INTRODUCTION
Chapter 1
Introduction

Information is a key resource for the progress and development of any organisation. Timely availability of relevant information is vital for the effective performance of managerial functions such as planning, organizing, implementation, and control. A well established and well-designed information system to facilitate the users of a library is essential for the success of any institution. To be successful, any project requires the efficient management of human and material resources. This cannot be done unless accurate, timely and relevant information is available to decision makers and the library users. Information not only facilitate their ability to make valid decisions and statements about academic and research activity, but information also enables the users to get quality information to fulfill their desired needs. Engineering disciplines in particular are special branches of professional knowledge which frequently require updating by the intellectuals. Here the library acts as the facilitator and provider of need-based information to such highly intellectuals and academicians.

Academic libraries in engineering institutions are prominent information organisations and play a crucial role in fulfilling the information needs of users of professional disciplines. The use of technological information emanating from these libraries contributes not only to the national development but also to the technical manpower development in engineering fields. Students, faculty members and research scholars in engineering subjects need constant updating of latest information in their respective field of interest. Latest information in their subject enables them to support their academic and research needs. They are more concerned about the speed and easy accessibility to the current information they search for. In order to make their study, teaching and research work more effective, they need right information sources to consult that only available in the libraries. Thus, such a library is expected to identify, acquire, organize, store, retrieve and disseminate information not only on the specific subjects covered by the curriculum, but also on the current direction of technological advancements. The library professionals working in these institutions should pay paramount importance to acquire appropriate and need based literature in
those subjects to the utmost satisfaction of their users. In this critical situation, librarians should have a clear understanding of their users' needs and their information seeking behaviour. Unless the needs are precisely determined, it is difficult to satisfy their requirements and develop an appropriate information system. Hence, identifying information needs and usage pattern of information resources, facilities and services of the students, faculty members and research scholars of engineering institutions is the crux of the problem for the development of the library and information system.

1.1 Engineering Education: An Overview

Engineering education is a skilful, artful and constructive education. Technical education plays a vital role in the social and economic development of our nation. Engineering education, unlike other kinds of professional education, does not have a long history. Though people in ancient and medieval civilization had built large brick and stone houses, castles, sites, and huge temples, constructed long highways and aqueducts and dug canals, which showed considerable knowledge of what is now called civil and hydraulic engineering as well of properties of building materials, this knowledge must have been derived empirically. The beginnings of mechanical engineering are to be found in the manufacture and use of tools, means of transport, simple machinery like lathes, and weapons of offence and defense. The rudiments of chemical engineering are to be seen in the old metallurgical practices. But there were no organised schools for teaching apprentices the use of machinery or knowledge of processes, the knowledge was passed from generation to generation of craftsmen and artificers, by word of mouth, and was thus confined only to the castes and guilds.

With the rise of engineering as a profession in the eighteenth century, the term became narrowly applied to fields in which mathematics and science were applied to these ends. Similarly, in addition to military and civil engineering, the fields then known as mechanic arts became incorporated into engineering.

1.2 Engineering Education in India

Engineering education in India began with the establishment of the Government College of Engineering at Guindy (Tamil Nadu) in 1794, which was
followed by the Thomson Engineering College at Roorkee (U P) in 1847 and the B E College, Howrah (West Bengal) in 1856. It was only after Independence that engineering and technological education got a boost. The development of technical education has been one of the major achievements of the post-independence period.

The All India Council for Technical Education (AICTE) was set up in November 1945 based on the recommendations of the Technical Education Committee of the Central Advisory Board of Education (CABE) to stimulate, coordinate and control the provisions of educational facilities and industrial development of the post-war period. At that time, the mandate of AICTE basically covered only programs in Engineering and Technology. All India Council for Technical Education (AICTE), an apex organization is responsible for the proper planning and the overall development of technical education in India. Programs for technical education, during the first three Five Year Plans, were devoted to expansion of technical education to meet the growing demand for technical personnel at diploma, degree and post-graduate levels. From the fourth Five Year Plan onwards, the emphasis was shifted to the improvement of quality and standard of Technical Education. This was done through implementation of the Quality Improvement Program consisting of three major components that provided for M.E/M.Tech and Ph.D programs, establishment of curriculum design and development cells, and short term training programs.

