Chapter 1

Introduction

The information society purports as one of the essential traits of an individual to be a lifelong learner. It is accomplished either in a formal or informal way yet the libraries are the essential key facilities in this context. They will be serving as nodes connecting the education, teaching learning, with vast store of information resources both in traditional print and the modern electronic form, set with the global trend of resources of information and knowledge. Information is very important for all round development of an individual for the survival in the emerging knowledge society, and information technology that gives considerable power to free and open access and use. The advances in Information and Communication Technology (ICT) have already led to the creation of information networks, and libraries are now empowered with the facilities to access the world wide sources of information. The rapid growth in the volume of available information and the continuing technological changes, have radically affected the way information, is accessed, and made a significant effect on information seeking behaviour of users in the changing information environment from print to electronic sources of information.

The information is one of the primary resources essential for development in all the vital encounters of the life of enlightenment and empowered society. For its realization, it is necessary to inspire and encourage, the appropriately direct development initiatives at the national level all over the world. National development is the ultimate goal of any country to aspire whether it is developed or in a developing stage.
When an individual encounters with a query or a problem about which he finds a solution he needs information or knowledge and this situation is normally termed as individual need for information. To satisfy this need paves the way for an attempt to search for information and this act of searching and doing something at satisfying his or her own information needs is broadly termed as an individual information seeking behaviour.

Individuals use information for different purposes in any possible way. Some individuals use information for education, others for carrying out research and create new information and knowledge. Some use it for training and skill updating of self and of others and some use it in their professional advancement. Thus, the kind of need and the method of seeking information differ from individual to individual, and even from one group of individuals to another group of individuals. Those who use information for one or the other purpose are information users. Usually, most of the information users are engaged in education, learning and doing active research and thus they comprise, students, teachers, scientists, researchers, experts, managers, administrators and others in different fields of activity and are the ones dealing with information and knowledge seeking.

For decades information seeking behaviour of academicians and research scholars has been the focus of inquiry within the library and information science community, (American Psychological Association (APA), 1963-1969; Bath University, 1979, 1980; Earle and Vickery, 1969; Garvey and Griffith, 1963-1967, 1971; Garvey, Lin, and Nelson, 1970, 1971; Line 1971, 1973; Line, Brittain, and Crammer, 1971). Initially, Library and Information Science (LIS) researchers conducted use and user studies primarily for evaluating collections (Broadus, 1977a, 1977b, 1980; Christiansen, Davis, & Reed Scot, 1983; Subramanyam, 1983). These were followed by studies aimed at
discovering useful information about the research habits if individuals or groups to design appropriate systems and services that could facilitate those habits (Belkin, Oddy, & Brooks, 1982a, 1982b; Ellis, 1989, 1993; Kuhlthau, 1993; Marchionini, G. 1995). In response to calls in the mid 1980s for more focus on the user rather than the system, the LIS researchers experienced a major shift both in conceptualization and research design (Dervin & Nilan, 1986). Most use and user studies evolved into examination of information-seeking behaviour employing more holistic approaches to the study of information-seeking behaviour (Fidel, 1993; Pettigrew, Fidel & Bruce, 2001; Wang, 1999) this was characterized by a change in the nature of data collection from studying large groups via questionnaires or structured interviews, to studying small groups via observation or unstructured interviews. This was also, characterized by a change in the nature of the approach to analysis, in an attempt to generate models of the information-seeking patterns of individuals or groups (Ellis & Haugan, 1997).

Many studies have been carried out in the field of information seeking behaviour particularly on the use of electronic resources. A majority of the academics have computer skills that facilitate the use of electronic resources, although majority of them need extensive knowledge of electronic resources in the search, access and use. This study is to find out the kind of lacuna of knowledge and facilities in fulfilling the information needs of users in the academic institutions particularly in the area of professional and technical education. The earlier results have indicated that, the engineering faculties still use conventional way of seeking information from the table of contents of journals by browsing with the provision of support services like current awareness and other information support services to fulfill such needs. The researchers depend heavily on in-house information sources such as library-subscribed databases and they still pay attention to the journal name when referring to the journals, reference books
and textbooks are considered as the most popular sources of information used in study, teaching and research work. The information users need to be taught how to use available library resources and services. Since with the change from print to electronic environment in particular with the advent of the Internet and in particular the World Wide Web, the role of the library in this information age has been changing rapidly; no longer it is possible to depend only on building collection, but to build technology enabled facilities to vast store of information in the virtual environment and library professionals should serve as a diviner, innovator and guide to access to electronic information resources. In this context basically it is necessary that the library professionals should become self learners on the electronic journals and other E-Resources and their various file formats such as .pdf or .docx the most preferred sources of information for researchers in engineering and technology institution’s information users. It is due to the reality of the fact that the impact of E-Resources is visible with the gradual decrease in number of printed resources like books and journals and in comparison the increase in number of electronic journals. This has resulted in the upward trend in the use of E-Resources in manifolds. It is observed that, now-a-days, the print resources are being gradually replaced by the electronic resources in all their formats and categories.

