CHAPTER 3

REVIEW OF RELATED LITERATURE

Every piece of ongoing research needs to be connected with the work already done, to attain an overall relevance and purpose. The review of literature thus becomes a link between the research proposed and the studies already done. Some of the literature reviewed is directly relevant and hence used as a preface to explain the background of the work. The review of literature is important to highlight difference in opinions, contradictory findings or evidence, and the explanations given for their conclusions and differences by different authors. In some cases, an analysis of these factors could help one to understand many facets of a complex issue and at other times, such an analysis could lead to a new possibility that can be researched upon in the current project. Thus, review of literature is a very important aspect of any research both for planning one’s work as well as to show its relevance and significance.

Prior to launching the study a survey of the related literature was undertaken, the purpose of this exercise was to understand the already existing trends, findings and problems so as to arrive at a right perspective. The research topic has been divided into five sections and a search was made for related research material in various journals, books, reports of seminars and conference proceedings. A bibliography was prepared of the most relevant and related research-based articles. A detailed and in-depth study of these articles was done and findings noted down. The literature part was divided into five sections namely challenges in library automation and electronic sources, challenges in computer networking and Internet, challenges in preservation of digital and traditional collections, challenges in skill development and challenges in copyright
and intellectual property rights. The literature reviews were arranged in the chronological order.

3.1 CHALLENGES OF LIBRARY PROFESSIONALS

The vision and mission of academic libraries are changing in India. These academic libraries take the key role of providing the competitive advantage to various universities, research and development organisations which play a pivotal role in the process of nation building. Academic libraries are positioning themselves to be the torch-bearers and path-makers of educational advancement by way of integrating knowledge systems and resources. These academic libraries are required to do serious introspection on their roles, responsibilities and contributions. The library and information professionals are required to enrich their professional competence and leadership qualities which would facilitate meaningful identification, location and evaluation of information resources in order to promote professional excellence among the user community.

Academic libraries in India play a crucial and leading role over other types of libraries by transforming their information management skills, techniques, practices and resources. With the ascent of digital documents and digital libraries, library and information professionals’ role has expanded and challenges have increased manifold. These challenges relate to collection management, knowledge organisation, digital preservation, online searching, content management, knowledge management, and promoting the use of libraries and networks. LIPs are required to work as leaders, managers and facilitators.
3.2 CHALLENGES IN LIBRARY AUTOMATION AND ELECTRONIC SOURCES

Many engineering libraries in India have yet to be automated. This creates some challenges to the library professionals in the area of library automation and electronic sources. This part of the review literature has dealt 14 reviews from journals, Websites and conference proceedings.

Mulla et. al., (2010) in the study ‘Usage and Performance of Various Library Software Modules in Engineering Colleges of Karnataka’, analysed the library automation in Karnataka Engineering college libraries. In India, library automation began in the late 1970s in a few special libraries and it has now reached most of the university libraries. It has yet to take off in college libraries in Karnataka owing to various problems. Many studies on library automation have been undertaken in the developed countries, but few have been undertaken in India. This study is a survey of Engineering College libraries that have computerised their operations and services in Karnataka. The study is limited to the automated libraries of Engineering College libraries in Karnataka. It gives a status on the software packages used by the various libraries, and opinions of the librarians about the performance of the different modules of the software they have used.

Sadanand and Shamin (2008) concluded in the study ‘A Survey of Library Automation in College Libraries in Goa State, India’, that the status of automation in the colleges of Goa is similar to that of college libraries throughout India. Libraries, librarians and college administrations must initiate automation in order to provide effective and efficient services to users. Library professionals must upgrade their skills in order to meet the growing expectations of users from libraries.
Harinarayana and Raghavan (2008) examined the comparative retrieval effectiveness of the two packages, namely CDS/ISIS and LIBSYS. A set of eight well-defined parameters were employed to compare the two packages. The result showed that neither of the two packages provided support for all the features expected of ideal retrieval software. The researchers found some significant difference in the need of a model for the automation, networking, and federating of resources for other groups of libraries in India.

Another study carried out by Husain and Ansari (2007) discussed the effectiveness of library services including efficient organisation and retrieval of information activities. Since the application of information technology in libraries, one of the greatest challenges before the library managers has been the selection of a good library automation software, which can cater to the needs of a particular library. The authors found that though a number of Indian as well as foreign software companies had entered the market, only a couple of library automation software packages gained success in making their presence felt. Their study also discussed the salient features of cataloguing module of three such packages, namely, ALICE for Windows, LIBSYS, and VIRTUA and their acceptability in a developing nation.

Ramanujam (2007) in the study ‘The Changing Library Scene’ explained non-LIS professional looks at the merging electronic communication in libraries from a subjective and impressionistic perspective and argued in a half-serious-half-humorous vein that the electronic environment has resulted in three kinds of losses: the loss of self-importance (in the author’s own case); the loss of a sense of discovery; and the loss of comfort and solitude.
A study conducted by Matoria and Ram Kumar (2007) provided an understanding of the challenges confronted by the National Informatics Centre (NIC) in the scale and scope of the deployment of e-Granthalaya. NIC proposed a Web-based online library service connecting public libraries in India and integrating library services in a “single window access”. There is a need of a model for the automation, networking and federating of resources for other groups of libraries in India.

Mulla and Chandrashekara (2006) studied on ‘E-Resources and Services in Engineering College Libraries – A Case Study’ explained the libraries have witnessed a great metamorphosis in recent years both in their collection development and in their service structure. Over the past several years, a significant transformation has been noticed in book collection development policies and practices. Print medium is increasingly giving way to the electronic form of materials. This study examined libraries by region within the State of Karnataka, India. It also examined the level of efforts taken by the engineering college libraries in Karnataka to build electronic resources.

Mukhopadhyay (2006) discussed the development of library management software over the past decades, the characteristics and trends of software with special reference to packages available in Indian environment and compared the services and facilities incorporated in library automation packages.

Anjali Watane, et. al., (2005) analysed the library professionals’ computer literacy and use of IT in college libraries of Amravati city. The authors conducted a questionnaire survey of selected college libraries to find out the proportion of librarian's computer literacy and use of IT in college libraries. The finding of this study was that out of 38 colleges, 14 colleges were selected including Engineering Colleges that
covers IT awareness of the library professionals and IT application in libraries. The result of the study was that though the librarians are computer-literate, they are not reluctant to make use of IT applications in library. 50 per cent of IT is applied in college libraries. The library professionals are now at the stage of automating the libraries with vast emerging trends in Information Technology (IT).

