2.1 Introduction

One of the simplest ways of economizing an enquiry is to review and build upon the work already done by other researchers. The Research in Library Science can help to understand the mechanism of information transfer and to improve this process both in quality and in quantity. The review of literature assesses not only the length and breadth of the topic of research but also the vastness and depth of the subject itself. This will also help in identifying the gaps in the research. However, very scanty attempts have been made to study in depth, the specific aspects of Information Communication Technology (ICT) Skills in general and about the professionals working in Engineering College libraries in particular. The researcher has endeavored to go through the major basic studies made in the world. The detailed literature on the development of ICT Infrastructure, ICT in libraries, ICT and library professionals, Professional development and educational needs of library professional skills, and Competencies of library professional in India & abroad have been reviewed and discussed.

2.1.1 Sources of Literature

For the purpose of collection of relevant sources of information on the topic, Researcher has referred and reviewed the following source of literatures.

**LISA: Library and Information Science Abstracts:** It is an international abstracting and indexing tool designed for library professionals and other information specialists. Currently abstracts over 440 periodicals from more than 68 countries and in more than 20 different languages. The abstracts are covered from 1969 till present. Over 360,892 record as of February 2013.

**LISTA: Library Information Science & Technology Abstracts:** Library, Information Science & Technology Abstracts (LISTA) indexes more than 560 core journals, nearly 50 priority journals, and 125 selective journals; plus books, research reports and proceedings. Subject coverage includes librarianship, classification,
cataloging, bibliometrics, online information retrieval, information management and more. Coverage in the database extends back as far as the mid-1960s.

**EMERALD INSIGHT DATABASES: Library and information studies:**
Nearly 25 Journals are published by Emerald group of publications in Library and information studies such as Library Review, Library hi-tech, Aslib Proceedings, Advanced Librarianship, Programme: Electronic Library and Information systems etc.

**SCIENCE DIRECT: Library Journals and Books:**
Elsevier Science Direct published Library and information science journals and books such as How to Build Digital Library, The International Information and Library Review, Library and Information Science Research and Library Collections, Acquisitions and Technical Services etc.,

**GOOGLE SCHOLAR:**
Google Scholar covers bibliographic as well as full text database of all articles published from all journals and covers presentations etc., and ERIC Databases, Blogs, Presented papers in Conference/Seminars, Discussions, Reports, Reviews and Thesis was used as the source of Documents in this context. Review is presented here under appropriate headings that fall within the scope of this study. The information sources, particularly articles, are reviewed and their content is presented in ICT and Automation in the Libraries and ICT skills and Library professional’s National and International wise sequence under each heading.

### 2.2 ICT and Automation in the libraries

The advent of information technology, the advancement of science and technology has accelerated the massive production of literature in all subject fields that resulted in the exponential growth of knowledge. It well recognized that, libraries all over the world are undergoing transformation, especially owing to the development in information and communication technologies. The traditional libraries are replaced by the digital libraries and the new libraries that are being set up are increasingly of the digital kind. As a result, there is a widespread interest and consequently, many research and development activities are carried out in this area.
world over (Mahesh & Rekha, 2008). The ICT has changed the traditional methods of library activities and services and is providing new dimensions for the teaching, learning and research in higher educational institutions (Mathew, 2011). It is important to assess the ICT applications in library and information centers in the context of changing user needs. There are many studies conducted already to know about the ICT & Automation in libraries.

2.2.1 International Level

Worldwide, many Research works, case studies and reviews were carried out in the field of ICT Application and Automation in Academic, Special and Public Libraries. Some of the related works are reviewed and explained in this section. The UNESCO initiated many programmes on ICT applications in Higher Education. The higher education institutions worldwide increasingly utilize the Information and Communication Technology (ICT). ICT is emerging as a part of on-campus delivery as well as open and distance modalities of higher education delivery. The UNESCO actions in this area focus on assisting Member States to develop robust policies in ICT and higher education.

The ICT in higher education used for developing course material; delivering and sharing content, communication between learners, teachers and the outside world, creation and delivery of presentations and lectures, academic research, administrative support and student enrolment. In developing countries, the higher education institutions have made available computers and software’s to all, even though challenges, including insufficient telephone and telecommunication infrastructure, lack of training resources for teachers, and lack of skilled and experienced information technology specialists to assist with development, maintenance and support of ICT usage in higher education institutions (HEIs) remain bleak. The positive ICT policies and investments are clearly beneficial to HEIs, even though ICT has not replaced classroom-based modes of learning or teaching. Undoubtedly, ICT can provide greater access for different target learners, and has become a vehicle for enriched pedagogical experiences, particularly for distance educators and learners separated by time and space. The coordinated implementation
of new or revised policies will likely require the involvement of outside Ministries (such as Telecommunications, Trade, Health), national, private and non-government educational boards and agencies (for accreditation and recognition where applicable).

Siddiqui (1997) surveyed the use and availability of IT like computers, networks, electronic mail, online information retrieval, CD-ROMs, facsimile transmission, personal computers (PCs) and the Internet in Seven University libraries of Saudi Arabia. The study also tries to determine computerized library systems, databases and services used in the libraries, the most widely used automation systems (DOBIS and MINISIS) and the numbers of online and CD-ROM databases acquired by specific libraries. Agboola (2000) reported on situation in Nigerian university libraries from 1948, when the first university institution was established in the country up to 1998, the issues relating to their governance, funding, physical facilities, staffing, services and application of IT are reviewed through the literature. He concludes that, there has been considerable quantitative growth in the number of university libraries over this period. Recommendations were made that better funding, access to foreign exchange for timely acquisition of books and journals considered very important as over 80% of the tertiary level book needs of the country meet by imported literature.

Tam and Robertson (2002) explained that the Libraries and information services face many challenges due to the changes in the information environment. For example, the changes that took place in the author’s own workplace i.e. the University of Hong Kong libraries outlined in which, most of the changes have occurred because of the developments in electronic information resources and the evolution of the “digital age”. This paper outlines the characteristics of the information society, describes various aspects of the challenges facing libraries, both externally and internally, and makes suggestions as to how library managers can make changes within their organizations in order to ensure that they retain their place in the information world. Al-Qallaf and Azmi (2002) surveyed the availability and use of IT in public libraries in Kuwait. The results of the study reveal that many information technology inequalities exist among the libraries. Only eight libraries make use of computers and 15 are without any type of IT-related technology. The study shows that
few libraries have connectivity, limited use of applications, and the implementation of an automated library system are slow moving. The factors impeding the development of information technology are planning, funding, human resources, and building structure. The recommendations were made with the intention to encourage the public library sector and information professionals in Kuwait to take a proactive position in overcoming the forces that hinder the development of IT. Zainab, Abdullah and Edzan (2002) identified five conditions of an information rich society: the existence of a conducive info-structural environment; a reliable and robust information and communications technologies (ICT) infrastructure; a community that is ICT literate, a community that has the necessary information skills, and the existence of supportive governance. The barriers comprise situations that are not in consonance with overall development objectives.

Siriwongworawat (2003) expressed that, many libraries in Thailand had used computers and particularly the UNESCO-developed CDS/ISIS since 1980’s for their library operations in higher education institutions. In 1987, Chiang Mai University library introduced URICA integrated software; by 1992, the National library of Thailand installed the Dynix Library Automated Systems software. These days, a number of library-automated softwares are using ALICE, Dynix, INNOPAC, TINIIlib, VTLS etc. The trend for library operations in the early 2000s was for electronic information resources, e-books and the virtual library. Fitzgerald and Savage (2004) explore the impact on public libraries in Victoria, Australia, as they become increasingly reliant upon information communications technology (ICT) to manage access and deliver information services. The Libraries Online and Rural Libraries Online have, since 1998 been developing Internet access in Victorian public libraries. The specific projects such as satellite delivery of bandwidth, rural points of presence (POPs), Victoria’s Virtual Library, the Gulliver Consortium and the SWIFT Initiative have discussed. Aligned critically to the actual ICT models and implementations is the capacity of the 44 individual public library services to understand and meet the ongoing issues.

Martey (2004) describes the ICT scene in Ghana from 1996 to 2004. The emphasis is on the benefits that distance learners in Ghana will derive from an ICT-
enhanced distance education. The article also draws attention to the efforts made by various governments of Ghana and some agencies to solve the major problems facing ICT-driven distance education in Ghana. The attention of Distance education providers has made aware of the minor but disruptive operational hindrances to the use of ICT. Some suggestions are made as to how academic libraries in Ghana can assist distance learners now. Gyamfi (2005) explained the aims to suggest approaches that can apply to close the digital divide between Sub-Saharan Africa (SSA) and the rest of the world including the provision of information and communication technology (ICT) infrastructure, access to ICTs and the development of appropriate content and information literacy skills. He identifies some international initiatives to develop ICT infrastructure and proposes the development of telecenters, technobiles and technology resource centers and the use of the 'old boy network' or 'past students' associations' to provide access to digital technology. He concludes that the implementation of these approaches to closing the digital divide calls for strategic interventions by governments.

Oduwole (2005) studied 16 federal universities and two state universities that had automated their cataloguing processes using the TINLIB software in Nigeria, and reported that, the automation of the cataloguing process had increased efficiency in these libraries. However, the high cost of maintenance of the TINLIB software identified as a major constraint to the use of the software. Other constraints included poor computer literacy on the part of the librarians, incessant power-cuts and lack of infrastructure. Ani, Esin and Edem (2005) investigate the extent of adoption of information and communication technology (ICT) in the university libraries in Nigeria. Nearly 29 university librarians surveyed and found that only six university libraries are fully “computerized”, nine are “about to be computerized”, seven of the surveyed libraries have installed local area networks; five have online public access catalogue and only four libraries provide internet service. The major obstacles are the influence of effective adoption of ICT in the university libraries inadequate funds and the poor state of electricity in Nigeria.

Okiya (2005) identified the current state of information communication technologies (ICT) application for information provision in Nigerian University
libraries. the obstacles militating against effective application of ICT in university libraries such as inadequate funding, inadequate electricity supply, shortage of competent manpower for operation and maintenance of ICT facilities, lukewarm attitude of the Nigerian government towards the provision of ICT facilities and low level of computer literacy among Nigerians. **Swee and Abdullah (2005)** studied the status of library automation in Malaysian Chinese Secondary Schools (MCSSs) which comprise the Independent Chinese Secondary Schools (ICSS) and the National-type Secondary School (NTSS). The study showed that the MCSS libraries started automate during the 1990s and have actively involved in library automation projects since 2000. 43.8% school libraries (39.3% NTSS and 51.5% ICSS) have automated their library functions and circulation is the function mostly automated by libraries followed by cataloguing. The Turnkey system is the choice for most automated NTSS libraries, whereas ICSS libraries opt for systems developed in-house. Fifty (56.2%) libraries are not automated; however, 39 of them (78.0%) plan to do so in the near future. The small size libraries and libraries with no budget for automation do not plan to automate their libraries function. The Management decision is the most important factor in conducting library information work. The research has also identified important factors in determining the systems used, and the areas need for future planning initiatives in implementing library automation.