Keeping in view, this study is mainly focused on how frequently engineering faculty seek information, how they keep abreast of current developments in the field. This study also emphasizes how often they visit the library in person, and how important library services and resources are in meeting their information needs, pertaining to their research and teaching requirements.
1.1 **Genesis and Growth of Electronic Information Resources:**

The information in electronic format was created with the advent of computer in 1950s, it was not until the early 1960s that the first database suitable for searching was developed (Meadow, 1988). The non-book materials like microforms started to appearing in the late 1960s (Taher and Davis, 1994). Sodak and Schwarz being the first to (1973) conceive electronic form of the scholarly journal; their vision was distribution of computer output microfiche to individual subscribers (Lancaster, 1995). MEDLARS was the first on demand computer-based information retrieval service, and it was developed primarily for the health sciences. In 1971, MEDLINE, the online version of MEDLARS, became the first major online dial-up database search service. DIALOG offered the first public online commercial database. With the introduction of CD-ROM in mid-1980 electronic resources began to have a major impact on selection practices in libraries (Meadow, 1998). The emergence of various distribution systems of electronic journals from CD-ROM was the first step to local data loading, where publishers provided image and text data directly to libraries (Barnes, 1997). The advances in computerized storage systems and the birth of World Wide Web in the late 1990s projected a new dimension to electronic information resources and services in the libraries and to the users. They moved from magnetic storage to optical storage devices from computer output microforms to the online information retrieval services. The advent of economic digital technology for mass storage and fast delivery across the computer networks started popularizing the E-Resources in various forms and formats. In pursuance of these developments in computer science, storage technology and the advent of Web easy and faster delivery, electronic resources started appearing in large scale in the new millennium. In view of these developments in computer and communication technology, it is appropriate to give an overview of electronic information resources.
1.1.1. Types of E-Resources:

Different types of E-Resources are available now both in open access and as commercials and also in different formats, on physical media to virtual media. Hence, under every heading few important open access sources are listed below:-

1.1 1.1 CD-ROMs:

CD-ROMs are chief E-Resources of a large amount of data with user friendly search software. It can be networked through a CD server or exist as a standalone unit with either specific or general in coverage. The CD-ROMs came with bibliographic databases to full-text mostly for specialized collections. Two examples are given below:-

1. The first CD-ROMs commercial bibliography database was published by Silver Platter Service Inc. (www.silverplatterservice.com) UK with built-in search software called SPIRS.

2. Current Contents on CD-ROMs was, published by Institute of Scientific Information (ISI), USA, which became known as Thomson ISI and now is part of the Intellectual Property & Science business of Thomson Reuters. www.ip-science.thomsonreuters.com

1.1.1.2. E-Journals:

E-journals may be defined broadly as any journal, magazine, webzine, newsletter or any type of electronic serial publication which is available over the Internet and that can be electronically accessed via the World Wide Web (WWW). The examples of E-journal sources are:

- Indian Academy of Sciences http://www.ias.ac.in/
- NISCAIR : http://nopr.niscair.res.in/
The databases of full text e-journals are on the increase. Besides the full-text many reference bibliographic databases covering many Abstracting and Indexing services are also available on the Web and which are easily accessible from user desktops. Some examples are:

- MEDLARS
- ERIC database on education
- Agricultural online access (Agricola)

1.1.1.3. **E-Books:**

An e-book is the electronic version of a book covering its full contents (text, tables, diagrams, illustrations, etc.) An e-book collection is usually set up in an e-database, which supports full-text searching within and across titles, advanced search and bookmark functions. A good number of e-books are available in most of the subject areas online which can be accessed from Web either free or on payment. Some e-books are available for browsing online or in some cases titles can be downloaded from net.

1.1.1.4. **E-Courseware:**

The MIT Open Courseware portal pioneered the high quality online university courses available freely. Even in India the IGNOU e-Gyanakosh portal provides open courseware of all courses offered by the University. The examples are:

- MIT Open Course Ware: [http://ocw.mit.edu/](http://ocw.mit.edu/)
- IGNOU – e-Gyanakosh: [http://www.egyanakosh.ac.in](http://www.egyanakosh.ac.in)

1.1.1.5. **E-Standards:**

Major Standard Organizations have hosted their Standards databases on the Web for access.