Another survey covered various aspects of library automation such as information technology infrastructure, in-house activities, information services and their usage. Suku and Mini (2005) briefly described the role of INFLIBNET Centre in accelerating the automation activities of university libraries, especially in the context of the recently introduced UGC-INFONET programmes.

Ayyappan (2005) in the study ‘Electronic Media: Challenges Before Librarians’, analysed the impediments and challenges faced by library professionals for installing and managing electronic media services to their respective clientele. The concept of electronic media, need for electronic sources, various kinds of electronic information sources, the impact of electronic media on the library and the professionals are highlighted. The challenges faced by librarians for managing the electronic media in respect of additional skill, management aspects, security, infrastructure facility, finance, staffing, preservation, marketing, user education, standardization in purchasing and recruitment of IT oriented staff are also discussed. Suggestions to overcome the challenges are put forward.

Yogendra Singh (2003) analysed the various factors that directly or indirectly affect the progress of library automation such as management issues, resources available with the libraries, level of skill of staff, availability of suitable software, geographic location, the areas in which automation has taken place and role played by
the INFLIBNET, and found that things were changing for the better as library automation in academic libraries is now being regarded as an urgent need.

3.3 CHALLENGES IN NETWORKING AND INTERNET

This part of the review dealt with the challenges of library professionals in the area of networking and Internet which covers 18 studies from various journals and abstracts from Internet as well as published sources.

**Prabhat Singh Rajput and Gopal Singh Jadon (2007)** in the study ‘A Step Towards Developing of Digital Libraries: Changes and Challenges’, dealt with developing of digital libraries due to advancements in information technology. It analysed and considers a range of definitions for a digital library from the perspective of the properties of traditional library. The present study explained about digital libraries, technology requirement for creating digital library and conversion of the documents into digital format. Digital library provides better services to users but this brings the changes and challenges in libraries. Finally it is highlighted the basic changes and challenges in library due to digital library.

**Rochna Srivastava (2004)** explained in the study ‘Is Internet a Substitute for Library’, that the library and information science professionals start feeling that libraries are really in trouble, grave danger when important higher education officials say ‘Internet has made libraries obsolete’. But the same is not true as reading ‘is Culture’. If users want to save this culture of ours, users really need to strike a blow for reading and above all need to change the notion that Internet is a substitute of the library.
Ojha, et. al., (2000) in the study ‘Impact of Information Technology on Libraries: A Futuristic Approach’, reviewed the changing scenario of libraries with special reference to India and the application of information technology during the last decade of the 20th century. It visualised that libraries in the 21st century will be known as paperless or electronic libraries. Paper will be replaced by CDs, and other forms of non-book material. Internet will be another important medium for retrieving and marketing of information. The libraries may not require to have huge buildings but they may be available at readers' desks, may it be the home or office.

Chowdhury and Choudhury (1999) in the study ‘Digital Library Research: Major Issues and Trends’, noticed that a number of technical and related issues are to be addressed by hybrid libraries. Information Communication Technology has brought many new avenues for librarianship to increase their own capabilities in organising and retrieving information in the 21st Century. All the same it has given a challenge to the profession in a different way.

John Barnard (1999) stated in the study ‘Web Accessible Library Resources for Emerging Virtual Universities’, and gave a new assumption, arising among many current students – Whether correct or wrong - is that they can obtain most or all of what they need through the Internet. Academic libraries have seen a distinct shift in the way much of their information has been made available over the past few years because of the rapid technological advances. Journal indexes, encyclopedias, and many other databases have become virtually extinct in print form with the proliferation of digital resources. Even these digital media have quickly moved from stand-alone CD-ROM to local area networks within libraries, then to campus-wide area networks, and finally to
it is capable to provide more library services to distant students, while minimizing the need for travel to a campus library.

**Pat Tefferies and Fiazy Hussain (1998)** in the article, ‘Using the Internet as a Teaching Resource’, concluded that the many benefits of the Internet is the facility to produce and edit multimedia communication related material, as well as the ability to provide virtual words for an increasing variety of collaborative learning environment. Thus, use of the Internet may be seen to support and encourage the revolution which has been taking place in education whereby new learning environments have been developed which are based on principles of active learning - reflecting the change in the culture of education from teacher-centred to learner-centred.

**Jange Suresh and Koganuramath (1998)** concluded in the article ‘Useful information sources on world wide web for social care professionals: A study’, that the Internet has increased the role of librarian and has made the librarian to act as navigator, consultant, facilitator and evaluator of global intellectual resources. Pressure is increasing on librarians to cope up with these new challenges and changing users needs. Library staff are undergoing Internet training programmes to keep pace with the new technologies and to satisfy the growing complex information needs of users.

**Moorthy and Mangla (1997)** in the article ‘Information Technology Applications in Academic Libraries’ described that academic libraries are interested in the Internet, but do not have the available resources to dedicate to exploring its usefulness. It is unfortunate that the Internet has become an issue when academic libraries and funding agencies are facing budget crisis. Many libraries simply cannot afford to investigate the potential of the Internet on a large scale as they concentrate their resources on maintaining the more traditional services. The main barrier to wider
use of Internet services will require investment in infrastructure, equipment and staff training. Some academic libraries are now involved in researching how to exploit the Internet, but the vast majority of academic libraries do not yet have access to it. It is difficult to stand in the midst of rapid change and develop a clear perspective on where technology will take us in the coming decades. Librarians providing digital access need to understand that information resources are not just text.

**Berghel (1997)** analysed in the study ‘Digital Village : Watermarking Cyberspace. Communications of the ACM’ that the Internet provides space and medium to share one’s ideas and interact with other ‘like minded’ people. It creates social interaction beyond geographical, political, religious and racial boundaries. The author called such a cyber community as digital village, brought about by the real-time interactive and participatory capabilities of the cyber space. These digital villages have no location, yet they connect individuals with shared interests and objectives.