**Fatoki (2005)** conducted a study on the poor telecommunication infrastructure of most library activities in Nigeria. The acceptance of global system of mobile communications (GSM) and the growth rate among the Nigerian populace have serious and great potentials for enhancing the communication and information technology-related services in libraries and information centers in Nigeria. However, information managers need to fully exploit the opportunities presented by this relatively new phenomenon with a view to providing improved products and services to the library users, especially in the academic sector. **Igun(2006)** studies the libraries in general and university libraries in particular and has consistently reported inadequate levels of Information and Communications Technology (ICT) literacy as one of the major problems facing libraries in Nigeria as they move into the 21st century. He has suggested that the knowledge of society of the 21st century is here, and Nigeria must operate in this environment. There are tools that are needed to
operate in this environment. One essential tool is ICT skills. If the government drags its feet, the professional library association in Nigeria can take lead by insisting that librarians to be so trained, starting from 2006.

**Efe (2006)** examined the level of automation in Nigerian meteorological stations. He has found that only two stations are automated by using CLICOM softwares. The reason for low level of automation is attributed to lack of funds, faulty equipment and obsolete computer systems. **Islam and Rahman (2006)** explained the present status of information and communication technology (ICT) in Bangladesh to represent the scenario of growth and development of ICT in relation to the evolution of the information explosion with the aim of providing better library and information services in Bangladesh. The status of Information technology (IT) in Bangladesh is not at par with the other developed countries, but recently the situation has changed significantly. Libraries and information services centres are expected to get immense facilities to access and cooperate with information world. A UNDP funded Program SDNP virtual library has prepared a union catalogue of 13 libraries, all of which are using CDS/ISIS software for bibliographic record keeping.

**Khudair and Bawden (2007)** find in their research, a detailed understanding of the current health library/information environment in Saudi Arabia, to identify problems, issues, and areas for improvement, to make recommendations for improvement and to initiate these in models and prototypes. The healthcare libraries are well used, and appreciated by their users, and the staffs are generally satisfied with their work. The problems and issues are identified as the use of information communication technologies and digital resources. The lack proactive information services, education, training and continuing professional development for health library work limited strategic planning and policy for these services. The recommendations were made for improvements. **Gbaje (2007)** defines the status of Virtual libraries in Nigeria. Unfortunately, various virtual library initiatives in Nigeria within the past six years have remained a mirage. Misconceptions of what constitute a virtual library, unavailability of the basic information infrastructure; poor policy implementation and lack of web technologies and skilled digital/systems the librarians have identified as some of the challenges in the implementation of the national Virtual
Library Project. The study also highlights the process of building a virtual library, collection development, acquisition and access of electronic resources in the virtual library which are the basic skills required for the deployment and sustainability of the national virtual library.

Islam and Islam (2007) reported that the installation of an IBM 1620 machine at the Atomic Energy Commission (Dhaka) in 1964. The Libraries in Bangladesh began to use computers in the early 1980s. A little progress was observed in the application of computers to library services between 1964 and 1995, but there has been a considerable progress since 1996. The International Center for Diarrheal Diseases Research, Bangladesh, Library (ICDDR, B) and the Agricultural Information Center (AIC) are pioneers in creating bibliographic databases using microcomputers. The Dhaka University Library has installed the library software package, Graphical Library Automation System (GLAS), equipped with a network server and a number of PCs distributed in a Local Area Network (LAN) within the different sections of library and other university buildings. Most libraries and information centers in Bangladesh, however, use computers as stand-alone devices whose applications were confined to bibliographic database maintenance and word processing. They have also found that there is not a single library or information centre in Bangladesh that is automate. Some libraries are in the initial stages of the automation and networking process. A few libraries have CD-ROM access, but no initiative has taken in action to produce information products on CD. Some libraries have an online connection and are providing external resource sharing on a limited scale.

Eve, Groot and Schmidt (2007) explained in the European project PuLLS (Public Libraries in the Learning Society), funded by the EU's Socrates programme, about the details of the model and the courses developed and offered by partner libraries. The results suggest that there is a significant role for libraries to play and support both ICT skills and wider information literacy learning. The sharing of results may be useful for public libraries wishing to develop open learning facilities/develop audiences for lifelong learning. They suggest that the libraries are beginning to move from a passive access approach to a more active approach in delivering library-generated content themselves.
Uwaifo (2007) examines the age and exposure to computers as determinants of librarians’ attitudes towards library automation in Nigerian universities. The investigation shows that, an overwhelming majority of the librarians registered a high and positive attitude towards library automation. However, the two variables of interest in this study found not to influence the librarians’ attitudes towards library automation. In addition, several university libraries in Nigeria are yet to be automating due to some identified impediments like financial constraints, shortage of IT personnel, irregular electric power supply, poor communication facilities, and absence of a national policy on information technology. Muqueem (2007) describes that the information environment is greatly changing throughout the world. The present rapid development in communication system and recent innovation in technology has witnessed as there is a changing emphasis in the role of information and its management. The new technologies have facilitated the transformation of data into digital format.

Virkus (2008) described the experiences of the Institute of Information Studies of Tallinn University in introducing ICT. He includes Web 2.0 technologies in library and information science education to explore the role that these can play in new models of learning and teaching. The Web 2.0 is influencing the way in which people learn access information and communicate with one another. The Institute of Information Studies of Tallinn University has a long history in using ICT in its teaching and learning. The experiences with open, distance learning, and e learning have transformed teaching and learning, provided a new alternative delivery mode and helped to reach new target groups. Recently, the staffs have been experimenting with Web 2.0 technologies and a few have successfully adopted them in teaching and learning. Womboh and Abba (2008) study found that due to the harsh economic conditions and government apathy towards library development in Nigeria, the state of ICT in university libraries is mediocre. The National Universities Commission (NUC) set up a Quality Control Division (QCD), which did research to test the quality of Nigerian university academic programmes.

Chiware and Dick (2008) presented the status of the use of information and communication technologies (ICTs) in Namibia's small and medium-sized enterprises
(SME) sector, to access business information services. Seeking patterns and utilization of ICTs in the SME sector in Namibia which was carried out at the University of Pretoria from 2005 to 2007, the findings revealed that there is a very low level of ICTs utilization among SMEs, whereas, among business support organizations it is relatively high. Mohsenzadeh and Alireza (2009) explained the status of the application of information technology in academic libraries located in Kerman, Iran is the centre and largest city of Kerman Province. To understand the problems and difficulties they use information technology in these libraries. The level of application of information technology in Kerman academic libraries is acceptable but they should improve their status to match with ever-increasing demand for better librarian services at universities. The most important problem and the serious difficulty is the lack of educated librarians, which needs a suitable investment and planning.

Omekwu and Ifeoma (2009) express that the library in a global information environment and examine the impact of ICT on global information network and globalization. It articulates the challenges for librarians and libraries in global information environment. It is most appropriate to begin with a conceptual clarification of the word globalization. Nemeth (2009) exposed to analyze the initial stages of co-operation between a Finnish community intranet-developing project and a ‘telecottage’ enterprise in a Southeastern Hungarian village community. Both the Hungarian telecottage and the Finnish North Karelian intranet initiatives have achieved much publicity in and outside their countries; their success stories and experiences have spread with the agency of researchers by their academic publications and the lines of their personal and professional, often-international networks. The case in focus is the evidence for more such informal ideas/innovation transfer processes, supported by information and communication technologies (ICTs).

Ortiz and McCarthy (2010) compare two academic libraries in very different parts of the world. The influence, which is the local origin, had on them as well the commonality, which the internationalization of the library profession has brought on them. There is a commonality of experience and that modern library technologies have changed the nature of professional practice significantly in recent decades; that
indigenous traditions of practice at local level being replaced by an integration of internationally shared experience. Adeleke and Olorunsola (2010) surveyed on use of online tools and techniques for catalogue, classification in Nigerian libraries. A questionnaire was designed to elicit information from librarians on pertinent areas relating to the use of online tools for processing library resources. They find out that high level of awareness among librarians in Nigeria about the benefits that could be derived in the use of online tools for cataloguing and classification processes and need for continuing education programmes for cataloguers for effective use of the tools. ICT infrastructural facilities are the major constraints to using online tools.

Kanwal Ameen (2011) Review on major challenges and opportunities the twenty-first century has brought to librarianship due to the emerging academic culture, and growing use of information and communication technologies (ICTs) in Pakistan and finds that Libraries in developing countries are being significantly affected by the ongoing ICT developments from basic infrastructure to collections to services to needed human resources. Sheikhshoaei (2011) revealed that the computerization of Iranian library services started with the recording of the central library collection of Ahvaz University on 80-column punch cards in the middle of the 1970s. He identified the determinant factors in the acceptance of information technology (IT) by librarians, in the libraries of engineering faculties of public universities in Tehran. That is to say, the organization has a potential role in providing the needed IT, the training of employees in the IT in use and in the updating/upgrading of their skills.

Quadri (2012) ICT is a significant development that provides tools for managing the avalanche of information generated by the modern society. Egunjobi and Awoyemi (2012) explained the constraints in the development of library automation in Nigeria, the poor infrastructure, funding and skills among library staff, as well as the software solutions. Therefore, the introduction of open source software such as Koha is therefore a positive revolution in Libraries across Nigeria. The Author urged to adoption of open source software in various libraries and information centres and automation, which can improve the library relevance to the academic community.


2.2.2 National Level

Indigenously, there are many Research works, case studies and reviews carried out in the field of ICT Application and Automation in Academic, Special and Public Libraries. Some of the related works are reviewed and explained in this section.

The National Mission on Education took initial steps to utilize the ICT in the field of higher education. The National Mission on Education through Information and Communication Technology (ICT), has been envisaged as a centrally Sponsored Scheme to leverage the potential of ICT, in teaching and learning process, for the benefit of all the learners in Higher Education Institutions in ‘any time anywhere’ mode. This is expected to be a major intervention in enhancing the Gross Enrolment Ratio (GER) in Higher Education by 5 percentage points, during the XI Five Year Plan period.

It is aimed to extend the computer infrastructure and connectivity to over 18000 colleges in the country, including each of the departments of nearly 400 universities/deemed universities and institutions of national importance, as a part of its motto, to provide connectivity up to the last mile. Therefore, the Mission, in addition to the utilization of the connectivity network of BSNL/MTNL and other providers, shall explore the possibility of providing the connectivity by utilizing Very Small Aperture Terminal (VSAT), Very Personal Network (VPN) and EduSat channels. It seeks to bridge the digital divide, i.e., the gap in the skills to use computing devices for the purpose of teaching and learning among urban and rural teachers/learners in Higher Education domain. In addition it empowers those who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy so that they can make the best use of ICT for teaching and learning.

The Mission would create high quality e-content for the target groups. The National Programme of Technology, which enhanced Learning (NPTEL) Phase II and III, will be part of the content generation activity. The peer group assisted content development would utilize the Wikipedia type of collaborative platform under the
supervision of a content advisory committee responsible for vetting the content. Interactivity and problem solving approach would address through “Talk to a Teacher” component, where the availability of teachers to take the questions of learners shall ensured appropriately. Moorthy and Karisidappa (2001) pointed out the information infrastructure available in India and the electronic media applicable for libraries. The result of survey is on Indian libraries with respect to the availability of information technology infrastructure for accessing electronic media and dissemination of information. Use of computers and the extent of progress in library automation, use of CD-ROM databases and electronic/online journals, and also deals with the availability of telephone, fax, e-mail, Internet in Indian libraries as well as the perceived impact of digital libraries on library system and its functions. It also evaluates the training and orientation needs of the library staff to cope up with the electronic media.

