



KUVEMPU UNIVERSITY

THE COLLECTION OF ELECTRONIC INFORMATION SOURCES AND SERVICES IN KARNATAKA STATE UNIVERSITY LIBRARIES AND THEIR AWARENESS AND USE BY THE ACADEMIC STAFF: A STUDY

**A THESIS SUBMITTED TO KUVEMPU UNIVERSITY FOR
THE AWARD OF THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN
LIBRARY AND INFORMATION SCIENCE**

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TO

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DECLARATION

I hereby declare that the thesis entitled “**The Collection of Electronic Information Sources and Services in Karnataka State University Libraries and their Awareness and Use by the Academic Staff: A Study**” submitted to the faculty of Science and Technology, Kuvempu University for the award of the degree of **Doctor of Philosophy** in Library and Information Science is the result of the research work carried out by me in the Department of Library and Information Science, Kuvempu University, Jnana Sahyadri under the guidance of **Dr. K.C. Ramakrishnegowda**, University Librarian.

I further declare that this thesis or part thereof has not been previously formed the basis of the award of any degree, fellowship, etc., of any other university or institution.

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I further declare that this thesis or part thereof has not been previously formed the basis of the award of any degree, fellowship, etc., of any other university or institution.

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Research Guide

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ABSTRACT

The objectives of the present study were: to assess the ICT infrastructure available in Karnataka State university libraries; to know the status of library automation; to find out the collection of electronic information sources; to find out the provision of electronic information services made by the university libraries; to find out the awareness and use of the electronic information sources by the academic staff; to find out the awareness and use of the electronic information services by the academic staff; and to find out the academic staff's awareness and participation in user education programmes conducted by the university libraries.

The scope of the study area was limited to Karnataka State. Only six universities which were included in the Karnataka State Universities Act, 2000 had been taken into consideration for the purpose of the study. The universities which were included in the present study: the Bangalore University with headquarters at Bangalore, the Gulbarga University with headquarters at Gulbarga, the Karnatak University with headquarters at Dharwad, the Kuvempu University with headquarters at Shankaraghatta, the Mangalore University with headquarters at Konaje, and the Mysore University with headquarters at Mysore. The study was restricted to the academic staff working in post-graduate departments of the said universities.

The survey method had been adopted for the present study. Two questionnaires were designed: one for university librarians and the other for the academic staff for the collection of data and wherever necessary the questionnaires were used as interview schedules. The data collected were tabulated and analyzed statistically using appropriate descriptive and inferential techniques.

The study found that the university libraries greatly vary from one to another as far as the ICT infrastructure was concerned. Most libraries lack sufficient hardware and software facilities and did not have sufficient Internet nodes and bandwidth. The campus LANs of the universities were not fully extended to exploit the benefits of digital information environment. The efforts put in to develop electronic information resources on their own by the university libraries found to be meager. The scholarly literature accessible under the UGC-Infonet E-Journal Consortium was the only strength of these university libraries.

Though majority of the academic staff were aware of the electronic information resources and services, negligible number of them use for study, research and publication purposes. Based on the findings, suggestions were made to improve the provision of the electronic information resources and services in the Karnataka State university libraries, also to create awareness of and use them by the academic staff.

Key words: University libraries- Karnataka; Electronic information resources- University libraries- Karnataka; Electronic information services- University libraries- Karnataka; Electronic information resources- Awareness- Academic staff; Electronic information resources- Use- Academic staff; User education- University libraries- Karnataka; University libraries- Academic staff

1.1 Background

Education plays a pivotal role in the development of society. The universities are the apex bodies in higher education system. “Dissemination of knowledge in a university is achieved through (i) teaching, (ii) publication, and (iii) extension programmes.”¹ The convergence of Information and Communication Technologies (ICTs) coupled with globalization and liberalization have changed the methodologies of teaching, learning and research at every level of education. The document of National Policy on Education (1986), has rightly observed that “In the context of unprecedented explosion of knowledge, higher education has to become dynamic as never before, constantly entering uncharted areas.”² Higher education institutions are overrunning state and national boundaries. The university is no more a place where teacher and students have face-to-face interaction. The role of the teacher has been redefined from teacher to facilitator. Physical distances are no more important with new ICTs. Emphasis on life-long learning, easy access to information, interaction with knowledge, availability of powerful multimedia learning tools, has changed educational scenario.

The vast developments in higher education and research with an impetus of knowledge-economy has resulted in not only the exponential growth of information but also has paved way for the emergence of interdisciplinary and multidisciplinary subjects. The world is passing through unprecedented competency to establish supremacy over

knowledge. The nascent information thus generated has to reach and utilized by the academic community before it becomes obsolete. The developments in ICTs in general and Internet and World Wide Web in particular have revolutionised the way of information flow from its generation to use. The academic community needs to have quick access to the exhaustive information, generated world-wide, to be more effective and efficient in its academic endeavour. But the amount of information and various formats in which it is published is beyond any one individual or institutional reach to achieve control over world's information even in ones own field of specialization. It is here the university library extends its support to the academic community engaged in higher pursuit of knowledge by adjusting itself to the demanding needs of the knowledge society driven by ICTs.

1.1.1 University Library

“The role of libraries in providing widespread and inclusive access to knowledge is widely acknowledged. In today's context, libraries have to play two distinct roles - to serve as a knowledge centre of information and be a local gateway to national and global knowledge centre of information. In order to achieve this goal, existing libraries must modernize their collection, services and facilities, become more proactive and collaborate with other institutions, agencies and NGOs in order to develop a community-based information system.”³

The Radhakrishnan Commission (1948) on University Education in India aptly observed that “The library is the heart of the university’s work, directly so as regards its research work, and indirectly as regards its educational work. Scientific research needs a library as well as its laboratories while for humanistic research, the library is both the library and laboratory in one.”⁴ Library has thus become the heart and soul of university system.

Collection of information resources is an important activity of any library. Collection development is a complex process that includes assessment of user information needs, evaluation of present collection, designing collection development policy, procurement of information sources and planning for resource sharing. The university library takes into account the information needs of users - teachers, students, researchers, etc. - and develops the collection of all types of information sources in whichever format they are published.

Till recently, the libraries were procuring information sources in print form and organizing them physically in the libraries. The developments in ICTs have changed the world of information industry. The adoption of electronic technology in production of information sources has made collection development in libraries a more complex process. The developments in Internet services in general and WWW in particular have changed the face of library and information services in higher education and research. The libraries are providing access to the information through computer networks, which

have broken down the barriers of space and time. Hence, the shift is from information ownership model of librarianship to the information access model. The information behaviour of library users and their expectations of library and information services have also changed.

Hewitson (2002) is of the opinion that “Changes in technology in recent years have dramatically altered how information is accessed, stored and disseminated. Whereas information provision in academic libraries was previously based upon the collection of physical library materials, it is now increasingly the case that academic libraries are moving their collections into the virtual arena. With new advances in new technology opening up access to information on a local, regional, national and international basis, academic staff are now faced with a multitude of information sources available from their desktops.”⁵ The present day university libraries striving hard to possess electronic information resources and provide services on that basis through networks to the users wherever they are.

1.1.2 Electronic Information Resources and Services

Electronic information resources offer unique advantages: compact storage, rapid retrieval and delivery, interactivity and flexibility in transfer of information. These sources provide access to current information as these are updated frequently. Often, the sources such as full-text databases, e-journals, e-books including reference sources

(dictionaries, encyclopedias, directories, handbooks, atlas, etc.), text-archives, OPACs, image collections, multimedia products, collections of numerical data, etc., provide links to related information to the users in their field of interest. The university libraries have realized the importance of electronic information resources to fulfill the ever-growing and dynamic needs of their new generation of users, who give more importance to instant access to information than its authenticity and authoritativeness. They are Internet savvy.

Internet is considered as the treasure house of information which provides access to information resources both free and fee-based. Internet has become ubiquitous all over the world, and university libraries are not exception to it. University Grants Commission established INFLIBNET Centre in the year 1991, to help the university libraries in India not only to automate their house-keeping operations but also to establish campus-wide networks in the universities.

The consortia activities, such as UGC-Infonet, INDEST and others are gaining popularity among higher education and professional institutes in India. By making use of all these electronic infrastructure and resources, university libraries provide different kinds of information services to their users such as: information alert services, news groups, virtual reference service, retrospective search service, document delivery service, Web-based instructions (FAQs), translation service, user education, institutional repository and portal services.

University libraries can also alert their users of information resources procured recently, forthcoming conferences and seminars, important information appeared in newspapers, newsletters, etc. Personalised services are provided to the individual users through passing the information of their interest to their desktops. When the libraries introduce new resources and services all the users are informed through the list services. The university libraries create news groups and post them for wider dissemination among the users online to obtain their participation, suggestions, feedback, etc., regarding various resources and services offered by them.

University libraries offer virtual reference services to their users through e-mail, instant messages (chatting) and over telecommunication. General guidance in making use of resources and services are provided through FAQs.

University libraries have made provision for automated circulation, reservation and recommendation for procurement of information sources, and access to the OPAC which services save the time of the academic staff. A well-designed library web site serves as a gateway for the resources of the library and promotes the use of information sources and services. The information sources which are more important are mounted on the library website in order to bring to the notice of the users, and their instant access.

Through robust and reliable campus network, university libraries provide attractive services to the academic staff. Information about the subscription of online

sources and information sources available through consortia is passed on to the academic staff's desk-top. The CD-ROM server connected to the campus LAN provides access to the information sources available on CD-ROMs and DVD-ROMs at the door-steps of the academic staff.

User education is another important service provided by a modern library. University libraries arrange training programmes, workshops, special lectures, audio-visual presentations, publish brochures, handbooks, and tutorials on computer and Internet fundamentals, searching CD-ROM, DVD-ROM, Internet, consortia-based resources, institutional repositories, etc.

1.2 Statement of the Problem

Every institution engaged in pursuit of higher education and research is trying to achieve academic excellence. Every educational institute has realized the need for automation of their libraries. The university libraries in Karnataka are spending lakhs of rupees every year for the purpose of library automation and procurement of electronic resources. The UGC is also providing financial assistance for this purpose. Further, the UGC, under its UGC-Infonet programme, is providing access to e-journals to almost all the Indian university libraries for the benefit of academic community.

There seems to be no definite answer for several research questions like - the strategy being followed by the university libraries in Karnataka with regard to collection of electronic information resources other than those made available under UGC-Infonet consortium, the awareness of electronic information resources and services available in university libraries by the academic staff and such other questions. A review of the published literature in the selected area of study reveals that, no systematic study has been carried out either on the availability of ICT infrastructure, and e-resources and services, or on their awareness and use by the users of university libraries of Karnataka. And hence, the problem of the study is stated as: “COLLECTION OF ELECTRONIC INFORMATION SOURCES AND SERVICES IN KARNATAKA STATE UNIVERSITY LIBRARIES, AND THEIR AWARENESS AND USE BY THE ACADEMIC STAFF: A STUDY.”

1.3 Significance of the Study

From the dawn of last quarter of the 20th century, especially from the mid 1990s, Indian university libraries have made provision for electronic information resources and services. The libraries are equipped with number of computers, Internet connectivity, E-mail facility, Local Area Network (LAN), subscription of online resources such as e-journals, e-books and e-databases, access to consortia-based resources (such as UGC-Infonet), and CD-ROM databases. The automation of their traditional services like acquisition, cataloguing, circulation, serials control, etc., have been carried out. The

main intention of making provision for electronic information resources and services was to improve the quality of library services for the benefit of academic community. The university libraries in Karnataka are also making considerable efforts in this direction. The large amount of public money is being invested for this purpose. Though the university libraries are non-profit organizations, there is a need to study the extent to which the electronic resource-based services have added value to the higher education and research.

There is an urgent need to know the strength and weakness of the collection of electronic information resources and services available in Karnataka State university libraries. It is also because that, this study would reveal the problems faced by the library professionals in the process of establishing electronic library services. This study becomes an eye opener with regard to the existing situation of collection of electronic information resources and services in university libraries of Karnataka. The present study will help to know the problems encountered by the university librarians in the procurement of electronic information resources and services in university libraries of Karnataka. It is also important to know the extent to which the academic staff are aware of the electronic information resources and services, and also to what extent they use them for their academic activities.

The knowledge of these important aspects will have an immense value for planning and development of information services in university libraries of Karnataka. Moreover,

no systematic study has been undertaken to understand the collection of electronic information resources and services in university libraries of Karnataka on one hand, and their awareness and use by the academic staff on the other. Hence, the present study is undertaken to make a humble beginning to understand the issues raised above.

1.4 Objectives of the Study

The objectives of the present study are as follows:

- a) To assess the ICT infrastructure available in the university libraries of Karnataka.
- b) To know the status of library automation in the university libraries of Karnataka.
- c) To find out the collection of electronic information sources in the university libraries of Karnataka.
- d) To find out the provision of electronic information services made by the university libraries of Karnataka.
- e) To find out the awareness and use of the electronic information sources by the academic staff working in the universities of Karnataka.
- f) To find out the awareness and use of the electronic information services by the academic staff working in the universities of Karnataka.
- g) To find out the academic staff's awareness and participation in user education programmes conducted by the university libraries of Karnataka.

1.5 Hypotheses and Research Issues

The following hypotheses have been drawn for the present study.

- 1) There is a direct relation between the support extended by the UGC under its INFLIBNET and UGC-Infonet Programmes and the development of e-culture in the university libraries of Karnataka.
- 2) There is an association between the gender of the academic staff and the awareness and use of e-resources.
- 3) There is an association between the designation of the academic staff and the awareness and use of e-resources.
- 4) There is an association between the subject background of the academic staff and the awareness and use of e-resources.
- 5) There is an association between the computer training background of the academic staff and the awareness and use of e-resources.
- 6) The academic staff who have Internet facility at their department chambers and at homes use the Internet more frequently than those who use it at commercial centres.

The present study has several research issues and the important ones are given below:

- a) Is there any definite strategy being followed by the university libraries in Karnataka with regard to the collection of electronic information resources other than those made available under UGC-Infonet consortium?
- b) Whether the academic staff make use of the information offered by their university libraries through e-resources and services for teaching, research, publishing research papers and books, participating in seminars and conferences, and for guiding their P.G. students and research students to make the best use of them for their academic endeavours?
- c) What do the academic staff expect from their university libraries to create awareness and use of electronic information resources and services available in their university libraries?

1.6 Limitations of the Study

The study is restricted to the academic staff working in post-graduate departments of the selected universities in Karnataka State.

The scope of the study area is limited to Karnataka State. Only six universities which are included in the Karnataka State Universities Act, 2000 have been taken into consideration for the purpose of the present study. The names of the universities which are included in the present study are: Bangalore University with its headquarters at Bangalore, Gulbarga University with its headquarters at Gulbarga, Karnatak University

with its headquarters at Dharwad, Kuvempu University with its headquarters at Shankaraghatta near Shimoga, Mangalore University with its headquarters at Konaje near Mangalore, and University of Mysore with its headquarters at Mysore.

All other universities, viz., Agriculture, Medical, Technical, Kannada and deemed universities in Karnataka state are excluded from this study.

Tumkur University, Tumkur and Women's University, Bijapur are also excluded from this study.

1.7 Methodology

The survey method has been adopted for the present study. The detailed description of the methodology followed for the present study is presented in Chapter 3.

1.8 The Definition of the Concepts

The definition of the concepts used in the present study have been given below:

- a) **Collection:** The term collection has been used to mean the act of making available or accessible the different kinds of information resources in the university libraries of Karnataka by means of procurement and / or licensing, through consortia efforts, gift and free of cost.

- b) **Electronic information sources:** The phrase ‘electronic information source’ has been used to mean books, full-text journals, bibliographic sources, reference sources such as dictionaries, encyclopedias, directories, atlas, etc., theses, dissertations, online databases and other information resources encoded for manipulation by a computerized device. This resource may require the use of a peripheral directly connected to a computerized device (example, CD-ROM drive) or a connection to a computer network (example, the Internet).
- c) **Electronic information services:** The phrase ‘electronic information services’ has been used to mean the library services delivered through electronic means by making use of electronic information resources. This includes: current awareness service, alerting service, news groups, virtual reference services, retrospective search service, translation services, and other such services offered by the university libraries under the study.
- d) **Awareness:** The term ‘awareness’ has been used to mean the state of knowing about the availability and / or accessibility of electronic information resources and services in the university libraries of Karnataka State.
- e) **Use:** The term ‘use’ has been used to mean the electronic information resources and services an individual actually uses to satisfy his / her information need for his / her study, research, teaching, publishing books, research papers, etc., and other purposes.

- f) **Academic Staff:** The phrase ‘academic staff’ has been used to mean Professors, Readers and Lecturers working in post graduate departments of Karnataka State Universities.
- g) **Karnataka State Universities:** The phrase ‘Karnataka State Universities’ has been used to mean those universities which have been established under the Karnataka State Universities Act, 2000.
- h) **Karnataka State University Libraries:** The phrase ‘Karnataka State University Libraries’ has been used to mean those libraries attached to Karnataka State Universities at their respective headquarters.

1.9 Chapterization

The study is organized into the following six chapters.

Chapter 1: Introduction

This chapter includes the background of the present study, university library, electronic information sources and services, statement of the problem, significance of the study, objectives, hypotheses, limitations of the study, methodology, definition of the concepts used and chapterisation.

Chapter 2: Literature Review

In this chapter an attempt has been made to review the related literature. This chapter has been divided into three parts: i) studies related to the conceptualization of the research problem ii) studies by foreign authors; and iii) studies by Indian authors.

Chapter 3: Research Methodology

This chapter includes the site of the study, population of the study, instruments used for the study, data collection and analysis methods.

Chapter 4: Collection of Electronic Information Sources and Services in University Libraries

This chapter deals with historical overview of the selected university libraries in Karnataka State, and provides analysis and interpretation of the data collected from the university librarians about the ICT infrastructure, status of library automation, information sources available in university libraries, electronic information services provided by the university libraries and user education programmes conducted by the university libraries.

Chapter 5: Awareness and Use of Electronic Information Sources and Services by the Academic Staff.

In this chapter, the data received from the academic staff have been tabulated and analysed. The data received from the academic staff have been divided as respondents' background, respondents' knowledge of computer, ICT facilities available to the academic staff, awareness and use of Internet facility, UGC-Infonet E-Journal Consortium, CD-ROM databases, OPAC, and awareness and participation in user education programmes, awareness and use of electronic information services.

Chapter 6: Findings, Suggestions and Concluding Observations

This chapter provides an overview of the major findings regarding the collection of electronic information sources and services in the university libraries and the extent to which the academic staff are aware of and use these sources and services. Based on the findings, the suggestions have been put-forth to enhance the collection of electronic information sources and services in university libraries and enhance the awareness and use of these resources and services by the academic staff.

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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 thrust 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: cope 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 over-due 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.

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- 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

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- 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

Type	Definition	Pros	Cons
Virtual reference	Librarians answer questions by e-mail and chat	Users assisted who cannot visit the library	Technology slow and harder to communicate with users

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).

The Association of Research Libraries issued four Systems and Procedures Exchange Centre (SPEC) kits on user surveys and studies between 1981 and 1994 (Association of Research Libraries, 1981, 1984, 1988, 1994).

A substantial body of literature has been developed on survey and service quality, led by studies and reviews from such library educators/professionals as Herson and McClure (1990); Nitecki and Franklin (1999); Herson 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 Herson 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 iteration 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, one 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 academics 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 Lithuanian 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 identify 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 Bangkok 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 Bachelor 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).

Muswazi 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.

Bavakuly 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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3.1 Introduction

The present study is an effort to know the status of electronic information sources and services in select university libraries of Karnataka State on the one hand, and to study the extent to which the academic staff of these universities are aware and use the electronic information sources and services on the other. To carry-out such a study, six universities in Karnataka have been selected. The survey method has been used for the present study. The researcher visited the universities under the study and collected the required data and analysed the data by making use of the appropriate statistical techniques.

The following sections of the Chapter deals with the research design which includes the site of the study, population of the study, survey instruments, data collection and data analysis.

3.2 Study Area

The scope of the present study is limited to the State of Karnataka. Only those universities which are included in Karnataka State Universities Act, 2000, are taken into consideration for the present study. The names of the universities which are included for the study are:

- i) Bangalore University with the headquarters at Bangalore;
- ii) Gulbarga University with the headquarters at Gulbarga;
- iii) Karnatak University with the headquarters at Dharwad;
- iv) Kuvempu University with the headquarters at Shankaraghatta;
- v) Mangalore University with the headquarters at Konaje; and
- vi) Mysore University with the headquarters at Mysore.

A historical overview of these 6 universities has been given in Chapter-4.

There are two more universities in Karnataka State which have been established under the same Act recently. These universities are: (i) Karnataka State Women's University, Bijapur with the headquarters at Bijapur, established in 2003; and (ii) Tumkur University with the headquarters at Tumkur established in 2004/2005. These two universities have not been included for the present study, because the former university was just established and the latter was not at all established in 2003 (when the present study had been started).

3.3 Population of the Study

The population of the present study includes the university librarians and the academic staff working in the universities. The phrase 'academic staff' includes Lecturers, Readers and Professors working in the post-graduate departments of the universities under the present study.

3.3.1 Characteristics of the Study Population

The characteristics of the study population include: gender, age, designation, subject background, teaching experience and educational qualification. On the basis of these characteristics, the respondents have been categorized as follows:

Gender	:	i) Male	ii) Female	
Age	:	i) Up to 30 years	ii) 31 to 40 Years	
		iii) 41 to 50 years	iv) 51 years and above	
Designation	:	i) Lecturer	ii) Reader	iii) Professor
Subject Background	:	i) Social Science	ii) Science	
		iii) Humanities		
Teaching Experience	:	i) Up to 10 years	ii) 11 to 20 years	
		iii) 21 to 30 years	iv) 31 years and above	
Educational Qualification	:	i) Ph.D	ii) Non-Ph.D	

3.3.2 Sampling

A list of academic staff was availed from each of the universities under the study. Then the stratified random sampling technique was used to divide the resultant universe of population into three strata on the basis of designation as Lecturers, Readers and Professors for the selection of the representative sample. Fifty percent of each of the stratum so formed was drawn as a representative sample on the basis of the subject background of the academic staff. In total 931 academic staff were selected as

representative sample and questionnaires were distributed personally. The respondents were given sufficient time to fill the questionnaires. Finally 578 filled in questionnaires were received back that amounts to 62.08% of the actual questionnaires distributed. These 578 respondents were classified on the basis of the characteristics of the universe of population described earlier for the further analysis of the study and the details of which is presented in Chapter 5 of the study.

3.4 Instruments

The survey method was used for the present study. Two questionnaires were designed: one for university librarians and the other for the faculty members for the collection of data and wherever necessary the questionnaires were used as interview schedules.

3.4.1 Survey Instrument for University Librarians

In order to collect the data about the electronic information sources, electronic resource-based services and user education programmes in the university libraries under the present study, a questionnaire was designed and the same was used as interview schedule. The major contents of the questionnaire were as follows:

- i) **General Information:** This part of the questionnaire intended to explore the details about the library building, working hours, staff and users.

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- ii) **ICT infrastructure:** As the ICT infrastructure is the base for providing electronic information services, questions were raised to know the hardware and software infrastructure available in the university libraries under the study. Apart from this, the details were also sought about the network facilities such as campus LAN and Internet facilities made available to the academic staff both within the library premises and throughout the campus.
- iii) **Library Automation:** The questions included under this facet sought the details of automation of the house-keeping operations such as acquisition, serials control, technical processing, circulation, etc., creation of OPAC and efforts made to digitize the important library collection.
- iv) **Library Collection:** As one of the core objectives of the study was to know the nature of library collection, the questions under this part were designed meticulously which aimed at the details of collection development policy, library collection in print version, non-book materials, CD-ROM/DVD-ROM databases, electronic information sources subscribed by university libraries individually, electronic information sources accessible through consortia efforts, digital archive of open access information sources and institution repository. Also, questions were raised to know the factors influenced them to

develop collection in electronic version and problems faced by them in the process of collection of electronic resources.

- v) **Electronic Information Services:** This facet of the questionnaire was intended to explore the particulars regarding the provisions made to provide electronic resource-based services by the university libraries to the users in general and academic staff in particular. The particulars were sought regarding the provision of synchronous and asynchronous electronic reference services, alerting services aimed at a group of users as well as individual users, metadata services such as indexing and abstracting, electronic document delivery service, referral service and translation service.
- vi) **User Education:** This was another important facet of the questionnaire. The questions were raised to the university librarians to know the efforts made by them to create awareness among the academic staff about the information sources and services. Specific details were sought about the methods followed for user education and the modules covered in such training programmes.
- vii) **Future Plans:** At the end, the university librarians were requested to record the future plans regarding the collection of electronic information sources and services, and user education programmes to create awareness about such sources and services and obviously these two questions were open-ended ones.

The researcher visited different sections in the university libraries to observe the automated activities and the organization of electronic information resources. The researcher also visited the University Computer Centres to know the resources and services rendered by them in collaboration with the university libraries for the benefit of academic community. The informal discussions were held with the personnel in-charge of the University Computer Centres.

3.4.2 Survey Instrument for Academic Staff

A questionnaire was designed for the collection of required data about the awareness and use of electronic information sources and electronic resource-based services from the academic staff working in the post-graduate departments of the universities under the study. The major contents of the questionnaire were as follows:

- i) **Personal Information:** First facet of the questionnaire was designed to explore the information regarding respondents' gender, age, teaching experience, subject background, designation, educational qualification, academic activities, availability and accessibility of computer and Internet at home as well as department chamber, working knowledge of computer, nature of computer training undergone, etc.
- ii) **Awareness and Use of Electronic Information Sources and Services:** This facet was designed to elicit details about the awareness and use of the electronic infrastructure including

campus LAN and Internet facility, UGC-Infonet E-Journals Consortium, CD-ROM databases, OPAC, and electronic resource-based services offered by the university libraries. The respondents who do not use the e-resources though aware of their availability were asked to indicate the reasons for the non-use. The respondents who are aware and also use the e-resources were asked to indicate the frequency of use, purpose of use, expertise to use and the problems faced in the use of e-resources.

- iii) **User Education:** This part of the questionnaire included the questions on the awareness and usefulness of the user education programmes conducted by the university libraries.
- iv) **Suggestions:** This facet was designed to know the respondents suggestions, if any, for the improvement of collection in electronic version, electronic resource-based services and user education programmes.

3.5 Data Collection

For the collection of the data required for the study from the university librarians, the researcher personally visited the universities under the study. The researcher handed over the questionnaire to each of the university librarians and allowed sufficient time to fill-up the questionnaires. Interview was held with each of the university librarians to confirm the accuracy of the data filled-up in the questionnaire as well as to seek the

exhaustive information regarding the problem at hand. The researcher visited each and every section of all the university libraries under the study to know more about the electronic information sources and services. The researcher held discussions with the personnel in-charge of the University Computer Centres which have been established in Gulbarga, Karnatak, Mangalore and Mysore University.

In order to collect the data from the academic staff, the researcher handed-over the questionnaires to the respondents personally and allowed sufficient time to fill-up the questionnaires and then collected personally. The researcher used the same questionnaire as interview schedule for collection of data from the senior professors.

3.6 Data Analysis

For the convenience and data analysis work, the data collected through questionnaires have been coded using a coding structure. In the coding structure the statements of the questionnaire are referred with coded variable as Q (representing question) followed by main question number and serial number of an aspect/source/service. For example, the first aspect i.e., Beginner given in Question No. 16 is coded as Q.16.1

The data collected were tabulated and analysed statistically using appropriate descriptive and inferential techniques included in the Statistical Package for Social Sciences (SPSS). The descriptive statistics including frequency distribution, percentage,

were used to provide a general picture of the awareness and use of electronic information sources and services by the academic staff in universities. Simple table analysis method has been followed for analyzing the data collected from the university librarians. The data received from the academic staff was analysed by four independent variables namely, gender, subject background, designation and computer training background in relation to the awareness and use of the electronic information sources and services. The inferential statistical techniques, viz., cross tabulation and Chi-Square test were used to point out the association between the variables.

To facilitate data analysis, necessary measurement scales were used.

4.1 Introduction

There were only 20 universities in India prior to Independence in 1947. Now the number of universities in the country has exceeded 350. Similarly, the teaching and learning methodologies have undergone a sea-change. Teachers can address their students from distant and remote places. The research has changed from solo research to team research due to inter-disciplinary nature of the subjects. It has resulted in generation of abundant information.

The vital role of information institutions such as libraries, documentation centres and information centres in education, spread of literacy, research and overall development of a country is well recognized (Mangla, 2006). The university libraries have invited the ICT with an open arm, and adopted it in their each and every activity. The ICT offers compact storage, interactivity, quick retrieval and delivery, and flexible transfer of information. Time and space are not barriers in information communication in the electronic environment. Large amount of scholarly literature in the form of full-text journals, books, reports, etc., are published in electronic medium. Recognising the fact that the use of ICT opens new avenues for better services, an increasing number of libraries and information centres have made attempts to computerize their activities in India (Venkata Ramana, 2004).

University libraries have assumed the responsibility of providing right kind of information to the right user at the right time in the right form. In order to keep pace with the changing environment, university libraries have transformed from mere store-houses of traditional sources in print form to facilitator to provide instant access to the information required by the end-users. This has become possible through the adoption of ICT which have accelerated the efficiency and effectiveness of their services. Libraries have become increasingly aware of the revolutionary impact of developments in ICTs on their key functions (Kaula, 1997). In this context, an attempt has been made to assess and report the ways in which the Karnataka State University Libraries have responded to the changes that have brought in by the electronic environment.

4.2 University Libraries in Karnataka: A Historical Overview

According to the Karnataka State Universities Act, 2000, there were six universities in the State. Recently two more universities have been added: Tumkur University and Women's University Bijapur. As already mentioned, the six universities which have been established under the Karnataka State Universities Act, 2000, have been covered in this study. Two maps have been given in the following pages: (1) the map of India showing the jurisdiction of Karnataka State; and (2) the map of Karnataka State showing the jurisdiction of the universities. The historical overview of the six universities under the present study has been given in brief in the following sections.

