CHAPTER - II

REVIEW OF LITERATURE

2.0 Introduction
2.1 Information and Communication Technology (ICT)
2.2 Academic Libraries in the Changing Environment
2.3 Collection Development and Collection Development Policy
2.4 Management of Electronic Information Resources
2.5 Electronic Publishing and Libraries
2.6 User Attitudes towards EIRs
2.7 Usage and Impact of Electronic Information Resources
2.8 Inferences drawn from the Review of Literature
2.9 Summing Up

References
2.0 Introduction

The literature review plays a very important role in the research process. It is a source from where research ideas are drawn and developed into concepts, and, finally, into theories. It also provides the researcher a bird's eye view of the research done in that area so far. According to Newman et al. (1997) and Mauch and Birch (1998), a literature review serves four main functions;

I. Firstly, the literature review of a thesis is primarily focused on what has been done before and is designed to highlight how the study will fill in the current knowledge 'gap';

II. The review outlines the instruments which the researcher will use and why;

III. The review points out why it is necessary to conduct the research; and

IV. Finally the review sets the boundaries for the research study (called delimitations2).

In the present study, a retrospective search of literature was made by using books, Library and Information Science Abstract (LISA) on CD-ROM, Indian Library Science Abstract (ILSA), Annual Review of Information Science and Technology (ARIST), works of Dr. T.D. Wilson of Sheffield University (UK) and online databases, viz., Emerald, ProQuest, EBSCO, J-STOR, J-Gate, University Microfilms International (UMI) and Reports, Manuals, Guides, Theses / Dissertations and articles from journals reviewed for
the purpose of review of literature. Attempts were also made to trace and collect the original articles and the same have been used for review.

In this chapter, the literature has been reviewed in the following subheading:

- Information and Communication Technology (ICT)
- Academic Libraries in the Changing Environment
- Collection Development and Collection Development Policy
- Management of Electronic Information Resources (EIRs)
- Electronic Publishing and Libraries
- User Attitudes towards Electronic Information Resources
- Usage and Impact of Electronic Information Resources

2.1 Information and Communication Technology (ICT)

The use of digital information in the modern world is increasing at a phenomenal rate. At the same time, an increasing proportion of new information is also being conceived, produced and distributed in electronic form, and librarians and other information professionals are facing a new world of primary electronic objects, requiring professional management. Digital libraries have emerged as a crucial component of global information infrastructure, adopting the latest Information and Communication Technology (ICT) to promote an organizational structure that encourages communication between scholars across nations, and helps disciplinary boundaries. The growth
of Internet, the increased sophistication of web based tools, the information available in different formats, the intranet and campus networks within the organizations have changed the role of libraries.

In 1991, the first ever Directory of Electronic Journal (1991) was published by the Association of Research Libraries in Washington, D.C. This directory was based on the earlier work of Michael Strangelove of the University of Ottawa and Diane Kovacs of Kent State University.

CD-ROM technology has a considerable impact on resources in libraries. Reference works, Medical databases, Government reports and almost all disciplines are bringing out their data on CD-ROMs. Supplementing this view, Glory (1994) in his article explains how CD-ROM technology has transformed the storage media.

Johnson (1994a), explains in his paper that the web, now a major portion of the Internet, is based on a technology called hypertext, and it merges this technology with the techniques of information retrieval. Information can be stored on the web in any format, including text, graphics, sound and video.

Leisner (1995) deals with the acquisition of information sources which is becoming a tough job with the changing information industry. The author briefly mentions the changing practices followed by publishers of unconventional sources of information such as CD-ROM, etc., and suggests that librarians should change their traditional practices of acquiring new titles.
Deploying yet another strategy, the Association of Research Libraries has built an initiative that is named SPARC in 1996. This is a coalition of academic libraries, but reaching out to learned societies and other not-for-profit organizations.

Lynden (1996) says that the research library of the next century will be “a virtual library which gives to the user an illusion of access to materials which are not actually present. It is a gateway or springboard for users who require information not held on site”.

Robson (1996) summarizes briefly the development of online bibliographic databases from their beginnings in the early 1970s to the present, and also expresses his concern over the matter that most academic journal publishers have not changed their structures and overheads, and, insists that they must now co-operate strategically with agents and libraries, if they are not to be made redundant by the virtual library.

Reflecting upon the technological growth, Ramareddy and Varatharajan (1998) explain features of DVD. Further, they discuss the impact of DVD in the entertainment and consumer electronic industries. Brand (1999) also reminds readers of a recent format now rarely seen, that is 5 ¼ inch floppies – as an example of the rapidity of change. “Due to the relentless obsolescence of digital formats and platforms, along with the ten-year life spans of digital storage media such as magnetic tape and CD-ROMs, there has never been a time of such drastic and irretrievable information loss as right now”. There is
still nothing in the digital world like acid-free paper…. We need a digital equivalent to microfilm, a 500 year solution”.

Darch et al. (1999) conducted a study on Information and Communication Technology (ICT) developments and their applications in South African Libraries. The study reveals that the society consists of a technologically sophisticated sector and an underdeveloped third world sector.

Reflecting upon the short history and fast development of electronic journals, Chan (1999) writes that e-journals have opened up exciting service opportunities, like multimedia capabilities, speed of production and distribution, and accessibility for academic libraries.

Commenting on the developments in the storage media, Subba Rao (1999) outlines information access through the right mixture of technologies, namely, online and CD-ROM. While mentioning the electronic databases and generations of online services, the author discusses the salient features of CD-ROMs, their cost effectiveness, database services in various subjects and select databases.

Krishna Gopal (2000) describes in his book that the stupendous technological developments in computer, telecommunication and electronic publishing require professional skill development of librarians to acquire information to access, retrieve and disseminate it. The emphasis is on shifting from print-media to non-print electronic and multimedia.
Munro (2000) explains that ICT is being increasingly introduced into classrooms, and hence teachers and learners will have an unparalleled resource base to explore. The judicial use of the WWW together with the multimedia CD-ROMs currently on the market and the imaginative deployment of presentation software offer historians tremendous possibilities to explore and to understand increasingly the past. ICT is poised to make a massive contribution to understanding and explanation in history.

Evaluating the e-books, Gibbons (2001) discusses the transition from paper based books to electronic books. Continuing his discussion, the author asks "should libraries further embrace the digital world by providing access to e-book content or continue to focus their often scare resources on their more traditional collections?" and concludes with the words that libraries must first evaluate the technology and assess its potential impact for library patrons. Only then we can articulate the unique needs of libraries to the e-book world.

Gornaik-Kocikowska (2001) describes the impact that the computer has on college/university libraries. The university library, in its present form, is a product of the printing press revolution. Further, the computer revolution will have an even more profound impact on the library than the printing press ever did.

Patra and Basak (2001) conducted a study of collection development in CSIR libraries in India. The authors reported that convergence of technologies had revolutionized the process of collection development in CSIR libraries.
ICT is enabling libraries to go in for CD-ROM or online databases because of its conveniences.

Explaining the changing contours of information services, Khode and Dhar (2002) narrate that IT has influenced the way library collections are developed. Accordingly, there is a change in the nature of information services generated through these electronic services. Discussing the growth and development of technology, Campbell (2003) explains the role of scholars' portal in networked world. Further, the author discusses on search engines as a retrieval tool and scholars' portal as a new discovery and a retrieval tool.

Information Technology has conceptualized and innovated major preservation techniques, like photocopying, microfilming, scanning and digitization. Each is having its own promises and perils. Information Technology is continuously in a state of flux, and as such these technologies tend to be obsolete very fast (Narang, 2003).

The information revolution is rapidly widening the scope of application of IT with promise of ensuring timely access to relevant information to user at all levels on one hand, and is enhancing the productivity in information work and services, on the other. Modern libraries are equipped with modern forms of technology, which is making libraries more dynamic. This view is supplemented by Khan and Upadhyay (2003).

Bilawar (2004), in his paper, focuses on different modes of communication technology and its impact on library activities and information
services. The author further highlights digital library concept, and also attempts a comparison between traditional and modern library.

