Chapter 2

2.1 INTRODUCTION

It is rather a “Herculean task” for an individual researcher to review the whole quantum of studies, conducted to know the availability of electronic information sources and services in university libraries, which took its genesis during the last quarter of the 20th century. The difficulty in reviewing the published literature in this area could be attributed to the following reasons: (i) Electronic Resources have become ubiquitous, acquired various forms and influenced each and every discipline. Hence, the studies on electronic information resources, and their use by the end-users have been scattered in other fields like information science, communication studies, etc; (ii) Such studies are abundance in number; and (iii) There is no consistency in the use of terms and concepts as far as electronic information resources concerned. Because of the apparent difficulties, here an attempt is made to present a bird’s-eye-view of most relevant research studies published in connection with the collection of electronic information sources and services, and their awareness and use by the academic community in general with special reference to university library environment.

An effort has been made to search relevant literature by making use of electronic version of LISA, conference proceedings, journals and books in Library and Information Science field and also Internet. A closer look at the literature published on the topic chosen for the present study reveals that, though many professionals in the field of
Library Information Science have made attempts to study the topic under investigation, their approach is not wholistic in terms of scope and coverage of electronic resources and services on one hand and their usage on the other.

The literature reviewed for the present study is classified and presented under three categories, viz., 1. Studies related to the conceptualization of research problem under study; 2. Studies by Foreign Authors; and 3. Studies by Indian Authors. The first set of studies have helped the researcher to establish theoretical understanding of the research issues raised in this study on one hand and theoretical foundation of the research problem under investigation on the other. The second set of studies reviewed are empirical in nature, conducted in different settings and contexts in India and abroad. For the sake of convenience the second set of studies are classified on the basis of their origin as studies by foreign authors and studies by Indian authors.

2.2 Studies related to the conceptualization of research problem

The last quarter of the 20th century has witnessed significant changes in the higher education system all over the world. In this system, the major paradigm shifts took place, such as from teacher-centred to learner-centred, class-centred to virtual classes and subsidization to privatization / commercialization. As Srinivas (2003) put it rightly “Higher education today is changing from a conventional type of campus based university into an Internet-based virtual university; and from time and space confined
education to life-long, ubiquitous and perpetual education. Mass higher education is undergoing a radical process of globalization which includes not only round-the-clock, round-the-globe markets and new information technologies but revolutionary concepts of time and space.”

Higher education has witnessed a sea-change with regard to teaching and research. According to Welukar and Deshpande (2002) “The information technology has ushered into a whole new era of teaching and learning. It will now make the university campus borderless and transform the traditional classroom learning into direct learning environments, the students into knowledge workers and teachers into information disseminators. The traditional teachers with their archaic teaching methods would soon become obsolete as informed teachers would opt for the best educators through expanding Internet and satellite system.”

Electronic devices such as multimedia packages, audio-visual aids, computers, Internet, etc., have made teaching and learning more interesting, teachers and students need not sit in a classroom for imparting education. Teachers can address their students scattered all over the world from distant place. Internet-based teaching and training materials are gaining popularity among the academic community (Sangam and Vatnal, 2000). Internet has altered the ways in which the research activities are carried out (Prodhani and Gautam, 2001).
As the technology occupied the prime place in the university activities, the university libraries started to use them in order to keep pace with the changing environment. Kumar (1987) lists the major factors that contributed to the introduction of computerization in Indian libraries, viz., (i) Greater speed; (ii) Increase in efficiency; (iii) Capability to handle large volume of data; (iv) Flexibility to numerous manipulations; (v) Improved quality in service; (vi) Economy in power; (vii) Availability of hardware and software facility; (viii) Responsibility thrusted on the organization; and (ix) To enhance the prestige.

Rowley (1993) stated that the objectives of library computerization are: to accommodate an increased workload; to achieve greater efficiency; to introduce new services; and to benefit from cooperation and centralization.

According to Haravu (1995), the main reasons for application of IT in academic and special libraries are to: (i) obtain increased operational efficiencies; (ii) relieve professional staff from clerical chores so that they are available for user oriented services; (iii) improve the quality of services; (iv) provide new services hitherto not possible; (v) improve the management of their physical and financial resources; (vi) facilitate wider access to information for their clients; (vii) facilitate wider dissemination of their information products and services; (viii) enable their participation in resource sharing library networks; and (ix) enable rapid communication with other libraries and professional peers.
As listed by Lancaster and Sandore (1997), the reasons for adoption of new technology in libraries are to: cop with increasing demands; to reduce staff or prevent staff increases; allow more jobs to be performed by clerical or para-professional staff; improve existing services; to provide new services; and to collect better data to aid overall management of the library.

By making use of the Information Technology, the libraries have automated their house-keeping operations such as acquisition, cataloguing, circulation and, serials control (Ashok Babu, 1998; Sridhar, 2000).

Automated acquisition system eliminates tasks such as typing order records, filing order records, updating budget figures, etc. (Harbour, 1994).

Kumar (1987) states that computerization provides the benefits in classification as it saves time by avoiding reference to the schedules of schemes for classification on and often. Also, the constructed class number can be used as query language in a typical retrieval system. It improves accuracy and speed in classification.

The growing complexity of the card catalogue and the increasing cost of catalogue maintenance were identified as important factors for library automation. As collections in libraries expand and grow, it becomes more difficult to maintain the manual card catalogue (September, 1990).
Computerized cataloguing offers benefits such as: No filing or other routine catalogue maintenance is required; different catalogue formats can be chosen for different catalogue locations; and extracts from the main catalogue database may be printed or consulted online (Rowley, 1993).

Automated circulation system performs the following functions: provide information on the location of the item: on loan at the bindery, on reserve, etc.; give details of items on loan to a borrower; record of reserves, alerting the library staff on return; print recall notices for items on long-term loan; renewal of loan; and alerting library staff about overdue items and printing of over-due notices, etc. (Kumar, 1987).

Serials control can be automated as follows:

(i) Ordering: Ordering new journals, renewal / discontinuation, sending reminders, receiving the journals.

(ii) Reader Services: Preparation of a list of periodicals received, list of periodicals cancelled, list of holding with their status (i.e. on shelf, in binding, on loan, etc), and,

(iii) Management services: Budget management, announcement of the missing serials (Ravichandra Rao, 1983).

Libraries have been profoundly influenced by the developments in electronic publishing. The evolution of electronic publishing, as found by Lancaster (1995), has
evolved gradually over a period of four decades and the evolution has the following manifestations:

1. Use of computers to generate conventional print-on-paper publications. This development can be traced back to the early 1960s (e.g., the production of Index Medicus at the National Library of Medicine). The use of electronics to print on paper is not a completely pedestrian application since it allows new capabilities such as printing on demand and even the production of customized publications tailored to individual needs.

2. The distribution of text in electronic form, where the electronic version is the exact equivalent of a paper version and may have been used to generate the paper version. For secondary publications (indexing and abstracting services), electronic distribution began early in the 1960s. For primary journals, the development occurred somewhat later. There is a considerable activity and interest in projects - in which electronic version is accessible online, as CD-ROM, or as a combination of these - that make electronically accessible the text and / or graphics of journals that are also sold in print-on-paper form.