Figure 1: Map of India showing the Jurisdiction of the Karnataka State

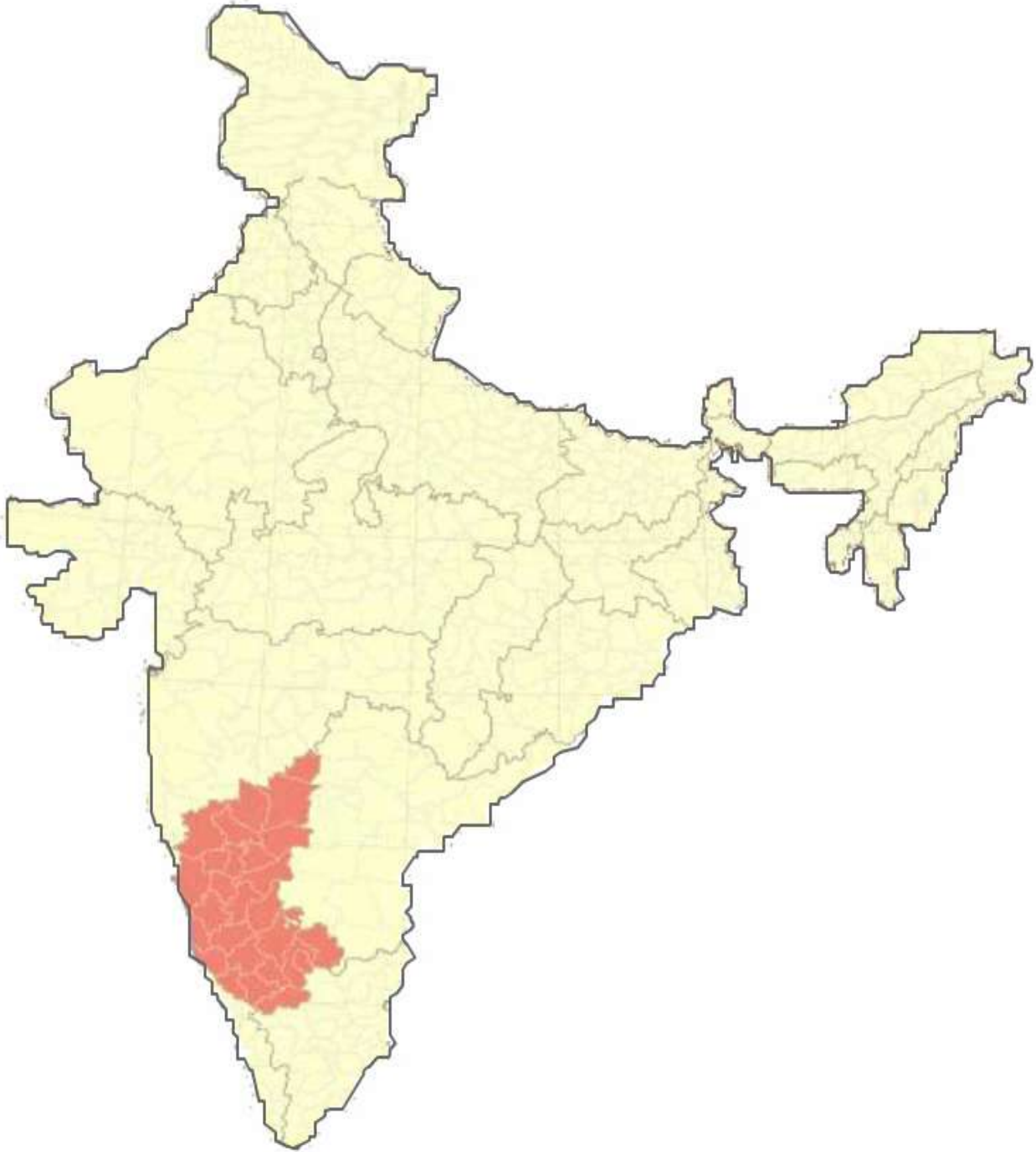
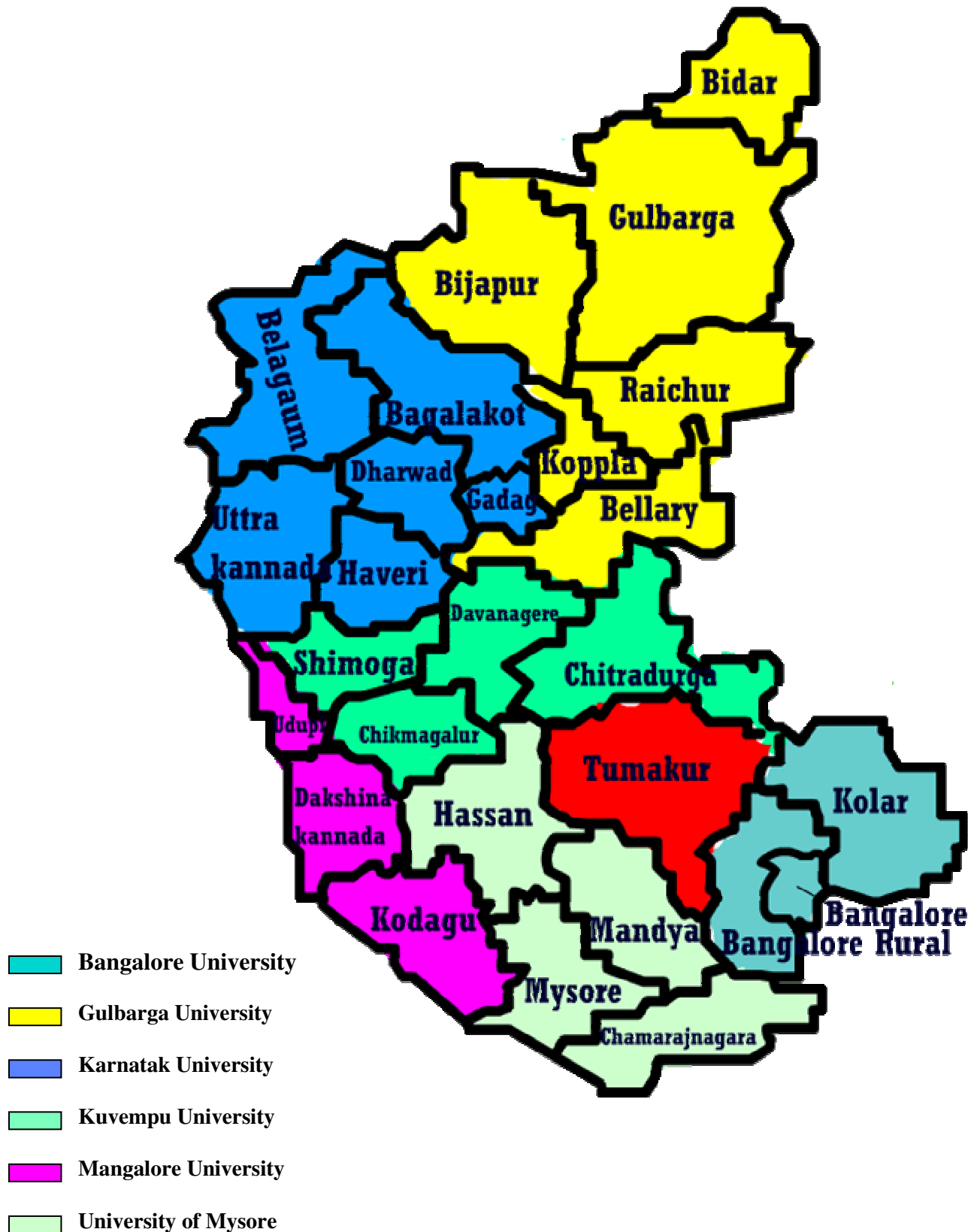


Figure 2: Map of Karnataka showing the Jurisdiction of the Universities



4.2.1 Mysore University Library, Mysore

The Mysore University Library (MUL) housed in Manasagangotri, is one of the largest university libraries in the country and in particular, the largest of all the university libraries in Karnataka State. The University of Mysore was established on 27-07-1916 by its founding father, His Highness Nalvadi Krishnaraja Wodeyar IV, the then Maharaja of Mysore and Sir M. Vishweswaraiyah, the then Dewan of Mysore. The University of Mysore was the 5th university established in the country and the very pioneer in the princely State of Mysore. The present jurisdiction of the University covers Mysore, Hassan, Mandya and Chamaraja Nagar districts in the State.

The inception collection of the MUL was 2311 books which was housed in Jubilee Building and later moved to Maharaja's College campus, and finally shifted to the new building at Manasagangotri campus in 1965. It was inaugurated by the then president of India Dr. S. Radhakrishnan on 7th December 1965 (University of Mysore, Mysore).

4.2.2 Karnatak University Library, Dharwad

The Karnatak University Library (KUL) came into existence in 1949. The Karnatak University was established on April 17, 1947 under the chairmanship of Justice N.S.Lokur and the Karnatak University Bill, based on its recommendations, passed by the State Legislature in April 1949. The Karnatak University office started working in

August 1949, in the office of the Curator of Libraries, Bombay and later shifted to Dharwad, the seat of the University, in Karnataka State in October 1949. The jurisdiction of the University extends to Bagalkot, Belgaum, Bijapur, Dharwad, Gadag, Haveri and Uttar Kannada districts in the State. The University has 5 constituent and 246 affiliated colleges. The University has P.G. Centres at Belgaum, Bijapur, Dandeli, Gadag and Karwar. The University's main campus is host to faculties of Arts, Humanities and Social Sciences, Languages, Commerce and Management, Science and Applied Sciences (Karnatak University, Dharwad).

4.2.3 Bangalore University Library, Bangalore

The Bangalore University Library (BUL) came into existence along with the establishment of the University on July 10, 1964. The jurisdiction of the Bangalore University has extended to include affiliated colleges situated in the districts of Bangalore Urban, Bangalore Rural and Kolar. There are 450 affiliated colleges and 3 university colleges. The University has established a post-graduate centre at Kolar.

The Bangalore University offers courses in the faculties of Arts, Humanities and Social Sciences, Education, Law and Commerce. The BUL fulfils the mission of the University with the collection of information resources in print as well as electronic media and provides information services with the help of qualified staff (Bangalore University, Bangalore).

4.2.4 Gulbarga University Library, Gulbarga

The Gulbarga University Library (GUL) established in the year 1980, to support teaching, learning and research activities in the faculties of Arts, Humanities and Social Sciences, Education, Law, Commerce, Pure and Applied Sciences. The Gulbarga University, before becoming an independent university in 1980, was a P.G. Centre of Karnatak University from 1970. The jurisdiction of the Gulbarga University has been extended to cover Gulbarga, Raichur, Bidar, Bellary and Koppal districts in the State. The University has 160 affiliated colleges and P.G. Centres at Bellary, Bidar, Raichur and Sandur (Gulbarga University, Gulbarga).

4.2.5 Mangalore University Library, Mangalore

The Mangalore University Library (MaUL) was established in 1980. The Library intends to cater to the needs of the users from the Sciences, Social Sciences and Humanities faculty of the University. The Mangalore University came into existence on September 10, 1980. Prior to this, it was a P.G. Centre of Mysore University. The jurisdiction of the University extends over the districts of Dakshina Kannada, Kodagu and Udupi. The University has 108 affiliated colleges (Mangalore University, Mangalore).

4.2.6 Kuvempu University Library, Shankaraghatta

The Kuvempu University Library (KUL) came into existence with the establishment of the Kuvempu University on June 29, 1987. Prior to this, it was

functioning as a P.G. Centre Library under the control of University of Mysore and the Library resources were housed in a temporary building at B.R. Project. In the year 1988, the Library was shifted to the Academic Building on Jnana Sahyadri campus. Finally, the Library was shifted to its newly constructed modular independent building in the year 2003. In the midst of its excellent set-up of academic activities, the Library acts as a nerve-centre catering to the academic and research needs of the students, researchers and faculty members of post-graduate departments covering Sciences, Social Sciences Humanities, Commerce and Law.

The University has 184 affiliated colleges, 05 constituent colleges and 02 P.G. Centres at Davangere and Kadur (Kuvempu University, Shankaraghatta).

All the university libraries under the study are actively participating and contributing for the success of UGC's Inlibnet and Infonet activities, and availing the facilities of these programmes for the benefit of their users.

With this brief historical background of the university libraries under the study, further details about the present status of library building, staff, and users have been given in the following sections.

4.2.7 University Library Buildings

A university library must be located at the centre of the university, easily reachable to the users approaching from academic departments, administrative sections and hostels and other residences. The library is expected to have elegant independent

building with sufficient seating arrangement. The library needs to accommodate the information sources in print as well as electronic form. The library should provide an ambience for peaceful reading.

University authorities should realise the importance of properly planned functional buildings for libraries because of the basic premise that “the library is the heart of a University” which keep the entire academic system functioning (Saxena, 1994).

In order to know the particulars of the library buildings, the questions were raised to the librarians. The data received in response have been presented in Table 4.1.

Table 4.1: Particulars of university library buildings

Sl. No.	Particulars	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Library building built in the year	1966	1980	1981	2002	1993	1965
02	Plinth Area	15513 sq.feet	54000 sq.feet	12,580 sq.feet	20752 sq.feet	11648 sq.feet	99000 sq.feet
03	Floors	02	02	04	02	02	03
04	Total seating capacity for users	250	500	250	350	400	500
05	Independent building	Yes	Yes	Yes	Yes	Yes	Yes
06	Planned to accommodate information sources in print and electronic form	Yes	Yes	Yes	Yes	Yes	Yes
07	Separate section/hall for maintenance and Electronic Resources	Yes	Yes	Yes	Yes	No	Yes
08	Equipped to Provide Electronic Information Services	Yes	Yes	Yes	Yes	Yes	Yes
09	Separate section for Academic Staff	Yes	Yes	No	Yes	No	No

It is evident from the data presented in Table 4.1 that all the six university libraries have independent buildings, planned to accommodate print as well as electronic information sources, and provide electronic information services to the users. Except MaUL, the remaining university libraries have separate sections for the maintenance of electronic resources. Three (50.00%) university libraries have separate sections exclusively meant for academic staff.

Discussion/Interpretation

Electronic resources need to be maintained preferably in air-conditioned rooms/sections and kept separately from print resources. The library buildings need to have a separate section meant for academic staff.

4.2.8 University Library Staff

Professionally qualified staff play a predominant role for successful management of library resources and services. They establish link between the right reader and right resource at the right time. In order to serve their users effectively and efficiently in the electronic environment, the library staff need to be given ample training opportunities to update their knowledge. The particulars regarding the staff strength working in university libraries were sought from the librarians and the data received in this regard has been presented in Table 4.2.

Table 4.2: Particulars of university library staff

Sl. No.	Library Staff	BUL	GUL	KaUL	KUL	MaUL	MUL
01	University Librarian	01	01	01	01	01	01
02	Deputy Librarian	02	02	-	-	01	02
03	Assistant Librarian	04	08	04	03	07	04
04	Library Assistant	-	02	-	01	01	07
05	System Administrator	-	01	-	-	01	-
06	Computer Programmer	02	-	-	01	-	-
07	Data Entry Operator	03	04	03	-	-	-
08	Adequacy of Library Staff	Not adequate	Not adequate	Not adequate	Not adequate	Not adequate	Adequate
09	Efficiency of Staff	Majority efficient	Majority efficient	All are efficient	Majority are not efficient	Majority are not efficient	Majority are not efficient
10	In-house training opportunity for staff	Yes	Yes	Yes	Yes	Yes	Yes
11	Training opportunity on deputation for staff	Yes	Yes	Yes	Yes	Yes	Yes
12	Staff's interest to adopt change	Yes	Yes	Yes	Yes	Yes	Yes

Table 4.2 reveals that all the university libraries under study are headed by the professionally qualified librarians. Except KaUL and KUL all other university libraries have Deputy Librarians. The number of Assistant Librarians varies from 08 to 03. The GUL has highest number of Assistant Librarians (i.e. 08) followed by 7 in MaUL. The

KUL has the least number (03) of Assistant Librarians among the university libraries under study. As far as the semi-professional staff are concerned, the MUL stands first with 07 Library Assistants followed with 02 each in GUL and KUL. There is no semi-professional staff in BUL and KaUL.

The university librarians were asked to express their view about the adequacy of the library staff and their efficiency in handling electronic information resources and services. They were also requested to tell the opportunities created for acquiring the competencies required to handle electronic resources and the response of the staff to such programmes. Except the Librarian of MUL, all other university librarians under study have opined that the library staff are inadequate. As far as the efficiency of the library staff to handle electronic information resources and services, 50.00% of the university librarians have noted that the majority of staff are inefficient whereas 33.33% have indicated that the majority of staff are efficient in handling electronic resources and services. Only the Librarian of KaUL has expressed that all the library staff are efficient in handling electronic resources and services.

All the university librarians under the study have indicated that in-house training programmes were organized to train their library staff. The library staff were also deputed to acquire training in handling electronic information resources and services. Each of them have opined that their professional staff have shown interest to adopt to the changing information handling environment.

Discussion/Interpretation

Almost all the university libraries are facing the problem of inadequate number of professionally qualified and trained staff to handle changing technologies in digital environment. The majority of incumbent library professionals have been trained / educated in handling traditional resources in print medium and are expected to work in electronic environment. This situation demands more training opportunities for the development of required skills to handle new resources and services in e-environment for the library professionals and semi-professionals alike. Every university library should give emphasis on inducting technical assistants with computer science background to face the emerging challenges.

4.2.9 University Library Users

The teachers, research scholars, post-graduate students and non-teaching staff form the most important user population of any university library. The strength of user community belonging to different categories of users of university libraries under the study is presented in Table 4.3.

Table 4.3: Particulars of users in university libraries

Sl. No.	Types of Users	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Academic Staff	211	275	250	174	176	330
02	Research Scholars	350	350	700	155	301	400
03	Students	1798	2500	5000	2480	1705	2000
04	Non-teaching Staff	534	550	1500	240	276	1500

The KaUL is providing library and information services to the highest number of users (i.e. 7450) whereas MaUL is catering to lowest number of users (i.e. 2458). The MUL is serving 330 academic staff followed by GUL with 275 academic staff, KaUL with 250 academic staff, BUL with 211 academic staff, MaUL with 176, and KUL with 174 academic staff. The KaUL is providing services to 700 research scholars whereas KUL is serving only 155 research scholars.

4.2.10 Library Budget

Expenditure incurred on procurement of information sources and equipments in the university libraries indicates the financial commitment to strengthen the learning resources for the benefit of academics. The particulars were sought from the university librarians about the expenditure towards procurement of information sources in print as well as electronic form and electronic equipments. The data received in this regard has been presented in Table 4.4.

The analysis of the data presented in Table 4.4 clearly indicates that the expenditures incurred on procurement of information sources in print and electronic form and electronic equipments, the university libraries vary from one to another. During the year 2003-04, the BUL spent Rs. 96.25 lakhs whereas the MUL spent only Rs. 6.00 lakhs on procurement of information sources in print form. The MUL spent Rs. 1.25 lakhs and the MaUL spent Rs. 0.72 lakhs for procurement of information sources in electronic form. The BUL, GUL, KaUL and KUL have not spent any amount for procurement of information sources in electronic form during 2003-04. The MUL spent Rs. 5.80 lakhs

whereas the KaUL spent Rs. 0.50 lakhs for procurement of electronic equipments such as computers, printer, etc. and the GUL and KUL have not spent any amount for such purpose during 2003-04.

Table 4.4: Particulars of expenditures towards information sources in university libraries (Rs. in lakhs)

Sl. No.	Heads of Expenditure	BUL	GUL	KaUL	KUL	MaUL	MUL
01	2003-04						
	Information Sources in Print form	96.25	10.05	8.80	26.93	30.04	6.00
	Information Sources in Electronic form	-	-	-	-	0.72	1.25
	Electronic Equipments (Computer, Printers etc)	1.52	-	0.50	-	3.50	5.80
02	2004-2005						
	Information Sources in Print form	96.50	23.00	40.44	19.39	30.69	6.00
	Information Sources in Electronic form	-	34.21	-	-	0.72	2.60
	Electronic Equipments	-	12.00	0.50	-	-	6.00
03	2005-2006						
	Information Sources in Print form	96.50	9.81	25.42	26.69	33.39	6.00
	Information Sources in Electronic form	-	-	-	0.18	0.72	2.75
	Electronic Equipments	0.35	10.00	0.50	-	-	6.50
04	2006-2007						
	Information Sources in Print form	77.75	28.59	33.22	46.02	17.92	12.00
	Information Sources in Electronic form	4.00	-	-	0.18	0.98	2.50
	Electronic Equipments	5.97	-	0.50	-	0.81	2.50
05	2007-2008						
	Information Sources in Print form	87.75	17.00	13.49	49.80	27.08	15.00
	Information Sources in Electronic form	4.00	-	-	0.04	0.72	3.75
	Electronic Equipments	0.48	100.00	0.50	-	1.22	0.75

The GUL has spent Rs.100.00 lakhs for procurement of electronic equipments whereas the BUL spent Rs.0.48 lakhs for such purpose during the year 2007-08.

Discussion / Interpretation

It is clear from the data presented in Table 4.4 that there is a huge difference in expenditure incurred on procurement of information sources in print form as well as in electronic form and electronic equipments. The university libraries have spent negligible amount on procurement of electronic information sources and electronic equipments, and some libraries have not spent any amount for the said purpose.

The university librarians were asked to indicate whether the library budget allocated for procurement of information sources and equipments is sufficient or not. The response received in this regard has been presented in Table 4.5.

Table 4.5: University librarians' opinion about the sufficiency of budget

Sl. No.	Opinion	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Sufficient	-	Yes	-	-	-	-
02	Not Sufficient	Yes	-	Yes	Yes	Yes	Yes
03	Can't Say	-	-	-	-	-	-

It is quite evident from the data presented in Table 4.5 that except GUL, all other university libraries have indicated that the budget allocated for the library is not sufficient for procurement of information sources and electronic equipments.

4.3. ICT Infrastructure

The provision of electronic information services in any library requires the establishment of ICT infrastructure. The details regarding hardware and software facilities, the campus LAN and Internet facilities were sought from the university librarians covered under the study. The data have been tabulated and analysed in the following sections.

4.3.1 Hardware Infrastructure

The details regarding the hardware infrastructure available in university libraries under the study have been given in Table 4.6.

The MUL has maximum number of server systems (06) followed by GUL with 5, BUL and KUL with 3 each, and KaUL and MaUL with one each server systems. The number of desktop computers available in university libraries varies from 140 to 12. The GUL has 5 laptop computers, and BUL and KUL have one laptop computer each. Half of the University libraries do not have laptop computers at all.

All the university libraries under the study have printers. The number of printers varies from 12 to 3. Except GUL and MUL, other university libraries do not have digitization scanner. The BUL has 2 barcode printers, and GUL, KUL and MUL have one barcode printer each. Other details regarding the hardware facilities available in the university libraries under the study have been given in Table 4.6 which are self-explanatory.

Table 4.6: Infrastructure facilities in university libraries

Sl. No.	Hardware	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Computers						
	Server Systems	03	05	01	03	01	06
	Desktop Computers	70	140	25	50	12	14
	Laptop Computer	01	05	-	01	-	-
02	Printers	03	12	07	09	03	06
03	Scanner for Digitization	-	01	-	-	-	01
04	Barcode Scanner	03	03	01	01	01	01
05	Barcode Printer	02	01	-	01	-	01
06	Back-up Device (Tape Drive)	-	15	02	-	-	01
07	LCD Projector	01	02	-	01	-	01
08	Modem	01	-	-	01	-	01
09	Fax	01	01	-	-	01	01
10	Web Camera	-	02	-	01	-	-
11	Hubs	01	-	01	-	01	01
12	Network Switches	04	05	01	05	02	02
13	Router	01	01	-	02	-	04
14	Firewall	02	01	-	02	-	02
15	UPS	01	01	03	05	01	02
16	Identity Card Printer	-	-	-	01	-	-
17	Others	-	-	-	-	-	-

Discussion / Interpretation

As far as hardware facilities are concerned the GUL has full-fledged ICT infrastructure to cater to the information needs of its users, and BUL and KUL are moderately equipped. The KaUL, MaUL and MUL are poorly equipped and these two university libraries need to take necessary steps to establish the required ICT infrastructure.

4.3.2 Software Infrastructure

The software facilities available in libraries indicate the level of automation activities. The university librarians were asked to provide details regarding the software facilities available with them. The data received in response is presented in Table 4.7.

In order to automate the house-keeping operations such as acquisition, technical processing, circulation, and serial control the GUL and MaUL are using LIBSYS. The KaUL is using SOUL, and KUL is using SOUL along with CDS/ISIS. The BUL is using New Gen Lib, and MUL is using SLIM++ for automation of house-keeping operations.

Table 4.7: Software facility in university libraries

Sl. No.	Software	BUL	GUL	KaUL	KUL	MaUL	MUL
01	House-Keeping Operations	New Gen Lib	LIBSYS	SOUL	CDS/ISIS, SOUL	LIBSYS	SLIM++
02	Digital Library	E-Prints	D-Space	-	E-Prints	-	New Gen Lib
03	CD-Net management	-	CD-NAS	-	-	-	-
04	Anti-virus	Norton	McFae	Norton	Trendmicro	Norton	Norton
05	Research Data Analysis	SPSS	SPSS	-	-	-	SPSS
06	Others	-	-	-	-	-	-

For the purpose of digital library activities, BUL and KUL are using E-Prints, GUL is using DSpace, and MUL is using New Gen Lib. The KaUL and MaUL are not

using digital library software. Except GUL, no other library under the study is using CD-Net management software. Four university libraries are using Norton anti-virus software. The GUL is using MCFae and KUL is using Trendmicro anti-virus software. The BUL, GUL and MUL are using SPSS for research data analysis. Half of the university libraries do not have software facility for research data analysis.

Discussion/Interpretation

There is no uniformity with regard to the software facilities available in Karnataka State University Libraries. Majority of the university libraries (05) do not have CD-Net management software. In order to support the research activities in the universities, the libraries are expected to have software for research data analysis, and the libraries under the study lack such facilities.

4.3.3 Campus LAN

The Local Area Network (LAN) of a university system, popularly known as campus LAN, is essential to provide access to the information sources and services electronically to well-defined end-users at their points. The users can be alerted of the information resources such as books and journals procured and / or licensed to have access in the university library over campus LAN. The users can recommend, request for loan or reserve the information resources through campus LAN. The users can search OPAC of their university library from their desktop. They can browse the Internet from their end-point in the campus. Information can be repackaged according to the needs of the end-users, and even personalized SDI services can be extended to the individual users

through the campus LAN. In order to know the status of campus LAN in the universities under the study, the questions were raised to the librarians, and the data received in this regard has been presented in Table 4.8.

All the universities under the study have established their campus LANs. The Kuvempu University has set-up an extensively spread-out campus LAN which reaches-out from library to all the academic departments, administrative sections, hostels, guest house and selected residences of the officers and academic staff. The campus LANs of BU, GU and MaU have spread-out over the library, university computer centre, academic departments and administrative sections of their respective universities. The campus LANs of KaU and MU are restricted only to the library, university computer centre and academic departments.

The BUL and KUL have shouldered the responsibility of their campus LAN maintenance. The GU and MaU have given such responsibility to their university computer centres. The physical medium of transmission used for LAN are UTP cable and OFC in BU, GU, and MaU. The KU has used wireless connectivity apart from UTP cable and OFC. The KaU and MU have used only OFC for the purpose.

Discussion/Interpretation

The campus LANs of the universities are expected to be robust and reliable, accessible to the end-users around the clock. It is clear from the data that the campus LANs of the majority of the universities have not spread-out over hostels and staff residences.

Table 4.8: Particulars of campus LANs of Universities

Sl. No.	Campus LAN	BU	GU	KaU	KU	MaU	MU
01	Established campus LAN	Yes	Yes	Yes	Yes	Yes	Yes
02	Levels of Extension:						
a)	Library Computer Centre, University Computer Centre, and all Academic Departments	-	-	Yes	-	-	Yes
b)	Library Computer Centre, University Computer Centre, Academic Departments, And Administrative Sections	Yes	Yes	-	-	Yes	-
c)	Library Computer Centre, Academic Departments, Administrative Sections and Residences	-	-	-	Yes	-	-
03	Maintenance of campus LAN	University Library	University Computer Centre	Exam Section	University Library	University Computer Centre	Dept. of Physics
04	Physical Medium of Transmission used for LAN	UTP Cable, OFC	UTP Cable, OFC	OFC	UTP Cable, OFC, Wireless	UTP Cable, OFC	OFC

4.3.4 Internet Facilities

Internet as a computer network of networks offers access to a wide range of e-resources such as full-text journals, books, reports, standards, newspapers, etc., content pages of journals and books, abstracts of bibliographic databases of research articles, reference sources such as dictionaries, encyclopedias, directories, etc. In short, it serves as a window to the world of knowledge. The e-mail, bulletin boards, newsgroups, electronic commerce, etc., are few other services of the Internet. The Internet can be used to support library activities such as acquisition, technical processing and serials control. It is an effective channel for marketing of library and information products and services at global level. With an intention to know the Internet facilities made available in the universities under the study, with special emphasis on their respective university libraries, the librarians were asked to furnish the details. The data received in this regard has been presented in Table 4.9.

The universities under the study have either leased line or V-SAT, or both for Internet connection either from BSNL or ERNET India, or both of them. The Internet bandwidth varies from 512 kbps to 4 mbps. The Internet nodes created in the libraries vary from 140 in GUL to only 12 in MaUL. Except MaUL, all other university libraries have Internet browsing section. Four university libraries have separate Internet browsing sections for academic staff. The Internet nodes created for academic staff in the libraries varies from 40 in GUL to 02 in MUL.

Table 4.9: Internet facilities in the university libraries

Sl. No.	Internet Facilities	BU	GU	KaU	KU	MaU	MU
01	Type of Connection	V-SAT Leased Line	V-SAT	V-SAT , Leased Line	Leased Line	V-SAT Leased Line	Leased Line
02	Service Provider	BSNL, ERNET India	ERNET India	BSNL, ERNET India	BSNL, ERNET India	BSNL, ERNET India	BSNL
03	Bandwidth	512 kbps, 2 Mbps	2 Mbps	512 kbps	2Mbps 2Mbps	512 kbps, 2 Mbps	2 Mbps
04	No. of Internet Nodes Created in University Library	75	140	25	45	12	15
05	Browsing Section in University Library	Yes	Yes	Yes	Yes	No	Yes
06	Separate Browsing Section for Academic Staff in University Library	Yes	Yes	No	Yes	No	Yes
07	No. of Internet Nodes for Academic Staff	18	40	-	10	-	02
08	Personnel Supervising Internet Section in University Library	Library Staff with IT skills, and IT Trained	Library Staff with IT skills	Library Staff with IT skills	IT trained staff	-	Library staff
09	Department Chamber	Yes	Yes	Yes	Yes	Yes	Yes
10	Levels of Provision	All Academic Staff	All Academic Staff	Chairpersons of Departments	All Academic Staff	Chairpersons and Professors , Readers	All Academic Staff
11	Plans to Update Network Infrastructure	Yes	No	Yes	Yes	Yes	Yes

Discussion/Interpretation

It is threatening to note that there is a huge difference among the universities as far as Internet nodes created in the libraries and academic departments. If one university has as many as 600 Internet nodes another has only 165 nodes. It is high time for university libraries to take active role in providing adequate Internet facility to their academic community. It is a healthy sign to note that all the university libraries are continuously expanding network infrastructure.

4.4. Library Automation

Automation brings a revolution in the functioning of a library. It is highly productive not only for library operations and management but also equally useful for library users. Automation of library activities increases the accuracy and efficiency of information processing, retrieval and distribution. Library automation saves a lot of time of the library staff as well as users. The librarians were asked to furnish details about the status of automation of the house-keeping operations, creation of OPACs, and digitization of documents in the university libraries under the study. The data received from the university librarians has been presented in Table 4.10, 4.11 and 4.12.

4.4.1 Automation of House-keeping Operations

Mechanization or computerization of house-keeping operations such as acquisition, serials control, technical processing, circulation control, financial

management, stock verification, etc., is prerequisite for introducing electronic resource-based services in libraries. Automation of library activities helps to improve the existing services and also to introduce new services. It is essential to share the resources among various libraries, and to avoid duplication of work. In order to have control over the continuously growing information and provide access to multiple end-users expeditiously library automation is unavoidable. Automation activities in academic libraries slowly picked up with the support from INFLIBNET, UGC, NISSAT and other similar agencies combined with increased awareness of IT and its applications among librarians (Ravichandra Rao, 1997).

The university librarians were asked to provide details regarding the computerized operations in their libraries, and the data received in this regard has been presented in Table 4.10.

Table 4.10: Automation of library activities

Sl. No.	Library Activities	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Acquisition	PA	NA	NA	PA	NA	NA
02	Circulation	PA	NA	NA	NA	PA	NA
03	Cataloguing	PA	PA	PA	PA	PA	NA
04	Serials Control	PA	PA	NA	PA	PA	NA
05	Financial Management	PA	PA	NA	PA	NA	NA
06	Stock Verification	NA	NA	NA	NA	PA	NA
07	Inter-library-loan	NA	NA	NA	NA	PA	NA
08	Theft Detection	NA	NA	NA	NA	NA	NA
09	Others	NA	NA	NA	NA	NA	NA

(PA= Partially Automated; NA= Not Automated)

None of the university libraries under the study has fully automated their house-keeping operations. Except BUL and KUL, none of the other university libraries under the study has automated its acquisition functions. The BUL and MaUL have partially automated their circulation functions. Except MUL, all other university libraries under the study have partially automated their cataloguing functions. The BUL, GUL, KUL and MaUL have partially automated serials control functions. The BUL, GUL and KUL have partially automated their financial management. Except MaUL, no other university library under the study has automated stock verification and inter-library-loan. None of the university library under the study has automated theft detection.

Discussion/Interpretation

The MUL has not automated any of its house-keeping operations. Similarly, the KaUL has not automated majority of activities. In total, the majority of libraries under the study have been lagging behind as far as automation of the house-keeping operations is concerned, and have failed to provide advanced services upto the expectations of their users.

4.4.2. Online Public Access Catalogue (OPAC)

The library catalogue converted into a machine-readable form offers a variety of search facilities as compared to print catalogue. The introduction of OPAC has created enormous changes in library practices. It has made the library collection easily

accessible to everyone by breaking the physical boundaries of the library. It is also necessary to find out the usage of the OPAC from time to time, so that necessary measures can be initiated for better utilization of this service (Rajput, Naidu & Jordon, 2008). The OPAC is convenient to use and provide access at different places not only within the library but also from different places in the campus. The web-enabled OPAC offers search facility to the world-wide users around the clock. It is an effective tool for inter-library loan. The OPAC saves a lot of time of the users as well as the library staff in their day-to-day activities. The university librarians were asked to provide details regarding OPACs in their libraries. The data received in response has been presented in Table 4.11.

