Chapter 1

RESEARCH DESIGN

1.1 Introduction

Due to tremendous growth and continuous development in technology, the role of library becomes more responsive in making the world techno-savvy. Technological developments have effected not only the formats and sources of the information, but also how and where to provide library services. Libraries and their resources have partially moved to the virtual world of the internet. As a result, library users can access the resources from outside the physical library. In an effort to reach users accessing the library via their computers, many libraries are extending their services to include virtual reference. Technology now allows users to submit their queries to the library at any time, from any place in the world.

Encroachments in technology have changed the way information is presented and disseminated. The collection of library is not limited to just print collections that require the user to visit the library. Collections have gone through many changes from traditional print formats to the current digital formats. These include microfilms in the 1930s, audio-visual materials in the 1940s-50s and CD-ROMs in the 1980s. In the 1990s, online electronic resources such as e-journals, e-books, the e-thesis and the full-text databases have emerged as important sources of information. These online formats allow users who have access to internet connections to search and retrieve information from anywhere and anytime.

Traditionally, library collections were books, manuscripts, journals and other forms of recorded information. It also included audio-visual items such as audiotapes, videotapes, CD-ROMS and other forms of media. However, the explosive escalation of information technology during 1990s has a great impact on the libraries. This was because of the developments in the way of information can be stored and accessed through technology. As most of the today's libraries, especially academic libraries, offer the facilities to access information resources electronically, user may increasingly become remote users of libraries. As such, the use of library resources will no longer
require user to physically visit the library but this does not mean the use of library material decreased.

With the advent of Internet, the mode of communication has also been transformed. This technology caused a significance change to traditional library structures in the way information is accessed. The librarians are now working in the environment that has the following features:

- Larger access to a range of information
- Increased speed in acquiring information
- Analyzing and linking information
- Constantly changing technology
- Continuous learning for users and library staff
- Substantial financial investment for technology

As more libraries move towards providing services in digital environment, the improved access to remote library collection is making the use of electronic library resources more realistic and more attractive. Traditional online services have transformed themselves into internet based online services using web based technologies. From traditional online services to today, four generations of information retrieval tools have passed that assist users in searching the internet. Web based resources, digital library resources, internet resources and electronic resources are terms with similar meanings.

Libraries 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. Print medium is increasingly giving way to the electronic form of materials. Today, the Internet plays a vital role in the teaching, research and learning process. It is assumed that the engineering students in India feel more dependent on the Internet for their class assignments and for the latest information of their subject areas than conventional resources of information. Engineering teachers also feel a bit handicapped in updating their knowledge base quickly without using the Internet for their research and classroom teaching activities.
For better or worse, technology has dramatically changed the way people interact with one another. The creation of an electronic media has revolutionized the way information is gathered and transmitted. The electronic resources, stand as the latest in a series of technological developments that has the potential to induce societal change. The library world has stepped into the ultra modern era. The most significant achievement of the era had been making of the vast world into a small electronic valley. This was possible on account of the revolutionary information technologies, i.e. modern media (other than print on paper) for storage, communication and transmission of information have emerged in the last two decades with distinct advantages and added dimensions over that of paper as a medium.

The availability of e-resources opens new vistas for teaching, learning and research. In present scenario, information is highly explosive and available in various formats. Information which can be stored, accessed and transmitted through electronic gadgets is called electronic information. More and more information is available in various electronic formats such as CDs/DVDs, e-databases, e-journals, e-books, digital achieves, audio/video cassettes, Web OPAC of library collection. The advantages of electronic information resources are mainly in respect of density of storage, speed of access, searchability, integration of text images, pictures and sound on to a single medium and rapid and reliable transmission over long distance.

