorado definition one could add personal web pages discussing items of current interest, blogs, and digests bringing a number of publications together. The earliest e-resources date from the late 1980s, in plain text format, and some of them can still be viewed in their original form today. Not surprisingly one of the first to appear concerned the price of serial publications, and others mushroomed in the areas of librarianship and information science, and in the arts. A good example of this early form of e-resources is ‘Postmodern Culture’, founded in 1990 and continuing to this day under the umbrella of Johns Hopkins University Press. This journal appeared just as the Internet was being established, as the culture was changing to allow mass viewing of material from home computers. It took

advantage of the infant browsers – not yet capable of sophisticated interfaces or the presentation of multimedia content and contributed to the development of an audience for journals which followed. All of this encouraged an audience for armchair digital content which could only increase with the passing of time. Despite the internet originally being seen as a medium for scientific and academic organizations to develop their global presence; a small but loyal popular audience for digital content was certainly developing.

An Open Journals Framework Project report by Hitchcock et. al\textsuperscript{20} stated that there were 115 e-resources in existence in 1995. Later research by the same authors found an increase to 1,300 within the next three years. During these three years, academic institutions had taken on board the need to organize, evaluate and promote this content, through initiatives like the Super Journal Project (SJP). The number of e-resources available rose to 10,000 by 1999. In 2004 the most recent estimates more than treble this total. The rise of this information source has been unprecedented and quite possibly unexpected in terms of publishing development. The situation becomes unmanageable of serial management specialists within academic libraries. It is still the case that whatever the e-resources might achieve in technical excellence it does not yet have the long-term reliability to guarantee it permanence in the academic literature market, and will require considerable innovation and involvement by information specialists as well as commercial producers to ensure it achieves its

promise so far. The growth of the e-resources in terms of sheer numbers has been staggering to witness, not only with the major publishers taking the strategic decision to digitize their content, but with the growth of innovative publishing models such as open access and open archiving.

In the internet the blogs are created by different groups and individuals for various purposes. A blog is basically a journal that is available on the web. Blogs are typically updated daily software that allows people with little or no technical background to update and maintain the blog. This is, in effect, a definition of interactive e-resources. Indeed, some blogs, such as Open Access News, present themselves as fully-fledged e-resources, with ISSN, although they retain the general structure of a personal web log. The services called e-resources have maintained the structure of the journal and can be searched both by search terms, volumes and issues. In this respect they are compatible with the requirements of performing the same functions as their printed predecessors. From the e-resources information can be found throughout links to related material, to related citations or most frequently cited items. These versatile search possibilities, to some degree, can compensate for the complexity of a web service, caused by the necessity to use an internet connection and a computer to read an article. In many cases, e-resources can be characterized as personalized and specialized.

On average, they are more heavily used than the article files, which also offer full text journals in a digital form. The e-resources among themselves, but
also compared to article files, differ from each other greatly in composition and it can be argued that they can learn from each other.

### 1.2.10.2 Significance of E-resources

Scientific e-resources are accountable to the worlds of print and the Internet. E-resources are part of both a tradition of scientific society publishing and an emerging interactive communications and publishing environment. Scientists turn to e-resources for the same content they receive from print journals. They approach e-resources with the same set of expectations they have developed for print editions. Therefore, the characteristics, legacies, and user expectations of both paper and electronic domains shape e-resources usage. Scholars develop their preferences and strategies for searching, reading, and publishing in both of these media contexts.

E-resources provide a bridge between publicizing and publishing scholarly work. Scientists publicize their work in person, in print, and, increasingly, in virtual formats—from informal networks to journal clubs, from database postings to conference presentations to peer-reviewed publication. As they tap into the flexibility of online information dissemination and retrieval, Internet technologies such as e-mail, and the computational power of the computer, e-resources enable closer links with a wider variety of publicizing practices than do their print counterparts. In many ways, e-resources shrink the gap between publicizing and publishing, bringing informal and supplementary information into closer proximity with formal, peer-reviewed material. This offers
unprecedented opportunities for creative cross-referencing of domains of information, but also creates new tensions between published and unpublished material; between gray literature and peer-reviewed literature; between formal and informal material. E-resources and their broader technological context can provide new tools, forums, and forms of dissemination with the potential to significantly shape scholarly communications and publishing practices in the future.

E-resources improve the efficiency of scientific scholarship. Electronic search engines and online access to abstracts and full-text articles clearly speed up the process of searching and retrieving relevant scholarly content. E-resources help scholars develop more effective vision at the borders of specific content areas without creating too much work. They facilitate both deep, narrow searches of core content areas and broad searches that cover the periphery of sub fields and distinct disciplines; e-resources can act as a microscope and a telescope for scholars.

E-resources facilitate participation in a greater flow of information and scholarly communications. E-resources provide new ways for presenting scientific results that contribute to new thinking processes. E-resources make data more visible and increase evaluation and scrutiny. For the reader, increased access to evidence promotes scientific transparency, visibility, and accountability. E-resources, with the capability to link to more complete data sets and additional information, potentially could increase the level of scrutiny of scientific results and interpretations.
The readers of a digital is required to adopt new ways to work, to read from the screen, browse electronically, and not to be able to take the resources into his own hands, which all can be considered complexities of the resources. Also electronic equipment and network connections enabling all this are necessary. Requirements like this may slow the adoption of electronic publications. It would also be interesting and important to study whether the scientific e-resources really strengthen connections between scientists, by also offering less formal communication than authoring and citing scientific articles, and whether this communication has any impact on the quality and quantity of scientific production. Even though the probable complexity of the electronic resources web sites does not prevent people from using them, as the growing user statistics demonstrate a usability study would be welcome. In some cases the search page is several click’s beyond the home page of the site. For an experienced user it is not any problem, but for the occasional browser it may be hard work to find the place, where to search.

1.2.10.3 The Role and fit of E-resources in scholarly practice

Scientific e-resources are accountable to the worlds of print and the Internet.

E-resources create new knowledge boundaries and domains of equivalency.

E-resources belong to a cluster of technological innovations that shape the way scholars adopt these journals.

The most significant current source of value from e-resources is in the scholars ability to search them.
Online searching emphasizes the article as structure.
E-resources improve the efficiency of scientific scholarship.