Table 4.11: OPAC in university libraries

Sl. No.	OPAC	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Created OPAC of:						
a)	Books	Yes	Yes	Yes	Yes	Yes	No
b)	Serials	Yes	Yes	No	Yes	Yes	No
c)	Theses	Yes	Yes	Yes	Yes	Yes	No
d)	Dissertations	Yes	Yes	Yes	Yes	Yes	No
e)	Kannada Books	Yes	No	No	Yes	Yes	No
f)	Others	No	No	No	No	No	No
02	No. of terminals provided to consult OPAC	04	05	04	02	02	No
03	Accessibility of OPAC over campus LAN	Yes	No	Yes	No	Yes	No
04	Accessibility of OPAC over the Internet	No	No	No	No	No	No

It is clear from the data that except MUL, all other university libraries have created the OPACs of books, theses and dissertations. Four libraries, BUL, GUL, KUL

and MaUL have created the OPAC of serials. The BUL, KUL and MaUL have created the OPAC of Kannada books. The GUL has devoted five terminals for consulting the OPAC, followed by BUL and KaUL with 04 terminals each and KUL and MaUL with 02 terminals each.

The BUL, KaUL and MaUL have provided accessibility to their OPACs over their campus LAN. None of the university libraries under the study has made its OPAC accessibility over the Internet.

Discussion/Interpretation

The MUL needs to take necessary steps to create the OPAC of its information resources. The KaUL has not included the serials and Kannada books in its OPAC. The university libraries are expected to make a provision for more number of terminals for using their OPACs within the libraries as well as over their respective campus LANs. The provision of web-enabled OPAC is a dire need for satisfying the users from all over the world.

4.4.3. Digitization of Documents

University libraries are the treasure-houses of valuable and rare collections. Books written by eminent personalities, which are out-of print, need to be preserved for future generations. Apart from these resources, the libraries can digitize theses and dissertations, research articles, research reports, etc., that need to be used through online

as well as off-line, and preserved for posterity. In order to know the digitization scenario in the university libraries, the questions were raised to the librarians to furnish details. The data received from the librarians has been presented in Table 4.12.

Table 4.12: Digitization of documents in university libraries

Sl. No.	Digitization	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Digitized Library Collection	Yes	-	-	-	-	-
02	No. of Books Digitized	280	-	-	-	-	-
03	Other Collection Digitized	-	-	-	-	-	-

Except BUL, none of the university libraries under the study has digitized its collections. The BUL has indicated that it has digitized 280 books.

Discussion/Interpretation

The university libraries under the study have not paid a due attention for digitization of their collections which affects the preservation of information resources of immense value and fail to satisfy their users effectively and efficiently.

4.5 Information Resources in University Libraries

Information resources collected in university libraries form a strong basis for efficient services to the academic community. The libraries need to collect all types of resources available in print medium, non-book materials and resources in electronic medium in order to satisfy the information needs of all types of users. The details

regarding the collection development policy, information sources in print medium, non-book materials and resources in electronic medium have been given below.

4.5.1 Collection development Policy

A well-planned collection development policy offers clear guidelines for collection development in libraries. Formulation of full-fledged written collection development policy avoids ambiguity in the selection and acquisition of information resources in the medium required by end-users, budgetary provisions, persons to be involved in the process of collection development, legal and technical aspects and the usage of library collection (Prasher, 1993). The particulars regarding the collection development policy in the university libraries under the study have been given in Table 4.13.

Table 4.13: Collection development policy in university libraries

Sl. No.	Collection Development Policy (CDP)	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Formulated CDP	Yes	Yes	Yes	Yes	Yes	-
02	Form of CDP:						
a)	Written	Yes	Yes	-	-	-	-
b)	Unwritten	-	-	Yes	Yes	Yes	-
03	Extensiveness of CDP						
a)	Outline	-	-	-	-	-	-
b)	Short Summary	-	Yes	-	-	-	-
c)	Full-fledged	Yes	-	-	-	-	-
04	Selection of Electronic Information Sources Based on CDP	-	Yes	-	-	Yes	-

Except MUL, all other university libraries under the study have formulated the collection development policy. The BUL and GUL have the collection development policy in written form whereas KaUL, KUL and MaUL are following conventional form. Between the two university libraries which have the policy in written form, the BUL has full-fledged document and the GUL has the policy in outline form.

Discussion/Interpretation

It is clear from the above analysis that the majority of university libraries under the study have not formulated a full-fledged collection development policy. This situation certainly affects the need-based collection development in these libraries, and in turn the library users cannot be satisfied to the fullest extent.

4.5.2 Library Collection in Print Medium

The university libraries in India are still more heavily dependent on print resources than on electronic resources. The details of information resources available in print medium in the university libraries under the study have been presented in Table 4.14.

It is quite evident from the data presented in Table 4.14 that the MUL has the largest collection of books, back-volumes, theses and dissertations and general magazines. The BUL occupies the second place with a collection of more than 3 lakhs of

books, and large number of back-volumes of periodicals, theses and dissertations. The KUL has comparatively a small number of collections.

Table 4.14: Library collection in print form

Sl. No.	Information Sources	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Books	310517	220000	288298	85196	138885	650000
02	Journals	292	435	193	290	279	216
03	Back-volumes	55000	8500	45210	4500	20685	150000
04	Theses and Dissertations	7500	5400	7398	555	1417	100000
05	Reports	-	150	31090	1560	4480	5000
06	Patents	-	-	-	-	-	25
07	Standards	-	-	-	-	-	100
08	Maps	140	-	-	-	150	40
09	Magazines	57	35	-	25	59	200
10	Newspapers	20	20	-	10	23	25
11	Others	-	-	-	-	-	-

4.5.3 Collection of Non-book Materials

The university librarians were asked to furnish the particulars about the non-book materials such as magnetic tapes microfilms, microfiches, audio cassettes, audio recordings and music scores available in their libraries. The details received in this regard are presented in Table 4.15.

It is clear from the data that except MaUL none of the university libraries under the study has the non-book materials. The MaUL has 250 audio recording in its collection.

Table 4.15: Non-book materials in university libraries

Sl. No.	Non-Book Materials	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Magnetic Tapes	-	-	-	-	-	-
02	Microfilms	-	-	-	-	-	-
03	Microfiches	-	-	-	-	-	-
04	Audio Cassettes	-	-	-	-	-	-
05	Audio Recordings	-	-	-	-	250	-
06	Music Scores	-	-	-	-	-	-
07	Others	-	-	-	-	-	-

4.5.4 Availability and Access to E-Resources

Electronic information sources have brought significant changes in academic environment. The university libraries can provide access to the wide variety of resources to the users in the modern era. The libraries can have electronic resources through procurement, subscription, gift, open sources on the Web as well as through consortia. The university libraries can provide access to these resources at the desktops of the end-users wherever they are and at whatever time. The details about the availability and accessibility to electronic information sources are given below.

4.5.4.1 CD-ROM Collection

CD-ROMs technology came into existence in the mid-1980s. Since then CD-ROM databases containing various types of information-- bibliographic and full-text databases, numeric databases, and of late multimedia databases-- have become very

popular and highly used information sources (Chowdhuri & Chowdhuri, 2001). The information sources such as books, journals, abstracting and indexing journals, reports, patents, standards, reference sources of all kinds are available in the form of CD-ROMs. The details of the collection of CD-ROMs available in the university libraries under the study are presented in Table 4.16.

Table 4.16: CD-ROM collection in university libraries

Sl. No.	CD-ROMs	BUL	GUL	KaUL	KUL	MaUL	MUL
01	No. of CD-ROMs	785	616	657	575	750	900
02	CD-Net Facility	-	Yes	-	-	-	-

It is clear from the Table that the MUL has the highest number of CD-ROMs with 900 followed by the BUL with 785 and MaUL with 750 CD-ROMs. The KUL has the least number of CD-ROMs (575). Only GUL has CD-Net facility.

The university librarians were also asked to furnish the details of the important CD-ROMs available in their libraries and the details are given in Table 4.17.

As can be seen from the Table 4.17, all the university libraries under the study have the CD-ROM databases namely the BIOSIS and MathSci supplied under the UGC-Infonet programme. The GUL and MaUL have procured comparatively a worthy collection in the form of CD-ROMs. However, these university libraries have not updated their CD-ROM collection by continuing the subscription. The KaUL has not procured the CD-ROMs of importance.

Table 4.17: Important CD-ROMs available in university libraries

BUL	GUL	KaUL	KUL	MaUL	MUL
1) BIOSIS	1) ABI Inform	1) BIOSIS	1) Atlas,	1) BIOSIS	1) Analytical
2) Census of India 2001	2) BIOSIS	2) MathSci	Maps of India	2) Chaitanya Sangayana	Abstracts
3) CMIE	3) Biotech Abstracts		2) BIOSIS	3) Distance Education Database	2) BIOSIS
4) India Patents	4) Cabasac		3) Census of India 2001	4) Indian Science Abstracts	3) Econlit
5) MathSci	5) Cross Culture		4) Fluid Mechanics	5) Information Directory of E-Resources	4) Eric
6) Psychinf	6) Dissertation Abst. Inf		5) Mahatma Gandhi Biography	6) Indian Business Insight (IBID)	5) Geography
	7) Econlit		6) Maps of India	7) Manorama Knowledge Adventure	6) Human Nutrition
	8) Eric		7) MathSci	8) MathSci	7) ISA Plus
	9) Georef		8) Mysore Vishwavidyalaya English-Kannada Nighantu	9) National Union Catalogue of Science Serials	8) LISA
	10) Indian Business Insight (IBID)		9) Tenth Five Year Plan Report	10) National Geographic	9) MathSci
	11) INSPEC			11) Perfect Guru Yoga	10) OCLC Environmental Library
	12) LISA Plus			12) Social Science Index	11) PsycLit
	13) MathSci				12) Socio File
	14) Psychinfo				13) Wilson Business Periodicals
	15) Sociofile				
	16) Supreme Court Case Finder				

Discussion/Interpretation

It is quite evident from the details presented in Table 4.17 that the libraries have not paid due importance to the information resources available in the form of CD-ROMs and DVD-ROMs and have not made them available to the end-users through CD-Net facility.

4.5.4.2 Online Information Sources subscribed by the University Libraries

In order to satisfy the information needs of the users, the university libraries need to subscribe to the online resources individually. The details furnished by the university librarians about the subscription of online information sources is given in Table 4.18.

Table 4.18: Online information sources subscribed by university libraries

Sl. No.	Online Sources	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Subscribed Online Sources	Yes	-	-	-	Yes	-
02	Type of Source subscribed:	-					
2.1	E-Books	-	-	-	-	-	-
2.2	E-Journals	-	-	-	-	-	-
2.3	E-Reference Sources	Yes	-	-	-	-	-
2.4	Abstracting and Indexing Journals	Yes	-	-	-	Yes	-
2.5	Others	-	-	-	-	-	-

Except the BUL and MaUL, none of the other university libraries under the study is subscribing to any online resources individually. The BUL has a subscription to e-

reference resources, namely Exrefer, and EBSCO Academic Premier. The MaUL has subscription to the abstracting service, namely Inside Web.

Discussion/Interpretation

The majority of university libraries under the study have not subscribed to any of the online information sources. This kind of situation certainly affects the productivity of the academic community they serve.

4.5.4.3 Online Information Sources Accessible through Consortia

The cost of information sources is so high that individual libraries cannot afford them. It is possible to share the information sources among the group of libraries in a particular locality, region, state even at national level through consortia. It avoids unnecessary duplication of subscription and thereby helps to save funds, and by making use of funds saved through consortia, it can be used to subscribe more number of resources in the libraries. The questions were raised to the university librarians under study to know the consortia in which they participate. The data received in this regard have been given in Table 4.19.

Table 4.19: Participation of university libraries in consortia

Sl. No.	Consortium	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Participation	Yes	Yes	Yes	Yes	Yes	Yes
02	Consortia :						
2.1	UGC-Infonet	Yes	Yes	Yes	Yes	Yes	Yes
2.2	Others	-	-	-	-	-	-

The data presented in Table 4.19 shows that all the university libraries under the study are active participants of the UGC-Infonet E-Journal Consortium only.

4.5.4.3.1 UGC-Infonet E-Journals Consortium

UGC-Infonet E-Journal Consortium has been launched by the University Grants Commission (India) with an intention to bring a qualitative change in the supply of scholarly literature published all over the world and making it accessible to the academic community of higher education. The Consortium is an ambitious programme of UGC to interlink all the Universities in the country with state-of-art technology. The Network will overlay on ERNET backbone and provide Internet and Intranet Services. In order to make use of these resources, the selected Indian universities have been provided with funds for the establishment of campus LANs. Under this programme a large number of full-text journals published in different subjects, bibliographic databases, and gateway portals are accessible. The JCCC (J-Gate Custom Content for Consortia), a gateway portal, has been recently added in the Consortium. This gateway portal provides access to more than 7900 journals (INFLIBNET Centre, Ahmedabad). The UGC-Infonet E- Journals Consortium aims at covering all fields of learning including Arts and Humanities, Social Sciences, Physical Sciences and Chemical Sciences, Life Sciences, Mathematics, Statistics and Computer Sciences (Murthy, 2006). The mirror sites are established all over the country for content hosting (see Figure 3). The information resources received under the UGC-Infonet E-Journals by all the university libraries under the study are listed in Table 4.20.

Figure 3: Map of India showing the UGC-Infonet Mirror Sites

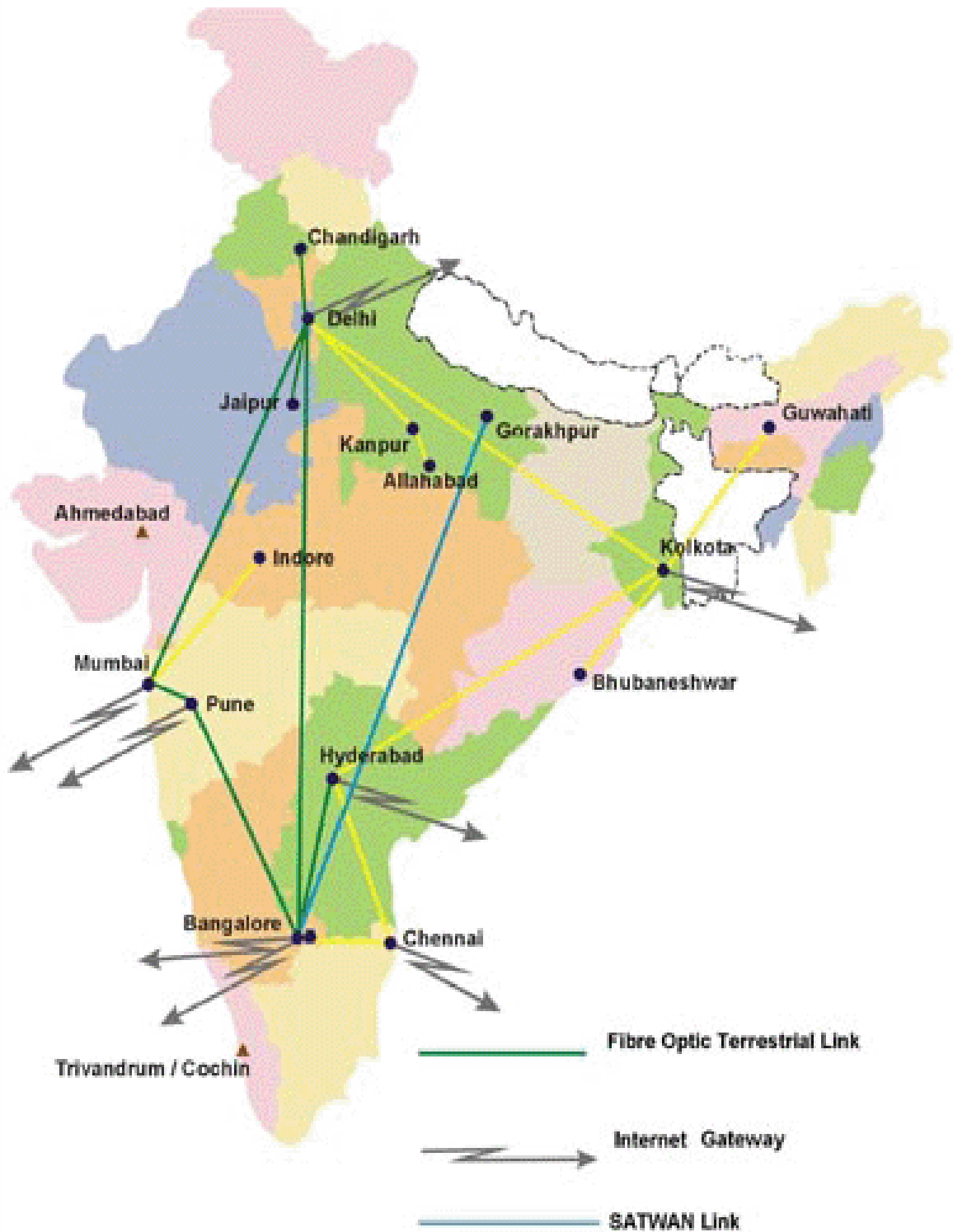


Table 4.20: Electronic resources accessible under UGC-Infonet E-Journals Consortium

Sl. No.	Source /Publisher	Contents
01	American Chemical Society	37 Full-text journals in Chemistry with access to all back files
02	American Institute of Physics	18 Full-text journals in physics with some having access from 1968
03	American Physical Society	10 Full-text journals in physics with access from 1997 onwards
04	Annual Reviews	33 Full-text journals in Biomedical, Physical, Social Sciences with access for last ten years
05	Blackwell Publishing	498 Full-text journals in all disciplines with access from 1997 onwards
06	Cambridge University Press	223 Full-text journals in all disciplines with access from 1997
07	Elsevier Science (Cell Press)	34 Full-text journals in life science and health science with access from 1995 onwards
08	Emerald (LIS Collection)	29 Full-text journals in Library and Information Science with access from 2001 onwards
09	Institute of Physics	46 Full-text journals in physics with access to all volumes
10	JSTOR	1048 Full-text journals in all discipline with access to all volumes
11	Nature	Full-text journal
12	Oxford University Press	198 Full-text journals in all disciplines with access from 1996 onwards
14	Project Euclid	36 Full-text journals in applied mathematics and statistics with access from 2002 onwards
15	Project Euclid	36 Full-text journals in applied mathematics and statistics with access from 2002 onwards
16	Project Muse	297 Full-text journals in humanities, arts and social sciences with access from 1999 onwards
17	Royal Society of Chemistry	29 Full-text journals in 6 databases in chemistry with access from 2002 onwards
18	Society for Industrial and Applied Mathematics (SIAM)	14 Full-text journals in applied mathematics with access from 1997 onwards
19	Springer Link	1950 Full-text journals in all disciplines with access from 1997 onwards
20	Taylor and Francis	1076 Full-text journals in all disciplines with access from 1998 onwards

21	Bibliographic Databases: - MathSciNet - JCCC (J-Gate Custom Content for Consortia) UGC Infonet - SciFinder Scholar - Institute for Studies in Industrial Development (ISID)	Database of reviews in mathematical sciences consisting over 2 million items and over 7,00,000 direct links to original articles. Article level access to journals subscribed by the Consortium as well as by selected university libraries with interface to facilitate inter-library loan. Explore scientific information from 10,000 current journals and 57 active patent issuing authorities through a windows-based Z39.50 client. Index of 125 Indian social science journals in the field of economics, finance, management, business, health, education, sociology and a number of other social science subjects.
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4.5.4.4 Digital Archives

The digital archives can be maintained by the individual university libraries for the benefit of their user community. A large number of information sources such as full-text journals, books, bibliographic archives and reference sources are available on the Web freely. These can be downloaded and archived in the libraries. The libraries can create and maintain institutional repositories containing the intellectual output of their own staff such as research articles, books, reports, theses and dissertations, etc., and provide access to their users. The university librarians under the study were asked to provide details regarding the digital archives that they have created and the data received in response has been presented in Table 4.21.

Except the BUL and KUL, no other university library under the study has created the digital archive. The BUL has created the institutional repository by making use of open source software (E-prints), and added 55 reprints of research papers. The KUL has

created the digital archive of open access information sources by providing links to important scholarly literature available freely on the Web and made available on its home page. The KUL has also initiated the creation of institutional repository by making use of E-prints software and added 100 reprints of research papers.

Table 4.21: Digital archives in university libraries

Sl. No.	Digital Archives	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Have digital archive/s?	Yes	-	-	Yes	-	-
02	Types of Digital Archives:						
2.1	Open Access Information Sources	-	-	-	Yes	-	-
2.2	Institutional Repository	Yes	-	-	Yes	-	-
2.2.1	Collection in Institutional Repository:	-	-	-	-	-	-
2.2.1.1	Theses and Dissertations	-	-	-	-	-	-
2.2.1.2	Reprints of Research Papers	55	-	-	100	-	-
2.2.1.3	Preprints of Research Papers	-	-	-	-	-	-
2.2.1.4	Books / Monographs	-	-	-	-	-	-
2.2.1.5	Project Reports	-	-	-	-	-	-
2.2.1.6	Others	-	-	-	-	-	-
2.2.2	Institutional Repository Accessible on LAN	Yes	-	-	-	-	-
2.2.3	Software Used	E-Prints	-	-	E-Prints	-	-

Discussion/Interpretation

The majority of university libraries under the study have not paid due attention to develop digital archives of open access sources and institutional repository, and provide access to the end-users at their door-steps.

4.5.4.5 Factors Influenced the Collection of Electronic Information Sources

Phenomenal developments in the field of ICT have brought notable changes in library resources. The University Grants Commission is providing financial assistance to the universities to develop electronic infrastructure that enables to share the information resources from every nook and corner of the world. Even the development of such an infrastructure has become imperative for the universities to project themselves in the competitive environment. In this context, the university librarians were asked to give their opinions about the factors that have influenced the collection of electronic information sources in their libraries. For this the researcher constructed a few factors to obtain the university librarians' opinions. The scoring of the factors in a five-point scale are: strongly Agree=1, Agree=2, Undecided=3, Disagree=4, Strongly Disagree=5. In this scoring method, the most positive attitude is represented by the lowest score. When the scores for all responses are averaged, the scores that are closest to 1 are the ones that represent the most positive attitude. The response received from the university librarians are presented in Table 4.22.

According to the data presented in the Table 4.22, the university librarians are of the opinion that the developments in the field of ICT, allocation of funds from the INFLIBNET Centre, and the attention of the NAAC were most positive factors that were responsible for collection of electronic information sources in their libraries. The factors with which the university librarians agreed were to provide advanced services to the users, and demand from the users. The university librarians have responded negatively to

the factors such as pressure from the university administration, and competitive environment.

Table 4.22: Librarians' opinion about the factors influenced the collection of electronic information sources and services

Sl. No.	Factors	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Allocation of funds from the INFLIBNET Centre	02	02	02	01	01	02
02	Developments in the field of ICT	01	01	02	01	01	01
03	Demand from the users	03	02	03	01	03	02
04	Competitive Environment	03	03	03	03	04	03
05	Pressure from University Administration	03	03	04	04	01	02
06	To Provide Advanced Services to Users	01	01	04	01	02	04
07	To Attract the Attention of the NAAC	02	01	03	02	01	02
08	Others	-	-	-	-	-	-

(Rating Scale: 1=Strongly agree, 2= Agree, 3= Undecided, 4= Disagree, 5= Strongly disagree)

4.5.4.6 Barriers in Collection of Electronic Information Sources

The collection of electronic information sources is not out of problems. With an intention to know the barriers in the collection of electronic information sources by the university librarians, questions were raised to them. The response received from them has been presented in Table 4.23.

As can be seen from the data presented in the Table, the majority of the university librarians strongly agree with the barrier of lack of funds, and just agree with the barrier

of lack of support from the university administration. They are uncertain about the barriers of lack of trained staff, and cost effectiveness as the problems in collection of electronic information sources in their university libraries. The university librarians disagree with the statements - lack of ICT infrastructure, lack of trained staff, and library staff's resistance to change - as the barriers in the collection of electronic information sources.

Table 4.23: Barriers in the collection of electronic information sources and services in university libraries

Sl. No.	Barriers	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Lack of Funds	03	01	01	01	01	02
02	Lack of Knowledge to use e-resources among users	02	04	04	03	02	01
03	Lack of Support from the University Administration	03	02	03	02	03	02
04	Lack of ICT Infrastructure	03	03	04	04	03	03
05	Frequent Power Cut	02	03	04	05	02	03
06	Lack of trained staff	02	04	05	02	02	03
07	Library Staff's Resistance to Change	03	04	05	02	04	02
08	Cost Effectiveness	03	03	04	01	02	05
09	Others	-	-	-	-	-	-

(Rating Scale: 1= Strongly agree, 2= Agree, 3= Undecided, 4= Disagree, 5= Strongly disagree)

Discussion/Interpretation

From the above analysis it is clear that the university librarians are facing the problem of acute shortage of funds and lack of support from the university administration particularly in appointing trained staff who are capable of handling ICTs.

4.6 Electronic Information Services

Information service, in the most general sense, is the process of helping library users to identify sources of information in response to a particular question, interest, assignment, or problem. Information service is not limited to helping users who approach the reference desk to ask a question. The libraries offer remote assistance via the telephone, e-mail, or Internet. Librarians are also designing Websites, developing archives, and creating links to answers to “Frequently asked questions”, all designed to anticipate user questions and help people find information independently (Cassell & Hiremath, 2006). The electronic information services offer enhanced satisfaction to the users as well as library staff since these services have no barriers of time and space.

The university libraries can provide a wide variety of services by making use of electronic resources. The reference service can be provided to the users through e-mail and chat. The chat or instant messaging is most useful in providing ready reference service. The e-mail can be used for providing long range reference services. The users can be assisted in making use of the information resources electronically. Providing access to the electronic reference sources is another kind of reference service. The reference sources such as dictionaries, encyclopedias, directories, maps, etc, can be mounted on the library home page and CD-Net for the benefit of end-users who are at distant places.

In this age of information explosion, no library is self-sufficient in satisfying the diversified needs of the users. The libraries can provide referral service to them. In other

words, the users can be advised to contact or approach another library for getting their information. The libraries can go a step further in helping their user, by contacting the library where the information required for the users is available and making a reference of their user so that he/she will get the information without any problem. Electronic medium is most useful in providing alerting services such as sending a list of new books added to the library collection, content pages of journals, forthcoming conferences and seminars, current news items, etc., through e-mail and CD-ROMs. Since the universities are the important research centres, the individual researcher and teacher can be provided SDI service. They can be alerted of the latest developments in his/her area of interest by providing nascent scholarly information which helps the furtherance of his/her research work smoothly. Electronic environment has provided new avenues for the librarians as well as the end-users in providing electronic document delivery, information consolidation, translation and reprographic services.

The university librarians under the study were asked to provide details regarding the electronic information services that they have extended to their users. The data received in response has been presented in Table 4.24.

The BUL, GUL, KaUL and MaUL have reported that they are providing reference service to their users through electronic mode. These libraries receive and answer the users queries through e-mail, and assist their users in making use of CD-ROMs, online databases, etc. However, these libraries do not provide reference service through chatting. The KUL and MUL do not provide electronic reference service to their users.

Table 4.24: Particulars of electronic information services in university libraries

Sl. No.	Electronic Resource-based Services	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Reference Service						
	1.1 Receiving queries from users through E-mail	Yes	Yes	Yes	-	Yes	-
	1.2 Receiving queries from users through Chat	-	-	-	-	-	-
	1.3 Answering queries through E-mail	Yes	Yes	Yes	-	Yes	-
	1.4 Answering queries through Chat	-	-	-	-	-	-
	1.5 Assisting users in making use of CD-ROMs, online resources, etc.	Yes	Yes	Yes	-	Yes	-
02	Referral Services	-	Yes	Yes	-	-	-
03	Alerting Services (CAS)						
	3.1 New Addition/Accession List	Yes	-	-	Yes	Yes	-
	3.2 Content pages of journals	Yes	-	-	-	-	-
	3.3 Announcement of research in progress	-	-	-	-	-	-
	3.4 Notification of forthcoming conference/ seminars	Yes	-	-	Yes	-	-
	3.5 Newspaper Clipping	-	-	-	Yes	-	-
04	Selective Dissemination of Information Service	-	-	Yes	-	-	-
05	Document Delivery Service	Yes	-		-	Yes	-
06	Bibliographic Services	Yes	Yes	Yes	Yes	Yes	Yes
07	Translation Service	-	-	-	-	-	-
08	Reprographic Service						
	8.1 Computer Print-out	Yes	Yes	Yes	Yes	-	-
	8.2 Xerox	Yes	Yes	Yes	Yes	Yes	Yes
09	Others	-	-	-	-	-	-

Except GUL and KaUL, no other library under the study provides referral service through electronic mode. Half of the university libraries under the study provide alerting services to their users. Equal number of libraries provide a list of new additions, content pages of journals and announce the forthcoming seminars and conferences. The KUL alerts the users of forthcoming seminars and conferences, and provides newspaper clipping service. MaUL supplies new additional list to the users through electronic mode. The GUL, KaUL and MUL do not provide alerting services at all. Except KaUL, none of the university library under the study is providing selective dissemination of information service.

The BUL and MaUL are providing electronic document delivery service to their users. All the university libraries under the study have reported that they are providing bibliographic service by making use of e-resources available under UGC-Infonet E-Journals Consortium.

None of the university libraries under the study is providing translation service to their users. Except MaUL and MUL, the remaining university libraries do provide reprographic service through computer print-out. All the university libraries provide xerox service.

Discussion/Interpretation

As can be seen from the data provided in Table 4.24, the majority of university libraries have failed to provide electronic information services to their users. There is an urgent need on the part of these university libraries to introduce electronic information

services to serve their users better. Probable reason for why the university libraries have failed to capitalise e-resources to strengthen their services is lack of required expertise to handle them and ICTs.

4.7 User Education Programmes

User education is an instruction given to readers to help them to make the best use of library (Meadow, 1983). The objectives of the user education are to create awareness and understanding of the basic relevant library and information sources and services, to bridge the gap between the potential user and education, to enhance users ability to select appropriate information sources and system for their specific information needs (Satyanarayana, 2008). Unless the available electronic resources in the libraries are made known to end-users, the goal of investing on electronic resources could not be achieved (Mounissamy & Kaliammal, 2005). As the application and use of electronic information sources and services became increasingly important in achieving academic excellence in higher education, the users need to be educated for creation of awareness and optimum use of them. Promoting the use of library resources is the responsibility of the libraries. The user-education must become a continuous process in this electronic environment. As and when the new resources and services are introduced in the libraries, they must be made known to the users so that they can use them to the maximum extent.

In order to know the user education scenario in the university libraries under the study, the librarians were asked to indicate the methods followed for providing user

education, modules covered, and their preparedness with regard to space and equipments required for providing user education. The response received in this regard has been presented in Table 4.25.

All the university libraries under the study have conducted user education programmes. Conducting training programmes / workshops and arrangement of audio-visual presentations found to be the most popular methods of user education. Except KaUL, all the university libraries under the study have arranged demonstrations / visits to familiarize e-resources among the users. The BUL and KaUL publish handbooks, brochures, etc., in electronic form and the majority of libraries under the study do not use this method for user education.

All the university libraries under the study have conducted training programmes for users in searching information sources available under UGC-Infonet E-Journal Consortium. The GUL, KaUL and KUL have conducted user education on searching the Internet. Except GUL, none of the libraries under the study has conducted user education on searching CD-ROMs.

The BUL, GUL, KUL and MaUL have separate halls for conducting user education and have sufficient seating arrangement in the halls. The BUL, GUL and MaUL have OHP, LCD, etc., required for conducting user education programmes. The KaUL and MUL do not have separate hall and required equipments for conducting user education.

Table 4.25: User education programmes conducted by university libraries

Sl. No.	User Education	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Conducted User Education programmes	Yes	Yes	Yes	Yes	Yes	Yes
02	Methods followed :						
	2.1 Training programmes/workshops	Yes	Yes	Yes	Yes	Yes	Yes
	2.2 Lectures	Yes	-	Yes	-	Yes	Yes
	2.3 Audio-Visual Presentations	Yes	Yes	Yes	Yes	Yes	Yes
	2.4 Demonstrations/Visits	Yes	Yes	-	Yes	Yes	Yes
	2.1 Publications such as library handbooks, brochures, tutorials, etc. in print form	Yes	Yes	-	Yes	Yes	-
	2.6 Publications in electronic form	Yes	-	Yes	-	-	-
03	Modules covered in Training Programmes / Workshops:						
	Computer fundamentals	-	Yes	-	Yes	-	-
	Searching Internet	-	Yes	Yes	Yes	-	-
	Searching CD-ROMs	-	Yes	-	-	-	-
	Searching Online Information Sources	Yes	Yes	-	Yes	-	-
	Searching Online Information Sources available through UGC-Infonet E-Journal Consortium	Yes	Yes	Yes	Yes	Yes	Yes
	Searching Digital Archives of Open Access Information Sources	-	-	-	-	-	-
	Searching Institutional Repository	-	-	-	-	-	-
04	Provision of Space and Equipments:						
	4.1 Separate Hall for Conducting User Education	Yes	Yes	-	Yes	Yes	-
	4.2 Sufficient Seating Arrangement in the Hall	Yes	Yes	-	Yes	Yes	-
	4.3 Projectors in the Hall (OHP, LCD, etc.)	Yes	Yes	-	-	Yes	-
05	Others	-	-	-	-	-	-

Discussion/Interpretation

The majority of university libraries under the study do not publish handbooks, manuals, brochures, etc., that help users to develop awareness and make effective use of the information resources. The university libraries need to conduct training programmes on searching CD-ROMs and Internet. Computer skills are basic for making effective use of electronic resources. Hence, the university libraries are expected to provide user education on the usage of computers. The university libraries should have a well-planned and well-furnished hall for user education as user education is expected to become a continuous process.