Eynon (2005) explore in his paper academics' experiences of using Information and Communication Technologies (ICTs) for teaching and learning. The most common use of ICTs in all subjects was to provide students with access to a wide range of online resources. Academics' motivations for using ICTs included: enhancing the educational experience for their students; to compensate for some of the changes occurring in higher education such as the rise in student numbers and demand for flexible learning opportunities; and personal interest and enjoyment. The difficulties academics encountered when using these technologies for teaching included a lack of time, dissatisfaction with the software available, and copyright.

Soltani and Barforoush (2007), in their article, propose a new system named OILSW for instant learning of ontology from web pages of websites in a common domain. This system is the first comprehensive system for automatically populating the ontology for websites. Also they explain that by using this system, any website in a certain domain can be automatically annotated.

2.2 Academic Libraries in the Changing Environment

The way the university library services are viewed, planned and managed so far must change radically, if they are to survive and thrive in the future. Advances in technology, economic and political pressures, and socio-
demographic factors have combined to create an environment that poses unprecedented challenges and opportunities. The Joint Funding Councils' Libraries Review has highlighted the need for stronger management and more confident involvement in institutional planning and organizational change. Electronic communication will transform service provision, with a significant shift towards distributed networked services, empowering the end-user and offering new roles and responsibilities to information intermediaries. Effective communication between library, computing and academic staff will be essential in order to ensure relevant and responsive services. New resource models will be required to take account of diverse customer needs and different modes of delivery. Organizational structures and management styles must change to meet future needs, and for that human resource development must be given higher priority. Bold leadership will enable organizations to enhance their strategic role and respond positively to environmental change.

Gorman (1991) in his article considers the future of academic libraries under five broad headings: funding, buildings and space, materials and access, staff and users. Further the author describes the impact of new technologies and considers new media. He concludes that change is inevitable.

Pal (1992) highlights the impact of collection development in university libraries on their space requirement, and shows how CD-ROM technology can alleviate the problem with the use of compact disks on various subjects of interest in university libraries. He suggests its effectiveness as an alternative to
on-line searching of international databases and the value for retrospective searches. Further, he calls for introducing CD-ROM in university libraries.

Corrall (1995), in his paper, describes how academic libraries are passing through a period of continuing change, which will present challenges to the staff and users. Communication will be among the critical success factors for survival and success in the information society, but the ability to address the human factors will be even more important than the capacity to master the technology. The information society of the twenty first century offers an opportunity for libraries to play a central role in the academic community, but it will require a bold and confident leadership along the way.

Owens (1996a) says, “libraries will survive not despite of but because of technology”. Even in a fully digital environment, scholars will require assistance that machines simply cannot offer. They will need librarians’ interpretation …. skills. Silveria and Leonard (1996) in their article say that supporting remote users is “a balancing act”. Off-campus and on-campus needs must be weighed along with such other considerations as range and level of resources, ownership and access, and the print and electronic mix.

According to Potter (1997), “academic libraries are forming consortia to provide common access to electronic resources across the Internet, and they are forming these consortia on a statewide basis.

Riggs (1997) discusses leadership and management issues in academic libraries, quality improvement, staff creativity and globalization of knowledge.
Review of Literature

The future of academic libraries appears to be complex and a bit uncertain on the one hand while, on the other, it is dynamic and exciting.

Wilson (1998) outlines the forces that are currently affecting academic libraries in the UK, and proposes a strategy whereby the transformation from the handling of artefacts to the handling of electronic sources may be effected with maximum benefit to the information user.

Stern and Connaway (1999) highlight the power that electronic books give to traditional libraries in order to more effectively use their resources in the service of their patrons by improving the quality of their collections and access, while saving on the expense of maintaining paper-based books and monographs. Further, the authors argue that library professionals should embrace the opportunities offered by electronic libraries, and thereby gain control of their collections and their future. Kirk and Bartelstein (1999) note that by 1998, the American Council on Education estimates about 85 percent of 'traditional' colleges and universities either offered, or would soon offer, distance - accessible courses.

Wood and Walther (2000) explain the essence for librarians to review the pace of change occurring with higher education and how information will be provided in academic libraries to their vastly changing student population. The integration of technology in higher education has an impact on academic libraries in two direct ways: changing material formats and the scholarly communication options; and changing how information is delivered beyond the
Review of Literature

classroom experience. Further, they examine the depth of the format change issues, including changes in data preservation and conversion, personnel and facility issues and a close examination of scholarly communication and distance education issues that our higher education and academic libraries face.

Thornton (2000) described in her article that the future look of the academic library would be very different from what it is now. Clearly, consortia will become an even more important force in the electronic information world.

Akeroyd (2001) touches upon some economic changes, and looks for evidence in statistical trends derived from the United Kingdom reportage. From this he extrapolates scenarios relating to the function of libraries as a collection of resources, as a physical place, its role in organizing information and its service function. Library collections will continue to exist, but in different ways, whilst physical collections will mutate into multifunctional spaces. Knowledge management will become increasingly important and the overriding shift will be towards a service and support role. Also he discusses the librarian's role and summarizes the changes.

Snoj and Petermanec (2001) discuss how to stimulate librarians in their thinking about the new role they have been given more or less unwillingly by the advent of new information technologies, globalization of supply, new competitors and not least by the needs and expectations of their users. Further,
they explain about additional trends making the situation even more challenging for libraries:

- Organizational restructuring with boundaries between functional areas becoming more blurred.
- Rising user sensitivity to the "soft" service components, to the value of services offered and to their quality; and
- The boom of information technology;

Vasanthi (2001) in her article dealt with end-user education and training programmes. Further, he discusses the growing universe of print-based publications and digital documents and declining universe of library budgets that can be handled confidently by adopting certain strategies such as developing critical thinking skills as well as promoting information literacy at large. In the near future, users should expect timely access to quality information.

Troll (2002) describes that academic libraries are changing in response to changes in the learning and research environment and changes in the behaviour of library users. The changes are evolutionary. Libraries are adding new digital resources and services while maintaining most of the old, traditional resources and services.

Veeranjaneyulu and Singh (2003) examine the impact of Information Technology (IT) on academic libraries. The authors feel that these computer
applications have helped libraries in meeting the complex needs of library users and hence thereby a positive effect.

Lafferty and Edwards (2004) demonstrates the relevance of the theory of disruptive technologies to academic libraries, higher education and the academic publishing industry. The way universities are organized and how they operate could change radically; scholarly communication could be transformed, placing academic publishers at risk; academic libraries may become irrelevant as new business models come into being. There are strategies that these organizations might adopt to limit the effect of such technologies and/or preferably transform them into sustaining technologies.

Ramesha et al. (2004) have conducted an evaluative study on the IT services and the user requirement and satisfaction in the six university libraries in Karnataka state. General view of the library users is that IT has brought about considerable improvements in the library services. However, half of the respondents expressed that they are not satisfied with the IT infrastructure at their libraries. This could also be attributed to the depleting budgets and lack of trained manpower in libraries.

Kanamadi (2005) in his thesis explains that information technology has a positive impact on all library and information services, like Reference service, CAS, OPAC, etc. Human resource is another aspect, which is influenced by the development in IT and its applications at libraries. Further, the author recommends that librarians should develop exclusive presentations.
and demonstrations to educate users as to how to get maximum benefit from these digital sources.

Explaining the need of the hour Chakravarty and Singh (2005) highlights two major consortium initiatives, UGC-Infonet and INDEST – Consortium that have come to the rescue of academic libraries so that they can cater to the needs of academia. They conclude that the efforts of UGC-Infonet and INDEST - Consortium are appreciable and will definitely strengthen the higher education system in India.

Brindley (2006), in his article, gives a clear articulation to the challenges faced by libraries. Through the case study the author identifies seven themes as central to redefining the library in the twenty-first-century: know your users and keep close to them; re-think the physical spaces and create a desirable draw; integrate marketing into an organization; open up legacy print collections to digital channels, and through digitization, reduce legacy costs and continue to improve productivity in traditional activities; invest more in innovation and digital activities; and develop our people and ensure the right mix of skills.