**Mernit (1996)** observed in the study ‘Publication on the WWW: What’s happening today and what may happen in future’ that the Internet could bring new benefits to the users of an academic library. The benefits are the use of the Internet as a means of supporting a more holistic and multifaceted approach to education, removing constraints of time and place, and dependence on conventional resources for learning, providing a resource for lifetime reading which is already widely available in the workplace and will become increasingly so in people’s own homes, provision of a facility which enables students and educators to publish their projects, writing and curriculum materials in a way that is both similar to and different from, traditional methods and providing support for collaborative working which various researchers believe to be extremely important for the learning experience.
**Herb Brody (1996)** made an attempt to study ‘The Internet : Promise and Reality’, that users could search for information on the Net by “surfing”, and making educated guesses about which links to follow from a few select Web pages to find the information needed. But the phenomenal growth of the Internet makes that strategy about as successful as looking for a lost contact lens in the sand on the beach with your eyes closed. That leaves millions of pages of information floating out there in cyberspace, somewhere, unreachable by anyone lacking the specific Web address. Unfortunately, as the Web grows geometrically, the number of pages grows exponentially, making the task of the searcher all the more difficult.

**Barbara Stewart (1996)** in the article ‘Internet advantages for the technical services librarian’, explained that Internet provides a wealth of information for the libraries. There are many Internet sites of interest available in each and every field of knowledge. Internet immensely helps all the important activities and services offered by a library including acquisitions, cataloguing, reference services, serials interlibrary loans and specialised resources lists over 350 sites of librarian Interest in these areas. Price verification and ordering clarifications regarding price or exchange rates could be done by using Internet.

**Cronin and McKim (1995)** emphasized in the study ‘Science and scholarship on the World Wide Web : A North American Perspective’, that scholars have been the most active builders who use a number of diverse discussion forums such as list servers, e-mail, e-journals, and home pages for debating and sharing ideas. The worldwide reach of the Web means that the academics and researchers in less developed countries can interact with remote data sets hosted by the institutions in the developed countries. Web facilitates new kinds of technology transfer for educational
purposes. The Institute for Scientific Information as well as major abstracting and indexing services started including some titles available on Internet for indexing and coverage in their databases.

Gokhale (1995) quoted in the study ‘Collaborative Learning Enhances Critical Thinking’ that collaborative working means that students will be capable of performing at higher intellectual levels. Internet provides adequate materials for the learning of students. It leads to augment the need of Internet uses. The Internet adds a whole new dimension to reading and calls for new approaches on the part of both staff and students. The Internet is being used to provide shared workspaces for students to allow them to contribute to each other’s learning.

Clifford Stoll (1995) described the challenges in the study ‘Silicon Snake Oil : Second Thoughts on the Information Highway’. Challenges to imposed filters and other blocking devices in libraries are springing up everywhere, as one might expect. These challenges raise interesting and nettlesome questions. Does the library have the right-or even the responsibility – to pay close attention to the viewing or accessing habits of its patrons via the Internet that it is denied in the realm of normal, print-source materials? Should librarians undertake the additional role of “information cops”, snooping into their patrons’ search behaviors? What about patron confidentially, privacy, and one’s right to free inquiry and free access to information? Are these legal and constitutional issues at stake?

Bruce Park (1992) concluded in the article ‘Libraries Without Walls: or Librarians Without a Profession’ that accessibility and deliverability of information is priced accordingly and would see discrimination based upon “information have’s” and “information have-not’s”. And besides those who are priced out of the information
market, those who want the information and can pay but find that the library does not provide the services, must then go elsewhere to get their information. Another differentiation between the “information have’s” and “information have-not’s” is in the knowledge that information exists and the skill to access it effectively. To address this growing problem, some librarians are teaching patrons with information retrieval skills.

**Keisler, Sara (1986)** in the study ‘The Hidden Messages in Computer Networks’ gave the social efforts of computer networks which is far greater and more important than you imagine, and modern technology would enable libraries to cooperate and create networks with speed and ease. New technology provides opportunities for delivering of services in which the role of the librarian would be that of entrepreneur, marketing information without waiting for users to come to the institution. Now we have a technology that will allow us to move from a holdings-oriented environment to that of an access-oriented one.

### 3.4 CHALLENGES IN PRESERVATION OF DIGITAL AND TRADITIONAL DOCUMENTS

**Jagtar Singh (2009)** suggested in the study ‘Future of Academic Libraries in India : Challenges and Opportunities’, based on the assumption that the future of academic libraries is in our own hands. It further emphasized the need for change in academic libraries in the context of the emerging knowledge economy. It underlined the mandate of the National Knowledge Commission and gives the present scenario with regard to higher education and access to knowledge and information. It also highlighted the impact of ICT and paradigm shift in academic libraries. It appreciated library consortia, institutional repositories, and open access archives as strategic response to the paradoxical situation of growing digital documents and declining
library budgets. It emphasized that more important than the name of a library (traditional or digital), is the mandate and the context of the library. It also enlisted the challenges and opportunities facing the academic libraries.

**Mani (2009)** in the article ‘Digitisation: Preservation and Challenges’ studied the major challenges in choosing methods from analog to digital conversion is obtaining an in-depth understanding of the source material and the techniques being used for the same. The following factors should be taken into account before undertaking the job: format of the source (including size of object, its structure, and its physical condition), and its impact on the ability of the item to be handled during the conversion process and level of detail (including the colour of the paper ink used.) All conversion tools have limitations in terms of the size of source documents they can handle with a given level of digital resolution in the digital world, preservation is the action and access is the thing—the act of preserving access. A more accurate construct simply states “preserve accessibility”. Librarians and archivists can influence vendors and manufacturers to provide new equipment that is backward compatible with existing systems.

**Samir Chattopadhyay (2006)** analysed in the study ‘Digital Preservation In The Twenty First Century: Concept, Needs, Problems And Solutions’ explained that more and more information is being created in digital form. This is done either through converting existing materials to digital form or increasingly born digital. There is no other format but digitise the original. There are increasing expectations in all spheres of life. The information we all need will be available on the Internet or at least in an off-line digital format, such as CD-ROM. Digital access has many advantages over paper-based or microform access in terms of convenience and functionality.
The present paper deals with the concept of preservation and digital preservation. Difference between digital and paper-based material are discussed. The paper highlighted the objective and benefits of digital preservation. Preservation by document type like electronic journals, theses and dissertation and scientific data sets and standard by document type like text, images, numeric data, and video and audio are briefly discussed.

Kademani et.al., (2003) explained in the seminar paper ‘Preservation of Information Resources in Libraries: New Challenges’, paper discussed about the importance and need of preservation of information resources in libraries, factors that affect degradation and deterioration of library materials and methods of tackling them. It also discussed the preservation problems that are associated with the digital information and the challenges faced by the librarians in preserving the intellectual content contained in the digital media.