4.8 Receptivity/Acceptance of Electronic Medium by the Users

It is a general understanding that university librarians will have a close contact with their users. They can very well analyse the information needs as well as the medium/version in which the users would like to have the information from their libraries. In order to seek the opinions of the university librarians regarding the receptivity/acceptance of the electronic medium by their users, a question was raised. The response received in this regard from them has been presented in Table 4.26.

The majority of university librarians under the study have opined that both electronic and print media are acceptable for their users. Only KaU Librarian has indicated that their users prefer print medium to electronic.

Table 4.26: Librarians' opinions regarding receptivity / acceptance of electronic medium by the users

Sl. No.	Librarians Opinion	BUL	GUL	KaUL	KUL	MaUL	MUL
01	Electronic medium is preferred to print	-	-	-	-	-	-
02	Print medium is preferred to electronic	-	-	Yes	-	-	-
03	Both media are acceptable	Yes	Yes	-	Yes	Yes	Yes

Discussion/Interpretation

The analysis reveal that the university library users are not comfortable in making use of electronic medium, and they want to have their required information in print as well as electronic media.

4.9 Conclusion

The recent developments in the field of ICTs have greatly influenced the provision of information in university libraries. The fast and abundant growth of the information on the one hand and demand for accessing this information before it becomes obsolete on the other, has forced the university libraries to adopt ICT in their information activities. The closer look at the ICT infrastructure developed in the universities under the study brings home the fact that these universities stand at different stages of development.

Automation of library activities, a prerequisite for providing electronic information services, is found to be not fully geared up in the university libraries under the study.

Moreover, these libraries have not formulated the suitable collection development policies for collection development and management of electronic resources. The university libraries seem to be very weak with regard to the collection of electronic resources. University libraries have not paid due attention to procure the CD-ROM databases on the regular basis and do not have CD-Net facility for remote access of CD-ROMs. Further, surprisingly most of the libraries under the study are not subscribing e-resources for the benefit of users. All the libraries are dependent on e-resources accessible through the UGC-Infonet E-Journals Consortium.

A very few university libraries are providing electronic information services to their user community. The libraries have failed to provide synchronous virtual reference services to their users (through instant messaging or chatting). The majority of libraries do not provide referral service. As the universities are the research centres apart from imparting higher education, the research community should be alerted of the latest developments in their own field. However, the findings of the survey reveal that the university libraries have fallen behind in providing alerting services to their users. Electronic document delivery is yet another service which has not been provided by the majority of libraries. User education programmes have not been conducted on the regular basis to make the users information literates in this e-environment.

In the light of the findings of the survey, the researcher suggests that the university libraries under the study need to take necessary steps to develop need-based collection of electronic information sources and provide electronic information services

to the users. Every university should further strengthen the ICT infrastructure and see that every faculty member shall have access not only to Internet but also to all e-resources on their desktops at the department chamber. Every university library should develop a dynamic Web page of its own and make it a gateway for the universe of knowledge. The user education should become the regular activity of the libraries to create awareness and increase the use of information resources.

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5.1 Introduction

The impact of electronic information sources and services on the academic library users is potentially enormous, whether in support of research, teaching, publishing or communications (Banwell & Gannon- Leary, 1999). Realizing the importance of electronic information sources and services, the university libraries have introduced them in their activities as well as services (Nyamboga & Kemparaju, 2002). Mere development of these resources in the libraries is not the objective, but they need to be explored by the end-users. To know whether these resources have reached the end-users or not, there is a need to measure the impact of resources and services on them.

Performance measurement is central to library management, since without a firm grasp on what is actually being achieved it is impossible to move forward to improve service or even to maintain the status quo (Brophy, 2006). The ultimate criterion for assessing the quality of service is its capability for meeting the user needs it is intended to serve, and the value of a service must ultimately be judged in terms of the beneficial effects accruing from its use (Orr, 1973).

To assess the use of information sources and services, the respondents are classified according to their characteristics such as gender, age, faculty, teaching

experience, education, designation, etc. Because, the concept of a single typical user of information systems is clearly a fallacy. Scientists seek or use information more differently than those of social scientists or humanists (Tenopir, 2003). Differences in electronic journal use may be attributed to age, status or rank (Sathe, Grady & Guise, 2002). Gender differences in the use of information sources and services have been proved (Monopoli, et al., 2002).

Guided by these studies and the other studies reviewed in chapter 2, the present study has been carried out to determine the extent to which the academic staff of universities are aware and use electronic information sources and services. An attempt has been made to know the awareness and use of Internet facility, UGC-Infonet E-Journals Consortium, CD-ROMs, OPAC and user education programmes. The data sought to know from the respondents include: whether they are aware or not? If aware whether use it or not? the frequency of use, information sources used, purpose of using, problems faced in using, ability to use and reasons for not using. The data received from the respondents has been presented in the tables and analyzed in the following sections.

5.2 Respondents' Background

The present study is focused on the teachers working in various post graduate departments of the six conventional universities in Karnataka State. The

population for this study consists of permanent teachers such as Lecturers, Readers and Professors. The stratified random sampling technique was used to choose the sample. Table 5.1 provides the university-wise details of questionnaires distributed, questionnaires received and percentage of the response.

Table 5.1: Survey response by academic staff

Sl. No.	No. of Questionnaires	BU	GU	Ka U	KU	Ma U	MU	Total
01	Distributed	260	105	166	85	105	210	931
02	Received	124	80	102	70	71	131	578
03	Percentage of Response	47.69	76.19	61.45	82.35	67.62	62.38	62.08

The data presented in Table 5.1 shows that 931 questionnaires, were distributed among the teachers of the universities under the study and 578 questionnaires were received back. The percentage of response is 62.08.

The respondents are classified by gender, age, teaching experience, subject background (faculty), designation and by their educational qualification and it is presented in Table 5.2.

As Table 5.2 indicates, the majority (75.78%) of the respondents are males. Age-wise distribution of the respondents reveals that the majority of them fall under the age group of 41 to 50 years (41.00%) followed by more than 51 years (31.14%). Teaching experience-wise, 39.45% of the respondents come under the group of 11

to 20 years followed by 21 to 30 years of experience (28.55%). Faculty-wise, the majority of the respondents are from Science. Most of the respondents (86.16%) have completed Ph. D degree.

Table 5.2: Particulars of respondents

N=578

Sl. No.	Particulars	No. of Respondents	Percent
01	Gender :		
	Male	438	75.78
	Female	140	24.22
02	Age:		
	Up to 30 years	22	3.81
	31-40	139	24.05
	41-50	237	41.00
	51 and above	180	31.14
03	Teaching Experience:		
	Up to 10 years	144	24.91
	11-20	228	39.45
	21-30	165	28.55
	31 and above	41	7.09
04	Faculty:		
	Social Science	196	33.91
	Science	284	49.13
	Humanities	98	17.96
05	Designation:		
	Lecturers	208	35.99
	Readers	180	31.14
	Professors	190	32.87
06	Education:		
	Ph.D.,	498	86.16
	Non- Ph.D.,	80	13.84

5.3 Respondents' Knowledge of Computer

In order to explore the benefits of electronic resources, the basic knowledge of computer operation is a prerequisite. A question was raised to know the

respondents' knowledge of computer operation. The data received has been presented in Table 5.3.

Table 5.3: Respondents' knowledge of computer

N=578

Sl. No.	Knowledge of Computer	No. of Respondents	Percent
01	Yes	578	100.00
02	No	-	-
Total		578	100.00

As Table 5.3 shows, all the respondents have indicated that they have the knowledge of computer operation.

5.3.1 Means of Acquiring Knowledge of Computer

There are different means by which one can acquire computer knowledge. It may be through formal training or through informal training. The respondents were asked to indicate the way by which they have acquired the knowledge of computer. The feedback received is presented in Table 5.4.

Table 5.4: Means by which respondents acquired the knowledge of computer

N=578

Sl. No.	Means	No. of Respondents	Percent
01	Through Formal Training	138	23.88
02	Through Informal Training	440	76.12
04	Not Responded	-	-
Total		578	100.0

Of the 578 respondents, 440 (76.12%) indicated that they have learnt the computer operation through informal training, whereas 138 (23.88%) through formal training.

5.3.2 Assessment of Knowledge of Computer

The respondents were asked to indicate the adequacy of computer training that they have received. The data received has been presented in Table 5.5.

Table 5.5: Self-assessment of knowledge of computer by the respondents
N=578

Sl. No.	Assessment	No. of Respondents	Percent
01	Adequate	59	10.21
02	Inadequate	214	37.02
03	Need more training	305	52.77
Total		578	100.00

Of the 578 respondents, 59 (10.21%) have indicated that the training they received was adequate, 214 (37.02%) inadequate and 305 (52.77%) respondents indicated that they need more training.

Discussion / Interpretation

The findings regarding the respondents' knowledge of computer operation show that there is a need for training through formal computer training courses to gain adequate knowledge. The universities have to design systematic plans to train academic staff either by arranging internal computer training courses or by deputing the staff to acquire such training from wherever such training courses are conducted.

5.4 Availability of ICT Facilities to Respondents

With an intention to know the availability and accessibility of ICT facilities, questions were raised to the respondents. The data received in this regard have been tabulated and presented in Table 5.6.

Table 5.6: Availability and accessibility of ICT infrastructure to the respondents

N=578

Sl. No.	ICT Infrastructure	Response		Total
		Yes	No	
01	Availability of Computer at Dept. Chamber	468 (81.00)	110 (19.00)	578 (100.00)
02	Accessibility to Internet at Dept. Chamber	443 (76.64)	135 (23.36)	578 (100.00)
03	Accessibility to campus LAN at Dept. Chamber	347 (60.00)	231 (40.0)	578 (100.00)
04	Availability of Computer at Home	422 (73.00)	156 (27.00)	578 (100.00)
05	Accessibility to Internet at Home	298 (51.56)	280 (48.44)	578 (100.00)
06	Accessibility of campus LAN at Home	-	-	-

(Note: Number given in parenthesis shows the percentage)

As Table 5.6 shows, 81.00% of the respondents have computers at their department chambers and 76.64% have accessibility. Sixty percent of the respondents have accessibility to campus LAN at their department chambers. Seventy-three percent of the respondents have computers at their homes and only 51.56% have Internet connectivity at home. None of the respondents has access to campus LAN at their homes.

Discussion / Interpretation

Nearly one-fourth of the respondents do not have Internet connectivity at their department chambers. And, nearly half of the respondents do not have such facility at their homes. None of the universities under the study have extended campus LAN to the residences of the respondents. Lack of accessibility to Internet and campus LAN at their departments and homes will come in the way of

respondents in making use of e-resources where much of the time of the respondents is spent in departments and homes.

5.5 Awareness and Use of the Internet Facility

The Internet has great potential for the information seekers in the university system especially in the present day information environment. It is a means of enhancing and accelerating scholarly communication, fostering indigenous publications, facilitating computer-based teaching and under-pinning distance learning strategies (Devarajan,1999).

An awareness of the information sources available on Internet is essential to use e-resources effectively and efficiently. In the previous chapter, the particulars of Internet facility in university libraries has been analysed. Here, an attempt has been made to know the awareness and use of Internet facility by the academic staff.

The respondents were asked to indicate their awareness and use of the Internet facility available in the university libraries. The data received in this regard has been presented in Table 5.7.

Table 5.7: Awareness and use of Internet facility in university libraries

N=578

Sl. No.	Response	No. of Respondents	Percent
01	Aware and Use	578	100.00
02	Aware But Do Not Use	-	-
03	Not Aware	-	-
Total		578	100.00

The data presented in Table 5.7 clearly shows that all the respondents, are aware of and use Internet facility available at university libraries.

5.5.1 Places of the Internet Access

The respondents were asked to indicate the place or places where they use Internet. The data received in this regard has been presented in Table 5.8.

Table 5.8: Places where the respondents use the Internet

N=578			
Sl. No.	Places	No. of Respondents	Percent
01	University Library	135	23.36
02	Department Chamber	443	76.64
03	Home	298	51.56
04	Commercial Internet Centre	14	2.42
05	Other	-	-

The majority (76.64%) of respondents use Internet at their department chambers followed by 51.56% at homes whereas only 23.36% use it in their respective university libraries. A negligible percentage (2.42%) of respondents use Internet in commercial Internet centres.

5.5.2 Frequency of the Internet Use

The respondents who are aware and use Internet facility were asked to indicate the frequency of its use. The data received in this regard has been presented in Table 5.9.

Table 5.9: Frequency of use of Internet

N= 578

Sl. No.	Frequency	No. of Respondents	Percent
01	Daily	259	44.81
02	Once in two days	79	13.67
03	Twice in a week	59	10.21
04	Once in a week	39	6.75
05	Once in two weeks	43	7.44
06	Once in a month	47	8.13
07	Occasionally	52	9.00
Total		578	100.00

The data presented in Table 5.9 shows that 259 (44.81%) respondents use Internet daily and 79 (13.67%) use it once in two days. Fifty-nine (10.21%) respondents use Internet twice in a week followed by 52 (9.00%) who use it occasionally. Forty-seven (8.13%) respondents use it once in a month, 43 (7.44%) use it once in two weeks and 39 (6.75%) use it once in a week.

The data pertaining to the frequency of Internet use has been further analysed by the gender, faculty and designation of the respondents and presented in Table 5.10.

The analysis of the data presented in Table 5.10 reveals that the male respondents are ahead of female the respondents among those who use Internet daily. Nearly half of the male respondents (49.09%) use the Internet daily against 31.43% of female respondents. The calculated chi-square value for the frequency of Internet use by the male and female respondents is (21.964) greater than the critical value (18.5) for 6 degrees of freedom at 5.00% probability level. The association between the frequency of

Internet use and gender is statistically significant. Therefore, it could be inferred that males are frequently making use of the Internet as compared to females.

Faculty-wise analysis of the frequency of Internet use clearly shows that Science faculty use the Internet more frequently than the faculty belonging to Social Science and Humanities. The majority of Science faculty (75.70%) use the Internet daily as compared to that of Social Science (20.41%) and Humanities (4.08%). This shows that the Internet is most popular among Science faculty and is least popular among the Humanist faculty. The chi-square value estimated for the frequency of Internet use by the respondents belonging to different subjects is statistically significant at 1.00% probability level. Hence, it could be inferred that Science faculty are found to be making use of the Internet more frequently as compared to Social Science and Humanities respondents.

More than half of the Professors (51.58%) use the Internet daily. Slightly less than half of the Readers (49.44%) and 34.62% of the Lecturers use the Internet daily. The chi-square value estimated for the frequency of Internet use by the respondents belonging to different designations is statistically significant at 1.00% probability level. Hence, it could be stated that Professors and Readers are found to be making use of the Internet more frequently as compared to Lecturers.

Table 5.10: Frequency of Internet use: Analysis by gender, faculty and designation

N=578

Sl. No.	Frequency	Gender		Faculty			Designation		
		M N=438	F N=140	S. Sc. N=196	Sc. N=284	H N=98	L N=208	R N=180	P N=190
01									
02	Daily	215 (49.09)	44 (31.43)	40 (20.41)	215 (75.70)	4 (4.08)	72 (34.62)	89 (49.44)	98 (51.58)
03	Once in two Days	53 (12.10)	26 (18.57)	38 (19.39)	35 (12.32)	6 (6.12)	57 (27.40)	18 (10.00)	4 (2.11)
04	Twice in a week	41 (9.36)	18 (12.86)	22 (11.22)	26 (9.15)	11 (11.22)	22 (10.58)	10 (5.56)	27 (14.21)
05	Once in a week	23 (5.25)	16 (11.43)	17 (8.67)	8 (2.82)	14 (14.29)	12 (5.77)	15 (8.33)	12 (6.32)
06	Once in two weeks	28 (6.39)	15 (10.71)	24 (12.24)	-	19 (19.39)	13 (6.25)	14 (7.78)	16 (8.42)
07	Once in a month	35 (8.00)	12 (8.57)	26 (13.27)	-	21 (21.43)	15 (7.21)	18 (10.00)	14 (7.37)
08	Occasionally	43 (9.82)	9 (6.43)	29 (14.80)	-	23 (23.47)	17 (8.17)	16 (8.89)	19 (10.00)
09	Total	438	140	196	284	98	208	180	190
10	χ^2	21.964		300.873			66.715		

(Note: Number given in parenthesis shows the percentage)

5.5.3 Frequency of Internet Use: Analysis by Places

After knowing the places where the respondents use Internet, they were asked to indicate the frequency of Internet use by places. The data received from the respondents has been presented in Table 5.11.

Table 5.11: Frequency of Internet use: Analysis by place

N=578

Sl. No.	Frequency	University Library N=135	Dept. Chamber N=443	Home N=290	Commercial Internet Centre N=14
01	Daily	21 (15.56)	204 (46.05)	125 (43.10)	-
02	Once in two days	34 (25.19)	76 (17.16)	73 (25.17)	-
03	Twice in a week	19 (14.07)	44 (9.93)	31 (10.68)	-
04	Once in a week	17 (12.59)	39 (8.80)	24 (8.28)	2 (14.29)
05	Once in two weeks	16 (11.85)	35 (7.90)	13 (4.48)	3 (21.43)
06	Once in a month	16 (11.85)	24 (5.42)	8 (2.75)	3 (21.43)
07	Occasionally	12 (8.89)	21 (4.74)	16 (5.52)	6 (42.86)

As the data clearly show, among those who use the Internet at their department chambers, 204 (46.05%) use daily followed by 76 (17.16%) use once in two days. Similar results have been found in case of those who use the Internet at home wherein 125 (41.95%) use daily and 73 (24.50%) use once in two days. Among who use the Internet at university library 21 (15.56%) use it daily and 34 (25.19%) use once in two days. Occasional users of the Internet are negligible in

numbers. Among who use the Internet at commercial centres, majority 6 (42.86%) use it occasionally.

5.5.4 Use of the Internet-based Resources

The ease of dissemination of information via the Internet has resulted in an unimaginable quantity and variety of sources of potential interest to any Internet user (Cooke, 2001). The respondents were asked to indicate the information sources that they used on the Internet. The data received in this regard has been presented in Table 5.12.

Full-text journals and abstracting journals are found to be the most frequently used information sources by the faculty through Internet. Full-text journals available on the Internet have been used by 221 (38.24%) of the respondents, and abstracting and indexing journals have been used by 214 (37.02%) respondents. Reports and books available on the Internet have been used by 115 (19.90%) and 112 (19.38%) of the respondents respectively. Theses and dissertations have been used by 81 (14.01%) of the respondents. The use of reference sources such as encyclopedias (12.98%), dictionaries (11.42%), biographies (5.54%), maps and atlases (9.17%) found to be less popular resources among the respondents. Institutional repositories were the least used resources by the respondents.

Table 5.12 Internet-based resources used by the respondents

N=578

Sl. No.	Information Sources	No. of Respondents	Percent
01	Full-text Journals	221	38.24
02	Abstracting and Indexing Journals	214	37.02
03	Books	112	19.38
04	Reports	115	19.90
05	Theses and Dissertations	81	14.01
06	Newspapers	75	12.98
07	Advertisements	21	3.63
08	Dictionaries	66	11.42
09	Encyclopedias	75	12.98
10	Biographies	32	5.54
11	Maps and Atlases	53	9.17
12	Institutional Repositories	11	1.90
13	Library Catalogues	22	3.81
14	Films, Songs, Games	33	5.71
15	Others	12	2.08

5.5.5 Purpose of Using the Internet

In order to know the purpose of using the Internet, Question No. 14 was asked. The responses received from the respondents have been presented in Table 5.13.

According to the data, communication (e-mail) was the main purpose of using the Internet followed by writing research articles and keeping abreast with the latest developments. The Internet is found to be less preferred for searching new jobs and recreation.

Of the 578 respondents, 512 (88.58%) use the Internet as a means of communication followed by 332 (57.43%) for writing research articles.

Table 5.13: Purpose of using Internet-based resources

N=578

Sl. No.	Purposes	No. of Respondents	Percent
01	To keep abreast with the latest developments	315	54.50
02	For teaching preparation	188	32.53
03	For own research	292	50.52
04	For guiding research students	138	23.88
05	For writing books	55	9.52
06	For writing research articles	332	57.44
07	To know forthcoming conferences and seminars	219	37.89
08	To know funding agencies	82	14.19
09	For searching new jobs	16	2.77
10	For communication (E-mail)	512	88.58
11	For recreation	25	4.33
12	Others	14	2.42

More than half of the respondents use the Internet to keep abreast with the latest developments (54.50%) and to collect the information required for own research (50.52%). For the purpose of knowing the forthcoming conferences and seminars 219 (37.89%) respondents use the Internet followed by 188 (32.53%) for teaching preparation. For guiding research students 138 (23.88%) and for information about funding agencies only 82 (14.19%) respondents use the Internet. Fifty-five (9.52%) respondents use the Internet for the purpose of writing books.

A number of studies in Library and Information Science have demonstrated the purpose of using the Internet by the academic staff.

The findings of the present study regarding the usage of Internet for communication (e-mail) is in conformity with the results of the study reported by Pangannaya and Sujith Kumar (2000). However, the results of the study reported by

Patitungkho and Deshpande (2005) are not in conformity with the findings of the present study.

5.5.6 Problems faced in making use of the Internet

The respondents were asked to indicate the problems faced in making use of the Internet facility. The data received in this regard has been presented in Table 5.14.

Table 5.14: Problems faced in the use of Internet facility

N=578			
Sl. No.	Problems	No. of Respondents	Percent
01	Lack of sufficient Internet nodes in University Library	325	56.23
02	Lack of Internet connectivity in Dept. Chamber	130	22.49
03	Slow Internet bandwidth	346	59.86
04	Technical problems (server down)	256	44.29
05	Frequent power cut	241	41.70
06	Lack of assistance by library staff	86	14.88
07	Others	18	3.11

The analysis of data presented in Table 5.14 clearly shows that 59.86% of the respondents are facing the problem of slow Internet bandwidth and 56.23% are facing the problem of lack of sufficient Internet nodes in university libraries. Technical problems such as server down was indicated by 44.29% of the respondents and whereas 41.70% of the respondents have expressed their concern for frequent power cut as a problem. Lack of Internet connectivity in department

chambers of the respondents was reported as a problem for 22.49% of the respondents.

The findings regarding the problems faced by the respondents are in conformity with the results of the study reported by Amritpal Kaur (2006).

5.5.7 Ability to Use the Internet

The respondents were asked to assess themselves their ability to use the Internet efficiently. The result would help to assess the training needs of the academic staff for using the Internet effectively. The data received in this regard have been presented in Table 5.15.

Table 5.15: Self-assessment of ability to use the Internet by the respondents
N=578

Sl. No.	Ability	No. of Respondents	Percent
01	Beginner	85	14.71
02	Below Average	116	20.07
03	Average	214	37.02
04	Above Average	98	16.96
05	Expert	52	9.00
06	Not Respondents	13	2.25
07	Total	578	100.0

The analysis of data in Table 5.15 reveals that only a small percentage (9.00%) of the faculty have the required expertise. Those who have declared that they are above average in their ability to use the Internet are also comparatively negligible to those who are average (37.02%) and below average (20.07%).

Discussion / Interpretation

Among those who use the Internet daily, male respondents are ahead of female respondents. Faculty-wise analysis clearly indicates that the respondents belonging to faculty of Science are ahead of Social Science and Humanities among those who use the Internet daily. Designation-wise analysis indicates that Professors and Readers are ahead of Lecturers among those who use the Internet daily. Hence, the characteristics of respondents such as gender, faculty and designation are directly related to the frequency of Internet use.

Among the Internet-based e-resources, the respondents prefer to use information sources that reflect the nascent thought generated in their subject field rather than reference sources.

About more than 30.00% of the total respondents do not use the Internet efficiently and they need extensive training in the use of Internet. The respondents who have assessed their ability to use the Internet as average may also need advanced level of training. Only one-fourth of the faculty are found to have the required skills to use the Internet effectively.

5.6 Awareness and Use of the UGC- Infonet E-Journals Consortium

The respondents were asked to indicate their awareness and use of the UGC- Infonet E-Journals Consortium accessible at their respective universities. The data received in this regard has been presented in Table 5.16.

Table 5.16: Awareness and use of the UGC-Infonet E-Journal Consortium
N=578

Sl. No.	Response	No. of Respondents	Percent
01	Aware and Use	230	39.79
02	Aware But Do Not Use	208	35.99
03	Not Aware	140	24.22
Total		578	100.00

Of the 578 respondents, 230 (39.79%) have indicated that they are aware of and they use the Consortium, 208 (35.99%) are aware of but do not use it and 140 (24.22%) are not aware of the Consortium.

Further, the data presented in the Table 5.16 has been analysed by gender, faculty and designation of the respondents, to know the relation between these characteristics and the awareness and use of UGC-Infonet e-resources. The data has been presented in Table 5.17.

Gender-wise analysis of the data reveals that the academics belonging to the fairer sex are slightly ahead of their male counterparts in both use and non-use of the UGC-Infonet e-resources. Faculty-wise analysis of the data brings home the fact that the respondents belonging to Science faculty are far ahead of their Social Science and Humanities counterparts. Designation-wise analysis of the data shows that the Readers are ahead of Lecturers and Professors.

Out of 438 male respondents, 172 (39.27%) are aware of and use the UGC-Infonet e-resources, 152 (34.70%) do not use it though aware of them, and 114 (26.03%) are not aware of e-resources.

Table 5.17: Awareness and use of the UGC-Infonet E-Journals Consortium: Analysis by gender, faculty, designation and computer training background of respondents

N=578

Sl. No.	Particulars of Respondents	Aware and Use		Aware but do not use		Not Aware		Total		X2
		No.	%	No.	%	No.	%	No.	%	
01	Gender:									3.386
	Male (N=438)	172	39.27	152	34.70	114	26.03	438	100.00	
	Female (N=140)	58	41.43	56	40.00	26	18.57	140	100.00	
02	Faculty:								100.00	313.657
	Soc. Science (N=196)	38	19.39	135	68.88	23	11.73	196	100.00	
	Science (N=284)	189	66.55	50	17.61	45	15.85	284	100.00	
	Humanities (N=98)	3	3.06	23	23.47	72	73.47	98		
03	Designation:									12.012
	Lecturer (N=208)	76	36.54	84	40.38	48	23.08	208	100.00	
	Reader (N=180)	89	49.44	50	27.78	41	22.78	180	100.00	
	Professor (N=190)	65	34.21	74	38.95	51	26.84	190	100.00	
04	Computer Training:									92.116
	Formal Training (N=138)	103	74.64	19	13.77	16	11.59	138	100.00	
	Informal Training (N=440)	127	28.86	189	42.95	124	28.18	440	100.00	

Fifty-eight (41.43%) of the female respondents are aware of and use it, 56 (40.00%) are aware of but do not use it, and 26 (18.57%) are not aware of the UGC-Infonet e-resources. The chi-square value estimated for finding out the association between the awareness and use of UGC-Infonet e-resources as well as gender of the respondents is not statistically significant. Hence, it could be inferred that there is no association between the variables.

Faculty-wise analysis of data reveals that the majority of Social Science respondents (68.88%) do not use it though they are aware of e-resources accessible under the UGC-Infonet E-Journals Consortium. In the case of the respondents from the Science faculty, the majority (66.55%) are aware of and use e-resources. Nearly three-fourths of the Humanities respondents (73.47%) are not aware of the UGC-Infonet e-resources. The chi-square value estimated to determine the association between awareness and use of the UGC-Infonet e-resources and the subject background of the respondents is statistically significant at 1.00% probability level. Hence, it could be inferred that more number of Science faculty are found to be aware of and making use of the UGC-Infonet e-resources as compared to Social Science and Humanities respondents.

Designation-wise analysis of the data shows that nearly half of the Readers (49.44%) are aware of and use the UGC-Infonet e-resources. More number of Lecturers (40.38%) and Professors (38.95%) do not use it though they are aware of them. The chi-square value estimated for knowing the association between the awareness

and use of UGC-Infonet e-resources as well as designation of the respondents is not statistically significant. Hence, it could be inferred that there is no association between the variables.

An analysis of the data by computer training background of the respondents reveals that 74.64% of those who have undergone formal training course are aware of and use the UGC-Infonet e-resources. Among those who have not undergone formal training course, only 28.86% are aware of and use e-resources. The chi-square value estimated to determine the association between awareness and use of the UGC-Infonet e-resources and the computer training background of the respondents is statistically significant at 1.00% probability level. Hence, it could be inferred that more number of faculty who have undergone formal computer training are aware of and making use of the UGC- Infonet e-resources as compared to the respondents who have not undergone formal computer training.

5.6.1 Frequency of Use of the UGC-Infonet E-Journals Consortium

The respondents who indicated that they are aware of and use e-journals of UGC-Infonet Consortium were asked to indicate the frequency of its use. The data received in this regard has been presented in Table 5.18.

The data reveals that 88 (38.26%) respondents use the UGC-Infonet e-resources daily and 27 (11.74%) use it once in two days. Twenty-five (10.87%) respondents use the resources twice a week and an equal number of respondents use it once in a week. Twenty-three (10.00%) respondents use it once in a month and

slightly less than that (9.57%) use it once in two weeks. Twenty (8.70%) respondents use the UGC-Infonet E-Journals Consortium occasionally.

Table 5.18: Frequency of use of UGC-Infonet E-Journals Consortium

N=230

Sl. No.	Frequency	No. of Respondents	Percent
01	Daily	88	38.26
02	Once in two days	27	11.74
03	Twice in a week	25	10.87
04	Once in a week	25	10.87
05	Once in two weeks	22	9.57
06	Once in a month	23	10.00
07	Occasionally	20	8.70
Total		230	100.00

It is interesting and important to know the relation between the respondents' gender, faculty and designation and the usage of e-resources of UGC-Infonet Consortium. Hence, the data pertaining to the frequency of use of e-resources has been further analysed by the respondents' gender, faculty and designation and presented in Table 5.19.

Gender-wise analysis of the data shows that 69 (40.12%) male respondents use the consortium daily against 19 (32.76%) female respondents. Among those who use the Consortium once in two days, the percentage of female respondents is higher (15.52%) than that of male respondents (10.47%).

The respondents from Science faculty use the Consortium more frequently as compared to Social Science and Humanities respondents. Of 189 Science respondents, 87 (46.03%) use the Consortium daily whereas out of 38 Social Science respondents, 1 (2.63%) uses it daily. None of the Humanities respondent uses the Consortium daily.

Table 5.19: Frequency of Use of the UGC-Infonet E-Journals Consortium: Analysis by gender, faculty, designation, computer training background of the respondents

N=230

Sl. No.	Frequency	Gender		Faculty			Designation		
		M N=72	F N=58	S. Sc. N=38	Sc. N=189	H N=3	L N=76	R N=89	P N=65
01	Daily	69 (40.12)	19 (32.76)	1 (2.63)	87 (46.03)	-	7 (9.21)	39 (43.82)	42 (64.62)
02	Once in two days	18 (10.47)	9 (15.52)	1 (2.63)	26 (13.76)	-	11 (4.47)	14 (15.73)	2 (3.08)
03	Twice in a week	20 (11.63)	5 (8.62)	2 (5.26)	23 (12.17)	-	14 (18.42)	8 (8.99)	3 (4.62)
04	Once in a week	19 (11.05)	6 (10.34)	4 (10.53)	21 (11.11)	-	12 (15.79)	8 (8.99)	5 (7.69)
05	Once in two weeks	17 (9.88)	5 (8.62)	6 (15.79)	15 (7.94)	1 (33.33)	9 (11.84)	8 (8.99)	5 (7.69)
06	Once in a Month	16 (9.30)	7 (12.07)	13 (34.21)	9 (4.76)	1 (33.33)	12 (15.79)	7 (7.87)	4 (6.15)
07	Occasionally	13 (7.56)	7 (12.07)	11 (28.95)	8 (4.23)	1 (33.33)	11 (14.47)	5 (5.62)	4 (6.15)

(Note: Number given in parenthesis show the percent)

Among those who use the Consortium occasionally, the percentage of Humanities respondents is higher (33.33%) than that of Social Science (28.95%) and Science respondents (4.23%).