1.2.10.4 Scholarly usage of E-resources: Idiosyncratic and contextually based practices

No single pattern of usage predominates for e-resources.

Scholars craft multiple routines for using e-resources to support a range of information practices.

E-resources provide a bridge between publicizing and publishing scholarly work.

E-resources features get blurred with the features of the broader search and retrieval environment.

1.2.10.5 Impacts of E-resources on scientific scholarly practice; A new relationship to information, knowledge and peers

E-resources facilitate new forms of scholarly practice through new relationship to information, knowledge and peers.

E-resources create new kinds of work in scholarly practice.

Insights on E-resources adoption and implications for the future.

E-resources are part of a cluster of innovations and technologies that can be leveraged to create value for scholars.

Scholars work in an integrated media environment, with synergies between paper and electronic resources.

Scholars obtain more value from e-resources when the journals support a wide range of information practices.
E-resources offer different types of value for searching, reading and publishing.

The zone between informal publishing and formal publication is a rich and critical area for scholarly communications.

E-resources challenge the notion for resources brand. E-resources is an electronic resources management system that facilitates retrieval of electronic resources from across subscribed electronic databases without having to search the databases separately.

Over the period of the study 1991 to 1994, there was a shift in the pattern of visiting the library, browsing and borrowing material. In each case, fewer academics visited, browsed and borrowed on a daily basis, with more doing so weekly or monthly. There was also a decrease in the number of academics who rarely did so, suggesting a greater demand on all library services. It was possible that more time was spent accessing electronic sources on a daily basis, with academics then visiting the library weekly or monthly, to retrieve material they had identified over the network.

1.3 Open access: About Open Access Journals

The Open Access movement aims to make peer-reviewed research literature freely available via the internet. A growing number of researchers, societies and publishers, especially in the sciences, are developing collections of open access journals.

Definition: The open access initiative defines open access literature as “its free availability on the public internet, permitting any users to read,
download, copy, distribute print search or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial legal, or technical barriers other than those inseparable from gaining access to the internet itself.

This is useful for the people who are really interested in theory and practice surrounding the creation, transmission, storage, interpretation, alteration and replication of electronic text, broadly define. Institutional libraries are increasingly unable to fund resources title subscriptions, limiting the dissemination of academic research. The importance of copyright depends on the academic authors who allow their research available for a wider audience which let to the increased publications of the new e-resources. This leads to a new group of e-resources into the mix strong, peer-reviewed titles with high-profile editorial boards. Open access of course works on the principle that all cost are covered by the authors or their institutions, rather than being a drain on departmental budgets through ever-rising subscriptions.

1.3.1 E-resources provide scholarly support

To consider the development of the e-resources as a central source and outlet for scholarly research, one need to consider the pros and cons of the format, with particular emphasis on what the evolving medium means to the reader. Naturally, the print format remains core to student research, with the ease of photocopying, sharing information, and ease of browsing. In favour of the digital publication are such advantages as more than one person able to view an article
within a collection at the same time (with the exception of publishers which impose user limits on downloading text); instant delivery of the journal on screen, wherever the reader may be, thus freeing important time for further study; assumed 24 hour access for remotely available content; ability to quickly search content for specific points, and follow hyperlinks to other items of interest; and technological advances allowing additional information in a range of file formats to be incorporated into a published piece.

The evolving phase of digital libraries is bringing everyone close to the turning point where scientific publications, especially resources, predominantly only appear in an electronic format. The use of electronic resources has grown, although this innovation has not yet been fully adopted by scientists even in the developed countries. Scholarly practices differ considerably in the way they store, use and disseminate information. It may be hypothesized that they may also differ in their need for electronic resources and these journals may have different effects on scholarly practice. This brief study used secondary sources of information to compare the impact of electronic resources on different disciplines. The literature presented the characteristics of disciplines in the natural sciences, the social sciences and humanities and in applied disciplines. The use of information in these disciplines and demonstrates the different roles that traditional journals play in different disciplines. From the literature and with the assistance of domain experts who attended a workshop, a set on proposition were formulated about the implications of scholarly practice for electronic resources.
1.4 Advantages and disadvantages of E-resources

Technology cannot always been relied upon to deliver the exact results a reader might want; there can be server problems and broken hyperlinks; there may be a need for specific software to read article files may be corrupted or in hard-to-handle formats; there may be content in the printed journal excised from its electronic version; and there is an assumption the reader has the technological expertise to browse and navigate content in several different interfaces.

A scholarly resources in electronic form can potentially offer several advantages over the printed resources, including:

- More rapid publishing of research results through electronic submission of articles, and network communication among authors, editors and referees and by the fact that contributions can be added to a database as accepted rather than held to form the next “issue”.

- More efficient dissemination of information through the matching of articles newly accepted into the database with the interest profiles of potential readers.

- Innovative ways of presenting research results and other form of data and information with the help of motion, sound, hypertext and hypermedia linkages.

- Public peer review facilitated through the ability to link reader comments and evaluation to published articles.

- An electronic text can be updated or corrected with great immediacy, whereas a book must either go through a second edition, or if the error is caught in time, have an erratum slip inserted.
The technology is still, to a significant degree, user-unfriendly to many people. All the academic community may not have access to needed equipment and network. An electronic version not only requires computer hardware, but also software, and this software will have to know the format of the resources to display it. Online resources are less permanent (The response “This URL doesn’t exist” is quite often). Sometimes the network connection can be slow and the screen quality of graphics and photos will not be that good. The equipment required for accessing e-resources is expensive, frequently needs replacing as technology progresses and incurs heavy maintenance costs. The pricing schemes of some suppliers of e-resources are very complicated and limiting, and this might hinder libraries from utilizing e-resources. Sometimes full-text e-resources cover only a small percentage of what is available. Not all libraries can afford to have full connection to the Internet and have all the facilities to access, download and preserve the e-resources.

There are severe copyright problems due to the inadequacy of current legislation and the ease of replication, modification and transmission. Commercial publishers asserting their entitlement is to have copyright and intellectual property through licensing policies. Scholarly communities’ value sharing information and the academic model of e-resources reasserts a gift culture. Resources that are published exclusively in electronic format present an innovation in the way that scientific information is communicated to the research community. Significant concerns remain regarding the impermanence of materials in electronic formats and the use of innovative features of electronically
formatted material. It has taken some time for the e-resources to become integrated into scientific information systems indexed by major services, appear in library catalogs, or cited by other researchers.