According to Wheatley and Holdsworth (2001), in ‘Emulation, Preservation and Abstraction’, the technical feasibility of emulation raises questions about emulation as a unified concept. It analysed and tested Rothenberg Proposal which reveal the potential flaws or a high degree risk if future recovery of preserved digital information depends on the ability to write emulators on an as needed basis at some point in the future. In one experiment than it developed an emulator for an operating system which had been obsolete for nearly two decades, the investigators were not able to develop an emulator based on available documentation. Rather they relied on access to some of the original developers of the system and their own knowledge of it to cope with many undocumented work-around that programmers who had introduced into the original system to overcome what were, at that time, hardware and memory limitations.
Lawrence et.al., (2000) studied in ‘Risk Management of Digital Information: A File Format Investigation’, and explained the standards for preservation. Without well established standards, each migration requires a customized approach that involves an analysis of the source file format, a selection of a target file format, and a conversion using either off-the-shelf products or programs written specifically for the conversion. There is no generic off-the-shelf software available to implement migration as a general preservation strategy, although some commercial products include several generations of backward compatibility as well as import and export functionality for related classes of documents, images and data files.

Rothenberg (1999) in the article ‘Avoiding Technological Quicksand: Finding a Viable Technical Foundation for Digital Preservation’, studied the reliance on standards alone as a digital preservation strategy. The researcher found the various limitations in the study. First, there are many areas for which no technical standards yet exist. Commonly, new types of media, new forms of representation, and other innovations precede the development of either open or proprietary standards. Typical examples today include digital audio, digital video, color representation schemes for images, and multi-media objects, all of which are being generated in competing formats. Second, in the absence of open standards for many aspects of digital objects, proprietary standards become the de facto standard. Even where open standards exist, they may not be effective because a proprietary standard is technically superior to an open standard or because few or no vendors produce products that conform to the open standard. Third, standards change and evolve over time. Even strict adherence to standards will not eliminate the need eventually to convert digital materials in obsolete, but standard formats, to newer formats. Finally, even if there are accepted and implemented standards for the types of materials that a digital library collects and
wishes to preserve, the digital library developers may not be able to enforce those standards on the firms, organisations, and individuals that supply information to it.

Ross and Gow (1999) studied on ‘Digital Archaeology: Rescuing Neglected and Damaged Data Resources’, found the computer museums have been ruled out as a long-term preservation strategy because of the impossibility of keeping computers or peripheral devices in operating condition for the long run. There are attempts however in a few museums to extend the useful life of obsolete hardware and these could intersect in a meaningful way with efforts by librarians and archivists to salvage obsolete materials. Finally, digital archeology refers to a variety of methods that can be used to access data on media that have been damaged in disasters, from age or neglect, or where the hardware and software are either no longer available or are unknown. The researchers summarized the results in several case studies of data recovery using digital archeology and concluded that with sufficient resources, much materials seem lost when media are damaged or allowed to deteriorate which could be recovered.

Hedstrom and Montgomery (1998) in the study ‘Digital Preservation Needs and Requirements in RLG Member Institutions’, suggested that there are several factors that have worked against development of clear management structures for digital preservation. First, many early digital library programs and many projects to develop digital collections were launched as research, experiments, or special projects with no consideration for preserving the assets that each program or project developed. Second, beyond conceptual frameworks, specific standards for some data formats, and a few persistent repositories that were under development, there were no working models of well-integrated and cost-effective digital preservation programs. Third, competing claims about the technical feasibility or effectiveness of different preservation
methodologies has caused confusion among program administrators and possibly promoted a "wait-and-see" attitude. Finally, there were no well developed financial models for digital archiving that could help managers to assess the overall costs of adding preservation capabilities to digital libraries or to compare the relative costs of different strategies.

**Ann Gerken Green** and **Joan Dionne (1996)** examined in the ‘Preserving the Whole: A Two-track Approach to Rescuing Data and Metadata’, that there was an urgent need to augment research in the area of digital preservation. Projects which further increased our knowledge in the challenges of preserving various types of materials maps, archival materials, color documents, bound volumes, data-sets, music, and electronic formats like SGML, PDF, ASCII and HTML must be undertaken. The research needs to include a careful accounting of the actual costs of preserving these materials. If projects do not provide cost effective preservation solutions or have only marginal benefits, users need to be informed of this. If some techniques or strategies work better than others, users need this information clearly stated.

**Giguere (1995)** in his study ‘Electronic Document Description Standards: A Technical Feasibility of Their Use in the Augmentation of the Microform Preservation of Contextual Cues Embedded in Structured Electronic Documents During Successive Digital, Analog or Digital Reformatting’, faster, cheaper and higher resolution conversion technologies are another critical element needed to make digital preservation feasible on a large scale. Most archivists and librarians accept the fact that users live in a hybrid environment where paper, microfilm, video, and magnetic and optical media need to inter-operate in a more integrated and transparent manner. The vast majority of primary sources today still resides on paper and/or microfilm with little
chance that users would see the mass conversion of existing archival and library holdings to digital formats. Moreover, improvements in conversion technologies might support hybrid solutions to preservation and access problems by permitting repositories to store certain formats of digital material on stable media, such as microfilm, which on demand to convert to digital form for analysis and reuse. Efforts to capture and store descriptive mark-up on film for subsequent conversion are hampered by unacceptable error rates in OCR technology and cumbersome conversion processes.

**Levy and Marshall (1995)** studied on ‘Going Digital: A Look at Assumptions Underlying Digital Libraries’, that the challenges in preservation of digital documents. The important challenge is the absence of established standards, protocols, and proven methods for preserving digital information. With few exceptions, digital library research has focused on architectures and systems for information organisation and retrieval, presentation and visualization, and administration of intellectual property rights. The critical role of digital libraries and archives in ensuring the future accessibility of information with enduring value has taken a back seat to enhancing access to current and actively used materials. As a consequence, digital preservation remains largely experimental and replete with the risks associated with untested methods; and digital preservation requirements have not been factored into the architecture and resource allocation or planning for digital libraries.

**Graham, Peter (1995)** studied on ‘Requirements for the Digital Research Library,’ and suggested that the mechanisms that will enable users to establish authenticity, require archives and libraries to store much more than the content of digital documents. It attributed such as formal document structures, metadata that document the maintenance and use history of the document, time and date stamps and a
series of references among documents are essential for determining authenticity and for understanding the provenance of sources and placing them in a larger context.