Turk (2007), in his paper, examines some measures for assessing library performance from three perspectives; efficiency, effectiveness and service quality. The author fulfils the need for a practical solution to the problem of improving service quality in university libraries.
2.3 Collection Development and Collection Development Policy

The name and fame of a university library is very much depending upon the collection. Collection Development is either a single activity or a group of activities but a planning and decision making process. Its key functions are planning and policy-making, collection analysis, materials selection, maintenance, resource sharing, etc. Each of these functions involves several activities, and they are interrelated. The impact of Information Technology (IT) on collection development is related to several issues such as ownership vs. access, co-operative efforts and evaluation. In the context of IT, librarians are now giving importance to accessing the other libraries' collection rather than trying to possess almost all documents. Recent advances in IT have resulted in bringing together the libraries all over the world, and thus the librarians have opportunities to use the available collections world over for providing a variety of services to users.

Before the advent of electronic revolution, Gardner (1981) published a book on library collections, in which he has mentioned four basic criteria for selection, viz., quality, library relevance, aesthetic and technical aspects, and cost.

According to LaGuardia and Bentley (1992), the criteria for selection of electronic materials include consideration of vendor support, administration of costs, maintenance, and security, and searching and system capabilities. They
note the importance of license agreements and staff support as well as the audience selected for hardware, software and content.

Munshi (1992) mentions that no library can have an adequate collection in real terms to cater to the needs of its clientele. He points out that individual libraries are becoming less and less self-sufficient. He discusses five media choices for the data storage/recording such as paper, magnetic media, CD-ROM, Erasable Optical Disks and WORM. Also he critically examines the application of optical storage for the purpose of mass storage.

As Branin (1994) describes “rapid advances in information technology, difficult economic conditions, and the restructuring of the workplace are the three forces that appear to cause utmost change in collection development and management, and in librarianship.

Harloe and Budd (1994), in their paper, look for a “more dynamic” relationship between collection development and the system of scholarly communication. They see this as more complex than economic uncertainty, technological changes, and increased user expectations. Throwing light on the same aspect, Johnson (1994) points out that collection development is not in any way just selection.

For developing Internet based e-resources collection, libraries should use the same collection criteria as more traditional resources. Demas et al. (1995) clarify the analogous relationships between Internet resources and other
Review of Literature

types of resource formats. Pointek and Garlock’s (1995) article is primarily a webliography of collection development tools.

Evans (1995) notes the following steps in selection:

a. Determine how much money is available for CD and divide that money into a specific amount for each format or subject.

b. Develop a plan for identifying potentially useful materials to acquire.

c. Identify collection needs in terms of subjects and formats.

Hazen (1995) reports that the collection development policies have outlined their usefulness and the library would be better served by “devising flexible guides to all the information associated with particular fields of study. Local collections will comprise a part of these “information maps”, but only within the context of a richer and less bounded universe of scholarly resources”.

“Academic libraries must change”, say Stoffle et al. (1996). “Giving up the focus on acquiring, processing, and storing physical objects”, they doubt that in the future, costs will permit libraries to “manage large print collections side by side with digital ones” but see more information moving to digital formats.

Billings (1996), in his article, reveals that collection development policies should reflect co-operative resource – sharing agreements as well as recognize new relationships among physical and digital information sources,
and acknowledge the new forms of multimedia including text, graphics, sound, video and animation, available globally.

Pastine (1996) suggests a far more complex future encompassing far more than selection. Such things as (1) “site licenses”, (2) “decisions on whether to mount databases on the university’s mainframe or client server systems” (3) making recommendations “on Standalone CD-ROM workstations” (4) “as well as networked CD-ROM subscriptions”. (5) Deciding on “purchasing gateway access to commercial vendors”, and (6) “decisions on whether or not the library will fund actual electronic document delivery or change the user for this and related services”. Johnson (1996) reminds us that “the need to evaluate licenses, contracts and pricing structures as part of a selection decision is a new phenomenon. Martin and Rose (1996) point out that inclusion of CD-ROM databases in the collection repertoire carries with it a consideration of the documentation and customer support that can be expected.

Rouge (1996) draws a policy for electronic information resources. This policy provides criteria and guidelines for acquiring and providing access to electronic resources titles. Commenting on the collection development in libraries, Parameswaran (1997) and Bali (1997) suggest a policy for collection development. They feel that the balancing act of selective in house collection development and use of information technology which can quench the thirst of research community.
Alastair (1997) gives a toolbox of criteria that enable Internet information sources to be evaluated for use in libraries, e.g., for inclusion in resource guides and helping users evaluate the information found.

Aptagiri (1997) discusses the constraints and criteria for collection development in libraries and information centres, and examines the Internet as world-wide source of information and as a scope for electronic collection development. The role of Internet as more than just a channel for communication is also discussed. The different roles the Net has to play in the information scenario, especially in connection with collection development are given.

Fedunok's (1997) article provides a synthesis of 18 library electronic resource collection policy statements. Yochelson et al. (1997) wrote a handbook for Library of Congress recommending officers, which reviews the practical literature upto 1997, and also describes the collection tools that were extant for use in collecting Internet resources. Coutts (1998) reports on Collection Development and E-resources for research collections in the UK.

Johnson (1997), in her article, defines a policy as a framework for decisions. If kept current, such a policy can identify issues and assist in responses. Also she considers categories of information, types of resources, and delivery mechanisms.

Rioux (1997) feels that developing a collection of electronic resources is "like foraging in the jungle; a trackless, vine tangled wilderness full of
unknown species, some of which appetizing but may be poisonous....". The librarian, who is collecting electronic resources, is not a harvester of cultivated crops but a hunter and gather of wildfruit and other treasures.

Maheswarappa and Tadasad (1997) critically examine the issues involved in development of collection for libraries in the context of electronic publication and networking with special reference to formulation of policies, users, formats, storage, modes of access, selection, acquisition, bibliographical control, finance, evaluation and manpower. They conclude that developing a need-based, relevant and cost-effective collection, consisting of electronic and other publications in document form, requires systematic planning and effective implementation.

Johnson (1998) notes that collection development policies can inform staff and users about the criteria that guide collection decisions and protect the library from claims against such decisions. Her guidelines for traditional materials are applied to electronic resources. "The need to balance traditional print resources with electronic resources should be stated along with information about the high inflation rates affecting all serial formats, print and electronic".

Among the early efforts to offer criteria for the new electronic resources is Ferguson's (1998) article with eight criteria for selecting CD-ROMs: relevance, scope, need, quality, currency, accessibility, language and cost, followed by observations on cultural and political factors.
Chen (1998) feels that a library’s collection development, which is a continuous process, responds to the needs and goals of its users. It includes not just the policy of collection development itself but also the procedures of selection, acquisition and evaluation. He considers future directions for collection development from four standpoints: changes under the virtual library environment; the means of acquisition; related problems; and future directions.

Ward et al. (1998) describe the Collection Development Policy for electronic resources in which the authors give guidelines for the selection and provision of information in electronic formats. This policy deals with the decision-making process factors governing selection decisions, information content considerations, the variety and appropriateness of various formats and the access related issues.

The preservation of electronic resources may prove to be equally daunting. As Tennant (1999) notes: “The more serious threat is technological obsolescence”. He reminds us of extinct 8-track tapes as well as more “complex materials that were born digital, such as multimedia presentations”.

Chadwell (2000) describes the challenges in providing access to offline electronic resources warrant a separate collection development policy focusing on these materials. This policy will provide guidelines for the selection and acquisition of offline electronic resources as well as the provision of access.

Further, the author outlines some of the issues that surround electronic resources, which differentiate them from print publications.

Singh (2004) describes the impact of IT on collection management in libraries and also on the librarians' role. Factors affecting collection management in libraries and emphasizes the need for change in collection management policy. Further, he discusses the usefulness of subject gateways and compares pricing structures of different electronic resources.