Designation-wise analysis reveals that more number of Professors use the Consortium daily (60.62%) than Readers (43.82%). Lecturers are the least in using the Consortium daily. Among those who use the Consortium occasionally, Lecturers are more in number (11.47%) than Professors and Readers.

5.6.2 UGC-Infonet Resources Used by the Respondents

The UGC-Infonet e-resources are made available from different publishers of online resources. The respondents were asked to indicate the publishers from which they access e-resources. The data received in this regard has been presented in Table 5.20.

As the data reveals, among all the resources accessible under the UGC-Infonet E- Journals Consortium, the Springer Link resources are used by more number of respondents (40.43%) followed by Blackwell Publishing (37.83%). The resources of American Chemical Society and Nature are found to be next popular resources with 85 (36.96%) of the respondents in favour of each. The resources of Oxford University Press and Royal Society of Chemistry have been used by 83 (36.09%) respondents each. The resources from Elsevier Science and American Institute of Physics have been used by 82 (35.65%) respondents each. The resources from MathSciNet (9.57%) and Emerald (9.13%) are found to be less popular among the respondents.

Table 5.20: Publishers from which UGC-Infonet e-resources were used by the Respondents

N=230

Sl. No.	Publishers of UGC-Infonet Resources	No. of Respondents	Percent
01	American Chemical Society	85	36.96
02	American Institute of Physics	82	35.65
03	American Physical Society	69	30.00
04	Annual Reviews	72	31.30
05	Blackwell Publishing	87	37.83
06	Cambridge University Press	81	35.21
07	Elsevier Science (Cell Press)	82	35.65
08	Emerald (LIS collection)	21	9.13
09	Institute of Physics	75	32.61
10	JSTOR	49	21.30
11	Nature	85	36.96
12	Oxford University Press	83	36.09
13	Portland Press	45	19.57
14	Project Euclid	24	10.43
15	Project Muse	32	13.91
16	Royal Society of Chemistry	83	36.09
17	Society for Industrial and Applied Mathematics (SIAM)	28	12.17
18	Springer Link	93	40.43
19	Taylor and Francis	81	35.21
20	BIOSIS (Biological Abstracts)	73	31.74
21	Institute for Studies in Industrial Development (ISID)	45	19.57
21	MathSciNet	22	9.57
22	JCC-UGC-Infonet	44	19.13
23	Any other	-	-

5.6.3 Purpose of Using the UGC-Infonet E-Journals Consortium

In order to know the purpose of using the UGC-Infonet E-Journals Consortium Question No. 21 was asked. The data received from the respondents has been presented in Table 5.21.

Table 5.21: Purpose of using the UGC-Infonet E-Journals Consortium

N=230

Sl. No.	Purpose	No. of Respondents	Percent
01	To keep abreast with the latest developments	96	41.74
02	For teaching preparation	124	53.91
03	For own research	165	71.74
04	For guiding research students	72	31.30
05	For writing books	32	13.91
06	For writing research articles	171	74.35
07	Others	4	1.74

It is clear from the data presented in Table 5.21 that the 171 (74.35%) respondents use the UGC-Infonet resources for writing research articles whereas 165 (71.74%) for carrying out their own research, and 124 (53.91%) for teaching preparation. Keeping up-to-date with the latest developments in one's own field of interest / specialization is most important for 96 (41.74%) respondents followed by 72 (31.30%) for guiding research students. Thirty-two (13.91%) respondents use the resources for writing books.

The findings of the present study are in conformity with the results of the study carried out by Singh, Nazim and Singh (2008).

5.6.4 Problems faced in Using the UGC- Infonet E-Journals Consortium

The respondents were asked to indicate the problems faced by them in making use of the UGC-Infonet E-Journals Consortium. The data received in this regard has been presented in Table 5.22.

Table 5.22: Problems faced by those who are aware and use the UGC-Infonet E-Journals Consortium

N=230

Sl. No.	Problems	No. of Respondents	Percent
01	Lack of knowledge to use	85	36.96
02	Lack of sufficient Internet nodes in University Library	116	50.43
03	Lack of accessibility to UGC-Infonet E-Journal Consortium at Dept. chamber	53	23.04
04	Slow Internet bandwidth	165	71.74
05	Technical Problems (server down)	104	45.22
06	Frequent power cut	72	31.30
07	Lack of relevant information sources	94	40.87
08	Lack of assistance by library staff	17	7.39
09	Others	4	1.74

According to the data, the majority of respondents have faced the problem of slow Internet bandwidth (71.74%) and lack of sufficient Internet nodes in university libraries (50.43%) for making use of UGC-Infonet resources. Technical problems such as server down (45.22%) and lack of relevant information sources (40.87%) were also indicated as problems faced by the respondents. More than one-third (36.96%) of the respondents indicated that the lack of knowledge to use the Consortium and slightly less than that (31.30%) indicated frequent power cut as a problem for using the UGC-Infonet resources. Considerable number of respondents (23.04%) have indicated that the lack of accessibility to UGC- Infonet E- Journals Consortium at their department chambers was a problem for making use of it.

The findings of the present study are in conformity with the results of the study reported by Gupta (2008).

5.6.5 Ability to Use the UGC-Infonet E-Journals Consortium

The respondents who are indeed the actual users of the Consortium were asked to indicate their ability to use it. The response is essential for assessing their confidence as well as their training needs in making effective use of the Consortium. The data received in this regard has been presented in Table 5.23.

Table 5.23: Self-assessment of respondents' ability to use the UGC-Infonet E-Journals Consortium

N=230

Sl. No.	Ability	No. of Respondents	Percent
01	Beginner	22	9.57
02	Below Average	25	10.87
03	Average	127	55.22
04	Above Average	40	17.39
05	Expert	12	5.22
06	Not Responded	04	1.74
Total		230	100.0

The data presented in Table 5.23 reveals that the majority of respondents (55.22%) have indicated their ability as average. Only 17.39% of the respondents assessed their ability as above average and 5.22% as experts. Twenty-five (10.87%) respondents have indicated as below average and 9.57% as beginners as far as their ability to use the UGC-Infonet E-Journals Consortium is concerned.

5.6.6 Reasons for Not Using the UGC- Infonet E – Journals Consortium

The non-use of the UGC-Infonet E-Journals Consortium, though they are aware of it were asked to indicate the reasons for not using. The data received in this regard has been presented in Table 5.24.

Table 5.24: Reasons for non-use of the UGC-Infonet E- Journals Consortium
N=208

Sl. No.	Reasons for Not Using UGC-Infonet E-Journals Consortium	No. of Respondents	Percent
01	Lack of knowledge to use	67	32.21
02	UGC- Infonet E-Journals Consortium is not Accessible in Dept. Chamber	82	39.42
03	Lack of sufficient Internet nodes in University Library	67	32.21
04	Lack of assistance by library staff	18	8.65
05	Lack of relevant information sources	92	44.23
06	Lack of time	81	38.94
07	Others	5	2.40

The data presented in Table 5.24 reveals that the information sources included in the Consortium are not relevant for 92 (44.23%) respondents for their studies. As indicated by 82 (39.42%) respondents, lack of accessibility to the Consortium at their department chambers is the reason for non-use, and lack of time for 81 (38.94%) respondents. Lack of knowledge to use and lack of sufficient Internet nodes in university library are the reasons for not using the Consortium for 67 (32.21%) respondents. Eighteen (8.65%) respondents have indicated that the lack of assistance by the library staff is the reason for their non-use.

Discussion / interpretation

University authorities should give serious thought about how to make the Social Science and Humanities faculty use the UGC-Infonet e-resources. It is also necessary to impart systematic computer training for the benefit of the faculty.

It is quite evident from the data that nearly half of the respondents use the UGC-Infonet E-Journals Consortium frequently. The university libraries need to take

measures to convert the remaining half of the respondents into regular users by way of user education.

More number of male respondents use the UGC-Infonet E-Journal Consortium daily than female respondents. Academics belonging to the faculty of Science use the Consortium more frequently than those belonging to the faculty of Social Science and Humanities. Professors are ahead of Readers and Lecturers among those who use the Consortium daily. Hence, it can be safely said that there is a direct relation between the gender, faculty and designation of the respondents and the frequency of the use of e-resources accessible through the Consortium.

Problems faced by the respondents with regard to the use of the Consortium found to be serious and need to be solved immediately. According to the data presented in Table 5.19, only 7 (9.21%) Lecturers use the UGC-Infonet resources daily. And, the data presented in Table 5.22 reveal that 53 (23.04%) respondents face the problem of lack of accessibility to the UGC-Infonet resources at their department chambers. This clearly shows that the respondents who do not have accessibility to the Consortium at their department chamber, cannot use it frequently and thus face the problem in using it. The authorities have to strengthen and expand campus LAN and see that every faculty avails the benefit of it.

The majority of respondents found the resources included in the Consortium as not relevant for their use. As the respondents have engaged in tight academic schedule, they hardly find time to come to university library frequently for making

use of e-resources. The university libraries also have not adequately equipped to accommodate the users who come to use e-resources. Nearly one-third of the respondents lack the knowledge to use the Consortium. Hence, training programmes need to be organized to overcome the problem.

5.7 Awareness and Use of the CD-ROMs

The availability of CD-ROMs in the university libraries under the study has been discussed in the previous chapter. Here, an attempt has been made to assess to what extent the academic staff are aware and use these resources. The respondents were asked to indicate their awareness and use of the CD-ROMs available in their university libraries. The data received in this regard has been presented in Table 5.25.

Table 5.25: Awareness and use of the CD-ROMs

N=578

Sl. No.	Response	No. of Respondents	Percent
01	Aware and Use	92	15.92
02	Aware But Do Not Use	352	60.90
03	Not Aware	134	23.18
Total		578	100.00

Of the 578 respondents, 352 (60.90%) respondents are not using CD-ROMs though they are aware of the availability of them in their university libraries. As many as 134 (23.18%) respondents are not at all aware of availability of the CD-ROMs in the university libraries. Only 92 (15.92%) respondents are aware of and use them.

Further, the data presented in Table 5.25 has been analysed by gender, faculty, designation and computer training background of the respondents to know the relation between these factors and the use of CD-ROMs. The data has been presented in Table 5.26.

Among the respondents who are aware and use CD-ROMs available in the university libraries, male respondents are more in number (17.81%) as compared to female respondents (10.00%). The chi-square value estimated for finding out the association between the awareness and use of CD-ROMs as well as gender of the respondents is not statistically significant. Hence, it could be inferred that there is no association between the variables.

Faculty-wise analysis brings home the fact that the respondents belonging to the faculty of Science are ahead of their Social Science and Humanities counterparts among those who use CD-ROM databases. The chi-square value estimated to determine the association between awareness and use of the CD-ROMs and the subject background of the respondents is statistically significant at 1.00% probability level. Hence, it could be inferred that more number of Science faculty are found to be aware of and making use of the CD-ROMs as compared to Social Science and Humanities respondents.

Table 5.26: Awareness and use of CD-ROMs: Analysis by gender, faculty, designation and computer training background of the respondents

N=578

Sl. No.	Particulars of Respondents Classified by:	Aware and use N=-92		Aware but do not use N=352		Not Aware N=134		Total		X ²
		No.	%	No.	%	No.	%	No.	%	
01	Gender:									
	Male (N=438)	78	17.81	244	55.71	116	26.48	438	100.00	20.565
Female (N=140)	14	10.00	108	77.14	18	12.85	140	100.00		
02	Faculty:									
	Social Sc. (N=196)	31	15.82	116	59.18	49	25.00	196	100.00	71.040
	Science (N=284)	53	18.66	198	69.72	33	11.62	284	100.00	
	Humanities (N=98)	8	8.16	38	38.78	52	53.06	98	100.00	
03	Designation :									
	Lecturer (N=208)	24	11.54	132	63.46	52	25.00	208	100.00	6.70
	Reader (N=180)	38	21.11	104	57.78	38	21.11	180	100.00	
Professor(N=190)	30	15.79	116	61.05	44	23.16	190	100.00		
04	Computer training:									
	Formal Training (N=138)	68	49.28	61	44.20	9	6.52	138	100.00	156.74
Informal Training (N=440)	24	5.45	291	66.14	125	28.41	440	100.00		

Designation-wise analysis indicates that the senior faculty such as Readers and Professors use CD-ROM databases more often than those of Lecturers. Sixty-eight (49.28%) respondents among those who have undergone formal computer training courses are aware of and use CD-ROMs whereas only 5.45% of those who have not undergone such training courses are aware of and use CD-ROMs. The chi-square value estimated for knowing the association between awareness and the use of CD-ROMs as well as designation of the respondents is not statistically significant. Hence, it could be inferred that there is no association between the variables.

Nearly half of the respondents (49.28%) who have undergone formal computer training course are aware of and use CD-ROMs against negligible number (5.45%) of those who have not undergone such training. The chi-square value estimated for finding out the association between the awareness and use of CD-ROMs as well as computer training background of the respondents is statistically significant at 1.00% probability level. Hence, it could be inferred that there is an association between the variables.

5.7.1 Frequency of Use of the CD-ROMs

The respondents who have indicated that they are aware of and use CD-ROMs available in the university libraries were further questioned to indicate the frequency of using CD-ROMs. The data received in this regard has been presented in Table 5.27.

Table 5.27: Frequency of use of the CD-ROMs

N=92

Sl. No.	Frequency	No. of Respondents	Percent
01	Daily	1	1.09
02	Once in two days	1	1.09
03	Twice in a week	2	2.17
04	Once in a week	2	2.17
05	Once in two weeks	4	4.35
06	Once in a month	6	6.52
07	Occasionally	76	82.61
Total		92	100.00

The data reveals that the majority of respondents are occasional users of CD-ROMs available in their university libraries. Of the 92 respondents, 76 (82.61%) use CD-ROMs occasionally and 6 (6.52%) respondents use them once in a month. Four (4.35%) respondents use CD-ROMs once in two weeks. Two (2.17%) respondents each use CD-ROMs twice a week and once in a week. One respondent uses them daily and another uses it once in two days.

The data obtained to know the frequency of the use of CD-ROMs has been further analysed by gender, faculty and designation of the respondents and presented in Table 5.28.

The analysis of data presented in Table 5.28 reveals that 1 (1.28%) male respondent who is a Lecturer in Science faculty indicated that he uses CD-ROMs daily. Another male respondent from Science faculty, who is a Reader, uses them once in two days. Of the 2 respondents who use CD-ROMs twice in a week one is a male and another is female, one is from Science and another is from Social Science faculty, and one is a Lecturer and another is a Professor.

Table 5.28: Frequency of the use of the CD-ROMs: Analysis by gender, faculty and designation of the respondents

N=92

Sl. No.	Frequency	Gender		Faculty			Designation		
		M N=78	F N=14	S. Sc. N=31	Sc. N=53	H N=8	L N=24	R N=38	P N=30
01	Daily	1 (1.28)	-	-	1 (1.89)	-	1 (4.17)	-	-
02	Once in two days	1 (1.28)	-	-	1 (1.89)	-	-	1 (2.63)	-
03	Twice a week	1 (1.28)	1 (7.14)	1 (3.23)	1 (1.89)	-	1 (4.17)	-	1 (3.33)
04	Once in a week	2 (2.56)	-	-	2 (3.77)	-	1 (4.17)	1 (2.63)	-
05	Once in two weeks	3 (3.85)	1 (7.14)	1 (3.23)	3 (5.66)	-	1 (4.17)	2 (5.26)	1 (3.33)
06	Once in a month	5 (6.41)	1 (7.14)	2 (6.45)	6 (11.32)	1 (12.50)	1 (4.17)	4 (10.53)	1 (3.33)
07	Occasionally	65 (83.33)	11 (78.57)	27 (87.10)	39 (73.58)	7 (87.50)	19 (79.17)	30 (78.95)	27 (90.00)

(Note: Number given in parenthesis shows the percentage)

Two male respondents from Science faculty use them once in a week. Of the 76 respondents who use CD-ROMs occasionally, males are more in number as compared to females, Social Science and Humanity faculty respondents are more in number as compared to Science faculty respondents, and Professors are more as compared to Readers and Lecturers.

5.7.2 Type of CD-ROMs Used by the Respondents

The respondents were asked to indicate the information sources which they have used on CD-ROMs. The data received from the respondents has been presented in Table 5.29.

Table 5.29: Type of CD-ROMs used by the respondents

N=92

Sl. No.	Information Sources	No. of Respondents	Percent
01	Full-text Journals	23	25.00
02	Abstracting and Indexing journals	57	61.96
03	Books	38	41.30
04	Theses and Dissertations	11	11.96
05	Reports	34	36.96
06	Census Reports	28	30.43
07	Dictionaries	22	23.91
08	Encyclopedias	17	18.48
09	Biographies	11	11.96
10	Maps and Atlases	15	16.30
11	Directories	6	6.52
12	Others	3	3.26

The data reveals that the majority of respondents (61.96%) have used abstracting and indexing journals followed by books (41.30%). Government reports

and census reports have been used by 34 (36.96%) and 28 (30.43%) respondents respectively. Full-text journals have been used by 23 (25.00%) respondents. The reference sources such as dictionaries (23.91%), maps and atlases (16.30%) and directories (6.52%) found to be less used by the respondents. Theses and dissertations have been used by only 11 (11.96%) respondents.

5.7.3 Purpose of Using the CD-ROMs

The respondents were asked to indicate the purposes for which they use CD-ROMs available in their university libraries. The data received from them has been presented in Table 5.30.

Table 5.30: Purpose of using the CD-ROMs

N=92			
Sl. No.	Purpose	No. of Respondents	Percent
01	To keep abreast with the latest developments	26	28.26
02	For teaching preparation	14	15.22
03	For own research	58	63.04
04	For guiding research students	21	22.83
05	For writing books	4	4.35
06	For writing research articles	46	50.00
07	Others	2	2.17

According to the data, the majority of respondents use CD-ROMs available in their university libraries for their own research (63.04%) and for writing research articles (50.00%). For keeping abreast with the latest developments 28.26% of the respondents use CD-ROMs, and 22.83% of the respondents use it for guiding

research students. For the purpose of teaching preparation, 15.22% of the respondents use CD-ROMs and only 4.35% of the respondents use them for writing books.

5.7.4 Problems faced in the Use of CD-ROMs

The actual users of CD-ROMs were asked to indicate the problems faced by them in making use of CD-ROMs. The data received in this regard has been presented in Table 5.31.

Table 5.31: Problems faced by those who are aware and use the CD-ROMs

N=92

Sl. No.	Problems	No. of Respondents	Percent
01	Lack of knowledge to use	28	30.43
02	Lack of sufficient number of computers in university library	52	56.52
03	Lack of assistance by library staff	13	14.13
04	Frequent power cut	48	52.17
05	Lack of relevant information sources	59	64.13
06	Not accessible over campus LAN	62	67.39
07	Cannot be borrowed for using outside the University Library	36	39.13
08	Lack of time	42	45.65
09	Other	2	2.17

The majority of respondents (67.39%) have indicated that CD-ROMs are not accessible over the campus LAN. Lack of relevant information sources is another problem which has been indicated by 59 (64.13%) respondents. Fifty-two (56.52%) respondents have faced the problem of lack of sufficient number of computers for using CD-ROMs in university libraries. Frequent power cut was a problem for 48 (52.17%) respondents. Other problems faced by the respondents include: lack of

time (45.65%), no borrowing facility (39.43%), lack of knowledge to use (30.43%) and lack of assistance by library staff (14.13%).

5.7.5 Respondents' Ability of Use the CD-ROMs

The actual users of CD-ROMs were asked to indicate their expertise to use CD-ROMs. The data received from them has been presented in Table 5.32.

Table 5.32: Self-assessment of actual users about their ability to use the CD-ROMs
N=92

Sl. No.	Ability	No. of Respondents	Percent
01	Beginner	17	18.48
02	Below Average	21	22.83
03	Average	28	30.43
04	Above Average	14	15.22
05	Expert	8	8.70
06	Not Responded	4	4.35
07	Total	92	100.0

Of the 92 respondents, 28 (30.43%) have assessed their ability to use CD-ROMs as average and 21 (22.83%) have assessed themselves as below average. Seventeen (18.48%) respondents have indicated they are beginners. Only 8 (8.70%) have indicated that they have the required expertise to use CD-ROMs.

5.7.6 Reasons for Non-use of CD-ROMs Available in University Libraries

The respondents who are aware but do not use CD-ROMs available in their university libraries were asked to indicate the reasons. The data received in this regard has been presented in Table 5.33.

Table 5.33: Reasons for non-use of the CD-ROMs

N=352			
Sl. No.	Reasons for Not Using CD-ROMs	No. of Respondents	Percent
01	Lack of knowledge to use	69	19.60
02	Lack of sufficient number of computers in university libraries	74	21.02
03	Lack of assistance by library staff	19	5.40
04	Lack of relevant information sources	208	59.09
05	Have own collection of CD-ROMs	21	5.97
06	Lack of time	83	23.58
07	Not accessible over campus LAN	118	33.52
08	Cannot be borrowed for using outside the university library	42	11.93
09	Other	4	1.14

The data presented in Table 5.33 reveals that 208 (59.09%) have felt that information sources available in CD-ROM version in the university libraries are not relevant for their use. For 118 (33.52%) respondents, CD-ROMs are not accessible over the campus LAN for which they are unable to use them. Eighty-three (23.58%) respondents have indicated that the lack of time and 74 (21.02%) indicated that the lack of sufficient number of computers to use CD-ROMs in university libraries were the reasons for which they do not use them. For 69 (19.60%) respondents, lack of knowledge to use was the reason for which they do not use CD-ROMs. Lack of borrowing facility was the reason for not using CD-ROMs for 42 (11.93%) respondents.

Discussion / Interpretation

It is quite evident from the data that though three-fourth of the faculty are aware of the availability of CD-ROMs in their university libraries, a very small

percentage of them actually use CD-ROM databases. Those who are not at all aware of the availability of CD-ROMs in the university libraries are also alarming. The characteristics of respondents such as gender, faculty to which they belong and the position they held have definite impact on the awareness and use of e-resources. There is a definite relation between one's computer training background and his/her awareness and use of CD-ROMs.

Even among the small group (92) of actual users of CD-ROMs as many as 76 (82.61%) are occasional users. The reason for this may be that CD-ROMs are becoming irrelevant in the Web environment or may be because CD-ROMs are not updated with nascent information. The concerned authorities should take note of it and take suitable measures.

The problems faced in using CD-ROMs by the respondents can be divided into two groups: first the problems associated with the respondents themselves and secondly the problems associated with the university libraries (though both are inter-dependent). Lack of knowledge to use and lack of time are the problems with the respondents. Lack of CD-Net facility, frequent power cut, lack of sufficient number of computers, no borrowing facility, irrelevant sources and lack of assistance by the library staff are the problems with the university libraries. These problems need to be solved immediately by the university libraries as well as the respondents to be more effective and efficient in their endeavours.

As already discussed in the previous chapter, university libraries under the study have less number of CD-ROMs and the majority of them have been received along with books. The university libraries have hardly procured CD-ROMs required by the respondents. The secondary sources such as abstracting and indexing journals procured once have not been updated with the latest issues, hence have become incomplete and irrelevant for the users.

None of the university libraries under the study has designed and adopted systematic plans for providing CD-ROM technology-based services to their user community. The university libraries have not developed need-based CD-ROM collection, not established CD-Net server for providing access to the resources at academic department chambers, and not conducted training programmes for making effective use of CD-ROM resources. Neither the university libraries have sufficient number of computers for using CD-ROMs nor they lend them. Hence, the university libraries need to take necessary steps to overcome these problems and to be relevant in the changing electronic environment.

5.8 Awareness and Use of the OPAC

The respondents were asked to indicate their awareness and use of OPAC available in their university libraries. The questions relating to OPAC have not been asked to the respondents from the University of Mysore as the Library of this

university does not have the OPAC at all. The data received from the faculty from the remaining five universities under the study has been presented in Table 5.34.

Table 5.34: Awareness and use of the OPAC

N=447

Sl. No.	Response	No. of Respondents	Percent
01	Aware and Use	117	26.17
02	Aware But Do Not Use	267	59.73
03	Not Aware	63	14.09
Total		447	100.00

According to the data presented in Table 5.34, a large number of respondents (59.73%) are not using the OPAC though they are aware of it. Only 26.17% of the total respondents are aware of and use the OPAC and 14.09% of the respondents are not aware of it.

In order to know the relation between gender, faculty, designation and computer training background of the respondents and the awareness and use of the OPAC, data has been further analysed and presented in Table 5.35.

Among 117 respondents who are aware of and use the OPAC, 90 (27.03%) are male and 27 (23.68%) are female respondents. Seventy-two (63.16%) female respondents do not use the OPAC though they are aware of it. Among 63 respondents who are not aware of the OPAC, male respondents are more in number as compared to female respondents. However, the chi-square value estimated for finding out the association between the awareness and use of OPAC as well as gender of the respondents is not statistically significant. Hence, it could be inferred that there is no association between the variables.

Table 5.35: Awareness and use of the OPAC: Analysis by gender, faculty designation and computer training background of the respondents

N=447

Sl. No.	Particulars of Respondents Classified by:	Aware and use N=117		Aware but do not use N=267		Not Aware N=63		Total		X ²
		No.	%	No.	%	No.	%	No.	%	
01	Gender:									0.758
	Male (N=333)	90	27.03	195	58.56	48	14.4	333	100.00	
	Female (N=114)	27	23.68	72	63.16	15	13.16	114	100.00	
02	Faculty:									62.504
	Social Sc. (N=144)	32	22.22	74	51.39	38	26.3	144	100.00	
	Science (N=227)	75	33.04	148	65.20	4	9	227	100.00	
	Humanities (N=76)	10	13.16	45	59.21	21	27.63	76	100.00	
03	Designation :									8.637
	Lecturer (N=155)	49	31.61	91	58.71	15	9.68	155	100.00	
	Reader (N=139)	38	27.34	81	58.27	20	14.3	139	100.00	
	Professor(N=153)	30	19.61	95	62.09	28	18.30	153	100.00	
04	Computer training:									102.536
	Formal Training (N=115)	71	61.74	39	33.91	5	4.35	115	100.00	
	Informal Training (N=332)	46	13.86	228	68.67	58	17.47	332	100.00	

Faculty-wise, 75 (33.04%) of the Science respondents are aware of and use the OPAC whereas 32 (22.22%) of the Social Science respondents, and only 10 (13.16%) of the Humanities respondents are aware and use the OPAC. More number of Science respondents do not use the OPAC though they are aware of it as compared to Humanities and Social Science respondents. The percentage of Humanities respondents is higher than that of Social Science and Science respondents among those who are not aware of the OPAC. The chi-square value estimated to determine the association between awareness and use of the OPAC and the subject background of the respondents is statistically significant at 1.00% probability level. Hence, it could be inferred that more number of Science faculty are found to be aware of and making use of the OPAC as compared to Social Science and Humanities respondents.

Professors stand first among the non-users of OPAC though they are aware of it than those of Readers and Lecturers. The number of Professors is higher than that of Readers and Lecturers among those who are not aware of the OPAC. Higher percentage of those who have not undergone formal computer training course are not aware of the OPAC as compared to those who have undergone such training. However, the chi-square value estimated for finding out the association between the awareness and use of OPAC as well as designation of the respondents is not statistically significant. Hence, it could be inferred that there is no association between the variables.

The percentage of those who have undergone formal computer training is high (61.74%) as compared to those who have not undergone formal computer training

(13.86%) among those who are aware of and use the OPAC. More number of respondents - those who have not undergone formal computer training courses - do not use the OPAC though they are aware of it as compared to those who have undergone such training. The chi-square value estimated for finding out the association between the awareness and use of the OPAC as well as computer training background of the respondents is statistically significant at 1.00% probability level. Hence, it could be inferred that there is an association between the variables.

5.8.1 Frequency of Consulting the OPAC

The respondents were asked to indicate how frequently they use the OPACs of the university libraries. The data received in this regard have been presented in Table 5.36.

Table 5.36: Frequency of consulting the OPAC

N=117

Sl. No.	Frequency	No. of Respondents	Percent
01	Daily	2	1.71
02	Once in two days	3	2.56
03	Twice in a week	6	5.13
04	Once in a week	41	35.04
05	Once in two weeks	36	30.77
06	Once in a month	16	13.66
07	Occasionally	13	11.11
Total		117	100.00

Of the 117 who have indicated that they are aware of and use the OPACs of their university libraries, the respondents who use it once in a week are more in number (35.04%) followed by those who use once in two weeks (30.76%). Very less number of respondents (1.71%) use the OPAC daily and only 2.56% of the respondents use it once in two days.

The findings of the present study are not in conformity with the results of the studies reported by Rajput, Naidu and Jadon (2008).

Further, the data has been analysed by gender, faculty and designation and presented in Table 5.37.

Only 2 male respondents working in Science faculty as Lecturers use the OPAC daily. None of the female respondent uses the OPAC daily. Faculty-wise, none of the Social Science faculty uses the OPAC daily or once in two days. Humanities respondents do not make use of the OPAC before a week.

Among the respondents who use the OPAC once in a week, male respondents are more in number as compared to female respondents. Similarly, faculty belonging to Science are more in number than that of Social Science and Humanities. Comparatively a less number of Professors use OPAC than Readers and Lecturers among those who use the OPAC once in a week.

Among those who use the OPAC once in two weeks, the percentage of female respondents is higher (33.33%) than that of males (30.00%). Faculty-wise, the percentage of Social Science respondents are higher (41.67%) than that of Humanities (33.33%) and Science faculty (27.59%) among those who use the OPAC once in two weeks. Designation-wise, 39.47% of the Readers use the OPAC once in two weeks followed by Professors (33.33%) and Lecturers (22.45%).

Table 5.37: Frequency of consulting the OPAC: Analysis by gender, faculty and designation of the respondents

N=117

Sl. No	Frequency	Gender		Faculty			Designation		
		M N=90	F N=27	S. Sc. N=24	Sc. N=87	H N=6	L N=49	R N=38	P N=30
01	Daily N=2	2 (2.22)	-	-	2 (2.30)	-	2 (4.08)	-	-
02	Once in two days N=3	2 (2.22)	1 (3.70)	-	3 (3.45)	-	1 (2.04)	1 (2.63)	-
03	Twice a week N=6	3 (3.33)	3 (11.11)	2 (8.33)	4 (4.60)	-	3 (6.12)	2 (5.26)	1 (3.33)
04	Once in a week N=41	33 (36.67)	8 (29.63)	5 (20.83)	35 (40.23)	1 (16.67)	18 (36.73)	14 (36.84)	9 (30.00)
05	Once in two weeks N=36	27 (30.00)	9 (33.33)	10 (41.67)	24 (27.59)	2 (33.33)	11 (22.45)	15 (39.47)	10 (33.33)
06	Once in a month N=16	13 (14.44)	3 (11.11)	4 (16.67)	11 (12.64)	1 (16.67)	8 (16.33)	5 (13.16)	3 (10.00)
07	Occasionally N=13	10 (11.11)	3 (11.11)	3 (12.50)	8 (9.20)	2 (33.33)	6 (12.24)	1 (2.63)	7 (23.33)

(Note: Number given in parenthesis shows the percentage)

5.8.2 Purpose of Consulting the OPAC

It is important to know the purpose for which the OPAC is consulted. The data received in this regard has been presented in table 5.38.

Table 5.38: Purpose of consulting OPAC

N=117			
Sl. No.	Purpose	No. of Respondents	Percent
01	To locate books in the University Library	108	92.31
02	To check the required book	83	70.94
03	To compile bibliography	32	27.35
04	To check the number of copies of the required book	38	32.48
05	To find out bibliographic details of books	14	11.97
06	Others	4	3.42
07	Not responded	12	10.26

As the data shows, the majority of respondents (92.31%) consult the OPAC to locate books in the university libraries followed by those who consult it for the purpose of checking the availability of required book in the university library (70.94%). For the purpose of checking the number of copies of the required book in the university library, 38 (32.48%) respondents use the OPAC and 32 (27.35%) use it for compiling bibliography of books on a subject or topic. Fourteen (11.97%) respondents use the OPAC for finding bibliographic details of books.

The findings of the present study are in conformity with the results of study reported by Sangam and Hadimani (2004).

5.8.3 Problems Faced in Consulting OPAC

The respondents who indicated that they are aware of and use the OPAC were asked to indicate the problems they faced in consulting the OPAC. The data received in this regard has been presented in Table 5.39.