Kannappanavar and Vijayakumar (2001) surveyed the use of hardware and software facilities in the University of Agricultural science libraries in Karnataka, and evaluate the access of networks, information services and barriers in information technology applications. The survey also covered collections of the agricultural university libraries, In-house database, use of IT in administration and the impact of IT applications on libraries. The results reveal that, none of the University libraries at the time of study is having databases and complete implementation of IT applications in its libraries. Though the agricultural university libraries have hardware and software facilities to some extent, the results have not reached the clientele. It recommends that the librarians should approach the university authorities to train the library personnel on IT application. Approach funding agencies like INFLIBNET (www.inflibnet.ac.in/) and ICAR (www.icar.org.in/) for their library automation and provide IT based information services to their clientele. Vijayakumar and Vijayakumar (2003) describe the effects of ICT developments in Indian University Libraries and how much they have been able to catch up with the more developed institutions and what the future agenda for connecting knowledge and communities would be. This paper gives an idea about ICT developments in India, ICT applications in Indian University Libraries, and the role of INFLIBNET and future programs. They
also point out that the future academic librarian should be skilled in communication/training, IT, management, and subject knowledge/profiling.

Sangeeta, Manjunath and Pujar (2004) conducted a study on the Impact of ICT on Journals and e-journals. Due to the ICT, many publishers have started giving free online access to electronic journals against print subscription, and Internet access, and how they can benefit from the free offer. The modalities involved in getting free access to such e-journals. Mahapatra and Jyotshna (2004) revealed that from 1997 to 2003, the Information and Communication Technology (ICT) emerged as a recent development and attracts attention of many LIS professionals. It has taken up for the research works done in this subject and nearly 19 Theses have been submitted.

Gulati (2004) discussed the status of information and communication technologies usage in Indian libraries, with special reference to special libraries and the efforts made by various institutions to propagate e-information products and services. This paper highlights the consortia efforts in India like JCCC Consortium, INDEST Consortium, CSIR E-journal Consortia, and UGC Infonet. It further discusses digitization efforts in India at NISCAIR, New Delhi, IIITM, Kerala, C-DAC Pune, and the Digital Library of India. In addition, it incorporates details on major information systems in India (such as NISSAT) and major library networks in India (such as INFLIBNET, DELNET, and CALIBNET etc.). The paper concludes with challenges for the library and information science professionals and an overview of initiatives taken by the Government of India. Cholin (2005) provides an overview of information technology implementation in different university libraries in India. The 54 Universities studied, include manpower in the universities, user population, budget, IT infrastructure-hardware, software, network tools, database development, etc., and reveals that the university libraries are at various stages of development in the application of information technology tools in their day-to-day activities.

Suku and Pillai (2005) present the results of a survey to assess the status of automation in the university libraries of Kerala. A structured questionnaire was used to elicit data from the Librarian/Librarian in- charge of the central libraries of six universities. The survey mainly covered various aspects of library automation such as
information technology infrastructure, in-house activities, information services and their usage, manpower development, and budget. The study also deals with the role of INFLIBNET Centre in supporting the automation activities of university libraries. It has seen that library automation has been rather slow in Kerala due to various reasons like absence of University Librarians in most of the libraries and lack of adequate qualified professional staff. 50% of university libraries in Kerala introduced comprehensive automation of housekeeping activities. The LAN facility is available in all university libraries. All university libraries in Kerala are using computers for their services. All the libraries, without any exception, are using only personal computers for the entire range of automation activities. The survey also reveals that all university libraries have conducted sufficient number of training programs to its staff members before acquiring the new technology.

ICTS&T (2005) Report revealed the application of ICT in libraries today is indispensable. It enlarges the scope of acquisition, processing, organization and dissemination of information and knowledge; it raises speed, reduces cost and overcomes space, time, language and media barriers. It links knowledge sources with researchers and creates knowledge networks. The librarians in academic and research institutions have to apply the tools and techniques of ICT, to meet the changing requirements of the users by innovating its procedures and systems. Patel (2006) focuses on changing role of the libraries and LIS professionals in the digital learning environment and the library services in an integrated environment, where the digital libraries and e-learning programmes go hand in hand. He highlights e-learning scenario in India, with special reference to the initiatives taken by educational institutions. Borang and Sarma (2008) study the overview of methods, means and steps taken for adoption of ICT in Rajiv Gandhi Central University and North Eastern Regional Institute of Science and Technology Libraries in Arunachal Pradesh. Both the libraries are facing problems because of inadequate trained manpower, insufficient fund, rigid topology, irregular power supply due to environmental factors etc., and the Librarians of both the libraries have expressed their future plans of automation. The authors have seen some significant developments in the use of ICT in the RGU Library and the NERIST Library, but observe that they still lag behind in the
development and in the application of the automation software acquired for the purpose.

**NACLIN (2009)** conventions on Information and Communication Technologies (ICT) have transformed the functioning of modern libraries in the 21st century. The applications of ICT to data, information and knowledge resources have given rise to data centres, digital libraries, and knowledge repositories. New software that based on international standards has emerged to undertake a wide range of jobs that suit the requirements of individual libraries. Keeping in view these developments, NACLIN 2009 dedicated his study to Managing Knowledge, Technology and Change in Libraries. Walmiki and Ramakrishnegowda (2009) in a survey of University libraries in Karnataka, outlined the status of ICT infrastructure of selected six University libraries. A structured questionnaire was used to obtain data from the University librarians. The data collected include details of hardware infrastructure like availability of servers, PCs, Laptops, printers and scanners etc. The Software facilities for automation of housekeeping operations, digital library activities are included in the survey. The availability of campus LAN and internet facilities, which provide access to information sources are detailed in the study. The survey reveals that, most of the libraries lack sufficient hardware and software facilities, and internet with required bandwidth. The University libraries have to plan, implement and develop ICT infrastructure, to exploit the benefits of digital information environment. Naik and Horakeri (2010) noted that, in the past few years, the academic libraries have changed considerably as bibliographic utilities, and online catalogs, automated circulation systems, and other new technologies have implemented in a majority of library operations and services.

Ram, Anbu and Kataria (2011) explore the implementation of some of the innovative Web 2.0 applications at Jaypee University of Information Technology, with the aim of exploring the expectations of the users and their awareness and usage of such applications. The LRC has made a number of provisions to adopt some Web 2.0 applications in its library services to create information literacy. The users of the JUIT library still lack awareness about various Web 2.0 applications necessary for teaching and learning. Balaji (2012) stated the current developments in Indian
libraries, information services and cultural sector collectively, while highlighting the recent trends and developments, as India increasingly takes centre stage in the area of libraries and information literacy development.

Related to ICT applications in special libraries in India, Singh and Garg (2002) explained the improvement in the biomedical information centres and Libraries (ICLS) with the help of Information Technology (IT). They deal with the computer aspect of Information Technology and aimed at developing a model of Indian biomedical Information Systems using computer technology, its relationship with ICLs, Users and Professionals. They have identified the Government of India (GOI) policies and programmes to promote and design Information Technology based services. Nair and Jeevan (2004) explored the ICT Adoption in Kerala libraries, conducted surveys among the 18 premier libraries in the Thiruvananthapuram city of Kerala to assess the Information Technology adoption in these libraries and the results reveal that the libraries are very positive about the use of IT in libraries and many of the libraries are IT intensive. All eighteen libraries were of the opinion that IT had a positive impact on the day-to-day work of the library and that IT played a positive role in enhancing services, user satisfaction, meeting users' demands, and overall library image. Kattimani and Yarnal (2007) briefed about the knowledge management in academic libraries and the emerging field of knowledge management offers academic libraries, the opportunity to improve effectiveness, for both themselves and their parent institutions. Emerging tools for knowledge sharing and management in educational institutions are Digital repositories like Institutional Repositories, Digital Libraries, Open Courseware Initiatives (OCI) and Learning Object Repositories (LOR) applications in academic libraries and higher education described.

Singh, Sharma and Negi (2009) study the 25 LICs from different sectors such as public, government, corporate, public enterprises, and private. The data have been collected through a structured questionnaire and distributed personally through mail/e-mail among the librarians of selected institutions. The study finds that, majority of the LICs of NOIDA have the basic hardware facilities such as servers, computers, printers, photocopier, Internet connectivity, etc., except one library, i.e.,

~ 36 ~
Network Programs library. About half of the LICs have better hardware facilities including scanner, barcode printer, barcode scanner, etc., but the hardware facilities in the majority of LICs not being properly utilized, as majority of the library professionals are not properly aware of the use and operations of the hardware.

Several studies have conducted on the adoption of ICTs in many states of India for instance. Bansode and Periera (2008) reported about the status of automation in the colleges of Goa (India), wherein only Twenty-three college libraries have undertaken automation of the library. A majority of the libraries initiated their automation process in the year 2005 and 2006. Four of these fully automated, five partially automated and 14 were in the early stages of library automation. A majority of the libraries are lacking staff, required for automation. A majority of the libraries faces the traditional barriers such as insufficient funds, lack of trained staff, and lack of space. The Libraries, librarians, and college administrations must initiate automation in order to provide effective and efficient services to the users. The Library professionals must upgrade their skills, in order to meet the growing expectations of users from libraries. Sangeeta and Sarika (2008) highlight the present status of academic libraries of Manipur. particularly of college libraries of valley areas on varied aspects like-ICT based services, automation status and others including problem in ICT application and study revealed that, only 33.3% of the college libraries provide ICT based services (i.e. automated) and most of the librarians are not well qualified and adequate competent staffs are not employed in these libraries.

Sampath Kumar and Biradar (2010) explained the use of information communication technology (ICT) in 31 college libraries in Karnataka, India, by investigating the ICT Infrastructure, status of library automation, barriers to implementation of library automation and librarians' attitudes towards the use of ICT. The application of ICT in Indian college libraries has not reached a very high level. The lack of budget, work force, skilled staff and training are the main constraints for not automating the library activities. Even though the library professionals have shown a positive attitude towards the use of ICT applications and library automation, they need extensive and appropriate training to make use of ICT tools. Kumar, Das
and Ramesh (2011) opined that, the effectiveness of the library service now largely depends upon the application of Information and Communication Technology (ICT) with adequate infrastructure and skilled library professionals. This study attempts to reveal the gradual implementation of modern technologies in operation of library activities and to identify various components of ICT, which are used in day-to-day library functions. This also delineates the functions, impact and challenges of ICT based library system, which can be achieved with the convergence of computing and telecommunications. It examines the situation of ICT application and various problems in private Engineering and Management colleges of Orissa.

Kattimani S.F et al (2012) explained the standardization of library activities and services in the ICT era of M.S.Ramaiah Institute of Technology (Autonomous), Bangalore (India). The emerging trends in digital technologies and their applicability to information handling activities added new challenges to library professionals. As a result, the library is promoting reading and intellectual activities in the fields of science and technology. Further, it notes that all the conventional services of the libraries such as circulation services are already automated to save the time of the users. Gupta and Sharma (2012) report the status and future trend of outsourcing in science and technology libraries in Delhi. Most Indian libraries have been using selective outsourcing for many years which has had favorable impact on these libraries. The majority of libraries outsource professional-automated and non-professional activities and services. They are still not ready to outsource the professional traditional library activities and services, whereas, the literature shows that, the international libraries outsourced tradition activities and services equally. The Indian libraries also want to continue and expand the use of outsourcing in the future, especially digitization, RFID tagging and maintenance.