**Van Bogart (1995)** reported in ‘Magnetic Tape Storage and Handling’, about the improvements in the stability, capacity, and longevity of the base storage media are needed drastically to reduce the vulnerability of digital materials to loss and alteration and to lower storage costs. Ample research and experience provide evidence of what could go wrong with magnetic media as a result of binder degradation, magnetic particle instabilities, and substrate deformation.

**Conway (1994)** studied in ‘Digitizing Preservation’, and concluded that the most commonly used preservation strategy is to transfer digital information from less stable magnetic and optical media by printing page images on paper or microfilm. It seems ironic that just as libraries and archives are discovering digital conversion as a cost-effective preservation method for certain deteriorating materials; much information that begins its life in electronic form is printed on paper or microfilm for safe, secure long-term storage. Yet, high-quality acid neutral paper can last a century or longer while archival quality microfilm is projected to last 300 years or more. Paper and microfilm have the additional advantage of requiring no special hardware or software for retrieval or viewing. Perhaps, this explained why in many digital conversion projects, the digital images serve as a complement to rather than a replacement for the original hard copy materials.

**Lynch Clifford (1994)** analysed in ‘The Integrity of Digital Information: Mechanics and Definitional Issues’, and found the generalizations, even if restricted to one community of users such as humanities scholars, run the risk of overlooking and understating potential user needs. Precise requirements for presentation and analytical
tools vary among disciplines, yet some basic requirements are likely to transcend fields
and disciplines. The ability to establish the authenticity and integrity of a source is
critical to users, whether it is generated by an individual, created in the conduct of
institutional business, or produced through a formal publication process.

Eaton, Fynnette (1993) reviewed in the article ‘The National Archives and
Electronic Records For Preservation,’ and proposed the current methods for monitoring
the physical status of digital materials are labour intensive, unreliable, and potentially
damaging the materials themselves. Recommended procedures for monitoring physical
deterioration of magnetic tape, for example, involve reading a small sample of tapes
periodically to determine whether any data losses have occurred. The potential exists to
build monitoring and reporting mechanisms into digital objects, storage systems, and
network architectures that could support self-reporting of physical status and initiate
automatic maintenance procedures.

Swade (1992) in the study ‘The Problem of Software Conservation’, explained
that there are three other technical approaches to digital preservation that warrant
mention because they may have some role to play in preserving certain types of digital
objects or in hybrid solutions. The strategy of print-to-paper is so primitive that
it barely deserves attention, except for the fact that printing to paper may serve as a
stopgap measure for preserving digital information in very simple formats, such as an
exact page image, in institutions that lack the technology infrastructure and capacity to
pursue other methods. This approach however, is becoming increasingly limited in its
application as digital objects become more complex and as they contain more features
and/or behaviors that can only be preserved or replicated if the materials are preserved
in digital form. Another approach relies on "computer museums" or repositories
of obsolete computer hardware, peripheral devices, operating systems, and application software.

Michael, Lesk (1992) analysed in ‘Preservation of New Technology’ that digital preservation requirements may be expressed differently by archives, libraries, and other types of repositories that are struggling to meet escalating user expectations with limited financial and technical resources. Storage systems should be capable of handling digital information in a wide variety of formats, including text, data, graphics, video, and sound. Digital storage is not only an alternative means for storing print formats because many types of digital objects do not have print equivalents and cannot be preserved in non-digital formats. Ideally, storage media will have a long life expectancy, a high degree of disaster resistance, sufficient durability to withstand regular use, and very large storage capacities. Conversion from analog to digital formats and migration to new generations of technology would be rapid, accurate, and inexpensive enough to permit very large scale transfers of heterogeneous materials. Storage space requirements will be minimal and do not demand highly sensitive environmental controls. To make digital preservation affordable to the widest possible range of organisations and individuals, equipment, media, and maintenance costs must be modest.

Michelson and Rothenberg (1992) argued in the article ‘Scholarly Communications and Information Technology: Exploring the Impact of Changes in the Research Process on Archives’, that networking and access to digital sources will change all dimensions of the scholarly work process, including identifying sources, communicating with colleagues, interpreting and analyzing data, disseminating research findings and teaching. If their projections are correct, digital preservation
programs must support a high degree of integration of source material into analytical processes by coupling research sources with the tools necessary to analyze them; by maintaining linkages between research results and the sources on which they are based; and by providing a means to incorporate primary sources into teaching. Digital preservation would add little value to the research process if it serves only as an alternative form of storage from which analog replicas are produced for use with conventional analytical methods. Preserving digital materials in formats that are reliable and usable, however, would require long-term maintenance of structural characteristics, descriptive metadata and display, computational and analytical capabilities that were very demanding of both mass storage and software for retrieval and interpretation.

O'Toole and James (1989) developed the study, ‘On the Idea of Permanence’, that digital preservation raises challenges of a fundamentally different nature which are added to the problems of preserving traditional format materials. By digital preservation, the researcher meant the planning, resource allocation, and application of preservation methods and technologies necessary to ensure that digital information of continuing value remains accessible and usable. The researcher intentionally used the term "continuing" rather than "permanent" value to avoid both the absolutism and the idealism that the term "permanent" implies.

Gould, Constance (1988) in his study entitled ‘Information Needs in the Humanities: An Assessment’, explained that in order to preserve digital materials on a scale commensurate with mass storage capabilities and in formats that are accessible and usable, it was necessary to articulate some basic requirements. There were two ways to examine digital preservation requirements: from the perspective of users of
digital materials and from the view of libraries, archives, and other custodians who assume responsibility for their maintenance, preservation, and distribution. Libraries and archives would not accomplish their preservation missions if they do not satisfy the requirements of their users by preserving materials in formats that enable the types of analyses that users wish to perform. At the same time, libraries and archives were unlikely to be able to satisfy all requirements of all potential users primarily due to resource constraints. By making explicit preservation requirements from both the users' and custodians' perspectives, libraries and archives would be better able to integrate digital preservation into overall planning and resource allocation. The potential uses of digital materials were varied, unpredictable and almost endless.

3.5 CHALLENGES IN SKILL DEVELOPMENT

According to Maitrayee Ghosh (2009), in the article entitled ‘Information Professionals in the Open Access Era: the competencies, challenges and new roles’, the push for open access is to encourage new avenues of disseminating information quickly and broadly to advance knowledge. Self-archiving in open access repositories, metadata harvesting, electronic resource management and interoperability in searching were presenting a whole new dimension of the information landscape. Information professionals working in libraries have been facing tremendous challenges in disseminating scholarly material and learning objects emanating from their institutions. Librarians serving in universities and academic institutions can launch a program to help faculty pay for publishing in open access journals, introduced the concept and secured the funding through various means. A pro-active approach in information handling and collaboration with IT staff and academics are essential for open access to be sustained. The skills and competencies for information professionals are outlined,
along with challenges they may face in developing sustainable models for open access repositories. The paper elaborates the different roles that information professionals have been playing in the development and promotion of digital resources in this open access era and offers recommendations for further improvement.