On one level, the resources need to be of good quality and useful. In general the libraries that e-resources has been undergone the same selection process as print journals. Some of these factors included.

Importance of the periodical, as indicated by its inclusion in standard lists.

Importance of periodicals subject matter in relation to the university’s educational goals.

Inclusion in the periodical in indexes and abstracts

Authoritativeness as reflected by recommendation or criticism.

Reputation and standing of the publisher, and

Price.

Obviously, it is easier to search an electronic resources than it is to search a paper journal, although subjects in café, just expressed some confusion about the range over which a search would operate. For example search functions exists in netscape, in acrobat, and many of the resources also provide for searching across their issues. The most frequently mentioned advantages reported were broader distribution and the speed of publication. The most frequently cited disadvantages were that e-resources are not always referred and an increased potential for plagiarism. Faculty awareness of electronic publication outlets varied by functional discipline and this level of awareness influenced faculty perceptions of advantages and disadvantages. Implications for the future of e-resources are
discussed from the academic librarian’s point of view. While libraries struggle to balance competition between print and electronic resources collections, librarians have a pressing need to know how these collections are used in order to maximize their investments in acquisitions funds and staff time. Comparisons of print and electronic usage that do not take into account the broader coverage and longer back files of the print collection as compared to the electronic collection can create the impression that print is still very much the dominant and preferred medium. When a study like this compares usage levels for an identical subset of information available in both formats, the results are likely to show more clearly the degree to which electronic usage is overtaking print usage. As the archives for electronic resources grow in coming years, the phenomenon will become increasingly clear.

1.5 **Standard data formats**

The producers of e-resources in particular are urged to use standard, durable formats and to communicate with the archives regarding this problem. The archives should provide comprehensive information, including concrete recommendations, as a means of helping the producers of e-resources, for whom this is often unpaid work, to handle this. Great efforts are currently to develop and establish durable standard formats; these will become available in the foreseeable future meaning that knowledge about this subject needs to be updated on a regular basis.
1.5.1 Metadata standards

Metadata contains information about digital objects, which is used to locate, manage and process them. A range of international standards exists for the coding of this metadata, but XML-based standards have come to dominate in the last few years. These standards not only facilitate the exchange of data, they also permit its automatic processing in the repository. For these reasons standards which are widely available and which also have an open format should be used for storing metadata, thereby allowing the storage of any new metadata types that may be added in the future.

Producers and repositories should confer about metadata to set the course at an early stage, thereby facilitating extensive standardization. It is important not only to archive the individual articles but also the hitherto neglected resources context, which often contains important information extending beyond the individual user. Here, too, standard formats are currently being developed which will soon be available; all parties concerned should also keep abreast of developments in this area.

1.5.2 Data organization and transfer

Besides technical standards for storing data and metadata, long-term preservation standards are also required for the organization, administration and exchange of data. The widely used reference model of the Open Archival Information System (OAIS) provides a framework model, which includes basic definitions for parts of digital archives, covering internal processes and their
external communication. This model also contains a method for generating data packages for submissions to archives (Submission Information Package, SIP).

1.6 Future developments

There will be massive advances in multimedia capability and real-time interaction, to develop a living archive of research material totally unprecedented in print resources of the past. Print of course will continue but there will be an increase in ‘electronic supplementary content’: it will also be the case that e-resources subscriptions will continue to exist independently of their print versions, allowing further development and innovation by editorial boards and academic contributors. Meanwhile the popular end of the market will continue to develop, ensuring the e-resources and its less established forms make further inroads into general culture. The development and take-up of digital television will necessarily have an impact on supporting written content available on text services or the web. E-resources will have a knock-on impact on not just serial publications, but monograph texts too as e-books become the growth market of the 21st century for all groups of user.

The E-resources looks set to continue as a healthy alternative to its print cousin, existing in tandem for the most part. In the future ‘born digital’ content will continue to increase, gaining stature and acceptance amongst the likely contributors; while these same contributors will embrace the philosophy of open archiving to obtain the largest possible
For the publishing environment to become more competitive and offer more diverse options to scholars, several core areas related to publishing and e-resources should change in the next decade:

- New publishing structures and economies of scale.
- Closer relationships to user communities.
- New methods of measuring impact.
- Diverse peer-review models.
- Alternatives for journal editorial boards.

Experts identified the following four areas that would provide significant leverage for libraries. Change in these core areas would drive up library visibility.

- Limited funds not locked into a single publisher.
- Subject specialists as pivotal members of knowledge communities.
- University content as a source of value.
- Rights and permissions as a source of expertise.

1.7 Role of the Library in promoting E-resources

Librarians must realize the significance of e-resources. Libraries now must decide whether or not to catalog electronic resources. Some libraries list e-resources on their web pages (portal pages) as an alternative to cataloging them.

OCLC's CORC (Cooperative Online Resource Cataloging, http://www.oclc.org/oclc/research/projects/corc/) project holds some potential for libraries to be able to create cataloging records for electronic resources more economically. For research libraries, the long-term preservation of digital
collections may well be the most important issue in digital libraries. Libraries can fulfill their current service requirements without facing the issues involved in the preservation of the resources.

It is important to know how librarians see the economics of electronic publishing, but it is equally important to recognize that there is no one "right" view. Rather, there are perceptions and values differently held by different users in the scholarly and scientific communications system. If here begin by seeking to privilege or no privilege any view, will surely end in bickering. A more fruitful approach is to recognize that all parties have legitimate interests and concerns and to seek collectively to make a new system that responds as well as possible to the things that all parties value, recognizing that the primary interests to satisfy, in principle, are those of scientists and their research enterprise. In practice, it is a question of matching the needs of science to the practical requirements and possibilities of the institutions that house scientists.

It will not be bashful about reminding that librarians have a distinctive vantage point from which to view the system, poised as they are in the middle of the information food chain between authors and readers. But to be sure, librarians are closer to readers than to authors and often represent the interests of the scholars and scientists who need good access to information.