The present scenario of technical field is information and knowledge revolution. Many electronic resources are available in the library. Innumerable types of information, in a large variety of containers and in many different locations, are all available in one place. In the modern society, the types of information and the media which present them have become manifold and multifarious, offering users a vast selection. A new information society has emerged in which electronic information is playing a key role. Information society is getting all help from information technology in occupying a centre stage role. Information technology is the modern science of collecting, storing, manipulating, processing and communicating information. This includes technologies, which are used in collection, processing, storage, retrieval and dissemination of recorded information.
1.2 Web Based Resources

Today, users may have access a variety of textual information resources. There are different kinds of web based reference resources and services for accessing information from libraries such as OPAC, Gateways, Subject Portals, Electronic Journals, E-Books, Online Database, Subject Directories etc. These resources overlap considerably in the type of information they cover and sometimes it is difficult to distinguish between some of them. A library should have a good collection of these resources like selected web links, subscription resources and library material in well-organized pages for serving better services to their users.

Many libraries and organizations are providing digital reference service through collaborative services. Existing library consortia are adding digital reference service to current shared service and networks of libraries. Some regional library consortia are offering member libraries the opportunity to share reference questions with each other using the internet and other technologies.

E-Books: An electronic book is a book-length publication in digital form, consisting of text, images, or both, and produced on, published through, and readable on computers or other electronic devices. Sometimes the equivalent of a conventional printed book, e-books can also be born digital. The *Oxford Dictionary of English* defines the e-book as "an electronic version of a printed book," but e-books can and do exist without any printed equivalent. Commercially produced and sold E-books are usually intended to be read on dedicated e-book readers. However, almost any sophisticated electronic device that features a controllable viewing screen, including computers, many mobile phones, and nearly all smart-phones, can also be used to read e-books.

E-Journals: Electronic journals form a large part of the collection of a library for providing web based services. Today many journals are available electronically – some are full text and some contain only bibliographic information with abstract. Major advantage of electronic journals is that they are constantly updated and easy to access but disadvantage is that breaching of copyright law is very easy. Library services may be delivering to users on CD-ROM, through e-mail or through web.

Web-OPAC: Online Public Access Catalogue form an important part of many digital library's collections. It allows users to search for the bibliographic records contained
within a library's collection. Now-a-days, some OPAC also provide access to electronic resources and databases, in addition to the traditional bibliographic records.

**Subject Portals:** Web search engines had been developed initially by computer scientists, by borrowing techniques from information retrieval search such as best match searching and relevance ranking. Information professionals are increasing bringing their skills to help organize to growing wealth of internet resources. A good example of their influence is the development of subject specific web search engines known as subject portals, where evaluation of material covered is a major concern.

**Online Database:** These are large collection of machine-readable data that are maintained by commercial agencies and are accessed through communication lines. Many libraries subscribe to them for easy access and use of current information. The disadvantage is that only bibliographic data is presented and not full text.

**Subject Directories:** Subject directories differ from search engines in that search engines are populated by robots whereas humans making editorial decisions that populate subject directories. Subject directories are basically index home pages of sites and can be classified as general, academic, commercial or portal. Strengths include relevance, effectiveness and relative high quality of content. Weakness is that they lack depth in their coverage of the subjects.

**Institutional repositories:** Over the last decade all aspects of computer technology, processing techniques, storage media and input/output devices have become faster, more compact, sophisticated and less expensive. Internet is one of the boons of information technology. Introduction of Internet and web technology has reduced the cost, time and manpower of publishing documents. As a result organizations, institutions and even individuals are publishing on the Internet. The place of exploitation of Internet by the Library and information center is unlimited and endless. Internet provides a wealth of information such as online E-books, E-journals, E-news letter, E-database etc. These vast resources can be accessed by the library and information centers and can be provided to the users. (Bhatnagar, 2005)

**1.3 Web Based Library Service**

Library service on the web requires many of the same qualities as traditional references: accuracy, promptness, courtesy, an understanding of the information need.
It provides users with the convenience of accessing information in their own time, saving them traveling cost and time and new options for answering reference questions. The provision of these services is not constrained by the traditional opening hours but can be offered on a round the clock basis. Web base services are established due to the following reasons:

- Ensuring needs of users and the accessible information sources are suitable matched at all time.
- Delivering those information sources to the user in a timely and appropriate fashion.
- Ensuring the information provided in a high quality, accurate and appropriate.
- Assisting the user in interpreting the materials, if necessary.
- Promoting user awareness of new services and information sources as they develop.
- Providing users with individualized guidance and support as the build their information search and application skills.