1.1.1.6. E-Patents:

Now Patents are available through open access and some of the important Patents Organizations accessed through online are mentioned below.

- World Intellectual Property Organization: [http://www.wipo.int/portal](http://www.wipo.int/portal)

1.1.1.7. ETD-Electronic Theses and Dissertations:

Many Indian and foreign Universities have initiated projects ETD and they are:-

- VIDYANIDHI - University of Mysore: [www.vidyanidhi.org.in](http://www.vidyanidhi.org.in)
- Shodhganga - INFLIBNET: [www.shodganga.inflibnet.ac.in](http://www.shodganga.inflibnet.ac.in)
- British Library - ETHOS (Electronic Theses Online Service): [http://ethos.bl.uk/Home.do](http://ethos.bl.uk/Home.do)

In addition to the above E-Resources which cater to the needs of scholarly scientific literature to the users, the Weblogs’, Wikis and the Social Network sites are also becoming popular E-Resources for the scientific community for sharing and exchange of their research publications. In recent years, the organization like Creative Commons is encouraging open access to scientific literature to overcome copyright restrictions on the open access to the scholarly communication.
1.2 Consortia Approach to E-Resources:

The growth of E-Resources in particular the scholarly literature with parallel advances in ICT facilitated with faster access to and delivery of information to libraries and publishers have adopted a new approach to provide E-Resources access and services to the users through E-Resources consortia. The libraries thus have witnessed a great metamorphosis in recent years both in their collection development and in their service structure. Over the last several years, a significant transformation has been noticed in collection development policies and practices. The libraries in India have an option now to subscribe to the full-text and reference databases through consortia of digital resources. Most of the important publishers now offer Web-based interfaces and full-text of their journals. Some of the major players in electronic full-text journals publishing include:-

- Association for Computing Machinery (ACM): [www.acm.org](http://www.acm.org)
- American Society for Civil Engineers (ASCE): [http://www.asce.org](http://www.asce.org)
- Association for Mechanical Engineers: (ASME): [http://asmedigitalcollection.asme.org](http://asmedigitalcollection.asme.org)
- ASTM Digital Library (ASTMDL): [http://enterprise.astm.org](http://enterprise.astm.org)
- Business Source Elite (EBSCO): [http://search.ebscohost.com](http://search.ebscohost.com)
- Emerald Insight: [www.emeraldinsight.com](http://www.emeraldinsight.com)
- The Institution of Engineering and Technology (IET): [www.theiet.org](http://www.theiet.org)
- Institute of Electrical & Electronics Engineers (IEEE): [http://ieeexplore.ieee.org](http://ieeexplore.ieee.org)
- Journal Gateway (J-Gate): http://www.jgate.in
- Springer Verlag (Link Electronic Service): http://link.springer.de/
- Springer: www.springer.com
- Wiley Interscience: http://www.wiley.com/

As many as 17 Digital Library Consortia are operating in India now and the example of the consortium for engineering and technology institutions is the INDEST: Indian National Digital Library in Engineering and Science and Technology was set up in 2003, (panit.iitd.ac.in/indest/).

Moreover electronic journals, one of the cornerstones of the digital library, have grown steadily in number (APL, 1997). Besides electronic journals, there are several online databases that are now available through the Web including MEDLINE (several versions), AGRICOLA, and ERIC. Reference works like encyclopedias, dictionaries, handbooks, atlases, etc. are also making their electronic appearance on the Web. Web of Science (http://www.isinet.com/) IEEE/IEE Electronic Library (http://www.ieee.org/ieeexplore/), Engineering Sciences Data Unit (http://www.esdu.com) are some of the important examples. Several digital library projects are concerned with providing digital access to materials that already exist within traditional libraries in printed media. The digitization of the library collections has given a new mission to librarians in terms of providing training to the users in the skills needed to discover access to in-house as well as remote materials, and in evaluating the retrieved information. In a digitized library, an engineering college librarian is required to be an active player-retrieving information from vendors, publishers, websites, and other E-Resources on the one hand; and processing and transmitting it to the users on the other
hand. The information has to be transmitted to library staff by training and upgrading of skills.