Table 5.39: Problems faced by the actual users in using OPAC

N=117

Sl. No.	Problems	No. of Respondents	Percent
01	Lack of knowledge to use	14	11.97
02	Lack of sufficient number of computers	29	24.79
03	Frequent power cut	34	29.06
04	Technical problems (under repair, etc.,)	37	31.62
05	Lack of assistance by library staff	4	3.42
06	OPAC not comprehensive	36	30.77
07	Others	3	2.56

According to the data presented in Table 5.39, technical problems with the computers that are kept for consulting the OPAC found to be the major problem as indicated by the respondents. Thirty-six (30.77%) respondents have indicated that the OPAC does not cover all the information sources available in the university libraries. Frequent power cut was a problem for 34 (29.06%) respondents. Lack of sufficient number of computers to consult the OPAC was another problem as indicated by 29 (24.79%) respondents. Fourteen (11.97%) respondents have indicated that they lack knowledge to consult the OPAC.

5.8.4 Respondents' Ability to Consult the OPAC

Question No.36 was asked to know the respondents' ability to consult the OPAC. The data received in this regard has been presented in Table 5.40.

Table 5.40: Self-assessment of the actual users of OPAC about their expertise to consult the OPAC

N=117

Sl. No.	Ability	No. of Respondents	Percent
01	Beginner	23	19.66
02	Below Average	26	22.22
03	Average	38	32.48
04	Above Average	16	13.68
05	Expert	8	6.84
06	Not Responded	6	5.13
Total		117	100.00

The data presented in Table 5.40 shows that nearly one-third (32.48%) of the respondents have assessed their ability to use the OPAC as average followed by 22.22% as below average and 19.66% as beginners. Only 13.67% of the respondents have assessed their ability as above average. Only 6.84% respondents indicated that they have the required expertise to use OPAC.

5.8.5 Reasons for Non-use of the OPAC

It is interesting to probe further the reasons for the non-use of OPAC by those who are actually aware of it. Therefore Question No. 32 was asked. The data received in this regard has been presented in Table 5.41.

It is clear from the data that the main reason for not using the OPAC found to be incomplete OPAC. The university libraries have not provided the OPAC on campus LAN is found to be another reason for which 31.46% of the respondents are not using it. Sixty-two (23.22%) respondents have indicated that they lack knowledge to

use the OPAC. Lack of time is the reason for 58 (21.72%) respondents followed by lack of sufficient number of computers for using the OPAC for which 35 (13.11%) respondents are the non-users. Nineteen (7.12%) respondents have indicated that the lack of assistance by the library staff in making use of the OPAC is the reason for which they are not using it though they are aware of its importance.

Table 5.41: Reasons for non-use of the OPAC

N=267

Sl. No.	Reasons for Not Using OPAC	No. of Respondents	Percent
01	Lack of knowledge to use	62	23.22
02	OPAC is not comprehensive	115	43.07
03	Lack of sufficient number of computers	35	13.11
04	Lack assistance from library staff	19	7.12
05	Lack of time	58	21.72
06	Non-availability in campus LAN	84	31.46
07	Other	8	3.00

The findings of the study are not in conformity with the results of the study reported by Rajaput, Naidu and Jadon (2008).

Discussion / Interpretation

The majority of respondents do not use the OPAC frequently, the respondents belonging to Social Science and Humanities as well as female respondents, and Professors fall in this category. The respondents' subject background has a considerable role in the frequency of use of the OPAC. The respondents from Humanities and Social Science faculty do not use the OPAC frequently and they use it occasionally.

As indicated by the respondents, problems such as technical flaws, power cut and lack of sufficient number of computers to use the OPAC need to be attended for providing effective and efficient services to the users. The OPACs need to be comprehensive as far as their coverage is concerned.

It is quite evident from the data that a large number of the actual users of the OPAC are not confident of their ability to use it efficiently / effectively. These respondents need to be given training in making use of the OPAC.

The steps need to be taken to provide access to the OPAC over the campus LAN so that the users can consult the OPAC in their departments, thereby the time of the users can be saved. The university libraries need to conduct training programmes in the use of OPAC.

5.9 Awareness and Use of Electronic Information Services

The respondents were asked to indicate the awareness and use of electronic information services provided by their university libraries. The data received in this regard has been presented in table 5.42.

Table 5.42: Awareness and use of electronic information services

N= 578

Sl. No.	Response	No. of Respondents	Percent
01	Aware and Use	124	21.45
02	Aware but Do Not Use	202	34.95
03	Not Aware	252	44.00
Total		578	100.00

The data presented in Table 5.42 reveals that as many as 252 (40.00%) respondents are not aware of the electronic information services provided by their university libraries, whereas 202 (34.95%) respondents are aware of but do not use them. Only 124 (21.45%) respondents are aware of and use electronic information services provided by their university libraries.

Further, the data presented in Table 5.42 has been analysed by gender, faculty, designation and computer training background of the respondents and presented in Table 5.43.

Among 124 respondents, 103 (23.52%) of the male respondents are aware of and use electronic information services against 21 (15.00%) of the female respondents. The chi-square value estimated for finding out the association between the awareness and use of electronic information services as well as gender of the respondents is not statistically significant. Hence, it could be inferred that there is no association between the variables.

The respondents from the faculty of Science are much ahead (33.45%) of their Social Science (12.76%) and Humanities (4.08%) counterparts. The majority of faculty belonging to Social Science (58.67%) and Humanities (54.08%) are not aware of the electronic information services provided by their university libraries. The chi-square value estimated to determine the association between awareness and use of the electronic information services and the subject background of the respondents is statistically significant at 1.00% probability level. Hence, it could be inferred that more number of Science faculty are found to be aware of and making use of electronic information services as compared to Social Science and Humanities respondents.

Table 5.43: Awareness and use of electronic information services: Analysis by gender, faculty, designation and computer training background of the respondents
N=578

Sl. No.	Particulars of Respondents Classified by:	Aware and Use N=124		Aware But Do Not Use N=202		Not Aware N=252		Total		X ²
		No.	%	No.	%	No.	%	No.	%	
01	Gender:									4.609
	Male (N=438)	103	23.52	150	34.26	185	42.24	438	100.00	
	Female (N=140)	21	15.00	52	37.14	67	47.86	140	100.00	
02	Faculty:									69.188
	Soc. Sc. (N=196)	25	12.76	56	28.57	115	58.67	196	100.00	
	Science (N=284)	95	33.45	105	36.97	84	29.58	284	100.00	
	Humanities (N=98)	04	4.08	41	41.84	53	54.08	98	100.00	
03	Designation:									16.227
	Lecturers (N=208)	29	13.94	81	38.94	98	47.11	208	100.00	
	Readers (N=180)	51	28.33	65	36.11	64	35.56	180	100.00	
	Professors (N=190)	44	23.16	56	29.47	90	47.37	190	100.00	
04	Computer Training:									104.087
	Formal Training: (N=138)	71	51.45	42	30.43	25	18.12	138	100.00	
	Informal Training: (N=440)	53	12.05	160	36.36	227	51.59	440	100.00	

Readers are ahead (28.33%) of Lecturers (13.94%) and Professors (23.16). However, the chi-square value estimated for finding out the association between the awareness and use of electronic information services as well as designation of the respondents is not statistically significant. Hence, it could be inferred that there is no association between the variables.

More number of respondents (51.49%) who have undergone a formal computer training are aware of the electronic information services as compared to those who have not undergone such training (12.05%). The chi-square value estimated for finding out the association between the awareness and use of the electronic information services as well as computer training background of the respondents is statistically significant at 1.00% probability level. Hence, it could be inferred that there is an association between the variables.

5.9.1 Frequency of Use of the Electronic Information Services

The respondents, who have indicated that they are aware of and use the electronic information services, were asked to indicate the frequency of using such services. The responses received in this regard have been presented in Table 5.44.

As data shows, the majority of respondents (66.13%) use the electronic information services occasionally followed by those who use it once in a month (12.90%), and 7.26% with once in two weeks. Six (4.84%) respondents use the

electronic information services once in a week and an equal number of respondents use it twice a week. Four (3.23%) respondents use the electronic information services once in two days and only 1 (0.81%) respondent uses them daily.

Table 5.44: Frequency of use of electronic information services
N=124

Sl. No.	Frequency	No. of Respondents	Percent
01	Daily	01	0.81
02	Once in two days	04	3.23
03	Twice in a week	06	4.84
04	Once in a week	06	4.84
05	Once in two weeks	09	7.26
06	Once in a month	16	12.90
07	Occasionally	82	66.13
Total		124	100.00

The data pertaining to the frequency of use of the electronic information services by the respondents has been analysed by gender, faculty and designation and presented in Table 5.45.

One respondent from the Science faculty who is a Reader uses the electronic information services daily. Among 4 respondents who use the services once in two days, all are male respondents from the faculty of Science, and among them 2 are Readers and the remaining 2 are Professors. Female respondents and faculty belonging to Social Science and Humanities, and the Lecturers are not the frequent users of the electronic information services.

Table 5.45: Frequency of using electronic information service: Analysis by gender, faculty and gender of respondents

N=124

Sl. No.	Frequency	Gender		Faculty		Designation		Total	
		Male N=103	Female N=21	Soc. Sci N=25	Science N=95	H. N=04	L. N= 29	R N=51	P N=44
01	Daily	01 (00.97)	- -	- -	01 01.05	- -	- -	01 01.96	- -
02	Once in two days	04 (03.88)	-	-	04	-	-	02	02
			-	-	(04.21)	-	-	(03.92)	(04.55)
03	Twice in a week	05 (04.85)	01	-	06	-	01	03	02
			(04.76)	-	06.32	-	03.49	05.88	04.55
04	Once in a week	04 03.88	02	01	05	-	01	02	03
			09.52	04.00	05.26	-	03.49	03.92	06.82
05	Once in two weeks	07 06.80	02	02	07	-	01	04	04
			09.52	08.00	07.37	-	03.49	07.84	09.09
06	Once in a month	13 12.62	03	02	13	01	02	09	05
			14.29	08.00	13.68	25.00	06.90	17.65	11.36
07	Occasionally	69 66.99	13	20	59	03	24	30	28
			61.90	80.00	62.11	75.00	82.76	58.82	63.64

5.9.2 Adequacy of Electronic Information Services

The actual users of electronic information services were asked to indicate the adequacy of electronic information services provided by their university libraries. The data received in this regard has been presented in Table 5.46.

Table 5.46: Adequacy of electronic information services

N=124

Sl. No.	Response	No. of Respondents	Percent
01	Adequate	18	14.52
02	Inadequate	97	78.23
03	Can't say	-	-
04	Not responded	09	07.26
Total		124	100.00

It is clear from the data presented in Table 5.46 that the majority of the actual users of electronic information services (78.23%) have indicated that the electronic information services provided by their university libraries are inadequate and only for 14.52% of the respondents the services are adequate.

5.9.3 Problems faced in the Use of Electronic Information services

The respondents were asked to indicate the problems that they faced in making use of the electronic information services. The data received in this regard has been presented in Table 5.47.

Of the 124 respondents, 52 (41.94%) have indicated that they lack knowledge to use the electronic information services followed by 34 (27.42%) with technical problems,

32 (25.81%) with frequent power cut, 26 (20.97%) with lack of time, 15 (12.10%) with lack of assistance by the library staff, and 11 (8.87%) with lack of accessibility to electronic information services to the respondents department chambers.

Table 5.47: Problems faced in the use of electronic information services

N=124

Sl. No.	Problems	No. of Respondents	Percent
01	Lack of knowledge to use	52	41.94
02	Lack of accessibility to E.I. Services to department chamber	11	08.87
03	Lack of assistance by library staff	15	12.10
04	Technical problems	34	27.42
05	Frequent power cut	32	25.81
06	Lack of time	26	20.97
07	Other	01	00.81
08	Not responded	05	04.03

5.9.4 Assessment of Ability to Use the Electronic Information Services

The actual users of electronic information services were asked to indicate their confidence level to use the said services. The data received in this regard has been presented in Table 5.48.

Table 5.48: Self-assessment ability to use the electronic information services by the respondents

N=124

Sl. No.	Ability	No. of Respondents	Percent
01	Beginner	25	20.16
02	Below Average	31	25.00
03	Average	46	37.10
04	Above Average	11	08.87
05	Expert	06	04.84
06	Not Responded	05	04.03
Total		124	100.00

Forty-six (37.10%) respondents have assessed their ability to use the electronic information services as average followed by 31 (25.00%) as below average, 25 (20.16%) as beginners, 11 (8.87%) as above average, and only 6(4.84%) as experts.

5.9.5 Reasons for Non-use of the Electronic Information Services

The respondents, who do not use the electronic information services though aware of such services, were asked to indicate the reasons for their non-use. The data received in this regard has been presented in Table 5.49.

Table 5.49: Reasons for non-use of the electronic information services
N=202

Sl. No.	Reasons	No. of Respondents	Percent
01	Lack of knowledge to use	56	27.72
02	Lack of accessibility to E.I. Services to department chambers	12	05.94
03	Lack of assistance by library staff	18	08.91
04	Technical problems	52	24.74
05	Frequent power cut	41	20.30
06	Lack of time	38	18.81
07	Other	02	00.99
08	Not Responded	34	16.83

The data presented in Table 5.49 shows that 56 (27.72%) respondents have shown their concern for lack of knowledge to use the electronic information services followed by 52 (24.74%) for technical problems 41 (20.30%) for frequent power cut, 38 (18.81%) for lack of time, 18 (8.91%) for lack of assistance by the library staff, and 12 (5.94%) for lack of accessibility to electronic information services at their department chambers.

5.9.6 Importance of Electronic Information Services

The respondents were asked to indicate the extent to which the provision of each of the electronic information service is important for them. The data received in this regard has been presented in Table 5.50.

From the data presented in Table 5.50 it is clear that all the electronic information services listed are more important for the respondents. For 452 (78.20%) respondents, the SDI service is most important. The current awareness services such as information about newly added information sources, research in progress, library news bulletin, content pages of journals and forthcoming conferences / seminars have been indicated as most important by the respondents. For 439 (75.95%) respondents information about newly added information sources is most important. The circulation of information about research in progress is most important for 427 (73.88%) respondents.

Virtual reference services have been viewed as important by the respondents for getting their queries solved as well as for obtaining assistance of the library staff regarding the usage of CD-ROMs, Internet, online resources, etc. For 410 (70.93%) respondents virtual reference services through e-mail and chatting are most important. The referral service is most important for 382 (66.09%) respondents. The electronic document delivery service has been viewed by 372 (64.36%) respondents as most important.

Table 5.50: Respondents' opinions about the electronic information services

N=578

Sl. No.	Electronic Information Services	MI	I	U	NI	NAI	NR
01 a)	Virtual Reference Service: Getting answers from library staff for your queries via e-mail/ chatting	410 (70.93)	125 (21.63)	21 (3.63)	3 (0.52)	2 (0.35)	17 (2.94)
b)	Getting assistance in using electronic sources such as CD-ROMs and Internet	408 (70.59)	114 (19.72)	29 (5.02)	6 (1.04)	8 (1.38)	13 (2.25)
02	Referral services: seeking information about the availability of resources other libraries	382 (66.09)	123 (21.28)	26 (4.50)	11 (1.90)	9 (1.56)	27 (4.67)
03 a)	CAS: Information about newly added collection	439 (75.95)	116 (20.07)	17 (2.94)	6 (1.04)	5 (0.87)	5 (0.87)
b)	Circulation of content pages of journals	396 (68.51)	114 (19.72)	21 (3.63)	9 (1.56)	8 (1.38)	30 (5.19)
c)	Circulation of research in progress	427 (73.88)	122 (21.11)	11 (1.90)	4 (0.69)	3 (0.52)	11 (1.90)
d)	Circulation of library news bulletins	410 (70.93)	113 (19.55)	32 (5.54)	6 (1.04)	8 (1.38)	9 (1.56)
e)	Information about forthcoming conferences / seminars	403 (69.72)	125 (21.63)	17 (2.94)	9 (1.56)	5 (0.87)	19 (3.29)
04	SDI: Information to individual teachers about receipt of new resources added / required by him/ her	452 (78.20)	74 (12.80)	29 (5.02)	10 (1.73)	8 (1.38)	5 (0.87)
05	Document delivery service	372 (64.36)	154 (26.64)	26 (4.50)	13 (2.25)	8 (1.38)	5 (0.87)

(Note: Number given in parenthesis shows the percentage)

(MI= Most Important; I= Important; U= Uncertain; NI= Not Important; NAI= Not At all Important; NR= Not Responded)

Discussion / Interpretation

Very less number of respondents are aware of and use the electronic information services provided by their university libraries. The majority of respondents are not aware of the services. The majority of respondents use the electronic information services occasionally. Female respondents, Social Science and Humanities faculty and Lecturers do not use the services frequently. It is quite evident from the data presented in Table 5.48 that the majority of respondents are not confident in making use of the electronic information services and they need extensive training.

Most of the respondents have felt that each of the electronic information service is most important for them. Hence, the university libraries need to take necessary measures to make provisions for providing electronic information services for their academic staff.

5.10 Awareness and Participation in User Education Programmes

The university libraries often conduct a variety of user education programmes, but no serious attempt was made to know to what extent the users have participated in the programmes. Therefore, here Question No. 47 was asked. The data received in this regard has been presented in Table 5.51.

The data presented in Table 5.51 clearly shows that, of the total 578 respondents, as many as 216 (37.37%) have indicated that they are aware of and participated in the

user education programmes, whereas almost equal number (34.77%) have stated that they have not participated in spite of the fact that they are aware of the programmes. It is important to note that 161 (27.85%) are not at all aware of such programmes conducted by their university libraries.

Table 5.51: Awareness and participation in user education programmes

N=578

Sl. No.	Response	No. of Respondents	Percent
01	Aware and Participated	216	(37.37)
02	Aware But Not Participated	201	(34.78)
03	Not Aware	161	(27.85)
Total		578	(100.00)

Further, the data pertaining to awareness and participation in the user education has been analysed by gender, faculty, designation and computer training background of the respondents and presented in Table 5.52.

The data presented in Table 5.52 reveals that 39.27% of male respondents are aware of the user education programmes and participated in them against 31.42% of the female respondents. The chi-square value estimated for finding out the association between the awareness and use of electronic information services as well as gender of the respondents is not statistically significant. Hence, it could be inferred that there is no association between the variables.

The higher percentage of Science faculty (43.31%) are aware of the user education programmes and participated in them as compared to their Social Science (37.24%) and Humanities (20.41%) counterparts.

Table 5.52: Awareness and participation in user education programmes

N=578

Sl. No.	Particulars of Respondents Classified by:	Aware and participated N=216		Aware but not participated N=201		Not Aware N=161		Total		x2
		No.	%	No.	%	No.	%	No.	%	
01	Gender:									6.396
	Male (N=438)	172	39.27	140	31.96	126	28.77	438	100.00	
	Female (N=140)	44	31.42	61	43.57	35	25.00	140	100.00	
02	Faculty:									140.552
	Social Sc. (N=196)									
	Science (N=284)	73	37.24	26	13.27	97	49.49	196	100.00	
	Humanities (N=98)	123	43.31	101	35.56	60	21.13	284	100.00	
03	Designation :									4.411
	Lecturer (N=208)									
	Reader (N=180)	67	32.21	81	38.94	60	28.85	208	100.00	
	Professor(N=190)	75	41.67	56	31.11	49	27.22	180	100.00	
04	Computer training:									10.014
	Formal Training (N=138)	49	35.51	62	44.93	27	19.57	138	100.00	
	Informal Training (N=440)	167	37.95	139	31.59	134	30.45	440	100.00	

The chi-square value estimated to find out the association between awareness and participation in the user education programmes as well as the subject background of the respondents is statistically significant at 1.00% probability level. Hence, it could be inferred that more number of Science faculty are found to be aware of and participating in the user education programmes as compared to Social Science and Humanities respondents.

Seventy-five (41.67%) of the Readers are aware of the user education programmes and have participated in such programmes against 74 (38.95%) of the Professors and 67 (32.21%) of the Lecturers. However, the chi-square value estimated for finding out the association between the awareness and participation in user education programmes as well as designation of the respondents is not statistically significant. Therefore, it could be inferred that there is no association between the variables.

Forty-nine (35.51%) of the respondents who have undergone formal computer training course are aware of the user education programmes and have participated in them against 167 (37.95%) of those who have not undergone such training course. The chi-square value estimated for finding out the association between the awareness and participation in user education programmes as well as computer training background of the respondents is not statistically significant. Therefore, it could be inferred that there is no association between the variables.

5.10.1 Number of User Education Programmes Participated

The respondents who have been participated in the user education programme were asked to indicate the number of programmes they have attended. The data received in this regard has been presented in Table 5.53.

Table 5.53: Number of user education programmes participated by the respondents
N=216

Sl. No.	No. of U.E. Programmes	No. of Respondents	Percent
01	One U.E. Programme	182	84.26
02	Two U.E. Programmes	34	15.74
03	Three U.E. Programmes	-	-
04	Total	216	100.00

The data presented in Table 5.53 reveals that the majority of respondents (84.26%) have participated in one user education programme whereas only 15.74% respondents have participated in two programmes.

5.10.2 Adequacy of User Education Programmes

A specific question was raised to elicit the respondents' views about the adequacy of the user education programmes. The data received from the respondents have been presented in Table 5.54.

Table 5.54: Respondents' opinion about the adequacy of user education programmes
N=216

Sl. No.	Response	No. of Respondents	Percent
01	Adequate	13	6.02
02	Inadequate	198	91.67
03	Can't say	-	-
04	Not responded	5	2.31
Total		216	100.00

The data presented in Table 5.54 shows that 91.67% of the respondents found the user education programmes inadequate whereas only 6.02% of the respondents indicated that the programmes are adequate.

5.10.3 Problems with User Education Programmes

The participants who participated in the user education programmes were asked to indicate the problems they faced at the time of their participation. The response received in this regard has been presented in table 5.55.

Table 5.55: Opinion of the participants of user education programmes

N=216

Sl. No.	Problems	No.of Respondents	Percent
01	User education programme was lecture-oriented, but not practical oriented	144	66.67
02	The period was too short	72	33.33
03	Too many participants	52	24.07
04	Participants were from different subject back-ground, hence in-depth discussion was not possible	29	13.43
05	Others	15	6.94
06	Not Responded	12	5.56

Two-third (66.67%) of the respondents have opined that the user education programmes need to be practical-oriented. More than one-third (33.33%) of the respondents felt that the period or duration of the programme was too short. Nearly one-fourth of the respondents faced the problem of too many participants in the programmes. Another problem faced by 13.43% of the respondents was that the

participants were from different subject back-ground. Hence, an in-depth discussion was not possible.

5.10.4 Reasons for Not Participating in User Education Programmes

The respondents, who did not participate in the user education programmes though they were aware of such programmes, were asked to indicate the reasons. The data received in this regard has been presented in Table 5.56.

Table 5.56: Reasons for having not attended the user education programmes
N=201

Sl. No.	Reasons	No. of Respondents	Percent
01	Lack of information	95	47.26
02	Not required	103	51.24
03	Lack of time	68	33.83
04	It was not for all	45	22.39
05	Other	18	8.96
06	Not Responded	12	5.97

According to the data presented in Table 5.56, more than half of the respondents (51.24%) felt that they do not find any need to attend user education programmes. Ninety-five (47.26%) respondents have indicated that they did not know the exact date and time of the user education programmes. For 68 (38.83%) respondents lack of time was the reason for which they could not participate in the programmes. Forty-five (22.39%) respondents indicated that the user education programmes were not for all but for a chosen few. Eighteen respondents (8.96%) have cited academic or administrative

reasons such as examination duty and election duty for which they could not attend the programmes.

5.10.5 Importance of User Education Programmes

All the respondents were asked to indicate the importance of user education programmes. The data received from the respondents have been presented in Table 5.57.

As the data clearly shows, the respondents are positive about the importance of user education programmes. With regard to imparting the user education through lectures by the experts is most important for 151 (26.12%) respondents and it is important for 142 (24.57%) respondents. For 105 (18.17%) respondents lecture method is not important and for 95 (16.44%) it is not at all important.

User education through audio-visual presentations/ demonstrations found to be most important for 59.52% of the respondents. A very few respondents (4.84%) found it not important. Imparting user education by publishing handbooks and brochures has been viewed positively by the respondents where 232 (40.14%) respondents have indicated as most important and 155 (26.82%) as important and only 58 (10.03%) have said they are not important.

Regarding the modules to be covered in the user education training programmes, more number of respondents have found the modules listed most important.

Table 5.57: Respondents' opinion about the importance of user education programmes
N=578

Sl. No.	User Education	MI	I	U	NI	NAI	NR
01	Conducting Lecturers by experts	151 (26.12)	142 (24.57)	59 (10.20)	105 (18.17)	95 (16.44)	26 (4.50)
02	Audio- Visual presentations / Demonstrations	344 (59.52)	118 (20.42)	46 (7.96)	28 (4.84)	19 (3.29)	23 (3.98)
03	Publishing user manual : handbooks, brochures in electronic and print form	232 (40.14)	155 (26.82)	65 (11.25)	58 (10.03)	36 (6.23)	32 (5.54)
04	Training on Using:	218 (37.72)	93 (16.09)	38 (6.57)	105 (18.17)	98 (16.96)	26 (4.50)
a)	Internet						
b)	UGC-Infonet E-Journals Consortium	415 (71.80)	90 (15.57)	19 (3.29)	14 (2.42)	11 (1.90)	29 (5.02)
c)	Subscribed Online Resources	328 (56.75)	78 (13.49)	61 (10.55)	48 (8.30)	31 (5.36)	32 (5.54)
	CD-ROMs	306 (52.94)	84 (14.53)	65 (11.25)	72 (12.46)	28 (4.84)	23 (3.98)
d)	Institutional Repository	256 (44.29)	218 (37.72)	46 (7.96)	32 (5.54)	26 (4.50)	29 (5.02)
e)	Theses and Dissertations Database	328 (56.75)	94 (16.26)	38 (6.57)	58 (10.03)	29 (5.02)	31 (5.36)
f)	OPAC	328 (56.75)	94 (16.26)	59 (10.20)	48 (8.30)	23 (3.98)	26 (4.50)
g)	Electronic Information Services	332 (57.44)	103 (17.82)	61 (10.55)	31 (5.36)	19 (3.29)	32 (5.54)

(Note: Number given in parenthesis shows the percentage)

(MI= Most Important; I= Important; U= Uncertain; NI= Not Important; NAI= Not At all Important; NR= Not Responded)

More than half of the respondents have indicated that training programmes on the usage of UGC-Infonet E-Journals Consortium, online resources, OPAC, database of theses and dissertations and CD-ROMs as most important. Training on using institutional repository and Internet have been found most important for 256 (44.29%) and 218 (37.72%) respondents respectively.

Discussion / Interpretation

It is evident from the data that the university libraries need to conduct the user education programmes frequently to create awareness and enhance the usage of library resources and services.

University libraries need to design user education programmes in such a way that the benefits of the programmes reach the participants. User education programmes should be more and more practical-oriented through audio-visual presentations and practical demonstrations of the information sources and services rather than mere lecture-oriented ones. The duration of the user education programmes need to be extended in order to clear the doubts, if any, in making use of information sources and services. The university libraries should see that the user education programmes are conducted for small groups so that they can give individual attention and are related to a specific subject area such as Social Science, Humanities, Chemical Sciences, Biological Sciences, etc., so that the programmes will be more effective.

University libraries have to announce the date and time of the user education programmes well in advance. The user education needs to become a regular activity so that each of the users attend the programmes whenever they find it convenient and essential.

The majority of respondents have opined that the methods and modules of user education listed in Table 5.57 are most important for them. More than half of the respondents would like to have user education through audio-visual presentations / demonstrations. Hence, university libraries need to impart user education through audio-visual presentations and demonstrations rather than through publications or lecture method. Most of the respondents opined that the training on the usage of electronic information sources and services as most important. Therefore, university libraries should conduct training programme on the usage of UGC-Infonet resources, subscribed online resources, theses and dissertations database, OPAC, institutional repository, CD-ROMs, Internet and electronic information services. A bird's eye view of the data in Table 5.57 clearly brings home the fact that the users of university libraries are in need of rigorous training about e-resources and services so that they can make use of the facilities most effectively.

5.11 Respondents' Preference of the Form / Version of Information Sources

The respondents were asked to indicate the form / version in which they prefer to use information sources. The data received in this regard has been presented in Table 5.58.

Table 5.58: Respondents' preference of different versions of Information Resources
N=578

Sl. No.	Information Sources	Electronic Version	Print version	Both P. and E. version	Not Responded	Total
01	Primary Journals	146 (25.26)	52 (9.00)	375 (64.88)	5 (0.87)	578 (100.00)
02	Conference Proceedings	193 (33.39)	95 (16.44)	282 (48.79)	8 (1.38)	578 (100.00)
03	Theses and Dissertations	158 27.34	111 19.20	295 51.04	14 2.42	578 (100.00)
04	Reports	164 (28.37)	36 (6.23)	369 (63.84)	9 (1.56)	578 (100.00)
05	Newspapers	63 (10.90)	249 (43.08)	255 (44.12)	11 (1.90)	578 (100.00)
06	Books/ Monographs	45 (7.79)	198 (34.26)	325 (56.23)	10 (1.73)	578 (100.00)
07	Handbooks and Manuals	132 (22.84)	152 (26.30)	286 (49.48)	8 (1.38)	578 (100.00)
08	Dictionaries	86 (14.88)	134 (23.18)	351 (60.73)	7 (1.21)	578 (100.00)
09	Encyclopedias	107 (18.51)	173 (29.93)	292 (50.52)	6 (1.04)	578 (100.00)
10	Biographies	135 (23.36)	148 (25.61)	286 (49.48)	9 (1.56)	578 (100.00)
11	Abstracting and Indexing periodicals	96 (16.61)	32 (5.54)	438 (75.78)	12 (2.08)	578 (100.00)
12	Geographical Sources	157 (27.16)	162 (28.03)	246 (42.56)	13 (2.25)	578 (100.00)
13	Yearbooks	151 (26.12)	176 (30.45)	236 (40.83)	15 (2.60)	578 100.00
14	Directories	204 (35.29)	84 (14.53)	274 (47.40)	16 (2.77)	578 (100.00)
15	Others	-	-	02 (0.35)	576 (99.65)	578 (100.00)

(Note: Number given in parenthesis shows the percentage)

The analysis of the data presented in Table 5.58 clearly shows, the majority of respondents have indicated that they prefer to have the information sources both in print as well as in electronic version/format. The respondents who prefer to have the

information sources in electronic version alone or print version alone are less in number.

More than three-fourth (75.78%) of the respondents have indicated that they prefer to use abstracting and indexing periodicals in print as well as electronic version. More than half of the respondents prefer to use primary journals (64.88%), reports (63.84%), dictionaries (60.73%), books (56.23%), theses and dissertations (51.04%) and encyclopedias (50.52%) in print as well as in electronic version.

Discussion / Interpretation

It is quite evident from the data that the majority of respondents are of the opinion that they prefer to use the information sources both in print and electronic version / format. Hence, the university libraries need to collect the information sources in print as well as electronic versions to satisfy their users.

5.12 Importance of Electronic Infrastructure

Question No. 45 was asked to know the respondents' opinion about the development of electronic infrastructure for their use. The data received in this regard has been presented in Table 5.59.

According to the data presented in Table 5.59, the majority of respondents found the development of electronic infrastructure in their universities as most important and negligible number of the respondents have reacted negatively.

Table 5.59: Respondents' opinion about development of electronic infrastructure
N=578

Sl. No.	Electronic Infrastructure	MI	I	U	NI	NAI	NR
01	Teleconferencing facility	208 (35.99)	138 (23.88)	65 (11.25)	86 (14.88)	69 (11.94)	12 (2.08)
02	University Library Website	436 (75.43)	105 (18.17)	10 (1.73)	8 (1.38)	4 (0.69)	15 (2.60)
03	CD-Net facility	319 (55.19)	141 (24.39)	24 (4.15)	47 (8.13)	20 (3.46)	27 (4.67)
04	Institutional Repository	418 (72.32)	116 (20.07)	20 (3.46)	8 (1.38)	3 (0.52)	13 (2.25)
05	Theses and Dissertation Database	338 (58.48)	146 (25.26)	24 (4.15)	33 (5.71)	13 (2.25)	24 (4.15)
06	Archive of Open Access E-Resources	217 (37.54)	138 (23.88)	65 (11.25)	76 (13.15)	27 (4.67)	55 (9.52)
07	E-mail Facility to interact with library staff and obtain E.I. services	509 (88.06)	43 (7.44)	10 (1.73)	2 (0.35)	2 (0.35)	12 (2.08)
08	Separate Section in University Library for academic staff to use E- resources	418 (72.32)	98 (16.96)	24 (4.15)	18 (3.11)	13 (2.25)	7 (1.21)
09	Campus LAN reaching academic dept. and residences of teachers	428 (74.05)	105 (18.17)	20 (3.46)	8 (1.38)	4 (0.69)	13 (2.25)

(Note: Number given in parenthesis shows the percentage)

(MI= Most Important; I= Important; U= Undecided; NI= Not Important; NAI= Not At all Important; NR= Not Responded)

The e-mail facility is found to be the most important facility required by the respondents for which 88.06% indicated as most important. University Library Website is another facility for which 75.43% of the respondents have indicated as most important and 418 (72.32%) respondents have found the separate section for academic staff in university library as most important. Nearly three-fourth of the respondents have indicated that the campus LAN that reaches their academic departments as well as residences is most important. More than half of the respondents have indicated the development of theses and dissertations database and CD-Net facility as most important. The development of archive of open access resources and teleconferencing facility have been indicated as most important by 37.54% and 35.99% of the respondents respectively.