Most of the literatures describing the recent growth in electronic publications emphasize three important factors: money, technology and convenience or speed. In recent decades print publication prices have continued to rise beyond inflation, especially for scientific publications. That negative cost factor has driven many scholars and academic librarians to embrace and even strongly promote the alternative of “free and Open Access” electronic publishing.

The greatest paradox of printed scholarly publications is that they act more like archival and legitimizing tools than as communication tools. E-journals and magazines are “often credited with the ability to be establishing the communication purposes of scholarly publications, without losing their archival or legitimizing roles.

The publication of documents over the internet has brought in number of advantages for both libraries as well as to the user community. Some of them are briefly enumerated below;

**Speed**: The speed of publication and diversity of each issue of e-resources and articles is much faster, than the print, further reducing the gap between author of the paper and the end user.
**Distribution:** The major advantages of e-publications are their global distribution, their hypertext links, the ability to access from different sites and the ability to search.

**Retrieval:** There are good numbers of search engines available to access and to retrieve the appropriate articles. Most of the publishers of e-publications are providing keywords, author search and thus reducing the role of additional indexing and abstracting.

**Print/Downloading:** E-publications provide the facilities of downloading and printing the appropriate articles at the end user's workstation.

**Saving shelf space:** With the introduction of e-documents libraries will be relieved of many problems such as space, shelving, missing issues, missing pages and ripping of the pages etc. which have taken considerable time.

**Multiple accesses:** Most of the publishers of E-documents are coming up with site license policy, providing multiple access and access through the campus LAN.

**Storage and Archiving:** The conservation and preservation problem will be less with E-publications compared to print documents. There are very small incremental costs to storing longer documents so it is easy to include data sets, images, detailed analyzers, simulations etc. that can improve scientific communication.

**Manageability:** Electronic information can easily be managed by adding bookmarks and personal notes to the sites or by downloading it to private files or databases for copying and editing.

### 1.4 Life Cycle of Electronic Resources in Libraries

The life cycles of electronic resources are complicated and challenging. It undergoes different phases to reach the users. The various stages of life cycle in libraries are as follows:

**Origin, identification and location:** The first stage of in the electronic resources life cycle is its origin and identification or discovery. These can be originated by the demands of the users or in anticipation. Further the e-resources may be by birth or by conversion from its print counterpart. Identification and location of the required e-resources is the job of the LIS professionals who identify and locate the resources to meet the information need of their clientele. The professionals have to identify various details such as bibliographic details, the coverage period, the license agreement, the
subscription fees, renewal provisions and interfaces through which the e-resources are available.

**Testing:** Before acquisition of the e-resource their need to be tested properly to know their merits, demerits and relevance and thereby help professionals to take decision about their procurement. Hence a demonstration or a trial process is required before the procurement of the e-resources, which helps to find out the desired areas of the library environment, identifies the relevant audience and obtains feedback.

**Selection and acquisition:** After the trial and examination of the electronic resources, the next stage is to select and initiate necessary process for their acquisition. The acquisition process is the same as print documents but with certain additional levels of work such as information about the license, the availability of resources, the access facilities etc. further if the e-resources are part of a package, the period of availability, price etc. Sometimes the print and the electronic formats are linked in such a way the cancellation of the print format would invalidate the license agreement of the electronic format. Another issue in acquisition of the e-resources is to handle the distribution of a payment between the licensor of the package and one or more interface providers.

**Access:** In e-resource management, access is a major issue. Hence once the library acquires an e-resource, the LIS professionals should ensure the optimum use in a user friendly way such as an A-Z list, OPAC, meta-search tool or a link server. Issue related to routine maintenance, temporary unavailability of the resources, change in the E-resource providers’ address should be taken care properly.