Meanwhile, expansion of institutions and intake remained at a low level in the government, private aided and university sectors. The policy shift during eighties towards involvement of Private and Voluntary Organizations in the setting up of Technical and Management Institutions on self-financing basis ushered in an era of unprecedented expansion of the Technical Education System, a trend which has continued during successive Five Year Plans. It was in this context that AICTE was given statutory powers by the AICTE Act of Parliament in 1987, with a view to ensure the proper planning and coordinated development of Technical Education System throughout the Country.

The growth of Technical Education before independence in the country has been very slow. The number of Engineering Colleges and Polytechnics (including Pharmacy and Architecture Institutions) in 1947 was 44 with an intake capacity of...
Due to the efforts and initiatives taken during successive Five Year Plans along with policy changes in the eighties to allow the participation of Private and Voluntary Organisations in the setting up of Technical Institutions on a self-financing basis, the growth of Technical Education has been phenomenal. Growth of Engineering Colleges in India is shown in Table 1.1

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Engineering Colleges</th>
</tr>
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<tbody>
<tr>
<td>2006-07</td>
<td>1511</td>
</tr>
<tr>
<td>2007-08</td>
<td>1668</td>
</tr>
<tr>
<td>2008-09</td>
<td>2388</td>
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<td>2009-10</td>
<td>2972</td>
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<tr>
<td>2010-11</td>
<td>3222</td>
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<tr>
<td>2011-12</td>
<td>3393</td>
</tr>
<tr>
<td>2012-13</td>
<td>3495</td>
</tr>
</tbody>
</table>

Engineering education in India is broadly structured into three levels: at the initial level, Industrial Training Institute (ITIs) offer certificate courses, then polytechnics offer diploma courses, and finally, engineering colleges and IITs, NITs, and Universities offer graduate, post graduate, and Ph.D. degree courses (AICTE, 2013).

1.3 Engineering Education in Karnataka

In Karnataka, the first Engineering College was started by the Mysore Government in 1917 at Bangalore. After 1946, three more colleges were started. By the time of the Integration of the State, there were in total five engineering colleges (two Government and three private) in the State. By 1993-94 there were 47 Engineering Colleges in the State, of which four were Government institutions, nine were aided, and the rest unaided.

The Visvesvaraya Technological University (VTU) was been established in 1998 by the Government of Karnataka in order to promote a planned and sustainable development of technical education consistent with state and national policies. VTU is one of the leading Technological University in India with a vision to become an
outstanding Technological University at the cutting edge of Science and Technology that produces world class knowledge-delivery, research, extension and leadership in technology innovation for industry and society. The University offers undergraduate, postgraduate, and PhD programmes in the fields of engineering, management and computer applications. Presently, there are 208 colleges affiliated to the University. The colleges are categorised as government, private-aided, and private-unaided based on the type of funding. A few colleges are classified as Minority Linguistic and Minority Religious based on the minority status of languages and religions. Further, these colleges are placed under the Autonomous and Non-Autonomous category of institutions based on the autonomy granted by UGC (VTU, 2012).

The Manipal Institute of Technology (MIT) was the first engineering college established in 1957 in the Udupi district. (formerly Dakshina Kannada district). After that in 1960, The Karnataka Regional Engineering College, presently known as National Institute of Technology Karnataka (NITK), was established in Dakshina Kannada district. At present, there are 20 Engineering Colleges in Dakshina Kannada and Udupi districts affiliated to VTU, AICTE and MAHE. Out of these, 17 are in Dakshina Kannada and 3 are in Udupi districts.