Ally Sornam and Prakatheswaran (2008) studied about in the study ‘Present and Desired Level of Competencies of College Librarians’, and analysed that library professionals are expected to respond with a sense of urgency to critical information needed by the clients. In order to fulfill this key role they require two main types of competencies – professional and personal. This study attempted to study about the present and desired level of competencies of college librarians. In addition to studying the present and desired level of competencies, the paper examined the overall competency level and their association with select demographic variables like age, experience, professional qualification, marital status, and type of family, native place, income, number of dependents, nature of training attended and type of training.

Nirmal Ranjan Razumdar (2007) analysed in the article, ‘Skills For Library And Information Professionals Working In Borderless Library’, about the skills of librarian in the borderless library. Borderless library is a technologically empowered web-based library, which provides services to its user throughout computer networks. As the changes occurred in library environment, the library and Information Science professionals should be acquaintance with different skills. The author tried to reflect 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.
Ramesh Babu et. al., (2007) analysed in the study ‘ICT Skills among Librarians in Engineering Educational Institutions in Tamil Nadu’, 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 around Information Technology, especially in educational institutions. Application of ICT in academic environment in India has increased gradually in the recent decades, more particularly in Tamil Nadu. This study examined the ICT skills among librarians in engineering educational institutions in Tamil Nadu. The analysis of the data represents the extent and the level of ICT skills possessed by the librarians of these institutions.

Dinesh and Khaiser Nikam (2007) gave a study on 'Strategic Marketing of Engineering College Library Services and Products', was an attempt to know what were the strategic methods adopted by engineering colleges of Karnataka in order to serve their users effectively. It covers some of the aspects like different types of marketing tools and techniques to provide diversified, well rejuvenated services, application of market audit and strategies for promoting the use of library resources and services like creating awareness through different medias, special invited lectures and competitions or debates. The findings of the study were fascinating, which would be definitely useful to the present and future Engineering College library professionals to promote their products and services.

Youngok Choi and Edie Rasmussen (2006) concluded in the study ‘What Is Needed to Educate Future Digital Librarians’, that due to the changing nature of librarianship resulting from the increasing amount of information available in digital format, educating digital librarians has become an important agenda within library and
information science schools. To design and offer appropriate courses and teaching approaches for training competent digital librarians, educators can benefit from the feedback provided by current practitioners in order to determine accurately what skills and knowledge are really required for digital librarians to be effective in the digital workplace. To that end, we surveyed current digital library professionals in academic libraries in the United States to identify their activities, skills and to detect any gaps in their training. The researchers analyzed input from the survey responses to learn more about the nature of digital library work practices and to identify common and necessary attributes (knowledge and skills) required for "digital librarians." The findings from the study have implications for the design of digital library education that meets.

Kalpana Dasgupta studied on ‘Libraries and Librarians in India on the threshold of the 3rd millennium: Challenges and Risks’, analysed the information era with its electronic facilities would come with many challenges in all the sectors of development since information is the base for all developmental activities. Libraries and information centres and librarians would have their share of challenges and risks to partake in this major activity. To bring about this change India would need to have a vision for the third millennium and each sector will have to adopt the latest developments in information technology. This included change in the functions of the library to make it service oriented rather than collection building oriented; preservation and access may be considered as vital; marketing of information and library service development of library professionals to cope with new environment and to deal with the management techniques for dealing with the new objectives and prepare a national policy for library and information centres keeping in mind the needs of the different sectors within the field of Indian librarianship.
Kanwal Ameen (2006) in the study ‘Challenges of preparing LIS Professionals for Leadership roles in Pakistan’, stated the library leadership is almost an unexplored area in LIS education and literature in Pakistan. All library education schools in the country offer management courses to impart skills needed for managing libraries but there hardly exists awareness regarding the importance of inducing leadership concept and traits-as distinct to managerial skills-among LIS academia, researchers and practitioners. The paper explores different aspects of the issue with specific reference to Pakistan by using triangular research method. The review of the literature was instrumental in developing data-gathering tools. Data was obtained from professionals through questionnaire, content-analysis, focus, group discussion and personal observation and experience. The paper identified fundamental leadership attributes required for US professionals and their status among professionals in Pakistan. General and specific barriers related to the profession were also identified as LIS education, poor working of professional associations, low profile among the public, low status among other colleagues in the same organisation, low self-esteem and so forth. Findings suggest that emerging social, professional and technological scenario in the country requires information professionals, with leadership qualities, to foresee and create the future by timely planning and not become the victim of unforeseen changes. The role of the concerned quarters in this regard has also been suggested.

Gayatri Mahapatra1 (2006) conducted a study on ‘LIS Education in India: Emerging Paradigms: Challenges and Propositions in the Digital Era’, and explained the libraries all over the world are moving beyond the conventional framework and giving the footprints of radical changes in the skeletal concept of LIS profession. The librarians of 21st century have to prepare themselves suitable for working in network environment and should also acquire necessary skills such as leadership, exploiting
information handling, communication, crisis management, team building and decision making. So, the library professionals were in dire need to acquire the relevant skills and expertise to track the world of information and become competent enough to serve in a digital culture. An attempt was made here to project issues related to the LIS education in India and suggested some proposals in this respect based on routine features and experiences. The study also proposed the core elements of the LIS curriculum and the vision LIS education in India for coming decade. The paper also stressed the needs of revised course contents and allied challenges for readiness of Indian LIS education in digital era.

Sharma (2005) carried out a study ‘Changing role of librarians in digital library era and need of professional skills, efficiency and competency’, concluded that a librarian with diverse talents and training, and who is flexible, would be able to meet the challenges of future library scene. The container of information was not only the print materials but also a huge rate of information born in digital format. Technology alone cannot help to bring about the required changes. Attitudes, practices, and policies need to change if libraries in India are to truly benefit themselves and their community of users by the application of new technologies.