**Renewal or Cancellation:** Normally the e-resources are subscribed for a definite period of time, commonly for one year. So, when the period ends, it is either renewed or cancelled. Unlike the print resources, the decision for the renewal or cancellation depends on the information stored in the management system such as the actual usage of the resources, the reliability of the interface, the response of the user etc. further at the time of subscription it should be taken into consideration that even after cancellation of a subscription, the library might have perpetual access or archiving rights to the data. (Farmer, 2009)
1.5 Role of Libraries and Information Centers

Information resources are unlimited but the budget of the institution is limited particularly in case of self financed engineering and technical institutions. The ministry of Human Resources Development has arranged for Consortia based subscription of online electronic journals and databases for IIT (Indian Institute of Technology) REC/NIT (Regional Engineering Colleges / National Institute of Technology) on the other hand personal experience of the author found that self financed engineering college libraries except a few have been suffering from acute shortage of budget and they are not in a position to subscribe core journals of the concerned discipline.

Modern education expects a teacher only to initiate the students in the new vistas of the universe of knowledge, but leaving it to them to explore further and give final shape and totality to what has been presented already. The search begins after the close of the first phase of learning, that is the classroom lecturing. It is in the library that the second and possibly the more vital phase of learning takes place. As such heavy responsibility lies on libraries to keep the candle always burning. The college library is not only the connecting link between teaching and learning, but where students are intelligent the library can supplement from its rich resources what the class room has failed to supply.

The new technologies have made a deep impact on the engineering college libraries. Now-a-days the emphasis in libraries is shifting from collection to access. The card catalogue has been replaced by Online Public Access Catalogue (OPAC). The integrated library system had improved the operation of acquisition, cataloguing, periodical and circulation departments. The trend is the transition from manual to electronic system.

**IT Implementation:** Information Technology has changed and will continue to do so both in form and substance. It is time to reevaluate service models that have functioned for years. We have to creatively identify new solutions to old problems and achieve results. Being prepared to manage changes can furnish us with the ability to flourish. We should attempt to reestablish standards, criteria or bench marks that are considered to be basic to quality library services. The potential strength of information technology is being exploited for efficient, effective and cost benefit library services. Engineering college libraries, if not the first, started applying IT gradually for all their activities. While applying IT care must be taken in every step of implementation. Sudden shifting
of the old system to a new one by way of applying IT may prove not only dangerous but is sure to create several problems. Librarians must keep themselves briefed of all matters concerned with application of IT for library activities to counter all problems. Converting the library records into a machine-readable form has to be tackled very carefully. Converting the records of the most recently acquired documents first, and then convert the backlog later may be the good solution to satisfy the users. Before start converting the total library collection, a management decision should be arrived on weeding out of some of the old, damaged and unused documents. It is prerequisite to identify the core, important and usable collection for conversion into machine-readable form. The entire library staff as well as users need proper education and training in ensuring that the new system is used properly, effectively and with confidence. They may be trained locally or should be deputed to attend the training programmes, workshops, conferences, exhibitions etc. at national and international level. The initial training program is not itself enough; it should be a part of a continuous process. It will help the library to keep its staff abreast of the latest techniques and to impart training to the new entrants. What is considered best today may become obsolete tomorrow. This is true in case of IT and its applications. Once the new system has been implemented, provision should be made to monitor, audit and evaluate it for refining the system. Obsolescence in hardware and software has to be managed with upgrading and replacement policy.

