IMPACT OF INFORMATION TECHNOLOGY ON CHANGING ETHOS OF RESOURCE SHARING AND NETWORKING IN THE LIBRARIES OF NATIONAL INSTITUTES OF TECHNOLOGY IN INDIA: A STUDY

Thesis

Submitted for the Award of the Degree of

Doctor of Philosophy

in

Library and Information Science

Under the Supervision of

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DECLARATION

I hereby declare that this thesis entitled **"IMPACT OF INFORMATION TECHNOLOGY ON CHANGING ETHOS OF RESOURCE SHARING AND NETWORKING IN THE LIBRARIES OF NATIONAL INSTITUTES OF TECHNOLOGY IN INDIA: A STUDY"** submitted by me for the award of the Degree of Doctor of Philosophy in Library and Information Science to the Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University, Lucknow is an outcome of my own efforts and is an original work. The contents of this thesis did not form a basis for the award of any previous degree to anyone else. It is also undertaken that the thesis is essentially free from all kinds of plagiarism.

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CERTIFICATE

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The thesis submitted to Babasaheb Bhimrao Ambedkar University Lucknow satisfies all the requirements as stipulated in the *Doctor of Philosophy (Ph.D.) regulations- 1999 as amended in 2013* and it is fit for submission and evaluation for the award of the degree of Doctor of Philosophy of the University.

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Date: 13-01-2021

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PREFACE

Information communication technology has transformed the institutions or organizations. Libraries are also utilizing modern technology for improvement of existing library services and creation of new services which shows the impact on the shape and size of the existing libraries and proving the existence in the organizations. Information technology has also changed the trends of libraries and brought extraordinary transformation in academic library specially in field of resource sharing and networking. Every day, lots of information get published throughout the world. Therefore, it is impossible for any modern library to procure all the resources to meet the various needs of the users. Several factors such as rapid increase of publications, reduced financial resources, increase of prices and ever increasing expectations of users have made the libraries to look for alternative means of resources. One of the important means is sharing of resources among themselves. This study will intend to evaluate the initiatives taken towards the resource sharing and networking in the libraries of National Institutes of Technology in India. It also discusses difficulties faced by the libraries in resource sharing and networking and various opportunities and strategies for collaboration among the libraries of NIT in India.

The first chapter is introductory of the whole study. Starting from the background of the study to the methodology adopted for this study was discussed in this chapter in detail. In between concept of resource sharing and networking, resource sharing initiatives in India, historical overview of NITs, statement of the problem, need and significance of the study, objectives of study, as well as hypothesis, scope and limitations of the study, were discussed.

The second chapter presents the literature review related to the study. It is subdivided into the concept of resource sharing and networking, guidelines provided by international organizations for resource sharing and impediments to resource sharing and networking were discussed.

The third chapter is the research methodology adopted to conduct the study. In this chapter population of the study, sample of the study, tools for data collection like prepration of questionnaire has been disscussed in detail.

The Fourth chapter presents tabulation, statistical analysis, interpretation, and graphical representation of the collected data from libraries

The fifth chapter entitled “Proposed model for NIT library for resource sharing” attempts to suggest a conceptual model to create a library network for resource sharing among all NIT libraries in India.

The sixth chapter presents the major findings and conclusion of the study. It deals with recommendations of the study and suggestion for further future research.

CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF IMAGES

LIST OF ABBREVIATION

Abbreviation	Full-Form
MANIT	Maulana Azad National Institute of Technology, Bhopal
NITD	National Institute of Technology, Delhi
NITG	National Institute of Technology, Goa
NITKKR	National Institute of Technology, Kurukshetra
NITM	National Institute of Technology, Meghalaya
NITP	National Institute of Technology, Patna
NITPDY	National Institute of Technology, Puducherry
NITR	National Institute of Technology, Raipur
NITRKL	National Institute of Technology, Rourkela
NITS	National Institute of Technology, Silchar
NITT	National Institute of Technology, Tiruchirappalli
SVNIT	Sardar Vallabhbhai National Institute of Technology
NITDGP	National Institute of Technology, Durgapur
NITJSR	National Institute of Technology, Jamshedpur
MNIT	Malaviya National Institute of Technology, Jaipur
VNIT	Visvesvaraya National Institute of Technology, Nagpur
MNNIT	Motilal Nehru National Institute of technology, Allahabad
NITH	National Institute of Technology, Hamirpur
NITJ	Dr. B R Ambedkar National Institute of Technology, Jalandhar
NITUK	National Institute of Technology, Uttarakhand
NITSRI	National Institute of Technology, Srinagar
NITC	National Institute of Technology, Calicut

NITK	National Institute of Technology, Surathkal
NITANP	National Institute of Technology, Tedepalligudem
NITW	National Institute of Technology, Warangal
NITAGR	National Institute of Technology, Agartala
NITSKM	National Institute of Technology, Sikkim
NITN	National Institute of Technology, Nagaland
NITMN	National Institute of Technology, Manipur
NITMZ	National Institute of Technology, Mizoram
NITAP	National Institute of Technology, Arunachal Pradesh

Chapter I

Introduction

Chapter I

INTRODUCTION

1.1 Introduction

"*People today are in danger of drowning in information; but because they have been taught that information is useful, they are more willing to drown than they need be. If they could handle the information they would not have to drown at all*." – Idries Shah

The above quote by Shah (1972) was taken from the book called "Reflections". The author's quote reflects the overflow of information in the world. In the Information explosion driven world, it has become extremely complicated for all kind of libraries to solely satisfy the information needs of their users without cooperating with others. In the case of academic libraries, it is imperative to meet the users' current demand then only the research and development can be promoted in the institute. This is the main reason which has been forced by many libraries to think about the co-operative arrangement for resource sharing. In North America, some librarians, vendors and library technology specialists realised the high need for collaborative efforts for sharing their resources and came together in the year 2005. A larger group then formed to begin radically rethinking resource sharing in response to global developments in technology and with a greater focus on customer service; thus, the concept of Rethinking Resource Sharing Initiative (RRSI) was born. After ten years of this initiative members also created an expanded checklist for best practices named STAR (Sharing and Transforming Access to Resources) administered by RUSA (reference and user service association) a division of American Library Association. (Ellingson, Erlandsen, & Kaler, 2018).

Resource Sharing is typically composed of two activities. The first is a collaborative collection development, whereby subject specialisations are intended to be distributed among libraries within a clearly defined geographic region so that individual libraries need not attempt to collect resources in all fields; but can concentrate on a particular area. The second form of resource sharing is through various document delivery mechanisms and inter-library loan might suitably fall into this category (Grycz, 1997). Today library cannot satisfy all informational needs of their patrons. Networking in the libraries is beneficial, especially in facilitating resource sharing and improving the services of the library. The underlying philosophy is sharing resources and working together for the common goal, namely enhancing access to information.

The word resource includes any material, person or available assets. Sharing means co-operative use of resources by two and more entities. Thus, the meaning of resource sharing in libraries can be understood as sharing of materials, functions or services. In India, the development of sharing of resources started during the period of 1990s, as a result of journal crunch due to higher cost and advent of scholarly electronic publishing, due to this shifting towards electronic format and the price of journals escalated and it became practically impossible for any library to continue subscription of electronic resources. This situation compelled Indian libraries to move towards a strategic partnership.

According to Kaul (1996), The concept of resource sharing goes by the term library co-operation has been in use all along among those who had been working in libraries or had anything to do with the development of libraries. The term, however, has been replaced by a new coinage Resource Sharing which sounds more attractive and makes better sense in this age of inflation and budgetary reduction.

Jebaraj & Devadoss (2004) defines a library network is broadly described as a group of libraries coming together with some agreement of understanding to help each other to satisfy the information needs of their clientele. The National Commission on Libraries & Information Science in its National Programme Document (1975) defines a network as two or more libraries engaged in a common platform of information exchange, through communications for some functional purpose.

The objective of resource sharing activity is to create an environment in which the librarian can offer better services and more materials without any extra financial involvement. The four significant objectives of resource sharing have been identified, and they are conceptual, operational, behavioural and research. Some of the other essential purpose of resource sharing are enlisted below:

1. Assisting member libraries in the selection, procurement and processing of materials;
2. Coordinating acquisitions, interlibrary loan and reproduction of materials for the member libraries;
3. Promoting expanded use of library resources;
4. Improving library facilities and services;
5. Cooperating in the training and development of personnel;
6. Achieving an economy in the use of human and material resources; and
7. Facilitating the sharing of materials among participating libraries, which are beyond the reach of individual libraries.

After analysing the objectives of resource sharing it is observed that there is an emphasis from the collection of documents to access of desired information and that too most effectively and efficiently, there have been consistent efforts to achieve the

objectives in best possible ways. An improved approach to these objectives discernible in recent literature may be summarised as; improvement of bibliographic access, i.e., the information needed to identify documents, their existence and location; Improvement of physical access, i.e., the delivery of the published item in the textual or copied form.

Currently, the emphasis has been shifted from collection development and acquisition to access of information and from information access to delivery.

1.2 Need for Resource Sharing

Information is an essential ingredient of all human activities. It acts as a medium for the communication of ideas, a resource for research and development necessary for the sustenance and progress of socio-economic well-being. The need for a variety of information along with many complexities in its dissemination and access has necessitated resorting to this phenomenon. The various factors, which have influenced and increased the current pace of resource sharing activities, are:

- Due to Information explosion, it is not possible for any library to collect all the bibliographic materials at one place.
- Individually libraries cannot afford the subscription cost of the materials, hardware & software and the manpower required to maintain the modern information technologies.
- Gradual decrease in budgetary provisions for the library and information Centre's to provide various information services.
- The exponential growth of interdisciplinary subjects is motivating the researchers to innovate something new and which leads the responsibility of

libraries to provide the required information timely, is also an important reason which promotes the resource sharing activities among libraries.

- Increase in variety and degree of user demands and growing awareness for access to information motivates the sharing of resources.
- Change in emphasis from ownership to collective access, holding to document delivery, materials to client-centred approach and document delivery to information delivery.
- The advent of increasingly effective information technology applications.

The efficiency of its services and the satisfaction level of the users leads the importance of a library, which in turn is totally dependent upon the richness and freshness of library collection. Without ample and latest collection, resource sharing cannot be imagined. The library must be able to provide appropriate information or document to meet user needs. The appropriateness implies that the collection shall be planned and developed by following well-defined objectives, policies and procedures.

A library collection is the total of the library materials, which includes library books, manuscripts, journals, reports, microforms, films, databases and so on. Collection development is a term which has replaced the term book selection and acquisition. Collection development is a broad term, and book selection is an activity of this process. The collection development programmes are guided by users point of view, and hence the collection should be adequate, up-to-date and capable of meeting the present as well as future needs of the clientele.

The availability of library records in machine-readable form is the essential requirement for efficient resource sharing and the extensive application of information technology (IT) has revolutionised the conceptual framework of library services and

has led to the process of resource sharing and networking among libraries a reality. It may be seen that out of five crucial technologies namely, information technology, biotechnology, space technology, nuclear technology and materials technology, which have influenced our life at work tremendously, the IT is the one having the potential to control all other. There is no area, which has escaped the impact of this versatile technology. It holds with the world of library and information dissemination.

Information Technology is not a single identity, but it is considered as an amalgamation of three technologies (i) Computer Technology, (ii) Data Communication Technology, and (iii) Document Reproduction Technology.

There are certain problems listed out in managing libraries with traditional methods due to information explosion:

- The question of acquiring information;
- Challenges of organising information;
- The problem of disseminating information;
- Problems of providing reference services
- Issues of information analysis and consolidation, i.e. bibliographic services, document reproduction services, etc., and Space problems."

For the above problems libraries found the solution with the application of the following technologies and techniques:

- Use of computing technology;
- Use of data communication technology;
- Use of document reproduction technology;
- Use of compact discs; and

- Use of compact shelving.

It is discernible from the literature that the new ITs provide libraries with a new and fast set of alternatives for gathering, organising and using information. The advantages of using IT in libraries have been summarised below:

- Redundancy of dept. Classification
- Enhanced productivity
- Enhanced efficiency
- Provision of quality information services
- Provision of exhaustive information
- Use of national and international databases through a network

It is seen that introduction of IT in libraries is not that simple. Numerous problems are encountered in the process. However, the application and adoption of information technologies help libraries to improve the overall performance of library services with greater accuracy, speed and effectiveness, the modernisation of library and information services in India have not been attempted vigorously. Some of the problems in IT application are listed below:

- Lack of planning
- Financial constraints
- Choice of hardware and software
- Resistance to change
- Retrospective conversion of records into machine-readable form
- Lack of suitably trained human resources
- Lack of resources and infrastructural facilities

In the changing environment with an onslaught of ever-improving IT, the libraries are left with no option but to go in for these technologies. Emphasising the need for adoption of IT, it is seen that failing to keep abreast of rapidly changing technology in products and processes is an obvious, excessive and potentially lethal cost: an equivalent of the cost of man conformance, which is the hidden burden bending the backs of libraries without modern quality management.

1.3 Sharing of resources through Library Networking: Indian scenario

In late 1980s and early 90s many local, metropolitan, regional and national level library networks in India had been established. The National Information system for Science and Technology (NISSAT) under department of Scientific and Industrial research initiates towards the designing and developed a library network in India in the year 1985 (Ghosh, 2002).

Resource sharing is the collaborative use of resources of participating libraries based on the agreement of cooperation to share the resources of each other's materials. This entails not only to share the document resources but also facilitates services, equipment and even the human resources among the participating libraries. Libraries have started using the computers in large number and have automated their functions and services. After the introduction of the internet in libraries, the concept of on-line resources was introduced, and the libraries started subscribing e-journals regularly. The traditional sources of information, i.e. books, journals, magazines are supplemented by electronic forms of documents e-books, e-journals, e-newspaper etc. The electronic libraries get connected to one or the other networks. A computer network allows the user of one computer to use the resources of another computer which may be space, database, programs or printer.

The traditional libraries were facing barriers for an interlibrary loan such as indifferences of lending library, conservative attitude, distance, language, cost time etc. The recent developments in information science, computer and telecommunication technologies have changed these perceptions on account of multidimensional growth of published documents. The modern libraries with advanced technology are forming library consortium for sharing electronic resources.

1.4 Historical Overview of NITs

The National Institutes of Technology (NITs) are autonomous institutes of higher education. These are governed by the National Institutes of Technology Act, 2007 which has been declared as institutions of national importance and lays down their powers, duties and framework for governance. The National Institutes of Technology Act, 2007 lists thirty-one institutes. Each NIT is autonomous, linked to the others through a common council named Council of National Institutes of Technology, Science Education and Research (NITSER), which oversees their administration and all NITs are funded by the government of India. The MHRD minister is the ex officio chairperson of the NIT Council.

The first prime minister of India Pt. Jawaharlal Nehru sought to develop India as a leader in science and technology. The government started fourteen RECs between 1959 and 1965, at Bhopal, Allahabad, Kozhikode, Durgapur, Kurukshetra, Jamshedpur, Jaipur, Nagpur, Rourkela, Srinagar, Surathkal, Surat, Tiruchirappalli, and Warangal. It established one in Silchar in 1967 and added two others located at Hamirpur in 1986, and Jalandhar in 1987. The RECs were jointly operated by the central government and the concerned state government. Non-recurring expenditures and expenditures for post-graduate courses during the REC period were borne by the

central government, while recurring spending on undergraduate courses was shared equally by central and state governments. (Council of National Institute of Technology, 2018) The success of technology-based industry led to high demand for technical and scientific education. Due to the enormous costs and infrastructure involved in creating globally respected Indian Institutes of Technology (IIT), in 2002 MHRD Minister Murli Manohar Joshi decided to upgrade RECs to "National Institutes of Technology" (NITs) instead of creating IITs. The central government controls NITs and provides all funding. In 2003, all RECs became NITs. The upgrade was designed along the lines of the prestigious Indian Institutes of Technology (IITs) after it was concluded that RECs had potential as proven by the success of their alumni and their contributions in the field of technical education. Subsequently, funding and autonomy for NITs increased, and they award degrees which have raised their graduates' perceived value. These changes implemented recommendations of the "High Powered Review Committee" (HPRC). The HPRC, chaired by Dr R.A. Mashelkar, submitted its report entitled "Strategic Road Map for Academic Excellence of Future RECs" in 1998.

In 2006, MHRD issued NIT status to three more colleges, located at Patna (Bihar Engineering College - a 110-year-old college), Raipur (Government Engineering College), and Agartala (Tripura Engineering College). Based on the request of state governments and feasibility, future NITs are either converted from existing institutes or can be freshly created. The 21st (and the first brand-new) NIT is planned for Imphal in the north-eastern state of Manipur at an initial cost of Rs. 500 crores. In 2010, the government announced setting up ten new NITs in the remaining states/territories. This would lead to every state in India having its own NIT. With the technology-based industry's continuing growth, the government decided to upgrade

twenty National Institutes of Technology to full-fledged technical universities. Parliament passed enabling legislation, the National Institutes of Technology Act in 2007 and took effect on 15 August of that year. The target is to fulfil the need for quality workforce in the field of engineering, science, and technology and to provide consistent governance, fee structure, and rules across the NITs. The law designates each NIT an Institute of National Importance (INI).

1.5 Statement of the problem

The study is entitled as "***IMPACT OF INFORMATION TECHNOLOGY ON CHANGING ETHOS OF RESOURCE SHARING AND NETWORKING IN THE LIBRARIES OF NATIONAL INSTITUTES OF TECHNOLOGY IN INDIA: A STUDY"***

Specific study on NIT Libraries in India is going to make in the present study. It aims to explore the current status of resource sharing among NIT libraries. Study focus on assessing the impact of information technology on resource sharing and networking.

Definitional Analysis

1.5.1 Information Technology

The term 'information technology' encompasses the methods and techniques used in information handling and retrieval by automatic means. The means include computers, telecommunications and office systems or any combinations of these elements (Rajaraman, 2018).

1.5.2 Resource sharing

"Resource Sharing is the activity is the result from an agreement, formal & informal among a group of Libraries (usually a consortium or network) to share collection, data, facilities, personnel etc, for the benefit of the users and to reduce expense of Collection development". (Reitz, 2004).

1.5.3 Network

A network can be defined as a group of individuals or institutes/ organisations that are interconnected. The linking must include a communication mechanism (Lal & Kumar, 2007). A library network is a description of an activity which existed before the nomenclature was devised. When two or more libraries come together and communicate for one fundamental condition that is exchange. Interlibrary loan or bibliographic exchange in any form is the justification of a network.

1.5.4 Networking

The concept of networking is usually referred to describe a form of arrangement or/ and administrative structure that links a group of individuals and organisations who have agreed to work together and to share resources.

1.5.5 Networking and Resource sharing

A computerized inter-library loan system overcomes these limitations. For resource sharing, the participating libraries need to come together and cooperate in two broad areas: (a) developing the collection on shared basis, and (b) developing services for exploiting such collection (Dhawan, 1999).

1.6 Need and significance of the Study

There have been many efforts cooperatively managed by Indian libraries for resource sharing in the last three decades, but it is very difficult to state that particularly that one is a successful model which could set a benchmark. Although, E Shodhsindhu is working very well but, this national collaborative service is not in a state to provide a model/ framework from which collaborative service can be customised. After going through the literature survey, it seems that initiatives in this area are not enough to satisfy the demands of the engineering and technical communities. The need of the day is a broad resource sharing and networking and formation of a single platform for sharing the resources among all NITs in India.

At present, there are 31 NITs in the country, which are engaged in higher education and research & development activities. For the efficient result in research, the effective and timely access to relevant information is a basic ingredient. As the experience shows globally libraries of science and technology engaged in education, research, training in engineering and allied fields, can never lead to self-sufficient effectiveness and designed user satisfaction. This kind of study is needful because libraries are expected to be originators and high-quality service providers to the users. Study helps to present the current status of the National institutes of technology in India.

1.7 Objectives of the Study

The main objectives of the study are:

I. To assess the feasibility of developing a library network of NIT Libraries in India;

II. To identify the problems and barriers faced in Resource Sharing by the NIT Libraries in India;

III. To examine the information technology tools adopted by NIT libraries for enhancement of resource sharing;

IV. To assess the user's perception about the present status of resource sharing and networking;

V. To study the resource sharing programs and techniques adopted by the libraries of National Institute of Technology in India.

1.8 Hypotheses of the study

The hypothesis is an essential rational instruction of research. It is usually considered as a tentative declaration or statement about the relation between two or more variables, which can be observed empirically. The following hypotheses were intended to be tested in the study:

I. Lack of skilled library personnel is one of the significant barrier faced by NIT libraries in India.

II. Application of IT tools is effectively incorporated in all NIT libraries for enhancement of resource sharing.

III. The users of NIT Libraries have yet to achieve satisfaction with technical facilities provided by the library.

IV. There are no policies as well as appropriate rules for resource sharing in the NIT Libraries of India.

1.9 Scope and limitations of the study

As a higher learning institute, primary missions of any academic institute is imparting knowledge and carrying out research in prime areas which is of concern not only to institute themselves but also to the government as well as public. The scope of this study is limited to explore the impact of information technology, especially in resource sharing among the NIT libraries in India. Total 31 national institutes of technology are located in India.

For the present work, the researcher has categorised six zones that are east, west, north, south, northeast and central zone of India (https://www.mapsofindia.com). From these zones, NITs are classified, and the following list (Table 1.1 and Image 1.1) has indicated the same. There are varying numbers of institutes in the selected zone. Due to this unequal proportion of NITs across the zones, two institutes present in a particular zone had been selected for the study.