1.3 Information Seeking Behaviour:

Information seeking is a fundamental human process closely related to learning and problem solving. Nature has evolved tools and methods to support information seeking, resulting in physiological and psychological abilities that are well suited to information seeking. Our cognitive process adopts various organizational structures and systematic strategies for filtering, comparing, and storing information in a variety of media. Our emotive selves derive stimulation and pleasure from seeking and integrating information. Information seeking is thus a natural and necessary mechanism of human existence. Today, the generation, storage, and communication of information are inextricably linked with technology and today without technology to manage the generation, storage and flow of information is impossible. Thus, one of the key changes in the information society is that information seeking has become a fundamental skill for larger portions of the populations in order to survive and prosper and they must use an expanding array of technologies to do so.

Information seeking, like learning, is a fundamental and high level cognitive process, information seeking is often part of learning or problem solving, but it is also distinct. Information acquired during learning is stored, so that it can be recalled and used at a later time, although information acquired as a result of information seeking may be useful for a specific task and then discarded. Some of the elements related to information seeking are described in brief below.
1.3.1 Information Need:

Line (1974) emphasized that information need arises when a person requires a gap in his/her state of knowledge and is to be resolved and wishes to resolve the anomaly. Information need arises out of a desire to meet one or another of the three basic human needs:- physiological needs (food, shelter etc.) psychological needs (security etc.) and cognitive needs (to plan, to learn a skill etc.). A need is a potential demand for information.

1.3.2 Information Want:

Brittain (1971) has proposed in his draft definitions of need, want etc. As a ‘Want is what an individual would like to have, whether or not the want is actually translated into a demand on the Library. Individuals may need an item they do not want, or want an item they do not need. A want, like a need, is a potential demand.

1.3.3 Information Demand:

Information demand is what an individual asks for, more precisely, a request for an item of information believed to be wanted. Individuals may demand information they do not need, and they may not demand information, which they actually need. Demand is partly dependent an expectation, which in turn depends partly on existing provisions of library and information service. A demand is a potential use.

1.3.4 Information Use:

Information use is what an individual actually uses. A use may be satisfied demand, or it may be result of browsing or information recognized and received accidentally, which is not previously articulated in to a demand. Individuals can only use what is available; use is therefore heavily dependent on provisions and availability of information sources and information services.
1.4 Definitions:

Some definitions on information behaviour, information seeking behaviour, information searching behaviour and information use behaviour are given here for the purpose of understanding their expressions and use. The definitions are given by Wilson, who has contributed in the area of human information behaviour. (Wilson, 2000).

a) Information Behaviour is the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking, and information use. Thus, it includes face-to-face communication with others, as well as the passive reception of information as in, for example, watching TV advertisements, without any intention to act on the information given.

b) Information Seeking Behaviour is the purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the individual may interact with manual information systems (such as newspaper or a library), or with computer-based systems (such as the World Wide Web).

c) Information Searching Behaviour is the ‘micro-level’ of behaviour employed by the searcher in the interacting with information systems of all kinds. It consists of all the interactions with the system, whether at the level of human computer interaction or Boolean search strategy or determining the criteria for deciding which of two books selected from adjacent places in a library shelf is most useful, which will also involve mental acts, such as judging the relevance of data or information retrieved.

d) Information Use Behaviour consists of the physical and mental acts involved in incorporating the information found into the person’s existing knowledge base. It may involve, therefore, physical acts such as making sections in a text to note their importance or significance, as well as mental acts that involve, for example, comparison of new
information with existing knowledge. It was felt that provision of few definitions to some of the terms used in this would be of much help in understanding the implications.

1.5 Information Seeking in Electronic Environment:

Information seeking according to Marchionini is: “We are concerned here with search for information that we call information seeking, process in which humans purposefully engages in order to change their state of knowledge. The term search is used to mean the behavioural manifestation of human engaged in information seeking and also describe the action taken by the computers to match and display information objects”. He further states that “throughout our lives we develop knowledge, skills and attitudes that allow us to seek and use information”. So it is apt to find how information is sought and used in electronic environment. In the electronic environment more information is available in digital forms that is more dynamic, accessible anywhere anytime. The trend is that much of the information in future will be made available in electronic form. An individual’s collective abilities, experiences, and resources to gather, use, and communicate information are referred to as a personal information infrastructure or information management skills. In electronic environment there will be more interactivity than in the print media as in the latter it is more a monotonous affair or it could be introspective, only if the user has comprehended the content of the information. A personal information infrastructure is a collection of interacting mental models for specific information systems; mental models for events, experiences, and domains of knowledge; general cognitive skills and specific cognitive skills related to organizing and accessing information, materials resources such as information systems, money, and time, meta-cognitive resources for planning and monitoring thought and action; and attitudes towards information seeking and knowledge acquisition.
Nicholas and others have reappraised the information seeking in digital environment as have found new typology of digital users. “The characteristic behaviour found is one of bouncing in which users seldom penetrate a site to any depth, tend to visit a number of sites for any given information need and seldom return to sites they once visited. They tend to “feed” for information horizontally, and whether they search a site or not depends heavily on “digital visibility”, which in turn creates all the conditions for “bouncing”. “Ge has after examining the information-seeking behavior of scholars in these fields, six characteristics of seeking: starting, chaining, browsing, differentiating, monitoring, and extracting”. Information seeking is fundamentally an interactive process. It depends on initiatives on the part of the information seeker, feedback from the information environment, and decisions for subsequent initiatives based on the feedback. Our personal information infrastructures serve to regulate and standardize our interactions with information. It is necessary to comprehend the interactive nature of information seeking, to understand why electronic environments are so conducive to information seeking.