**Advances in Communication Technology:** It is widely accepted that technological advances always bring revolution in all disciplines and convert our dreams into reality. Similarly, advances in information communication technology are full with solutions for day-to-day problems of engineering college libraries. Now all the jobs involve in information processing can be done more effectively, efficiently and economically with in less possible time with the help of computers and user-friendly software. Beside this compact discs or electronic media is an excellent solution for storage or space problems of libraries which can solve not only the space or storage problem but also capable to make information accessible anywhere and anytime. Further, maximum utilization of available information or libraries collection is now possible due to LAN, MAN, or networking.
Use of Internet: Internet has now emerged as a very powerful communication and publishing medium and it has changed the overall ways, means, mode and methods of information dissemination. Like other libraries, engineering college libraries as disseminators of information too it has made a great impact. Many people consider internet like a global library without walls that can be accessed anywhere by anyone at any time to get any type of information. It is often struggle to locate information on the web, and librarians must learn to use the directories and search engines in order to better assist patrons. Here librarians can work as an information manager to provide right information to the right person at the right time or in other words they can give their traditional services such as Reference Service, Indexing and Abstracting Services, Selective Dissemination of Information and Current Awareness Services with a new look. Our source of information will be in digital or electronic form on internet whether journals or book, we can select and store information as per user's requirements. Librarians are challenged to develop new technical skills and abilities to validate the quality of information resources over the web.

Electronic Books and Journals: Electronic books are digital objects containing electronic representation of a book that means they are converted into digitized form in order to be read by a computer. Readers should change their mind set to understand the advantages of eBooks. Print versions of late have become very expensive as the number of copies printed has been coming down. Many reference books, which occupy major space in libraries, will one day be replaced by machine readable formats and reference area may completely disappear in the libraries. E-books are distributed via internet and sold in many ways. Some e-books stores have already been specializing in selling exclusively e-books. Book stores like amazon.com and Bernes Noble are selling all kinds of e-books from all of the major publishers. In recent decades the price of print journals, especially scientific journals, has continued to rise beyond affordable limit and thus has prompted the librarians to look for an alternative mainly 'Free electronic journals'. In addition to this, the time required for publishing an article, from the time of its submission to its final appearance in the print journals has also prompted the authors to look for an alternative source. E-journals like print also have editorial board, reviewers and so forth. To most of us it is some thing similar to the print except it being different in format. E-journals have almost all the characteristics of the print journals.
and would be available either online or offline or both. Many E-journals are available as offline products, i.e. on CD/DVD. Therefore in such case certain barriers such as internet connectivity and bandwidth do not concern. However, majority of the journals, both free and paid, are available on-line with downloading facility. The online access to journals is provided by the publishers or through their aggregators and the access policy varies from publisher to publisher. The access could be through a password or could be through IP address. Some time a small programme, which locates on the workstation, may also be needed for the access.

**Library Homepage:** Developing a website is one of the best tools to integrate and communicate all the library’s resources and services effectively to a wide range of users irrespective of the place and future trends. Engineering college library by developing homepage can disseminate a wide range of information to users' community. It is best way to keep users abreast about latest developments of library resources and services with the introduction of pictures, graphics, 3D images, audio and video. A lovely homepage of library can be developed which will really help the users to have a complete knowledge of library. Resources like library databases, online databases and other useful websites can be linked which will be useful for book selection and link of other library databases may be useful for Inter Library Loan.

**Expectations of Users:** Traditional models of library services are insufficient to meet current requirements of users. The increasing online environment resulting in users more technology savvy and are demanding and expecting more from the library. The potential of delivering information anytime anyplace challenges libraries to reexamine how space is organized and used. It is necessary to create new modes to deliver services to the user desktops even outside the campuses. As more resources are created via the web, issues arise related to licensing, archiving, security and access. Users would like to see their library on the internet able to meet their all information needs not only on demand but also in anticipation of demand. Besides this they would also expect to get comprehensive information on broader range of disciplines while an engineering college library could have good collection only in their specific discipline. Again it would be a big cause of users' dissatisfaction. But to overcome this problem engineering college libraries may share their collections and shall have to offer new and more qualitative services to their users. (Venkateshwarlu, 2014)
1.6 Statement of Problem

Libraries have always been appreciated for and measured by their collections. However, library budgets and space constraints have led many libraries to make choice of the formats for information resources they collect. The electronic publishing of books is increasing, e-journals are emerging and databases are costly, yet provide lots of information for higher education especially in the field of science and technology. Libraries need to consider which format needs to be retained in the library collections. Libraries have been building up the collections of reading materials while having very little information about the needs of their users. As a result, libraries have been facing hard choice between journals and books, and even the formats of the materials because of increasing budgetary pressure.