2.3 ICT skills and Library professionals

2.3.1 International Level

"Information competencies are a key factor in lifelong learning. They are the first step in achieving educational goals. The development of such competencies should take place throughout citizens’ lives, especially during their educational years, where librarians, as a part of the learning community and as experts in information"
management, have or should assume the key role of facilitating information literacy. Through the creation, with faculty, of curriculum-integrated programs, librarians should actively contribute to the students’ learning processes in their search to enhance or develop the skills, knowledge and values needed to become lifelong learners.” (IFLA)

UNESCO Introduced ICT for Library and Information Professionals (ICTLIP) Training Package for Developing Countries and its plan to provide the knowledge and skills required to deal with the application of ICT to library and information services. It is meant for the library and information personnel who may become trainers in the area. The UNESCO Asia & Pacific Regional Office with funding from the Japanese Fund in Trust for Communication and Information has developed the Package. ENTITLE (Europe’s new libraries Together in Transversal Learning Environments) report submitted that one of the major pillars of Europe’s i2010 initiative calls for "inclusion, better services for citizens and quality of life" and emphasizes the enhanced use of ICT (Information and Communications Technology) for life-long learning and social inclusion. Sufficient resources in the form of funding and well-qualified staff are a precondition for the development of innovative library programmes and projects. Each country, region and community has its own specific funding opportunities for support and this guideline will through desk research and examples from the country surveys, draw conclusions and recommendations about how to identify and draw effectively upon funding opportunities, illustrating good practice from EU-funded LLL projects. The guideline will also focus on staff training needs and skills required.

Aina (1993) evaluates the curricula of library schools in Africa to know whether their courses are relevant to the emerging library and information science market based on a standard list of topics, ranging from computer technology, information and records the management to information repackaging and journalism. Thompson (1993) examines the time for change, the reasons behind the decision to change career and the personal account of the factors to consider while applying for a position in fields related to librarianship. The author assessed the skills, knowledge and experience gained within the library and information work and applied them to
sell to prospective employers. He gave advice on how to know when the time is right to make a move, as well as useful interview tips.

**Elkin (1994)** stresses the need for continuing education in the modern information environment. He points out that the education and training must become a continuous lifelong process to keep abreast of the changes as professional knowledge is becoming increasingly complex and specialized so that the individuals need constant updating of their skills to keep in touch with their area of specialization. To review the profile of LIS courses in 16 universities in the US, the potential employers expect students to have skills in IT, in analysis, synthesis and repackaging as well as high quality management and personal transferable skills, allied to the ability to communicate effectively through a range of media. **Freeman (1995)** made the possibility of LIS professionals undertaking research for a doctorate (PhD) as an option of continuing professional development. He reviews Doctorate in Library Studies (DLS) being offered by the British library schools together with the opportunities offered in business schools in UK. In addition he points out that for the most librarians full-time study as a doctoral candidate will not be feasible and they will have to investigate the part-time modes or distant learning options. The library professionals have to advance their knowledge in the profession faced with rapidly evolving and converging disciplines containing many interesting topics for research.

**Griffiths (1995)** explained his views on Information Technology Developmental changes and application of IT and Professional changes towards New Technologies, involvement in an information-based society including electronic and multimedia publishing, local, national, and global networking; development of navigational and filtering tools for access to network and non-electronic sources and new modes for delivering information and educational programs. **Chisenga (1996)** examined the Use of information technology in libraries and documentation centres in Lesotho. He has looked at the types of computers being use software systems installed and library and information activities to which computers are applied. He recommends that, the Lesotho Library Association should organize appropriate information training programmes and workshops for the library professions, library and information profession in the country should have a positive
attitude towards the use of information technology and that parent institutions should increase funding for their libraries.

Leach, Arundale and Bull (1996) reported the use of information networking for continuing professional development. With the help of postal surveys, they assessed the extent of librarians’ and information professionals’ interest in CPD which include computer networks, network based course materials and teleconferencing. The degrees of professional demand for such programmes were analyzed. One survey was conducted in the institutions conducting library and information science education in Europe, North America, Australia, South Africa and Jamaica to establish their involvement in CPD. The second survey collected opinions on the requirements of CPD and its delivery through electronic networks. The main conclusion was that the professionals were interested to accept training through networks, but the technical infrastructure was insufficient to provide distance learning through network. Farmer and Campbell (1997) described the professionals’ attitudes towards CPD to identify their transferable skills. Address the problems of a changing workplace and the difficulties attached to career progression for information professionals and the growing need for CPD.

Lively, Lynn and Racine (1997) explored the current role of information professionals in academic settings based on a university library case study. The author suggested the skills and attitudes necessary to develop to cope up with the change. Barden (1997) described the training and development of librarians and Information workers based on discussions, lectures of wide range of information workers in both the public and private sectors, during the last ten years. The author also suggests a manifesto, for the training and development of information workers, which will see them as the major contributors of the 21st century. Seela, Bruch and Hochschule (1997) reviewed the development and the current situation of librarians’ training in the eastern part of Germany. He explained the development and Training activities of library professionals from 1914 to 1998 in detail. The changes in the library work take place more often than ever before, due to the huge impact of computer technology on all fields of information handling and supply. This, of course, will have an immediate effect on training requirements and seeks prompt replies in course modification.
Nevertheless, historical roots should take into account in every revival. The Leipzig faculty is one of the oldest training centres in Germany and has some very good prerequisites for reconciling tradition and renewal.

Ilyas (1998) observes that the new skills and a change in attitude on the part of librarians in Pakistan are required, if they are to be able to provide efficient and effective information services to users into the next century. About 250 professionals are produced annually through the library schools in Pakistan excluding those trained by the Allama Iqbal Open University through distance education. Hence, there is an intense need to tune the profession according to the multifaceted needs of the emerging scenario of information technology and the communications revolution. Alemna (1998) pointed out the education and training needs of future librarians in Ghana. He assumed that both short- and long-term training programmes must develop based on the assessed needed skills – actual and potential. He observed that any changes in the curriculum of the Library School in future must also consider the need to keep a proper balance between theory and practice.

Leadbeater and Holden (1999) submitted a report to UK report Department for Culture, Media and Sport about the Libraries face more intense competition in recruiting and retaining the staff they need the Librarians’ skills have become more valuable in businesses that thrive on information processing and retrieval. As a result, library school graduates are entering the private sector. At more senior levels, there has been a very little turnover in the library workforce. There has been only a modest infusion of young people and new skills. With the exception of the Lottery funded ICT training programme for library staff, investment in continuous development is limited. A generation of leaders recruited into the library profession thirty or more years ago is due to retire within the next few years. Developing a new generation of library leaders fully trained in business management and marketing skills is thus an urgent priority. Odini (1999) presents at SCANUL-ECS Conference held in Kenya 23-26 July 1998, challenges posed by the accelerating pace of change in the world of information. Especially in Eastern, Central and Southern Africa stresses the importance of managing the change in order to meet the needs of library users. He recognizes the need for training institutions to review information training needs and
to design an appropriate curriculum to produce graduates with right skills for a rapidly changing information environment and recommended that the information on training institutions in Africa should continue to reduce the lecture method in the training and development of skills in the education and training of students. He stresses the importance of continuing education and of incorporating new specializations and new professional practices into the curriculum, as soon as they emerge.

Edem (1999) in a survey studies the issues and obstacles affecting the career advancement prospects of librarians in Nigerian universities. The main objectives of the study were to identify the career advancement structure in Nigerian universities and to evaluate the career advancement opportunities for the librarians. One of the main problems faced in the career advancement was lack of higher educational qualification. The other factors include lack of inadequate norms for promotion and unnecessary emphasis on publication requirement. Marjariitta (1999) reports a study carried out in order to identify the educational needs of the library staff of Finnish polytechnics. The educational needs identified by the library staff cover four main topics i.e., library work, leadership and management, information technology, and learning and learning environment as well as the main topics for continuing professional education. To conclude, the library staff of Finnish polytechnics has many different educational needs. The staff is willing to gain both new personal and professional competence. It is found that they want to learn to teach, relate library and information services to the polytechnic education, organizational mission and strategies, exploit networks effectively, and speak foreign languages.

Kendall and Eve (2000) described the impact of information and communication technology (ICT) training for community librarians in the UK, New Library and the People’s Network to develop understanding of the place of existing provision of ICT facilities as a baseline for research. The existing levels of ICT skills among community librarians, as a baseline different approaches to and content of, training the value and success of training, which is currently providing and the potential role of different providers in meeting ICT training needs. The use of data collected as part of the process of providing training could be a way of assessing its
value and impact on those being trained. Although the 'Making Connections' project was small in scale, the idea of combining training with research has wider relevance, given that the similar developments are taking place in other countries throughout the world. The findings of such research would have impact not only on the design of training, but at a national level on the policy and in understanding of the complex interactions between ICT provision, professional roles and the delivery of appropriate services.

Dalton, Mynott and Schoolbred (2000) explained the Library and Information Commission (LIC) report on cross-sectoral mobility in the LIS Profession consider some of the barriers to career development within the Library and Information Services profession. It focuses specifically upon the difficulties experienced by LIS professionals in moving to different sectors of the profession. It discusses issues such as professional segregation, employer prejudice, poor employment strategies, lack of confidence among LIS professionals, training and lack of professional support. In addition to outlining some of the barriers to the career development of LIS professionals, the paper offers a number of recommendations for employers, professional bodies and LIS professionals that may help to alleviate many of these barriers. Orick (2000) discussed since the 1930 the Library Bill of Rights has acknowledged the ethical responsibility of librarians to provide access to information in all formats to all people. The librarians are charged with selecting, organizing, and instructing patrons on how to locate and use the resources and preserving information regardless of format or technology.

Spacey, Goulding and Murray (2003) made implications of the technological change for public library staff and a manager in the UK is based on the selected results of a literature review. The recent developments affecting the growth of information and communication technology (ICT) in public libraries provide a context against which research into the effects of automation, the introduction of ICT in a variety of library environments and into society generally explored. Tedd (2003) described the report submitted by “New Library: the People’s Network (1997)”, the developments in the UK, and especially in Wales, related to the improvement of information and communication technologies for public libraries. The author focuses
on training programmes for library staff, which are a key element for putting into action the People's Network.

**Ramzan (2004)** presents the librarians’ attitudes toward information technology, their level of knowledge in IT, and their relationship with each other. The study also revealed that the librarians’ level of knowledge in technology is a good predictor of their attitude towards the application of information technology in libraries. Based on the findings, the paper puts forward recommendations to improve the librarians’ attitudes toward IT applications in Pakistan and other developing countries. **Adekunle, Omoba and Tella (2007)** explained about implementing information communication technology (ICT) in Nigerian library, depends largely on librarians’ attitudes toward it. The application of ICT has caused significant changes in the libraries, so the librarians also must change and need training in the new technologies. The Training and knowledge are the sine qua non of a positive attitude towards ICT. Training is the first step which will reduce fear when implementation of ICT begins.

**Adeyinka (2009)** examined the attitudinal correlates of some selected Nigerian Librarian towards the use and application of ICT in their various libraries. The explosion of information communication technology (ICT) since the beginning of the 20th century has been rendering manual-based library system in academic, research, special and public libraries less relevant. This is because the use and implementation of information communication technology in the library depend largely on the librarian’s attitude towards the current digital age. It recommended that, the libraries in the developing countries should consider training those librarians who do not have knowledge of ICT in order to remove the fear and anxiety, hindering them from developing good attitude towards the use of ICT in their libraries. **Hull (2001)** made Librarians now more relevant as facilitators than custodians and, in order to fulfill this role successfully, they require a high degree of sensitivity to the potential effects of such variables as gender, age and social background on their clients’ interactions with information sources, whether paper- or electronic-based. The much discussed “digital divide” indeed a reality, is confirmed by the author’s own recent research on the “Barriers to libraries as agents of lifelong learning”, conducted at a
UK university and two further education colleges. The Social class and home access to information technology are shown as dividers influencing the extent of use of all services offered by the learning resource centre. In the education of future librarians, the need for greater sensitivity to client group characteristics and an enhancement of good interpersonal skills indicated.