1.6 Purpose of the Study:

There is steady growth of engineering colleges in India in the last two decades and in Karnataka it is more significant than other states. The growth trend has been upward since last decade of the 20th century due to ‘liberalization, privatization and globalization’ (LPG) policy adopted by the government. This triggered the need for engineering graduates in the country and abroad which was catalytically enhanced with the advances in the ICT. Besides number of the colleges, the number of courses and specialization has also been on the increase with diversity of engineering subjects – like nanotechnology, signal processing, digital communication, mobile technology and areas like biotechnology and environment science and engineering courses have also been
introduced in engineering colleges. This diversity has been responsible for the new information resources emerging in these areas. Additionally the advent of e-content its acquisition, processing and organization and putting into use by the libraries of engineering institutions started posing challenges on the changing demands and needs of information seekers. The advent of digital library consortia to access to E-Resources added complexities as users are drawn to new information environment - the electronic environment and to know their information needs, to facilitate access, deliver information added a dimension to know the information needs and information seeking behaviour of users in the new electronic environment. There are diversities in subject fields, sources, therefore the needs and seeking process is also becoming quite different. The Internet and the World Wide Web is providing free and open access to scholarly literature and this sought to know the changing information needs and behaviour of users in the electronic and/or digital environment. So to know the present situation of engineering college libraries affiliated to the Visvesvaraya Technological University (VTU), Belgaum was the most purposeful intend of this study. The purposes of the study are;

- To identify the current status and kinds of user needs,

- To study various aspects of E-Resources and their developments,

- To identify the importance of various E-Resources in engineering institutions,

- To save the time of the user in gathering and search of required information,

- To design and develop need-based and user-oriented information systems and services,

- To suggest various access procedure and usage aspects,

- To prepare the users to have the liberty to seek information independently,
- To know the user’s knowledge, abilities and skills and self-reliance to access to information.

1.7 Statement of the Problem:

The research problem after identifying the purpose of the study is conceived under the title “Information Seeking Behaviour in an Electronic Environment in Libraries among Teachers and Research Scholars of Engineering Colleges under Visvesvaraya Technological University, Karnataka: A Study”.

This study describes and analyses the information seeking behavior of engineering faculty members who are engaged in teaching and pursuing research in the VTU affiliated engineering colleges coming with the jurisdiction of Bangalore region. It attempts to explore the background of research scholars, similarities and dissimilarities of their characteristics, their information seeking behaviour and academic accomplishments. It will also attempt to correlate information seeking behaviour and environmental factor that influence human behaviour.

1.8 Need for the Study:

The need for the present study has been felt for the reason that, very few studies has been reported so far, about information seeking behaviour of users in electronic environment at four tiers of academician’s viz., Professors, Associate Professors, Assistant Professors and Research Scholars working in engineering colleges in the specified region. Further, such study has been necessitated due to extensive use of information and communication technologies with close relation to growing need and demand for access to E-Resources in engineering colleges at Bangalore region. Hence, the study has been considered as one of the important investigations in this vital area of engineering education.
1.9 **Significance of the Study:**

The study has high significance in the present day of information explosion and its global accessibility with a concept of ‘library without walls’. The single force that has brought revolutionary changes in functioning of libraries in IT environment has been the tremendous growth of E-Resources. The influence of IT has forced the libraries to provide E-Resources to its end users like teachers, research scholars and students at their place. The functionality of the E-Resources and policy matters from the assessment and accreditation authorities like All India Council for Technical Education (AICTE), Visvesvaraya Technological University (VTU) and National Board of Accreditation (NBA) which have significantly mandated the Libraries as important central facilities in the institutions of higher learning and especially in professional colleges. This has been emancipated with the recognition given to the libraries as learning resource centers, support research in the engineering institutions and hence the study draws enough significance in this context. The information seeking in electronic environment has been further emphasized as significant aspect of this study.