Fulton (2003) suggested in the article ‘Shifting sands of professional identity: The leader’s role’, and argued that one of the biggest challenges is from colleagues who do not realize the full implications of our changing profession and who tend to hold on to traditional practice of librarianship. When such individuals are facing a change in their roles, or as the researcher called it “a shift in professional identity”, they can be difficult and require the leader to take an active role. They may display their
feeling of vulnerability, anxiousness, inadequacy and self-consciousness with contemptuous, hostile and angry behaviour.

**Tennant (2002)** conducted a study on ‘Digital libraries: The digital librarian shortage’, described the digital librarian challenges. Librarians were faced with the challenge of acquiring advanced knowledge and skills to augment what they traditionally learned, and to do so while at the same time there is a shortage of experienced library staff. As a consequence, educating digital librarians who were competent to work in the dynamic and complex digital environment has become a high priority.

**Julien and Boon (2002)** analysed in the study ‘From the front lines: Information literacy instruction in Canadian academic libraries’, and argued the librarians’ skills in the areas of technology, educational design and teaching techniques which were crucial in their new educational role. Teaching skills are the key in today’s environment where librarians are taking an active role in forming partnerships with faculty in achieving key information literacy outcomes. The deficient skills of librarians in key competencies regarding information literacy instruction in Canada, Western Libraries and the Taylor Library Support encourage professional development. During the recent years, staff development budgets have increased, and librarians are encouraged to take advantage of learning opportunities which directly support their skill building in key strategic areas.

**Joseph Jestin and Parameswari (2002)** conducted a study ‘Challenges for Library Professionals in India in the new Millennium Information’, and explained information as the saying goes, is power. The primary objective of libraries is to organize and provide access to information. This objective will never change, although
the format and the methods that are used can change dramatically, providing new opportunities and challenges. Higher education, scholarship, technology and economics, which are all interrelated, play an important role in understanding the needs of libraries. In this study, the term "technology" refers to computer technology, communications technology and information technology. A librarian who is aware of all of these three technologies can face the challenges of the new millennium.

Crowley (2001) stated in the study ‘Tacit knowledge, tacit ignorance, and the future of academic Librarianship’, and articulated the threat of being seen as peripheral, invisible and not inconsequential. It should encourage academic librarians to design and sustain service programs that appeal to those who have the power to alter or sustain value definitions in their particular academic contexts. Moreover, it should be a strong incentive to initiate or continue both short-range and long-range efforts to ensure that the librarian, in any academic environment, is seen as central, visible and consequential.

Rao and Babu (2001) highlighted in the study ‘Role of librarian in Internet and World Wide Web Environment’, that a well viewed interface always attracts the users and increasingly relevant to the way people access and use digital technologies. A beneficial way for librarians to break out of their insularity is to become much more closely involved and collaborate in the work of computer and information scientists tasks such as design, organisation, development and maintenance of digital library repositories, interfaces, search engines, networks and Web documents.

Scheirer (2000) analysed in the study on ‘The changing role of the teacher-librarian in the twenty-first century’, concluded that the LIS professionals have been playing a versatile role beyond their traditional job. Library professionals have to
gather adequate knowledge of computer and communication technologies, networks and networking, operating systems, Internet concepts, database management systems, along with adequate practical exposure to handle technological devices. In mobilization of all kinds of information resources librarians are expected to work as pathfinders by assisting all users with varied backgrounds and abilities through information supportive environment and multiple strategies.

3.6 CHALLENGES IN INTELLECTUAL PROPERTY RIGHTS AND COPYRIGHT RIGHTS

Rupak Chakravarty (2010) explained in the study ‘Preserving traditional knowledge: Initiatives in India’, Traditional knowledge is a valuable asset for any country as it plays a vital role in making the nation more progressive and transforming its society. The author discussed the need for preserving traditional knowledge. The paper described the role of the Traditional Knowledge Digital Library and its activities in preserving traditional medicinal knowledge in India. The copyright protection is not merely confined to books but extends to sound recordings, computer programs, films, radio and broadcast. The Indian copyright act was passed in 1957 and amended in 1994 and 1999 to include computer generating works. Intellectual Property Right in Indian scenario is less known by the people due to extreme illiteracy in context to patent system and copyright which included under TRIP (Trade Related Intellectual Property Rights). Librarians play an important role in protecting the rights of copyright holders, patent holders, trademarks and industrial design. The Librarians or Information officers should keep themselves aware with latest changes in the Intellectual Property Right and Information Technology Act and their implementation. It is an obligation of the Librarian to keep the user aware about copyright.
Natarajan and Gayas Makhdumi (2009) concluded in the article, ‘Safeguarding the Digital Contents: Digital Watermarking’, that protecting intellectual property is currently a “hot” topic for scholars, for university administrators, and for the media and for publishing industries. This has drawn lawyer, legislators and computing service professionals. For fine arts and manuscript sources, quality of representation in the Internet and other digital images distributions is as important to the curators as aspects more commonly considered intellectual property rights. The possibilities for digital watermarks in the fields of geo-imaging and e-commerce are only just being realized. Watermarking can support a broad range of imaging data types whilst supporting industry standards security implementations. It is transparent in use, does not increase files sizes, and yet is highly robust, secure and customisable. The technology has unique ability to safeguard, both digital and printed work, and secures the complete workflow with minimal impact on existing processes. A deeper understanding of the theory behind DWM will lead to the design of more robust and reliable systems for a variety of applications.

Kathy Matsika (2007) stated in the article ‘Intellectual Property, Libraries and Access to Information in Zimbabwe’, and addressed some of the issues affecting access to information and knowledge in Zimbabwe. It would look at the major challenges posed by finances, technology, infrastructure, the Intellectual Property Laws and the Copyright Act, in particular. It would discuss the role of ZIMCOPY, the Reproduction Rights Organisation of Zimbabwe, in the information chain in Zimbabwe. It will pay particular attention to what Zimbabwe has done in trying to harness the potential of Information and Communication Technologies (ICTs) in accessing information; the availability of the Internet and constraints of bandwidth. Zimbabwe has more than 70 per cent of its population living in the rural areas. The paper would show the attempts
that have been made to provide access to information through libraries and similar
information centers, in both urban and rural communities of Zimbabwe.

Property’, and explained the term "Intellectual property" has come to be internationally
recognized as covering Patents, Industrial Designs and Trademarks used to be
considered as different kinds of Industrial property. But when copyrights, confidential
information were included the phrase Intellectual property gives more appropriate
description. Although the creation of a trade mark has very little to do with intellectual
creativity it could not be doubted that patents, designs and copy rights are the products
of intellectual effects and creative activities in the field of applied arts or technology
and fine arts.