Matthews and Thebridge (2001) addressed the training needs of archivists, librarians and museum staffs, involved in preserving the national heritage and consider how these domain’s needs might meet in a co-ordinated and collaborative manner across the cultural heritage sector, and within the context of educational provision. Chaudhary (2001) reports the continuing educational needs of librarians and information professionals in the University libraries of Pakistan. The study explores the needs of university librarians in Pakistan and Azad Jammu and Kashmir and determines the obstacles of the continuing education programs. It also tries to identify different methods to motivate librarians towards continuing education programs. It expected that the results of this study would be of practical importance to design continuing education programs for the university librarians.

Garrod (2001) reviewed the staff and end-user training issues in a hybrid library. He provided an overview of some of the related skills encountered during a project, working with non-standard entrants in the Institute of Health Studies at the University of Plymouth. If you want them to use this type of service they require skills and confidence and to gain confidence they need practice which takes time and effort and to gain skills they need guidance, tuition, training and ongoing support. Anwar and Al-Ansari (2002) reported the results of an investigation into current continuing professional development practices, perceptions of academic library employers about skills that need to develop in their staff in the six Gulf Cooperation Council countries. The Information and communications technology (ICT) skills preferred to relate to automated systems, electronic resources, networking and multimedia applications. The Writing and research skills are related to measurement and evaluation, studying information needs, and report writing. The paper concluded with a number of recommendations, which made in order to improve the situation.
Breen et al. (2002) evaluated the traditional library skills in relation to the information technology developments in the workplace. It shows that as LIS, courses are not reoriented and most jobs are lost to library professionals. A survey to establish the extent to which the curricula of current information studies departments teach the relevant skills shows that there are two courses under LIS one for employment in the library sector and the other for the information management. The authors point out that LIS courses must adapt to provide professionals with the necessary skills to take a new role in the workplace. Hewitson (2002) reports the results of an investigation undertaken at Leeds Metropolitan University to study the awareness and extent to which the university academic staff use and assimilate electronic information services (EISs) in their work. The University staff, especially those with low-level IT skills, frequently use the internet because it is easy to access and provides instant results. It is clear that members of staff, who used EISs regularly used it for their own research or after joining some form of professional development such as a Ph.D.

McNicol (2002) expressed that, as providing support for learners is assuming increasing importance in libraries, the librarians will need a broad understanding of learning methods in order to recognize the many and varied ways in which their users approach learning. An appreciation of some of the concepts and techniques of both formal and informal education should therefore be delivered as part of librarians’ initial training, with additional opportunities to develop skills provided through continuing professional development. Khurshid (2003) reviewed job advertisements published in American Libraries (AL) and College and Research Libraries News (C&RL NEWS) to assess the impact of automation and use of IT in libraries on job requirements and required skills of qualifications for catalogers. The analysis reveals that, the most preferred qualification is a master's degree in library and information science, or in some libraries a master's degree in computer science or relevant field, or a subject master's degree with library experience.

Minishi-Majanja and Ocholla (2003) stated that, the Information and Communication Technologies (ICTs) have become central to education and training in Library and Information Science/Service (LIS) because of the great influence of these technologies on the professional world. This study on Kenya is part of a larger...
doctoral research project that aims to map and audit the types, nature and diffusion of ICTs in LIS education and training programmes in Africa. Omager (2003) described the six modules of training packages on ICT for library and information professionals (ICTLIP) launched by UNESCO in June 2002. He briefed six modules viz., ICT for Library and Information Professionals: A Training Package for developing countries, introduction to integrated library systems, information seeking in an electronic environment, Database design information storage and retrieval, the Internet as an information resource and Web page concept and design: getting a Web site up and running. Parker (2003) explains the importance of museums, archives and libraries. The education, training and development of staff in the sector have always been important, as they need continuously broaden their experience and skills base, in order to achieve their potential. The Staff need to become multi-skilled so that their working lives become broader, more flexible, more expansive and hopefully more rewarding. The converged education and training can help to bring together the different domains, helping to create a common cultural voice in a community.

Shiholo and Ocholla (2003) explained the changing trends in the training of information professionals in Kenya since 1970. Issues and trends are discussed based on a literature review representative of popular publications and research reports from 1970 to the current time. This paper is adapted from a chapter on such research completed by the authors. The information reflected herein will be helpful for comparative studies on Library and Information Studies (LIS) education in Africa. The paper concludes that core knowledge and skills for information providers ought to be reviewed regularly and that support from LIS education dispensation stakeholders, such as a national library associations and national experts, should be enlisted in determining such requisite skills. Elgohary (2003) investigated the preparation of entry-level research librarians in Florida research libraries through a web-based survey to identify the current and the potentially required skills for entry-level research librarians. The study focuses on subject knowledge skills, management, marketing skills, information technology skills and interpersonal skills of librarians in academic and research libraries in Florida. Adding more management and marketing curricula will help MLIS students to deal with some of the important issues raised in
libraries, information centers, and information technology curricula that focus on issues such as information system and database design.

**Adomi and Nwalo (2003)** expressed the prospects for continuing professional education (CPE) of library and information science (LIS) professionals in Nigeria using Delta State as a case study. 51 practitioners were made up of professionals and para-professionals from academic, public, special libraries and information centres and were use in the study. They recommended that NLA should establish a body to work out a syllabus and set the machinery in motion for a CPE and certification programmes for practitioners in Nigeria. **Chan and Auster (2003)** examined the professional development of reference librarians of Urban Public Libraries in Ontario. Nearly 733 Professional Librarians with reference duties surveyed. The authors examined those competencies the reference librarians were choosing to acquire through formal and informal professional development activities and explored the barriers that might be preventing reference librarians from participating in these activities. In their professional development activities, the most popular topics were related to internet and more than half the respondents studied the electronic resources, office applications, integrated library system applications, communication skills and public service skills. The instructional skills and management skills were studied by about 40 percent of the respondents.

**Eclaksa (2004)** submitted a Training Needs Survey to discover what areas ECLAKSA library staff feel they needed training or support in, and thus help to produce a work plan for the Continuing Professional Development Special Interest Group (CPD SIG). **Baruchson and Bronstein (2004)** report a Delphi study conducted in Israel during 1998-2000 to examine the views of library science experts regarding the future of library science profession and the skills of library science professionals due to developments in information technology. 40 experts participated in the study through e-mail. The most salient skill the library professional to acquire is, the training role and act as guides in information technology related issues. The LIS professionals need to promote and market their skills and thereby acquire necessary social and communication skills. **Okiy (2004)** expressed the training programme organized for non-professional and professional staff of the Delta State
University Library, Abraka. Coming about twelve years after the University Library opened, it was obviously overdue, as these categories of staff had started to display some shortfalls in the performance of their duties. The problems encountered in the course of the training include the limited ICT skills of most of the staffs being train. This slowed down the pace of the training on the computers recommendations made to encourage and improve on similar training programmes in future.

Ashcroft and Watts (2005) explained the changes in the provision of information brought about through the emergence of electronic information resources which have created subsequent changes in the skills needed by information professionals. Information professionals now expected to be aware of and capable of using emerging information communication technologies as well as having essential communication skills. The professional bodies such as CILIP in the UK and the ALA in the US, recognize the importance of continuing professional development in order to keep skills and expertise up-to-date for all aspects of work. Adeyoyin (2005) found out the levels of ICT literacy among professionals, paraprofessionals and “other” members of staff of 18 Nigerian university libraries. 32% were literate in ICT out of 268 professional librarians, 8% were literature in ICT out of 358 paraprofessionals and only 6% were ICT literature among 1133 other staff members and recommended to acquire an enhanced level of ICT literacy: both staff training and adequate ICT infrastructures.

Bawden, Vilar and Zabukovec (2005) explained the approaches to the education and training of librarians for work in digital libraries and identify the important competencies required by information professionals in creating and managing digital libraries. Their findings show that the formal education and continuing development training cover aspects of the digital library environment, both in the UK and in Slovenia. The Curriculum development includes redesigning of degree programmes, training courses and Digital library skills. Clyde (2005) reports a descriptive study undertaken to gain an overview of library and Information workplace needs for library professionals with knowledge and skills related to user education and information literacy instruction. The study describes a small-scale research project that used content analysis techniques to study job advertisements.
posted to the international LIBJOBS listserv over a period of three months. The findings of the study, and recent literature, indicate that skills associated with user education and information literacy instruction are important for today’s library professionals.

Feret and Marcinek (2005) presented at the 20th IATUL (International Association of Technological University Libraries) the Delphi study conducted in 1999 verify the results of the previous study (comparison of the experts predictions with the reality as of the year 2005) and assess the competencies that librarians should develop as professional information suppliers and experts to meet future needs. The study also predicts that the IT progress and changes in higher education will play a predominant role in shaping the image of future libraries and their important role will be the information management and access, teaching, support for research and cooperation. Gosine and McNish (2005) conducted a survey to identify whether the particular country environment of today’s professional librarian influences upon his/her skills, capabilities as well as upon his/her access to opportunities for continued development. The satisfaction level of librarians with regard to six recommended skills and characteristics like communication; training; information technology (IT); managerial; commitment and subject knowledge/profiling was measured and recommended to emerging need for improved IT and managerial skills important for librarians’ professional relevance and progress.

Okon (2005) expressed that the Library and information centre managers have the responsibility to provide effective and efficient but relevant information to their user. They must incorporate information and communication technology into both practice and training, if they are to become relevant in this new information age. The new paradigm for the library manager is that of champion of change in their organization. Further to stress, this, the national president of the Nigerian library Association (NLA) Daniel (2004), emphasizes the need to have a plan with mission and a vision which will equip the association to meet the challenges of the 21st century globalization of our profession. Yafan song (2005) expressed the Continuing Education in Chinese University Libraries, changing educational environment in China and requires new functions for university libraries and these functions demand
that the librarians possess different skills and talents. The quality and skills of university library staff are decisive factors for the development of both librarianship and national education in China’s digital and networked environment. The suggestions put forward on how to expand the scope of education, and how to utilize the networked environment to supply e learning to library staff, to improve their ability in organizing information resources and in providing higher quality information services.

Urquhart et al. (2005) conducted a research on what type of training was required and how should the training programmes be delivered to Library professionals of National Library for Health. He described the systematic approach used to collate and synthesize the findings of published and unpublished studies (1999-2004) on the training needs of health library staff. The research included two workshops with health library staff to discuss the interim findings (in late 2004). The results showed that the health librarians required specialist skills in information retrieval and knowledge management, as well as more advanced research related skills. The conclusions suggested the need for an agreed competency framework but also some vision of the capabilities of librarians in the future. For librarians working outside the health sector, the findings indicate that the profession needs to offer career advancement through specialist routes as well as through the managerial route.