The basic purpose of the research is to identify the problems which are faced by the engineering students or research scholars when they try to locate their required information over the web. It is always heard that internet is an information superhighway, but it has lots of curves and junctions. We need sophisticated riders and proper training to reach our goals smoothly and efficiently. It is not an easy task to always find out relevant information in internet. Most of the time users take the help of the search engines and keyword or string search. But it provides mostly irrelevant items, as the crawler detects the keyword. In the syntactic web the search strategy or advanced search is very much important for digging out the best result. It is not sufficient by the institution only by providing some computers, a lab and internet connection. It is also important for the library professional to check whether they are able to locate their information and should extend helping hand to the users. In modern day of IT, users spend a major part of the day in internet thinking that it will help them and provide all they need. The problems that have been identified from the survey are.

1. Users face lots of problems for location their needful information. Unless and until they are guided by the professional, their time and effort is not fully utilized.
2. There is a myth that everything regarding studies is available in internet and can be accessed easily.
3. There is a myth that Internet is the ultimate source of information and can replace traditional printed resources.
The availability of traditional library print materials, the growth of the Internet and online databases produce various choices for the users to access information. With all these choices of information that are available to the users, it is therefore, important to know the user’s perceptions of preferences towards the format of information resources that are available to them. Academic libraries have been building up the collections in print and electronic resources according to the terms and conditions in the library policy. The users have the privilege to access vast information resources in print and electronic format. However, there is very little information about users’ needs and choice of formats. There is also a need to understand the information needs of this generation of users which may be different as they may have been exposed to various methods to find the information they need. With all the different formats of information available to the user, it is necessary to know how the various information resources format affect the users’ choice of format. Therefore the purpose of the study is to find out the use of electronic resources is actually need of the academic community of engineering institutions.

"Use of Web based Resources in the Engineering College libraries of Assam: An empirical study" is a topic of great significance and interest not only to the scholars of LIS but also to the policy makers, planners, administrators, universities and technical organizations. Using electronic information resources is inevitable for the academic community to update their knowledge for pursuing their career. There may be different purpose for the academic community using the electronic resources.

The title of the research says it is an “empirical study” because the output is derived from observation or experiments and it is verifiable or provable. According to The Free dictionary by Farlex, the word “empirical” means derived from or relating to experiment or observation rather than theory.

Wikipedia says “Empirical Research” is a way of gaining knowledge by means of direct and indirect observation or experience. Empirical evidence (the record of one's direct observations or experiences) can be analyzed quantitatively or qualitatively. Through quantifying the evidence or making sense of it in qualitative form, a researcher can answer empirical questions, which should be clearly defined and answerable with the evidence collected (usually called data). Research design varies by field and by the question being investigated. Many researchers combine qualitative and quantitative
forms of analysis to better answer questions which cannot be studied in laboratory settings, particularly in the social sciences and in education.

Pennstate University library says that “Empirical research is based on observed and measured phenomena and derives knowledge from actual experience rather than from theory or belief.”

Electronic information is gaining more and more importance in the academic activities, especially in the field of engineering and technology with the drastic change in the pattern of dissemination of knowledge. Therefore, a teacher in the engineering college plays a vital role in providing up to date information with the latest technologies, he has to be good users of such information. So it is worth studying the use of electronic resources by the engineering faculty members. The use of e-resources as a tool is changing the way users live and learn. In the recent years, there has been a phenomenal growth of e-resources. Now, academic scenario, over the years, has undergone a fabulous change assuming new dimensions influenced by the technology driven applications. Engineering education is no exception to this. Information technology has influenced the very nature of engineering institute libraries. They are undergoing significant changes today not only in outlook but also in function, services, methods and techniques for collection development, processing and dissemination of information. In the present era, engineering colleges are playing an important role in imparting technical education. The engineers, who are the products of these colleges, require the latest information in their respective fields and by using the e-resources they can achieve their educational goals effectively and efficiently. The e-resources are inseparable part of today’s engineering educational system. Engineering colleges invest a good deal of amount on providing this facility to both the teachers and students. It is, therefore, important to find out up-to what extent they are utilizing this facility.