Discussion / Interpretation

It is quite evident from the data that the e-mail facility is most important for them which enables them to obtain virtual reference service, recommend for procurement of information sources, and reserve the information sources for their use. The university libraries have to take necessary measure to host the Website of their own which reflects their resources and services for the benefit of user community. A provision of separate section for the academic staff is found to be most important for maximum use of electronic resources in the libraries. Similarly, university libraries need to take necessary measures to develop institutional repository, database of theses and dissertations, and CD-Net facility for providing effective and efficient services to the academic staff.

5.13 Respondents' Suggestions for the Improvement of the Collection of Electronic Information Sources and Services, and User Education Programmes

Two open-ended questions were raised to elicit the suggestions from the academic staff about the improvement to be brought in relation to electronic information sources and services in the university libraries. The other question was about creating awareness and enhancing the use of electronic information sources and services. The suggestions of the respondents have been summarized below.

- Sufficient number of computers with Internet connectivity in the university library
- High speed Internet bandwidth
- Provision of computers with Internet connectivity to every teacher in the campus
- Provision for remote access to the e- resources
- Subscription to more need-based online journals (full-text as well as bibliographic)
- Subscription to important online reference sources
- Procurement of CD-ROM databases and making them accessible over the campus LAN
- Conducting user education programmes regularly
- Provision of electronic information services such as virtual reference service, alerting service, and electronic document service
- Circulars / Notices regarding newly added e-resources
- Well-equipped user education hall in the university libraries
- Library Web page which can serve as a link between the library and users in all respects.

5.14 Hypotheses Tested

The following hypotheses have been tested for the present study:

Hypothesis (1):

There is an association between the support extended by the UGC under its INFLIBNET and UGC-Infonet Programmes and the development of e-culture in the university libraries of Karnataka.

According to the data presented in Table 4.18, except BUL and MaUL, no other university libraries under the present study is subscribing online journals on their own. Both of these university libraries, viz. BUL and MaUL, are subscribing negligible number of online journals. On the contrary to this, all the six university libraries under the study are having access to nearly 5000 online full-text journals in different subjects, bibliographic databases, and a gateway portal under the UGC-Infonet E-Journal Consortium (Table 4.20). Hence, the hypothesis has been accepted.

Hypothesis (2):

There is an association between the gender of the academic staff and awareness and use of e-resources.

a) According to the data presented in Table 5.10, the association between the gender of the academic staff and frequency of Internet use is statistically significant at 5.00% probability level. Hence, the hypothesis has been accepted.

- b) According to the data presented in Table 5.17, the association between the gender of the academic staff as well as awareness and use of UGC-Infonet E-Journal Consortium is not statistically significant. Therefore, the hypothesis has been rejected.
- c) According to the data presented in Table 5.26, the association between the gender of the academic staff as well as awareness and use of CD-ROMs is not statistically significant. Hence, the hypothesis has been rejected.
- d) According to the data presented in Table 5.35, the association between the gender of the academic staff as well as awareness and use of OPAC is not statistically significant. Therefore, the hypothesis has been rejected.
- e) According to the data presented in Table 5.43, the association between the gender of the academic staff as well as awareness and use of electronic information services is not statistically significant. Therefore, the hypothesis has been rejected.

Hypothesis (3):

There is an association between the designation of the academic staff and awareness and use of e-resources.

- a. According to the data presented in Table 5.10, the association between the designation of the academic staff and frequency of Internet use is statistically significant at 1.00% probability level. Hence, the hypothesis has been proved.
- b. According to the data presented in Table 5.17, the association between the designation of the academic staff as well as awareness and use of UGC-Infonet E-Journal Consortium is not statistically significant. Therefore, the hypothesis has been rejected.

- c. According to the data presented in Table 5.26, the association between the designation of the academic staff as well as awareness and use of CD-ROMs is not statistically significant. Therefore, the hypothesis has been rejected.
- d. According to the data presented in Table 5.35, the association between the designation of the academic staff as well as awareness and use of OPAC is not statistically significant. Hence, the hypothesis has been rejected.
- e. According to the data presented in Table 5.43, the association between the designation of the academic staff as well as awareness and use of electronic information services is not statistically significant. Therefore, the hypothesis has been rejected.

Hypothesis (4):

There is an association between the subject background of the academic staff and awareness and use of e-resources.

- a. According to the data presented in Table 5.10, the association between the subject background of the academic staff and frequency of Internet use is statistically significant at 1.00% probability level. Therefore, the hypothesis has been proved.
- b. According to the data presented in Table 5.17, the association between the subject background of the academic staff as well as awareness and use of UGC-Infonet E-Journal Consortium is statistically significant at 1.00% probability level. Hence, the hypothesis has been accepted.
- c. According to the data presented in Table 5.26, the association between the subject background of the academic staff as well as awareness and use of CD-ROMs is

statistically significant at 1.00% probability level. Therefore, the hypothesis has been proved.

- d. According to the data presented in Table 5.35, the association between the subject background of the academic staff as well as awareness and use of OPAC is statistically significant at 1.00% probability level. Hence, the hypothesis has been accepted.
- e. According to the data presented in Table 5.43, the association between the subject background of the academic staff as well as awareness and use of electronic information services is statistically significant at 1.00% probability level. Therefore, the hypothesis has been proved.

Hypothesis (5):

There is an association between the computer training background of the academic staff and awareness and use of e-resources.

- a) According to the data presented in Table 5.10, the association between the computer training background of the academic staff and frequency of Internet use is statistically significant at 1.00% probability level. Hence, the hypothesis has been proved.
- b) According to the data presented in Table 5.17, the association between the computer training background of the academic staff as well as awareness and use of UGC-Infonet E-Journal Consortium is statistically significant at 1.00% probability level. Therefore, the hypothesis has been accepted.

- c) According to the data presented in Table 5.26, the association between the computer training background of the academic staff as well as awareness and use of CD-ROMs is statistically significant at 1.00% probability level. Hence, the hypothesis has been proved.
- d) According to the data presented in Table 5.35, the association between the computer training background of the academic staff as well as awareness and use of OPAC is statistically significant at 1.00% probability level. Hence, the hypothesis has been accepted.
- e) According to the data presented in Table 5.43, the association between the computer training background of the academic staff as well as awareness and use of electronic information services is statistically significant at 1.00% probability level. Therefore, the hypothesis has been proved.

Hypothesis (6):

The academic staff who have Internet facility at their department chambers and at homes use the Internet more frequently than those who use it at commercial centres.

According to the data presented in Table 5.11, the respondents who have Internet connectivity at their department chambers and homes are using the Internet more frequently as compared to those who use the Internet at commercial centres. Hence, the hypothesis has been accepted.

5.15 Conclusion

The emergence of ever dynamic ICTs, information sources in electronic form and electronic information services have challenged the traditional activities and services of

the university librarians. The changed electronic information environment has forced the librarians to plan, evaluate, procure and provide advanced services to the end-users. For this, they need to know the information needs of their users. Aimed at this end, the present study has revealed very interesting results on the awareness and use of e-resources and services by the academic staff of Karnataka State universities.

The Internet is found to be the popular tool among the academic staff. It has become indispensable for communication and for finding scholarly literature. However, the percentage of the academics who have imbibed the skills to use and integrate benefits into their academic activities is negligible. Less than half of the academic staff are aware and use the UGC-Infonet resources. The CD-ROM technology has not attracted the academics. Less than 16.00% of the academic staff are aware and use CD-ROMs available in their university libraries. The awareness and use of OPAC by the academics is discouraging as only 26.17% of them have responded positively.

The relation between the respondents' gender, faculty, designation and computer training background, and awareness and use of electronic information sources and services has been proved. The academic staff belonging to the faculty of Science are far ahead of their counterparts in Social Science and Humanities as far as awareness and use of electronic information sources and services is concerned. Similarly, the academic staff who have undergone formal computer training are much ahead of those who have not undergone such training. The accessibility to the e-resources at the department chambers encourages the academics for using them more frequently. The junior staff,

namely Lecturers, are the disadvantaged as far as the accessibility to the ICTs and information sources and services at their desk-tops.

Very less number of academic staff make use of e-resources for their scholarly activities such as writing research articles, books, teaching preparation, and guiding research students. However, the lack of sufficient number of Internet nodes at university libraries as well as at department chambers, low Internet bandwidth, technical problems (server down etc.), and frequent power cut have come in the way of smooth usage of electronic information sources and services by the academics. Lack of knowledge to use e-resources is another problem expressed by the academic staff. In the light of these findings, the university libraries should be proactive in developing the need-based collection and creating the awareness of these resources among the end-users through systematic user education programmes.

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FINDINGS, SUGGESTIONS AND CONCLUDING OBSERVATIONS

The present study was undertaken with the following major objectives:

- a) To assess the ICT infrastructure available in university libraries of Karnataka.
- b) To know the status of library automation in university libraries of Karnataka.
- c) To find out the collection of electronic information sources in university libraries of Karnataka.
- d) To find out the provision of electronic information services made by the university libraries of Karnataka.
- e) To find out the awareness and use of the electronic information sources by the academic staff working in universities of Karnataka.
- f) To find out the awareness and use of the electronic information services by the academic staff working in the universities of Karnataka.
- g) To find out the academic staff's awareness and participation in user education programmes conducted by the university libraries of Karnataka.

6.1 Major Findings

The major findings of the study have been summarised below.

6.1a. ICT Infrastructure

A closer look at the hardware facilities available in the university libraries suggests us that they greatly vary from one to another. If the GUL has 140 desk-top

computers MaUL has only 12 desk-top computers. The GUL has 5 laptop computers whereas KaUL, MaUL and MUL do not have laptop computers at all. The GUL has 12 printers whereas BUL and MaUL have only 3 printers each. In four of the six university libraries there are no scanners for digitization.

Except the Kuvempu University none of the universities under the study has established an extensively spread-out campus LAN. The campus LAN of Kuvempu University reaches Library Computer Centre, Academic Departments, Administrative Sections, Hostels, Guest House and Residences of the officers of the University.

Except GUL, none of the university libraries under the study have software for CD-Net management. Only half of the university libraries, viz., BUL, GUL and MUL, have software for research data analysis.

As far as Internet facilities are concerned, the university libraries under the study are poorly equipped. The MaUL has the least number of (only 12) Internet nodes. The Internet bandwidth made available in universities is very low. The Karnatak University, Dharwad has the least bandwidth (only 512 kbps).

The MaUL does not have Internet browsing section at all. The MaUL and KaUL have not provided Internet facility to the department chambers of all the academic staff.

6.1b. Library Automation

None of the university libraries under the study has fully automated all of their house-keeping operations. The BUL and KUL have partially automated their acquisition functions. The BUL and MaUL have partially automated their circulation functions. Except MaUL none of the other university libraries has automated its stock verification and inter-library-loan functions. None of the university libraries under the study has automated the theft detection functions.

The MUL has not created the OPAC at all. Only four university libraries have created the OPAC of serials. Only BUL, KUL and MaUL have created the OPAC of Kannada Books. The BUL, KaUL and MaUL have made it possible to provide accessibility to OPAC over the campus LAN whereas none of the university libraries has provided accessibility to OPAC over the Internet. This kind of situation is a stumbling block in providing information about the resources available in the university libraries for the end-users from far off places.

Except BUL, none of the university libraries under the study have digitized any of their collection. The BUL has digitized only 280 books. This kind of situation hinders the university libraries from providing access to valuable sources which are in print version to the end-users who are in remote places.

6.1c. Collection of Electronic Information Sources

The efforts made by the university libraries under the study for the collection of electronic information sources are very meager. None of the university libraries has formulated a systematic collection development policy for procurement and subscription of electronic information sources. These libraries are spending a negligible amount, or not at all spending any amount on procurement of e-resources on their own (see Table 4.4). The particulars of collection of e-resources in the form of CD-ROMs, online sources subscribed by the university libraries, online sources made accessible under the UGC-Infonet E-Journals Consortium, and the initiative taken to develop the digital archives have been summarized below.

6.1c1. CD-ROM Collection

The MUL has maximum of 900 CD-ROMs whereas KUL has only 575 CD-ROMs. The majority of these CD-ROMs are either received along with the books that the libraries procure in print form or received from the publishers/suppliers as complimentary copies. The university libraries have procured a negligible number of CD-ROM databases. The CD-ROM databases once procured have not been updated with the latest issues in case of abstracting and indexing journals. Neither university libraries have sufficient number of computers to use CD-ROMs nor they issue them, nor they have CD-Net facility for providing access to the academic staff at their department chambers. This is the clear indication of the fact that the libraries have not paid due attention to procure CD-ROM databases for providing an access to the end-users.

6.1c2. Online Sources subscribed by the University Libraries

Except BUL and MaUL, none of the university libraries under the study is subscribing any online sources. The online sources subscribed by BUL and MaUL are very negligible. The BUL is subscribing online reference sources, namely Exrefer and EBSCO Academic Primer. The MaUL is subscribing one abstracting and indexing resource, namely Inside Web. This is the clear indication of the fact that the university libraries under the study have failed in procurement of online resources for the benefit of their academic community.

6.1c3. Electronic Information Sources accessible through UGC-Infonet E-Journal Consortium

All the university libraries under the study are participating in the UGC-Infonet E-Journals Consortium and this is the only strength of these university libraries as far as e-resources are concerned. Under this programme these libraries have access to nearly 5000 full-text online-journals, bibliographic databases and a gate-way portal on different disciplines such as Science and Technology, Social Sciences and Humanities. These valuable resources are expected to be utilized by the academic community to the maximum extent by providing accessibility not only in the university library buildings but also in the academic departments as well as at the residences of the staff within the campus and off the campus. As already has been discussed the campus LAN of the universities is not extensive enough to provide accessibility to e-resources at the residences of the staff. Moreover, not all the academic staff have accessibility to e-

resources through campus LAN at their department chambers. This kind of affair is another major stumbling block in providing accessibility to e-resources to the expected level.

6.1c4. Digital Archives

Except BUL and KUL, none of the university libraries under the study has initiated the creation of digital archives. These two university libraries have made a humble beginning in the creation of institutional repositories by making use of an open source software, namely e-prints. Except KUL, none of the university libraries under the study has made any effort to develop digital archive of open access information sources.

None of the university libraries under the study has initiated to create the digital archive of theses and dissertations, preprints of research papers books/monographs and project reports of their own staff which is a great public loss since the academic community is denied of having access to these resources which have enormous academic importance.

6.1d. Electronic Information Services provided by University Libraries

The provision of electronic information services is another area where the university libraries under the study have utterly failed.

6.1d1. Virtual Reference Services

The KUL and MUL are not at all providing virtual reference service to their end-users. Among the four university libraries which have indicated that they are providing virtual reference service, none of them is attending the queries through instant messaging. There is a chance of delayed response for the user's question in case of e-mail reference service. Only GUL and KaUL are providing referral service through electronic mode.

6.1d2. Alerting Services

The status of alerting services in the university libraries is very poor. Only BUL and MaUL are circulating the new addition lists, and only BUL is circulating content pages of journals. The BUL and KUL are passing the information about the forthcoming conferences and seminars through electronic mode. Except KUL, none of the university libraries under the study is providing newspaper clipping service electronically.

None of the university libraries under the study is providing information about research in progress. Except KaUL, none of the university libraries is providing SDI service to their academic community. This kind of situation will certainly come in the way of free-flow of information which is instrumental in carrying out the academic and research activities at a university level.

6.1d3. Document Delivery Service

Except BUL and MaUL, none of the university libraries under the study are providing electronic document delivery service. This situation will not help in saving the

time of the users. The MaUL and MUL are not providing reprographic service through computer printout for users.

Staff Support

Except MUL, none of the university libraries has adequate qualified staff. Also, half of the university libraries do not have efficient staff for handling the electronic information sources and services (see Table 4.2). This state of affairs certainly affects the quality of services.

6.1e. Provision of User Education Programmes

Except GUL and KUL, none of the university libraries has conducted training programmes for imparting computer skills to the academic staff. Similarly, searching the Internet, CD-ROM databases, online information sources, digital archives and institutional repositories demand for thorough training since the end-users are exposed to the new technology very recently. The initiatives taken by the university libraries in providing user education in these aspects are apparently grim. Only half of the libraries, viz., GUL, KaUL and KUL, have conducted training on the use of CD-ROM databases. None of the university libraries under the study has conducted training programmes on searching the digital archives.

It is expected from the university libraries that the user education, unlike other services, is a regular activity. Hence, the libraries should have a separate hall adequately

furnished for conducting user education. The actual condition is altogether different. There is no separate hall for conducting user education in KaUL and MUL.

6.1f. Awareness and Use of Electronic Information Sources by the Academic Staff

Mere collection of electronic information sources in the libraries and making provision of electronic resource-based services is not an end in itself. Rather these resources and services should reach the target users effectively and efficiently. For this, the creation of awareness and enhancing the use of these resources and services is the motto of the university libraries. In this study an attempt was made to know the awareness and use of electronic information sources in the university libraries and that brought some very interesting findings as presented below.

6.1f1. Awareness and Use of Internet Facility

Though all the academic staff covered under the study are aware of and use Internet facility available in their respective universities, frequency of its use differs. The study found that one-third of the academic staff do not use Internet before a week. Among those who use the Internet daily, males are ahead (49.09%) of the females (31.43%); those belonging to the faculty of Science are much ahead (75.70%) of those belonging to Social Science (20.41%) and Humanities (4.08%); and Professors (51.58%) as well as Readers (49.44%) are ahead of Lecturers (34.62%).

Full-text journals are used by 38.24% of the academic staff followed by abstracting and indexing journals with only 37.02% in their favour. The resources such

as books, reports, theses and dissertations, newspapers, advertisements, dictionaries, encyclopedias, biographies, maps and atlases, etc., have not attracted the teachers to the extent expected.

Slightly more than half of the academic staff are making use of Internet resources for writing research papers (57.44%), for keeping abreast with the latest developments (54.50%), and for their own research (50.52%). Negligible number of respondents are making use of Internet for knowing about forthcoming conferences and seminars (37.89%), for teaching preparation (32.53%), for guiding research students (23.88%), for knowing about funding agencies (14.19%), and for writing books (9.52%). Though the use of Internet for e-mail purpose has become ubiquitous, nearly 11.00% of the academic staff do not make use of it. This is the clear indication of the fact that the majority of academic staff have not realized the importance of the Internet-based resources and failed to integrate them into their academic activities. This will certainly affect the quality and productivity of the academic staff.

The academic staff are facing severe problems in making use of Internet such as the problem of slow Internet bandwidth (59.86%), lack of sufficient Internet nodes in their university libraries (56.23%), technical problems (44.29%), frequent power cut (41.70%) and lack of Internet connectivity at their department chambers (22.49%). These problems demand for immediate solutions otherwise the efforts made to provide Internet facility to the academic staff will go waste.

Every faculty member is expected to possess the ability to use Internet. But the actual situation is far from expectations. Only 25.00% of the respondents are confident enough in making use of Internet.

6.1f2. Awareness and Use of UGC-Infonet E-Journal Consortium

- Astonishingly only 39.79% of the academic staff are aware of the UGC-Infonet e-resource and use them.
- There is a relation, between the respondents' subject background and computer training background and the use of UGC-Infonet e-resources.
- Among the users of UGC-Infonet E-Journals Consortium 66.55% respondents belong to the faculty of Science whereas 19.39% belong to Social Science and only 3.06% Humanities faculty.
- The Readers (49.44%) are ahead of Lecturers (36.54%) and Professors (34.21%).
- The academic staff who have undergone formal computer training are much ahead (74.64%) of those who have not undergone such training (28.86%).
- Among the meager number of users of UGC-Infonet E-Journals Consortium, only 38.26% of the academic staff use these e-resources daily.
- Among those who use the resources daily, males are ahead (40.12%) of their female counterparts (32.76%). Faculty of Science are much ahead (46.03%) of Social Science faculty (2.63%), and none of the Humanities faculty use these resource daily. Professors are ahead (64.62%) of Readers (43.82%) and Lecturers (9.21%).

- 68.88% of the Social Science faculty do not use UGC-Infonet e-resources though they are aware of them.
- 73.47% of the Humanities faculty are not at all aware of UGC-Infonet e-resources.
- Academic staff - those who use e-resources under the UGC-Infonet do not integrate the benefits that they gain fully into their academic activities. 74.35% of the academic staff use the information for writing research articles followed by 71.74% for their own research, 53.91% for teaching preparation, 41.74% for keeping abreast with the latest developments, 31.30% for guiding research students, and only 13.91% for the purpose of writing books.
- Slow Internet bandwidth, lack of sufficient Internet nodes, technical problems, lack of relevant information sources, and lack of knowledge to use are the major stumbling blocks in making use of the UGC-Infonet e-resources. More than two-third of the academic staff are not fully confident of making use of e-resources.
- The respondents who are not using the UGC-Infonet e-resources though they are aware of them have expressed their concern for lack of relevant information sources, lack of accessibility to the resources at their chambers, lack of time and lack of knowledge to use e-resources.

6.1f3. Awareness and Use of CD-ROMs

- Only 15.95% of the academic staff are aware of and making use of CD-ROMs available in their university libraries. As many as 60.90% of the academic staff,

though aware of CD-ROMs, do not make use of them. 23.18% of the academic staff are not at all aware of CD-ROMs.

- Among the academic staff who use CD-ROMs, 82.61% of them use it occasionally.
- The resources available in the form of CD-ROMs are not used by academic staff to the fullest extent.
- Among the academic staff who use CD-ROMs, 61.96% of them use abstracting and indexing journals followed by 41.30% with books, 36.96% with reports, 25.00% with full-text journals, 23.91% with dictionaries, 16,30% with maps and atlases, 6.52% with directories, and only 11.96% with theses and dissertations are used by negligible number of academic staff.
- The academic staff are hardly integrating the information that they gain through CD-ROMs into their academic activities.
- Among the academic staff who use CD-ROMs, 63.04% use them for their own research, followed by 50.00% for writing research articles, and only 4.35% for writing books.
- Lack of accessibility to CD-ROMs over campus LAN, lack of relevant resources, lack of sufficient number of computers to use CD-ROMs, frequent power cut, lack of time, lack of borrowing facility and lack of knowledge to use the CD-ROMs are the major hurdles in the use of CD-ROMs.

- Only 15.22% of the academicians have assessed their ability to use the CD-ROMs as above average and only 8.70% as experts. This clearly shows that one-fourth of the academicians need extensive training in making use of the CD-ROMs.
- 60.90% of the academic staff are not using CD-ROMs though they are aware of them.
- Lack of accessibility to CD-ROMs over campus LAN, lack of time, lack of sufficient number of computers to use CD-ROMs, lack of knowledge to use CD-ROMs, lack of borrowing facility are the reasons for the non-use of CD-ROMs.

6.1f4. Awareness and Use of OPAC

- Only 26.17% of the academic staff are aware of and use OPACs. Among them only 1.71% use OPAC daily.
- Technical problems, incomplete OPAC, frequent power cut, lack of sufficient number of computers for consulting OPAC, and lack of knowledge to use are the major stumbling blocks in making use of OPAC by the academic staff.
- 13.68% of the academic staff have assessed their ability to use OPACs as above average and only 6.84% as experts.
- As many as 59.73% of the academic staff are not using OPACs though they are aware of them. They do not use OPAC because of incomplete OPAC, lack of its availability over the campus LAN, lack of knowledge to use, lack of time, lack of sufficient number of computers to use OPAC, and lack of assistance by the academic staff.

6.1g. Awareness and Use of Electronic Information Services

- Only 21.45% of the academic staff are aware of and use electronic information services. Among them 33.45% belong to the faculty of Science, 12.76% Social Science and 4.08% belong to Humanities.
- 51.45% of the academic staff who have undergone formal computer training are aware and use electronic information services against only 12.05% of those who have not undergone formal computer training.
- Only 0.81% of the academic staff under the study use electronic information services daily and 66.13% occasionally.
- Only 14.52% of the academic staff have considered electronic information services provided by their university libraries as adequate.
- The academic staff, who are using electronic information services, are facing the problem of lack of knowledge to use, technical problems, frequent power cut, lack of time and lack of assistance by the library staff.
- 8.27% of the academic staff have assessed their ability to use electronic information services as above average, and only 4.84% as experts. This is the clear indication of the fact that more than 85.00% of the academic staff need extensive training in making use of electronic information services.
- 34.95% of the academic staff are not using electronic information services though they are aware of them. Lack of knowledge to use, technical problems, frequent

power cut, lack of time and lack of assistance by the library staff are the reasons for non-use.

6.1h. Awareness and Participation in User Education Programmes

- Only 37.37% of the academic staff are aware of the user education programmes conducted by their university libraries and have participated in them. Among them 84.26% have participated in only one user education programme.
- 91.67% of the academic staff have found the user education programmes conducted by their university libraries as inadequate.
- The academic staff have expressed their concern for lecture-oriented user education programmes, too short period of user education programmes, too many participants in the user education programmes, and participants from different subject background. This situation has implications for planning the user education in such a way that the user education programmes are not lecture oriented but practical-oriented demonstrations, long duration ones, and limited number of participants belonging to a single discipline in a session.

6.1i. Hypotheses Tested

The following hypotheses are tested for the study:

- The first hypothesis “There is an association between the support extended by the UGC under its INFLIBNET and UGC-Infonet Programmes and the development of e-culture in the university libraries of Karnataka” has been accepted.

- The second hypothesis “There is an association between the gender of the academic staff and awareness and use of e-resources” has been rejected.
- The third hypothesis “There is an association between the designation of the academic staff and awareness and use of e-resources” has been rejected.
- The fourth hypothesis “There is an association between the subject background of the academic staff and awareness and use of e-resources” has been accepted.
- The fifth hypothesis “There is an association between the computer training background of the academic staff and awareness and use of e-resources” has been accepted.
- The sixth hypothesis “The academic staff who have Internet facility at their department chambers and at homes use the Internet more frequently than those who use it at commercial centres” has been accepted.

6.2 Suggestions

The following suggestions have been put-forth for the development of e-resources and services in university libraries under the study and their best use by the academic staff.

- In order to provide advanced level services to the end-users, the universities under the study need to come out with plans for establishing robust and reliable ICT infrastructure. The universities should establish extensive campus LAN that not

only reaches university library, university computer centre, academic departments, administrative sections, but also residences of the academic staff.

- The Internet facility should be extended to the department chambers and residences of all of the academic staff. The academic staff should be facilitated to have access to the library resources and services from their department chambers as well as from their residences. The Internet bandwidth should be increased to have speedy access to the resources.
- There is an urgent need to develop ICT infrastructure in the university libraries in terms of hardware and software facilities. Every university library should have separate Internet browsing section with sufficient number of Internet nodes exclusively meant for academic staff.
- There is a dire need on the part of the university libraries to fully automate their house-keeping operations for facilitating the end-users in general and academic staff in particular so that they take active part in the acquisition activities, borrow the resources or request for reservation of the resources.
- The university libraries should take necessary steps to keep update their OPACs by including all the resources available in their respective libraries. All the libraries should see that the OPACs are made accessible not only over the campus LAN but also over the Internet which will reflect the strength of information resources for facilitating end-users who are spread-out all over the world. It is not far from the truth that the modern universities will have students and teachers from all over the world.

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- The university libraries should take necessary measures to develop need-based collection of CD-ROM databases. The university libraries should procure CD-ROM databases such as full-text journals, abstracting and indexing journals, books and reference sources such as dictionaries, encyclopedias, geographical sources, yearbooks, demographic sources, etc. CD-Net facility should be provided to have access by the end-users in general and academic staff in particular at their door-steps of departments and residences.
 - The university libraries under the study should plan for subscription of online-resources. For this, these libraries need sufficient funds exclusively allocated for online resources as well as a well-designed collection development policy which includes particulars about identification, licensing, maintenance, archiving, and providing accessibility to the e-resources to the end users at their desktops.
 - As the e-resources accessible through the UGC-Infonet E-Journals Consortium are the only worthy resources, the university libraries under the study should come-out with plans for making the best use of these resources. The users should be made known of these valuable resources and provide accessibility not only at all the places within the university campuses but also off the campus residences of the end-users.
 - In order to make the best use of valuable scholarly resources which are accessible freely on the Web and the scholarly literature produced by the academic community of their own, the university libraries under the study should plan for development of digital archives. The software required for development of digital

archives are available free of cost on the Web. The technical support extended by the institutes such as NCSI (I.I.Sc.), Bangalore can be explored in this venture. In this positive situation, the university libraries should not fall back in development of digital archives of open access information sources, institutional repositories of theses and dissertations, reprints and preprints of research papers, books and project reports that are produced by their own academic community. Also, the libraries should see that these digital archives are made accessible not only over the campus LAN but also over the Internet to their end-users.

- The poor status of the electronic information services in the university libraries under the study calls for thorough planning to bring complete change. The university libraries should take steps to provide virtual reference service through e-mail as well as instant messaging.
- As no university library is self-sufficient in catering to the information needs of their users, they need to direct their users to the right places where the needed information is available. Hence, the university libraries should plan for providing referral service through electronic mode.
- The university libraries, keeping in mind the importance of the nascent information generated in the fields of interest of their users, should plan for providing alerting services. The university libraries should circulate the new addition/accession list of resources, content pages of journals, information about research in progress, notifications of forthcoming conferences and seminars, and newspaper clipping online to the academic staff's desk tops. The university

libraries should go a step ahead to know the information needs of the academic staff and provide SDI service by making use of ICTs and e-resources.

- Electronic document delivery service is another service on which the university libraries should act upon. The libraries should create awareness about the electronic resources available through the UGC-Infonet E-Journals Consortium, namely under the JCCC Gateway portal.
- The university libraries are expected to provide reprographic services through computer print-out of the resources which are downloaded from the Internet, online resources subscribed by the university libraries, online resources accessible through the consortia activities and extracted from CD-ROM databases. Even, individual teachers should be provided with printing facility at their department chambers to make the best use of the electronic information sources and services to the optimum level.
- As it is very important to deliver the electronic information services effectively, the universities under the study should come forward to recruit adequate number of well-qualified staff.
- In this technological era, the university libraries should play an active role in imparting the information literacy among the end-users. In order to respond positively to the challenge, the university libraries should conduct the user education programmes regularly by organising lecturers by the experts, audio-visual presentations and demonstrations in making use of electronic information sources and services. The libraries should publish handbooks, manuals and

brochures as self-instructional materials for imparting user education. The libraries should organize training programmes on computer fundamentals, searching Internet, online resources, digital archives, and CD-ROM databases. For this, the libraries need to have a separate hall with sufficient furniture and equipments required for conducting user education programmes.

- The university libraries under the study should come out with the robust and thorough planning to enhance the use of Internet skills, and eradicate the problems in making use of Internet by the academic staff. They should be educated of the availability of e-resources accessible on the Internet and their educational and research value. The university libraries should provide an extensive training to the academic staff for enhancing their ability to use the Internet effectively and efficiently. Also, there is an urgent need on the part of the university libraries that they should increase the Internet bandwidth, increase the number of Internet nodes in the libraries as well as in department chambers of the academic staff, and solve the problem of frequent power cut with alternative arrangements such as establishing UPS systems.
- The university libraries should take measures to create awareness about the e-resources accessible under the UGC-Infonet E-Journal Consortium, online information sources subscribed by the university libraries, CD-ROM databases, digital archives, and OPACs.
- Every university library should have its own Web page and it should serve as a gateway for all the resources and services of the library.

6.3 Concluding Observations

But for the support extended by the UGC under its INFLIBNET and UGC-Infonet programmes none of the university libraries under the study have made sincere efforts to develop their collection in electronic form and to provide electronic resource-based services to their end-users. The Karnataka State university libraries under the study have made a good beginning in the development of ICT infrastructure with the financial assistance extended by the UGC.