Thyagarajan (2004) suggested in the article on ‘Information Technology: Ten
Challenges for the next Ten years’ suggested that university lawyers and scientists who
follow intellectual property issues say that among the biggest issues of the coming
decade will be long-sought revisions to the Digital Millennium Copyright Act. Critics
of the law have complained ever since it was passed, in 1998, that it favors the financial
interests of copyright owners over the needs of librarians, classroom instructors,
researchers, and just about everyone else. The Association of Research Libraries and
the American Library Association would particularly like to see the Congress, the US
Copyright office, or the courts to loosen a provision of the digital-copyright law that
prevents users from bypassing technologies that limit access to digitized copyrighted
works. The law should allow consumers to copy and distribute excerpts from books for
research and teaching, just as traditional copyright law allows them to do with print
editions of books.
Ramesh (2004) presented an article on ‘Patent Illiteracy : A Threat to Economic Growth’, explained the patent illiteracy in the concept of intellectual property right and threat for the copyright regime. The author explained the concept ‘intellectual property’ is a “Product of mind”. It is similar to the property consisting of movable or immovable things like a house or a car wherein the proprietor or owner may use his property as he wishes and nobody else can lawfully use his property without his permission. Intellectual Property Right is a general term covering patents, copyrights, trademarks, industrial design, geographical indications, and protection of layout design of integrated circuits and protection of undisclosed information (trade secrets). Of these, patents are the most important ones. One of the specialised agencies of the United Nations System, provided that “intellectual property” shall include rights relating to literary, artistic, and scientific works, performance of performing artists, phonograms and broadcasts, inventions in all fields of human endeavor, scientific discoveries, industrial designs, trademarks, service marks and commercial names and designations and protection against unfair competition and all other rights resulting from intellectual activity in the industrial, scientific, literacy, or artistic fields.

Harish Suryavanshi (2004) elucidated in the article ‘Intellectual Property and Information Technology: Perils and Prospects’, and explained the revolution information technology is changing access to information in fundamental ways. Increasing amount of information is available in digital form; networks interconnect computers around the globe; and the World Wide Web provides a framework for access to a vast array of information, all available at the click of a mouse. Yet the same technologies raise difficult fundamental issues concerning intellectual property, because the technology that makes access so easy also greatly aids copying both legal
and illegal. As a result, many of the intellectual property rules and practices that are evolved do not work well in the digital environment.

According to Michael Seadle (2004), in the article ‘Copyright in networked world; Permissions services in Library’, no obvious or unambiguous solutions are available, but some pitfalls have grown clearer. The management of IPR could not eliminate the reasonable exercise of consumer rights without risking widespread popular resistance and potential economic harm specially, if protections are applied to all forms of IP regardless of purpose. The Information Professionals have to forge ahead in understanding these issues in the real sense, so as to become the true information intermediaries between the generators and receivers of information.

Keefe (2002) studied on ‘For now, congress won’t take on Digital piracy; industry seeks its own solutions’, developed the concept of digital piracy and rightly opined that, many contemporary right holders view Internet as their enemy. The author further quoted ‘after copyrighted music and movies move to the Internet, it is almost impossible to stop the material from being used over and over again despite, copyright laws. Scanners which are largely being used to store and transmit information could not determine whether a particular sheet of paper contains copyright protected words. The same holds good for sound and video recordings, as analog sources provide no unambiguous clues about possible infringement. One could easily argue, that once the Information is available on the net, it is meant for free access, and digital copy suffices for world wide distribution.

Satarkar (2002) while specifying the infringement aspects has quoted the various sections and concepts related to the above but a small extract of the same reads as : Copyright in Infringed when, a person makes for sale or hire, or sales or lets for
hire by way of Trade Displays or offers for sale or hire, distributes either for the purpose of trade, or to such an extent as to affect prejudicially the owner of copyright or by way of trade exhibits in public or imports to India, any infringing copies of the work.

Sridevi Goel (2002) concluded in the article ‘Redefining IPR in the new digital Environment’, explained the wonderful insight into the work being carried out in this area. The paper clearly indicated that there is a marked rise in such cases and the subsequent raids that have been carried out in five major areas in India, all of which clearly point out its importance in the digital environment today.

Kala Thairani (1998) narrated in the article ‘Copy-right law and its enforcement in 50 years of book publishing in India since independence’, suggested that the basic aim of this branch of law is to promote the cultural development of the society by affording legal protection to the rights of authors of creative works as well as those concerned with the dissemination of such works to the public in order to prevent unauthorized appropriation. It is in the above context that, Information professionals have to assume greater responsibilities by acting as a negotiator to transfer the information as well as the technology to their clients.

Ahuja, Ashish (1996) opined in the article ‘Chaining the Unchained books’ that copyright as an infringement on the philosophy of the library science In the new digital era, the librarians and the readers have been enjoying with the recent technology but they have positively understand the concept of IPR. Information Officers should keep themselves up to date about the IPR and Copyright Act, and there should be a provision for short term courses or training for the purposes. It is an obligation of the librarian to keep aware the user about copyright.
Moorthy, Lakshamana and Karisiddappa (1996) studied on ‘Electronic publishing: impact and implications on library and information centre in Digital Libraries’, regarding the copyright issues. Display, downloading, copying or printing of copyright works in electronic form have to be performed under control license, since copyright violation leads to revenue loss for publisher. ISI electronic library project is developing a security and rights management system, which will take care at the client, both at local and central server levels. The system will use password, secure printing through encryption and watermarks and guaranteed authenticity with the use of digital signature.

Satyawrat Ponkshe (1991) wrote on his book ‘The management of Intellectual Property’, stated the intellectual property rights are created by incorporating information in tangible object capable of multiplying in an unlimited number of times at different location anywhere in the world. The property is basically with the concept, idea, and thought and thereafter in the actual product, work and process.

After analyzing all the related studies in this area, the researcher found out the research gap. To fill up the gap the researcher has chosen the title “Challenges for Library Professionals of Engineering Colleges in Southern Districts of Tamil Nadu”.
REFERENCES

I. Challenges in Library Automation and Electronic Sources


II. Challenges in Networking and Internet


4. **John Barnard, (1999).** Web accessible library resources for emerging virtual universities. The Journal of Library Services For Distance Education, II(1), July, 89.


III. Challenges in Preservation of Digital and Traditional Documents


**IV. Challenges in Skill Development for Modern Library**


V. Challenges in Intellectual Property Rights and Copyrights