NITs with their location and year of establishment

Sr. No	**Zones**	**Names of NIT**	**Location**	**Founded**	**Established year**
1	**East Zone**	National Institute of Technology	Durgapur	1960	2003
		National Institute of Technology	Jamshedpur	1960	2002
		National Institute of Technology	Patna	1886	2004
		National Institute of Technology	Rourkela	1961	2002
2	**West Zone**	Malaviya National Institute of Technology	Jaipur	1963	2002
		Visvesvaraya National Institute of Technology	Nagpur	1960	2002
		S V National Institute of Technology	Surat	1961	2003

Sr. No	Zones	Names of NIT	Location	Founded	Established year
		National Institute of Technology	Goa	2010	2010
3	**North Zone**	Motilal Nehru National Institute of Technology	Allahabad	1961	2002
		National Institute of Technology	Hamirpur	1986	2002
		Dr B R Ambedkar National Institute of Technology	Jalandhar	1987	2002
		National Institute of Technology	Kurukshetra	1963	2002
		National Institute of Technology	Uttrakhand	2009	2010
		National Institute of Technology	Srinagar	1960	2002
		National Institute of Technology	Delhi	2010	2010
4	**South Zone**	National Institute of Technology	Calicut	1961	2002
		National Institute of Technology	Surathkal, Karnataka	1960	2002
		National Institute of Technology	Tiruchirappalli	1964	2003
		National Institute of Technology	Tadepalligudem	2015	2015
		National Institute of Technology	Warangal	1959	2002
		National Institute of Technology	Puducherry	2010	2010
5	**North East**	National Institute of Technology	Agartala	1965	2006
		National Institute of Technology	Silchar	1967	2002
		National Institute of Technology	Sikkim	2010	2010
		National Institute of Technology	Meghalaya	2010	2010
		National Institute of Technology	Nagaland	2010	2010
		National Institute of Technology	Manipur	2010	2010
		National Institute of Technology	Mizoram	2010	2010
		National Institute of Technology	Arunachal Pradesh	2010	2010
6	**Central Zone**	Maulana Azad National Institute of Technology	Bhopal	1960	2002
		National Institute of Technology	Raipur	1956	2005

Table: 1.1 (Source: https:// www.nitcouncil.org.in)

Location of NITs on Map of India

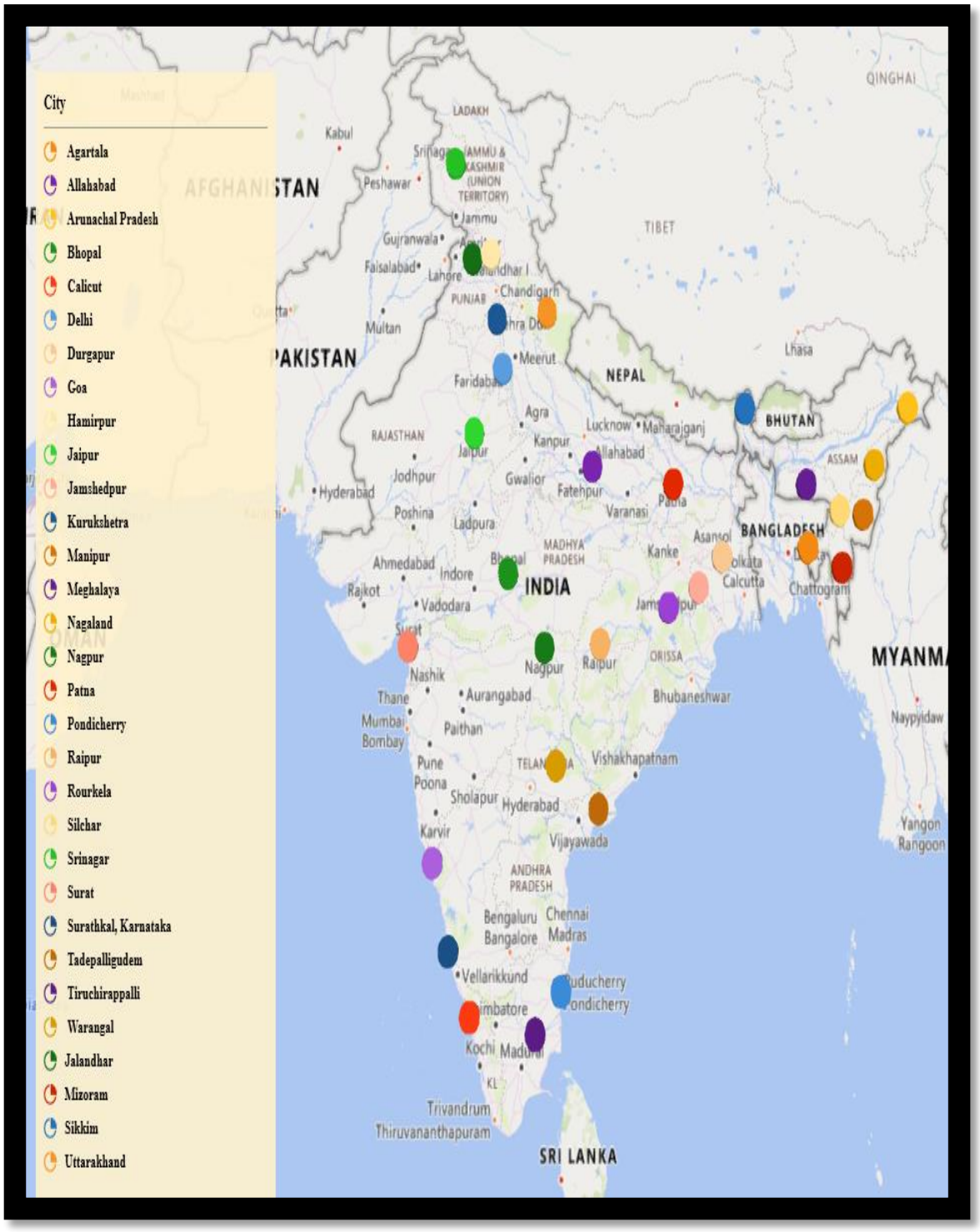

Image: 1.1 (Source: Microsoft Excel 3D map tour)

1.10 Methodology adopted

The main objective of this study is to assess in quantitative and qualitative both concerning the impact of information technology on changing scenario of resource sharing among the libraries. The present study has been completed by following these steps:

1. *Data Collection:* In the study, data has collected by using a structured questionnaire, observation as well as interview method. Also, the indirect method of data collection, which is the usage of websites of all NIT and its library websites has been used by the researcher.
2. *Population and Sample:* To analyse the status of networking and resource sharing among the libraries of the National Institute of Technology in India, the present study has been performed. The population of the study is librarians and the users of NIT Libraries in India. The sample is homogeneous as they belong to the same discipline. Stratified sampling has been used for selecting the institute among the population of the study.
3. *Data Analysis:* After collecting the data, suitable tables have been formulated for each aspect with the help of Statistical analytical tools. The analysis involved various steps like categorising data, coding data and calculation that is tabulated and analysed. Summary of questions has been carried out in the same order as given in the questionnaire. Separate tables, along with graphs and textual presentations, have been prepared for different aspects asked in a survey.
4. *Result and discussion:* The result and discussion have been interpreted and reported in the final report of the study.

5. Reference style: References and Bibliographies had been prepared according to the American Psychological Association guide available at the Website of www.apastyle.org.

A detailed explanation of the methodology has been discussed in chapter 3.

1.11 Structure of the Thesis

The report of the present study be divided into the following chapters:

Chapter 1. Introduction: This is the first chapter of the Thesis, and it sets the background, need of the study and defines the problem of investigation. The objectives, scope, hypothesis and methodology of the study had been explained in the chapter.

Chapter 2. Review of Related Literature: This chapter depicts an evaluative report of the prior studies done and the related literature to the present study. The review describes, summarises, and clarify the essay and give a theoretical base for the research. It helps the researcher putting the present research in context with the available literature.

Chapter 3. Research Methodology: This chapter portrays the steps adopted by the researcher to conduct the study. Including the population of the study, sample size, data collection tools & technique, and analysis methods had been logically explained.

Chapter 4. Data Analysis and Interpretation: In this chapter, the data had been analysed by using descriptive statistics. After defining the data process of making inference and the solution to the problem had been interpreted in the report.

Chapter 5. Proposed model for NIT library network for resource sharing: This chapter of the study attempted to suggest a conceptual model to create a library network for resource sharing among all NIT libraries in India.

Chapter 6. Findings, Conclusion and Suggestions: Presents the major findings and conclusion of the study. It deals with recommendations of the study and suggestion for further future research.

1.12 Conclusion

Above chapter introduces the whole idea of the present study. It discusses the concept, needs and the current status of resource sharing and networking. To conclude the section, we can say that resource sharing is an agreement amongst participating libraries wherein each participant is willing to spare its resources with other members. In turn, it is privileged to share the resources of other participant members as and when the need arises. For supporting the topic and creating a base for the study, a detailed and exhaustive literature survey has been discussed in the next chapter of the report. Where a systematic review of previous studies had been discussed.

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Chapter II

Review of Literature

Chapter II

REVIEW OF LITERATURE

2.1 Introduction

Review of literature is a study of literature available on the problem selected by the researcher and to review the relevant documentation that has been reported earlier in any form of research. It suggests a new planning approach for the investigations. In the words of Busha & Harter, (1980) 'Literature review is a critical summary of different facets of research problem as reported in existing sources'. Further, they stated that the literature search on literature review is an attempt to identify, locate and synthesise completed research reports, articles, books and other materials about the specific problems of a research topic. The present chapter provides the comprehensive review of literature of survey-based research on resource sharing and networking among NIT Libraries in India which enumerate the utility, usage and its perception, satisfaction, feeling and general opinion about the resource sharing and Networking. Therefore, the literature is reviewed by studies on networking based library services, library networks, co-operative library services. The existing literature was searched using queries such as; "resource sharing AND networking", "library cooperation", "Interlibrary Loan", "interlibrary lending", "library resource sharing", "barriers in resource sharing" during the period of study in the scholarly database; SCOPUS, Research gate and Google Scholar. The collected articles were critically reviewed to assess their relevance to the chosen topic based on the scope, objectives and type of study.

2.2 Library Resource Sharing and Networking

Nemati-Anaraki & Tavassoli-Farahi (2018) in his document "Library Resource Sharing and Networking" highlights the growth of library automation since its start to the late nineties; the various components used in each developmental phase and also state the importance of networking in resource sharing.

Dlamini & Snyman (2017) Librarians and Information professionals are confronted today by the rapidly changing environment. The significant aspects of this change are new technologies and the potential for new service which they bring. At the same time, library users and their demands are also changing. They are now coming with new expectations and insist on high-quality service. also explained the concept, need and objectives of networking, enumerates components of library networks proposes a library network for this university region for sharing resources and improving services.

Dezdar (2017) in their paper promoting knowledge sharing in academic environments using non-monetary factors defined the concepts of local area network and wide area network and networking options. It desires to share the database for university library with databases of other libraries. Study suggested a theoretical framework to investigate the non-monetary factors that encourage knowledge-sharing behaviour among postgraduate students.

Wakeling, Rutter, Birdi, & Pinfield (2016) revealed the use of global interlibrary loan to meet the needs of today's academic and scholar through library networking and resource sharing program.

Egberongbe (2016) highlighted the innovations in resource sharing in the library community with an international perception. Ohio LINK contributes to its users' educational activities through access to and use of the documents and information resources which it deliveries. It provides a set of priorities and initiatives for consideration.

Thi & Thuy (2014) describes the library consortia are significant tools to information resource sharing and can add to increase the quality of academic education. explained the collaborative, user-initiated, and interlibrary loan service for all eight universities in Hong Kong and described detail the introduction of a service that will be of interest and impact to many other libraries facing shrinking budgets and the need to share resources in an efficient way.

Ogba (2014) explored the practicality of resource sharing among the law libraries of Nigeria. Telephonic interview and email system was used to collect the data analysed by arranging responses into facets; thus like facets were grouped together and evidences representing issues in this study were selected and used as evidences of findings. Findings showed that Lack of innovation, lack of zeal, and lack of interest from the Council of Nigerian Legal Education(CNLE) on resource sharing were found as factors behind non-practicability of resource sharing in the law libraries studied. Findings also showed that the interest of the Council of Nigerian Legal Education(CNLE) on collaboration by law libraries would boost immediate results.

Ebunuwele Eseohe & Ola (2014) presented the success factors of resource sharing (RS) and cooperation in Nigerian Academic Libraries. They described the need for rethinking resource sharing to offer both library users and non-library users' options to obtain the material they seek from both libraries and commercial sources.

Similarly a questionnaire based study was conducted by Okamoto (2012) examined the management of article request of electronic journals by libraries. With an increasing number of publishers and e-journal content providers permitting interlibrary loan (ILL) sharing, and with the availability of new license management tools and services, many respondents stated that they share e-journal articles. Study also pointed out some major issues like restrictive licenses, automatic deflection of e-journal article requests, and the lack of information from libraries about what e-journal titles they are licensed to ILL.

Hales (2012) describes the developments in Australian libraries and the national interlibrary loan and document delivery systems, in particular, the outcomes of the Local Inter-lending and Document Delivery Administration Systems (LIDDAS) project.

Igwe (2010) studied the challenges facing Nigerian University Libraries with respect to information and communication technology application and utilisation for resource sharing, as well as to areas of library operations to which information and communication technology can be applied and utilised for resource sharing. It concludes by volunteering solutions for viable information and communication technologies based cooperation among university libraries in Nigeria.

Bakker (2008) studied the background and values of resource sharing in engineering libraries and also provides an understanding of the collections, e– resources access, user requirements, and resource sharing essential to meet the information needs of library Users.

Geronimo & Aragon (2005) discussed in their study to identify the benefits of participation in consortia (CBIES/RJ).In the study holdings of two libraries have been compared—a statistical survey of a collection of both libraries & its users. Also, the statistic survey of consortia data was collected from annual reports of libraries and work presented in meetings by (CBIES/RJ). The above study pointed out the strength and weaknesses of the CBIES/RJ consortia like ILL, co-operative acquisition information interchange, co-operative serials, OPAC, interchange of web facilities, a partnership among member libraries of consortia. The study firmly pointed out the weaknesses of particular consortia, i.e. lack of juridical experience, support from grant agencies also lack financial resources to support projects.

Singh et. al. (2004) in his paper "Regional Information Networks: necessary thrust area for INFLIBNET to establish integrated information system in India." Evaluates INFLIBNET program based on activities and achievements and suggests necessary deviation in future plan of action. It stresses the need for integrated and 36 total development of libraries and information sector in the country by concentrating on the establishment of regional networks for resource sharing.

Rao (2001) in "Networking and Libraries" describes the development of networking in India with special emphasis on project INDONET. It also deals with an email system to be provided on INDONET. All these efforts will lead to flexible and reliable modern computer network offering users many services. The main thrust areas of the project were to create the infrastructure for a network and promote a "network culture" within the nation. By any standards, the organization has been extremely successful in fulfilling its last three objectives. The fulfilment of its first objective - developing a network culture within the country -has however had rather

mixed success. The network has not made a great impact on the general business community in India, especially in the private sector. In some ways, this is not the fault of the organization but rather of the uncertain economic environment in India.

2.3 Guidelines for the resource sharing

International federation of library association (2015) has recommended certain guidelines for resource sharing and networking in terms of the best practices for interlibrary loan and document delivery. These guidelines were made after discussing with the members of the document delivery and resource sharing section of IFLA. Overall the recommendations were categorised under three categories: general recommendations, recommendation for requesting, libraries and recommendation for supplying libraries. the brief description of these recommendation has been discussed below:

a) General recommendation

   Under this section IFLA suggested that each library should define their performance indicators so that the time to time evaluation can be made and librarian can monitor the work flow also they suggested that too any hands are not good for handling the requests and it should be handled by one electronic system preferably having the efficiency of handling the interlibrary loan and document delivery. They suggested that libraries should keep the data on availability of resources as well as arrange that data suitable with the national needs.

b) Recommendation for requesting libraries

For requesting libraries certain recommendations have been made such as interlibrary loan should be an integrated part of requesting library's service to its users and implement new technologies in all processes of library. Involve the users' access for requesting material and treat the borrowed material with extra care.

c) Recommendation for supplying libraries

IFLA suggested to the supplying libraries that they should involve the experienced staff for handling the requests made from requesting libraries as the errors can be reduced. Firstly, libraries should make their policy for ILL/DD accessible on website and review the license of electronic resources subscription regarding the ILL/DD. Supplying libraries should create an online form for placing requests and to interoperate with other systems.

"Each country should aim to develop an efficient national resource sharing system, since national resource sharing systems are the essential infrastructure of international resource sharing." (IFLA, 2015)

2.4 Resource Sharing at International level

Gallagher (2020) had explained the evolution of the medical library centre of network including the development of union catalogue and also the dissolution of the centre due to extreme changes in scholarly communication and their needs under its essay entitled "library resource sharing and the medical library centre of New York." The author pointed out several reasons for the closure of MLCNY. Emergence of internet was the prime reason which played vital role in providing the information very quaint and also it was more easy to obtain journal directly from the publishers. But at the end author concluded the essay in a very positive note that, it is dream that is being reborn in new and exciting forms.

Pereira and Franco (2020) reviewed the consortium perspective of libraries and pointed out the various reasons to form library consortia to allow the resource sharing so that efficiency of libraries can increase and they can smoothly satisfy their users' information needs. Major reasons are: to improve the education system and to economise on financial resources, to share the technical service like physical description of the available library resources, and collaborative acquisition of the information resources. Study found that inter-lending and document supply was the most relevant information source where majority of papers on resource sharing got published. Study also contributed in the area of library consortia by revealing the paths followed by scientific literature on consortia also pointed out the open access contracts and their challenges.

Hu (2019) opined a clustering algorithm to evaluate the resource sharing operation mechanism in his paper entitled "library information resource sharing cloud service based on cloud computing mode." Author signifies the specific technology that are being include in library information resource sharing such as: resource integration technology, resource description technology and their indexing technology. Among these technologies study suggested to adopt information resource integration technology and provide an algorithm for building cloud service sharing model this model was completely based on cloud computing and make it experimentally verified with the basic thought of CCWs word segmentation and clustering result of training set data.

Murphy (2019) examined the different models for libraries to share the e-books by removing the barriers like licensing agreements with the publishers also the rights management in digital era and the electronic resource sharing issues. For the licensing

agreement author suggested "package" model for sharing the large e-book bundles where consortia can negotiate subscriptions for all member libraries. primarily at less price with the market price for individual libraries along with the consortial models author also described some important e-book programs like; Orbis Cascade Alliance, NovaNet and Colorado alliance of research libraries as well as whole books interlibrary loan initiatives such as Ebook loans, Dccams reader, VIVA whole – ebook ILL initiative. Finally, author end the discussion with the final thought about consortial management that the lack of awareness among librarians and the library staff in the world will be the biggest reason to continue the cancelling user requests for complete ebook.

Dempsey (2019) strongly supports library collaboration especially in trying environments where scale is important for generating the capacities and its impact on the library services. Author supported the scale and also quoted some examples which underlines the importance of scale in a network where libraries are devoted to collaboration. Author commented on the lack of appropriate approaches along with particular dimensions of collaboration. Having this discussion, he pointed out the challenges faced by libraries during the collaboration such as; the collective action problems of libraries, another problem is that libraries participate in shared activities both too much yet not enough in meeting the desired goals, also they do not have to go towards more even should be more strategic especially where the new the new infrastructure demands.

Acadia (2016) examined the use of library resources, focusing on e-resources by the members of the faculty of the higher educational institute in Thessaloniki, Greece. The study conducted a census survey using a structured questionnaire. The frequency

of use of resources mainly e-resources examine the impact of demographic or situational characteristics are examined. The researcher found that the majority of faculty members use printed resources, but they also use e-resources frequently. They found that use of e-resources is higher in the school of Business Administration and Economics, among those who hold Ph.D. degree and younger faculty members. Further, they added that the use of e-resources is positively indicated by the researchers as the convenience of access. The study also examined the computer anxiety rating scale which indicated that the less anxious the faculty feels about PC" s, the frequent users they become.

Ullah (2015) investigated of the collaboration and resource sharing among central library and the departmental library. Study also deals with the impact of ICT growth which has created new dimensions of opportunities among central library and seminar library. Main objective of the study is to discover the popular areas where both the libraries are sharing and collaborating. Author conducted a survey here for measuring the collaboration among universities central library & seminar library. For data collection author prepared a semi structured questionnaire having questions related with the strength of library. Also informal interview has been followed for the collection of data from library executives and personnel. Basically researcher had followed various data collection tools like interview, semi structured questionnaire and observations. And also secondary source of data has been taken for completing the survey. Study found:

- One of the finding of the study shows that 50% of libraries had not recruited library professional for managing their seminar libraries.

- 70% libraries organised events in campus with collaboration of others. 50% have created joint OPAC's.
- Relationship between central library and seminar library are diverse of nature. Private sector has developed more profound relation than government sector.
- All interviews strongly raised the point what seminar library should be equipped with skilled staff and for that recruitment is necessary.
- There are one major findings of the study is that 100% respondents said seminar library should be independent but the opinion differs. Regarding integrated and interactive relationship.
- Seminar library & central library both are affiliated with one university that this study has explored different relationship.

Maria, Soares, & Gaude (2012) traced out the development of Library Consortia by conducting a literature review from the period 1960-2000. After tracing the historical review, the paper highlighted the scenario in 2000. The paper discussed the new purchasing environment created due to electronic publishing, types of consortia as well. The researchers mentioned that the consortia have increased the levels of library services and convenience for the patrons of large libraries. The library consortia cause the shifting from peripheral and limited sharing of resources to an integrated system-wide and formalised resource sharing. Further, the researchers added that this has been possible due to the developments in electronic access.

Posner (2012) mentioned that access to electronic media is the way of future in the paper, where the efforts were done for tracing out the history of Canada Institute of Scientific and Technical Information in resource sharing. Further the paper included present scenario faced by the libraries such as declining in the budget and ever-

increasing budgetary pressures faced by the information consumer. The paper has discussed the accessibility to the resources in Canadian Universities offered through the consortia approach. The activities of the major co-operative venture in Canada "scholar portal project at OCUL" which is funded by Ontario Innovation Infrastructure and Ontario Universities to expand the access to electronic and printed resources were also highlighted. The DSP (Depository service Program of Communications in Canada) provides access to federal government information. It provides this information through a network of more than 790 libraries in Canada and 147 institutions around the world. The program is administered by Communication Canada.

Siddike (2012) studied the interlibrary network and document supply service of National Health Service (NHS) in the UK. The study did a comparative analysis of the same with the service models in five countries as USA, Italy, Australia, Iceland and Canada. They identified the issues related with the interlibrary network and document supply. The study shows interesting findings where the researchers mentioned that automation of library system should improve 33 the user experience, but does not necessarily replace the need for involvement of the library services and the staff. Complementary collections are necessary for widest and most effective access to information. Access to electronic resources does not alleviate for remote document supply.

Anasi & Ali (2012) opined basic parameters for promoting the resource sharing between concerned universities. To explore the areas of resource sharing with having particular documented policy. Study also investigated the major problems of resource sharing between those universities and at the end some strategies has been suggested

by the author taken from the respondents of concerned universities. Presented study has opted survey method of research. For collecting the data questionnaire has been used as a tool. Total 85 questionnaires have been distributed and 70 were returned. For analysing the data basically percentage and mean ratings were used. For hypothesis testing t-test have been used. Major findings of the study is inter library lending is the most popular area of resource sharing among universities and major finding is about the documented policy on resource sharing where out of 70 universities 63 says that they are not having any documented policy on resource sharing.

Ejedafiru (2010) conducted a survey on evaluating the usability of CUNY + a wide area network database (City University of New York). The survey used questionnaire technique five-point Likert scale. The survey results found that 70% users denote positive opinion in using the database while only 10% disagreed.60% interested in using the system again and 10% were not. General satisfaction about the database was denoted by 60% users. The paper emphasises the relevance of the user and user participation in any system planning design.

Soares (2010) discussed how the new thinking is required about the access services provided by the large academic libraries in the United States in the scenario of Internationalisation of higher education. It provided an overview of the agreements (MOU) concluded by East Asia library staff at Yale University, USA to secure access, for Yale affiliates to the University of Tokyo and Waseda University Libraries, Tokyo, Japan. The researchers argued that due to an increasing trend of going abroad for research among the faculty and students, the need for the services that support their users globally provided by the library professional has also increased. Further,

they added that "global access", should refer not just to retrieve information on-line but also to the myriad institutions beyond national borders that provide access to information sources and services. To provide worldwide accessibility/entry in other libraries is another role of the library science professionals in today's scenario of internationalisation of education.

Resource sharing among library and information centers has been acquiring increasing significance. The factors like information explosion, inflation, and resource crunch, variety of forms and channels of multidisciplinary and complex subjects have made all concerned to realise the limitations of individual libraries and information centers in fulfilling the varied information needs of increasing number of users.