The study is an attempt to explore the use of e-information by the faculty of leading engineering colleges of Assam with an objective analysis of the data and the same time to evolve appropriate strategy so as to overcome the problems encountered in the concerned fields.
1.7 Objectives of the study

This study examines the engineering college libraries within the state of Assam situated in the North-Eastern part of India. It examines the level of effort taken by the engineering college libraries in Assam to build and manage electronic resources. The main objective of this study is to analyze the patterns of Web based information resources & their use, the Internet skills of the engineering professionals, the perceived impact of the e-resources on their academic efficiency and problems faced by them while retrieving the Information in the library. This survey was particularly conducted to assess the benefits of the web based resources over conventional resources of information. Following are the objectives of the research:

1. To know the extent of searching e-resources in the engineering college libraries of Assam;
2. Identification of purposes for searching Web based resources in the engineering college libraries of Assam;
3. Detection of the problems faced by the users in accessing e-resources in engineering college libraries;
4. Analyzing the satisfaction level with the Web based facilities provided by the engineering colleges under study.

1.8 Hypotheses of the study

The following hypotheses are proposed for the study:

H1. The users of engineering college libraries extensively used web based resources for their academic and professional activities;
H2. The engineering college libraries of Assam are lacking in providing web based resources to the students sufficiently in infrastructure & subscription point of view;
H3. There is major setback in awareness on the part of the academic community regarding the availability and access technique of the electronic resources.
1.9 Area of Coverage

The research will concentrate on the most frequent users of Internet & e-resources in the engineering colleges i.e. the teachers and the students including research scholars. The study will also evaluate the data collected from the library authority mostly librarians. There are 18 Engineering Colleges (including universities) offering engineering degree in Assam. [Annexure IV]. The scope of the study is limited to the 5 engineering colleges listed below arranged chronologically:

<table>
<thead>
<tr>
<th>Name Of The Institute</th>
<th>Location</th>
<th>Year of Establishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assam Engineering College (AEC)</td>
<td>Guwahati</td>
<td>1955</td>
</tr>
<tr>
<td>2. Jorhat Engineering College (JEC)</td>
<td>Jorhat</td>
<td>1959</td>
</tr>
<tr>
<td>3. National Institute of Technology Silchar (NITS)</td>
<td>Silchar</td>
<td>1967</td>
</tr>
<tr>
<td>5. Girijananda Institute of Management &amp; Technology (GIMT)</td>
<td>Guwahati</td>
<td>2005</td>
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Initially the research was started with all the engineering colleges of North east India. After Pilot study and final registration in January, 2010 (as per GU guidelines), the study was limited to only 5 engineering colleges of Assam due to the following reasons:

- Only engineering colleges with the Year of establishment before 2008, as the research had been started in 2008;
- Availability of well established library;
- Subscription of e-resources / Indest;

The polytechnic & ITI institutes providing diploma level education are excluded from the study area.

1.10 Methodology

The methodology opted during this research include mainly questionnaire method & personal interview with the librarians of those institutions. Initially a set of questionnaire is also prepared for the librarians. But after preliminary study, it is found
that no concrete idea could be derived from the questionnaire. So, it has been decided to analyze the data on the basis of data provided by the librarians and statistical data of the web resources download (UGC Infonet and Indest). Separate questionnaire had been prepared for the librarians and users. Opinions are made through personal visit to the libraries under survey during the course of the research. The questionnaire was drafted using Google Docs and then e-mailed to the remaining targeted respondents. Some responses were received electronically and after few reminders, the response through e-mails was satisfactory.