For obvious reasons, this will, necessarily, represent an American librarian's view. Some people like scientists, think that electronic information is going to be very cheap; and also people like STM publishers, think that electronic information will be more expensive than print information has ever been
depending on whom one asks, librarians offer a range of views, but even the most optimistic look with concern on early library studies that suggest that digital costs, at least digital transition costs, will be high indeed. At the same time, it must be admitted that all such assessments to date are at least premature and incomplete and quite possibly very wrong. There are as yet very few examples in place of a system for original creation and production of high quality electronic products that does not at some level imitate printed resources. Further, there has been only a limited market period to allow consumers (individuals or institutions devoted to research and teaching) to vote with their money, to say just what they want and how much may pay for it. Electronic resources were first suggested some years ago as a possible means of revolutionizing the world of research journals. Electronic resources could be distributed more economically than paper journals, because the main costs of preparing the text, the review process and other like procedures are not as capital intensive as the costs of printing and mailing print copies. Consequently, it was hoped that the financial costs of resources in the electronic environment could slow or reverse the escalating costs of scientific resources. Accessing print resources has long involved a number of methods including the use of a variety of both specialized and general indexes, library catalogues, references/citing from other resources, and recommendations from readers and colleagues. When electronic resources first appeared they fell outside the formal communication patterns, especially that of journal indexes and library catalogs. Libraries are the major archive of resources for most scientific researchers and must be involved in providing access to e-resources.
Except for those published free of charge, electronic resources have to be paid for and, in contrast with the print versions, there is a wide range of payment structures, often involving restrictions on use imposed by the publishers that go well beyond any constraints that exist with print publications. Subscription models include: free with a print subscription; a surcharge on the cost of the print subscription (typically between 10% and 25%); available as part of a regional/national consortium deal; available through a local/regional/national site license agreement. The whole question of libraries signing licenses for electronic products - whether they are electronic resources, CD-ROMs or networked databases - is fraught with difficulty. The terms of each license vary considerably and the small print has to be read thoroughly to ensure that institutions are not committed to terms, which are unenforceable. So what do people think of electronic resources?

Despite the generally negative perception of electronic resources, users do see some potential advantages to them. For example, in café just two thirds of the subjects saw the electronic version as offering easier access. It is easy for the people and they could see an advantage to access an e-resources from their office rather than walk to the library. Additionally, it was remarked that the electronic version was readily available at any time, where as the paper version might be in use by another person. One subject commented people could view lots of resources without having to go out of their mind trying to find all the paper versions in the library. Perhaps the basic difficulty is that in the resources field at least, publishers don’t really care about readers. Publishers and editors know that
if they can attract the best authors in a field than academic libraries. It will take some time find out just how important this step will be, Authors, publishers, and librarians are only just beginning to take advantage of the potential of electronic media.

1.7.1 Cataloguing, classification, information retrieval and metadata

Traditional library catalogues included the content of books, but not the content of journals -- that is, the library catalogue would note the fact that the library held, say, The Biochemical Journal from 1950 to date, but would not index the papers contained within the resources. For the content of resources, one had to use the bibliographical databases which are now generally provided in electronic form either online or on CD-ROM. The electronic medium offers the possibility of linking the library's own catalogue directly (with a single interface) to the bibliographical databases and from there in principle to the electronic full text of the articles. Although potentially very valuable, these hybrid services can be frustrating to use. It is difficult to explain to users why they can access the full text of some resources but not others (usually dependent upon whether a print subscription is held), and that the library does, or does not, financially support the document-delivery option on offer. The same holds true for bibliographic databases offering similar functions -- but many of these are at least developing interfaces that provide locally tailored information on document availability to the end user. Partial electronic publishing is possibly the most frustrating of all options. Such publications are set up as tasters for the full publication and provide
access to the full text of the resources. Librarians offering an electronic resources service would be well advised to flag such incomplete publications very clearly.

1.7.2 The librarian as an electronic-resources expert

The contribution of library and information professionals to reference work has increased, rather than the reverse, as electronic information sources have proliferated. It was probably never true that users could use all of the resources of a library unaided, but many thought that they could. With the great variety of bibliographic databases, numerical databanks, electronic resources, and general Internet resources that exist today, few users can make optimal use of them all. The software needed to search in these files, the command languages, and the facilities available for output or transfer of "hits" to other files for further processing are so complex and varied that professional help is very often needed.

In 1994, there was an indication that academics were making greater use of the network to retrieve the e-resources. The number who had received none in that academic year had dropped significantly, while other had increased significantly. This trend was a strong indication that academics were at the least exploring this feature of networked services, but also that, to a small core academics, it was becoming increasingly important.

In spite of the amount of information available electronically the tendency to photocopy had actually increased between 1991 and 1994. The research showed that a large number photo copied if the material appeared useful. Again pressure of time was probably a factor in this pattern, with academics needing to
make a copy to read later. There was also an indication that if academics were asked to pay for the service, they would not photocopy as much. Time spent in information-seeking activities also decreased between the two surveys, as did time spent on the academics, behalf by other people, including research assistants.

Scholarly practices differ considerably in the way they store, use and disseminate information. It may be hypothesized that they may also differ in their need for electronic resources and these resources may have different effects on scholarly practice. This research used secondary sources of information to compare the impact of electronic resources on different disciplines.

1.7.3 Holdings, document delivery and interlibrary loans

There are more practical issues concerned with access. In the print medium, either the library held the required item or it could be obtained by interlibrary loan, for which well-established procedures existed. With electronic resources, access is more complex. First, and most obviously, an appropriate infrastructure must exist within the institution for delivery of electronic information services. The internal network and its outside links to the Internet must have adequate capacity for the traffic, and users (including faculty) need sufficient numbers of machines of adequate specification to retrieve information with convenience. Access needs to be freely available in open-access student PC laboratories as well as on the desks of staff. Once it is assured that appropriate hardware and software is in place, people should turn their attention to access to titles. Many libraries have already set up electronic resources web sites to provide one starting place for
access to a range of different titles -- and also to provide information on passwords etc. Freely available Internet titles are, superficially, the easiest titles to access. They do not require passwords (although some do require registration) and a hypertext link can be set up to the title page. However, such titles tend to be unstable in that they move sites without notice and it is advisable to instigate some system of URL monitoring to prevent the frustration of repeated error messages.