Muhonen et al. (2006) developed a computer-assisted instructional program for giving special assistance in finding and using electronic information sources for the users at University of Illinois at Chicago(UIC). The program was designed mainly for the remote users of the libraries providing more network access to resources. During the study, the sixteen-lesson course was distributed to the faculty, staff and students of the sample size 450. During the study, the pre and post-tests were conducted to access the participant's prior knowledge and subsequent knowledge gain. The survey results showed that participants built on their familiarity with an e-mail to broaden their internet expertise. The well-developed instructional material serves as an ongoing resource for new users and past participants also. Instead of typical classroom instruction of one hour, the online medium allowed the library to reach a large number of users. The pre-course survey revealed that 60% users intended to use the internet for research and work while the post-course survey showed an increase in

personal use as the course increases the comfort and familiarity level of the participants.

Geronimo & Aragon (2005) provided a new approach to the modelling of networks where the libraries enter through the network library model, moved forward through the co-operative library model and ends in an advanced knowledge environment model. The research paper traced out three stages of development of networks as "Initial stage" which is equivalent to the Network Library Model where the libraries are self-sufficient and provide full services to users without relying on other libraries. Here the printed documents, CD-ROMs, and dial-up connections are the main resources and the resources are discovered through the OPAC mainly describing bibliographic data about the printed resources and the library staffs gives the face to face service. Further, the next stage is explained as "Intermediately", equivalent to Cooperative Library Model where the library provides access to more off-line e-resources. Further, the locale and networked resources are included in OPAC.

The catalogue can be accessed remotely and use of e-mail delivery can be traced. Library provides e-guide which is used by the users for accessing the system. The next stage described is "Advanced", equivalent to Knowledge Environment Model, where the libraries provide full remote access to resources, most of the material is in e-format, dedicated internet links are used. The metadata is used comprehensively for the bibliographic description of resources. The access is provided full on-line and remotely. On-site access not necessarily human and full computer-assisted support for information discovery is provided. In these models, the library is viewed as one player in the information transfer process along with the internet, community information services.

Mcdonald & Bolland (2003) discussed the issues relating to access to and bibliographical control of e-journals from a local and national perspective. The added purpose of the paper was to assist the librarians in implementing and enhancing the access mechanisms of e-journals. They identified 3 types of e-journals as online, CD-ROM and networked journals. They further argued that for facilitating access to e-journals there are three levels of access need to be considered by library and information services. The first was access to information about what titles are available and other bibliographic details. The second level suggested an access to information about the articles within individual journal issues: what is being published by whom? The third level was about access to the actual text of the journal: how can access be made quick and easy for the end user.

Liu & Zhang (2001) had indicated in their research paper that no network in the Asian region has achieved the advanced stage of Knowledge Environment Model. Further, the paper mentioned that The China Academic Library and Information System (CALIS) are moving towards the advanced stage. CALIS is a nationwide academic library consortium that links the services across 27 provinces and cities in China.

The professional organisations like International Federation of Library Associations and Institutions (IFLA), Association of College and Research Libraries (ACRL) in America and Association of Information Management (ASLIB) in United Kingdom etc. The success stories of library network in the developed countries such as the Online Computer Library Centre (OCLC), the Washington Library Network (WLN) in USA and the British Library Automated Information Service (BLAISE) and Joint Academic Network (JANNET) 38 in UK, are some of the important examples.

Almost all nations have given due importance and attention to resource sharing and networking among the libraries and are establishing their networks.

2.5 Resource Sharing in India

Since the present study is related to the group of libraries in the specific subject discipline in the Indian subcontinent, only selected literature concerning countries other than the USA and the UK has been reviewed. However, the investigator could consult the works of various prominent authors like Allen Kent, Ross Atkinson, M.B. Line, Richard De Gennaro, Bant Harlow, emphasising for resource sharing and distributed collection development in networked environment. Review of literature by Indian authors on resource sharing and networking indicates that, in India also, various aspects of resource sharing and networking have got adequate attention. It is revealed that the organised efforts in this direction have started in the 1980s. The working Group of the Planning Commission headed by Dr. N. Seshagiri recommended for the need for modernisation of library services and informatics during the Seventh Five Year Plan, 1985-90. An overview of the development of library networks in India by S.S.Murthy (1996) provides detailed account of the establishment of various metropolitan networks in the country. Description about Calcutta Library Network (CALIBNET), Delhi Library Network (now Developing Library Network) (DELNET), Bombay Library Network (BONET), Ahmedabad Library Network (ADNET) and Madras Library Network (MALIBNET), are available. Brief account of Pune Library Network (PUNENET), Bangalore Library Network (BALNET), Mysore Library Network (MYLIBNET) are available giving an indication that many such networks will come up at other cities in the country. Sufficient literature is available in various sources about Information Library Network

(INFLIBNET): a national network of the University Grants Commission. The sufficient amount of literature about countrywide networks like Education and Research Network (ERNET), National Knowledge Network (NKN) is available. Literature about similar subject-specific networks is discernible in proceedings of national and regional seminars and conferences (Mitra (1996); Kaul (1996) ; Ramani (1996); Thakore (1996); Raghavan & Jaysri (1996)).

With reference to the national institutes of technology in India a very informative study was conducted by Kaushik (2015) and revealed that majority of libraries provides very basic information of its library on their websites such as information about libraries' name, working hour, their team, available collection (printed and electronic) and their services. Study strongly recommend that every NIT library website should include upgrade date on their respective library.

Saini (2014) discussed the theoretical and practical aspects of document delivery service provided by the Babasaheb Bhimrao Ambedkar University. Author consulted the records available from the data. Study revealed that 92.78% of documents were received by the male users and the time of document delivery was also promisiable like 50% of documents were delivered within one to ten days of requests. It was seen from the study that mostly journal articles were demanded by users and also in printed from author suggested that proper information should be given for pending documents to the concerned user.

Aher, Matsagar & Wagh (2009) studied the impact of electronic resources on the libraries and their users in Nashik City. The study has targeted total 480 sample population using stratified random sampling method using questionnaire technique for data collection. The respondents included were teachers, librarians and students from

various colleges in Nashik city. The study found that percentage of students visiting the library for electronic resources such as CD‟ s, e-books and e-journals is ¼ of the population who visit for reading books and journals. Further, the researchers mentioned that the overall opinion of the user population is that the electronic media's help them in understanding their subjects collecting relevant information with a faster access as compared to the information in print form.

Desale, Londhe, & Patil (2009) evaluated JCCC@UGCINFONET and the document supply service at the University of Pune. The paper had taken a brief review of JCCC@UGC INFONET and the document supply service provided by the University library; problems come across while using the JCCC@UGC INFONET interface and the administrative interface in providing ILL service. The researchers discussed the new service initiated by INFLIBNET and evaluate the JCCC software from both the user's and administrative point-of-view.

Kaul (2009) conducted a survey of DELNET libraries for assessing the usage of DELNET services. The study results show that there were total 90% respondents indicating the dedicated internet facility in their libraries and 43 in 97% organisations, faculty have direct access to the internet from their own desk. Awareness of DELNET services was indicated by 92% of member libraries. Photocopying of journal articles and supply is the most popular service of DELNET. The study has found that 86% member libraries are benefited from the union catalogue and above 90% libraries are satisfied with the ILL/DD service of the DELNET.

Ghosh (2009) studied the digital setup and attitudes towards access and sharing of selected engineering libraries in Maharashtra, India. The researcher surveyed the forty-nine libraries and studied the current status of the libraries. The paper focused

financial, technical and structural factors of the libraries. The focus is on librarians‟ perceptions on the formation of state-level consortia; ICT infrastructure; users‟ needs; collection development policies and the services provided by engineering libraries to the community. The purpose is to explore the possibilities of forming regional consortia for enhancing the access to information and knowledge through cooperation for the benefit of the engineering communities.

The engineering libraries from diverse backgrounds such as central government-funded, autonomous deemed universities, fully state government funded colleges, partially state-funded colleges with autonomous status and unaided colleges. The study examined the data using various heads as library collection, information sharing infrastructure, use of on-line resources, and librarian's observation on the current levels of cooperation, consortia relationships and obstacles towards cooperation.

Research conclusions showed that 66.5% libraries have online journals and bibliographic databases through INDEST. 10.5% libraries are subscribing to online resources independently. 16.5% libraries have only offline A.V. resources. Above 50% of the libraries have memberships to INDEST and are receiving e-journals and bibliographic databases at discounted price. 56% of libraries have started some digital library initiatives. Out of 49 respondents, 13 indicated that they had engaged in at least one co-operative activity with other libraries.

Manthas & Kaur (2008) studied the use of internet services and resources in the engineering colleges of Punjab and Haryana (India). The study used survey research method and data was collected using the questionnaire technique with 80.8% response rate. A total sample of 625 teachers and 903 under-graduate was focused. Random sampling method was used for the data collection (least 5, 3 teachers, and 2 students)

from the respondent colleges. Results showed that all the respondents make frequent use of the Internet because they have access either at the college or at home. The survey revealed that the majority of the respondents, i.e. 65.6%, access the Internet from college or their workplace. More than 75% of the respondent's use the Internet services mainly for educational and research purposes. Google and Yahoo search engines are found to be more widely used than other search engines. More than 70% of the respondents impression that the Internet is useful, informative, easy to use, inexpensive and time-saving.

Sinha (2008) identified various issues relating to access and bibliographic control of e-journals, access management problems, policy issues and development of e-journals consortium approach to subscribing scholarly peer reviewed journals for their library users in network environment. The paper has set a brief account of various consortium efforts in India. The paper has concluded that in India and South Asia or developing countries, a number of e-journals are less and printed version of e-journals is available. Further they added that e-journals are very much costly and also the shortage of the funds provided by UGC to the institutions, therefore the national institutions like IIM's, IIT's and universities are involved in consortia approach for providing access to number of e-journals and databases to the user community.

Malviya & Kumar (2007) had described the concept of library consortia with their objectives. Author mentioned that library consortia could have their own structure of governance and worked as a corporate body. Further study discussed the responsibilities of member libraries like they should work collectively on collection development, price negotiation with the vendors/ publishers, also participating library should prepare a list of periodicals for resource sharing and development of union

catalogue. Study strongly suggested that there should be uniformity in all participating libraries in allocating email identification system to receive all the request at one place so that each member library can make an agreement to respond the request.

Madhusudhan (2007) evaluated the use of the internet as an information source by the researchers in the field of science and technology in University of Delhi, India. The study was conducted on the sample of 51 research scholars in the Central Science Library in the University of Delhi. The study used questionnaire observation and interview technique. The researcher used the stratified random sampling method for data collection. The study received 81% response. The findings of the research revealed that 66% respondents were using e-journals and databases and handsome figure of 70% use the internet. During the paper, the researcher stated a need for creating awareness among the research scholars about using the internet services more efficiently.

Patel, Vijaykumar & Murthy (2005) provided an overview of INFLIBNET‟ s institutional repository and archive-India which is developed for Indian academic and research community to archive their scholarly work by using D-space digital library system and accessibility is provided through the internet.

Singh, Singh & Singh (2004) in a study assessed the attitude of the users towards UGC-INFLIBNET services at Manipur University Library, India under INFLIBNET program. The researcher used survey research method for collecting the primary data using stratified sampling technique. The purpose of the study was to ascertain the requirements of the users and access their attitude towards INFLIBNET services of Manipur University Library. The study received 68% response. The researcher found that there are fewer users (51.96%) who are aware of the INFLIBNET services of the

Manipur University Library. Further among the various INFLIBNET services, Internet access, and E-mail are mostly used by the users. Use of OPAC was negligible due to lack of awareness among the users. Whereas "downloading of e-resources" is used remarkably by the researchers (82.61%). The users had the attitude towards the internet that its speed was felt poor. The teacher community carried the attitude towards the INFLIBNET services that it enables library automation and allows greater access to information sources.

Sinha (2004) studied the scenario of automation and networking of Libraries of North Eastern region of India. The researcher has evaluated the automation and networking services in 12 libraries that had financial assistance under INFLIBNET program. The researcher used survey research method including the questionnaire technique. The survey findings mainly cover various aspects of library automation and networking, multimedia application and use of CDROM databases, OPAC and internet services like in-house operations such as acquisition, circulation, retro-conversion, serial control, information retrieval and dissemination, bibliographical services, on-line search of databases, OPAC, web OPAC.

Survey result shows that out of 15 libraries only 26.7% libraries are fully computerised whereas 33.3% libraries are partially computerised and in 33.3% libraries computerisation was initiated. Only 6.7% libraries were willing to start computerisation. Further, out of 15 libraries, 40% libraries have started computerised acquisition of reading materials and serial control started in 60% and 39 library administration has started in 66%, whereas computerised cataloguing started in 80% libraries. The OPAC service was available in 60% libraries, interlibrary loan in 33.3%

libraries. Results of the survey showed that out of 15 libraries, the users of 40% libraries are assessing all services being offered by the INFLIBNET center.

Ramesha & Kanamadi (2004) evaluated IT-based services on the basis of user requirements and satisfaction. The study was conducted in the University Libraries in the Karnataka state. In this study, the researcher used the survey research method followed by two different sets of questionnaires one for users and another for the providers of service- for the Librarians. In the findings of the study, researchers noted that out of 7 universities, only 3 have full-time librarians and further the existing staff strength, both professional and others, is highly inadequate compared to magnitude of the work.

These libraries have traditional and modern infrastructure and IT facilities and network facilities are available in most of the university libraries. Most of them were participating in the one/another network system for sharing the resources. The researchers also traced out the awareness level of the users regarding the computerisation activities of the library. The results of the study showed that the lack of manpower is the basic cause of declining of the quality of library and information services. Further the study indicated that the university libraries are lacking in the programs of users awareness and publicity. The researcher revealed the need for the library professionals to update new skills by considering the changing environment in the respondent libraries.

Cholin (2004) in another paper took an outline of the implementation of information technology in different university libraries in India. The paper has discussed the role of INFLIBNET Centre and overall development of University libraries across the country with special emphasis on efforts through UGC-Infonet E-journals

Consortium. The paper has also related the availability of e-journals in western universities with Indian Universities. The paper found out the problem faced by the University Libraries in meeting the user requirements even after spending more than 75-80% library budget on journal subscription. The paper concluded that the libraries could increase buying power and access to resources 40 through qualitative resource sharing for effective document delivery service among the universities.

Singh & Gautam (2004) presented a summary of the electronic databases developed in India or on Indian topics. The paper emphasised various electronic databases in India as Indian databases on science and technology established by NISSAT (National Information System on Science and technology, SAARC social sciences and humanities database, National Institute of Science and Information Resources (NISCAIR) databases, National Union Catalogue of scientific serials in India (NUCSSI) database, DELNET databases, INFLIBNET databases, other databases such as Library and information science databases, statistical databases. Researchers claimed that the role of information science professional is to tap the unique items of useful information, the nuggets of knowledge and to extract the search pattern in the raw data. Further, it was concluded that the intermediary role of library science professionals in accessing, structuring, evaluating and refining has improved.

Srivastva & Kanaujia (2004) conducted a study for investigating the present situation of library automation, CD-ROM database services, internet and on-line facilities, reprographic services in Agricultural University libraries in India. The survey also highlighted the conventional documentation and information services namely bibliographic service, current awareness service, abstracting and indexing and newspaper clipping services in agricultural Universities in India. The study used

questionnaire technique for data collection and data collected from 30 agricultural University Libraries in India. Findings showed that 100% researchers recommended that all the libraries should provide agricultural newspaper clippings service. The further suggestion given for implementing OPAC in the library for better access to information and CD-ROM database service should be provided by all the respondent libraries and automate their library functions and services. The researchers finished that in the new millennium, each library in India must go on the electronic internet for better information services for meeting the future challenges.

Pandian, Jambhekar & Karisiddappa (2002) mentioned that there have been many co-operative efforts up to 2002 among the Indian Libraries for resource sharing, but it is hard to find one successful program that could use as a benchmark to replicate in other libraries. Further, they added that main factors affect such efforts are more human and attitudinal than technological or economical. Researchers designed a framework for the internet model based on a consortia approach for facilitating information access and use by providing a single web-enabled window to the information users for the participating institutions (IIM‟ s) in the consortia program not only to their resources but the other institutions resources also. The purpose of the model was to bridge the gap between information resource rich and information deficient libraries and enhance the information use shared access and optimum utilisation of information resources at an affordable cost. Thus the paper proposed a model for IIM consortia for sharing the on-line resources among IIM libraries and concluded with the fact that with the advent of the internet World Wide Web, it has been possible to provide instantaneous access to the resources available not only within the organisations but other institutions that participating in the consortia program.

Cholin & Karsiddappa (2002) argued that for meeting the genuine needs of users, libraries need to take an active part and provide access to on-line resources. The paper has discussed the role of OCLC (Online Computer Library Centre) and the services offered by OCLC in different packages.

Chikkamallaiah, & Usha (2002) discussed the efforts for accessing the on-line resources through the formation of IIM consortium and Raina Roshan Lal (2005) illustrated sharing of online resources among the IIM's at the INDEST Consortium of the MHRD. The IIM's are sharing 7 on-line databases at a consortium price.

Sridhar (2002) discussed the case study of sharing of on-line resources among the ISRO libraries where the effort has been made by using the consortia approach. Efforts were also put in to implement uniform library management software to enable remote networked access of holdings of about a dozen libraries within the organisation. The online resources such as Ulrich+, Aerospace, Compendex and BIP databases are shared. Additional shared resources through the consortia were the 22 on-line journals related to aerospace, IEEE journals.

Rao (2001) illustrated the challenges for the networking of libraries and information centers in India. The paper mentioned the changes that libraries and information centers need to undergo and also highlighted the role of ICT in transforming traditional libraries and information center into a digital mode. The paper also discussed the government policies that led to the development of national information infrastructure. The paper mentioned that the working group of the planning commission recommended the need for networking and modernisation of library and information centers in India during the seventh five-year plan (1985-90).

The paper further mentioned that the libraries and information centers should set the objectives which include the availability of computerised services to users, promotion of resource sharing among member libraries, the development of a network of libraries and the coordination of efforts for suitable collection development for reducing unnecessary duplication.

Mishra (2001) conducted a survey of local library networks in India for studying the factors affecting local library networks. A survey of participating libraries of four local networks (ADINET, CALIBNET, DELNET and PUNENET) in India was conducted using a survey method. The study revealed that organisational factors such as planning, governance, funding, communication and administration are related to each other. The study surveyed 131 libraries. The questionnaire included items related to computerisation and networking, organisational factors, and general data. The study considered six organisational factors as planning, governance; funding, communication administration and success and they were measured using a Likert 5point scale. The response for these factors indicating moderate level. Researchers indicated that raising the levels of these factors will assist in developing local area networks. The researcher concluded that the local area networks in India are in an elementary stage, further he added only DELNET is functioning in the true sense as a network. The researcher suggested few active steps for the development of local area networks in India as follows:

Proper long-term, strategic and short-term planning with specific agenda of action, the network service center should be located in one of the member libraries, constant up gradation of hardware and software for successful delivery of information within the network, nominal fees from the member institutions and training for professionals.

Raina (1997) proposed a model for establishing a network among the IIM libraries for sharing the resources through his thesis titled "Library Resource sharing and Networking: an approach to management schools in India." The research work is a comparative study of IIM's in India.

In a nutshell, the networking related services created multiple choices of accessibility to the users. The way of improvement is the successful application of it in the libraries. Automated library functions, on-line access to full-text databases, Web OPAC, Digital Library, remote access are few major highlights of it, whereas 44 benchmarking is mapping out the milestones of future development. It is an ongoing process of improvement. It is the process of understanding the user requirements and application of it for the future improvement.

2.6 Problems of resource sharing and networking

When libraries work together having a similar objective of maximising the availability of resources, services and minimise the expenditure is known as resource sharing. Resource sharing denotes "a mode of operation whereby the functions are shared in common by several libraries" (Muthu, 2013). The author discussed the challenges faced by the libraries in library collaboration for resource sharing. Mainly four broad challenges were pointed out in this study these are collective action problem, libraries participate in shared activities both too much and not enough, not just more collaboration but needed more strategic view of collaboration. The engagement of librarians in information resource sharing has evidenced various challenges across the world. These challenges have been discussed in several previous studies as Kalbande et al. (2019), Igbo and Imo (2017), Dalmini and Snyman (2017),

Chong, Yun and Gan (2014), Muthu (2013), Ansi and Ali (2012) and Owolabi *et al.* (2011).

Most of the reported studies underline the issues related to the documented policy of sharing the resources (Owolabi et al., 2011). Policies and procedures are an essential component in the formal communication among libraries; there is a significant need for standard policy and rules to maintain uniformity. Igbo and Imo (2017) inferred in their study that 61% university librarians of the public universities in Southern Nigeria were agreed with the absence of documented policy as a significant barrier in the resource sharing among universities.

Similarly, in the comparative study of state and federal universities in Nigeria was observed that out of 70 responses none of the response got in favour of availability of resource sharing policy in their university Nwegbu, Echezona & Obijiofo (2011). A skilled employee plays an essential role in the success of any organisation a trained professional always provides a healthy atmosphere in their workplace. A study conducted by Rifauddeen (2008) identified that 49% of technical libraries in Sri Lanka accepted the lack of trained staff in their libraries as a major constraint while performing resource sharing activities in their libraries.

Owolabi et al. (2011), commented in their study that inadequate security of material is one the hindrance found in the sharing of resources in Nigerian University libraries with 83.07% of responses. On the other hand, the study of Rifauddin (2008) expressed that 48% of technical libraries in Sri Lanka faced the inadequacy of security of materials while performing resource sharing. Chong, Yun and Gan (2014), Rifauddeen (2008), Nwegbu, Echezona & Obijiofo (2011). There are many several studies which highlighted the funding as a significant constraint in resource sharing

and networking (Dalmini and Snyman, 2017; Madumere et al., 2013; Anasi and Ali, 2012; Owolabi, Bamigboye, Agbuola & Lawal, 2011; Igwe, 2010; Rifauddeen, 2008; Etim, 2006; Hiremath 2001). A study done by Kalbande *et al.* (2019) reported that lack of funds was a significant hurdle in the implementation of resource sharing and networking among libraries in India.

Kalbande et.al. (2019) explore the challenges in sharing resources in libraries and they tried to situate India's position in networking and resource sharing. The study revealed that various technical, procedural, psychological, behavioural and legal barriers in achieving planned resource sharing and networking in agricultural college libraries in Maharashtra (India).

Library collaboration is a very common way of resource sharing and to support the statement Dempsey (2019) conducted a study and strongly emphasizes on collaboration of libraries and supports them more deliberately in a network environment, where scale is important in creating efficiencies and impact. The author discussed on the challenges faced by the libraries in library collaboration for resource sharing. Mainly four broad challenges were pointed out in this study these are collective action problem, libraries participate in shared activities both too much and not enough, not just more collaboration but needed more strategic view of collaboration.