Discussing about the impact of electronic publishing on library collection Kumbar and Hadagali (2005) differentiate between traditional and electronic collection development. Further, the authors highlight on collection development policy and selection criteria for off-line e-resources, websites and web resources. Also they discuss pricing issues, models and challenges before library professionals.

Susan and Vignau (2006), in their paper, discuss the topic of Collection Development in a digital environment. Developing digital collections is a logical consequence of inserting information technologies in organizations. Further, the authors propose a cycle to create a digital collection. The discription of the creation process is supplemented with an analysis of the term Collection Development starting from the user's focus.

Kumbar and Hadagali (2007) discuss Collection Development in a changed environment in academic libraries. Further, the authors throw light on formulating collection development policy, budgets, selection procedures,
evaluation criteria for electronic information resources and license agreements including problems and prospects. The authors conclude that “though electronic publishing has many advantages, but, at the same time, one has to realize that this can be used as complementary technology and but not as replacement technology.

2.4 Management of Electronic Information Resources

In the context of academic libraries, discussions on the evolving digital phenomenon mostly revolve around collections, their use, issues of access, extended services and the digital paradigm. Managing access to various kinds of information sources is the fundamental issue for university libraries. The proliferation of information sources in various formats (digital or non digital), carrying different types of content (scholarly, reference, research, fiction etc.) has a number of implications for collection management. Collection management is now a more demanding concept, which goes beyond the policy of acquiring materials, to policies of housing, preservation, storage, weeding and discard of stock. Rather than selection and acquisition, collection management emphasizes the systematic maintenance and management of library’s existing collection.

Woodward (1994) writes in detail on how e-information had an impact upon libraries and the management of their collections as well as technical and user services. The factors, which need to be assessed for the formulation of a collection management policy with regard to e-information, are also defined.
Chambers and Hayes (1998) hold that today managing electronic information resources is a challenge. With forethought and planning, it is now possible to build relatively comprehensive and intelligent electronic information resources without too much difficulty. Authors also discuss different mark-up languages, like HTML, SGML, XML to have a relatively cost-effective mark-up basis for the retention, exchange and management of data.

Weber (1999) states that Internet resources have become a standard part of the resources offered by many libraries. The decision to catalogue Internet resources poses a number of challenges to libraries as well. Decisions must be made as to what types of Internet resources will receive cataloguing, and what information should be included in the bibliographic record. Cataloguing decisions are further complicated by the fact that long-standing cataloguing conventions do not readily apply to Internet resources.

Wu and Liu (2001) discuss the Internet-based e-content management. Further, they explain the technologies, the criteria and the issues and concerns in content repository, content contribution, workflow, automation services, and lifecycle of automation services for controlling and managing content and processes.

Burnett and Seuring (2001) report on the practices and policies adopted for organizing university libraries and national libraries. Further, they show how libraries are integrating free Internet resources which their users can
access, and which resources should be included, and how they should be treated.

Butler (2003) enumerates that the copyright is a serious matter that carries implications for organizing the Internet from the viewpoints of both owners and publishers of a work to the work’s users. The author also discusses several stands within the dilemma of the Internet and Copyright Laws, like fair use, public domain, the Digital Millennium Copyright Act, Technology Education and Copyright Harmonization Act, etc.

The explosion of information services and resources, whether appropriate to the user’s need or not needs attention. There is also a need to organize the information resources available on the Internet so that the users/scientists could find information for their research work (Karimi and Srivastava, 2003).

Analyzing the present collection development procedures Varalakshmi (2004) highlights the fact that the collection management in the contemporary Indian University Library System has become complex owing to the diversity of formats and content of information resources. The situation warrants for redefining the existing collection development policies, and developing alternative means to provide best information to the user from the global resource basis in real time. She suggests that the INFLIBNET (UGC, India) can take a lead and prepare a model set of collection development policies that serves as guidelines to the individual libraries.
Introducing electronic journals, Johnson (2004) says that electronic versions have made serials collection management even more complex. The majority of publishers are charging separately for the print and electronic versions, and charging a higher price for both bundled together. In order to make the decision about what format to purchase, librarians need to know what format the users prefer. To determine these preferences, library personally can use several methods, such as user surveys, usage reports, and educated guessing.

Maharana et al. (2004), in their paper, points out the policies and practices of development and management of electronic resources in the Research and Development libraries of Kolkata city. The authors also examine various criteria for selection and evaluation of electronic resources. Further, some feasible recommendations have been put forth for the development of a balanced collection of electronic resources and its effective management.

Kar and Bhat (2005) state that the management of electronic resources is an ongoing process for most libraries, which make them hybrid or digital libraries. In order to manage access to the full range of resources available to the users, the Energy Resources Information (TERI) library has put a lot of work into the areas of website management, acquisition and cataloguing of electronic resources, authentication, metadata and resource discovery. Strategies employed in order to manage resources have been made with a minimum of cost in mind by using the existing staff resources and expertise.
Explaining the transition from print media to electronic media, Vinitha et al. (2005) highlight the necessity of preserving the digital form, strategies related to preservation technologies and provide guidelines for digital preservations. The purchase and management of e-journals through consortia and the various consortium efforts taken in India with special reference to INDEST consortia have also been explained.

Thamaraiselvi and Kaliammal (2005) explain the issues in archiving and preserving the back issues of the e-journals, the initiatives taken in archiving them and the role of e-journal agents in purchasing and managing electronic journals.

Choukhande and Dange (2006), in their paper, emphasize the preservation, digitization and dissemination of information in digitized or electronic form to the end user. The authors also highlight the key issues of copyrights faced during the work.

Highlighting the importance of digital library preservation issues, Joint (2007), in his paper, suggests that resourcing should be applied to digital preservation activity rather than a fresh round of digitization of print originals, the preservation implications of which are uncertain. The findings of the study reveal that theoretical models from non-LIS disciplines help illustrate and understand problems such as developing information between the need to develop new digital collections, and the preservation of the digital collections which have already been created.
Ameen and Haider (2007), in their paper, explore some major challenges in the area of collection management faced by university libraries in Pakistan. The challenges regarding collection management in the university libraries in Pakistan are: handling the hybrid character of collection, service to users, training of collection management staff, collection evaluation, resource sharing and preservation.

Saha et al. (2007), in their article, deal with various aspects related to the digital preservation. Preservation problem is complicated by the rapid obsolescence of the hardware and software required for it. Further, the technological ignorance of library personnel and users is one of the major obstacles in the way of development of digital libraries and its effective preservation.

2.5 Electronic Publishing and Libraries

The developments that emerged during the present century have provided many opportunities and challenges for the libraries. Interdisciplinary nature of research, information explosion, production and availability of sources of information in multimedia, automation of library systems, the changing concept from ownership to access, networks, financial constraints, etc., are some of the issues, affecting library services. Perhaps, the most important issues are electronic publishing and networking of libraries, changing concept from ownership to access, and commercial availability of databases, etc. Electronic journals are becoming rapidly available via the World Wide
Web, the electronic delivery mechanism of choice for most academic libraries. Over the past few years, many scholarly publishers have introduced electronic access to their entire range of journal titles.

As Lonberger (1991) says, “Online full-text retrieval is now viewed by a growing segment of library professionals as viable alternative to ownership of print journals and as the logical extension of the now-familiar online bibliographic database”. There are “new economic models for the delivery of journal articles in electronic form”, and “economic issues of scholarly publication are now inextricably intertwined with the technological ones” (Sullivan, 1991). It was clearly noticed that a new layer had been added without, however, the traditional concerns and activities of collection development having been minimized.

Middleton (1993) discusses the debate over the practice (print vs. electronic) by some libraries to pass on the changes from commercial online services to library users. Further, the author throws light on online information, electronic publishing and access issues.


Review of Literature

says that electronic resources create opportunities and challenges for library users and professionals alike. Evaluating the World Wide Web Wyatt (1997) discusses the methodology of evaluation as well as content, structure and functions of a website.