1.4 Information Resources, Facilities and Services in Engineering College Libraries

Information is broadly defined as recorded or communicated knowledge gained through experience, observations, experiments, and other means. It is a vast, dynamic, and inexhaustible resource related to a variety of disciplines. Everybody wants to gain information to sharpen his knowledge, this vital information is recorded in the form of documents. Information is an important and essential input for all types of organizations. The achievement of an institution ultimately depends on the information infrastructure available, and poor information management threatens the successful accomplishment of an institution process (Biradar, Kumar and Mahesh, 2009). The recorded information sources can be categorised in a number of ways, in terms of their physical forms, content, and so on. The recorded sources of information include printed documents such as books, monographs, theses, reports, articles, etc. Prior to the information being available in printed mode, information was recorded in some other mode as well. Evidence can be drawn from drawings,
paintings and writings on a variety of media ranging from stone to clay tablets, parchments, cloths, leaves and paper. Information is also increasingly recorded on electronic media ranging from local or home grown databases to remote (online) databases and CD/DVD ROM databases. Electronic resources are transmitting the collection of modern library. Electronic resources are those resources and services that users access electronically via computing networks from inside the library or from outside the library. A user defines use of e-resources as searching, browsing, examining and visiting an e-resource and/or service. Internet and its most used component WWW have turned into a biggest source of information with widest coverage and the fastest access available to users. It is the most powerful tool for global communication and exchange of information.

Engineers need constant updating of latest information in their subjects to support their learning, teaching needs, and myriad research requirements. Due to the fast changing e-environment of publishing, the need of user for information has increased. Online catalogues, electronic databases, and internet have evolved as the predominant tools used in information seeking today. Students, faculty members, and research scholars now expect to be able to access information around the clock, from almost anywhere in the world and via a growing number of devices, from laptops to phones. The use of electronic resources is growing more rapidly than expected and the use of old journals in electronic formats is increasing even more rapidly than the overall use of electronic resources. Therefore, the information need and behaviour of the engineers towards seeking information depends upon the type of problem they undertake for research, availability of time, teaching requirements, and the availability of the sources of information. Accordingly, the search methods, channels used for finding information, tools used for searching the information, time spent, frequency of visit, and the purpose of visit, and so on also vary. The search for information also depends upon the purpose of use, awareness, and availability of information resources in print and electronic formats. Further, the use patterns of resources and facilities depend upon the user's familiarity with these resources and information searching skills and techniques. The study by Millawithanachchi (2012) identified factors like technology, library support, information literacy, computer competency, usefulness and user attitudes do influence the use of information resources.
As rightly stated by Kahammal and Sarasvady (2007) the library is required to provide varied, authoritative, and up-to-date resources that support its mission and the needs of its users. Resources may be provided onsite or from remote storage locations, on the main campus and/or at off-campus locations. Moreover, resources may be in a variety of formats, including print or hard copy, online electronic text of images, and other media. A University/autonomous college should contain the quantity of resources as prescribed by government, UGC/AICTE and other governing bodies. They may generally be in the form of books, text books, standards, current journals which include national, international and peer reviewed journals, back volumes, e-resources such as full text/ secondary databases, CD/DVDs, AV materials, etc. Therefore, a Library and Information Centre has the primary responsibility to collect, organize and disseminate information, and knowledge to its users or readers.

1.5 Role of Libraries in Engineering Education

Engineering education aims to impart knowledge and make good engineers to the society. Engineering and technology are primarily aimed at developing the things which are already invented by scientists. Such developmental activities need new and nascent information. The ultimate aim of a library attached to an engineering and technical institute is to provide this nascent information. For a student seeking a graduate degree, it is largely an information resource centre that supplements classroom and outside teaching. On the other hand, for someone pursuing a higher degree, faculty members, and research scholars, the library serves as a source of information for new technological developments and their application, and so on. Research in the field of engineering and technology has a direct effect on the national development of a country. For research activities, the collection and rapid dissemination of scientific and technical information are a prerequisite. This is performed by the engineering college libraries. In addition, it is the responsibility of the library staff of engineering colleges to provide the right information to the right user. Since the time of the user of such libraries is precious, they should not be expected to spend their time in search of said information. Secondly, one should also be concerned about their psychological need in the sense that, if the required information is not acquired within the requisite timeframe, the interest might wane. The quality of research and innovations would be limited if the new and evolving
research findings and information are not passed on to researchers in time. Needless to say, duplication of research processes or reinventing the wheel only helps to add to the waste of resources and time. Since the key to economic prosperity and stability of a nation lies in the advancement of its science and technology, the collection, storage, and rapid dissemination of scientific and technical information are a pre-requisite for its proper development. Communication of such specialised knowledge is possible only through a network of well-equipped and well-organised scientific and technical libraries. It is therefore, very essential that the libraries attached to various research and development organisations, industrial establishments, higher educational institutions including those in the field of engineering and technology should be given top priority in the allocation of suitable and proportionate budget for the acquisition of various types of library materials and equipments, as also for recruiting suitably trained staff and sufficient space.