A research on use of cloud platform for resource sharing system of library service area has been conducted by Sun et.al. (2018). In this paper they build cloud platform architecture of library constitutes a local library and introduce the cloud computing related technology after that the system. However, the library resource sharing service system still faces many problems in the cloud-computing environment. Because the

sharing of library characteristic information resources is a new thing in the cloud computing environment, how to achieve resource sharing, the responsibilities, rights, obligations and contract performance time of each library How to formulate payment forms and amounts, etc. are all issues that need to be considered. A multi-agent sharing model for educational information resources under the cloud-computing environment has established to serve the construction of library information resources better.

Bangani et.al. (2018) analyzed the interlending services of North West University on various aspects like trends, languages and use of collection development by using bibliometric method. The results show that despite some challenges, ILS services at the NWU decreased. More than 98.5% of all documents requested are in English language. The study shows that Public university libraries in South Africa face a number of challenges which include, budget cuts, introduction of 15% VAT on e-resources, student protests and depreciation of the African Currency. Finding shows that Inter-lending services usage statistics had decreased sharply over the past years. The results support the continued use of Inter-lending Services data for collection development purposes as it can be an effective tool to fill the collection gap.

A similar study on Institutional Repositories in Africa by Dlamini & Snyman (2017) has been conducted to explore the reasons for the perceived little development and exploitation of IRs in Africa is limited. The paper identifies the obstacles and challenges regarding IRs in African academic institutions. The major obstacles were identified as inadequate funding, lack of support from institutional management and lack of awareness of IRs at institutional management level. Authors recommended to

create greater awareness of IRs, effective and appropriate IR advocacy strategies for the unique needs and nature of African academic institutions.

A study by Igbo & Imo (2017) explored the state of electronic information resource sharing among university libraries in Southern part of Nigeria highlighting the prospects and the challenges faced during electronic information resource sharing. Besides having diverse kind of electronic information resources and some ICT facilities many University libraries lacked web-based OPAC and library management software which results they could not engage in any meaningful form of structured resource sharing initiative. Other challenges mentioned in this study are lack of institutional policies and standards, slow rate of building local content for national/international access, unskilled librarians etc. They revealed that 74% of respondents think that professional development of librarians through workshops, seminars and symposium is significant for enhancing the electronic information resource sharing. It is also suggested by the respondents that there should be a coordinating body for creating standards for electronic information resource sharing (70%). In the same way as other helpful activities, resource sharing is confronted with many hindrances. However, there are several strategies such as proper planning, continuous professional development through training and retraining, adequate funds, proper maintenance of ICT facilities, central regulatory bodies and librarians must better understand and engage in the new online environment to enhance the resource sharing activities in the libraries (Madumere et al., 2013; Nwegbu, Echezona and Obijiofo, 2011; Obelander 2007; Etim, 2006).

Madumere & Others (2013) discussed the utilization of ICT in promoting networking and collaboration among libraries in Nigeria, they also pointed many challenges faced

by libraries in networking and collaboration these are insufficient power supply, poor maintenance culture, lack of funding, barriers of tradition in which old philosophy of librarian as a custodial approach is more favoured rather than the modern philosophy of user oriented approach, poor maintenance of ICT facilities, unavailability of location tools such as directories, accession list, indexes, abstract, union list, union catalogues etc. Paper concluded on optimal use of ICT to advance networking and collaboration among libraries especially in Nigeria.

Muthu (2013) describes the whole concept of resource sharing in a paper entitled resource sharing in libraries a vital role of consortia. The author highlighted what resource sharing is, why it is needed, what are the means and methods, what are the components, what are the barriers in the path of resource sharing and many more.

The author listed many barriers and problems faced by the libraries while performing resource sharing some are: Cost and manpower involved in resource sharing is a big barrier as lack of fund is a big issue for almost every library, lack of institutional and external support & Legal and administrative, difficulty in mutual agreement is another barrier in resource sharing according to the author. The author concluded this paper by praising library consortia and designating them the best solution at present scenario to fulfill the information hunger of society.

A study explores the feasibility of establishing a consortium for the sharing of electronic resources between two libraries located in Kingston has been conducted by Smart & Fullerton (2013). In this article authors compared the two libraries in terms of staffing, mission, funding and collection and also many similarities including e-resources. For analyzing three steps were taken by the authors: review of related literature, interviews and review of existing processes and documentation.

There are many barriers and obstacles in library collaboration like budget cuts, fluctuating currency exchange, mounting competition from internationally and locally branded institutions, discerning stakeholders, and competition between the two universities.

Siddike (2012) in the study on perception of users on networking and resource sharing, author find out the importance and awareness of information system in the libraries of Bangladesh, he realizes that networking and resource sharing is one of the most effective way to fulfil the information need of the users. This study also reveals many barriers in networking and resource sharing such as lack of fund, inadequate information resources, untrained staff, unavailability of modern technological facilities and most important unwillingness of higher administration. Findings showed that users are not satisfied with the information services provided by public and private university of Bangladesh.

A similar study on challenges and prospects of resource sharing in Nigerian University Libraries was conducted by Anasi & Ali (2012). The authors examine the barriers in implementing resource sharing among academic libraries in Nigeria. Finding shows that prospect for resource sharing is very high among libraries but the obstacles like inadequate funding, unskilled library professionals, interrupted electricity supply, absence of web OPAC and slow progress of library automation are big barriers in the way of resource sharing. This study recommended to allocate a specific annual budget for ICT development and for proper training of library staff for resource sharing.

In a study Hales (2012) reviews the potential impact that electronic resources have on resource sharing and to find out the steps taken by the libraries to ensure the provision

of access and services to their patrons. The researcher finds that many libraries are unable to provide their electronic resources through inter library loan due to prohibitive licensing language and failure of copyright law to address the issues involved in lending electronic resources and this attitude towards e-resources and inter library loan could limit the access to information and services.

A study on resource sharing in Nigerian University libraries by Owolabi & Others (2011) examines the status of resource sharing in 65 University Libraries of Nigeria. This study has many objectives including identifying the problems and barriers in the promotion of resource sharing among university libraries. According to the finding, lack of security of materials like plagiarism and copyright infringements are the major problem in the promotion of resource sharing.

Rifaudeen (2008) conducted a study on the problems of resource sharing among scientific and technical libraries of Sri Lanka. This study describes the main resource sharing program of SLSTINET and examines the problems faced in the process of resource sharing. SLSTINET is the National Library & Information Network of Science and Technology in Sri Lanka, it is a subject oriented network. The author identifies many barriers in resource sharing, lack of union catalogue is the major problem in SLSTINET. According to the study lack of mailing or transportation system and inadequate communication system are the barriers in resource sharing. The study also revealed many other obstacles in the path of resource sharing like inadequate security of materials, untrained staff, unavailability of adequate fund, unavailability of mutual agreement, non-cooperation of library staff and lack of government and institutional support.

2.7 Conclusion

The aforesaid review of the literature has been done with the help of research articles, review articles, conference proceeding articles and reports etc. It concludes that various research work have been carried out in the field of resource sharing and networking among libraries. Next chapter of the study discussed the research methodology adopted for the study in detail.

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Chapter III
Research Methodology

Chapter III

RESEARCH METHODOLOGY

3.1 Introduction

As a higher learning institute, major missions of the any academic institute is imparting knowledge and carrying out research in prime areas which is of concern not only to institute themselves, but also to the government as well as public. The scope of this study is limited to explore the impact of information technology especially in resource sharing among the NIT libraries in India. Total 31 national institute of technology are located in India taken from the website of NIT Council.

3.2 Population and sample of the study

For the present work, researcher has categorised six zones that is east, west, north, south, north east and central zone of India. From these zones NITs are categorised and following list indicates the same. There is varying number of institutes in the selected zones. Due to this unequal proportion of NITs across the zones, two institutes present in a particular zone had been selected for the study.

Table: 3.1 List of National Institutes of Technology in India

Sr. No.	Zones	Names of NIT
1.	**East Zone**	I. National Institute of Technology, Durgapur II. National Institute of Technology, Jamshedpur III. National Institute of Technology, Patna IV. National Institute of Technology, Rourkela V. National Institute of Technology, Arunachal Pradesh
2.	**West Zone**	I. Malaviya National Institute of Technology, Jaipur

		II.	Visvesvaraya National Institute of Technology, Nagpur
		III.	S V National Institute of Technology, Surat
		IV.	National Institute of Technology, Goa
3.	**North Zone**	I.	Motilal Nehru National Institute of Technology, Allahabad
		II.	National Institute of Technology, Hamirpur,
		III.	Dr. B. R. Ambedkar National Institute of Technology, Jalandhar
		IV.	National Institute of Technology, Kurukshetra
		V.	National Institute of Technology Uttarakhand
		VI.	National Institute of Technology, Srinagar
		VII.	National Institute of Technology, Delhi
4.	**South Zone**	I.	National Institute of Technology, Calicut
		II.	National Institute of Technology Karnataka, Surathkal
		III.	National Institute of Technology, Tiruchirappalli
		IV.	National Institute of Technology, Tadepalligudem
		V.	National Institute of Technology, Warangal
		VI.	National Institute of Technology, Pondicherry
5.	**North East**	I.	National Institute of Technology, Agartala
		II.	National Institute of Technology, Silchar
		III.	National Institute of Technology Sikkim
		IV.	National Institute of Technology, Meghalaya
		V.	National Institute of Technology, Nagaland
		VI.	National Institute of Technology, Manipur
		VII.	National Institute of Technology Mizoram
6.	**Central Zone**	I.	Maulana Azad National Institute of Technology, Bhopal
		II.	National Institute of Technology, Raipur

Sample of the Study

In order to analyze the status of networking and resource sharing among the libraries of National Institute of Technology in India thestudy will be performed. The population of the study will be librarians and the users of NIT Libraries in India. The

sample is homogeneous in nature as they belong to same discipline which is engineering and technology. Stratified sampling has been used for selecting the institute among the population of the study.

For the study first researcher has categorised all the NITs into 6 separate zones. Zones of India have been made as per the map given on mapsofindia.com a government website. For clear interpretation of each zone following table has been prepared. Where all the states have been mentioned.

Table: 3.2 List of selected NIT libraries

S. No.	**Zone**	**Name of the Library**	**Name of the Institute**
1	East Zone	Central Library	National Institute of Technology, Patna
		Biju Patnaik Central Library	National Institute of Technology, Rourkela
2	West Zone	Central Library	S V National Institute of Technology, Surat
		Central Library	National Institute of Technology, Goa
3	North Zone	Library	National Institute of Technology, Kurukshetra
		Central Library	National Institute of Technology, Delhi
4	South Zone	Central Library	National Institute of Technology, Truchirappalli
		Central Library	National Institute of Technology, Pondicherry
5	Central Zone	Central Library	Maulana Azad National Institute of Technology, Bhopal
		Central Library	National Institute of Technology, Raipur
6	North East Zone	Central Library	National Institute of Technology, Silchar
		Central Library	National Institute of Technology, Meghalaya

Image: 3.1 Source: Maps of India (2018, July)

Sampling for Users:

For measuring the satisfaction level of users, researcher needs data from the library users. Data collection Here researcher followed the random sampling technique with the help of using a table given by research advisors group (2006). By using this table researcher finalises the exact sample size which is 1318 at the rate of 3.5% margin of error and 99% level of confidence.

Mathematical expression of sampling has been discussed below:

Required Sample Size†

Population Size	Confidence = 95% Margin of Error				Confidence = 99% Margin of Error			
	5.0%	3.5%	2.5%	1.0%	5.0%	3.5%	2.5%	1.0%
10	10	10	10	10	10	10	10	10
20	19	20	20	20	19	20	20	20
30	28	29	29	30	29	29	30	30
50	44	47	48	50	47	48	49	50
75	63	69	72	74	67	71	73	75
100	80	89	94	99	87	93	96	99
150	108	126	137	148	122	135	142	149
200	132	160	177	196	154	174	186	198
250	152	190	215	244	182	211	229	246
300	169	217	251	291	207	246	270	295
400	196	265	318	384	250	309	348	391
500	217	306	377	475	285	365	421	485
600	234	340	432	565	315	416	490	579
700	248	370	481	653	341	462	554	672
800	260	396	526	739	363	503	615	763
1,000	278	440	606	906	399	575	727	943
1,200	291	474	674	1067	427	636	827	1119
1,500	306	515	759	1297	460	712	959	1376
2,000	322	563	869	1655	498	808	1141	1785
2,500	333	597	952	1984	524	879	1288	2173
3,500	346	641	1068	2565	558	977	1510	2890
5,000	357	678	1178	3288	586	1066	1734	3842
7,500	365	710	1275	4211	610	1147	1960	5165
10,000	370	727	1332	4899	622	1193	2098	6239
25,000	378	760	1448	6939	646	1285	2399	9972
50,000	381	772	1491	8056	655	1318	2520	12455
75,000	382	776	1506	8514	658	1330	2563	13583
100,000	383	778	1513	8762	659	1336	2585	14227
250,000	384	782	1527	9248	662	1347	2626	15555
500,000	384	783	1532	9423	663	1350	2640	16055
1,000,000	384	783	1534	9512	663	1352	2647	16317
2,500,000	384	784	1536	9567	663	1353	2651	16478
10,000,000	384	784	1536	9594	663	1354	2653	16560
100,000,000	384	784	1537	9603	663	1354	2654	16584
300,000,000	384	784	1537	9603	663	1354	2654	16586

Source: The research advisors group (2006).

Total population = 40,892

Sample Size = 1318 (@ 3.5% margin Error and 99% of level of Confidence)

Sample Size =?

Sample size $= \frac{Sample\ size}{Total\ Population} \times 100$

$= \frac{1318}{40,892} \times 100$

= 3.22%

Sample size = 3.22%

If one Institute's population size = 5000

Sample size % = 3.22%

Sample size $= \frac{Institute\ populataion\ size \times sample\ size\%}{100}$

$= \frac{5000 \times 3.22}{100}$

= 161

Sample size = 161

With the help of above calculations following table has been prepared. Here 3.76% of the total population of each institute has been taken as a sample of user for the study.

Table 3.3 Sample size of selected NITs

S.No	Name of the Institute	Number of Users	Sample Size
1	MANIT	5000	161
2	NITD	748	25
3	NITG	470	16
4	NITKKR	5441	176
5	NITM	1046	34
6	NITP	3221	104
7	NITPDY	600	20
8	NITR	4350	141
9	NITRKL	6000	194
10	NITS	3744	121
11	NITT	5500	178
12	SVNIT	4772	148
	Total	**40,892**	**1318(D)/ 1137(R)**

Data Collection

In the study data will be collected by using structured questionnaire, observation as well as interview method. Also the indirect method of data collection which is usage of websites of university will be used by the researcher.

3.3 Questionnaire Preparation

Questionnaire for Librarians

By following various steps, the detailed structured questionnaire (Ahuja, 1999) has been prepared for the librarians/ library-in-charge of National Institute of technology in India. The detailed overview on questionnaire has been discussed here:

- Questionnaire for librarian has been divided into 4 sections. Under which different types of question had been included like dichotomous close ended question, questions based on likert scale and some open ended questions.

- Section 1 deals with the personal profile of the library in charge/ librarian of the concerned NIT. Under which total 5 question have been asked. All 5 question are in open ended in nature where respondent have to fill their details like gender, research experience, qualification and designation of the respondent.
- Section 2 deals with the library profile. Here total 6 questions had been asked from the librarian. This section includes various types of questions like close ended with multiple choice questions. Researcher had given one any other option under each question which makes a close ended question in open ended.
- First 2 questions deals with name of the library and establishment year of the concerned library. Here purposes of including such questions are mandatory because name is major aspect of distinguishing the filled questionnaire.
- Other questions are related to number of registered users in the library, the details of the library collection especially with reference to the online full text or bibliographic databases.
- Last question of this section is related to figure out the staff strength of the particular library. Reason for asking this question is related to find out the appropriate library personnel behind providing the best library services.
- Since present study is based on finding out the impact of information technology on resource sharing among libraries so section three completely consist question related to information technology tools and techniques such as ICT infrastructure, web based services and mobile based library application or services etc. with the sequence of these question one question is related to the practical problems with the Information technology.

- Next section of the questionnaire deals with the budget of the NIT libraries, so that availability of funds can be monitored as per the requirement for resource sharing among all NIT libraries in India.
- All the question related with the areas, impediments and strategies of resource sharing were putted under the last section of the questionnaire. Under this section total seven questions had been asked from the librarian where three questions were open ended and rest of them were close ended.
- First question of this section was based on the areas of resource sharing. To find out the current status of resource sharing among NIT libraries this particular question had been asked. Next three questions were based on the consortium based practices in libraries and also the impact of consortium in their libraries. These questions were framed to figure out the popular consortium among NIT libraries as well as other than that from where they were subscribing their electronic resources for meeting their users' need.

Other than this structured questionnaire few interview based questions were also asked from the librarian to figure out the feasibility of networking among NIT libraries. All those question were opinion based and recorded by the researcher at the time of interview.

Questionnaire for users

For measuring the satisfaction level of the users of library a separate questionnaire having 15 questions has been prepared. The detail description of the questionnaire has been given under the points below:

- Questionnaire for users has been designed under 15 questions. Where first question have been asked from the users about their personal information like name, name of the institute, course name, gender of the respondents and their contact details. Reason behind asking such question is related only for the purpose of identifying the each respondent.
- Next question is related to the library visit of the users. This question is putted in the questionnaire for getting the number of regular users of library as well as users who are not using the library so that the exact amount of users can be figure out.
- With this sequence another point is related to the purpose of using the library. Reason behind this question was taking out the actual point that for what purpose such library has been used by its users. Remaining 3 questions are related to the library collection and their staff.
- Next question is related to the concept of resource sharing awareness. And with sequence of such question another one is related to the opinion of resource sharing. This question is based on the likert scale (Vagias, 2006) that how much the users are supporting the idea of networking and resource sharing among all NITs.
- Question 9 of the questionnaire is again based on 5 pointer likert scale where points are related to the library facilities. Reason for asking such question is for digging out the best facility provided by the library as well as figuring out the scope of improvement.
- Remaining questions are related with the satisfaction level of the users with the library services its electronic resources as well as the problems with usage

of electronic resources. Again purpose for asking such questions directly aims to digging out the area for improvement of such concerned library.

- At the end a suggestion based explanatory question have been asked so that users can get the space to present their points and perception toward the library and its services.

After collecting the data, suitable tables had been formulated for each aspect with the help of Statistical analytical tools. The analysis involved various steps like categorizing data, coding data and calculation that is tabulated and analyzed. Analysis of questions has been carried out in the same order as given in questionnaire. Separate tables along with graphs and textual presentations will be prepared for different aspects asked in questionnaire.

3.4 Handling non-response bias

Non-response bias is defined as being the result of non-responsiveness of the respondents to the questionnaires that were given to them (Bhattacherjee, 2012). Having a significant number of non-respondents can prevent the results of a study to be generalized. It is important to note that the response rate achieved in this study was high (as indicated in the next chapter). In order to achieve this, a set of measures were implemented to avoid non-response bias:

Relevance of the content

The content of the questionnaire was of relevance to the students. Literature has shown that students spend much of the time online, and they used their social media platforms to learn about what happening in the world (Bhattacherjee, 2012). The

respondents were more willing to participate in the study because it is related to what interests them. This might have been a reason for a high response rate.

Respondent-friendly questionnaire

The questions contained in the questionnaire were clear, short, straight to the point, and easy to understand. The questions were designed in this way to avoid taking a lot of time for the respondents to read, understand and fill the questionnaire. Furthermore, they were also designed in this way, in order not to discourage the respondents from participating in the study just because the questionnaire was long. Miller and Smith (1983) stated that questionnaires designed in this way have a tendency to improve the response rate.

Confidentiality and privacy

According to Bhattacherjee (2012), providing assurance to the respondents of the confidentiality of their personal information, can lead to higher response rates. An informed consent form was given to the respondents before they could fill the questionnaire. They were informed that their personal information would be kept confidential and would not be revealed to any third party during or after the research.

3.5 Ethics

According to Bhattacherjee (2012), the researchers have to conform to the ethical principles to guarantee that the research results have not been achieved subjectively. This is necessary to ensure that the research results have not been through any type of manipulation to suit the researcher's personal interests.

3.6 Conclusion

To conclude the chapter, we can say that truly defined methodology is the backbone of any research. This chapter presented the methodology that was followed to conduct this study. It was explained that a descriptive design was followed and a quantitative approach was employed in this study in order to achieve the objectives of the study. It also defined the tools and techniques which have been used in the study. An overview of the questionnaire used in this study was presented in this chapter. The chapter concluded with a discussion on the ethical principles upheld in the study. The next chapter presents the analysis of the data obtained. and its interpretation had been explaining in detail in the next chapter entitled "Data analysis and interpretation" of the report.

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Chapter IV
Analysis of Data and Interpretation

Chapter IV

DATA ANALYSIS & INTERPRETATION

4.1 Introduction:

The previous chapter highlighted a presentation of the research methodology that was used to conduct this study. This chapter presents the responses obtained from the respondents, as well as their analysis. The report on how the questionnaire was tested for reliability and consistency is presented in this chapter. The chapter also presents the inferential and descriptive statistics of the data collected. This chapter only displays the results the way they were collected from respondents; more detailed interpretations of the results are presented in chapter five. This chapter presents data analysis and interpretation. The data was collected through questionnaires and observation method. To understand the objective of the study, data was collected from librarians and the users of the libraries of National Institutes of Technology (NITs) on Resource sharing and networking among libraries. Librarian's questionnaire was prepared to find the information regarding the impact of IT-based practices in the library, available ICT Infrastructures, problems and issues in the implementation of ICT applications in the libraries. User's questionnaire was designed to identify broadly the use, satisfaction, opinion and question faced in using the electronic resources and digital services offered by the library. Following sections have been covered in the librarian questionnaire- Personal Profile General Information about the Library ICT Based Practices in Library IT Infrastructures Social Networking Sites Problems and Issues in the Implementation of ICT After collecting data, it was analysed using SPSS a statistical tool, MS Word, MS Excel, tables and graphs have

been created to summarize the data. The data has been presented in the following two sections:

- Analysis of Data Collected from the Librarians of National Institutes of Technology

And

- Analysis of data collected from the users of National Institute of Technology libraries

4.2 Response rate of Librarian/ Library-In charge

The present study was conducted on National Institute of Technology in India with the sample size of two NITs from each zone of India in conformity with the maps of India (Maps of India, 2019). For the librarians total, 12 questionnaires were distributed and received back by the personal visit of each NIT Library, and further, the responses from the librarians were analysed for the study.

4.3 Response Rate of Users:

As mentioned in chapter 3, the targeted population of the study was the total number of library users of selected NITs, and the sample size was 1318, in conformity with The Research Advisors (2006). Entire 1318 questionnaire was distributed among selected NIT Libraries, and 1137 responses were received back. This leading to a response rate of 86.26%; which, according to Dillman (2011), is acceptable. The distribution of questionnaire and response rate has been tabulated in the table 4.1

Table: 4.1 The response rate of Users of NIT Libraries

Name of the Institute	Distributed Questionnaires	Received Questionnaires	Percentage%
MANIT	161	128	79.50%
NITD	25	25	100%
NITG	16	16	100%
NITK	176	146	82.95%
NITM	34	34	100%
NITP	104	82	78.84%
NITPDY	20	20	100%
NITR	141	118	83.68%
NITRKL	194	169	87.11%
NITS	121	101	83.47%
NITT	178	162	91.01%
SVNIT	148	136	91.89%
Total	**1318**	**1137**	**86.26%**

Above table depicts the response rate of the respondents involved in the study. The table shows that the total 1137 responses (86.26%) were received back out of 1318 distributed questionnaires in selected NITs. Among all NITs, NITD, NITG, NITM and NITPDY got the 100% responses while NITP got the lowest response rate which is 78.84%.