Through the group-administered survey, it was observed that most of the respondents were very cooperative. They had taken their time to answer each of the questions seriously. As such, the answers provided were the valuable.

The data from the responses were checked and numerically coded and then entered on to a spreadsheet such as Microsoft Excel to obtain frequencies, descriptive statistics, percentage etc. Then the findings were synthesized and presented in figures, table, graphs and narrative form. Any additional comments made in the questionnaire were compiled carefully and reported in the findings.

Few problems were faced in collecting the data. Some respondents showed unwillingness to fill up the questionnaire and demanded the prior permission of their higher authorities. They also had lack of time due to their academic and other responsibilities. Some respondents wanted to leave the questionnaire with them to be filled in by them at free time. Collecting the data through e-mail, was not so easy process, the respondents were also reminded twice or thrice. It is also a tough job to collect the e-mails id's of users, but in this section the social networking media helps a lot including the help offered by friends studying in engineering colleges. The response from institute’s higher authority was quite pleasant and in most cases they easily permitted to interact with faculty members. Further, the response from library personnel was also good as most of the professionals were personally known to the researcher. Overall the response from all the persons, who were directly or indirectly associated with the survey, was excellent.

The quantitative study was designed to use the empirical/observed and descriptive methods employed to examine the research objectives. Generally, the quantitative method has been widely used in social science research because it is assumed to be
constant across time and setting. The findings of the quantitative research are replicable and can be generalized to the general population of the sample used. The survey method was chosen because it is suitable for a large group of respondents. For example, maximum questionnaire were distributed individually to the participants. Using such a captive audience, it permitted the data to be collected from large amounts of population in a relatively short time. This eliminated the possibility of participants misplacing or disregarding the questionnaire.

1.11 Thesis Presentation

The thesis is prepared after extensive study and proper analysis of data collected from the concerned libraries. The output of the research is represented in a systematic manner according to a standard guidelines directed by the Department of Library and Information Science and Gauhati University. There are two aspects of the thesis writing and presentation. They are

Terminology: During the writing of the thesis some words are used as synonyms at different sections of the thesis to avoid the repetition of the same words again and again. These are

- Engineering students = Engineering Community = Engineering College Users
- Web based resources = Electronic resources = E-Resources = Digital Resources

Chapter Planning: Further the thesis is distributed into 5 (six) chapters for structured analysis and presentation of thoughts. The final chapterisation is as follows:

Chapter 1: Research Design: This chapter gives an overview of the research topic, its objective, planning and execution of the study.

Chapter 2- Review of Literature: This chapter contains the review of related literature. The literatures available in different location both in printed and electronic form and consulted during the research work are described here.

Chapter 3- Engineering College Libraries in Assam: An overview: This chapter gives an overview about the institutes offering engineering education in B.Tech/M.Tech and Research Level. It also provides an idea about the growth of engineering education in Indian in pre and post independence era.
Chapter 4- **Survey and Analysis**: This is the chapter where the analysis of surveyed data is represented in a scientific way. The data collected from different engineering college are represented in tabular and graphical format to retrieve the required output.

Chapter 5- **Conclusion**: This chapter represents the major findings and suggestion derived through the research work. The chapter ends with concluding comment of the researcher.

At the end Reference are provided according to the APA Standard.

**1.12 Summing up**

The Internet has emerged as the single most powerful vehicle for providing access to unlimited information. The Internet is an inseparable part of today’s engineering educational system. The dependency on the Internet and its services is increasing day by day and the users of engineering colleges too are depending more and more on the Internet for their various educational purposes. The Internet facility has enabled the teachers and the students to enhance their academic excellence by providing them the latest information and access to the worldwide information.

The advancements of Information and Communication Technology (ICT) have brought many changes to the library. Library collections are no longer limited to the traditional print collection, but also electronic resource. Library materials such as books, magazine, journals etc. are no longer presented in print only format, these materials also presented digitally in various format either through Internet or any other sources. As such users can now free to access to massive range of information resources not only those controlled and subscribed database, but also those free and uncontrolled information resources that are available through Web.