3. Distribution in electronic form only but with the publication being little more than print on paper displayed electronically. Nevertheless, it may have various “value
added” features, including search, data manipulation and alerting (through profile matching) capabilities.

4. The generation of completely new publications that exploit the true capabilities of electronics (e.g., hypertext and hypermedia, electronic analog models, motion, sound).

The impact of electronic publishing on libraries is alarming. At the lowest level of effect, it is now commonplace for them to make electronic publications available, through online access or in CD-ROM form, and to instruct patrons in use of these resources. Several of the larger academic libraries have gone much further by establishing departments designed to support access to publications in electronic form and to exploit their capabilities. Some of these do more than the training of users and the provision of access. For example, the Electronic Text Centre at the University of Virginia Library has assumed responsibility for the SGML-tagging of certain texts that lack such encoding (Seaman, 1993).

According to Large, Tedd and Hartley (2001) by the 1990s CD-ROM became a recognized medium for publishing information covering a range of topics including many computer games and software. A further development in optical storage technology has been the digital video or versatile disc - read only memory (DVD-ROM) which looks similar to a CD-ROM, but which is capable of holding about seven times as much data
and was designed from the beginning to deliver high-quality multimedia streams at high data rates. The emergence of graphical user interfaces, client server technology and, above all, the rapid development of the Internet and WWW during the 1990s have completely transformed the electronic generation, storage and retrieval of information. Initially the Internet, which is essentially a network of networks enabling computer around the world to talk to one another using a specific set of commands, was used for communicating via e-mail, transferring files of data or programmes (ftp), and accessing remote data (telnet). However, the development in the early 1990s of the World Wide Web, which began as a hypertext publishing system at the European Laboratory for Particle Physics in Geneva and enables a searcher to follow links within and between documents, has had immense impact on the use of the Internet for publishing information and thus for searching. These electronic gadgets have brought major changes in the Library and Information Science field.

In order to satisfy the user information needs to the fullest extent, libraries need to collect and provide access to variety of information sources. Information sources have been categorized differently by different authors.

Chowdhury and Chowdhury (2001) have categorized the information sources exhaustively as given below.

- Natural sources: Solar system, oceans, rivers, mountains, forests, etc.
- Museum objects, relics, etc.
• Information sources created before the beginning of the printing era:
  Writings, pictures, etc., on stones, clay tablets, parchment, cloth, paper etc.
• Printed sources: Books, monographs, theses, conference / seminar / workshop / project reports, etc., periodicals, reference sources.
• Microforms: Microfilms, microfiches
• Analog storage devices: Audio and Video cassettes
• Digital Sources:
  - Online Sources: Internet and World Wide Web Sources
  - Online databases: Abstracts and full-text databases available through search services, like Dialog, STN, OCLC First Search, etc.
  - CD-ROM databases: LISA, INSPEC, Ei Compendex
• Institutional sources
• Human Sources

Gopinath (1984) divided the information sources into three groups namely (i) primary, (ii) secondary, and (iii) tertiary sources.

The information sources available on the Internet have been categorized by Cooke (2001) as follows: organizational sites, personal home pages and other websites; mailing lists, newsgroups and other forms of communication via the Internet; full-text documents; databases; electronic journals and magazines; sources of news information; advertising,
sponsorship and other commercial information; image-based and multimedia sources; current awareness and alerting services; FTP archives.

By making use of the electronic information sources available in different media, such as CD-ROMs, DVD-ROMs, Floppies, Pen drives, WWW and Internet, the librarians can provide various types of information services. The information services that are based on the electronic resources have been categorized by the LIS professionals differently.

Armstrong et al, (2000) categorized the electronic information services (EIS) in 21 distinct categories as below:

- JISC / CHEST negotiated services
- Other online services Via Vendors (Hosts/Aggregators)
- Online database via Web
- Data sets
- Text archives
- Gateways and Resource Discovery Network
- OPACs (Own institution)
- OPACs (from institutions other than own)
- Own HEI Web sites
- Web sites of other HEIs or institutions
- Current Awareness Services/SDI
- Individual article supply and other electronic document delivery services
- Messaging services
- Electronic journal collections
- Single electronic journals
- Individual publisher sites
- Pre-print collections
- Locally mounted electronic sources such as CD-ROMs
- Search engines/search Engine classifications
- Electronic collection Management services
- Other Web electronic information resources.

Bopp (1995) states that information services can take a variety of forms, from the simple provision of an address or telephone number to the tracking down of an elusive bibliographic citation to the identification and delivery of documents about a specific topic. An information service may take the form of a retrospective search service conducted in response to a user’s query, or it can be a current awareness or SDI service, proactive service that are provided in anticipation of user’s requirements.

Webb, Gannon-Leary and Bent (2007) opine that – Research support is a more substantial element of the work of pre-1992, research-intensive university libraries, where collections have developed to support research over many years, but these libraries may nevertheless have been unable to adopt proactive approaches to service development.
In libraries of all types and sizes reference and information services are a vital part of the function and mission of institution. The advent of electronic resources and digitized materials has changed the nature of reference, the essential service remains central. Indeed, far from minimizing the need for reference services, the rise of the Internet and other like innovations of the past few decades makes this element of the library all the more crucial. Whether at home on their computer or wandering through the stacks, many feel as though they are drowning in a sea of information. (Cassell and Hiremath, 2006).

Further, the authors (Cassell and Hiremath, 2006) came out with different Models of Reference Service, in which they have specified virtual reference service where librarians answer questions by e-mail and chat.

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<th>Type</th>
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<tr>
<td>Virtual reference</td>
<td>Librarians answer questions by e-mail and chat</td>
<td>Users assisted who cannot visit the library</td>
<td>Technology slow and harder to communicate with users</td>
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The widespread developments in electronic information sources and services have posed newer challenges and opportunities for the librarians. The traditional collection development activity has emerged as collection management as librarians need to manage technical, legal, budgetary and other issues in the rapidly changing environment.

Due to the emergence of electronic resources, a clear trend away from the purchase and ownership of print materials toward licensing access to electronic resources
is evident. Information sources are available on various forms such as print, microform, CD-ROM, DVD-ROM, Internet and World Wide Web. These sources are available for procurement, subscription, free of cost, inter-library loan and on the basis of consortia.

Due to the advancement of Information and Communication Technology and their application in the field of Library and Information services, there are paradigm shifts in libraries:

- from custodian of books to service oriented information providers;
- from one medium to multiple media;
- from own collection to library without walls;
- from in good time to just in time;
- from in-sourcing to out-sourcing;
- from local reach to global reach;
- and from user going to the library to library comes to the user. Thus making “Library as a Storehouse Model” to “Library as a Gateway Model” (Seetharam and Ambuja, 2000).

The electronic information sources have brought a revolution in the LIS profession. This has become possible because of the features of information and electronic media. The main features of the 21st century information and media are: high compact storage; ease of reproduction, multiplication and manipulation and transmutation; ease of migration of contents from one medium to another; ease of transmission, communication and storage; hypertext and multimedia; seamless integration of print and electronic resources; sophisticated and multiprong searches through keyword free text, Boolean operators, class numbers and natural language processing; wallless libraries leading to the vision of multimedia global virtual library
(MGVL) inaugurating an era of “death of distance”; and convergence of technology, which is getting more powerful each day (Satija, 2003).