4.4 Reliability and consistency:

According to Sekaran and Bougie (2016), the Cronbach alpha reliability test is done to determine whether the instruments used in the collection of data, in this case, questionnaires, were reliable and without errors. A reliability test results in a Cronbach alpha with a value ranging from 0 to 1. The possibility of getting more reliable responses is higher when the value of the Cronbach alpha is close to 1. To test the internal consistency, you can run the Cronbach's alpha test using the reliability command in SPSS, as follows:

RELIABILITY /VARIABLES=q1 q2 q3 q4 q5. (Indiana University, 2018).

Reliability and consistency

Reliability Statistics	
Cronbach's Alpha	N of Items
.618	18

4.5 Analysis of Data Collected from the Librarians of NITs

Descriptive statistics of the study

4.5.1 Gender wise respondents

It is explored from the table 4.2 that 75% of respondents of central libraries of National institutes of Technology are male and 25% of respondents are female. It means that the majority of respondents (Librarians or Deputy Librarian or Assistant Librarian or Senior Library Information Assistant.) of central libraries of NITs are male.

Table 4.2 Gender wise responses

S.No	**Name of the Institute**	**Gender**	
		Male	**Female**
1	MANIT	✓	
2	NITD		✓
3	NITG	✓	
4	NITKKR	✓	
5	NITM	✓	
6	NITP	✓	
7	NITPDY	✓	
8	NITR	✓	
9	NITRKL	✓	
10	NITS		✓
11	NITT		✓
12	SVNIT	✓	
13	Total	75% (9)	25% (3)

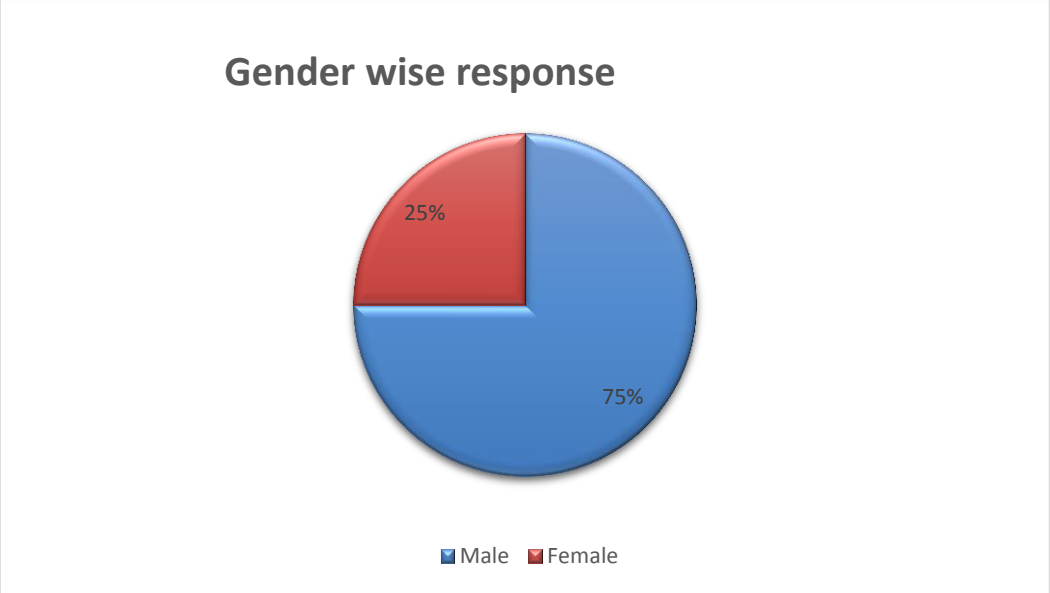


Figure 4.1

4.5.2 Educational Qualification of the respondents:

It is observed from table number 4.3 that 50% (6 out of 12) respondents (MANIT Bhopal, NIT Goa, NIT Kurukshetra, NIT Puducherry, NIT Silchar and SVNIT Surat) are postgraduate. Similarly, 50% (6 out of 12) respondents (NIT Delhi, NIT Meghalaya, NIT Patna, NIT Rourkela and NIT Tiruchirappalli) are having the doctorate in Library and Information Science subject.

Table 4.3 Educational Qualification of the respondents

S.No	Name of the Institute	Qualification		
		Post Graduate	M.Phil	PhD.
1	MANIT	✓	-	-
2	NITD	-	-	✓
3	NITG	✓	-	-
4	NITKKR	✓	-	-
5	NITM	-	-	✓
6	NITP	-	-	✓
7	NITPDY	✓	-	-
8	NITR	-	-	✓
9	NITRKL	-	-	✓
10	NITS	✓	-	-
11	NITT	-	-	✓
12	SVNIT	✓	-	-

4.5.3 Designation of the Respondents

Designation of the respondent is tabulated below in table 4.4 wherein National Institutes of Technology, one respondent was Librarian (L) in NIT Tiruchirappalli, 3 are Deputy Librarian (DL), and 8 were Assistant Librarians (AL).

Table 4.4 Designation of the Respondents

S.No	Name of the Institute	Designation			
		Librarian	**DL**	**AL**	**SLIA**
1	MANIT			✓	
2	NITD			✓	
3	NITG			✓	
4	NITKKR			✓	
5	NITM			✓	
6	NITP		✓		
7	NITPDY			✓	
8	NITR		✓		
9	NITRKL		✓		
10	NITS			✓	
11	NITT	✓			
12	SVNIT			✓	
13	Total	8%	25%	67%	NA

It is seen that the overall designation of respondents from 12 central libraries, most (67%) of respondents are Assistant Librarian, 3 (25%) respondents are Deputy Librarian, and only 1 (8%) respondent is Librarian.

4.5.4 Professional Experience

Table 4.5 discussed the experience of the library professionals in selected NITs, only 8% of respondents have less than five years' of experience, whereas 34% of professionals have between five to ten years' experience. The experience of ten to fifteen years is recorded only in 8% professionals while the expertise of professionals between fifteen to twenty-five years and above than twenty-five years is 25% (3 out of 12).

Table 4.5 Professional Experience

S.No	Name of the Institute	Experience				
		<5	5-10	10-15	15-25	>25
1	MANIT				✓	
2	NITD		✓			
3	NITG		✓			
4	NITKKR				✓	
5	NITM		✓			
6	NITP					✓
7	NITPDY	✓				
8	NITR				✓	
9	NITRKL			✓		
10	NITS					✓
11	NITT					✓
12	SVNIT		✓			
13	Total	8%	34%	8%	25%	25%

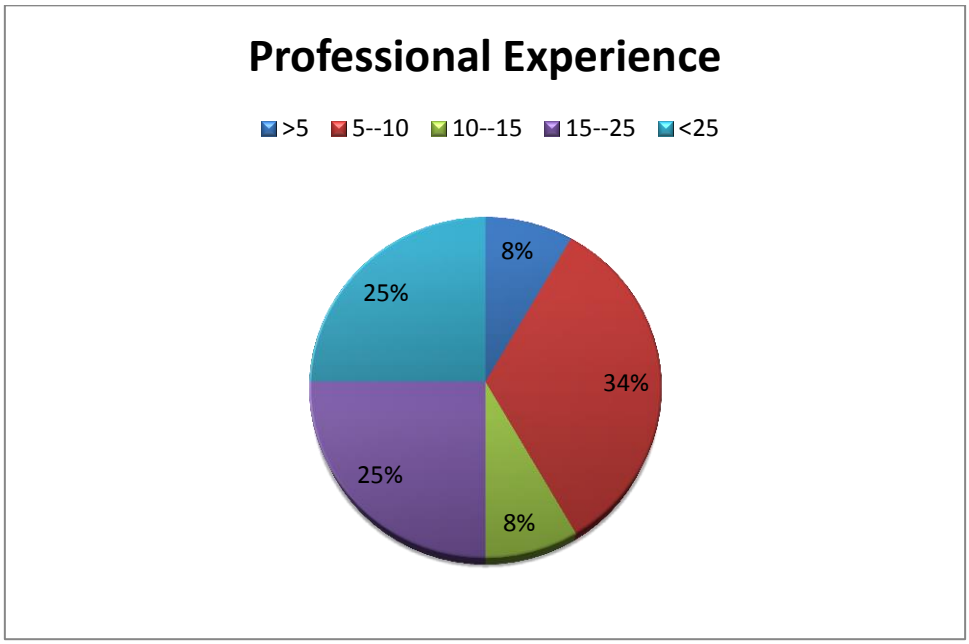


Figure 4.2

4.5.5 Registered users and their sitting Capacity in the libraries :

It is observed from the table 4.6 that in selected NITs, NIT Rourkela has the maximum (6000) number of registered students followed by NIT Tiruchirappalli (5500), NIT Kurukshetra (5441) and NIT Bhopal (5000). Above four libraries were having more than 5000 registered users in their libraries whereas NIT Goa is having

minimum (470) registered user in their library. There are three libraries which are having less than 1000 registered users in their library; they are NITG, NITD and NITPDY.

Here the figure 4.3 also depicts the sitting capacity of the users in the library. It revealed that there are five libraries which were having less than 100 students' sitting capacity (NIT Delhi, NIT Goa, NIT Meghalaya, NIT Puducherry and NIT Raipur). In contrast, the remaining seven libraries are having the capability of more than 200 students at a time. This table shows the sitting ratio of the student concerning the total strength and sitting capacity, and it disclosed that NIT Kurukshetra has the maximum sitting ratio 12.7 followed by NIT Silchar (9.61), NIT Rourkela (9) SVNIT (8.38) and NIT Tiruchirappalli (8.18). As per the registered users, NIT Raipur has the minimum sitting capacity ratio, which is 1.70.

Table 4.6 Registered Users & their sitting capacity in the libraries

S.No	Name of the Institute	Total strength	Sitting Capacity of Users	Ratio
1	MANIT	5000	240	4.8
2	NITD	748	40	5.34
3	NITG	470	20	4.2
4	NITKKR	5441	695	12.7
5	NITM	1046	60	5.73
6	NITP	3221	250	7.76
7	NITPDY	600	20	3.33
8	NITR	4350	74	1.70
9	NITRKL	6000	540	9
10	NITS	3744	360	9.61
11	NITT	5500	450	8.18
12	SVNIT	4772	400	8.38

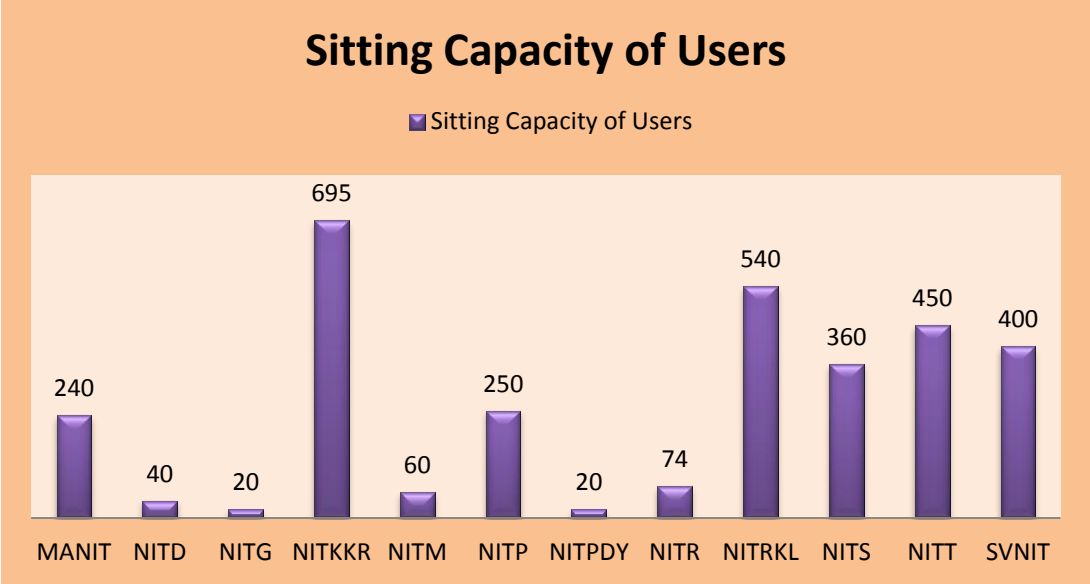


Figure: 4.3

4.5.6 Library Collection

Libraries play a significant role in gaining knowledge. Nowadays preserving the information in analogue as well as in digital format is one of the primary goals of the libraries the academic libraries satisfy the ever-increasing needs of their users. For this, they maintain their collection by acquiring different kinds of printed and non-printed material in the libraries. Likewise, other academic libraries NIT libraries also build a rich collection of documents in their libraries to satisfying their users need. We can see the overall library collection of NIT Libraries in Figure 4.4.

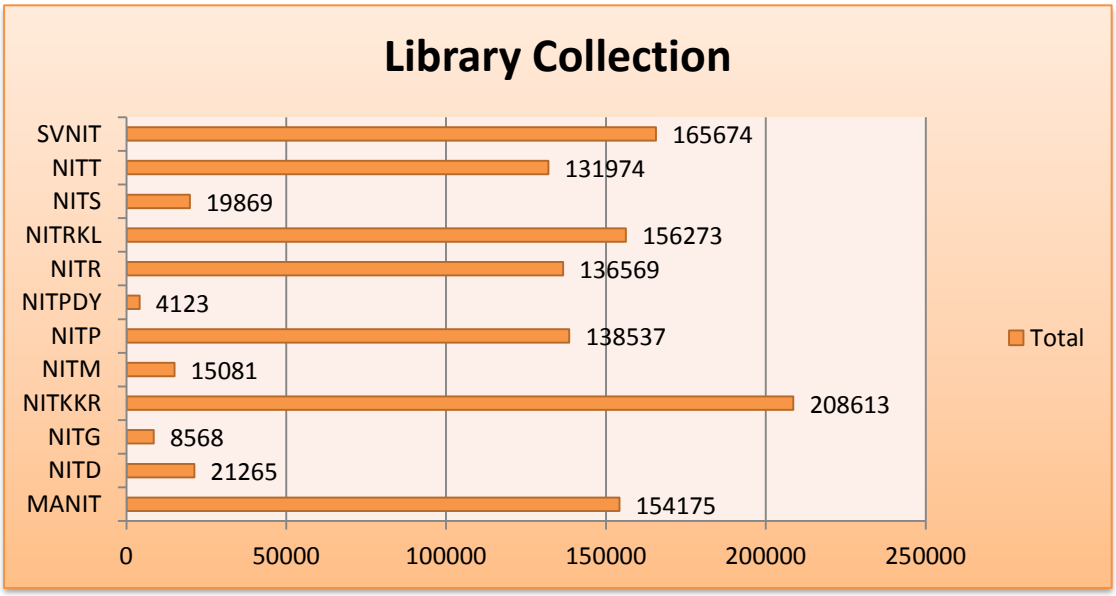


Figure: 4.4

From the above bar chart, among all selected NIT libraries, NITKKR has the highest collection, followed by SVNIT, NITRKL and MANIT. Since NITPDY is the newest NIT among all and having only 4123 documents in their library, it was seen that those institutes which were converted from RECs into NIT under the NITSER Act 2007 is having a rich collection in every means (like MANIT, NITKKR, NITP, NITR, NITRKL, NITT, and SVNIT they were earlier regional engineering centres and under this act they got converted into National Institute of Technology).

4.5.6.1 Print collection

The printed collection has great potential in learning and retaining information. Moreover, in comparison to electronic information, it gives ease to read and refer. For academic library printed material is more important for the students' academic growth and development. There are many services of technical academic libraries which entirely depend on the printed source of information like, book bank service is the most essential and frequent service of all technical institutes where student issued books related to their coursework. These kind of services are only possible when the library is having a rich printed collection for the students.

To assess the richness of library collection information was also collected from about the number of print documents. Data regarding print collection reveals the present status of the collection available in the central libraries of national institutes of technology in India.

Table 4.7 Availability of library Resources

S.No	Collection	NITs											
		MANIT	**NITD**	**NITG**	**NITKKR**	**NITM**	**NITP**	**NITPDY**	**NITR**	**NITRKL**	**NITS**	**NITT**	**SVNIT**
1	**Printed Books**	152859	14647	8000	169439	13886	97500	4123	112582	84553	105883	1.2 Lac	97827
2	**EBook**	26025	-	100	9792	1180	34588	-	17000	15000	-	800	9715
3	**CD-ROM Books**	2044	-	305	1284	-	4215	-	-	1200	4612	3000	15774
4	**Print Periodicals**	-	-	-	78	-	-	-	50	79	92	164	64
5	**Electronic Periodicals**	-	6500	-	5400	-	-	-	6922	5500	-	8000	8488
6	**Bound Volumes (Print)**	-	-	-	-	-	-	-	-	17974	5468	-	8754
7	**Bound Volumes (Electronic)**	-	-	-	-	-	-	-	-		202	-	5395
8	**Theses**	1236	05	05	5426	14	53	-	-	835	699	-	3839
9	**Dissertations**	80	108	155	-	-	2162	-	-	7161	-	-	-
10	**Patents/ Standards**	-	-	-	10097	-	-	-	-	20000	8627+152	-	15844
11	**Full Text**	-	05	03	7097	-	15	-	14	06	17	10	04
12	**Bibliographic**	-	-	-	-	01	04	-	01	05	-	-	
13	**Other**		-	-	-	-	-	-	-	688+128+3144	-	-	-
14	**Total**	**1,54,175**	**21,265**	**8,568**	**2,08,613**	**15,081**	**1,38,537**	**4,123**	**1,36,569**	**1,56,273**	**19,869**	**1,31,974**	**165674**

Printed Books

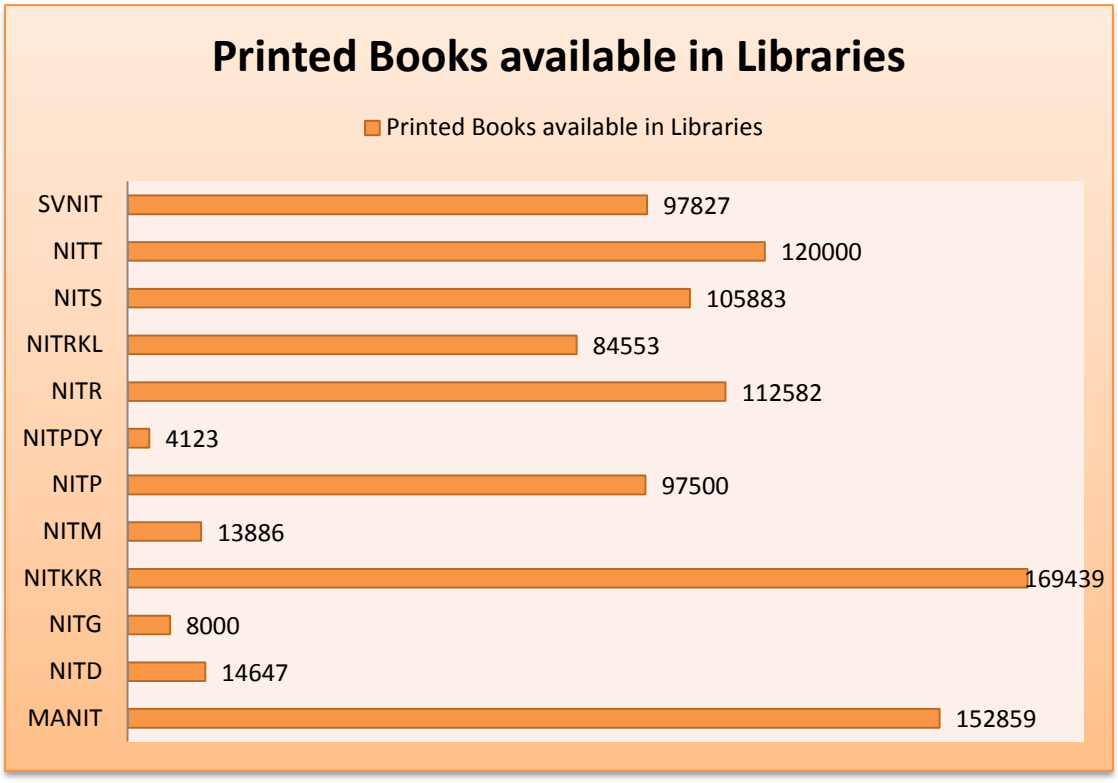


Figure 4.5

Figure (4.5) portrays that NIT Kurukshetra has the maximum amount of printed books collection in their library. They had approximately 169439 books in their central library, whereas NIT Puducherry has the least number (4123) of printed books in their central library. This finding of the study shows that the year of establishment played a significant role in the name of the printed collection of the library. NIT Delhi, NIT Goa, NIT Meghalaya, NIT Puducherry they are newly established institutes, and at present, they are working on their collection development and managing the library.

Print Periodicals

From the figure (4.6) it can clearly state, that NIT Tiruchirappalli is having the maximum (164) number of print periodicals available in their library. In contrast, NIT Raipur has the minimum (50) number of print periodical available in the library.

While NITPDY, NITM, NITD, NITG has not printed periodical available in the library. MANIT and NITP do not responded to the question.

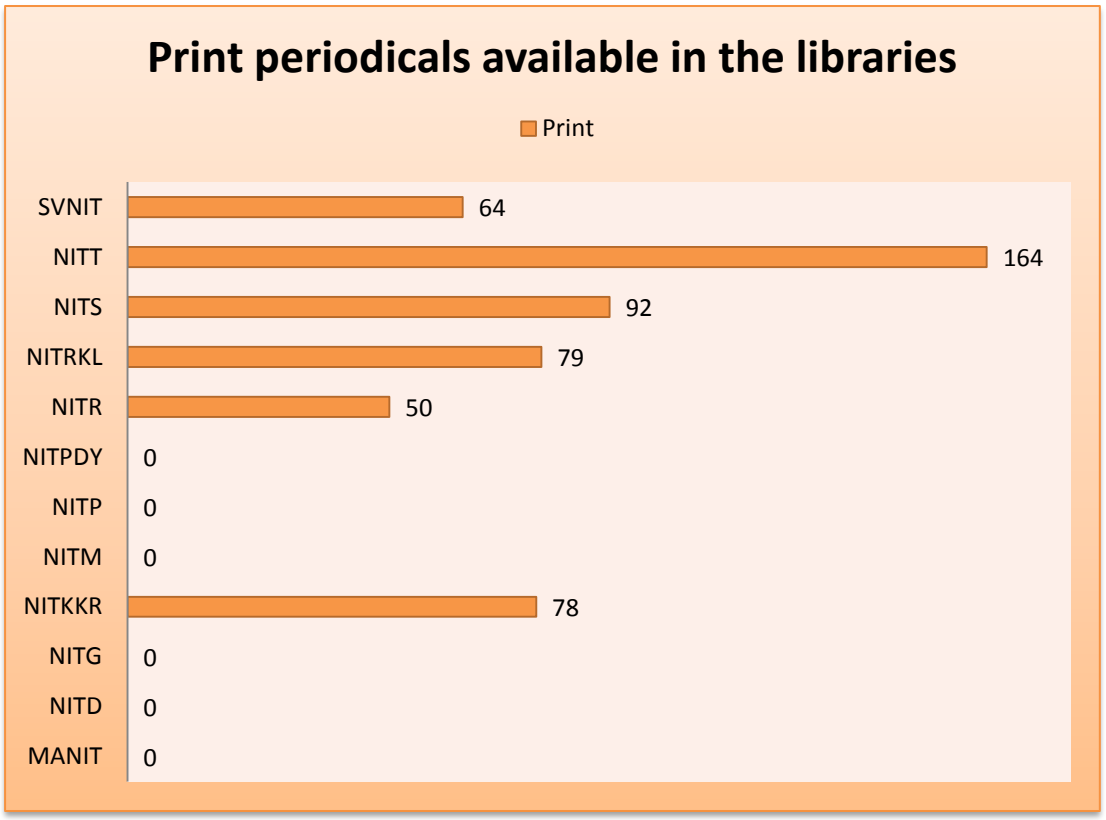


Figure 4.6

Printed Bound Volumes

With this sequence the availability of printed bound volume table entitled availability of library resources shows that only in SVNIT, NITRKL and NITS had printed bound volumes available in their libraries. Among these NITs, NIT Rourkela has the maximum number of print volume available in its library. Whereas the remaining nine libraries said they do not have printed bond volumes in their library.