Library professionals cannot ignore the changing shape of the information environment. Redefining and re-engineering of library and information systems for the modern era is the need of the moment. Informational professionals must change and adapt to the new electronic information environment. Creating web pages to promote library services and providing automated library management systems are the most appropriate ways to this changing information environment. In addition to this, proper information organisation and providing intranet services according to users and institution needs and objective will also be necessary. The professionals should act as the technology application leaders. They should be a part of the information system access tools. They should provide instructions and support to the users to cope with the changing information technology, so that optimum use of information sources becomes possible for the users. The transition of traditional collection to digital or virtual collections presented the library professionals with a new opportunity to play a new dynamic role and serve the information base society in a better way than hitherto, especially in the field of science and technology which is very sensitive to the changes. Science and Technology librarians may have to act as a facilitator, intermediary and end user trainer. They may have to provide a semantic web by searching, controlling, filtering and making sense of the chaotic information resources. This can be achieved by strategic and operational planning, acquiring new knowledge, skill, and ability in partnership with the students, faculty members, and
research scholars, as well reshaping and strengthening their relationship with the computer specialists and technologist in their institutions

1.6 Need for the Study

Modern engineering libraries have the prime responsibility of shaping the future generation by becoming rich in collection. The electronic media is competing with traditional media on different fronts and a good number of the net generation students, faculty members, and research scholars prefer this electronic media. Electronic resources in special libraries are making a significant growth as part of the library collection. Libraries invest a huge amount in the development of e-resources. The quality and quantity of library resources is determined by the user and the extent of use made by him. In order to equip students, faculty members, and research scholars for effective information gathering and seeking, they need to be given certain skills in order to plan a search, locate and use information resources. This is what is meant by info-literate-campus society and the library helps the organisation to achieve this mission to produce quality engineers.

With the latest development of Information Communication Technology (ICT), the process of managing, accessing, and re-engineering information resources and services has become extremely demanding. Access to information, knowledge, and technology are crucial ingredients for the users and librarians alike. Therefore, how the libraries in the electronic age are accessed and used by the user’s community needs to be constantly evaluated. With the improved understanding of the information requirements and information seeking behaviour of engineers in academic environments, librarians can develop better information resources and services, implement policies that help the engineering students, faculty, and research scholars to access quality information and improve the collection development practices.

The literature survey shows that studies have been conducted on various aspects of information resources, facilities, and services in different fields of specialisation. The investigator observed that there has been a lack of research study in Dakshina Kannada and Udupi districts on the use of information resources, facilities, and services in the engineering discipline. However, it is pertinent to identify the strengths and weaknesses of engineering college libraries in terms of
information resources, facilities, and services provided by them and also it is necessary to know the information needs of the students, faculty, and research scholars so as to formulate policies and suggest measures which could contribute towards the improvement of the engineering curriculum in the district, which could be applicable to the state too. Therefore the need was felt to study the “Information Resources and their Use by the Engineering College Libraries of Dakshina Kannada and Udupi Districts: A Study” on the following needs:

1. Today, information technology has developed rapidly and has had a huge impact on access to information and on the information seeking behavior. In this critical situation, the librarian and the library-staff should have a clear understanding of their users’ needs and usage pattern of information resources for providing the information services, designing new information systems, intervening in the operation of the existing systems or planning in-service programmes.

2. The information needs of the users of libraries of engineering colleges have become complex due to the tremendous publications and interdisciplinary researches that are being promoted at the level of higher education. The progress of engineering education and research depends upon providing the right kind of information in the right form at the right time.

3. Electronic resources play a vital role in the field of science and engineering studies. Electronic access to technology journals has become an important and valuable tool for research scholars, students, and faculty members. The user community is becoming more and more familiar with these tools and has started using them regularly. But how much of these resources are being used, and what is the impact of this electronic era on the non-electronic era, has to be examined. Technical institutions being the first to initiate the use of latest technologies, a study of the use and impact of the electronic resources at these institutions is the need of the hour, the results of which will facilitate other academic institutions to follow.