According to Sarbrinder Kaur and Satija, the major challenges with regard to electronic resources are: complicated procurement and preservation system; technological obsolescence; non-compatibility of organizational culture to digital environment; security in library environment; absence of a national repository of digital documents and legislative provisions in this regard; financial constraints; resistance to change; decentralization of library services; access related problems; and problems related to check the reliability and authenticity of digital information. (Sarbrinder Kaur and Satija, 2007).

Collection-development will begin to incorporate new challenges and concerns into the acquisition process, such as site licensing, copyright issues, and how access will be provided to various electronic resources (Feeko, 1997). In this regard librarians will have to take the help of legal experts.

Kumbar and Hadagali (2007) opine that “Collection-development policy is indeed an opportunity to better serve the user community by developing a need based, relevant and variable cost effective collection sometimes without owning but providing access to information through networking.”

According to Navjeet Kaur (2007) the various issues involved in developing a good electronic collection development policy are as follows: 1) How access can be provided; 2) Infrastructure; 3) Cost analysis; and 4) Developing selection criteria.
The shift from acquisition to access - with the availability of open access scholarly literature, research reports, reference sources, and electronic document delivery - has brought changes in collection-development policies. Lancaster (1998) suggests that “the electronic resources at least remotely accessible do not need to be acquired, nor do they need any selection. Rather, the selection activity is of a different kind. Librarian selects what to access, to satisfy a known demand rather than what to purchase in anticipation of future demands.”

According to Holleman (2000) “In the electronic age, there are immense pressures on librarians to abandon their selection principles. There is the pressure to abandon print in order to be proactive about the future; there is the pressure to stop collecting and responding only to demand, when the significance of the demand is usually at least partly defined by the status of the demander; and there is the pressure to purchase collection of materials aggregated by vendors without regard for the needs of individual libraries.”

The notion of library user study is not new to librarianship. Library user surveys have become widespread in academic libraries and often been used as a tool to assess service quality and user satisfaction (Hiller, 2001).

A substantial body of literature has been developed on survey and service quality, led by studies and reviews from such library educators/professionals as Hernon and Mcclure (1990); Nitecki and Franklin (1999); Hernon and Whitman (2001); Van House, Weil and McClure (1990). Some common characteristics of these surveys were: distribution within the library to users was more prevalent than mailed survey; focus on physical use of the library (e.g., “what did you do in the library today”); concentration on specific services (especially online catalogue; and interest in user satisfaction).

Although digital reference services have been a part of libraries for some time, most of the literature has been anecdotal in nature. The few studies that have been done have generally focused on the nature and existence of these services and not any sort of qualitative or quantitative approach to the results or outcomes of these services (Jane, Carter & Memmott 1999).

A broad-based survey of faculty and students came from the University of Washington Libraries’ first strategic plan in 1991 that called for a user-centered approach to services. Specifically, the strategic plan recommended that the libraries “Develop and implement a study to identify user populations, their information needs and how well they are being met” (University of Washington Libraries, 1991).

Providing quality services in academic libraries is a major issue among academic libraries. They see the library more in terms of the provision of and access to service quality than as just a physical place. The studies conducted by Hernon and Calvert
(1996), and Nitecki (1996) emphasize the provision of good library service as more important to the user than the mere physical library building.

Several factors influence the user satisfaction, viz, responsiveness, competence and assurance (which translated to demeanor), tangibles, and resources (Andaleeb and Simmonds, 1998).

According to Poll and te Boekhoerst (1995) the purpose of employing user surveys is described as follows: it provides detailed information about the user’s opinion of the service; helps to classify the librarian’s concept of the service as well as his/her assumptions about the users’ needs; indicates problems; and suggests solutions.

Sloan (1997) focuses on the continuing need for intermediation and assistance for users of electronic services, and describes several instances of libraries using video-based interactive reference services and e-mail reference services. He suggested that such systems must be designed with user needs and satisfaction in mind if they are to add value to the quality of library services overall.

Harter (1997) also sees the need for electronic service to meet user needs by offering selected, catalogued, and classified high-quality information sources, supported by a professional intermediation and user assistance service, if digital libraries of the future are to offer the quality of service of the traditional research library.
Cullen (2001) opines that the issues such as ease of use of access to systems to electronic resources ready assistance for users through electronic mediation and the quality of the resources need to be tested in the next interaction of the SERVQUAL model to ascertain their relevance to users’ perceptions of service quality in the academic library and ascertain the role of electronic services in user satisfaction at the macro and micro level. Such research also needs to examine which aspects of the electronic service contribute to the five variables (tangibles, reliability, responsiveness, assurance and empathy) and how libraries can ensure that these criteria are met in the new electronic environment.

Cook and Heath (2001) suggest that service quality may encompass the following dimensions: affect the service (empathy, responsiveness, and assurance); ubiquity and ease of access (formats, timely access to resources, and physical location); self-reliance; comprehensive collections; and library as place (utilitarian space and symbol of the intellect).

Bertot (2001) suggests different types of evaluation criteria that are used to describe library Internet-based use and service which are as follows:

- Extensiveness: How much of a service the network provides (e.g., number of users accessing a Web page per week, number of database sessions);
- Efficiency: The use of resources in providing or accessing networked information services (e.g., cost per session in providing access to remote users
of an online database, average number of times users are unable to successfully connect to the library’s services);

- **Effectiveness**: How well the networked information service met the objectives of the provider or the user (e.g., success rate of identifying and accessing the information needed by the user);

- **Service quality**: How well a service or activity is done (e.g., percentage of transactions in which users acquire the information they need);

- **Impact**: How a service made difference in some other activity or situation (e.g., the degree to which network users enhanced their ability to gain employment or pursue business);

- **Usefulness**: The degree to which the services are useful or appropriate for individual users (e.g., percentage of services of interest to different types of user audiences); and

- **Adoption**: The extent to which institutions or users integrate and adopt electronic networked resources or services into organizational or individual activities (e.g., answering reference questions, generating interlibrary loan requests).

Lai, Wu and Hsieh (2006) suggest that user satisfaction be measured by the degree to which users are satisfied with system service quality, content service quality and support service quality separately, and with overall user satisfaction as a whole.
No matter how user friendly is the system, end users need clear directions to help them get the best results; training programmes should emphasize system capabilities and the kind of information that can be obtained, and should include hands-on sessions in which users are taught how to do basic searches (Sanderson, 1990).

Supporting the development of effective skills in finding, using and managing information among the research community is fundamental. This development may come in many different forms, depending on circumstances and opportunity, but should at least include: involvement in research training programmes for postgraduates; proactive support for academics, research assistants, contract research staff, supervisors and postgraduates in identifying and using information sources and reference management tools (Webb, Gannon-Leary & Bent, 2007).

The modern university/college library (and many school libraries and public libraries) used to have two crucial functions: (1) it was supposed to serve faculty and students by providing texts and space to work comfortably with those texts, and (2) it guided faculty and students in their research and study (Gorniak-Kocikowska, 2001).

Doyson (1998) makes an interesting remark on the changing role of libraries as thus: “How the Net changes the role of libraries overall is an interesting question: Their role as financial intermediaries changes from buying books to providing Net access; whereas once they could finesse decisions about controversial books because of tight budgets now they have to decide explicitly what to do about access to Net-based
materials that may offend some in their communities. Meanwhile their role as guides and as community centres is increased, and they must reach out to those who cannot afford what better-off people have at home.”