Bradley (2006) presented at the ALIA New Librarians’ Symposium 2006 held in Sydney, Australia about barriers and motivators for new professionals who write for the professional literature. Majority of respondents would like to improve their research, writing and presenting skills. There is a strong interest amongst new professionals to write and publish, as found in the survey. Encouraging the new library professionals to report on their professional practice and providing the support for them to do so will be to the benefit of their peers who will have greater access to knowledge about activities and innovations in other libraries. Barton (2006) described the change management of digital librarians in academic libraries, the digital librarians increasingly play within their institutions and attempt to identify the defining skills and personal attributes that are required to fulfill this emerging role. Cassner and Adams (2006) assert that, the Professional development is essential for
academic librarians to keep abreast with skills, knowledge, and competencies in the rapidly changing times. The authors surveyed distance librarians in academic libraries to determine their professional development needs. The findings from the survey will inform library administrators, distance librarians, and professional associations about the professional development needs of distance librarians. The authors suggest that the core activities that will be most important in the next five years are instructional design, Web page design, and marketing/public relations.

CAVAL (2006) prepared and submitted a survey to assess the need for ICT training for information professionals in the regions of UNESCO Bangkok (Communication and Information) and Japanese Funds in Trust (JFIT). In October 2005, a survey was conducted to assess the e-readiness of 9 Asia-Pacific counties. The purpose of the survey was to gather data that would enable preliminary assessment of the need for ICT training for information professionals in the region. The representatives in China, Indonesia, Mongolia, Myanmar, New Zealand, Pakistan, Sri Lanka, Thailand and Vietnam completed the survey. In June 2006, they decided to extend the study to include those countries that did not respond to the initial survey. Additional responses were received from the representatives in Bangladesh, Brunei Darussalam, Cambodia, India, Lao People’s Democratic Republic (Laos), Malaysia and South Korea. It proved to be very difficult to get reliable informed input from the library colleagues in a wider range of targeted countries. The survey solicited responses related to telecommunication infrastructure, access to computers and the Internet, the availability of training in ICT skills and technology training, and the electronic resources available in the libraries. That comprehensive ICT training package are developed for information professionals in the universities that build on existing ICT skills and encourage marketing, advocacy, resource sharing and further effective uses of cooperation and collaboration. Further, it recommended that the local advice is to be taken regarding the preferred language used for the training packages.

Helminen (2006) presented at Copenhagen conference, the faculty and staff needs some means to improve their ICT skills. Sometimes the faculty and staff have worst ICT skills than students. There have been some preliminary plans for the ICT
Driving License for the faculty and the staff. However, there are many challenges because the skills and needs of the faculty and staff may be much more heterogeneous than students’ skills and needs. King, McMenemy and Poulter (2006) explained the staff perceptions of the UK-wide information and communications technology (ICT) training conducted under the People’s Network programme for public library staff. It was found that while the staff found the training rewarding, there were concerns at the lack of ICT troubleshooting in the programme, and the reliance on an off-the-shelf training programme not specifically designed for libraries, namely the European Computer Driving License, or ECDL. The paper suggests that ICT training for library staff should be built around problem solving and troubleshooting, rather than generic skills, in order to match the kinds of queries encountered in the front line of libraries.

Sacchanand and Jaroenpuntaruk (2006) developed a web-based self-training package for information retrieval, using the distance education approach. The package consists of three main components: The project, The Study modules, References and further readings. The features and functions of both modes are identical. Moreover, the print materials are also included as supplementary media. Larsen (2006) noted that the library staffs are expect to be qualified to offer high quality services to users visiting the physical library. Likewise, it is expect that they have substantial knowledge and skills needed for developing and maintaining electronic services and for dissemination of relevant services and facilities requested by the web-user. Serving remote library users calls for additional competencies, such as marketing, branding and communications skills in the electronic environment as well as knowledge of measuring and evaluation of the use of electronic services. Also it is to be considered carefully by those institutions responsible for continuing education and professional development of library staff.

Adanu (2007) reported the research carried out among professional librarians in the five state-owned university libraries in Ghana. The study was, to find out if their work environment encouraged continuing professional development (CPD). The results of the survey using questionnaire and interview show that the library environment in the state-owned universities was supportive largely of CPD. The study reveals that the professional librarian’s involvement in CPD was a shared
responsibility of the library and the individual. The author stresses the need for CPD and workplace learning to meet the challenges and changes faced by the library profession, due to the developments in ICT. Antonesa (2007) explained the professional identity of the academic librarian within higher education in the 21st century. This article suggests that the concept of librarian as a teacher is increasingly strengthening in library discourse and that this role will shape the future professional identity of the librarian working in higher education. Kavulya (2007) explained how to assess the status of the job market for library and information science (LIS) professionals in Kenya and the adequacy of current curricula and training resources in LIS training institutions in the country and secondly to identify the areas of training and critical IT skills required by LIS professionals in relation to current job market and performance requirements.

Mahmood and Ajmal (2007) expressed the continuing education (CE) needs for ICT of library and information science (LIS) professionals in Pakistan. The particular purposes of this study are the ICT-focused educational backgrounds, as well as personal and professional characteristics, of LIS practitioners in Pakistan. What are the preferences of LIS professionals for ICT training including methods of CE. Talja (2007) argued that consideration such as interconnectedness of professional identities and ICT, the mutually shaping relationships between ICT and the sociocultural context in which working and learning takes place and the importance of social networks for development ICT expertise are rare fore grounded in information society initiatives. The findings may thus inform efforts to support professional development in not only academia but other workplaces as well.

Shafique (2007) reviewed librarianship in different eras and throw light on its near future, as seen through the eyes of new librarians in Pakistan. Based on literature search, website visits personal communication with related experts and interviews of future librarians. The views of the new librarians in Pakistan who questioned for this survey suggest that librarianship has an interesting future. The electronic environment of the 21st century will demand a range of skills from librarians. Technology alone cannot help bring about the required changes. The attitudes, practices and policies
need to change if libraries are truly benefited themselves and their community of users by the application of new technologies.

Eells and Jaguszewski (2008) studied the task force of the University of Minnesota libraries which developed a list of core information technology (IT) skills that could be expected of all 300 staff, including technical services, reference services and stacks maintenance. Authors include the use of assessment reports and data gathered in the process to develop a training and professional development curriculum focused on the specific identified training needs of staff. Gerolimos and Konsta (2008) investigated the qualifications and the skills of the library professionals, as they are impressed through the job ads. Overall, 38 skills and qualifications were identifying through the job ads. Their percentage of appearance was recorded and this constitutes the basic element for the final findings of this research. Catts (2008) explained the nature of Information Society Technology (IST) skills (called Information Literacy in the USA and Australia) and some recent research into IST acquisition and practice. Then he turns to recent developments in European and international agencies, which are likely impact on IST policy at national level in Central Europe and asks questions about the implications for information providers, librarians and end users.

Leong (2008) in a case study tracks how academic reference librarians at the UNE, New South Wales, and Australia have faced changes in library services during the period from 2000 until January 2007. It reviews the steps involved in managing change and the approaches that taken. The study shows that, the staff responded positively to the challenges, developing new skills for a changing environment, for new areas of work and taking innovative approaches to improving service. Orme (2008) reveals that the entire library and information profession needs to be aware of the skills required by the employment market. The future professionals need to develop an understanding of the skills needed to pursue a career in the profession. Those responsible for their training should use the requirements of the employment market to inform the development of library school curricula. Williamson (2008) noted that the professional context for Canadian research libraries (as outlined in the 8Rs Canadian Library Human Resources Study by Ingles et al.) and examined the
approach and the response to dynamic human resources challenges and opportunities unfolding through a strategic planning and change management process at the University of Saskatchewan (U of S) Library. It also provides many opportunities for innovation and change to professional practice. Above all, it requires some creative and interventionist strategies to ensure that the Library staffs have the necessary knowledge, skills and abilities to meet the challenges head-on and ensure realization of that ambitious vision.

Abdelrahman (2009) explored the current situation of ICT at the university of Khartoum Library system (UKLIS), and identifies the staff training programmes carried out there in order to prepare the staff and equip them the necessary skills to cope with advances in ICT. Ademodi (2009) showed the status of academic libraries in Ondo and Ekiti states, found out that the fewer computers are available and these are using for other purposes. The Librarians are computer literate, but have no computers to use. The rate of computer skill and competence is low. It is imperative that they are properly trained to acquire computer skills; most libraries in the two states are making pre-computerization arrangements for the automation of their libraries. Ahmed and Mohamed (2009) explained the core competencies of Library & Information Science (LIS) professionals as managers of organizations. The comparative study of LIS professionals and managers of organizations found more similarities than differences and professional skills and necessary technological skills needed for library science professionals and managers.

Buarki Hanadi and others (2009) presented a Bobcats’ symposium about the ICT implementation and training for LIS professionals, students in Kuwait Higher education. The results of 54 analyzed interviews were conducted to present the views and explanations of Library and Information Science (LIS) students, teaching staff and employers on the implementation of Information and Communication Technology (ICT) skills into the LIS curriculum in Kuwaiti Higher education (HE). Maesaroh and Genoni (2009) explained the base-line data on the current levels of education, skills, and knowledge of Indonesian academic librarians and provide an insight into their continuing professional development. The paper also seeks to report the current level of qualifications of librarians working in Indonesian academic
and the current level and type of continuing professional development and work place training in Indonesian academic libraries.

Opadeji (2009) investigate the use of ICT skills by librarians and support staff in ELOML (The E. Latunde Odeku Medical Library), University of Ibadan, Nigeria, the investigation report that, the Library staff showed a lack of exposure to training. The information skills training can have a positive impact on any category of library staff. The appropriate formal or informal training can prepare library staffs confidently to assist readers with a literature search, and with packaging or repackaging information for users. Ugwuanyi (2009) survey the state of ICT literacy among academic librarians in Enugu state. ICT literacy is a sinequanon for effective functioning of information professionals in the emerging information society and recommend that ICT infrastructures be given more priority in the institutions’ budget and opportunities to attend seminars/workshops and other professional education courses created for librarians to upgrade their professional knowledge. The study provides recommendations to improve ICT literacy skill acquisition.

Judith Broady-Preston (2010) explained the contemporary theories of professionalism, together with an assessment of the complex factors resulting in a fundamental re-examination of the nature and role of the information profession (IP) in contemporary society. Moreover, it is moot not only the profession is recognizable but also the extent to which this should be a cause of great concern. If we grasp opportunities, seek new ways of working and new partnerships, but nonetheless ensure that, in doing so we recognize and retain our core values, then the future may indeed look bright. Alternatively, if not, we may suffer the same fate as the dinosaurs of extinction. Batool and Ameen (2010) studied the eight librarians from the faculty of Economics and Management, University of the Punjab (Pakistan). To identify themselves the library professionals have to possess the type and level of technological skills and information sources used to update technological skills. In addition, the major constraints in acquiring IT skills and knowledge are to be considered. It was revealing that the current LIS curriculum is no longer adequate for training the 21st century librarian. Igun (2010) discussed the influence of librarian’s years of working experience and sources of acquisition of ICTs' knowledge and skills.
The study is based on 169 librarians, working in thirteen university libraries, in the universities of six states located in the South- zone of Nigeria. It recommended that the librarians with longer years of working experience develop more interest in sources through which they can acquire ICT knowledge and skills.