1.7.4 Access to electronic resources

Electronic resources from commercial publishers can be tedious to access. Although most publishers are moving away from password authorization to IP address checking, it is still the case that for many publishers, access to their titles is via their web pages. This means that not only must the user know who the publisher of a title is (and how many know that for a range of favorite resources?) but also to work their way down a series of web pages before they actually find the title they wish to consult. Librarians would like to provide access to the content of electronic resources via an interface that their users are familiar with -- particularly, through the Online Public Access Catalogue (OPAC) system of their choice. Unfortunately, most publishers insist that one searches all the resources that they publish through their own site, with whatever interface and software have chosen to provide -- which will most likely be quite different from those provided by other publishers.

It is now approximately 10 years since academic libraries began to make a determined move towards the provision of enhanced electronic access to
information for their client communities. The reasons for this move are well documented but they can be summed up by saying that it was response to what became known as a crisis in the system of scholarly communication. This was not, however, something that occurred in isolation. It was part of an almost unprecedented period of rapid and continuous global change. As well as a new political world order and global economic instability, the period saw new technologies change the way to work, communicate, conduct wards, treat disease entertain and conduct finances. Information expanded exponentially and computers revolutionized the way it was used. Knowledge not only increased, but became increasingly specialized. Academic libraries and their client communities are two elements in the “the system of scholarly communication”. The reasons for the development of digital publishing and services include factors such as lower publishing costs, speed of publication, reduced storage volume requirement etc., These certainly are reasons for publishers to adopt the new publication format, as well as for libraries wishing to reduce their acquisition expenses and space requirements. The services called e-resources in this study have maintained the structure of the resources and can be searched both by search terms and issues. In this respect it is compatible with the requirements of performing the same functions as their predecessors. The publication channel of articles is clearly observable, which may be important from both the clearly observable, which may be important from both the author’s and the reader’s point of view. From the e-resources information, can be found throughout links to related material, to related citations or most frequently cited items. These versatile search possibilities to
some degree, can compensate for the complexity of a web service, caused by the necessity to use an internet connection and a computer to read. A lot of relative advantage compared to printed journals, is gained through utilizing the hypertext structure, navigability and the possibility, also to link, new kinds of material audio, video to the materials. An interesting feature of material is the existence of out links from it to relate to cited material, provided by the publisher.

Digital publishing is still far from standardization and the services differ greatly from each other. Some publishers offer important and even innovative services in addition to the contents of scientific papers. Several resources continue to be identified as an entity also after digitization. Some of them even suggest a new way to build and support scientific communities and communication. Although the research material only represents the services, it however includes thousands of papers. The results based on this study suggest that more personalized and specialized services, in which the individual resources still exist, are more heavily used than those, in which the unit of information no longer is a journal, but instead an e-resources.

1.8 Electronic Books

An electronic book is commonly referred to as an e-book, and is simply a print book in an electronic format. E-books can be produced in numerous formats that range from very basic text files to well structured, purpose built files that use one of the emerging standards for e-books such as the e-Pub and Adobe
PDF standards. As with print books, the e-book can be reference or narrative focused.

A large part of the interest in e-books is that they offer a new type of user experience for reading books that provide potential benefits such as new ways to access a book catalogue and flexible choices for delivery. The potential for interactivity (e.g. hyper linking) and the inclusion of multimedia, is where they differ from traditional print based books and is where they can possibly have an advantage to support learning and teaching.

Where a print book is commonly linear and with limited features: a contents list, content and an index, an e-book is structured like a web page providing the reader with additional features that enable fast navigation through hyper linking, annotation and keyword searches supporting multiple reader journeys through the content. It is these features that will be of interest to those thinking of building their own e-book.

E-books can be delivered or accessed via a number of channels. Common delivery methods are email or download, either from a repository or e-book store. E-books are viewed using an e-book reader, which may either be traditional desktop software or by using a mobile device (including purpose built e-readers) both of which are introduced later in this guide.

1.8.1 Features and key facts about e-books to support teaching and learning

Although there are a vast array of e-books and means with which to view them, there are a number of commonalities and considerations worth highlighting:
Access - e-books potentially remove limited access issues to key texts that can be a major problem for print books as they are available 24/7

Many institution library catalogues now offer e-book versions of some of their titles and journals and e-books open the door for a much greater range of books than the library could physically manage

E-books can support in-class information retrieval by broadening the learning resource range

E-books support accessibility in terms of being an alternative to print books and they have accessible aids to improve readability e.g. changing text size and contrast

Flexible delivery – e-books can be located (via hyper linking) in many places such as course materials and the VLE, offering access at appropriate points

Teachers can produce their own e-books as learning resources

E-books can work on desktop computers and mobile devices – note that many devices are included in the 'mobile' category e.g. laptops, mobile phones and dedicated e-book readers such as the Kindle. For clarity devices like the Kindle are normally identified as 'dedicated e-book readers'.

Usage can be tracked which helps catalogue managers manage expectations and resources such as which books to buy, license or remove

Portable – many e-books can be stored on a single device and taken with the owner or borrower which further supports access

Hyper linking within an e-book can increase the flexibility of topics covered from one source
E-books may be one solution to support an institutional 'green ICT' strategy

1.8.2 Multimedia use

Text is the dominant factor in an e-book. However, digital media can often be used too, depending on the e-book file format and target device. In addition to text, digital media use may include:

- Cover image (often also re-used for thumbnails)
- Illustrations (diagrams and decoration)
- Audio for 'text to speech' - normally an e-book reader feature
- Audio books – audio versions that can use a range of voices and languages
- Video – used much like images to provide additional context or advertising

The suitability of different types of digital media, format and sizing again depends on which target file format(s) and device(s) are being supported. Digital images are well supported across e-book readers of all types. However, regarding audio and video, at the time of writing in 2011, it is only recent mobile devices that provide good support for using audio and video within an e-book.