The trend in libraries is towards the acquisition of skills related to various aspects of computer technology. Lancaster (1999) states: If these technological skills are really the most important ones needed by the modern libraries, we are indeed encouraging the complete dehumanization of libraries.”

User education unifies the work of the library staff and the faculty; it makes the librarian move away from a curatorial and passive function into a more active, learning centred and professional role; publishing and marketing in a positive way the vast information of the library and the effective use of these resources (Sehgal, 1998).

According to Krishan Kumar (1991), the user education constituted of the four interrelated components: (a) user awareness; (b) library orientation; (c) interest profiling; and (d) bibliographic instruction. Once users have been made aware of the library as a primary source of information, then they must be oriented to library facilities.

User education in the age of changing information environment has opened new ways of teaching and learning, and use of library collection (Kirby, 1998). With the arrival of computers, Internet, multimedia and other sophisticated technologies, it has become essential to educate users so that they can feel the information environment friendly (Satyanarayana, 2008).
Information literacy is asserted by the American Library Association (1989) as personal empowerment and a survival skill. A new learning process was called for, on that would actively involve students in the process of: knowing when they have a need for information; identifying information needed to address a given problem or issue; finding needed information and evaluating the information; organizing the information; and using the information effectively to address the problem or issue at hand.

Majumdar and Singh (2008) started Information Literacy Program at Delhi University Library with the following objectives: to acquaint the users with the academic power of Internet; to provide an indication as to what is there on Internet related to the area of study and research; to show how web resources could be of immense use in their academic pursuit and research; to show the usefulness of various multimedia resources on the web in Social Science Research; to promote the use of subscribed databases in academies and research; to describe specific features of various databases being subscribed by Delhi University Library System; to acquaint the users with the use of various search techniques to retrieve relevant information; to recognize the need for information, and to evaluate, organize, interpret, and communicate information in all its formats; to promote that Information Literacy for participants’ academic and vocational success and for lifelong learning; to provide research-integrated instruction in collaboration with the faculty and in alignment with research objectives; to establish a direct interaction between users and library professionals; to explain the necessity of bibliographical citations and its usefulness; and to promote the use of standardized citations of bibliographical references.
2.3 Studies by Foreign Authors

A large number of studies have investigated the automation activities in libraries all over the world. A few of them have been considered here.

Lin (1988) reviewed the development of computerized library services in the Chinese People’s Republic. He discussed the important role of the National Library of China, and recent developments in computerized acquisitions, cataloguing, circulation control, union catalogues of periodicals, and on-line cataloguing.

Zhu (1998) provides an overview of the application of IT in academic libraries in China. The author opines that the establishment of networked information system and connecting with other networked system have explored the technologies from other countries in order to meet the challenges offered by the globalization.

Fong (1997) surveyed automation activities that took place in seven university libraries in Hong Kong. He made a detailed account of the development of online catalogues in these libraries. These university libraries have made the catalogues available on individual university homepage and via the Internet.

Younis (1990) studied the computer applications in 333 libraries in Jordan. The author found that lack of trained staff, funds, physical facilities and users’ indifferent opinions were the constraints in using the computers in these libraries.
Hossein Farajpahlou (1994) surveyed 42 Iranian academic libraries and observed that automation of library services started in the late 1970s, and they are at different stages of development. The findings of the study suggest that there were locally developed commercial software, CDS/ISIS software was preferred by the majority of libraries.

Mader (1995) reviewed the automation activities in university libraries in Hungary. The author set out a plan for library automation which includes: outline for library automation strategy, hardware and software requirements and networking of libraries.

Maceviciene and Tolusis (1995) provided an account of library automation in 15 Lithunian academic libraries. During the 1980s these libraries started automation, but developments were very slow in the beginning. Insufficient knowledge of library staff on the usage of modern information technologies and poor financial situation of the parent institutions were the major obstacles in automation of libraries.

Malik (1996) reviewed the status of library automation in Pakistan. The author found that the automation started during the 1980s, and traced the role played by the library schools and professional associations in imparting training on library automation. Inadequate funds, lack of standard software package and proper training were the major problems which came in the way of library automation.
Li (1997) surveyed the automation of Taiwanese university libraries and found that the automation began during the 1970s. In 1988, thirteen universities and colleges in Taiwan had automated library systems. By 1992, the number had increased to twenty-three. In 1994, these were forty-six institutions with library automated systems.

According to Brindley (1989) the creation of Joint Academic Network (JANET) encouraged networking activities in the UK universities. The author opined that the application of it in higher education has influenced teaching, research and administration.

Woods (1986) surveyed British university libraries to know the current status with regard to automation of acquisitions, cataloguing, circulation control, serials control and networking. He suggested a future plans with regard to automation of the UK university libraries.

Metz (1990) studied the trends in automation of the US university libraries. The study found that the libraries have used new technology to automate the house-keeping operations, providing access to commercial databases to their users, and some universities have merged their library and computer units on campus.

Hauptman and Anderson (1994) surveyed 800 different types of American libraries and found that the majority of libraries have possessed advanced technology. Large academic and research libraries have fully-automated their libraries. However, small special and public libraries could hardly function without modern technology.
Nelson (2001) reported online services offered by Wyoming University Library at Laramie to its students and faculty. The study revealed the development of menu-based interface and its successful acceptance by the users.

Richards and Johnson (1990) surveyed the history of LAN development in Lehigh University Library in Bethlehem, Pennsylvania. The campus-wide network, introduced in 1986, provides access to OPAC, Current Contents, full-text databases, locally-produced databases, interlibrary loan, reserves, recalls, and recommendations for acquisitions were automated. The LAN extended to dormitories, faculty and administrative offices, most classrooms and laboratories.

Bellardo (1985) reviewed the studies that were conducted to know online searching behaviour. These studies proposed various personal characteristics that were necessary in an accomplished seeker (in those days they were discussing intermediaries, not end users). These included such traits as intelligence, an analytical mind, enthusiasm, courage, self-confidence and perseverance. The author concluded that not all of them were designed and executed perfectly.

Saracevic et al. (1988) explored the four cognitive traits of searchers: (1) language ability (the ability to make inductive inferences through word association); (2) logical ability (the ability to make deductive inferences); (3) Preferred style of learning (concrete experience, reflective observation, abstract conceptualization and active
experimentation); and (4) searching experience (in this case, on the Dialog online system). They found that the records retrieved by those with greater language ability and an abstract conceptualization mode of learning were more likely to be on target that is, relevance scores were higher.

Abels, Liebscher, and Denman (1996) provide a concise review of the factors examined in use studies. They can be categorized as system factors such as proximity, ease of use, and prior experience; personal and professional factors such as academic discipline, task, or perceived utility; and institutional factors. The authors surveyed science and engineering faculty at six small universities and colleges in the southeastern United States to explore factors that influence adoption and use of electronic networks. They report that faculty members appear to be unlikely to adopt and use electronic networks if they are not perceived to be accessible.

King and Tenopir (1999) reviewed the literature dealing with scholarly journal demand, the use and readership over the past 40 to 50 years. They concluded that the high levels of useful and value-based scholarly journals has persisted over the years and scientists continue to read a great deal and spend considerable time reading, especially scholarly journals.