Safahieh and Asemi (2010) investigated the level of computer literacy skills of librarians in the University of Isfahan, Iran and attempts to examine their avenue of computer literacy, software used, benefits derived from computer and problems militating against effective usage of computers. The investigation reveals that the majority of the librarians do not yet possess a good level of computer skills and even their long duration experience of computer use has not necessarily improved their level of computer literacy. Shepherd (2010) described the need for continuing professional development for librarians in academic libraries in general and at Rhodes University Library, South Africa, aims to describe the planning, design, implementation and evaluation of a staff-development and training pilot programme for professional librarians at Rhodes Library. Unless we are prepared to embrace this opportunity and train present and future librarians for the competitive digital environment, the librarians’ skills will become increasingly redundant.

Corrall (2010) explored the phenomenon of the hybrid information specialist in the academic library setting. He does this in relation to curriculum development for preparatory and continuing professional education for librarianship and makes particular reference to the contemporary iSchools movement and review trends and developments in academic information services and the information science academy in the context of continuing technological advances and educational change. Hanadi, Hepworth and Murray (2011) review the comprehensive literature review on information and communication skills (ICT) of library and information science (LIS) students in worldwide LIS education and compare them with those skills needed by the job market in Kuwait. Although ICT skills taught and learn during LIS schools, these skills need to be improved, practice, and sometimes learned again during employment. Moreover, LIS graduates should have certain ICT skills that employers demand and they should prove that they are able to respond to the needs of the job market.

~ 59 ~
Daihani (2011) explores the students’ perceptions and views of the instructors, in relation to information and communications technology (ICT) education in library and information science (LIS) programs. The survey is carried out among students from the two LIS departments in Kuwait. It is interesting to note that all major studies reviewed indicated that there was a gap between the ICT skills provided by the information studies programs and the ICT skills considered important by the prospective employers. Upan (2012) describe how the attitude of information is most important for social development and stress the ways of human resources development in the academic librarianship of Serbia. Analytical cataloguing and classifying conference books and articles from periodicals is gradually gaining more emphasis and finds out that how the librarians in Serbia follow world positive practice and adjust themselves in order to achieve higher levels of professional competence.

Talab and Tajafari (2012) surveyed to identify and compare the impact of ICT on training of library human resource in two University libraries each of India and Iran. The University of Hyderabad and The Bangalore University included eight constituent libraries in India and The Ferdowsi University of Mashhad and the Shiraz University are including eight constituents’ libraries in Iran. The Questionnaire used in person and via e-mail. 78 and 117 responses received from India and Iran respectively. The study recommends that the ICT training programmes for library staff is inadequate and it is essential to initiate regular ICT training programmes for library human resources to keep up with ICT rapid developments. On the job, training and workshop/Seminars are the most preferred modes of training the staffs are interested in ICT training, and needs strong support from supervisor/managers and modification of their library staff working hours strongly recommended.

2.3.2 National Level

With regard to the professional’s attitudes towards the need for ICT skills in handling new technologies, Nair (1997) studied the attitude of librarians towards information technology in Kerala. The results of the study showed that, the majority of librarians showed a favorable attitude towards information technology. They were
prepared to accept modern technology in the library activities. The Librarians considered IT not as a means to reduce their workload but as a device to render effective information service to patrons. The Librarians engaged in different professional work were similar in their attitude towards information technology. Jain (1999) identified the main OJT (On-the-job training) training needs as: information technology, job orientation, customer service/public relations, marketing/publicity, refresher courses and managerial skills.

Sreenivasulu (2000) expresses the roles and functions of a Digital Librarian in information retrieval, content delivery, navigation, and browsing and stresses the need for professional education and training for digital librarians in the management of digital information systems. It denotes the DL’s interface functions, roles, skills and competencies for the management of digital information systems in the important areas of imaging technologies, optical character recognition, mark up languages, cataloguing, metadata, multimedia indexing and database technology, user interface design, programming, and Web technology. Jestin and Parameswari (2002) observe that the electronic environment of the 21st century will demand a range of skills from library and information science (LIS) professionals, including technical skills, IT skills, and managerial skills. The users may turn for help and advice on search techniques, database quality, database development, and the range of databases that are available. The Librarians will need organized training programs, which can be in the form of workshops, conferences, seminars, symposia etc.

Ramaiah and Moorthy (2002) have described the Changes in libraries and the expectations of their clientele are related aspects of LIS training. Those changes, like the use of IT, computers, communications, Internet, and multimedia, increase the expectations of users about the quality of the library services and the need and impact of continuing education programmes (CEP) for library and information science (LIS) professionals in India, particularly for college librarians. For this, a survey was conducted to assess the impact of CEP courses organized by different agencies in the field of LIS. Saraf and Temjen (2003) studied the attitudes of academic and research library professionals towards information technology and its relationship with library and information science courses in India. The study identifies the attitudes of library
professionals working in the seven states of Northeastern part of India, based on the
already developed and tested scales of attitudes towards computer and information
technology.

Srivastava and Srivastava (2004) surveyed in Jaipur the opportunities available for the professional development of librarians and their satisfaction level. The results reveal that the librarians need opportunities for higher education for attending conferences and are mostly ignorant of the developments in information technology. Most librarians are dissatisfied with their job and suggest that the authorities should encourage the library professionals to participate in professional development activities and provide opportunities for higher education. Nyamboga (2004) explained training opportunities for library and information professionals in India and how selections of Indian University libraries are providing information skills and information literacy programmes for their users. The needs for training students, researchers and staff to make appropriate use of resources are made available in libraries recognized. The library and information professionals need continuing professional development courses as new ways of providing information resources are developed. Sharma (2005) notes that as traditional custodians of information, the librarians need to be aware of the implications of these changes and develop technological and managerial skills which will enable them to make effective use of information and to meet their organizations changing information need.

Kannappanavar and PraveenKumar (2005) evaluate the training programmes pertaining to Library and Information science and their effectiveness as stated by library professionals in selected Agricultural Science Libraries in India. Most of the library professionals in agricultural university libraries have attended these training programmes and they stress the need for more specialized training programmes based on skills and competencies. All agricultural science libraries have partially computerized and the information is stored in digital format. It is found that the workshops organized generally designed to provide practical training on IT applications; but they are not assessing the training needs of library professionals.
Kumbar (2005) described some of the issues affecting the implementation of computerized networks among polytechnic libraries in Karnataka. The main issues highlighted in the paper were training and education programmes for librarians to enable the librarians to administer, operate and manage a computerized network effectively and efficiently. Neena (2006) explained the Libraries and information centres of agricultural universities closely supporting education, research and extension activities of the universities like other traditional universities. To bring qualitative improvements in agricultural sciences education, the agricultural university libraries must train the library professionals.

Venkata Ramana (2006) presents the role of library professionals in the modern world. He discusses the professional skills and technological competencies necessary for library professionals and considers how these are acquire and developed to survive in an ever-changing technological environment and to meet the future challenges of the 21st century. Guha (2006) presents the opportunities that Digital Learning Environments has put forward for teaching and learning. Focusing on a particular aspect of professional development i.e., continuing professional education (CPE) in the light of Information and communication technology (ICT), it also presents an open access Continuing Education Virtual Classroom, developed to provide a continuing professional education platform to LIS professionals in India. Kannappanavar and Kumbargoudar (2006) conducted a survey to evaluate the competencies of the library professionals working in Agricultural Science University Libraries in India. Concentrated on the different aspects of organizational change such as Digitization, Communication protocol like Z39.50, software to read the converted documents, internet etc.

Sagolsem, Purnima Devi and Vikas (2007) conducted a survey among the library professional staff, working in public libraries and NGO libraries of Manipur. The study reveals that the public libraries lack sufficient professional staff with required knowledge of IT. Though most of them had a favorable attitude towards IT applications, majority are not satisfied with their opportunities to enhance qualifications. The problems in IT application include a lack of qualified professionals, high cost of IT infrastructure and insufficient computer facilities. The
study recommends the importance of continuing educational programmes to upgrade professional competencies and suggests that the government should provide more grants for library development in the state. Babu.R and other (2007) explain that Library and information professionals today need to acquire knowledge and skills in information and communication technology (ICT) as the services of more and more libraries are now centering on information technology, especially in educational Institutions.

Mazumdar (2007) stated that the Borderless library is a technologically empowered web-based library, which provides services to its users throughout computer networks. As the changes occurred in library environment, the library and information science professionals should be acquainted with different skills. reflected on some skills required for the library and information professionals working at IT environment and highlights on different programmes to enhance these skills among the professionals. Menon (2007) quotes in the presidential address that the development and importance of library networks and referred to the role being played by the Internet and the digital libraries. He emphasized the efficacy of library networks and ICT in libraries and said that the use of ICT skills by library professionals was essential. Dhanavandan, Esmail and Mani (2008) studied the attitude of librarians towards the use of ICT tools. The study reveals that the females are somewhat higher than that of male and ICT tools play a significant role in supporting and enhancing their professional and research activities.

Singh and Pinki (2009) explained the need to equip library professionals with core competencies and emerging skills required for the service delivery in electronic information environment. Joginder (2010) expressed that the twenty-first century information professionals must possess skills in selection, content management, knowledge management, organization of information, research services, developing and maintaining digital libraries and bringing information resources to the desktop. The right skills are crucial to the success and competitiveness of contemporary information environments. The jobs of the librarians have become more competitive with similar professions such as those in information technology. In this environment, the library professionals must acquire the relevant skills and expertise to be competent.
in a digital culture. Kattimani and Naik (2012) discussed the various ICT skills of Library professionals working in the engineering colleges of Karnataka state (India) to assess the awareness of the library professionals in the use of computer operating systems, to explore the extent of skills of library professionals in library automation and to look into the knowledge of library professionals. He has suggested to purchase and automate their libraries with single library automation software, to share their resources, to possess more ICT based infrastructure and to depute ICT training programmes for all the engineering colleges.

Management is a challenging job. It requires certain skills to accomplish such a challenge. Thus, the essential skills that every manager needs for doing a better management are managerial skills. Manjunatha and Shivalingaiah (2004) express that the service quality assesses the performance of products and services from customers' perspective. A library should have both tangible products and intangible services. Assessing the service quality as a management technique is of recent origin and is new to the Library and Information Science (LIS) professionals. The authors briefly explained the concept of service quality, traced its development and highlight some of the results of an empirical study on service quality in academic libraries is presented. Sardesai (2005) explained that the information literacy is a survival skill in the information age irrespective of status and sex in the society. They illustrated that, the information literacy among people in the society is keeping libraries as main media and library associations and professionals as information motivators. They need various managerial skills to teach as they are not taught generally thoroughly in the library schools. Malhan (2006) discussed the problems and challenges of change management in the university libraries to facilitate their growth, resources management and service, similar to the work culture of the corporate sector. They reveal the complexities of change management in the university libraries and indicate that the university leadership, the library manager, and the professional staff play a key role in affecting change in the university libraries.

Pravakar (2007) stressed the need of the 21st Century Library professionals to gain access to information, through “Education for Information”. International initiatives and Developments forced the Developing Countries to keep pace with such
developments. The LIS Schools and Educators must be committed to act as qualitative Problem Solvers and Effective Information Managers. Kanamadi, Kadli and Koganuramth (2007) discussed the knowledge management process in libraries and outlined the responsibilities that are expected of librarians to function as knowledge managers. The various avenues available for librarians to acquire these skills for their professional development discussed. Shivaram (2007) presented the successful implementation of an integrated library system with all the key factors such as support from administration, staff competence, consideration of user requirements, and presence of the infrastructure (hardware, software, and network), available data, and the excellent managerial skill.