1.10 **Scope and Limitations of the Study:**

The scope of the present study is limited to the teachers and research scholars working in engineering colleges under Visvesvaraya Technological University (VTU), Karnataka. The number of engineering colleges affiliated to VTU is around 200 and it would be difficult to cover the entire population of institutions which are spread along the length and breadth of the state. The engineering colleges under VTU are grouped under four regions viz., Bangalore, Belgaum, Gulbarga and Mysore. The scope of this study is limited to the colleges coming under the purview of Bangalore region representative engineering college libraries. The geographical limits of Bangalore region comprises of
six districts and considered in the survey are; Bangalore Rural, Bangalore Urban, Chikkaballapur, Kolar, Ramanagar and Tumkur. This study covers the information seeking behaviour of faculty and researchers of ninety eight engineering colleges affiliated to Visvesvaraya Technological University, Belgaum, coming under Bangalore region.

1.11 Objectives:

The main objectives of the study are;

- To characterize the profile and levels of users of engineering college libraries
- To identify and study the information needs, demand and information seeking behaviour of users in an electronic environment
- To assess the purpose of information seeking
- To determine the nature and type of information required
- To determine the purpose(s)/motives in seeking and collecting information
- To study the degree of dependence on formal and informal sources of information
- To know the problems faced by the respondents while accessing to the E-Resources
- To assess the frequency of use of E-Resources
- To assess the level of satisfaction about E-Resources
- To find out the latest trends and nature of information required for academic community
1.12 Hypotheses:

Following hypotheses have been formulated to study the information seeking patterns and behaviours of engineering college library users identified specifically as Teachers and Research scholars.

1. There is a significant difference between different designated teachers and the methods by which they keep abreast of current developments in their fields.

2. There is a significant difference between various courses taught by teachers and the methods by which they keep abreast of current developments in their fields.

3. There is a significant difference between the experience of teachers and the methods by which they keep abreast of current developments in their fields.

4. There are differences in knowledge, skills and attitudes among the teachers and research scholars in their information seeking patterns.

5. There are also variations in information seeking behaviour by their subject specializations.

6. There are differences in information seeking among teachers with their functions in teaching and research.

7. The differences in information seeking are also identified, by gender, age, experience and subject specializations.

1.13 Methodology:

A Survey method of research has been adopted to collect primary data from engineering college teachers and research scholars from the Bangalore region engineering colleges. A structured questionnaire was designed to administer the same to the faculty members and
research scholars to elicit required information. The questionnaire design intends to cover
general questions and the questions related to information-seeking behaviour. To improve
reliability of the data, and to enhance the quality of research, interview with select faculty
was conducted. The questionnaire technique is used since there is no possibility of
observing faculty members behaviours. The questionnaire was validated both by face
validity and content validity.

The questionnaire elicited information on the following aspects;

a. Nature and type of information required
b. Purpose for which information being collected and used
c. Dependency of information sources
d. Extent of dependency on Library/information resources etc.,
e. Details of library, its usefulness, etc.,
f. Ways of getting relevant information
g. Mode of searching information, delegating the task to others and details
h. Information sharing
i. Motivation to seek and collect information.

1.14 Sources of Data:

Having decided the methods for collecting data for the research, it has been important to
take a decision about the sources of data for the study from which the information can be
obtained or collected. In the present study, sampling method has been adopted to collect
data for analysis, because only a part of the population is to be inspected and examined.
Keeping the objectives of the present study in mind stratified or controlled sampling has
been employed to get adequate representation of the colleges from different parts of the
region through the survey method. Faculty members who are teaching undergraduate courses and post graduate courses and research scholars who have undertaken research work as well as teaching were considered for the study as the sample frame. The data collected has been analyzed with descriptive statistics methods using SPSS software package and presented in the form of Tables and Graphs for the goal of a clear understanding of the survey results.

Stratified random sampling was adopted in administering questionnaires to faculty members, i.e. faculty members and research scholars representing from various subject disciplines with the engineering and basic science faculty is maintained. The 98 engineering colleges in Bangalore region under VTU are aimed to cover in the study are listed in Appendix - II.