Tenopir (2003) reviewed and summarized more than 200 research publications (published between 1995 and 2005) that focused on the use of electronic library
resources, and he came to the conclusions including: the rapid adoption of electronic resources in the academic environment; different usage patterns and preferences among different disciplines; the importance of browsing a small number of core journals for subject expertise, especially for current awareness; and that most journal article reading were of articles within their first year of publication.

Hewitson (2000) conducted a study using a questionnaire mailed to a random stratified sample of 200 university staff at Leeds Metropolitan University (LMU) of which 101 were returned. The purpose of the study was to determine the awareness and use of electronic information services by the academic staff. The study found that though academic staff were aware of many Electronic Information Services (EISs), their main preferred source for finding information was the Internet and not the variety of electronic subscription-based services aimed at the academic community. The academic staff used the information obtained from EISs for different purposes which include keeping up-to-date in their subject areas; to obtain texts; to gather information for research; and for teaching preparation.

Based on his quantitative study, Hewitson (2002) conducted a qualitative study to determine how do academic staff at LMU obtain information for their work; what do they do with the information they obtain; how aware are LMU staff of EISs; how confident are academic staff in using EISs and what barriers exist in their use? The study found that the academic staff obtain information for their work from Internet, Learning Centre
catalogue, Electronic abstract and indexes, CD-ROMs, and electronic newspapers and journals. EISs were used for teaching preparation, and collection of information for research work. Academic staff were aware of the many services available to them, but the wide variety of services presented problems. On one hand, the amount of different services made it difficult for staff to be sure which service was the most applicable to them. The Internet was seen as a speedy way to gain broad information on a particular topic. Although they were aware of EISs, some were not always sure that the service they were using was necessarily the right one for them. The majority of beginners in software application skills were consulting traditional library-based resources. Intermediate and advanced users are more likely to use EISs. Those staff who consulted EISs on a regular basis, did not have a problem in accessing the EISs; to them, having to have a password to access the service was seen as an acceptable procedure. For staff who did not use these services regularly, this was seen as a significant barrier. For those staff who used EISs regularly, the initial impetus has often come from either their own research or after embarking on some form of professional development such as a Ph.D. Once they have seen the value of these services in their own work, they began to incorporate them into their own teaching.

Herring (2001) conducted a study to determine faculty attitudes toward their undergraduate students’ use of web for class-related research. To do this, a survey instrument was designed that included some demographic questions, and a series of questions on classroom Web-use policies. The results show that although faculty
members generally feel positive about the Web as a research tool, they question the accuracy and reliability of Web content and are concerned about their students’ ability to evaluate the information found. Many faculty indicated that they either limit their students’ use of the Web, direct students to specific sites, or require students to get permission to use specific sites. The author recommended the academic library professionals to be proactive in working with teaching faculty to develop course-related training aimed at enabling students to find Web-based information effectively and to evaluate its quality, authority and credibility. Librarians need to work in conjunction with subject faculty to select appropriate sites for student use. Libraries must continue to develop traditional print resources along with electronic resources, because the teaching faculty does not consider Web a sufficient resource in either quantity or quality of research information available.

Lazinger, Bar-Ilan and Peritz (1997) conducted a questionnaire survey to examine and compare the use of Internet among various sectors of faculty. The objectives of the study were to determine: the field and research interests of the faculty members; formal training in the use of the Internet via courses, workshops, etc.; self-instruction in the use of the Internet by means of manuals, how-to-do books, etc.; general use of computers; and perceived need for the information the network can provide. The results indicated that Internet use is consistently higher among faculty members in the Science and Agriculture than among those in the Humanities or Social Sciences. The percentage of users who learnt to use the Internet without a course was higher in the Science and
Agriculture group than in the Humanities and Social Science group. Faculty members in the Science and Agriculture group tend to use the Internet more intensively than those in the Humanities and Social Science group.

Budd and Connaway (1997) conducted questionnaire survey to examine the use of networked information by university faculty at eight selected universities, and in 6 selected disciplines. The faculty tend to be conservative in their use and attitude. This is evident regarding submission of work to electronic journals which tend to be perceived as not contributing to promotion and tenure. The study found apparent variations in responses by demographic variables such as gender, rank and department affiliation.

Ehikhamenor (2003) conducted a survey among the academic staff of selected disciplines in the physical and biological sciences, drawn from 10 universities in the southwestern part of Nigeria to know their use and non-use of Internet facilities. The study reveals that though the majority of academic staff had Internet facility at their disposal, they still heavily dependent on printed information sources. Besides e-mail, very little use is made of other Internet facilities. Non-use of the Internet was attributed to problems of accessibility, ease of use (difficult) and cost. Most of the non-users were aware of the information and communication potential of the Internet in their disciplines, and believed that the Internet would become indispensable in their research in the future.
Sangowusi (2003) conducted a questionnaire survey among the lectures at the University of Ibadan, Nigeria to investigate the impact of information technology on their research activities and problems that hinder the use of IT. The study revealed that the IT has influenced the respondents’ research work as follows: increases formal communication; improves quality of work; widens the scholarly community; increases publication; produces more work in less time; improves creativity; and makes it easier to put publication together.

The problems encountered by the respondents were: fluctuation of electricity supply; lack of funds; exorbitant charges; not familiar with software used in libraries; lack of computer knowledge; and feeling uncomfortable with the technology.

Bane and Mitheim (1995) conducted a survey to know the utilization of Internet by the academic staff working in higher education institutes from different countries such as United States, the UK, Australia, Canada, Germany, etc. The study found that the Internet was a popular method for academics with computer experience. The Internet was useful for communication with individuals and groups through e-mail.

Adoms and Bonk (1995) conducted a survey of faculty use of electronic information technologies and resources. The main objectives of the survey were: to survey availability to faculty the equipment and network connections necessary for access to electronic information; to measure faculty use and their frequency of use of
information resources available through networks; to report the locations from which faculty access electronic information, that is, within the library or at remote sites such as campus office or home; and to elicit faculty perceptions of obstacles to the use of electronic technologies as well as to identity new services and other factors that might stimulate the use of such resources.

The survey found a need for improvement in campus networking and connection of home computers to the campus network in order to facilitate availability and use of electronic resources. The study documents the comparative lacks of computers, and especially the absence of connections to the campus network for the Humanities faculty as compared to faculty in the Social Sciences, Sciences and Professional Schools. The electronic resource presently used by the largest percentage of faculty was the online catalogue followed by e-mail. The library was the place preferred to use the e-resources than office/home.

The obstacles to the use of electronic information technology and resources by faculty include: lack of hardware; lack of software; lack of training; lack of information on databases; lack of operating funds; lack of interest or need; and lack of time. The study found that across the disciplines information about databases and training in use of e-mail and networks were the major factors that would stimulate use. Formal classes were regarded by faculty in all disciplines as the least attractive training mode. There was a consistent preference evident for small-group classes or workshops and printed
manuals. It was evident that large percentage of faculty desired the ability to initiate the transactions such as Inter-library loan requests, reference questions, renewals and recalls of library materials, document delivery, requesting materials to be placed on reserve via computer from home or office.