Farrington (1997) says that “when format was discussed, it was paper versus microform; a library would subscribe to paper and then purchase microform as the archival format. CD-ROM is the primary new format “that is tangible and not virtual or solely online”. Partly due to its compactness, as it allows users to search with Boolean operators and sort results, it has been a much preferred format “for index and abstract titles”. Supplementing this very view, Sharma and Patnaik (1998) discuss CD-ROM as an information storage and retrieval tool and its advantages.

Henderson and MacEwan (1997) explore the relevance between electronic resources and faculty in their teaching and research. Further, they state that electronic collection strategy emphasizes broad and generally useful materials and affords a commonality of baseline access and content, that is,

➤ Students share access simultaneously and diminish contention.

➤ Electronic materials provide a more timely expression of current information pertinent to discussion and learning.

➤ Electronic materials may not be defaced or mutilated to the point that they are unusable.
With the development of CD-ROMs and the onset of electronic publishing of serials, it has become obvious to Library/Information service personnel that the “ownership model requires fundamental restructuring (Kohl, 1997)”. The response has been immortalized by the mantra “access versus ownership”.

While examining the cost effectiveness of an electronic database, White and Crawford (1998) confirm that expenses are not always reduced when new services are offered; they may just be shifted elsewhere in the budget. New services may increase customer’s expectations, and such non-tangible benefits as immediacy of full text versus the time lapse for Inter Library Loan (ILL) should be considered.

Schwartz’s (1998) overview of the literature refers to over 200 publications on the “serials crisis”. He recommends cost-per-use analysis as a decision model involving the dual criteria of low use with high cost-per-use.

Varian (1998) says that a great deal of scholarly communication will move to an electronic format. Since the Internet offers reproduction and distribution at much lower cost than print, the scholarly community has excellent connectivity, and the current system of journal pricing seems to be too expensive. Each of these factors helps to push journals from paper to electronic media.

Chapin (1999) enumerates the basic principles of librarianship in its code of ethics and in the Library Bill of Rights and its interpretations to serve
to guide librarians in addressing issues of intellectual freedom that arise when library provides access to electronic information, services and networks. He feels that user policies should be developed, according to the policies and guidelines established by the American Library Association, including guidelines for the development and implementation of Policies, Regulations, and Procedures affecting access to library materials, services and facilities.

Gulati (1999), in her article, makes it clear that electronic publishing has put forth a spectrum of problems and issues in libraries, end-users in general and information professionals in particular. She specially discusses the major issues and challenges in electronic publishing such as accessibility, acceptability, copyright and pricing, standardization, credibility and technical issues, etc. Further, it lays emphasis on the advantages and problems connected with electronic publishing.

In an extensive review of end-users in academia, Herman (2001) concludes: “a perusal of the literature does indeed prove beyond any possible doubt that overall academia has been gradually moving to the electronic information era”.

Gyeszly (2001) is of the opinion that the escalating price of the rapidly growing electronic journals, databases, indexes and books, along with traditionally published print subscriptions and monographs, will soon force library administrators and collection development officers to choose between electronic or print products in the new millennium. The increasing costs of the
dual format subscriptions or indexes are unfeasible, and, perhaps, even unnecessary from the user’s point of view in the disciplines of political science and economics. He concludes that after the pricing information and use statistics for both electronic and printed resources were produced, the author had a clear answer to the electronic and paper dilemma.

Thappa et al. (2002) feel that electronic resources have become very popular because of the many advantages, like:

❖ Fast and easy access.
❖ Data updated online
❖ Less turn around time, etc.

Rousseau (2002) gives an overview of journal evaluation indicators, the strengths and weaknesses of different indicators, together with their range of applicability. The definition of a “quality journal”, different notions of impact factors, the meaning of ranking journals, and possible biases in citation databases are also discussed.

Evaluating e-books, Subba Rao (2003) discusses the genesis of e-books. The author lists various types of e-books with their characteristics and the major players in the market. He concludes that e-books are rapidly becoming a viable alternative, and provide growing advantages over the traditional medium.

Angadi and Koganurmath (2004), in their case study, discuss the availability of electronic resources, like e-journals, Electronic Theses and
Review of Literature

Dissertations (ETDs) and online databases to the users. The authors feel that these digital contents have facilitated fast and easy access to content with simple and powerful search and retrieval capabilities.

Evaluating the electronic sources of information, Sampath Kumar and Biradar (2004) studied analytically with particular reference to web based sources. Further, they explain the www search engines as a strategy for effective information retrieval. Evaluating the electronic journals, Kaushik and Relan (2004) discuss the growth, features and limitations of electronic journals associated with the services. Hence the number of e-journals is increasing day by day. This is an indication that the user community has learnt to accept e-publications.

Highlighting some of the important electronic databases developed in India or on Indian topics, Singh and Gautam (2004) state that access to information online or in CD-ROM media is now just a matter of money; at the same time access to indigenous information has remained a challenging effort both for the user and the infomediary. Information services/products of all kinds are being generated by various agencies in the government, public and private sectors and are emerging into the Indian Information market place.

Bhatia (2005), who deals with electronic publishing and the libraries, concludes that with respect to a comparison of the costs of “conventional journals” can only be drawn when an electronic journal is given a chance to establish itself and to outgrow the learning phase.
Majumdar and Singh (2005), in their article, describing the use of electronic scholarly publications, shows that they present serious utilization barriers to would-be readers. Practical awareness, indexing and archiving in this new literature can overcome these barriers, and it is essential to overcome them, if such promising publications are to transform scholarly communication.

Prakash et al. (2005) explain that subject gateways, portals, search engines and library OPACs are important methods of providing current and reliable information in a variety of disciplines and research areas. Further, the author highlights the importance of portal service to the Indian academic community in the light of the UGC-Infonet E – Journals consortium.

Rani and Geetha (2007), in their paper, discussing the use of e-journals, say that e-books have created a new source of information for the users. Their features attract the users to seek information from these media. The open access publishing has enhanced the availability of information by breaking down the financial barriers. It is this technology which has made tremendous impact on libraries.

2.6 User Attitudes towards EIRs

The information revolution fuels an unprecedented demand for storing, organizing and accessing information. If information is currency of the knowledge economy, electronic information resources will be banks where they are invested. Information use in student learning is a multi-faceted phenomenon. Users do not merely require generic information skills but
knowledge of the discipline and the capability to handle complex information. Today information seekers are no longer satisfied merely with in-house conventional printed sources. The key concept of today’s user perception is that they need a one stop shop to satisfy their information needs.

Dutton (1990) says that the skills required to maximize the potential of electronic resources are much greater than those required for searching printed sources. These skills include knowledge of the structure of the database and the instructions which must be provided to the computer by the searcher as well as an understanding of the ways in which the instructions are linked with one another.

General user opinion towards the use of electronic resources, in particular CD-ROM, has been positive, with students enjoying using these sources and finding relatively few problems while using them. Surveys undertaken at Oakland University (Schultz and Salomon, 1990) of student satisfaction with CD-ROMs discovered that:

- 83% of the students surveyed felt that this source saved them time, and they found it relatively easy to use.
- Two-thirds of those surveyed stated that if the CD-ROM was busy, they would wait for it to become free rather than use the print tool.
- 85% would prefer this version to print.
Similarly, Beecham Pharmaceuticals' Research Division (Goldfinch, 1990) conducted a survey regarding the end user searching of CD-ROM, and the results showed:

- It was easy to use
- It saved time in library searching.

There is a noticeable gap in the literature about student perceptions towards electronic information, "Most user studies have looked at the situation through the eyes of the information professionals, rather than the user" (Bawden, 1990). A number of surveys relating to the use of CD-ROM do exist, but they are significantly less, considering the amount of technology available. According to Faris (1992, "while user surveys can never tell the whole story of how patrons are responding to a library service, they can provide valuable ideas about what does and does not work").