1.15 Design of the Study:

It is appropriate before designing the study the teaching and research potentialities available in the VTU and to its teachers and research scholars. The research scholars especially in engineering and basic science disciplines are currently perusing research under VTU recognized research centers in different colleges in Bangalore region in the following engineering disciplines: Aerospace engineering, Architectural engineering, Automobile engineering, Biomedical engineering, Civil engineering, Chemical engineering, Computer Science & engineering, Electrical engineering, Electronics engineering, Industrial engineering & Management, Industrial & Production engineering, Information Science & engineering, Instrumentation Technology, Manufacturing Science & engineering, Mechanical engineering, Medical electronics, Mining engineering, Polymer Science & Technology, Silk Technology, Telecommunication engineering, and Textile Technology. The Teachers holding the position of Assistant Professor, Associate
Professor, Professor and above are covered in the survey. The study is further delimited to the researchers from UG departments and not from PG departments. It covers the teachers working in the respective colleges and enrolled as research students of the recognized centers only.

The purpose of information seeking is to establish communication among people and the information system, who share a concern about similar demands and purpose. Documents are only one means towards this end. The scope of this study is restricted mainly to the current and future information requirement of 98 Engineering colleges library users in Bangalore Region of VTU, Belgaum.

1.16 Survey and Analysis:

The survey method was considered most appropriate for this study because it measures users background, experience and what they know about seeking information in electronic environment and it was well suited to the research questions taken up for this study. The data has been obtained by using well designed questionnaire which was standardized for comparison. The study was carried out in two phases.

This study covers the teachers and scholars of various engineering colleges affiliated to Visvesvaraya Technological University (VTU), Belgaum, Karnataka aims to know “Information Seeking Behaviour in an Electronic Environment in Libraries among Teachers and Research Scholars of Engineering Colleges under Visvesvaraya Technological University, Karnataka” and dependency level of teachers and scholars for E-Resources provided by their Libraries. The faculty members who are teaching undergraduate courses and postgraduate courses and research scholars who are undertaking research work as well as teaching were considered for the study as the sample frame. The teachers and scholars working in engineering colleges of Bangalore
region which comprises of six districts such as Bangalore Rural, Bangalore Urban, Chikkaballapur, Kolar, Ramanagar and Tumkur were only considered. Sufficient time was given to the respondents to furnish the required data. A total of 1000 questionnaires were administered personally and 866 duly-filled-in questionnaires were received with a response rate of 86.06% and were considered for analysis (See Table 5.4). All the responses were tabulated, analyzed and interpreted by using SPSS package; certain statistical measures like mean, standard deviation, were obtained and Chi-Square test was conducted on data. The Factor analysis using Kaiser-Meyer-Olkin Tests and Bartlett’s Test was conducted. Survey method has adapted to study whether the teachers and scholars use the E-Resources, places for searching of E-Resources, awareness of the teachers about their library subscribing for e-Resource portals, most useful E-Resources for Teaching, Research and Development, frequency of access to their various tasks, how often they give visit to library, an average time spend to keep abreast current developments in the field, various advantages and disadvantages, the problems faced while accessing E-Resources, adequacy of infrastructure like e-Book reader facility, orientation programme for using E-Resources and information seeking habits of teachers and scholars and other such aspects connected with the study.

The total survey population of 866 was taken on the basis of availability of users during the time of the survey. The total number of users surveyed was based on random selection and categorized as Professors, Associate Professors, Assistant Professors and Research scholars working in various departments of the selected engineering colleges under Visvesvaraya Technological University, Belgaum, Karnataka. The accessibility and availability issues regarding the information were discussed with the experts, and Professors and the questions proposed by them were incorporated in the questionnaire
prepared for the final research study. Interpretations have been drawn more carefully, cautiously and judiciously as far as possible.

1.16.1 Design of Questionnaire schedule and pilot study:

The study has used the questionnaire tool to assess the opinion of the respondents. A structured questionnaire was used as tool in order obtain maximum results and avoid drawback of bias in interview and observation method. The total survey population of 1000 from 98 engineering colleges would be taken on the basis of availability of users during the time of the survey. The total number of users to be surveyed based on random selection that are considered as active users and categorized as Professors, Associate Professors, Assistant Professors and Research scholars working in various departments of the selected engineering colleges under VTU, Karnataka.

1.16.2 Time schedule:

The schedule for collection of data from the respondents is fixed at six months from the month of September 2012. As per the plan, the data was collected within six months of duration from 27th September 2012 to 27th March 2013.