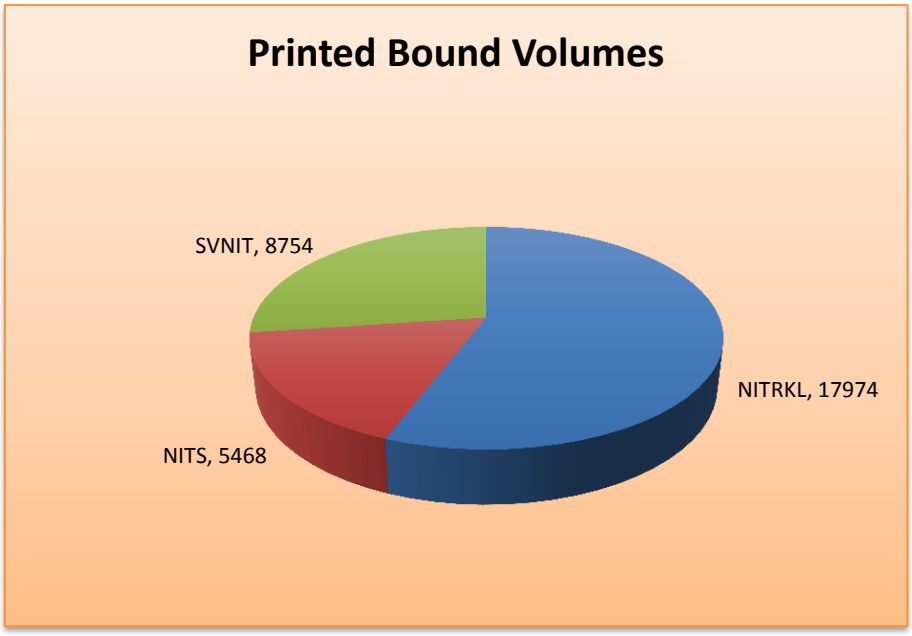


Figure 4.7

4.5.7 Electronic Collection

Electronic information resources have diverse kinds of benefits. Electronic resources deliver the collection of information as full text (aggregated) databases, e-journals, image collections, multimedia in the form of CD, tape, internet, web technology, etc. Electronic information sources are becoming more and more critical for the academic community.

Ebooks provided by the Libraries

It was observed from the figure 4.8 shows the diversity of collection on e-books in the selected libraries, and it was viewed that NIT Patna has the highest number (34588) of EBooks available for their users followed by MANIT (26025), NITR (17000) and NIT Rourkela (15000). Whereas NITD, NIT Puducherry and NITS did not respond to have a collection separately in eBooks. They replied for the query that they are a member of Eshodhsindu.

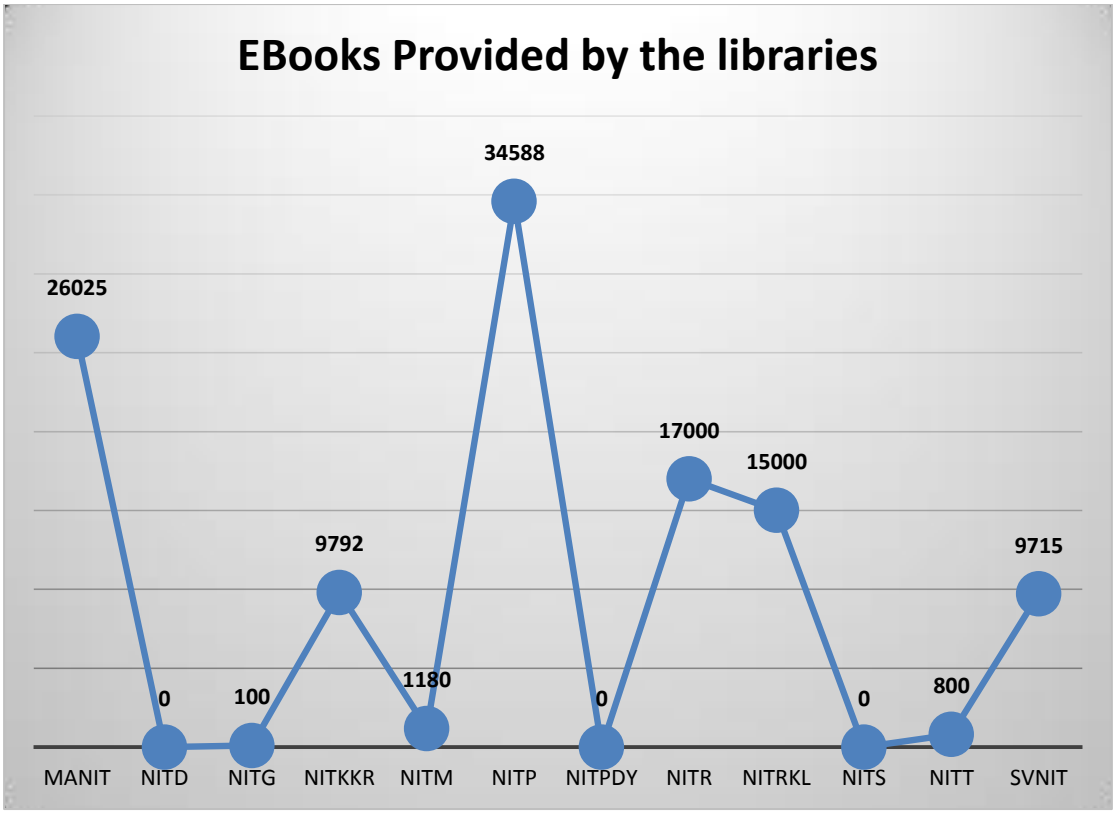


Figure 4.8

CD- ROM books available in the libraries

Figure 4.9 portrayed the availability status of books in the form of CD ROM in the central libraries of NITs. It was viewed from the bar diagram that library of SVNIT has the maximum number (15774), followed by NITS (4612), and NITP (4215) of books in CD format is available in the library, whereas, NIT Goa is having least number (305) of CD ROM books available in the libraries.

NITR, NITM, NITD and NITPDY did not have CD ROM collection available in the library.

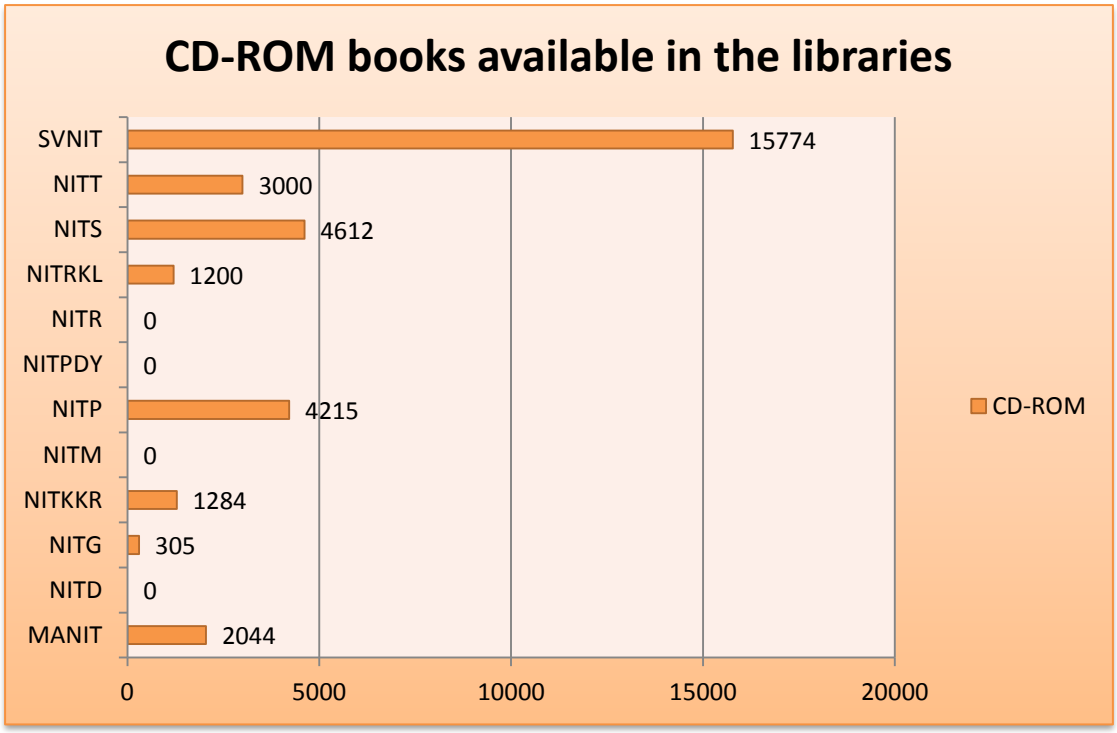


Figure 4.9

Electronic periodicals provided by the libraries

Figure 4.10 describes the status of availability of electronic periodicals in the central libraries of selected NITs. It was viewed from the chart that SVNIT was having the highest number (8488) of the collection in electronic periodical available in their library followed by NIT Tiruchirappalli (8000), NITR (6922) and NITD (6500). In contrast, six NIT libraries don't respond to the query, which was indicated as zero collection in the figure. Since each NIT is having the membership with the ESS which indicated that everyone has a definite collection of electronic periodicals.

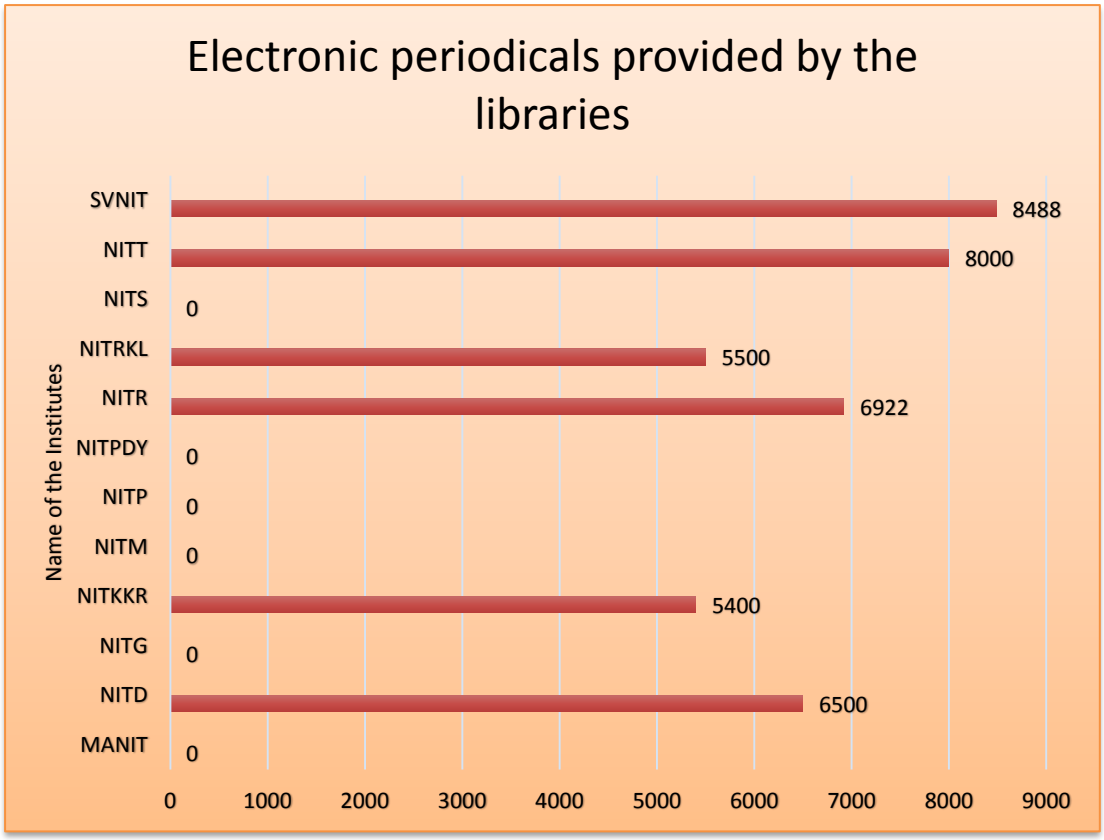


Figure 4.10

4.5.8 Information about Library Personnel:

Table 4.8 shows the details of library staff in the central libraries of selected NITs in India.

Two are the librarians, 3 are the deputy librarians, 17 are the assistant librarians, 19 are the Junior Library Information Assistant, 3 are the Senior Library Information Assistant, 19 are professional assistant, 2 are semi-professional assistant, 29 are the Graduate Trainees, and 24 are the other library staff.

In terms of the total strength of library staff, it was found that NITRKL is having the maximum (20) team working permanently in their library, followed by MANIT (14), NITT (13), NITS (10).

Table 4.8 Library Personnel

S. No	Name of the Institute	Personnel									Total
		L	**DL**	**AL**	**SLIA**	**JLIA**	**PA**	**SPA**	**GT**	**Others**	
1	MANIT	-	-	01	-	-	-	-	-	13	**14**
2	NITD	-	-	01	-	-	-	-	-	04	**05**
3	NITG	-	-	01	-	01	01	-	-	01	**04**
4	NITKKR	01	-	01	-	-	06	-	-	-	**08**
5	NITM	-	-	01	-	01	01	01	-	02	**06**
6	NITP	-	01	01	-	-	04	-	-	01	**07**
7	NITPDY	-	-	01	-	-	-	-	-	01	**02**
8	NITR	-	01	02	-	-	-	-	05	-	**08**
9	NITRKL	-	01	04	01	-	02	-	12	-	**20**
10	NITS	-	-	01	-	-	04	-	05	-	**10**
11	NITT	01	-	02	-	01	01	01	07	-	**13**
12	SVNIT	-	-	01	02	01	-	-	-	02	**06**
Total		**02**	**03**	**17**	**03**	**04**	**19**	**02**	**29**	**24**	**103**

After analysing the table an exciting fact arises that in all NITs there is a variation in the designation of library staff, as well as qualified professionals like MANIT, is having only one Assistant Librarian other than this all 13 staff comes under clerical category and also they are non-LIS professional. On the other hand, NITRKL has fully-fledged team in his library and all are qualified to have the minimum qualification of Masters in Library and Information Science.

4.5.9 IT-based Practices in Libraries:

Table 4.9 IT based practices in libraries

S.No	Name of the Institute	Library Management Software				
		Koha	Libsys	SOUL	VTLS	Others
1	MANIT					✓
2	NITD		✓			
3	NITG					✓
4	NITKKR	✓				
5	NITM	✓				
6	NITP		✓			
7	NITPDY					✓
8	NITR		✓			
9	NITRKL	✓				
10	NITS	✓				
11	NITT		✓			
12	SVNIT		✓			
		33%	42%	NA	NA	25%

Above table 4.9 depicts the use of library management software in NIT libraries which shows that all libraries were automated. There are many library management software to which hose keeping activities are done. This software is KOHA, Libsys and NewGenLib etc. The most commonly used LMS is Lybsys (05 out of 12) in NIT libraries. In contrast, SOUL and VTLS are not used in any NIT library, and three libraries are using customised commercial software for their housekeeping activities of the library.

4.5.10 Availability of Equipment in the Libraries

Likewise, no nation can be developed without investing in infrastructure in the same way infrastructure and equipment plays a vital role in the progress of libraries also. Now a day, libraries required varieties of hardware software and types of electronic devices in providing speedy and accurate services to satisfy their users need in the

present study researcher also identifying the availability of equipment and infrastructure of the NIT libraries. Table 4.10 discusses the availability of ICT infrastructure in the NIT libraries. The graph wise interpretation of each device has been discussed below.

Table 4.10 Availability of Equipment in the Libraries

S. No	Collection	NITs											
		MANIT	**NITD**	**NITG**	**NITKKR**	**NITM**	**NITP**	**NITPDY**	**NITR**	**NITRKL**	**NITS**	**NITT**	**SVNIT**
1	Computer	50	15	05	35	23	75	01	12	35	12	110	55
2	Server Machine	-	01	01	03	01	01	-	01		02	01	01
3	Photocopy Machine	01	01	01	01	01	01	-	01	01	01	03	03
4	Flatbed Scanner	-	01	-	-			-		01		01	01
5	Overhead Scanner	-	-	01	04	01		-	01	01		03	-
6	Barcode Scanner	02	-	03	06	04	05	-	01	04	02	01	05
7	Hand Held Scanner	05	02	-	-		01	-		01	04	01	-
8	Laser Printer	-	-	-	04	02	05	01	02	09	05	04	01
9	Digital Camera	-	-	-	-			-			01	35	-
10	LCD Projector	-	-	01	01	01		-		01	01	01	-
11	CD/DVD writer	-	03	-	-	23		-	03	01	01	01	01
12	Storage Devices	-	03	02	-			-		02	02	10	-
13	UPS Back-up Facility	-	03	04	-		01	01	01		02	02	04
14	Others	-	02	-	-			-					

Computers available in the Libraries

Computers are the basic need of the library for users to provide ICT based collection and services. Without a computer, the user cannot use the proper functions of the library. Analysis of the no. of machines available in the library are represented in the table 4.10.

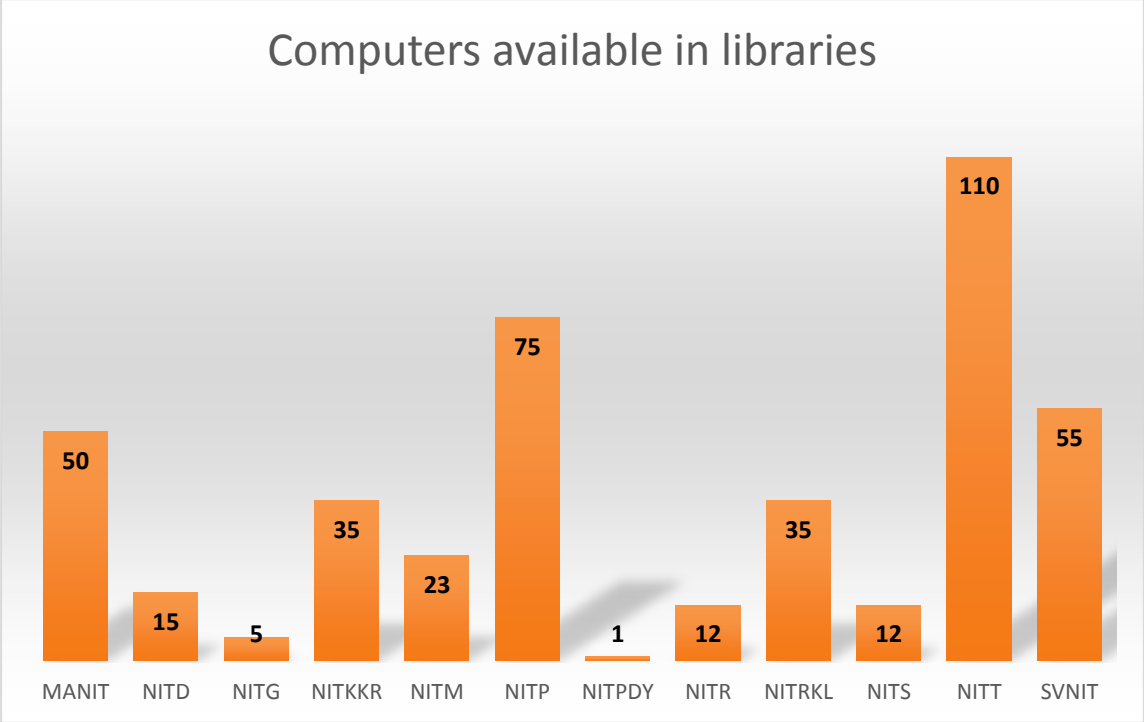


Figure 4.11

Above figure 4.11 shows that number of computers available in the central libraries of national institutes of technology where NIT Thiruchirapalli has the highest number (110) of machines available in the library for the library staff as well as for users also (in the digital library), followed by NIT Patna (75), SVNIT (55) and MANIT (50). NIT Goa and NIT Puducherry have the lowest number of computers 5 and 10 available in the library, respectively.

Server Machines available in the Libraries

Analysis of the no. of server machines available in the library is represented in the below figure 4.12. Figure showed that the availability of server machines in the central libraries of National Institutes of Technology in India. It is observed that NIT Kurukshetra provides the highest number of server machines to the library (3) followed by NIT Silchar (2). It was viewed that maximum libraries had one server machine in the library for the library routine work. In contrast, MANIT and NITRKL responded that they do not have any separate server machine for the library even they have one server for the whole institute. In comparison, NITPDY does not respond for the query.