Gardiner; McMenemy and Chowdhury (2006) conducted a nation-wide survey of academics in British universities. The purpose of the study was to know the information seeking behaviour of academics in the digital age. It compares information seeking behaviour of respondents in three disciplines: Computer and Information Sciences; Business/Management; and English Literature. The study found that English academics make higher use of printed information resources, such as text and reference books, than academics of any other discipline included in this study; they generally tended to be the least frequent users of electronic resources such as full-text-databases, indexing and abstracting databases, search engines, and Internet sites. Computer and Information Science academics generally tended to make greatest use of electronic resources, and the least use of print-based information resources, and Business/Management academics fell somewhere in between these two disciplines: Computer and Information Science academics were generally the most enthusiastic about the benefits of electronic resources, whereas English academics were the least enthusiastic about them.

Starkweather and Wallin (1999) have used two qualitative research methods - focus groups and interviews - to explore the experience and concerns of selected faculty
of the University of Nevada, Las Vegas. Most participants replied that the library’s computer-based information resources affected the way they conducted research. They saved time when searching electronic periodical indexes, they had increased confidence in their review of literature by using electronic resources, and they could identify resources in remote libraries and archives. Online access to catalogues and periodical indexes was very convenient and saved faculty time in speeding up research process.

Pease and Gouke (1982) surveyed online catalogue and card catalogue use patterns and showed that users preferred online catalogue to card catalogues.

Mathews Lawrence and Ferguson (1983) surveyed 28 libraries users and non-users of online catalogue and found that after the introduction of the online catalogue there was an increase in the use of library catalogues and collections. The users preferred online catalogue to card catalogue and using online catalogue was easy.

Patitungkho and Deshpande (2005) studied the information seeking behaviour of faculty members of Rajabhat Universities in Bankok using questionnaire. Consulting a knowledgeable person in the field, discussion with the colleagues, discussion with librarian or reference librarian were the popular methods of information seeking. The study found that 82.00% of the respondents used the information for the purpose of preparing class lectures, 79.00% for updating knowledge, 54.00% for writing and presenting paper, and 48.00% for doing research work, and 15.00% for guiding
researchers. The faculty use the Internet for education purposes. Google and Yahoo were the popular search engines among faculty members. The authors suggested to provide training in making use of electronic resources for the respondents.

Rafaat (2005) investigated the information seeking behaviour of Information and Library Science faculty at the University of North Carolina. The study explored the use of electronic resources such as E-mail, News group and List serves, E-journals, Indexing and Abstracting, and Full-text databases, Scholarly e-archives, Directories and search Engines on the Internet. The study found that faculty members were most satisfied with index and abstracts, full-text databases and electronic journals. The author suggested to provide single access point for all types of materials, with ability to search only for specific types of materials, and linkages to the documents themselves.

Franklin and Plum (2004) examined the methodology and results from Web-based surveys of more than 15,000 networked electronic services users in the United States between July 1996 and June 2003 at four academic health science libraries and two large main campus libraries serving a variety of disciplines. Results showed that at the four academic health science libraries, there were approximately four remote networked electronic services users for each in-house user. The ratio was even higher for faculty, staff and research fellows at the academic health science libraries, where more than five remote users for each in-house user were recorded. At the two main libraries, there were approximately 1-3 remote users for each in-house user of electronic information.
The use of networked electronic resources for sponsored research occurs outside the library. Since it is unlikely that faculty would divide their time in such way, or would come into the library for instructional purposes but not for research.

Kinengyere (2007) examined the effect information literacy has had on the usage of electronic information resources in academic and research institutions in Uganda. Data were collected for the study using interviews to both library staff and users of the selected institutions. The study found that availability of information does not necessarily mean actual use. Some of the available resources have not been utilized at all. This means that users are not aware of the availability of such resources and they do not know what the resources offer. All this calls for continued information literacy programmes. The study suggested that respective academic institutions should invest in ICT infrastructure as well as more e-resources for information literacy programmes.

Crawford, De Vicente and Clink (2004) have studied electronic information services (EISs) usage among the users of Glasgow Caledonian University by using a questionnaire. The study found that the users’ understanding of what constitutes EISs is poor; gender has no impact on the use of EISs; off-campus usage is growing; the role of academics in promoting EIS usage is vital; the traditional role of the library catalogue as ‘the key to the library’ is threatened; and gateways and links are of little importance.
Liao, Finn and Lu (2007) studied information needs and information seeking behaviour of international graduate students and American graduate students. This study was based on empirical data collected from an online survey. The goal of this comparative study was to investigate how graduate students from diverse ethnic groups discover, select, and use various information sources and to obtain insights into international students’ information seeking behaviour. Results demonstrate that the impact of language / culture communication barriers and technology barriers on the International students’ access to libraries has decreased. International graduate students are using various online searching tools and resources as often as their American counterparts. Although they are not familiar with many academic library services, they are not afraid to use them. Feelings of shame and embarrassment when asking for help at the reference desk have been replaced with interest in contacting librarians and taking the library instruction/workshops.

Karim and Hasan (2007) studied the reading habits and attitudes of the Bachelor of IT student and the Batchelor of Arts students from the International Islamic University, Malaysia. The study also aimed to explore these differences in terms of gender. The study used a survey approach in collecting the data. The study found that university students spend quite a significant amount of time reading newspapers, academic books and Websites. The amount of time spent on reading was seen as higher than the average individual adults surveyed in the past. The Website was seen as an increasingly important reading source. Analysis on the differences in gender revealed that male
students read significantly more for resources other than the academic books. The study suggested the opening hours be extended (for 24 hours).

Muswazl and Yumba (2007) assessed the impact of implementation of University of Swaziland strategic plan 2000/1-2005/6. The University effected considerable staff re-skilling and made some progress towards widening access to quality subscription-based electronic resources and optimizing the utilization of open access materials. Implementation was negatively influenced by low funding, limited local content on the web, inadequate ICT infrastructure, scarce professional skills, and restrictive policies and procedures. It concluded that further work revolving around the above factors, taking into account user needs for independent life-long learning, is the key to deepening the modernization of LIS at the University.

2.4 Studies by Indian Authors

Konnur and Rajendra (1997) surveyed the library automation activities at Pune University Library. The Library began automation in the year 1987. The activities accelerated after the financial assistance from the UGC under the Inflibnet Programme. The Library procured the computers, and databases of books and journals were created by making use of CDS/ISIS. Additional staff were required to carry-out automation activities.
Bavakulty and Salih (1997) reported the library automation and database creation at University of Calicut Library. Hardware failure was the major problem encountered during the retrospective conversion of the library information resources.

Chandran and Aruna Prasad Reddy (1997) studied the networking activities of Sri Venkateswara University Library. The Library started automation in 1992, and database was created by using CDS/ISIS. The Library got e-mail facility in 1996.

Prodhani and Gautam (1997) surveyed the ten university libraries in North-East India to know the status of automation under the INFLIBNET Programme. The libraries were at different stages of automation and only two libraries had e-mail facility.

The study comprising 45 academic libraries in and around Chennai by Kasi Rao, Ramesh Babu and Kaliyaperumal (1999) reported that these libraries started automation of house-keeping operation such as acquisition, circulation, serials control and inter-library-loan after 1995. Lack of funds and IT Infrastructure were the major problems that hinder the provision of electronic information services in the libraries.