Electronic information sources offer to today's students different opportunities from their predecessors. Brophy (1993) details the advantages of networking for the user as follows: the needed information can be delivered from the most appropriate source to the user; the user can re-specify his or her needs dynamically; the information is obtained when it is wanted, so it becomes "just in time" rather than "just in case"; the user selects only the information needed to answer the specific question. Electronic information, therefore, have a number of advantages over traditional print based sources.
A survey was undertaken by Biddiscombe (1996) to provide an international snapshot of the use of networks by academic library users. The findings of the survey are:

- Easier searching for information, both in terms of the wider range of databases and the ability to search by keyword.
- Time saved through using an interface.
- The ability to search the catalogues of other libraries.

Of those surveyed, 79% were happy with the results produced. Clearly, the views from users of electronic resources are favourable and provide some justification for the financial investment in installing and maintaining these systems in academic libraries.

IMPEL2 (Impact on People of Electronic Libraries Programme) project based at the University of Northumbria (Day et al., 1996), monitored organizational, cultural and human aspects of electronic library development. Specifically, the study focused upon the impacts of the electronic library on the qualified LIS staff and related support staff, academic staff and students. It examines the impact on LIS of resource-based learning and studies the implications for staff training and development. Research for this project was undertaken at 24 institutions, and it provided a vast array of qualitative and quantitative data. The IMPEL2 Project and an MA Information and Library Management Dissertation focused upon student attitudes towards electronic information at one of the United Kingdom Universities (Ray, 1997).
Tomney and Burton (1998) conducted a study on the usage and attitude of the faculty at the University of Strathclyde. The study examined attitudes towards electronic journals by both users and non-users. The main reason for not using e-journals was that the scientists were not aware of the existence of any relevant e-journals. The main advantage of e-journals, as stated both by users and non-users, was accessibility. Dellaert and Kahn (1999) conducted a study in which they concluded that waiting on the Internet had a negative influence on the customers’ evaluation of websites.

Peh and Foo (2001) express that with the emergence of the Internet and its related technologies, many educators assert that there are substantial benefits to reap from online learning and to provide insights into the experiences related by participants in the Virtual School of Business (V BUS), a Temusek Polytechnic’s online project. Revill (2001) argues that the future roles for academic librarians envisaged by the authors have always been the ideal intention. Librarians have particular attitudes towards subject content which is a jealously regarded province of the academic staff. Librarians must become more like the faculty in order to fulfill their role and potential, by demonstrating their ability to contribute at all levels in the educational process.

McDowell (2002), in his study, indicates that information use in student learning is a multi-faceted phenomenon. The study reveals that students do not merely require generic information skills but knowledge of the discipline and the capability to handle complex information. Partnerships between academics
Review of Literature

and librarians are a way forward in helping students to develop as autonomous information users. Today information seekers are no longer satisfied merely with in-house conventional printed sources. The key concept of today's user perception is that they need a one stop shop to satisfy their information needs (Bhatia and Goswami, 2003).

Lohar and Kumbar (2005), Asemi (2005) and Rajeshwari (2005) have conducted a survey of student attitudes towards digital resources and services. Based on the findings some suggestions are made, and one of them is that there is a need to conduct training programmes for students in order to show how to use the digital resources effectively. This supplements the above concept.

Kinengyere (2007), in his paper, seeks to examine the effect of Information Literacy (IL) on the usage of electronic information resources in academic and research institutes in Uganda. Further, he explains that users' attitudes and perceptions also influence the level of utilization. The study shows that availability of information does not necessarily mean actual use. Some of the available resources were utilized at all. This means that users are not aware of the availability of such resources, or they do not know how to access them, or they do not know what the resources offer.

Vasappa Gowda and Shivalingaiah (2007) have made an attempt to know the attitudes of the research scholars towards electronic resources in the universities of Karnataka. The findings of the study reveal the following points:
Review of Literature

a. Science research scholars depend more on electronic resources compared to humanities and social science research students.

b. It is observed that majority of the research scholars do need electronic resources for their research, which certainly improve the quality of research.

c. In all disciplines, the research scholars expressed that they needed training programme for proper utilization of the resources, facilities and services.

2.7 Usage and Impact of Electronic Information Resources

Research is the key factor for the development of knowledge in all disciplines. It is the gateway to the development of theoretical knowledge, practical skills and technical know-how in any discipline. The university libraries play an important role in providing the required information. The requirements of the researchers should be given priority. In the changing information environment, electronic resources are claiming their importance in all research activities. In the developing countries like India, the researchers have realized the importance of the electronic resources. Most studies have shown that electronic information resources have great impact on the quality of research as well.

Klobas (1994) says that most of the foundations, which people perform with the Internet, are new, and possibly they could not have been conceived before the network became available. He describes innovative uses of the
Review of Literature

Internet by the staff of two of Australian Universities. While the Internet provides opportunities for communication among its users, it poses challenges to the computing and information systems professionals who support them. It also presents librarians with the opportunity to apply their established skills as educators, information managers, custodians, information providers, and change agents in their work with Internet users.

Adams and Bonk (1995) focus their attention on the use of electronic information technologies and resources by the faculty at four library systems in the State University of New York. Further, the authors discuss user’s perceptions on the obstacles to the use of electronic technologies and library services.

Brown (1996) indicates that “by the end of the next decade there could be a wide range of new information systems which are not yet even on the drawing board”. Electronic information represents an outstanding opportunity to meet the known needs of the research community and to stimulate new lines of exploration and work methods to pursue them.

Hollonds (1997) explains the need to promote the use of Internet based information services among the teaching and research staff at a university in the U.K. The survey conducted by Lazinger et al. (1997) of the faculty members of the Hebrew University of Jerusalem, provided data on Internet access as of 1995. The results showed higher degree of usage by the members
of the faculty of science, medicine, and agriculture than the members of the faculties of social sciences and humanities.

Shoham (1998) conducted a survey among faculty members of two Israeli Universities in order to study the changes in scholarly communication in the wake of technological changes. The author found that 48% of the respondents used computerized databases as a channel for accessing information for research purposes.

According to Campbell (1998), there is an increased availability of information over the Internet along with "the ambiguity of the web means that our users are moving towards the digital library whether we like it or not".

Srikantaiah and Xiaoying (1998), in their paper, suggest that the Internet has significantly changed information management in developed countries by creating pressures to improve communication systems and to develop more user friendly environments for information sharing. Also they discuss the role of the Internet and its impact on developing countries, including major issues associated with electronic information access and delivery.

Akasawa and Ueda (1998), in their study, examine the use of electronic resources by a specific academic community in Japan-Academic Economists. The findings of the study reveal that 75% of the respondents perceived this medium as of "high value".

Tenner and Yang (1998) conducted a survey at the Texas A&M University. They found that the awareness of e-journals differed from the
Review of Literature

faculty to faculty. Hilary (1998) assesses the attitude of university academics towards electronic journals, and examines the level of use of these publications by university academics in the five faculties. Further, the author provides revolution of academic journals and factors contributing to the electronic publication of academic journals.

Ramesh Babu and Gopal Krishnan (1998) in their study found that the majority of the users were engineers, and that they belonged to the age group of 21-40 years. The most frequently used Internet services were e-mail and WWW. The female group of users use it more compared to the male group, and majority of the respondents use it for sending e-mails (100 %), retrieving the required information (93.8 %), getting news and publishing information.

Evaluating the usage and acceptance of e-journals Feja and Siebeky (1999) discus the advantages and disadvantages of electronic journals. The results of this survey show a significantly high acceptance of electronic journals and an unwillingness to return to print versions only.

Bavakutty and Salih (1999) conducted a study at Calicut University which reveals that students, research scholars, and the teachers use Internet for the purpose of study, research and teaching respectively. The purposes of Internet use were sending and receiving e-mails in connection with academic requirements, making a search on library catalogues, downloading images and communication with the peer.
Frazer and Morgan (1999) felt that the library realized a small savings of $3,607.75 from electronic-for-print substitutions, which was redirected into new print journal subscriptions. However, the experience of the Old Dominion University Library suggests that using electronic-for-print substitutions on a larger scale to redistribute funds across departments will be problematic.