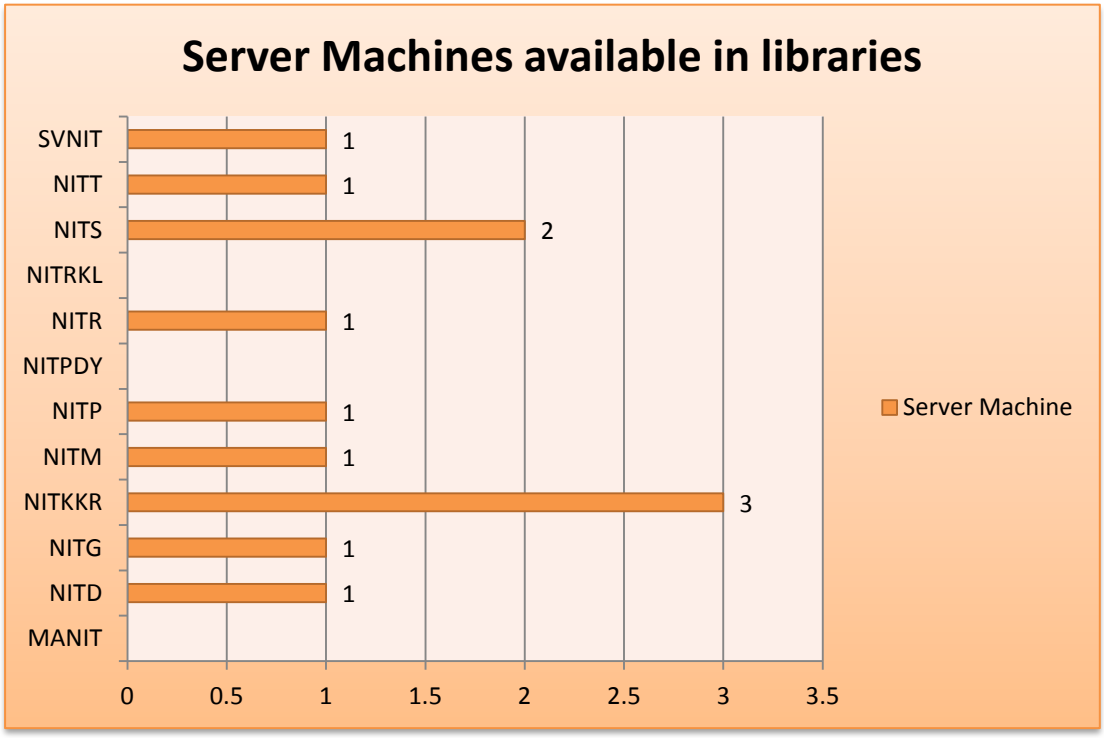


Figure 4.12

Photocopy Machines available in the Libraries

For providing reprographic services to the users of selected libraries, the library must have separate photocopier as well as printers for their users. In academic libraries, reprographic service has enormous importance for the users as students can't sit in the library for making their notes due to having classes as well as lab work. This is the main reason for any academic library for providing this service to their users. Despite serving to the users of the library photocopy machine and printers are very useful for library staff in day to day work of the library.

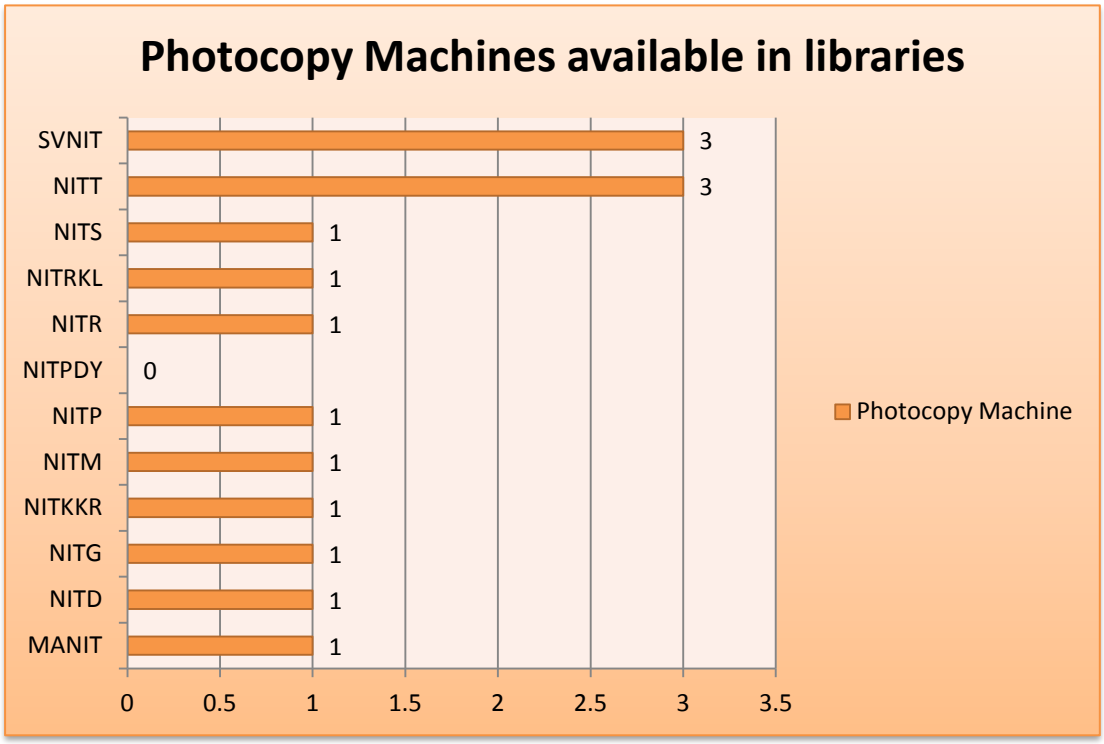


Figure 4.13

Figure 4.13 describes the availability of photocopier in the central libraries of NIT in India, and it was viewed that NITT and SVNIT are having three photocopy machine available in the library. Remaining 9 NIT libraries were having a single photocopy machine available in the library whereas NITPDY doesn't have any photocopy machine available in the library.

Flatbed scanner available in the libraries

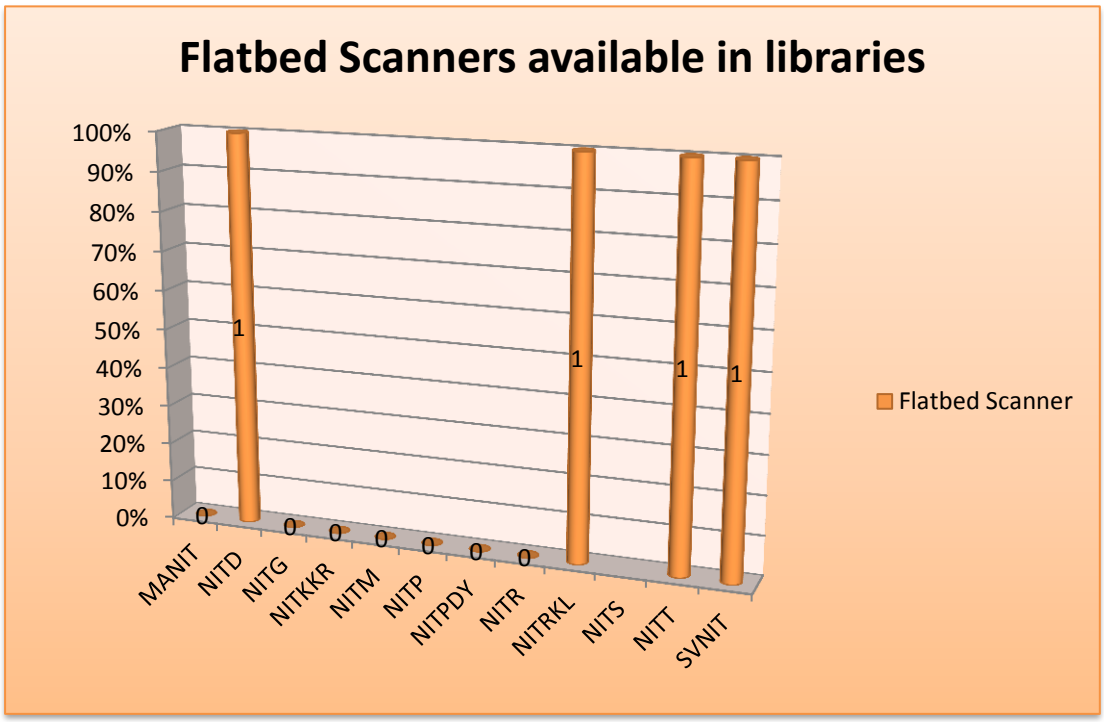


Figure 4.14

Flatbed scanner availability has been displayed in the figure 4.14 NITD, NITRKL, NITT and SVNIT have single flatbed scanner available for scanning the document of the library. NITG, MANIT, NITP, NITKKR, NITPDY, NITR and NITs do not have any flatbed scanner available in the library.

Overhead Scanner

Figure 4.15 displays the availability of overhead scanner in the libraries of NIT, and it was seen from the data that NIT Kurukkhsetra has the maximum number of overhead scanner available and being used for the document scanning followed by NIT Thiruchirapalli. While NITRKL, NIT, NITM and NITG have one overhead scanner available in each library.

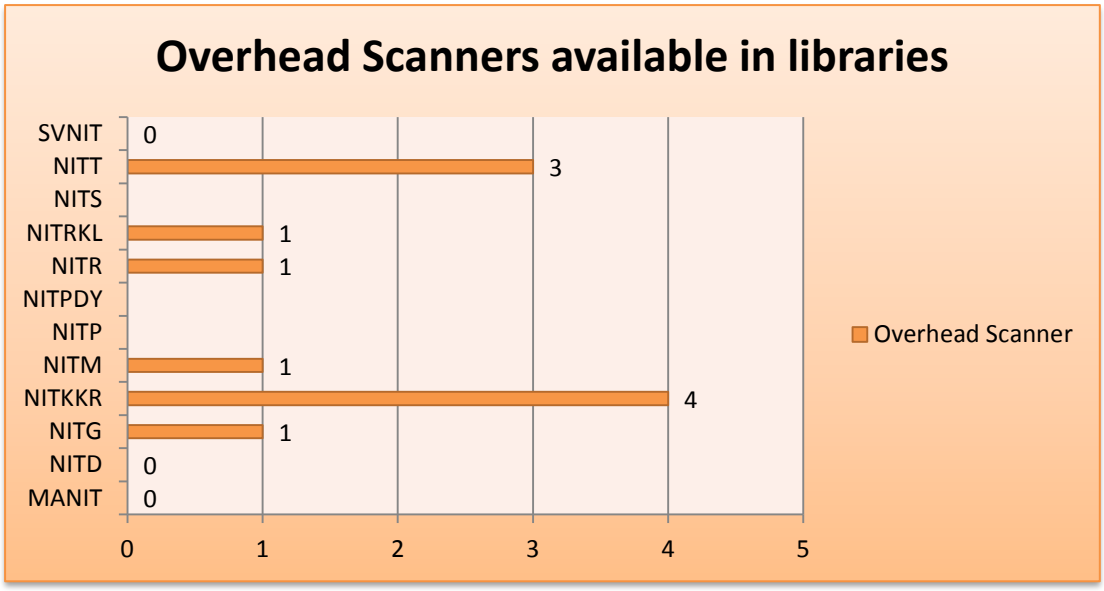


Figure 4.15

Barcode Scanner available in the libraries

Here figure 4.16 discussed the availability of the barcode scanner in the central libraries of NIT in India and it was being noticed that NITKKR has the maximum number (6) of barcode scanner available in the library. Whereas, NITT and NITR have a single unit of the scanner available in the library.

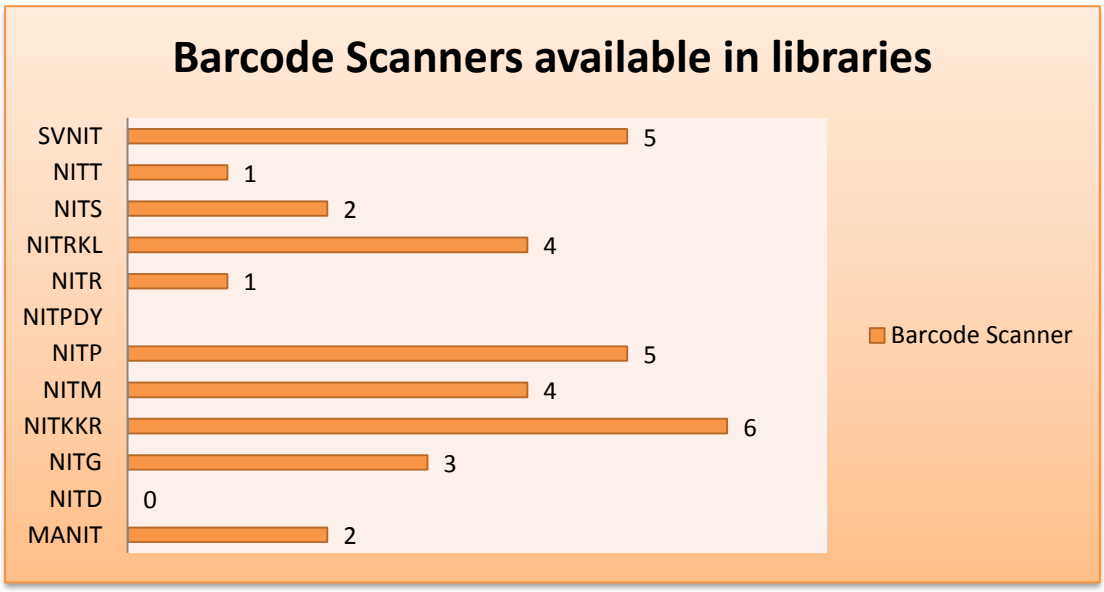


Figure 4.16

Handheld Scanner

Handheld scanner availability among the libraries had been discussed in the figure 4.17 figure indicated that the library of MANIT has maximum number of handheld scanner available. Whereas NIT Tiruchirappalli, Patna and Rourkela has one unit of scanner available in the library.

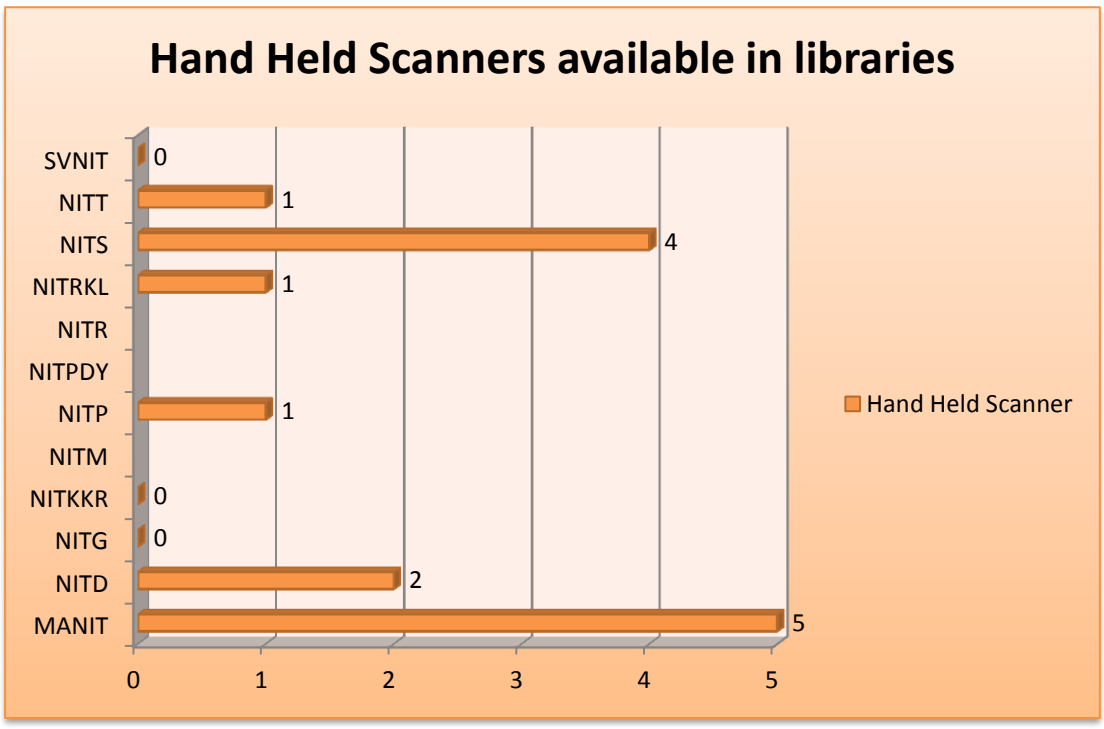


Figure 4.17

LCD Projector

In the figure 4.18, the availability of projector had been described. It was revealed from the figure that six NIT library (NITG, NITKKR, NITM, NITRKL, NITS and NITT,) has the LCD projector.

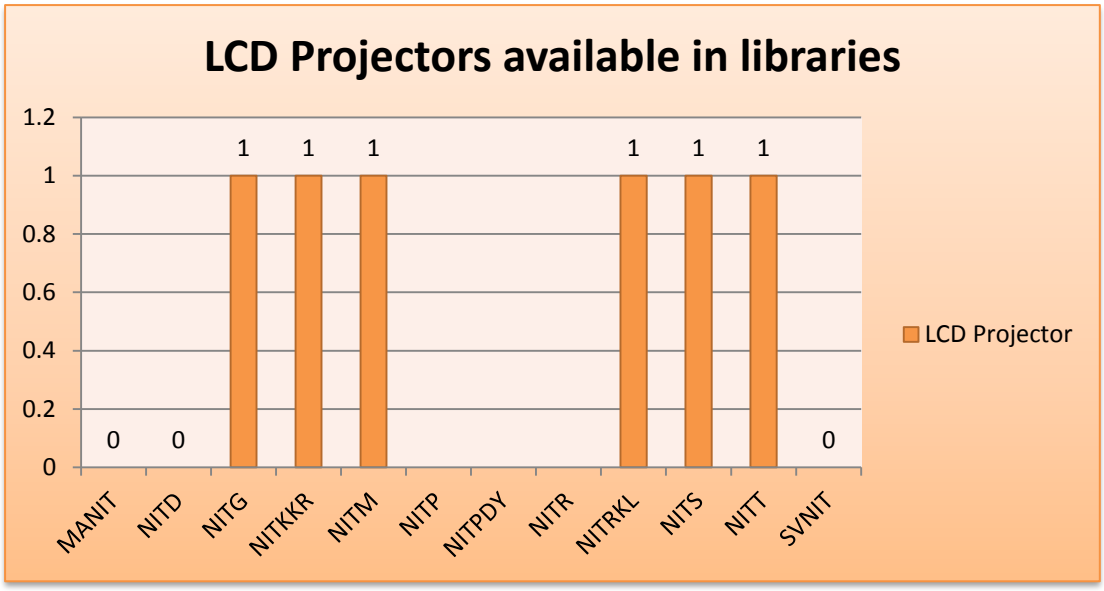
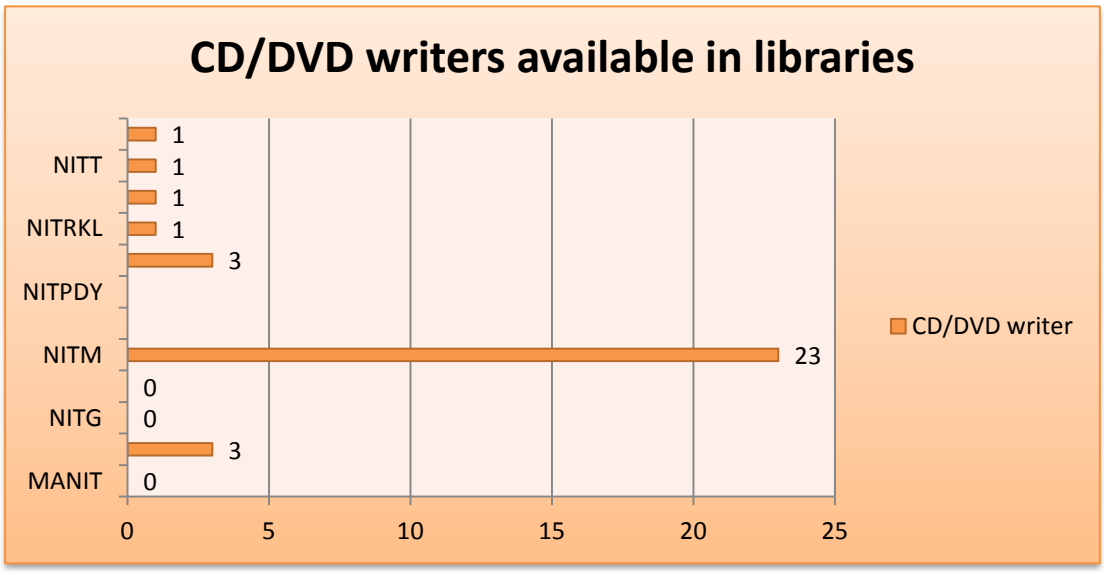


Figure 4.18

CD/ DVD Writer

The CD/DVD writer is a multipurpose rewriteable drive that can read, audio, data and video files and can record, or write, in both CD and DVD formats. It enables one to create custom audio/ video files, data that can be recorded onto CDs and DVDs. Here figure 4.19 shows the availability of these writer in the NIT libraries and it was viewed from the data that NITM has the maximum number of CD/DVD writers available in the library.

Figure 4.19



Storage devices

storage devices are the kind of computer equipment where the information which is being generated by the computer, can be stored. These types of devices are very important to create backup of the work has been done. It was viewed from the figure 4.20 that NIT Tiruchirappalli has the maximum number of storage devices available in the library in the form of external hard disks and pen drives.

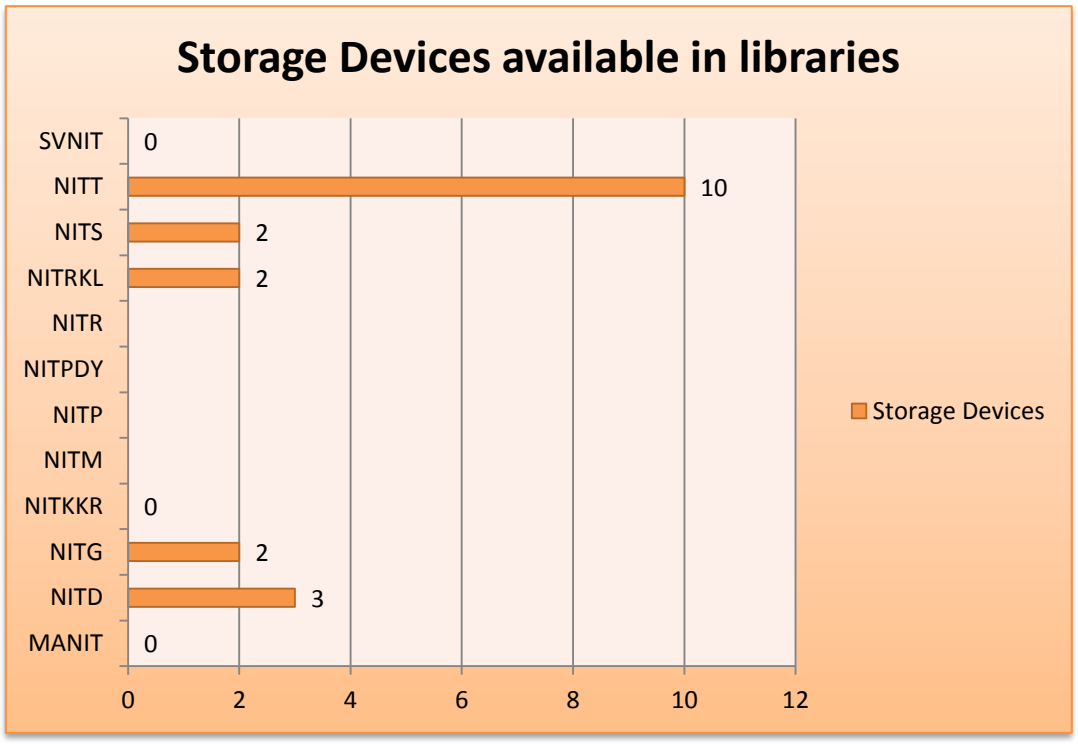


Figure 4.20

UPS Backup Facility

Figure 4.21 shows the availability of UPS Backup facility in the libraries of NIT in India. NITG and SVNIT has maximum number (4) of UPS available for the library. Whereas NITRKL responded that they were having a big backup facility for whole campus of NIT.