The scholarly literature accessible under the UGC-Infonet E-Journals Consortium has occupied the lion share of the e-resources available in these university libraries. In spite of the profuse support extended by the UGC, the Karnataka State university libraries have failed to develop electronic information sources for the benefit of their academic community. This can be attributed to the fact that these university libraries have not received the same support from their own universities in the development of ICT infrastructure and e-resources.

There is an acute need on the part of the university libraries to take steps to establish extensive campus LAN that reaches out the end-users at their door-steps. Internet facility is far from sufficiency to cater to the needs of the end-users which is needed to be strengthened further. There is a dire need on the part of the university libraries to develop collection of CD-ROM databases and CD-Net facility. The

university libraries need to give due importance for subscribing online resources on their own to serve the academic and research community better. The university libraries are expected to develop digital archives of open access information sources and institutional repositories of scholarly literature.

The university libraries need to pay due attention for making provision for well-planned electronic resource-based services to its end-users. The virtual reference services, alerting services, and electronic document services need to be provided to the end-users.

Surprisingly, only a small portion of the academicians is aware of electronic information sources and services provided by their university libraries. The majority of academic staff are not using e-resources and services though they are aware of them. And, considerable number of academics is not at all aware of e-resources and services provided by their university libraries. There is an urgent need on the part of the university libraries to convert the potential users into actual users by creating awareness about the e-resources and services that they have for offering to the academicians and made known of the importance of these resources and services in enhancing their academic and research productivity. The user education need to take up to make the end-users in general and academic staff in particular to convert them into information literates which is a dire need in this age of technology. For providing user education the users must be categorized into groups on the basis of their subject background and computer

training background. Greater stress need be given to the academic staff belonging to the faculty of Humanities and Social Sciences, and those who have not undergone formal computer training as they have fallen back in making best use of e-resources and services.

To succeed in this effort, the university libraries need to be helped by their own universities. The Karnataka State universities should come forward to support their libraries by allocating sufficient funds required for collection of electronic information sources and provide electronic information services, and for education of their end-users. The universities need to recruit well-qualified staff to carry-out these activities smoothly.

There is an absolute need on the part of professionals that they should enlighten the information professionals, university authorities and the UGC of the real needs of the end-users with regard to the collection of each of the electronic information sources and services, and the extent to which they need user education in making effective use of such resources and services.

The educational institutions engaged in pursuit of higher education and research must learn quickly, that, academic excellence cannot be achieved without opening themselves to the changes taking place in today's ICT driven networked digital environment. The academics too are to be awakened to acquire nascent knowledge through the judicious use of Internet and World Wide Web to push them to the forefront

of the knowledge society. Developments in ICT, no doubt has reduced the world into “vasudaiva kutumbakam” or a “global village” but the spectrum of the world of information it has created is so vast and deep that demand cent percent dedication and commitment from the teacher to keep abreast with the developments in one’s own field of specialization. Earlier the universities in India in general and Karnataka in particular realize this fact better it would be for their academics to face the challenges of the knowledge society.

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Questionnaire for University Librarians

1. General Information

Name of the University:
Address:
URL of the University:
Year of establishment:
Name of the University Library:
URL of the University Library:
Year of establishment of the Library:
Name of the Librarian:
Telephone No.:
Mobile phone No.:
E-mail Id.:

Library Building

2. Please furnish the following details about your University Library Building:

Library building built in the year: -----
Plinth area: -----
Floors of the building: -----
Total seating capacity (for users): -----
Independent building:
Attached with main or some other building:
Planned to accommodate information sources in print form only:
Planned to accommodate information sources in print and electronic form

3. Is there a separate section / hall for maintenance of Electronic Information Sources in your library?

Yes / No

4. Is your library building equipped to provide Electronic Information Services to your library users?

Yes / No

5. Does your library have separate section for Academic Staff?

Yes / No

Library Working Hours

6. Please furnish the details regarding working hours of your library:

Days	Opening Hours	Closing Hours
Monday – Saturday		
Second Saturday		
Sunday		
Holiday		
Others (please specify):		

Library Staff

7. Please furnish the details regarding your library staff:

Designation	Total No.	Male	Female	No. of staff undergone EIS training	Academic & Professional Qualifications
University Librarian	01				
Deputy Librarian					
Assistant Librarian					
Library Assistant					
System Administrator					
Computer Programmer					
Data Entry Operator					
Others (please specify):					

8. Do you have adequate number of library staff? Please indicate:

Adequate Not adequate Can't say

9. What is your opinion about the efficiency of your library staff regarding handling Electronic Information Sources and Services? Please indicate:

All are efficient Majority are efficient
Majority are not efficient Can't say

10. Do you organize in-house training programmes regarding handling the Electronic Information Sources and Services for your library staff?

Yes / No

11. Do you depute your library staff to acquire necessary training that enable them to work with E-resources?

Yes / No

12. Is the professional staff of your library showing interest to adapt themselves to the changing information (library) handling environment?

Yes / No

Library Budget

13. Please furnish the details about the expenditures towards information sources in print as well as electronic information sources and electronic equipments for the last five years:

Heads of expenditure	2003-04	2004-05	2005-06	2006-07	2007-08
<ul style="list-style-type: none"> • Information sources in print form • Information sources in electronic form • Electronic equipments 					

14. Is the allocation of budget sufficient for procurement of Electronic Information Sources in your library? Please indicate:

Sufficient

Not sufficient

Can't say

Library Users

15. Please furnish the following details regarding your library users:

Types of Users	Total No.
<ul style="list-style-type: none"> • Academic staff • Research Scholars • Students: • Non-teaching Staff • Others (please specify): 	

Infrastructure Facilities**Hardware:**

16. Please furnish the following details regarding the hardware infrastructure available in your library:

Hardware	Make	Quantity
<ul style="list-style-type: none"> • Computers: <ul style="list-style-type: none"> - Servers systems - Desktop Computers - Laptop Computers • Printers • Scanner (for digitization) • Barcode Scanner • Back-up Device 		

<ul style="list-style-type: none"> • LCD Projector • Modem • Fax • Web Camera • Hubs • Network Switches • Router • Firewall • UPS • Identity card printer • Others (please specify): _____ 		
---	--	--

Software:

17. Please name the software used for house-keeping operations in your library:

18. Please name the software used for digital library operations in your library:

19. Please name the software used for CD-Net management in your library:

20. Please name the anti-virus software used in your library:

21. Please name the software used for research data analysis in your library:

Intranet and Internet Infrastructure

22. Does your university have Campus LAN?

Yes / No

If *Yes*, how spread out is your Campus LAN? Please specify:

Restricted to Library Computer Centre and University Computer Centre

Restricted to Library Computer Centre, University Computer Centre and all Academic Departments

Restricted to Library Computer Centre, University Computer Centre, all Academic Departments and all administrative sections

Besides, Library Computer Centre, University Computer Centre, all Academic Departments and all administrative sections, LAN reaches out to hostels and residences also

23. Is the Campus LAN maintenance centre attached to:

University Library

Dept. of Computer Science

University Computer Centre

Others (please specify): _____

24. What is the physical medium of transmission used for LAN?

UTP Cable

Wireless

Coaxial Cable

OFC

Others (please specify): _____

25. Whether your library is part of your Campus Network?

Yes / No

26. Is your Campus Network / Library Network connected to Internet?

Yes / No

27. Please indicate the type of Internet connection:

Dial-up

Leased Line

V-SAT

Radio Link

DSL

Others (please specify): _____

28. Please indicate the Internet Service Provider to your university / library:

BSNL

ERNET

NICNET

Satyam Online

Asianet

Others (please specify): _____

29. Please specify the bandwidth of your university/library network:-----

30. Please specify the number of computers having Internet connection in your library:

31. Do you have separate Internet browsing section in your library?

Yes / No

32. Do you have separate Internet browsing section for Academic Staff in your library?

Yes / No

If **Yes**, how many computers have been exclusively meant for Academic Staff?

33. Is the Internet facility made available to different sections in the library for library staff?

Yes / No

If **Yes**, how many nodes are configured with the Internet access facility?

34. Please indicate the personnel supervising Internet section in your library:

LIS personnel

LIS personnel trained with IT skills

IT trained personnel

Others (please specify): _____

35. Is the Internet facility made available to all the Academic Staff in their own chambers in their departments?

Yes / No

If **Yes**, whether Internet facility is available for all the Academic Staff or chosen few? Please indicate:

All the Academic Staff (irrespective of designation and discipline)

Chairpersons of various academic departments

Professors

Readers

Lecturers

Others (please specify): _____

36. Does your library have sufficient Intranet and Internet infrastructure to use Electronic Information Sources?

Yes / No

If **No**, do you have plans to update your network infrastructure?

Yes / No

Library Automation

37. Please furnish the details regarding the automation of library activities in your library including starting year of automation:

Library Activities	Extent of Automation		
	Fully Automated	Partially Automated	Not Automated
<ul style="list-style-type: none"> • Acquisition Procedures • Circulation Procedures • Cataloguing • Serials Control • OPAC • Financial Management • Stock Verification • Inter-Library-Loan • Theft detection • Others (please specify): 			

38. OPAC Module

Please indicate the different OPACs you have in your library:

Books

Serials

Theses

Dissertations

Kannada Books

Others (please specify): _____

39. Please specify the number of terminals provided for users to browse the OPAC in your library: -----

40. Is the OPAC accessible over the Campus LAN (Intranet) of your university?
Yes / No

41. Is the OPAC accessible over the Internet?
Yes / No

Digitization of Documents

42. Have you digitized any of the library collection?

Yes

No

No but plan for digitization

If *Yes*, please name the materials digitized and specify the number of such materials:

Documents	Total No.	Documents	Total No.
Books		Standards	
Journals		Maps	
Manuscripts		Magazines	
Theses		Newspapers	
Dissertations		Exam question papers	
Reports		Others (please specify):	
Patents			

If your answer is *No* to Q. No.55, give reasons for not digitized:

Lack of funds

Lack of demand

Lack of equipments

Lack of trained staff

Lack of skills/expertise

Others (please specify): _____

Collection Development Policy

43. Do you have Collection Development Policy for your library?
Yes / No

If **Yes**, please indicate whether the policy is:

Written

Unwritten

If **Written**, please indicate whether it is in:

Outline form

Short summary form

Full-fledged document

44. Please indicate whether the selection of Electronic Information Sources is based on Collection Development Policy of your library?

Yes / No

Library Collection

45. Please furnish the following details regarding collection of information sources available in your library in print form as on 31-03-2007:

Information Sources	Total No.	Information Sources	Total No.
<ul style="list-style-type: none"> • Books • Journals • Back-volumes • Theses • Dissertations • Reports 		<ul style="list-style-type: none"> • Patents • Standards • Maps • Magazines • Newspapers • Others (please specify): 	

Non-book Materials

46. Please furnish the following details regarding the collection of non-book materials available in your library as on 31-03-2007:

Non-book Materials	Total No.	Non-book Materials	Total No.
<ul style="list-style-type: none"> • Magnetic tapes • Microfilms • Microfiches • Audio cassettes 		<ul style="list-style-type: none"> • Audio recordings • Music scores • Others (please specify): 	

Electronic Information Sources

CD-ROMs

47. Do you collect CD-ROMs for your library?

Yes / No

If **Yes**, please mention the total number of **CD-ROMs available in your library**:

48. Please furnish the details of important CD-ROMs procured / available in your library:

Title of CD-ROM	Type of information source (Books, Journals, Theses, Patents, Maps, etc.)	Scope (Physical Sc., Biological Sc., Social Sc., Humanities, etc.)	Period From - To
1.			
2.			
3.			
.			
n			

(Please enclose a separate sheet in this format if the space is not sufficient)

49. Do you have CD-Net facility for accessing CD-ROMs by the Academic Staff over the Campus LAN of your university?

Yes / No

Online Information Sources (Fee-based)

50. Do you subscribe Online Information Sources for your library?

Yes / No

If **Yes**, please furnish the details of important Online Information Sources subscribed in your library:

Title of the Online Information Sources	Type of information source (Books, Journals, Theses, Patents, Maps, etc.)	Scope (Physical Sc., Biological Sc., Social Sc., Humanities, etc.)	Period From - To
1.			
2.			
3.			
.			
n			

(Please enclose a separate sheet in this format if the space is not sufficient)

Electronic Information Sources on Consortia

51. Does your library participate in consortium activities?

Yes / No

If **Yes**, please indicate them:

UGC-INFONET Consortium

INDEST Consortium

DELNET Consortium

CSIR E-Journals Consortium

UGC-DAE Consortium

Others (please specify): _____

52. Please furnish the following details regarding the Electronic Information Resources for which you have access through each of the consortium:

Name of the Consortium	Source	Contents	URL
1.			
2.			
.			
n			

(Please enclose a separate sheet in this format if the space is not sufficient)

Digital Archives

53. Does your library have the Digital Archive/s?

Yes / No

If **Yes**, what are the different types of Digital Archives your library have? Please Indicate by (√) marking:

Repository of Open Access Information Sources (freely) available on the Internet

Institutional Repository of E-prints (Reprints, Preprints, etc.)

Digital Archive of Theses and Dissertations of your university

Others (please specify):

Open Access Information Sources on Internet (Free)

54. If your library has the Repository of Open Access Information Sources, please furnish the details:

Electronic Information Services

58. Do you provide Reference Service to Academic Staff through electronic mode?

Yes / No

If *Yes*, please answer:

Do you receive the reference queries from the Academic Staff through E-mail?

Yes / No

Do you answer the reference queries received from the Academic Staff through e-mail?

Yes / No

Do you receive the reference queries from the Academic Staff through chat?

Yes / No

Do you answer the reference queries received from the Academic Staff Through chat?

Yes / No

Do you assist the Academic Staff in using information sources on CD-ROMs, Online Databases and other electronic resources?

Yes / No

59. Do you provide Referral Service to Academic Staff through electronic mode?

Yes / No

60. Do you provide Current Awareness Services to Academic Staff through electronic mode?

Yes / No

If *Yes*, what type of CASs do you provide to the Academic Staff? Please indicate:

Forwarding New Additions / Accession List through E-mail

Forwarding content pages of subscribed journals through E-mail

Forwarding content pages of resources provided by journal publishers through E-mail

Announcement of research in progress

Notification of forth-coming Conferences/Seminars

Newspaper Clipping Service

Others (please specify): _____

61. Do you provide SDI Service to Academic Staff through electronic mode?

Yes / No

62. Do you provide Document Delivery Service to Academic Staff through electronic mode?

Yes / No

If **Yes**, do you have Document Delivery Agreement with other participating Universities / Institutions?

Yes / No

63. Do you provide Bibliographic Services to Academic Staff through electronic mode?

Yes / No

64. Do you provide Translation Service to Academic Staff through electronic mode?

Yes / No

65. Do you provide Reprographic Service to Academic Staff through electronic mode?

Yes / No

If **Yes**, please furnish the details:

Reprographic Service	Charges per page/exposure
<ul style="list-style-type: none"> • Computer print-out of data downloaded from Internet • Computer print-out of data extracted from CD-ROMs • Computer print-out of Ms Word documents • Xerox • Others (please specify): 	

User Education

66. Do you conduct User Education Programmes in your library?

Yes / No

If **Yes**, please indicate the methods you follow for User Education:

Training Programmes / Workshops

Lectures

Audio-visual presentations

Demonstrations / visits

Publications such as library handbooks, brochures, tutorials, etc. in print form

Publications such as library handbooks, brochures, tutorials etc. in electronic form

Others (please specify): _____

67. If you have conducted Training Programmes / Workshops to develop awareness among the Academic Staff about the Electronic Information Sources, please indicate the modules covered:

Computer fundamentals
 Internet fundamentals
 Searching CD-ROMs
 Searching Online Information Sources
 Searching information sources available through Consortia
 Searching Digital Archive of Open Access Information Sources
 Searching Institutional Repository
 Others (please specify): _____

68. Please furnish the details of the Training Programmes / Workshops conducted by your University Library as part of User Education:

Name of the Training Programmes / Workshops	Date: From - To	Nature of the Programme
1.		
2.		
3.		
.		
.		
n		

(Please enclose a separate sheet in this format if the space is not sufficient)

69. Do have separate section / hall for conducting User Education Programmes in your library?

Yes / No

If *Yes*, how equipped? Please indicate:

Sufficient seating arrangement Yes / No
 Projectors (OHP, LCD, etc.) Yes / No

Librarian's Opinion regarding Electronic Information Sources and Services

70. In your opinion, which are the factors that influenced the collection of Electronic Information Sources and Services in your library? (Please use this rating scale: 1= Strongly agree; 2= Agree; 3= Undecided; 4= Disagree; 5= Strongly disagree).

Factors	1	2	3	4	5
Allocation of funds from the INFLIBNET Centre					
Developments in the field ICT					
Demand from the users					
Other universities have collected Electronic Information Sources and Services					
University administration want it to be collected in the library					
To provide advanced services to users					
To attract the attention of the NAAC					
Others (please specify):					

71. What are the barriers in the collection of Electronic Information Sources and Services in your library?

Barriers	1	2	3	4	5
Lack of funds					
Lack of knowledge to use e-resources among library users					
Lack of support from the University Administration					
Lack of electronic infrastructure facilities					
Frequent power cut					
Lack of trained staff					
Library staff's resistance to adopt change					
Cost of Electronic Information Sources is high, and users make less use of them					
Others (please specify):					

72. How do you rate overall level of receptivity / acceptance of electronic media in comparison to print media by the users in your University Library? Please indicate:

- Electronic medium is preferred to print.
- Print medium is preferred to electronic.
- Both media are acceptable.

Future Plans

73. Please mention the future plans of your library regarding collection of Electronic Information Sources and Services:

74. Please mention the future plans of your library regarding User Education Programmes to create awareness about Electronic Information Sources and Services among the users:

Place:
 Date:

Signature

Questionnaire for Academic Staff

1. General Information

Name:

Sex: Male / Female

Age:

Total Teaching Experience

Department:

Designation:

Educational Qualification:

Telephone No.

Cell:

E-mail Id:

2. Do you have computer at your home?

Yes No

3. Do you have Internet connectivity at your home?

Yes No

4. Do you have computer at your chamber in the department?

Yes No

5. Is there Internet connectivity at your chamber in the department?

Yes No

6. Is your University campus LAN accessible to your chamber in the department?

Yes No

7. Do you work with computer?

Yes No

8. How did you acquire the knowledge of working with a computer? Please mark (✓) the relevant item:

Formal computer training

Informal computer training

9. How do you assess your knowledge of computer operation? Please mark (√) the appropriate one:

- Adequate
 Inadequate
 Need more training

Awareness and Use of Internet facilities available in University Library

10. Please indicate your awareness & use of the Internet facility available in your University Library:

- Aware & Use** **Aware But Do Not Use** **Not Aware**

11. If you are 'Aware But Do Not Use' the Internet facility available in your University Library, please indicate the reasons for not using it:

- I don't know how to use the Internet.
 I have Internet connectivity in my Dept. chamber, hence no need to go to our University Library for using it.
 I don't get the relevant information on the Internet required for my use.
 There will be rush in library whenever I go for using the Internet.
 Library staff are not cooperative / assist me in making use of the Internet.
 Lack of time
 Any other (Please specify):

12. Where do you use the Internet? Please mark (√) the relevant items:

- University Library
 Department chamber
 Home
 Commercial Internet centre

13. Please indicate information resources you have used on the Internet:

Information Resources on the Internet	Yes	No
Full-text Journals		
Abstracting & Indexing Journals		
Books		
Dictionaries		
Encyclopedias		
Biographies		
Maps & Atlases		
Reports		
Library Catalogues of other libraries		
Theses & Dissertations		
Newspapers		
Advertisements		
Institutional Repositories		
Films, Songs, Games		
Others (Please specify):		

14. For what purpose you use the Internet?

Purpose of Using Internet	Yes	No
To keep abreast with the latest developments		
For teaching preparation		
For own research		
For guiding research students		
For writing books		
To write research articles		
To know forthcoming Conferences / Seminars		
To know funding agencies		
For searching new jobs		
For communication (e-mail)		
For recreation		
Others (Please specify):		

14. How frequently you use the Internet?

- | | |
|---|--|
| <input type="checkbox"/> Daily | <input type="checkbox"/> Once in two weeks |
| <input type="checkbox"/> Once in two days | <input type="checkbox"/> Once in a month |
| <input type="checkbox"/> Twice in a week | <input type="checkbox"/> Occasionally |
| <input type="checkbox"/> Once in a week | |

15. Please indicate the problems faced by you in making use of the Internet facility:

- Lack of sufficient number of Internet nodes in university library
- Lack of Internet connectivity in department chamber
- Slow Internet bandwidth
- Technical problems (Server down)
- Frequent power cut
- Lack of assistance by library staff
- Any other (Please specify):

16. How would you rate your overall ability to use the Internet facilities available in your University Library? Please indicate by marking (√) the appropriate one:

- Beginner
- Below average
- Average
- Above average
- Expert

UGC-Infonet E-Journals Consortium

17. Please indicate your awareness & use of the UGC-Infonet E-Journal Consortium accessible / available in your University Library:

- Aware & Use**
- Aware But Do Not Use**
- Not Aware**

18. If you are 'Aware But Do Not Use' the information sources under UGC-Infonet E-Journals Consortium accessible / available in your University Library, please indicate the reasons for not using them:

- Lack of knowledge to use
- UGC-Infonet E-Journal Consortium is not accessible in department chamber
- Lack of sufficient Internet nodes in University Library
- Lack of assistance by library staff
- Lack of relevant information sources
- Lack of time
- Others

19. If you are 'Aware & Use' the UGC-Infonet E-Journals Consortium, please indicate frequently you use it:

- Daily

 Once in two weeks
 Once in two days

 Once in a month
 Twice in a week

 Occasionally
 Once in a week

20. Please indicate from which of the publishers you have accessed the UGC-Infonet E-Journals for your study?

Sl. No.	Publishers of UGC-Infonet Resources	Yes	No
01	American Chemical Society		
02	American Institute of Physics		
03	American Physical Society		
04	Annual Reviews		
05	Blackwell Publishing		
06	Cambridge University Press		
07	Elsevier Science (Cell Press)		
08	Emerald (LIS collection)		
09	Institute of Physics		
10	JSTOR		
11	Nature		
12	Oxford University Press		
13	Portland Press		
14	Project Euclid		
15	Project Muse		
16	Royal Society of Chemistry		
17	Society for Industrial and Applied Mathematics (SIAM)		
18	Springer Link		
19	Taylor and Francis		
20	BIOSIS (Biological Abstracts)		
21	Institute for Studies in Industrial Development (ISID)		
21	MathSciNet		
22	JCC-UGC-Infonet		
23	Any other		

21. For what purpose you use the UGC-Infonet E-Journals?

Sl. No.	Purpose	Yes	No
01	To keep abreast with the latest developments		
02	For teaching preparation		
03	For own research		
04	For guiding research students		
05	For writing books		
06	For writing research articles		
07	Others		

22. Please indicate the problems faced by you in making use of the UGC-Infonet E-Journal Consortium:

Sl. No.	Problems	Yes	No
01	Lack of knowledge to use		
02	Lack of sufficient Internet nodes in University Library		
03	Lack of accessibility to UGC-Infonet E-Journal Consortium at Dept. chamber		
04	Slow Internet bandwidth		
05	Technical Problems (server down)		
06	Frequent power cut		
07	Lack of relevant information sources		
08	Lack of assistance by library staff		
09	Others		

23. How would you rate your overall ability to use the UGC-Infonet E-Journals Consortium? Please indicate by marking (✓) the appropriate one:

- Beginner
 Above average
 Below average
 Expert
 Average

Awareness and Use of CD-ROMs

24. Please indicate your awareness & use of the CD-ROMs available in your University Library:

- Aware & Use**
 Aware But Do Not Use
 Not Aware

25. If you are 'Aware But Do Not Use' the CD-ROMs available in your University Library, please indicate the reasons for not using them:

Sl. No.	Reasons for Not Using CD-ROMs	Yes	No
01	Lack of knowledge to use		
02	Lack of sufficient number of computers in university libraries		
03	Lack of assistance by library staff		
04	Lack of relevant information sources		
05	Have own collection of CD-ROMs		
06	Lack of time		
07	Not accessible over campus LAN		
08	Cannot be borrowed for using outside the university library		
09	Other		

26. If you are 'Aware & Use' the CD-ROMs available in your University Library, please indicate how frequently you use them?

- Daily
 Once in two weeks
 Once in two days
 Once in a month
 Twice in a week
 Occasionally
 Once in a week

27. What type of information sources you have used on CD-ROMs? Please indicate by marking (√) all the relevant items:

Sl. No.	Information Sources	Yes	No
01	Full-text Journal		
02	Abstracting and Indexing journals		
03	Books		
04	Theses and Dissertations		
05	Reports		
06	Census Reports		
07	Dictionaries		
08	Encyclopedias		
09	Biographies		
10	Maps and Atlases		
11	Directories		
12	Others		

28. For what purpose you use the CD-ROMs?

Sl. No.	Purpose	Yes	No
01	To keep abreast with the latest developments		
02	For teaching preparation		
03	For own research		
04	For guiding research students		
05	For writing books		
06	For writing research articles		
07	Others		

29. Please indicate the problems faced by you in making use of the CD-ROMs:

Sl. No.	Problems	Yes	No
01	Lack of knowledge to use		
02	Lack of sufficient number of computers in university library		
03	Lack of assistance by library staff		
04	Frequent power cut		
05	Lack of relevant information sources		
06	Not accessible over campus LAN		
07	Cannot be borrowed for using outside the University Library		
08	Lack of time		
09	Other		

30. How would you rate your overall ability to use the CD-ROMs available in your University Library? Please indicate by marking (√) the appropriate one:

- Beginner
 Above average
 Below average
 Expert
 Average

Awareness and Use of Online Public Access Catalogue (OPAC)

(Please note: OPAC means computerized library catalogue)

31. Please indicate your awareness & use of the OPAC created / available in your University Library:

- Aware & Use
 Aware But Do Not Use
 Not Aware

32. If you are 'Aware But Do Not Use' the OPAC created / available in your University Library, please indicate the **reasons for not using it**:

Sl. No.	Reasons for Not Using OPAC	Yes	No
01	Lack of knowledge to use		
02	OPAC is not comprehensive		
03	Lack of sufficient number of computers		
04	Lack assistance from library staff		
05	Lack of time		
06	Non-availability in campus LAN		
07	Other		

33. If you are 'Aware & Use' the OPAC available in your University Library, please indicate the frequency of using the OPAC?

- Daily
 Once in two weeks
 Once in two days
 Once in a month
 Twice in a week
 Occasionally
 Once in a week

34. Please indicate the purpose for which you use the OPAC in your University Library:

- To locate book in the Library
 To check the availability of required book in the library
 To compile bibliography of books on a particular subject / topic
 To check the number of copies of the required book in the library
 To find out bibliographic details of books
 Any other (Please specify):

35. Please indicate the problems faced by you in making use of the OPAC:

Sl. No.	Problems	Yes	No
01	Lack of knowledge to use		
02	Lack of sufficient number of computers		
03	Frequent power cut		
04	Technical problems (under repair, etc.,)		
05	Lack of assistance by library staff		
06	OPAC not comprehensive		
07	Others		

36. How would you rate your overall ability to use the OPAC available in your University Library? Please indicate by marking (✓) the appropriate one:

- Beginner

 Above average
 Below average

 Expert
 Average

Awareness and Use of Electronic Information Services

37. Please indicate your awareness & use of the Electronic Information Services provided by your University Library:

- Aware & Use**

 Aware But Do Not Use

 Not Aware

38. If you are 'Aware But Do Not Use' the Electronic Information Services provided by your University Library, please indicate the reasons for not using them:

Sl. No.	Reasons	Yes	No
01	Lack of knowledge to use		
02	Lack of accessibility to E.I. Services to department chambers		
03	Lack of assistance by library staff		
04	Technical problems		
05	Frequent power cut		
06	Lack of time		
07	Other		

40. If you are 'Aware & Use' the Electronic Information Services available in your University Library, please indicate the **frequency** of using them?

- Daily

 Once in two weeks
 Once in two days

 Once in a month
 Twice in a week

 Occasionally
 Once in a week

41. Are the Electronic Information Services provided by your University Library adequate for your requirement? Please indicate:

- Adequate**

 Not Adequate

 Can't say

42. Please indicate the problems faced by you in making use of the Electronic Information Services:

Sl. No.	Problems	Yes	No
01	Lack of knowledge to use		
02	Lack of accessibility to E.I. Services to department chamber		
03	Lack of assistance by library staff		
04	Technical problems		
05	Frequent power cut		
06	Lack of time		
07	Other		

43. How would you rate your overall ability to use the Electronic Information Services available in your University Library? Please indicate by marking (√) the appropriate one:

- Beginner

 Above average
 Below average

 Expert
 Average

44. Please indicate to what extent the following provision of Electronic Information Services in your university library are important for you: (Please use this scale: 1=Most important; 2=Important; 3=Undecided; 4=Not important; 5= Not at all important).

Sl. No.	Electronic Information Services	Yes	No
01	Virtual Reference Service:		
a)	Getting answers from library staff for your queries via e-mail/ chatting		
b)	Getting assistance in using electronic sources such as CD-ROMs and Internet		
02	Referral services: seeking information about the availability of resources other libraries		
03	CAS:		
a)	Information about newly added collection		
b)	Circulation of content pages of journals		
c)	Circulation of research in progress		
d)	Circulation of library news bulletins		
e)	Information about forthcoming conferences / seminars		
04	SDI: Information to individual teachers about receipt of new resources added / required by him/her		
05	Document delivery service		

45. Please indicate to what extent the following provision of Electronic Infrastructure / Resource in your university library are important for you: (Please use this scale: 1=Most important; 2=Important; 3=Undecided; 4=Not important; 5= Not at all important).

Sl. No.	Electronic Infrastructure / Resource	1	2	3	4	5
01	Teleconferencing facility					
02	University Library Website					
03	CD-Net facility					
04	Institutional Repository					
05	Theses and Dissertation Database					
06	Archive of Open Access E-Resources					
07	E-mail Facility to interact with library staff and obtain E.I. services					
08	Separate Section in University Library for academic staff to use E- resources					
09	Campus LAN reaching academic dept. and residences of teachers					

46. Please indicate in which version / form you prefer to use the information source in your University Library?

Sl. No.	Information Sources	Electronic version	Print version	Both Electronic & Print versions
01	Primary Journals			
02	Conference Proceedings			
03	Theses and Dissertations			
04	Reports			
05	Newspapers			
06	Books/ Monographs			
07	Handbooks and Manuals			
08	Dictionaries			
09	Encyclopedias			
10	Biographies			
11	Abstracting and Indexing periodicals			
12	Geographical Sources			
13	Yearbooks			
14	Directories			
15	Others (please specify):			

Awareness and Use of User Education Programmes

47. Are you **aware** of the **User Education Programmes** conducted by your University Library?

Aware & Attended **Aware But Not Attended** **Not Aware**

48. If you are 'Aware But Not Attended' the User Education Programmes conducted by your University Library, please indicate the reasons:

Sl. No.	Reasons for Not Participated in User Education Programmes	Yes	No
01	Lack of information		
02	Not required		
03	Lack of time		
04	It was not for all		
05	Other		

49. If you are '**Aware & Attended**' the **User Education Programmes** conducted by your University Library, whether they were **adequate** to create awareness and enhance the use of Electronic Information Sources and Services among the Academic Staff? Please indicate:

Adequate **Not adequate** **Can't say**

50. Please indicate the number of user education programme/s you have attended:

- One Programme
 Two Programmes
 Three Programmes
 More than Three Programmes

51. Please indicate the problems faced by you while attending the User Education Programmes:

Sl. No.	Problems	Yes	No
01	User education programme was lecture-oriented, but not practical oriented		
02	The period was too short		
03	Too many participants		
04	Participants were from different subject background, hence in-depth discussion was not possible		
05	Others		

52. Please indicate to what extent the following provision of User Education Programmes in your university library are important for you: (Please use this scale: 1=Most important; 2=Important; 3=Undecided; 4=Not important; 5= Not at all important)

Sl. No.	User Education	1	2	3	4	5
01	Conducting Lecturers by experts					
02	Audio- Visual presentations / Demonstration					
03	Publishing user manual : handbooks, brochures in electronic and print form					
04	Training on Using: Internet					
a)						
b)	UGC-Infonet E-Journals Consortium					
c)	Subscribed Online Resources					
	CD-ROMs					
d)	Institutional Repository					
e)	Theses and Dissertations Database					
f)	OPAC					
g)	Electronic Information Services					

53. Please give your suggestions to improve the collection of Electronic Information Sources and Services in your University Library:

54. Please give your suggestions on measures to be taken by University Library about creating awareness and enhance the use the of Electronic Information Sources and Services in your University Library:

Place:
Date:

Signature