Yin (1999) considers the results of a survey of a group of library and information science researchers regarding their use of Internet-based e-resources. E-resources have been extensively used as part of the research process. The major problems and concerns identified include organization, quality, reliability, and stability of e-resources; access to e-sources in special formats; standards on regulating e-resources for research purposes; and social norms regarding using, accepting, citing, publishing, archiving and evaluating, e-resources.

Crawford (1999) gives information about a study that evaluated the use of electronic services and the qualitative level of use which they receive at the Caledonian Library and Information Centre of the Glasgow Caledonian University in Scotland. The study has emphasized the need to identify clear, simple performance issues in the measurement of electronic information but he has shown how difficult it is to achieve it.

Chandran (2000) conducted a study at the S.V. University, Tirupati which showed that more than twenty-five percent of the respondents used Internet for 2-3 times a week; more than 56 % used it for accessing
information, the majority of the respondents used WWW and e-mail. The purpose of using Internet includes communication and information gathering. The sources used for identifying information about Internet include web site itself, journals and magazines, staff and newspapers. Majority of the respondents used general websites compared to recreational and discipline oriented. Yahoo, Alta Vista, Rediff, 123India were some of the most often used search engines. The major problems faced by the users include slow downloading, technical problems, and guidance problems.

Naushad Ali (2000) conducted a study in which more than fifty percent of the study population was satisfied with the timing of Internet service, but they were not satisfied with the staff’s cooperation, and reservation facility. The majority of students were not happy with the limited number of nodes available.

Tracing the growth of electronic journals, Ashcroft (2000) describes the impact of electronic journals on the role of information professionals. In a mutually beneficial relationship, all the involved need to be aware of each other’s needs and problems. The focus in this situation is on the relationship between the information professional and the library provider: if they can establish a common ground, then, ultimately, the user stands to benefit.

Ren (2000), in his study, assessed the level of self-efficacy among college students in the United States regarding electronic information searching before and after library instruction. This study shows that college students’
self-efficacy in electronic information searching was significantly higher after library instruction, which combined lecture, demonstration, hands-on practice, and an assignment of electronic information searching. Cook et al. (2001) conducted a pilot survey in which the author examines traditional methods of assessing effectiveness while testing new theories to measure the delivery of services to the consumers of research library resources.

Simmonds (2001), in his article, suggests that the use of academic libraries is influenced most by a user's perceived familiarity with the library and its resources; those who are more familiar with the library are more likely to use academic libraries. If library usage is to be increased, it is important that libraries find ways to familiarize users with the library.

A longitudinal survey of the use of electronic journals, printed journals and electronic databases by the faculty and graduate students was conducted by Rogers (2001) at Ohio State University (OSU). The survey was made three times (once a year), allowing the researcher to gain insight into the changes of attitudes and adoption over a time of electronic services. The findings of the survey showed that since 1998 there had been a significant progress in the acceptance and usage of electronic resources at OSU.

Thompson et al. (2001), reflecting upon the users' perceptions, have conducted a study which is one in a series analyzing the results of a large-scale web-based survey of library service quality at several Association of Research
Libraries (ARL) member institutions. They explore the fewest dimensions required to measure users' perceptions of library service quality.

Dillon and Hahn (2002), in their paper, discuss a web-based survey conducted by the university of Maryland libraries. The staff at the libraries hoped to discover information that would suggest how best to manage collections to serve the university community efficiently. The survey adds two new dimensions to previous studies of electronic journal usage. First, it examines the respondent's current use of print journals in library collections, and secondly, it distinguishes between respondents' format preferences for those journals that are most central to their research and teaching activities as well as for less important titles.

Hoogland and Co-chairs (2002) conducted a survey in which an attempt was made to identify what resources and services faculty and staff currently use for research, teaching, study and work, in addition to planning for their future needs. The study also revealed that faculty and staff underutilized many of the library resources and services simply because they were not aware of their existence.

Kebede (2002) highlights the trend and nature of the physical form in which information content is currently being made available for users' access and use in electronic information environments. Further, he concludes that users' information needs have indeed changed (and are still changing) as a
result of the emergence and expansion of the electronic form in which information content is being made available for users’ access and use.

Shepherd and Davis (2002) state that the use of online information resources continues to increase and is having a tremendous effect throughout the information value chain. They also report the four activities that are reshaping the metrics used by publishers, librarians and information aggregators, and are providing an effective vehicle for the library community and the publishers to collaborate for their mutual benefit.

Shim and McClure (2002) are of the opinion that the proliferation of networked electronic information resources and services prompted interest and research in developing statistics and measures to describe this emerging information provision environment.

Monopoli (2002) conducted an online survey in 2000 at the University of Patras. The findings of the study revealed that the main reasons for preferring the electronic format were ease of use, access and search ability and the capability to save and print the information.

One of the largest projects to date was the Stanford E-Journal study (e-JUST), carried out by the Stanford University Libraries (e-JUST User Study, 2002). The data for the project were collected through interviews and surveys. Three surveys were conducted within the framework of the project. The first survey investigated how life scientists perceive online journals with regard to their impact on research quality and productivity as well as attitudes towards
online journal usage. The focus of the Second Survey (2002) was on finding out what online features improved or enriched journal usage and probed attitudes of current active users of this technology. Most respondents start searching for journal articles at PubMed (recall that the respondents came from the life and medical sciences), Website (for example, OVID, Science Direct). The third one (Third Survey, 2002), a follow-up survey, examined changes in perception and attitudes of scientists towards e-journal usage over one year and the impact of e-journals on their research. Almost all of the respondents of the third survey use e-journals regularly and frequently.

Research Support Libraries Group (2002), in its report, summarizes the impact of electronic information sources on researchers. Cho et al. (2003) conducted a case study in which they attempted to investigate what types of changes have been made in Korea owing to the transition of the networking environment. The findings of the study reveal that Internet users with a high speed Internet service system tend to enjoy various kinds of services, including e-mail, and depend less on the traditional media such as TV and radio for information and entertainment.

Maheshwarappa and Ebnazar (2003) consider the results of an exploratory study on the use of Internet resources and services in Gulbarga City based on the data collected from one hundred and twenty-three users of Internet in private and public sectors, covering forty-seven users from cyber cafes and seventy six users from University and College environment. Most frequently
used resources and tools of Internet are e-mail, web browsers and search engines. Most frequently used search engines are yahoo, rediff, MSN search and Lycos. Seventy percent have not received any instructions in the use of Internet, and they feel the need for training.

Ehikhamenor (2003) says that the Internet culture is creating a new scientific communication system with new facilities that are competing with, and might replace, the present printed information sources. The findings of the study shows that the scientists are still heavily dependent on printed information sources, journals, indexes and abstracts. And non-use of the Internet is attributed to problems of accessibility, case of use and cost.

Spink (2003) examines the public searching of the web and provides an overview of recent research, exploring what we know about how people search the web. The findings show little change in current patterns of web searching by many users from short queries and sessions. Organization of the web or web searching trends is becoming more important for users and web search engines alike.

The use of Internet, www is becoming increasingly significant for the Teachers of Bundelkhand University, and it has now occupied an important place among various sources of information, and it is also felt that proper training should be provided for creating awareness of knowledge of resources in the respective subject fields (Sridevi, 2003).
Tenopir (2003), in his article, identifies the need for further research into three important areas of electronic publishing.

(i) How is the change to digital information sources affecting the scholarly work of college and university students?

(ii) Previous search shows that students rely on web and online resources and ask for less help from librarians.

(iii) Are librarians – as intermediaries to the search process – still necessary in a digital age?

Electronic media has greatly changed the expectations and requirements of the user. Traditional concept of academic libraries and user's orientation are undergoing total change. Scholars and information scientists have started writing and working on projects of Internet based library services, electronic libraries and virtual libraries. This view was supplemented by Chopra (2003), Chaurasia and Ganesh Kumar (2003) and Nazim and Jawaid, (2003) also.