Sixty academic libraries were surveyed by Manimekalai and Amsaveni (2004) to examine the digital information sources and services. Depending upon the extent of automation the libraries were divided into 3 categories, viz., level I, level II and level III. The study found that most of the libraries lack digital resources and services, and manpower skills.
Vyas (2003) studied 12 State university libraries of Rajasthan to know the status of library automation. Another study conducted by Bharat Kumar (2003) surveyed 5 university libraries in Haryana. These two studies recorded the automation activities and problems faced by the libraries during automation. Insufficient funds, lack of support from higher authorities, lack of staff development programmes were the major problems.

The study conducted by Chandraiah (2003) noted the absence of collection development policy with regard to electronic information sources.

Nyamboga and Kemparaju (2002) examined the application of IT in 6 university libraries in Karnataka. They used a questionnaire as a data collection tool. The survey found that the libraries began automation in the early 1990s. The libraries use SOUL for automation, and CDS/ISIS and LIBSYS as well. The study reported the network facilities available in the libraries.

Naik (2003) surveyed the communication media available in 5 university libraries in Karnataka. The study found that all the 5 libraries had the Internet connectivity and only 2 libraries possessed teleconferencing and videoconferencing facilities.

The survey conducted by Ashu Shokeen and Kaushik (2003) at the university libraries of Delhi and Haryana revealed that only 0.13% of the total collection was in electronic form. Another study carried out at university libraries of Punjab, Haryana and Chandigarh by Dabas et al (2003) supports the results of Ashu Shokeen and Kaushik’s study where the collection of electronic information source was only 0.307% of the total collection.
Nair (1999) surveyed the strategic planning of IT applications in agricultural universities. The absence of strategic planning adversely affected the academic activities in the universities.

Venkataramana and Chandrasekhar Rao (2003) conducted a survey in 14 central university libraries. The study reported the computer systems and software used, computerized library operations and development of databases in the libraries. Some of the libraries were providing Internet access service, CD-ROM search service, CAS, SDI, accession list, reference service, and online search service to the users. The study suggested the libraries to plan systematically for successful implementation of IT in the libraries and derive maximum benefits and minimise problems.

Mohamed Haneefa (2006) surveyed 30 special libraries to assess the ICT infrastructure by using questionnaire, semi-structured interview and observational visits to the libraries. The study reported the hardware, software, network facilities, CD-Net server and OPAC development in the libraries. Only two libraries included electronic databases. One library participates in INDEST consortium and 2 libraries participate in CSIR e-journals consortium. The survey suggested to provide ICT infrastructure in these libraries to make use of the electronic resources optimally.

Maheswarappa and Todasad (1999) surveyed the college libraries in Karnataka to know the availability and use of computers. Out of 571 libraries surveyed, only 121 colleges had computers of which only 45 colleges allowed to use them for library activities. The study suggested to provide financial assistance for procuring computers for libraries.
Kanamadi and Kumbar (2007) surveyed the Management Institute Libraries in Mumbai to examine the e-resources and consortia activities. The majority of the libraries have collection of CD-ROM databases. Out of 22 libraries, only 9 libraries have license to access online databases and 13 libraries subscribe to e-journals. Four libraries participate in Management Libraries Network (MANLIBNET). The authors suggested to develop IT infrastructure and participate in consortium activities.

Thapa and Sahoo (2004) recorded the problems of automation at special libraries in Jabalpur. The authors categorized the problems as pre-automation and post-automation. Pre-automation problems include: paucity of funds for initiating computerization; non-availability of computer trained personnel; hesitance of staff towards learning computer operation; lack of administrative support; lack of funds to develop infrastructure; lack of space to accommodate computers and its peripherals; and hesitance of users for automation (This was revealed by a survey). Post-automation problems were: lack of funds; serious technical problems; software not user-friendly; lack of ICT awareness among users; and lack of standardization and incompatibility of hardware.

Borang and Sarma (2008) conducted a survey to know the application of ICT in two major academic libraries in Arunachal Pradesh. The study found that these libraries have developed IT infrastructure in terms of computer hardware and software, and automated their house-keeping operations. The libraries are the members of INDEST consortium and UGC-Infonet e-journal consortium. The study reported that the libraries
provide electronic information services such as: OPAC, e-mail and Internet services, access to resources under UGC-Infonet and INDEST consortium and DELNET databases and services, and computerized CAS and SDI service. The problems faced by the libraries were: inadequate trained manpower, disturbance in telecommunication facility, insufficient budget and irregular power supply.

Durvas Babu (1994) conducted a survey by making use of questionnaire and interview to investigate the information generation and library use by university teachers. The study explored the awareness of library services among the teachers. They were generally aware of reference service, reprography and CAS. Most of the teachers were not aware of the bibliographic service, SDI service, translation service and inter-library loan service. The reasons for seeking information from the library were: to prepare for class room; general awareness of new knowledge; for participating in seminars / conferences; to meet the needs of promotional opportunities; to generate new information; to write text books; and other purposes. The study suggested to establish user service unit in the university library to offer documentation list service, CAS and inter-library loan service. Union catalogue of journals available in University libraries in Andhra Pradesh for resource sharing and supply of content pages of journals for teachers were included in the suggestions.

Mitra (1983) surveyed the user attitude toward the use of microforms in academic libraries. The study revealed the users’ negative feelings to use the information sources available in microforms.
Surveys conducted by Chandran (2000) to examine the use of internet resources and services revealed that most of students, researchers, and faculty use Internet facility available within the university campus. The WWW and e-mail were the popular Internet services. Most of the respondents use Internet for communication of mails and gathering news. Friends and colleagues found to be playing important role in imparting Internet browsing.

Pangannaya and Sujith Kumar (2000) investigated the use of Internet by faculty, researchers and post-graduate students and found that 100.00% of the respondents use it for sending and receiving mails and 59.00% of the respondents for keeping-up-to-date. Yahoo was the most favourite search engine. The study reported that the time slot assigned to the Internet users was insufficient. The users were not aware of the important Websites in their subjects and ignorant about formulation of search queries. Low bandwidth was another problem raised by the users.

Varalakshmi (2003) surveyed the use of Internet by academic staff and reported that finding research information was the main purpose of using Internet. Too much information, irrelevant hits and heavy charges were the problems encountered by the respondents in using Internet.

Saraf and Jain (2006) studied the library services in networked environment at Banaras Hindu University Library. The Library is a part of UGC-Infonet and INDEST consortium for e-journal subscription. The Library provides access to Internet through 12 nodes. The study suggested to create awareness among the users about the availability of these services.
The use of electronic journals by the faculty was surveyed by Singh, Bhupesh Kumar and Kulvir Kaur (2006). The respondents found that e-journals are easier to access, time saving and less expensive as compared to their counterparts in print media. They were satisfied to “some extent.” Internet facility found to be down from the service provider (ERNET, Bangalore).

Mathew and Vijayakumar (2007) assessed the use of IT by students, teachers, IT professionals and scientists at Indian Institute of Information Technology Management, Thiruvananthapuram. The study found that Google and Yahoo were the widely used search engines. Most of the respondents found the Internet helpful to access information. The problems found in accessing Internet were: too much time needed for down-loading; no properly filtered, logically organized or structured information; and too much information. The study suggested to arrange training programmes in making use of the Internet.

