Chapter-1
Introduction to ICT
INTRODUCTION

INFORMATION COMMUNICATION TECHNOLOGY: AN OVERVIEW

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 priority over communication, it is the technology that makes communication both interactive and astir (Savio, 1990).

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 world. ICT includes acquisition, processing, storage, retrieval and dissemination of information by means of computers and communicating systems. In a dynamic and interactive academic learning
Introduction

environment, information communication technology also includes repro-
micrographic technology, database creation and use, in addition to computer
technology, digital technology, multimedia technology, network technology,
telecommunication technology, barcode technology, web technology, etc.

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.
NEED OF INFORMATION AND COMMUNICATION TECHNOLOGY

There is outstanding growth in the volume of publications in the various formats leading to the emergence of information society. Today, it is very difficult to run a library for providing the pinpointed and exhaustive information manually. Therefore has been essential to use information, communication and technology. It will be very helpful for libraries and information centers to publicize the scope of their activities and services and increase their significant within organizations.

Today, there are major factors and challenges which force the libraries and information centers to adopt the ICT, can be summed up as:

- Information explosion
- Rapid and constant technological developments
- Shrinking library budgets
- Multi use of machine-readable records
- Escalating price of documents
- Heightened level of user’ expectations for instant results
- Inadequate library collection
• Need to provide better services on wider scale by adopting online storage and retrieval techniques

• Changing trend from collection possession to information access provision

• Inadequate physical facilities in term of space, furniture and equipment.

• IT offers a new dimension to share resources among the libraries by creating library network

• Inability to provide efficient and effectiveness services with manual method

• Facilitate the storage, retrieval, dissemination and access of information much faster.

• Rise of competitors

• Availability of the information in machine-readable form.

ADVANTAGES OF INFORMATION AND COMMUNICATION TECHNOLOGY

A strong ICT (information and communications technology) strategy is pivotal to competitive survival for today’s environment. It has become a pervasive part of our working and living environments, and will continue to
Introduction

be an integral resource for business, information center, libraries, government and society at large

ICT combines information, knowledge, processes, and technology to provide a foundation for driving efficiencies and fuelling innovation. It is the key to helping organizations of all sizes to connect, collaborate and compete more effectively and get benefits in the following ways:

• Improve service performance, productivity and profitability through improved system performance, availability and security.

• Reduce administrative and back-office operational costs through the convergence of voice, data and video over IP.

• Enable and improve the quality, quantity and access to services from any location by allowing remote access, monitoring and management of systems and applications.

• Improve customer satisfaction, loyalty and service through the safe and secure deployment of customer-facing solutions

• Enhance collaboration and networking among employees, customers and partners by removing the barriers to real-time communication and effective information sharing.

• Ensure enterprise security and compliance more efficiently at less cost
• Provide opportunities for businesses to outsource non-core activities so they can focus on their core competencies and reduce in-house technical support requirements.
• Free up valuable funding resources that can be used to address other issues enable the mobile workforce.
• Improve work/life balance for employees.
• Cross geographical and time zone boundaries to meet the demands of a global economy.
• Contribute to environmental responsibility.
• Meet expectations of the new generation of employees in adapting to their communication habits (chat, etc.).
• Maximum data can be stored in the microfilm for the future exploitation and retrieval.
• Increased speed of access to both retrospective and current scientific and technological data through ability to interact with the computer to derive answers from international data bases in real time.
INFORMATION COMMUNICATION TECHNOLOGY 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), 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 journals, 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:

Table 1.1 Developments in Information activities (Source: Kumar, 2003)

<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, CDROM</td>
</tr>
<tr>
<td>Process</td>
<td>Cataloging, Classification Indexing</td>
<td>Electronic Data Processing, Artificial Intelligence/Expert Systems etc</td>
</tr>
<tr>
<td>Retrieval</td>
<td>Catalogues, Indexes</td>
<td>DBMS, Information Retrieval Online/Offline etc</td>
</tr>
<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, Reuse the Medium</td>
</tr>
</tbody>
</table>

8
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. 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.

According to Battin (1984), 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). 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. Developments in optical 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 LIS (Panda, 1994). 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 students at all levels of education. The development of expert systems along with availability of low-cost computers as a means of providing high-level 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 (Kawatra, 2000).

In a University 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 University 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. An 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 University Libraries are Oracle, MySQL, PostgreSQL and Microsoft SQL server, etc. MySQL and PostgreSQL are examples of open-source database software popular around the world. For small and medium-sized libraries, MySQL forms one of the components of LAMP (Linux, Apache, MySQL, 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 Stallman 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 are 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, PHP My Library, OpenBiblio, 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.

Communication technology

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 play 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 university libraries all over India 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 catalogs 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).

There are innumerable applications of Internet and web based
services. Some of these are Subject gateways, Portals, Subject directories,
Search Engines, etc. Subject gateways are internet services where all internet
resources on a particular subject are indexed for the users to access easily.
Examples are SOSIG in social sciences and PINAKES, a comprehensive
index of subject gateways. Portals provide information services to a specific
group of users. The information provided by portals 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 (Mutula & Wamukoya, 2007). Search engine, one
of the most popular internet application widely used around the world is a
software used to search a database. Search engine is useful to get an idea
about a subject or concept. Examples are Google, Bing, etc.
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 University 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. WiMAX (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.
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). The semantic web is a vision of information that is understandable by computers, so that computers can process the information on the web.

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 devices in the publication and distribution of information. The end product 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 journal, 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).

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 journal, which is a full text journal published electronically, and can be accessed on the web. Either an electronic journal can be free or subscription based. Advantages of electronic journal are its ease of access and regular updating, ease of downloading articles, etc. Many publishers now offer electronic journals along with print version with sometimes free access to the electronic journal on subscribing to the print version. 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., which are 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.

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. The application of Web 2.0 in libraries can be termed as Library 2.0. Some of the tools that are relevant to libraries are briefly described here.

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 (Majumdhar and Roy, 2008).

**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 students and teachers to share information, and teachers may create podcasts to be used as a preparation tool for students.

**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.

**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, Facebook, Twitter a microblogging service, Flickr 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 Mashup, 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 Flickr can be combined with Google Map to show correct location.
Introduction

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.

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 and students. 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, University 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:

a. Managing Information Organizations

b. Managing Information Resources

c. Managing Information Services

d. 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.

I. 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.

II. 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.
Introduction

• 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 students, faculty, and researchers 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).

III. 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.

- Knowledge about relevant developments in information technology like email, 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 summarize, understanding 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.
CONCLUSION

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 our LIS curriculum.
REFERENCES


16. *Shaping the future: ASERL's competencies for research librarians.*