The rapid growth of Information Technology has created a need to understand the information flow and the need for a user’s study to investigate the quality of
search requirements, users searching habits, and the problems encountered when using the library resources and services. Therefore, it necessitates the need for the study and development of new facilities to maximize the use of information resources by the users for education and research.

1.7 Significance of the Study

The librarians need to manage important resources and make them accessible so as to attain cost effectiveness in the engineering college library services and promote the use of the information resources of their library. Looking at the commitment of the engineering library to promote quality education, it is essential on the part of the library professionals to evaluate and assess the users' requirements, their information seeking pattern, and information use in the light of providing quality information services for the seekers to uplift engineering education and research. This study is significant because:

1. It helps the engineering college libraries in Dakshina Kannada and Udupi district to identify the strengths and weaknesses of their collection, effectiveness of the services, and the competency of their staff, particularly with reference to the requirements of students, faculty members, and research scholars.

2. With the improved understanding of the information requirements of the engineers in the academic environments, it helps librarians to better develop the information resources and services, implement policies that help the engineering students, faculty members, and research scholars to access quality information and improve the collection development practices.

3. The study can support and enhance engineering education by helping the engineering college libraries equip it with world-class information resources and facilities required for the academic community.

1.8 Statement of the Problem

The title of the study is "Information Resources and their Use in the Engineering College Libraries of Dakshina Kannada and Udupi Districts: A Study."
1.9 Definition of the Concepts

The concepts and terms used in the title of the thesis are defined as follows,

1.9.1 Information: Uttor (1999) defined information as data value in planning, decision making and evaluation of any programme. He goes on further to say that it is a data that have been subjected to some processing functions capable of answering a user's query. It is recorded, summarised, or simply collected that would help in decision making. It is well understood in terms of books, journals, magazines, public and private sector documents of all kinds, whether published for mass circulation or unpublished and restricted or confidential in nature, results of research efforts which are made available to colleagues in form of reports, books, articles and non-printed materials. According to Dervin and Nilan (1986), information is seen as "something constructed by human beings."

Belkin (1995) defines "the information associated with a text is the generator's modified (by purpose, intent, knowledge of recipient's state of knowledge) conceptual structure which underlines the surface structure (e.g. language) of that text." This definition is further elaborated by Ingwersen (2010) as information being, "the result of a transformation of the generator's cognitive structures (by intentionality, model of the recipients' state of knowledge, and in the form of signs)," and "on the other hand, information is something—a structure—which, when perceived, may affect and transform the recipient's state of knowledge."

1.9.2 Information Resources: The Encyclopedia of Information and Library Science defines Information Resource as "any organization, facility, or individual willing and able to give authorities responses to scientific or technical inquiries out of an existing store of knowledge or expertise" (Corea et al., 1993).

1.9.3 Use: According to the Online Dictionary, the meaning of Use is "to employ for some purpose," "put into service," or "make use of" (Dictionary.com, 2012).
1.9.4 Engineering: The American Engineers' Council for Professional Development has defined "engineering" as, “the creative application of scientific principles to design or develop structures, machines, apparatus, or manufacturing processes, or works utilizing them singly or in combination, or to construct or operate the same with full cognizance of their design, or to forecast their behavior under specific operating conditions, all as respects an intended function, economics of operation or safety to life and property” (Wikipedia, 2009).

1.9.5 Engineering College Engineering colleges generally refer to institutes of higher education which offer an engineering course at the undergraduate, postgraduate and Ph D degree level (Wikipedia, 2011).

1.9.6 Library: A library is an organized collection of resources made accessible to a defined community for reference or borrowing. It provides physical or digital access to material, and may be a physical building or room, or a virtual space, or both. A library's collection include books, periodicals, newspapers, manuscripts, films, maps, prints, documents, microform, CDs, cassettes, videotapes, DVDs, e-books, audio books, databases, and other formats (Wikipedia, 2010).

In the present study the "libraries" are those attached to the engineering colleges selected for this study.