1.8.3 Emerging E-book standards

There is no one agreed standard for describing what format and structure an e-book should take. A list of the many different file formats can be found on Wikipedia: 'Comparison of e-book formats'. There are a number of emerging dominant standards and file formats, whose popularity is based on their features, reader experience, and their compatibility with the popular e-book readers.
Non-professional publishers of e-books can naturally use any one or a combination of their favoured file formats, which could include just about any type of text or multimedia file. Professional publishers, however, are beginning to lean towards two open standard e-book formats, which are:

**e-Pub** – recognised as the standard for e-books is an open standard that supports jpeg, png, gif and svg images, and Flash, which can then in turn enable audio and video

**Adobe PDF** – an open standard largely used as an alternative or fallback for the e-Pub format, it is cross platform, easy to produce and compatible with a range of multimedia.

The ePub 2 standard is widely supported and the next version (ePub 3) specification is due in late 2011 and will include even better support for multimedia, so use of ePub should be considered when choosing the e-book format and providing an additional PDF version may also be of use for some audience types e.g. people who like to print parts of the book.

**1.8.4 E-book readers**

All e-book file formats require software to display the contents of an e-book. The software may run on one of three platforms, Desktop (standard computer/laptop), mobile devices (mobile phones, tablet PCs etc) and dedicated e-book readers.
1.8.5 Desktop Software readers

E-books can be read on a computer using e-book reading software designed to display various e-book file formats. Below are just some of the popular software readers and their associated supported file formats:

**TABLE - 2**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Input formats</th>
<th>Output formats</th>
</tr>
</thead>
<tbody>
<tr>
<td>calibre</td>
<td>CBZ, CBR, CBC, CHM, EPUB, FB2, HTML, LIT, LRF, MOBI, ODT, PDF, PRC, PDB, PML,</td>
<td>EPUB, FB2, OEB, LIT, LRF, MOBI, PDB, PML, RB, PDF, SNB, TCR, TXT</td>
</tr>
<tr>
<td></td>
<td>RB, RTF, SNB, TCR, TXT</td>
<td></td>
</tr>
<tr>
<td>Stanza Desktop</td>
<td>DRM-free Amazon Kindle, Mobipocket, Microsoft LIT, and PalmDoc, as well as</td>
<td>Amazon Kindle, Mobipocket, PalmDoc, Rich Text Format, HTML, plain text, and others</td>
</tr>
<tr>
<td></td>
<td>Microsoft Word, Rich Text Format, HTML, and PDF</td>
<td></td>
</tr>
<tr>
<td>Mobipocket reader</td>
<td>mobipocket, plain text, PDB, Microsoft Office, EPUB, HTML</td>
<td>n/a (only reads files)</td>
</tr>
<tr>
<td>Desktop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adobe reader</td>
<td>Adobe PDF</td>
<td>Adobe PDF, plain text, rich text, jpeg, PNG, TIFF, HTML, .doc, XML</td>
</tr>
</tbody>
</table>
1.8.6 Specific e-book reader platforms

In addition to being able to use standard computers and mobile devices, there are also dedicated e-book readers. Wikipedia has an extensive list in their 'Comparison' Current market leaders of e-book readers include:

**TABLE - 3**

<table>
<thead>
<tr>
<th>Device</th>
<th>screen Resolution</th>
<th>Supported digital media types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon</td>
<td>600 x 800 pixels</td>
<td>Supports importing of jpeg, gif, BMP and png image file types</td>
</tr>
<tr>
<td>Kindly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sony Reader</td>
<td>600 x 800 pixels</td>
<td>Supports importing of jpeg, gif, BMP and png image file types</td>
</tr>
</tbody>
</table>

JISC Collections also have a Compare e-book Platforms tool that compares the features of two or more different platforms.

1.8.7 Creating and editing e-book environments

As with traditional print publishing, most e-book manuscripts begin life as standard office documents, e.g. Microsoft Word written by the author. Professional publishers then take the manuscript and design the layout etc using professional tools such as Adobe In Design or Quarkxpress. These documents can be exported to the required e-book format. Future edits can be made using the professional tools instead of starting from the manuscript.
Non professionals will commonly produce the manuscript using a word processing application such as Microsoft Word and then use a tool such as Calibre to convert the manuscript into one or more e-book formats. The majority of these tools do not offer an editing environment and edits must be done in the original application used to write the manuscript.

The difference between non-professional and professional tools for creating and editing revolve around the fact that the Professional tools automate many of the editing and production workflows.

1.8.8 Delivering e-books

E-books can be distributed to desktop computers, mobile devices and e-book readers in a number of ways as outlined below.

**E-book online stores, publishers, and repositories** – a typical store allows to browse via computer or device and then purchase books which are then downloaded for viewing. The e-books themselves may be downloaded in a number of ways as shown below.

**Simple download** – e-books are either made publicly available or available upon registration or payment and then a link is provided which allows the requested e-book to be downloaded directly to a computer.

**Apps** – there are a growing number of software applications (apps) that allow to directly search, browse and download/purchase e-books straight to computer or device. These apps may be integrated with online desktop stores.
Email – some e-books are emailed to device and then manually added to e-book reader software or device.

Library – educational publishers have begun to provide some of their catalogues as e-books that staff and students can borrow like a traditional book. This method is in its infancy as there are challenges around how to lend and record usage of e-books.

The service of JISC TechDis has a guide to Accessible e-book Platforms that should be considered essential reading if you are looking at delivering e-books via a distribution platform.

1.8.9 Examples of e-book stores and repositories

Google Books (paid and free) provides access to millions of free and public domain Google eBooks.

Each major mobile operating system has its own native app store that will allow to view and/or purchase/download e-book apps and e-books. Examples of app stores are:

Apple app store
Amazon ebooks
Android Market

1.8.10 Designing an e-book

Like all resources, an e-book requires appropriate design for its medium, both at the presentation level and at the structural level. Designing an e-book
requires careful consideration of the key principles of both traditional print book
design principles and emerging digital design principles, for desktop, mobile and
e-book specific devices.

Metadata allows to provide additional descriptions about the e-book. It is important to consider this at the design stage to enable people to better find the e-book once it is published and stored in a collection.

1.8.11 Finding an e-book

Once libraries make a decision to invest in e-books then thought needs to be given to how the related metadata will be managed so that library users are able to find the desired resource.

Metadata records can be purchased at the same time as the e-Books. E-book publishers offer a number of alternatives in relation to the provision of metadata records. This can take the form of downloadable MARC 21 (MAchine Readable Catalogue) records, lists of URLs that can be inserted into OPACs (Online Public Access Catalogues) or simple A-Z lists.