Sangam and Hadimani (2004) surveyed the use of OPAC by researchers. The purpose of consulting OPAC by the respondents were: to check whether the required book is available in the library or not; to locate the books in the library; to compile bibliography on a particular subject; to find the bibliographical detail; and to check the number of copies of the required book in the stock. Most of the respondents approach the OPAC by author followed by title and subject. Most of them are satisfied with the assistance in the use of OPAC by library staff. The study suggested to train the users of OPAC, to keep-up-to-date the OPAC, to add journal articles in the OPAC, to locate OPAC near the book stacks, etc.
Rajput, Naidu and Jadon (2008) conducted a survey to find out the use of OPAC at Devi Ahilya University Library, Indore. The study found that 45.32% of the respondents use OPAC daily followed by 21.42% with once in two days, 14.83% with once in a week, 4.67% with twice in a week, 4.94% with once in two weeks, and 8.67% with occasionally.

The use of electronic resources by faculty members of Bapuji Institute of Engineering and Technology was studied by Lohar and Roopashree (2006). The faculty use Internet, CD-ROMs, e-journals, e-books, online databases, and OPAC. They use e-resources to access current information. The problems faced by the respondents in using e-resources were: lack of hardware, lack of software, lack of training, lack of information on e-resources, and lack of time. The study suggested to conduct training to create awareness of e-resources among faculty and provide funds to develop IT infrastructure in the library.

Kumbar and Vasantha Raju (2007) surveyed the use of Internet by faculty and students of engineering colleges. The survey found that most of the respondents use Internet only for e-mail followed by for entertainment, and for preparing assignments, seminars. Less number of respondents use Internet for career opportunities, keeping abreast with new developments, and publish papers. Retrieval of unwanted pages, less speed, system hang-up, and power failure were the problems faced by the respondents. The study suggested to train the users, develop IT infrastructure, and to extend Internet connectivity to the departments and laboratories of the colleges.
Mulla and Chandrashekhar (2006) conducted a questionnaire survey to know the use of Internet by teachers, researchers and students of Mysore University. The study found that Internet was a useful source of information and they use it for e-mail, and accessing information required for their work. Most of the respondents were satisfied with the information that found on the Internet. They took assistance from the friends for gaining knowledge of the Internet. The study suggested to conduct a training programme for the Internet users.

Survey conducted by Azmi and Khan (2006) to know the network-based services at the University Library of Jamia Hamdard found that the Library provides access to the DELNET’s Inter-Library Loan Services and UGC-Infonet e-journals to the users. The study suggested to conduct orientation programme to users on regular bases for utilisation of the networked resources. Membership of few more specialized professional networks at Jamia Hamdard was stressed.

Gupta (2008) conducted a survey to find out the use of e-journals at the University of Lucknow. The study found that 64.76% of the respondents faced the problem of slow speed, followed by lack of terminals with 31.43%, lack of Internet connectivity with 20.95%, and lack of training with 4.76% of the respondents.

Amritpal Kaur (2006) conducted a questionnaire survey of e-resources use by teachers and researchers. The purposes for using e-resources were: research/project work; teaching purpose; publishing articles/book; keeping-up-to-date in the subject area;
finding relevant information in the area of specialization; and for getting current information. Most of the respondents found the information adequate. The slow speed of Internet was the problem for 85.83% of the respondents. Other problems include: too much information for 22.50% of the respondents, and lack of IT knowledge was some of the problems faced by 19.17% of the respondents.

Vasappa Gowda and Shivalingaiah (2007) conducted a survey to know the researchers’ attitudes toward e-resources. The study found that the respondents prefer to use print resources to e-resources. The researchers of Science discipline use e-resources heavily as compared to their counterparts in Humanities and Social Sciences. The majority of respondents favoured the usefulness of e-resources and agreed that they have changed their way of finding information. Researchers opined that e-resources have helped to improve the quality of research. The respondents expressed the need for training in the areas: access to library resources, online search and retrieval skills, CD-ROM search and retrieval skills, how to filter resources effectively, to access articles published in particular disciplines, and how to write reference and citations.

Vishala and Bhandi (2008) conducted a survey to assess the opinion of librarians regarding the coverage of journals in the UGC-Infonet E-Journal Consortium and the extent to which the librarians enable to meet the information needs of users with the help of resources under the Consortium. Out of 6 librarians, 5(83%) considered - multi-user access, saving shelf space, reduction in theft and damages as in hard copies, desktop...
access - to be the advantageous to a great extent. Four (67%) respondents viewed -
current/up-to-date information, ease of search, downloading facility, 24 hours access - as
advantageous to a great extent. Ease of browsing was identified as advantage to a little
extent.

Veenapani, Singh and Rebika Devi (2008) surveyed the use of UGC-Infonet E-
Journal Consortium by the teachers and researchers in Manipur University. The study
revealed that the majority of respondents require print journals in addition to e-journals.
Only 55% of respondents were aware of Consortium. The majority of respondents
expressed their need for orientation/training programme for making use of e-resources
effectively. Problems faced by the respondents were: not aware of UGC-Infonet
consortium, illiteracy of ICT, frequent power failure, slow Internet speed, insufficient
number of computers, and problem in selection of desired title of journals. The study
suggested to conduct orientation/training programmes on regular basis and to improve the
IT infrastructure in the library.

Singh, Nazim and Singh (2008) conducted a survey to investigate the awareness
and use of online journals by the faculty members, researchers and P.G.students. The
respondents used online journals for research work (58.57%), for updating subject
knowledge (57.17%), for writing papers (27.14%), and for teaching preparation
(15.71%). The majority of the respondents take print-out, or download in storage devices
whereas only few read e-journals on computer screen. The majority of the respondents
were not satisfied as not many online journals were available on their subject and no assistance by the information professionals. Lack of training and slow Internet speed were other problems raised by the respondents. The study suggested to conduct training programmes, develop IT infrastructure and to include more online journals to their library.

Qualitative assessment study was carried out by Shukla (2008) to know the use of e-journals by P.G. students and researchers. The study found that most of the users use databases and e-journals daily and they prefer to access e-journals in the library while some users use them in their laboratories or classrooms. The study suggested to have a single window which could index all e-journals of different publishers on a particular subject. Another important suggestion was that there should be coordination among various other consortia running in the country so that all the users could have access to information dealing with a particular subject regardless of type of institution.

2.5 Conclusion

It is clear from the literature review that the university libraries have initiated collection development in electronic form and are at different stages of evolution as far as ICT infrastructure, electronic resource and electronic information service is concerned. Much of the published literature, particularly by Indian authors, found to be concentrated on just to report the ways in which university libraries developed basic IT-based infrastructure after receiving financial assistance under the UGC-INFLIBNET
Programme. It is evident from the literature reviewed that no systematic and holistic study has been carried out in Indian university libraries about the collection of electronic information resources and services, and their awareness and use by the academic staff. The majority of studies were restricted to either to study the use of Internet or e-sources under the UGC-Infonet programme. The stage is set to access the actual utilisation of ICT infrastructure, e-resources and e-library services by the users. Such studies would definitely help the policy makers to spend the public money more judiciously.

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