1.9.7 Dakshina Kannada and Udupi districts

The district of Dakshina Kannada, juxtaposed between the Arabian Sea and the Western Ghats, is a unique piece of land also popularly known as South Kanara. The district headquarters of Dakshina Kannada has been a trading centre for several centuries. The area under Dakshina Kannada jurisdiction is called as Tulunadu and Tulu language forms an important medium of communication along with Kannada language. Dakshina Kannada has the eighth major sea port, the New Mangalore Port Trust (NMPT) on the west facing the Arabian Sea and also an international airport. The three northern taluks, Udupi, Kundapur and Karkala, were separated from the Dakshina Kannada district to form the Udupi district in August 1997. Udupi district is surrounded by Uttara Kannada district in the north, and by Dakshina Kannada district in the south, Shivamogga district borders to the north-east and Chikamagalur district.
to the east. The Arabian Sea is to the west of Udupi district. Udupi has a literacy rate of 92%, which is as high compared to other districts of Karnataka. Udupi district is home to internationally renowned educational institutions. Quality professional education offered by the two districts of Dakshina Kannada and Udupi has attracted students from all over the country and even from abroad (Wikipedia, 2012).

1.10 Objectives of the Study

The main objectives of the present study are to find out the information requirements of the students, faculty members, and research scholars and their assessment of the resources, facilities, and services provided by the engineering college libraries in Dakshina Kannada and Udupi district.

The specific objectives of the study are:

1. To know the information resources, facilities, and services provided by the engineering college libraries in Dakshina Kannada and Udupi districts.

2. To understand the information requirements of the students, faculty members, and research scholars.

3. To know the preference and use of information resources and services in the colleges under study.

4. To identify the problems faced by the respondents in the use of the information resources and services.

5. To assess the satisfaction level of the respondents on the available information resources, facilities, and services of the library.

6. To suggest measures for improvement in the library and information services available in the colleges under study.

1.11 Chapter Scheme

The result of the study is provided in the form of a report consisting of seven chapters.
Chapter I – Introduction

The introductory chapter elaborates the research topic and explains its need and significance. It states the research problem, defines the important concepts relating to the present research, and lists the objectives. A brief summary of the remaining chapters is also provided in this chapter.

Chapter II - Review of Literature

This chapter attempts to present a review of the literature relating to the research problem. The reviews are arranged in eight parts. Part one reviews the “information need and information seeking behaviour.” The second part relates to “need and purpose of library use.” The third part deals with “use patterns of information resources.” The fourth part deals with “use pattern of facilities and services.” The fifth part deals with “use of internet.” The sixth part deals with “problems faced in searching for information.” The seventh part deals with the “role of librarian and user education in promoting information resources and services.” The eighth part deals with “information literacy and training.” The literature in each part is presented in a chronological order.

Chapter III – Research Methodology

This chapter describes the research process, including the hypotheses and population of the study, and also the instruments used for data collection, response pattern, techniques used for data analysis and scope and limitation of the study.

Chapter IV– Profile of the Engineering College Libraries in Dakshina Kannada and Udupi districts.

This chapter presents the physiological and demographical features of the engineering college libraries of Dakshina Kannada and Udupi districts.

Chapter V- This chapter consists of Part 1 and Part 2

Part 1: This part pertains to the information resources, facilities, and services of engineering college libraries under study.
Part 2: Part 2 is the core of the research, viz, data analysis. It attempts to present primary data about the use of information resources by the respondents of engineering college libraries. This chapter is presented in four parts. The first part provides the “demographic characteristics and information seeking pattern of the respondents.” The second part presents the “opinion of the respondents on the information resources.” The third part gives the “opinion of the respondents on the library facilities and services.” The “overall views and opinion of the respondents” is given in part four. The data collected was structured, analyzed, and presented with interpretations in the light of the objectives.

Chapter VI - Research Findings

It provides an opinion survey on the use of the information resources, facilities, and services provided by the respondents.

Chapter VII – Suggestions and Conclusion

On the basis of the data analysis and research findings, a final conclusion is drawn along with recommendations. It further attempts to suggest some research problems relating to this area, for future research.
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