Alternatively, libraries might decide to create the own metadata records once the e-books have been provided. This is particularly pertinent for libraries that retain a cataloguing department within the library service. There is a growing trend for libraries to purchase shelf ready books (as well as e-books). Once the metadata record has been created the information has to be made available to users. The library might decide to create a separate e-book catalogue or incorporate the e-book titles within the main library catalogue.
1.8.12 Audio book recording

Digital audio books are sometimes grouped under the classification of an e-book and they are briefly mentioned below in regards to recording it’s own.

Here it is assumed that the audio-book is a copy of a text-based book in which case the only concern is how to record the audio. Guides Recording Audio Voiceovers for Teaching and Learning Materials and Audio Post-Production Techniques for Spoken Word cover the essentials that you will need to order to record audio book.

1.8.13 Embedding digital media

With the ePub format being the dominant file format for e-books that can focus on adding media for this type of e-book.

The e-Pub format uses XHTML 1.1 as its mark-up language so it can use any of the supported elements from the official XHTML 1.1 specification. In short this means that embed presentational elements that are used for websites such as images, video and audio.

Embedding images (resolution, file formats and viewport) The e-Pub standard supports the inclusion of the following image file formats:

JPEG, PNG, GIF, SVG

Images will typically be used for the e-book cover, diagrams, photos and graphics. All print books have a cover and there is no reason not to include one for the e-book. Embedding images can be done either by manually coding the image at the required location or using a third party tool.
1.8.14 Viewport consideration

E-books, like websites may be viewed on many different types of device and configuration by researchers. This flexibility whilst beneficial does provide new challenges to bear in mind. One practical challenge is that of sizing media for the available viewport. The term viewport is used to describe the viewable area of the device that is displaying the e-book and refers to both height and width.

Devices have different viewports and as such there is no one size that media can be designed to in order to fit all viewports. However, that most of the current mobile devices support 460 pixels width or larger so can guess that a 460-1000 pixel range would be a good to consider. This is one reason that you can often get an e-book in multiple versions that support specific devices so that the media is optimised per device.

Generally the e-book reader is able to appropriately scale the media but it is worth bearing the viewport in mind.

The e-book arena is still in its infancy in terms of both their creation and use within teaching and learning. However the role of books is firmly established in education and will likely play a growing role in education over the next 5-10 years. As such it is worth considering how you may wish to use them. Already there are many e-book resources available and publishers are seeking ways to increase their usage.

Finally in the case of producing own e-books, pay careful attention to structure and don’t be afraid to experiment, as it may well be setting a future standard.
1.9 E-database

Electronic databases come very handy for searching vast data within a shortest possible time. There are good number of such databases are available on the internet today, which can be accessed free of cost.

An e-database is an organized collection of information, of a particular subject or multi-disciplinary subject areas. The information of an e-database can be searched and retrieved electronically. Contents include journal articles, newspaper articles, book reviews and conference proceedings, etc.

Usually e-resources have been updated on a daily, weekly, monthly and quarterly basis. Full-text databases contain the whole content of an article such as citation information, text, illustrations, diagrams and tables. Bibliographic databases only contain citation information of an article, such as author name, journal title, publication date and page numbers.

1.9.1 Why use an e-database?

An e-database is an organized collection of information. It supports flexible and in-depth searching of different fields, e.g. journal title, article title, author, abstract, year, etc.

1.9.2 Why not use the Library Catalogue?

It is possible to search for journal title in the Library Catalogue, but not the title or author of individual articles. Therefore, e-database is extremely useful to find articles on particular topics, e.g. peer assessment in classroom.
It is possible to retrieve journal articles on this topic from e-databases, but at the same time it could not find the same information via the Library Catalogue. This is because the Library Catalogue allows searching of journal title only; the search does not go into details of each issue or volume of the journal.

1.9.3 EBSCO host Databases

It offers a comprehensive set of databases, ranging from general reference collections to specially designed, subject-specific databases. Prominent e-databases available on this search platform include Academic Search Premier, ERIC, PsycInfo and SPORTDiscus. Please access the following links to learn more about search functions in the EBSCOhost Databases:

Basic Search
Advanced Search

1.9.4 ProQuest Databases

The ProQuest Databases include citations and full text articles from a variety of databases, covering arts & humanities, business, education, health & medicine, and social sciences. Prominent databases in this search platform include ProQuest Education Journals, ProQuest Dissertations & Theses A&I, Sociological Abstracts and ABI/INFORM Complete. Please access the following link to learn more about the search functions in the ProQuest Databases.
1.9.5 Scopus databases

Scopus is an abstracting and indexing database that includes over 19,000 titles from more than 5,000 international publishers. It offers researchers a quick, easy and comprehensive resource to support their research needs in the scientific, technical, medical, social sciences, and arts and humanities.

1.10 Need for the Study

The main purpose of this study is to explore how e-resources are engaged in research. It offers possibility to transform and enlace both e-resources and in creative interaction between technology and techniques to transform the research.

The skills of accessing e-resources are critical for researchers. Hence it is essential for them to understand technological convergent capacity to transmit and receive relevant information in the maze of websites. In the light of the above aspects the present research will be undertaken. The major objective of this research is to study the pattern of user of e-resources and probe into the problems and issues of the user of e-resources, which will ultimately help to identify the obstacles of information flow. Based on the survey the faculty preferences and strategies for searching e-resources will be determined. E-resources practices are like individual fingerprints—they are unique to individuals, representing a pattern of strategies and a personal signature. Usage of e-resources is highly contextual, with strategies for using them dependent on many variable factors in the faculty’s environment. Routines for using e-resources vary, for instance, depending upon information tasks and objectives.
Little research has focused on qualitative assessments of the meaning and potential value of e-resources as part of a larger scholarly communications toolkit—the why and how of e-resources usage by faculty members. This study is intended to contribute to the discussion of why faculty members use e-resources, how they use them, and what kinds of roles e-resources play in overall scholarly practice. It is essential that the librarian should understand the usage pattern of faculty members and help them to derive maximum benefit from the e-resources. Hence the study will throw light on the role of the librarians in facilitating and promoting the use of e-resources by the users of the library. From the user’s point of view, implementing a digital library service requires the adoption of new working methods. Finding digital material and reading from the screen may at least in the beginning, seem to be complicated and cause feeling of uncertainty. To be adopted an innovation should have advantages that exceed its probable complexity, and compatibility with the needs and values of the users. Faculty members are increasingly expected to use electronic resources while at college. Studies were undertaken to determine, the level of use of this type of resource, how faculty members feel about various issues surrounding electronic resources and whether attitudes change dependent upon subject studied. The last few years have seen a number of changes in the higher education sector which have exerted pressure upon the traditional role of the academic library.