Nyamboga et al. (2004), in their paper, report the findings of a study which aimed to identify how far the use of internet had enhanced teaching, research and scholarly communication at Egerton University. The results of the study show that use, interest and confidence in using the internet by female respondents is less compared to that of male respondents. E-mail and search engines were found to be the most frequently used resources and tools of Internet.
Jacoby (2004) identifies problems and issues involved in assessment of electronic reserves, and investigates usage measures, particularly web server logs, for after-hours and off-campus usages. The findings of the study indicate that electronic reserves are heavily used during non-traditional service hours and from outside the library's physical walls.

Rajeev Kumar and Kaur (2004), in their article examine the use of Internet by teachers and students in the Shaheed Bhagat Singh College of Engineering and Technology (SBSCET). The study demonstrates and elaborates the various aspects of Internet use such as frequency of Internet use, methods used for learning Internet skill, most frequently used place for Internet use, purposes for which Internet is used, use of Internet services, ways to browse the information from Internet, negative and positive aspects of Internet, problems faced by the users and satisfaction level of users with the Internet facilities provided in the college.

Kushkowski (2005) investigates the web citation behaviour of the authors of print and electronic thesis. This move to electronic formats has immense impact on academic institutions either by enabling or by requiring the submission of an Electronic Theses or Dissertations (ETDs).

Dadzie (2005), in his paper, investigates the use of electronic resources by students and the faculty of Ashesi University, Ghana, in order to determine the level of use, the type of information accessed and the effectiveness of the library's communication tools for information research. Further, he found that
the degree of general computer use for information access was high because of the university's State-of-the-art IT infrastructure. The author recommends that, among other things, the introduction of information competency across the curriculum and / or the introduction of a one-unit course to be taught at all levels and the provision of more PCs on campus.

Asemi (2005) conducted a survey to investigate the familiarity and use of digital resources by students through online and offline information databases of the Central Library, Central Library Books and Journals Database (CLBJD), and the CD-ROMs databases available in Isfahan Medical University. It was felt that the use of digital resources was still poor among the medical students of the Universities in the developing countries.

Griffiths and Brophy (2005) undertook a study on students searching behaviour on the web. They concluded that students preferred to locate information or resources via a search engine and found that Google was the search engine of choice. They also say that search engines now influences their perception and expectations of other electronic resources.

Biradar and Sampath Kumar (2005) investigate the use of Internet, its purpose, amount of time spent to use Internet, place of use, Internet expertise and the perceived obstacles in the use of Internet by physicists in the universities of Karnataka State. They also recommend some possible strategies to utilize the Internet to a greater extent. A similar study was undertaken by
Biradar et al. (2006) who concluded that E-mail was still one of the most popular services.

Kumbar et al. (2006) conducted a survey of the use of UGC-Infonet E-journal consortium by the faculty members and research scholars of the department of chemistry, Karnataka University, Dharwad. The survey has clearly indicated that:

- The electronic information resources are highly useful for the research and academic community in the present environment; and
- Use awareness programmes should be conducted to train the research and academic community in the maximum utilization of electronic information resources more effectively and efficiently.

Amarnath (2006) conducted a survey of use of information resources by the research scholars of Punjab Agricultural University Library, Ludhiana. The author examines the satisfaction levels of users regarding Internet, CD-ROM databases, online databases, e-resources, etc., as well as the services provided by the library. Further, the author suggests that SDI should be initiated through proper maintenance of database, and that proper orientation / training should be provided to the researchers so that the use of non-conventional forms can be optimized.

Asemi and Riyahiniya (2006) conducted a survey on awareness and use of digital resources in the libraries of Isafahan University of Medical Sciences, Iran. The results of the study are - 70 % of students are aware of the fact that
digital resources are available in university database, 87.2% of students feel that the available digital resources meet their information needs. The authors conclude that users face some problems, like low speed connectivity and shortage of inadequate hardware facilities.

Koovakkai and Hanna Noor (2006) conducted a survey on use of electronic information by the university teachers. The study reveals that the availability of electronic information and the satisfaction of the teachers in the available resources are not high. Non-availability of full-text, lack of time and lack of system speed are the most important barriers for the teachers in using the electronic information.

Korobili et al. (2006), in their survey, examine the use of library resources, focussing on e-resources, by the members of the faculty of a higher educational institute in Thessaloniki, Greece. The findings reveal that the majority of the faculty of TEI use printed sources more than e-resources, but they also use e-resources quite frequently. They mostly books, websites and printed journals. Also they indicated that the use of e-resources is positively influenced by the respondents' perceived usefulness of resources, the convenience of access to the sources and their academic productivity.

Ramana (2006), in her paper, presents the status regarding the use of electronic resources by the post graduate students and research scholars of Vellor Institute of Technology (VIT). The study shows that a large majority of students use online journals for preparing project reports and for listing
references only. Further, the author suggests that measures should be taken to improve the use of electronic services.

Explaining the electronic information resources Kaur and Verma (2006) describe the use of electronic resources by the teachers and students of Thapar Institute of Engineering & Technology Library, Patiala. Further, they examine the interest of the users in Internet, Infonet, CD-ROM databases and other services provided by the library.

Rokade and Rajyalakshmi (2006) conducted a survey on information needs of the users and electronic information services available in Dr. Panjabrao Deshmukh Krishi Vidyapeeth library, Akola. Further, they succinctly describe the evaluation of electronic information services in the light of current status of electronic information services and INFLIBNET services in agricultural university libraries of Maharashtra. It was concluded that the electronic information services and INFLIBNET services were quite useful to the users in agricultural university libraries in Maharashtra.

Shuling (2007) in her article investigates readers' utility of e-resources at Shaanxi University of Science and Technology. The investigative result shows that nearly half of the readers investigated are satisfied with e-resources of our university. The e-book does not substitute the traditional printed book. Readers selecting the printed and e-book form the greatest majority.
2.8 Inferences drawn from the Review of Literature

1. The relevant literature has been discussed and reviewed in six subheadings, viz., Information and Communication Technology; Academic Libraries in the Changing Environment; Collection Development and Collection Development Policy; Management of Electronic Information Resources; Electronic Publishing and Libraries; User Attitudes towards EIRs; Usage and Impact of EIRs.

2. Search of literature was made by using books, LISA on CD-ROM, ILSA, ARIST, online databases, reports, manuals, guides, theses and dissertations, articles from journals and works of T.D. Wilson, P.J. Johson, G.S. Owens and B.S. Maheshwarappa.

3. Most of the studies are based on foreign authors and Indian studies are to some extent minimum.

4. The study covers all types of libraries but concentrate more on academic library users.

5. A few case studies are noticed in the literature.

6. Most of the studies are funding projects like IMPEL2, eLIB, Research Libraries Group, etc.

7. Majority of the studies represent recent decade only.

8. Indian studies are based on theoretical foundations. They do not focus on the use of electronic information resources. Instead these studies focus on the use of Internet.
9. In the Indian context, hardly any study on the impact of electronic information resources on users is found.

2.9 Summing Up

In the context of university libraries in Karnataka, no such study in these lines has been undertaken. Whatever studies have been made in India, they hardly study the use of electronic information resources. They are based on theoretical foundations.

Looking at the Indian scenario, the situation calls for such studies. Hence the researcher has undertaken the present study.
References


10. Asemi, A. (2005). Familiarity and use by the students of digital resources available in the academic libraries of Medical Science University of Isfahan (MUI), Iran. In T.A.V. Murthy, et al. (Eds.),
Review of Literature


91. Kanamadi, S.T. (2005). The changing information environment; the impact of information technology innovations on resources and services of libraries: A Study with special reference to institutes of management studies in Mumbai. [Ph.D. Thesis submitted to the Karnataka University, Dharwad, Karnataka State].


Review of Literature


Review of Literature

(Proceedings of 3rd International CALIBER, Cochin, India, February 2-4, 2005) (pp. 705-711). Ahmedabad: INFLIBNET.