1.16.3 Pilot and Full study:

The Pilot study was conducted with 10 or 5 percent of stratified random sample taken from the total population. A questionnaire (Appendix - I) was used to collect the data from faculty members and research scholars. The data was analyzed on the basis of results of the pilot survey. The questionnaire was administered to the teachers and research scholars of selected VTU Engineering colleges. Based on the available infrastructure, resources and services available in the college libraries, 98 colleges are
identified as sample frame for this study. Out of which 866 duly filled-in by the respondents were received with answers from 88 colleges.

1.16.4 Attitude of the Respondents:

Due to certain practical problems, it was not possible to obtain information from each of the selected colleges. For instance, some of the respondents were not available at their places during the period of investigation. A small number of respondents did not return the questionnaire in time. Others supplied vague, ambiguous, incomplete and unintelligible information, which may digress the results and findings. The incompleteness of information, known as non-response is very likely to change the results of the survey. So attempts were made to minimize the non-responsive and unanswered questions. Successive reminders were sent and personal visits were made at regular intervals requesting the respondents to hand over the questionnaires as early as possible.

However, it was found that the teachers and research scholars in majority were very cooperative in answering the questions seriously with their valuable ideas and opinions. Even an interacting with them has been an exciting experience.

1.17 Organisation of the Thesis:

The thesis has been organized in a standardized logical pattern. The general format of the thesis can be considered as consisting of three main general divisions. Each of the division may be outlined in the following way. The first division is Preliminaries which include the Title page, Certificate from the Research Supervisor, Declaration, Acknowledgement, Abstract, List of Tables, List of Figures, Abbreviations and Acronyms Used and Table of Contents. The second division is the Main Body of the
thesis which includes seven main chapters. The third division is consisted of Bibliography, selected Websites, Appendix - I (Questionnaire), Appendix - II (List of Colleges), and Appendix - III (List of publications).

1.18 Summary of the Chapters:

The study has been organized into seven main chapters. A brief summary of each chapter has been mentioned below:

**Chapter 1 -** Introduction: It deals with Genesis and growth of electronic information resources and types of E-Resources. It provides an overview of consortia approach to E-Resources, information seeking behaviour, definitions and information seeking in electronic environment. The Statement of the problem, need for the study, significance of the study, scope and limitations of the study has been followed with objectives of the study, research hypotheses, methodology adopted for research, sources of data, design of the study, the method and summary of the chapters and organization of the thesis are also presented.

**Chapter 2 -** Review of Literature: It has been discussed on the following headings: Information Seeking Behaviour in General, Ellis Model of Information Seeking behaviour, Review on Information Seeking Behaviour, Electronic Resources, Digital environment, E-Resources in engineering colleges of India, E-Resources in engineering colleges of Bangalore region, user behaviour in electronic environment, and lastly summing up are covered in the chapter.

**Chapter 3** Presents the Growth and Development of Engineering Education, Technical Education System in India, Profile of Karnataka State, Genesis and growth of engineering education in Karnataka, Organizations for engineering education, establishment of All
India Council for Technical Education, National Board of Accreditation, Directorate of Technical Education and Visvesvaraya Technological University with list of approved UG and PG Courses. It also gives an overview of E-learning Initiatives at VTU, EDUSAT based distance education, and Web based e-learning programme and its Library facilities.

Chapter 4 Provides an Overview on the Developments in Electronic Information Resources, Current Trends and Developments on E-Resources, E-Resources Consortia - New paradigm to share E-Resources, E-Resources consortia in India, E-Resources Scenario in Engineering Colleges Libraries, VTU Consortium, issues and challenges and finally a summing up has given in the chapter.

Chapter 5 deals with Analysis and Interpretation, the responses, designation of respondents, courses taught by the respondents, years of experience of teachers, Analysis of data on library use, certain statistical measures like mean, standard deviation, percentage, Chi-Square, factor analysis using Kaiser-Meyer-Olkin Tests and Bartlett’s Test for E-Resources in R&D work and summing up are drawn here.

Chapter 6 highlights the Major Findings, on Respondents’ Criteria with fulfillment of the Objectives and validity of Hypotheses are examined here on Library and Resources Use, also Other Findings, ICT infrastructure facilities, opinion on E-Resources, user training programme, user information seeking behavior, findings of the Factor Analysis Kaiser-Meyer-Olkin Tests for Sampling Adequacy and Bartlett’s Test are used here. Suggestions and findings have been drawn here based on the analyzed data in the previous chapters.

Chapter 7 presents a Preamble to the study and final Conclusion on the study, Points for Further Research have been provided.
The thesis has made references to literature in support of its findings which forms the part of References. In the Appendices, the Specimen Questionnaire for Teachers and Research Scholars, List of Engineering colleges included in the study, list of publications, are presented in the last part of the thesis.