According to the researchers, the E-resources are wildly used by the researcher. They find it easy to use the E-resources instead of visiting the libraries or borrow a copy from somebody. By getting everything through e-
resources the faculty members feel very comfortable and think that it saves a lot of their time. They find it very easy because they are able to finish the work by sitting in a place and get all the details. Through e-mail alerts, they can refresh their knowledge, up to date by visiting the new copies and also the new sites which is available on the net. Most of them feel, the main problem regarding the e-resources is the payment. Institutional subscription is preferred by most of them, than the personal individual subscription. When the faculty members visit the e-resources site, it is very useful to get appropriate reference for own research and also for the other subjects for own interested categories.

They use different search techniques to search a document. It can be either by the author name or by the e-resources name or by date of publication of the resources etc. which is very useful for their studies. But sometimes it is very hard to get the relevant information in time, because the researcher has to go through many pages to get the appropriate information. Sometimes the key words what they entered may not match accurately with the key words. Other ways the search engines may not produce the exact information of their search about the contents of the author. Faculty members find it difficult to read the full contents of the materials since reading lot of pages is strain to their eyes. Disconnection of the internet and current failure also prohibit the users from reading on line.

The advantages include the fact that electronic information sources are often faster than consulting print indexes, especially when searching retrospectively, and they are more straight forward when wishing to use combinations of keywords. They open up the possibility of searching multiple
files at one time, a feat accomplished more easily than when using printed equivalents. Electronic resources can be printed and searches saved to be repeated at a later date; they are updated more often than printed tools. One main advantage those with limited time to access the library, is their availability from outside the library by dial up access.

On the whole, e-publication of e-resources are useful for the researchers to do their work by sitting in a comfortable place and getting all their need of references in hand to do their work. There are free e-publishing e-resources and also paid resources are also available. It is very useful for every one by using search engine to improve their knowledge.

1.11 Statement of the Problem

The need for this study has been explained elaborately in the above paragraph. Hence the present study has been undertaken to identify certain factors regarding to what extent e-publications and e-resources are utilised by the different category of users. Further the study has been intended to probe what type of category of users prefer full text materials and what type of institutions utilise more on-line full text resources. To understand the use of e-resources it is necessary to determine their mode of accessing on line resources, their preferred search terms and as well as the frequent search engines utilised by them. The study also extended to identify the reasons for using e-mail alerts. The major aim of the study is to reveal the pattern of accessing electronic information resources
by the faculty members of the engineering colleges affiliated to Anna University, Ramanathapuram district.

Based on the study and the findings inferences’ will be drawn and it is concluded the study not only will be benefited by the e-resources and as well service providers. Further the study provides concrete suggestion for the library to improve their services. The study also proves that Bradford’s Law of Scattering is true to certain extent.

1.12 Objective of the study

The major objectives of the present study are discussed here in under about e-resources of full text journal as follows:

1. To determine the category of the online users of full text material.

2. To determine in which type of institutions online full text resources are used more

3. To identify the mode of accessing online resources

4. To identify the reasons for using e-mail alerts

5. To determine the most preferred search terms for accessing online full text resources

6. To find out the type of search engine used to access online full text resources

7. To determine the preferred format for accessing full resources and reading, figures and images

8. To determine the views of the users regarding the payment for viewing the material.

9. To identify the problems of online access.
1.13 Limitations of the study

The sample consists of 400 which could be categorized as Professor, Associate Professor and Assistant Professor. The study confines itself to use and usage of e-resources by the faculty members of Ramnathapuram District. Further among the different types of e-resources of the study includes only on-line resources on Engineering and management disciplines, which subscribed by the library. The list of the engineering college is as follows:

Mohamed Sathak Engineering College, Kilakarai, Ramnathapuram District.
Syed Ammal Engineering College, Ramanathapuram
Ganapathy Chettiar College of Engineering and Technology, Paramakudi, Ramanathapuram
Anna University College of Engineering, Ramanathapuram District

1.14 Literature Survey

A number of sources have been consulted and the content gone thorough to identify the related studies on the present topic of research. It is essential that the librarian should understand the usage pattern of users and help them to derive maximum benefit from the e-resources. Hence the study will through light on the role of librarians in facilitating and promoting the use of e-resources by the users of the library. From the user point of view, implementing a digital library service require the adoption of new working methods. Hence the present study has been undertaken by the researcher.
The following are some example of the list of e-resources available in engineering colleges;

I. E-journals

IEEE Xplore
ASME
ASCE
ASTM
Springer
J-gate

II. E-books

Civil Engineering
Mechanical Engineering
Computer Engineering
Electrical and Electronic Engineering
Electronics and Communication Engineering

III. E-magazines

Electronics for you
Digit
Engineer IT
Engineering review
Electronic Components

IV. E-thesis

UGC-INFONET consortium
INDEST-AICTE consortium
V.  E-databases

EBSCO
PROQUST
Emerald
Gale Cengage Learning

1.15 Organizations of the thesis

The content of the thesis has been presented in the following five chapters.

Chapter 1: Introduction: This chapter contains information regarding introduction to E-resources. Further it also justifies the selection of the topic and enumerates the objective of the study.

Chapter 2: Review of Literature: one hundred scholarly work have been reviewed and included in this study, which helps to identify the lacunae in this particular field of research.

Chapter 3: Methodology: This chapter explains the modus operandi adopted to carry out this research work.

Chapter 4: Analysis: The data collected have been tabulated and analyzed statically.

Chapter 5: Findings and conclusions: The findings were listed on the basis of the inferences drawn from the analysis and final conclusions of the study has been presented.