Francis and Humayoon (2008) studied the technology management of university libraries in Kerala. The necessity of developing human resources in different cadres and the stress on modern digital technologies are established. This study identified the thrust areas needed for the development of human resources. Halder (2009) expressed the Innovation and development of Information and Communication Technologies (ICTs) and different library software’s and their application in the field of Library and Information Science (LIS) to create changes in the entire library management system. The author highlighted the present scenarios of LIS profession and the professionals in this changing environment. The new roles of LIS professionals especially as advocates, consortia managers, consultants, content managers, facilitators, guide/teachers, intermediary, knowledge managers, researchers, sifters, web designers discussed. To say in a single sentence, the core objectives of LIS professionals are unchanged, whereas the mode of services is changing to cope up with paradigm shifts.

Several studies have been conducted on Librarianship. Rathod (2005) said, ‘Librarianship should transform to e-librarianship: A paradigm shift”. He tries to emphasize the role of librarians from archivists to that of information navigators. Bavakutty and Majeed (2008) found out the profile of students joining the LIS programme in India and the influencing factors and their choice of course of study. The study also aimed at assessing the adequacy of the course content and training imparted in the current LIS programmes for managing the modern Library and
Information Centers in India and for meeting the professional challenges ahead. 

Mishra (2009) found out a lot of dissimilarity in similar kind of post and lack of explanation of ICT based skills requirements, based on the advertisements published by University/Institution, for different level of staff in Library concerning education qualifications/experience.

Varalakshmi (2009) explained the duties discharged by information professionals in changing environment, to make the digital information management a reality. Library and Information Science (LIS) education programmes in India now include digital library courses in their syllabi and analyze the digital library course content of LIS Master Degree programmes of selected University departments/Institutions in India. Biswas (2010) presented the importance and necessity of ICT in professional work in Higher education. The professionals should have a thorough insight into all techniques of information handling with special emphasis on the application of ICT & web technologies in order to design, implement, operate and manage the information system. If all these concepts are included in the BLIS & MLIS courses, then there will be no need to opt for any other computer courses (e.g. PGDLAN) separately.

Lalngaizuali (2010) found the four Universities offering LIS courses in North East Region. The research study has not undertaken so far by any research scholar in library and information science. In addition, he suggests that the Curriculum, skills and competencies expected from LIS learners are broadly grouped into ICT skills, Information Management, Communication Skills, Leadership skills & Seminars and Colloquia and further he recommends that the Traditional skills of Librarianship need to revamp to suit the digital environment. IFLA states that, “training is a vital element of the activities of any library. There must be a planned and continuous programme of training for staff at all levels. This should include both full time and part time staff. The rapid development in information technology makes the need for regular networking and access to other information sources should be included in the training programs” (Ademodi,2009). Mestri and Kumbargoudar (2006) discussed the developments in Information and Communication Technology. Further, the paper examined the applications of ICT to library services in detail. Due to the continuous
and faster development in ICT technology, the library and information professionals need training. Hence, the paper described the various considerations for designing suitable training programmes, analysing the training needs and selecting appropriate methods. **Gobbur, Kattimani and Kumbargoudar (2006)** examined the developments in the Information and Communication Technology and its application to the Library and Information Science. As it developed the library’s functions and services, there is a need for training of the library professionals in these applications. The paper briefly explained the role of the library professionals and applications of the Information and Communication Technology applications to the libraries.

**Koneru (2008)** describe that the Social, Technological, Economic and Political (STEP) changes and developments compelled the libraries to shift their roles from the resource-based to the access-based. In the current digital era, grooming the staff with necessary Information and Communication Technology (ICT) skills is the key for ensuring ‘information for all’ and ‘access to all’. Staff training is inevitable to better equip LIS professionals with ICT skills and keep current with the new technological trends and to infuse technologies in their library routines, not only for the benefit of patrons but also for staff themselves to get relieved from the cumbersome tasks. **Sinha (2008)** explained the concept of manpower planning, definition of human resource development, need for human resource and manpower planning for library activities, continuing education programme (CEP) for LIS professionals, role of various national level library organizations (both Government and associations) for imparting IT training for running modern libraries in network and digital environment. **Kattimani, Yaranal and Kumbargouadar (2008)** presented the present scenario of transformed libraries, digital libraries, Learning Resource Centers and Information systems, Information Explosion, the development of technology, Successful application of ICT to e-governance, communication, libraries and information. All these developments are limited to the large metro cities of India. There is a need to educate them in planning and management of the digital libraries including digital technology.

**Mondal and Bandyopadhyay (2010)** described the increased rate of application of ICT in Academic Institutions in West Bengal in the recent years.
However, in the government-aided General degree college libraries in Burdwan Sadar (North and South) the same decreased due to the trained work force. Hence, author recommended the need of analysis of training. Satpathi and Chitra (2010) described the challenges posed by the contemporary library environment which are the results of ICT and the digital revolution and call for developing new competencies and skills as well as a new set of proficiencies. It also seeks to analyze the role of professional bodies, especially in India, in preparing librarians to meet these challenges.

Thomas, Haneefa and Shukkoor (2010) examined the Information and Communication Technology (ICT) literacy among the library professionals of Calicut University. The study is confined to the library professionals in the central library and departmental libraries of Calicut University. The method used for the study was a structured questionnaire. The study reveals that the Professional Assistants are more ICT literates than the Junior Librarians and Assistant Librarians. Koganuramath (2010) studied the paradigm shift of the present knowledge, technologically proficient users, availability of vast amounts of information in multimedia and digital format has made library professionals to make proactive move to acquire those ICT skills that are necessary in providing value added services to their patrons. The knowledge society, thus requires inquisitive learning professionals who constantly track new ideas, keep in touch with latest happenings in the profession. Since the library and information profession itself is in a fluid state, it is essential that library and information professionals make enough efforts in catching up with ICT and associated influence on their professional life.

Satpathy and Maharana (2011) identified the need to acquire continuous knowledge and skills on the fast changing Information Communication Technology to provide better library services to the users in Orissa engineering institutions library professionals. Das (2011) illustrated how OER helps in democratizing lifelong learning spaces that eventually help in skills development. He finds out that the Indian OER initiative makes use of the textual platforms as well as audio-visual platforms embracing YouTube, Metacafe and other web-based streaming video channels and the collaboration patterns in OER initiatives in order to attain sustainability, optimum usage and integration with formal curriculum of skills development programmes.
Sawant (2012) investigated the LIS instructors' familiarity with Web 2.0 concepts, tools and services, and applications related to LIS education. It is found that LIS instructors, in some Indian universities, have a low level of familiarity regarding the use of Web 2.0. Most of the instructors use Web 2.0 for video sharing via YouTube. Nearly, half of the teachers have never used Wikis. The main problem in the use of Web 2.0 in teaching was the lack of training programs organized by universities and other institutions for instruction in the use/teaching of Web 2.0 tools. Susan and Baby (2012) analyse the ICT and skills of university library professionals of Kerala and have observed that the younger professionals showed more interest in emerging technologies and ICT based services. Most of the library professionals have a positive attitude towards the application of ICT based services in libraries. The main problems in ICT utilization was the lack of training in ICT applications. They recommended the University administration and Library associations in particular that due importance must be given to organize training programmes and workshops to equip the professionals with the required skills in modern technologies.

Vasishta (2012) exposed the problems of librarianship in technological era and the need for professionals to cope with the proliferation of information as well as high expectations of the users. He concludes that the competencies and skills form the basis for the continued survival and growth of librarianship in the information age.

Kattimani and Naik (2013) evaluated the competencies required in Librarianship and the Information Communication and Technology (ICT) Skills of different library professionals working in the Engineering College libraries affiliated to Visvesvaraya Technological University, Belgaum (VTU) (www.vtu.ac.in) in Karnataka State, India. The Questionnaire, observation and interaction methods were used to collect the data. They concluded that the majority of the Library professionals working in the engineering colleges in Karnataka state have chosen this profession accidentally. The significant difference is observed between different designations towards competence on the operation of computers, creation of files and folders, RFID, library automation software modules, various operating systems, internet related skills, web design/web editors, Search engines and digitization of IR, compared to all designations. These colleges ought to adopt modern technological applications particularly for their
libraries. Further, to manage such technology, there is a need to recruit library professionals who are experts in managing modern technological applications.

2.4 Inferences of the Literature Search

From the study of Literature review the researcher drawn some inferences,

- LISA, LISTA, Emerald insight database, Science direct: library journals and Books, Google scholar and ERIC databases reviewed.
- Blogs, Presented papers in Conference/Seminars, Discussions, Reports, Reviews and Theses reviewed.
- Most of the related articles published at international level are more compared to Indian context. For the past 20 years (1993 to 2013), huge developments initiated to encourage on skills, knowledge of library professionals in the field of ICT at International level.

2.5 Conclusion

The survey and the review of related sources of literature on the subjects of the research are always helpful, and they are the first step to the designing of research study and they are of great help in designing an appropriate methodology of study. For the purpose of collection of relevant sources of information on the topic, the researcher has referred and reviewed. Reviewing related literature which gave depth of knowledge about the developments, activities, action taken, new initiations in the field of ICT for the Development of Continuing Education programmes and training for library professionals all over the world.

In India, it is in the initial stage and there is no development shown for fast 10 years. The NGOs and the Government Organizations are taking much interest on developing ICT in the library and the development of library professionals. It is clear that the technological change clearly affects library staff and there is a need to develop guidelines and policies to train the professionals in providing frontline services in academic libraries. Hence, the researcher has undertaken the present study.
References


~ 72 ~


http://www.emeraldinsight.com/


competencies: A case study of university librarians. Library Philosophy and
Practice. Retrieved from http://digitalcommons.unl.edu/libphilprac/466

Choice and Equipage of Professionals Implications for Re-structuring LIS
Programmes in Developing Countries with special reference to India. Paper
presented at World Library and Information Congress: 74th IFLA General
Conference and Council 10-14 August, Québec, Canada. Retrieved Dec.27,

librarians: A Slovenia/UK comparison. Aslib Proceedings: new information
perspectives, 57(1), 85-98. Retrieved from Emerald Management First

Biswas, Ashish. (2010). Revising LIS Curriculum with Respect ICT Application in
India Power Point Presentation. Retrieved Feb. 25, 2011, from
www.slideshare.net/.../revising-lis-curriculum-with-respect-to-ict-appl

Academic Institution Libraries in Arunachal Pradesh: A Survey, Paper
presented at 6th International CALIBER-2008, February 28-29 & March1,
University of Allahabad, Allahabad.

Library Management, 29(8/9), 729-745.

Breen, C and et al. (2002). New information management opportunities in a changing

Buarki, Hanadi., Mark,Hepworth., Ian, Murray. & Cliff, McKnight.(2009). Educating
Library and Information Science Professionals in Kuwaiti Higher Education, Paper
presented at Challenges for the New Information Professional, 2009,
BOBCATSSS 2009, pp.1-10.. Retrieved Feb. 25, 2011, from
http://eprints.rclis.org/handle/10760/12941#.ULKA3YdfGgY

of distance librarians in academic libraries. Journal of Library Administration,
45(1), 81-99. Retrieved from
www.caspian.switchinc.org/~distlearn/resources/.../OrganizationalIssues.ht


Garrod, Penny. (2001). Staff training and end-user training issues within the hybrid library, Library Management, 22 (1/2), 30-36.


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