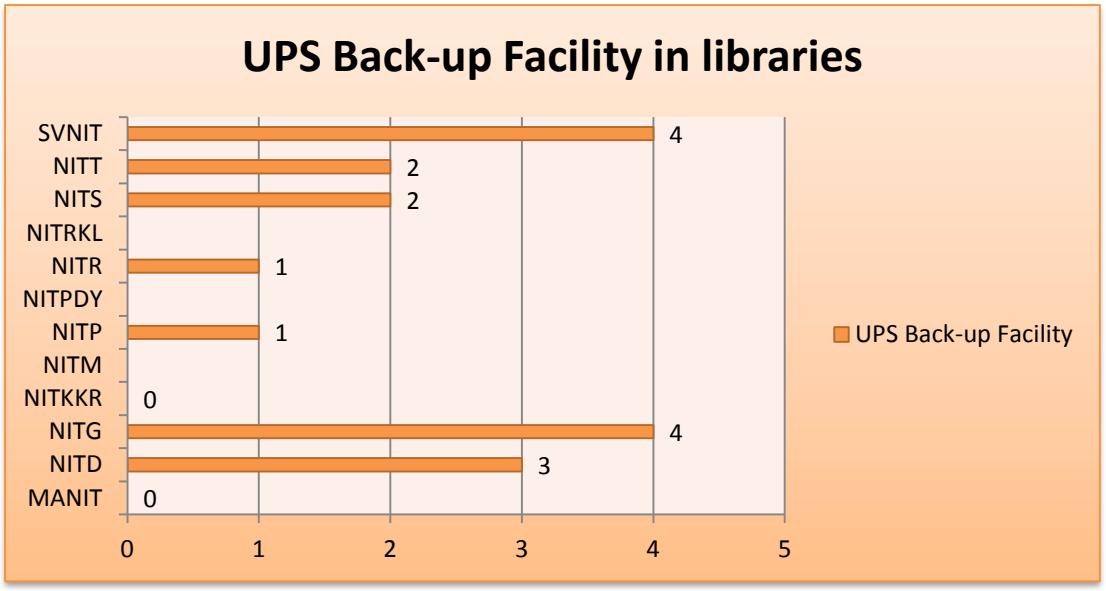


Figure 4.21

Laser Printer

Laser printers are more economical for long run this is the main reason usually institutes adopt this technology for printing. Here figure 4..22describes the availability of laser printers in the NIT Libraries and it was viewed that NITRKL has the maximum number (9) of these printers were available followed by NITP and NITS (5).

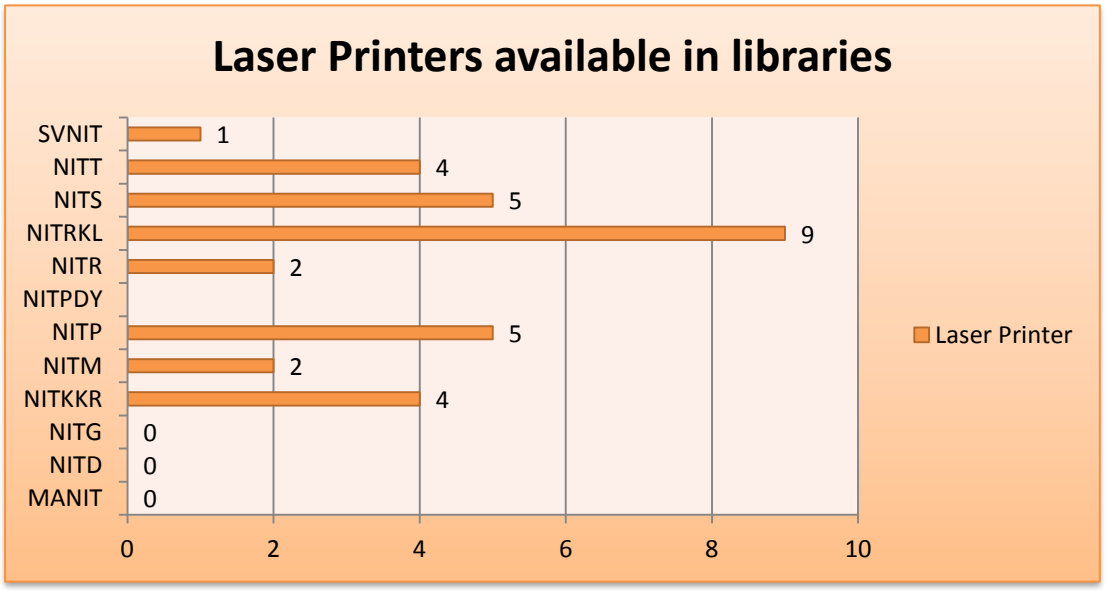


Figure 4.22

4.5.11 Budget

National institutes of technology are the institute having national importance, and they were entirely governed under the Ministry of human resource and development. MHRD is the funding body for all institutes having national importance. This is why NIT get their funds for the library by the MHRD. Other than that two libraries responded for other reasons like NITG responded for the overdue charges and NITRKL responded for the trust/ management grants and late fees.

Questions related to budget allocation was not appropriately answered by even one library. Due to the reasons of confidentiality, they did not provide any information about their budget allocation for different sections of the library.

Table: 4.11 Library Budget

S.No	Sources/Grants	NITs											
		MANIT	NITD	NITG	NITKKR	NITM	NITP	NITPDY	NITR	NITRKL	NITS	NITT	SVNIT
1	MHRD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	State Government												
3	Trust/Management Grants									✓			
4	Donation/ Endowments												
5	Over due Charges, Sale of Old newspapers, Xerox Charges, Membership Charges etc.			✓						✓			
6	Any Other			✓		✓							

4.5.12 IT-Based services offered by NIT Libraries

Table: 4.12 IT-Based services offered by NIT Libraries

S. No	Library Services	NITs												
		MANIT	**NITD**	**NITG**	**NITKKR**	**NITM**	**NITP**	**NITPDY**	**NITR**	**NITRKL**	**NITS**	**NITT**	**SVNIT**	**Total (%)**
1	Lending Service	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100%(12)
2	Remote Access to e-resources	✓	✓		✓			✓	✓	✓	✓		✓	66.67%(08)
3	Current Awareness Service		✓	✓		✓	✓			✓	✓	✓		58.33% 07)
4	Reprographic Service	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	83.33%(10)
5	Inter Library Loan			✓		✓	✓				✓	✓		41.66% 05)
6	User Education/ Orientation		✓	✓		✓	✓		✓	✓	✓	✓		66.67%(08)
7	Alerting Service		✓	✓		✓			✓	✓	✓	✓		58.33%(07)
8	Document Delivery Service			✓			✓			✓	✓	✓		41.66% 05)
9	Web OPAC	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		83.33%(10)
10	Online Database search Service		✓	✓		✓	✓		✓	✓	✓	✓		66.67% 08)
11	CD-ROM Database Service		✓				✓			✓	✓	✓		41.66% 05)
12	Digital Library Service	✓	✓	✓		✓	✓		✓	✓	✓	✓		75%(09)
13	Institutional repository		✓	✓	✓	✓				✓	✓	✓		58.33% 07)
14	Ask Librarian			✓		✓				✓		✓		33.33% 04)

IT-based services enhance the services of libraries in many ways, such as provides access to wider information sources, 24*7 access facility, remote access, speedy and secure access and increased flexibility. There are numerous ICT based services offered in libraries as an email alert, ask librarian, current awareness service, document delivery services etc. Libraries are ICT based service-oriented, and many services are user leading to saving the users' time and with the help of ICT. Services like indexing, abstracting etc. are the time saving, cost-saving and skill staff intensive. Many services like Selective Dissemination of Information, exhaustive literature search cannot be manually satisfactory, but with the help of ICT, these can be provided timely and efficiently. For the analysis of services offered by the library, the data were collected, and the same is represented in the above table.

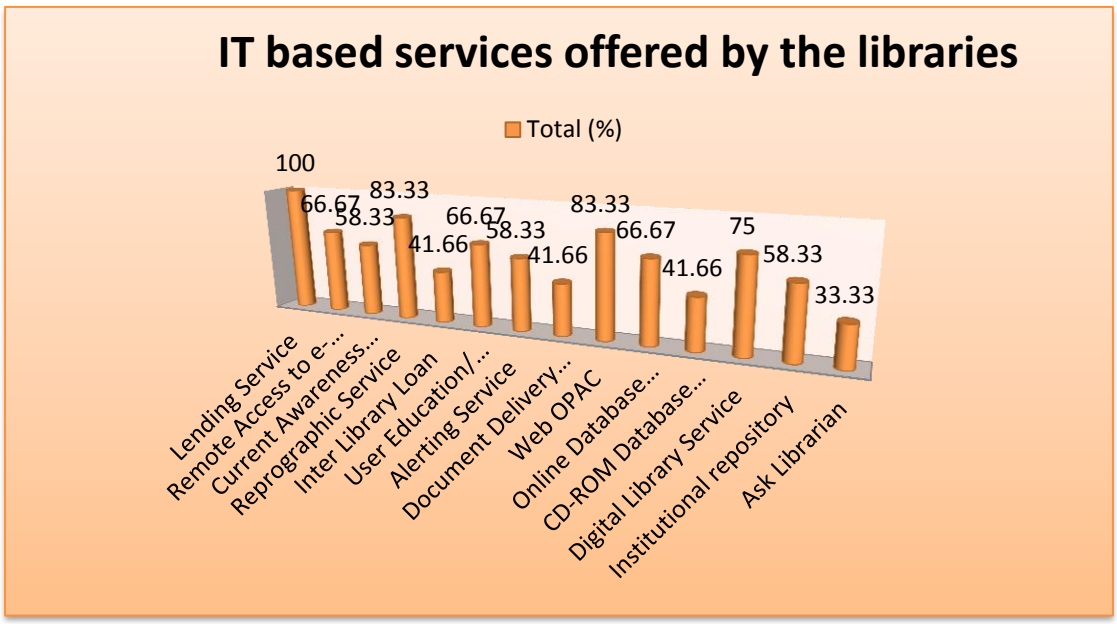


Figure 4.23

Analysis of the data in the table 4.12 exhibits that the services offered by the central libraries of NITs. 12 (100%) central libraries provide lending services, followed by reprographic service (83.33) and web OPAC service. Digital library service was

provided by 75% of NIT libraries. 66.67% of libraries offered the remote access to their online resources and online database search service. Whereas only 4 (33.33) NIT libraries were offering to ask a librarian service to their users.

NITRKL provides access to the exclusive collection based on Odia language to their students as well as they were creating an institutional repository for its users where they can get access to the information.

Similarly, NIT Tiruchirappalli is having a small collection on the Tamil language available in printed form and users can read those content by sitting in the library.

4.5.13 Mobile Based Application

Table: 4.13 Mobile Based Application

S.No	Name of the Institute	Yes	No
1	MANIT		✓
2	NITD	✓	
3	NITG		✓
4	NITKKR		✓
5	NITM		✓
6	NITP		✓
7	NITPDY		✓
8	NITR		✓
9	NITRKL	✓	
10	NITS		✓
11	NITT		✓
12	SVNIT		✓

Above table 4.13 discussed the availability of mobile-based application in libraries, and it was found that only 16% of libraries having mobile-based applications in their libraries. At the same time, 84% of libraries are not using any mobile-based application for their library service.

4.5.14 Problems during the implementation of IT application

Table: 4.14 Problems during the implementation of IT application

S.No	Name of the Institute	Yes	No
1	MANIT	✓	
2	NITD		✓
3	NITG		✓
4	NITKKR		✓
5	NITM		✓
6	NITP		✓
7	NITPDY		
8	NITR	✓	
9	NITRKL	✓	
10	NITS	✓	✓
11	NITT	✓	
12	SVNIT		✓
	Total	05 (41.67%)	07 (58.33%)

It is observed from the table that only 5(MANIT, NITR, NITRKL, NITS and NITT) NIT Libraries faced multiple problems in the implementation of IT application in their libraries on the other hand majority of libraries (07) accepted that they do not face any difficulties in the implementation of IT application.

Table: 4.15 Kind of problems

S.N	Problems	NITs				
		MANIT	**NITR**	**NITRKL**	**NITS**	**NITT**
1	Scarcity/Paucity of Funds			✓		✓
2	Lack of ICT Infrastructure			✓	✓	✓
3	Inadequate Trained Library Professional	✓	✓		✓	✓
4	Increasing Cost of Hardware and Software	✓		✓		✓
5	Lack of cooperation and coordination among staff	✓				
6	Lack of support from higher authority	✓				
7	Non Availability of Consultancy Services					
8	Implementation of latest device and gadgets			✓		

It is identified from the last table (table 4.14) that only five libraries faced problems in the implementation of IT applications in their libraries. Still, present table 4.15 explored the kind of barriers which those libraries faced as inadequately trained library professionals (4 out of 5) followed by lack of ICT infrastructure and increasing cost of hardware and software (3 out of 5). In contrast, only MANIT faced the problem of lack of support from authorities and lack of coordination among staff.

4.5.15 Impact of ICT Services in the Library

In the present era, higher education is highly influenced by the swift development in ICT with the advent of technology the ways of sharing and communication are

changed day by day. In the same context, NIT libraries are also affected by developments in the field of ICT.

ICT has a big impact on academic libraries in the past two decades, and we can do our day to day work in libraries. even we save our time

Resource sharing is the focal point of library networking and cooperation. The tested technological advances in this field have tremendously increased the ability to retrieve and accessing information over long distances.

4.5.16 Areas of Resource sharing among NITs

Table 4.16 Resource sharing among NIT libraries

S.No	Areas of Resource Sharing	NITs												
		1	2	3	4	5	6	7	8	9	10	11	12	Total
1	Inter-library lending and document delivery.	N		Y	Y	Y	Y	Y	N	Y	Y	Y	Y	09 (75%)
2	Shared access to the electronic database and information service.	N	Y	Y			Y	Y	N	N	Y	Y	N	06 (50%)
3	Training resources and expertise.	N		Y	Y		Y	Y	N	N	Y	Y	N	06 (50%)
4	Co-operative acquisition.	N					Y		N	N	N		N	01 (8.33%)
5	Co-operative cataloguing.	N					Y		N	N	N	Y	N	02 (16.67%)
6	Sharing of human resources.	N					Y		N	N	N	Y	N	02 (16.67%)
7	Electronic content licensing.	N		Y			Y	Y	N	N	Y		N	04 (33.33%)
8	Directory of Resource Persons/Experts	N				Y	Y		N	N			N	02 (16.67%)
9	Troubleshooting	N		Y				Y	N	Y			Y	04 (33.33%)
10	Directory of Research	N		Y			Y	Y	N	Y			Y	05 (41.67%)
	Total	0	01	06	02	02	09	06	0	03	04	05	03	

(1=MANIT, 2=NITD, 3=NITG, 4= NITKKR, 5=NITM, 6=NITP, 7=NITPDY, 8=NITR, 9=NITRKL, 10=NITS, 11=NITT, 12=SVNIT)

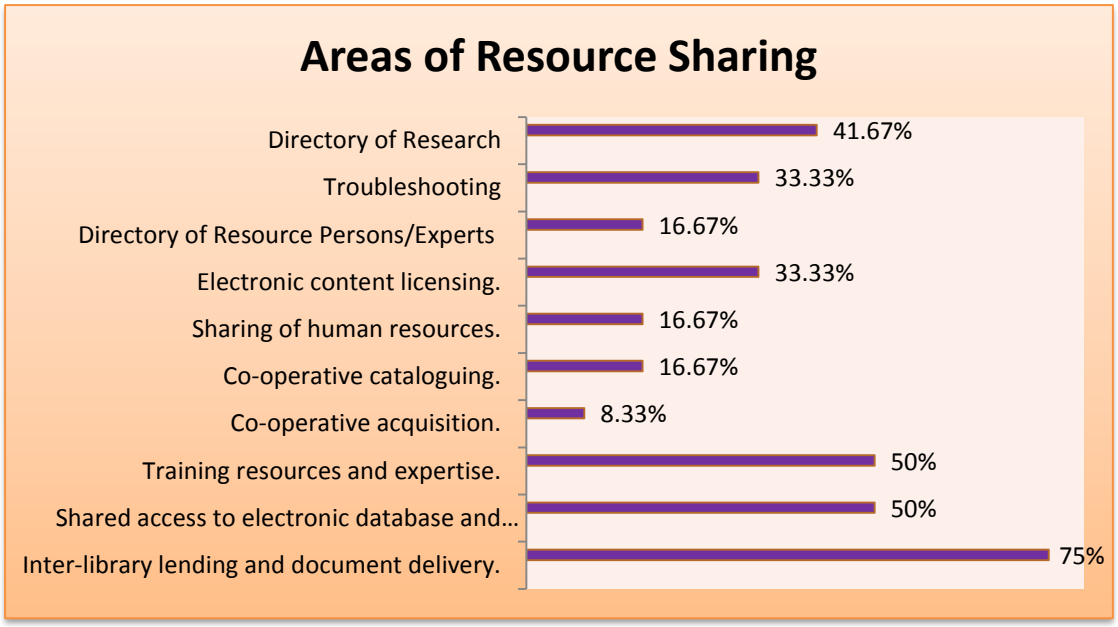


Figure 4.24

Above table describes the areas of resource sharing among NIT Libraries. It is observed that a total of ten areas for resource sharing among libraries have been listed and discussed one by one.

Mostly libraries (09) responded for interlibrary lending and document delivery, followed by shared access to electronic database and information service and training resources & expertise.

After the discussion made with the NIT librarian or library in-charge, it was found that on a formal platform no NIT library is sharing their resources with others by stating the common reason that "the need of the users is not same they are different from each library as every NIT is offering different courses." Another reason quoted by the respondent was "there is a consortium for NIT libraries named NIT Consortium working for resource sharing as providing negotiated price of electronic resources but due to lack of communication and regular meetings it was not fully executed".

Table (4.16) shows the various areas of resource sharing among NITs in India. It is observed from the table that Inter-library lending and document delivery is the most (75%) considerable area of resources sharing among NIT libraries followed by shared access to an electronic database and information service (50%), Training resource and expertise (50%) and directory of research (41.67%). The table also represents the NIT wise resource sharing activities performed by their libraries and found that NITP performed the highest number of resource sharing activities in their library. At the same time, MANIT and NITR do not show any activity in sharing their resources.

4.5.17 Information Resources through Information Centers/ Networks

Table: 4.17 Information Resources through Information Centers/ Networks

S.No	Name of the Institute	Yes	No
1	MANIT	✓	
2	NITD		✓
3	NITG		✓
4	NITKKR		✓
5	NITM	✓	
6	NITP		✓
7	NITPDY		
8	NITR		✓
9	NITRKL	✓	
10	NITS	✓	
11	NITT	✓	
12	SVNIT	✓	

Table 4.17 discussed the usage of information centres and networks, and it was viewed that 50% means six libraries said that they are using information resources through information centres and networks whereas remaining six libraries were not using any system.

4.5.18 Consortium based Practice

During the age of information explosion and price escalation of databases, libraries are bound to be the member of any network or consortium from where they can provide speedy and current information to there users.

Table: 4.18 Consortium based Practice

S.No	Name of the Institute	Consortium					
		DELNET	**E-Shodhsindhu**	**NKRC**	**DelCon**	**J Gate Plus**	**NIT Consortium**
1	MANIT		✓				
2	NITD		✓			✓	✓
3	NITG		✓			✓	
4	NITKKR		✓			✓	✓
5	NITM		✓			✓	
6	NITP		✓			✓	
7	NITPDY						
8	NITR		✓				
9	NITRKL		✓			✓	✓
10	NITS	✓	✓			✓	
11	NITT	✓	✓			✓	
12	SVNIT		✓				

Above table 4.18 describes the membership of consortium by all NIT libraries**.** All 12 NIT libraries are the member of E-Shodhsindhu consortium. From this consortium, they get the negotiated price of required electronic resources and purchase them individually. E- Shodhsindhu also provides maximum resources freely to the member libraries. Membership of this consortium is mandatory for all institutes having national importance. Along with this consortium, eight libraries are the member of JGate plus and two libraries (NITS & NITT) are the member of DELNET. Three libraries also responded for the NIT consortium they were NITD, NITKKR and NITRKL.

NIT Consortium

On 26th and 27th, November 2009 (20) National institutes of technology of India came together to form a consortium for NITs and in pursuance of the decision taken in the 5th meeting of the council of NITs (item no. 5.32) and subsequent letter of the MHRDF. No. 33-8/2012-TS.III/dated 7th December 2012, in the matter of "benefit of e-journal to made available to NITs" a meeting of representatives of libraries and Professor in charge of libraries, was conveyed on 12-13 July 2013 (https://www.nitconsortium). The plan of such initiative to work together and strive to find out the solution to various issues facing them. The consortium aimed to help in enhancing academic interchange between the participating members, including faculty and student exchanges. It should also help in the effective use of costly research infrastructure which has been developed in some of these institutions.

The consortium was expected to promote the delivery of specific programs and training of faculty and will help in developing an effective faculty development system by pooling their resources. The consortium has held three meetings first was on 12-13 July 2013, and the last was at NIT Rourkela on dated 12 January 2017.

Reasons for not using NIT consortium by libraries

Aina (2001) also observed that many of the university library cooperation failed due to the adoption of wrong strategies as cited in Nwegbu, Echezona and Obijiofo (2011). As per discussion with the library administrators of selected NIT libraries, reasons for not using NIT consortium was given below

- Mostly librarian confronted that NIT consortium was working only on the price negotiation with the vendors and publishers. After the emergence of E-Shodhsindhu (merger of UGC Infonet, NLIST and INDEST) the negotiated

price was available on ESS as well as most required resources were available freely. This was the main reason for not using the consortium.

- Another reason was mentioned by three library administrators, the lack of a regular meeting with the librarian.
- Lack of communication among each NIT library.
- Non Cooperation among participating libraries.
- Another reason listed was lack of interest showed by the side of library administrators.

4.5.19 Impact of Consortium participation in Library services

To find out the impact of Information technology on resource sharing an opinion based open-ended question had been asked, and it was found that all respondent has different views on resource sharing and consortium-based practice in library services. Where the most popular answer was cost savings. Every librarian/ library in-charge had accepted the fact that consortium based practice gave them the solution of the budget crisis and also found it the best platform for the negotiation of prices by the statutory body. Centralised resource selection was another factor which respondents agreed and recommended other libraries to adopt these types of platforms for their collection development of electronic resources. Some other factors had been pointed out by the librarian as the impact of consortium-based practices. They are as follows;

- Increase breadth and depth from access to the shared collection,
- Lessening the burden of price negotiation to individual libraries
- Reducing the burden of licensing negotiations to individual libraries
- Elimination of unnecessary duplication of documents among libraries
- Increased access to the needed information by the users of libraries.

These factors were figured out by analysing the responses received from the interview, and the findings have collaborated with the study of Levenson and Hess (2020).

4.5.20 Problems that hinder resource sharing

Table 4.19 Problems in resource sharing

Problems	Level of Agreement	Per cent
Lack of Adequate Funds	Strongly Disagree	**33.33**
	Disagree	16.67
	Neither Agree or Disagree	25
	Agree	16.67
	Strongly Agree	8.33
Lack of trained staff	Strongly Disagree	0
	Disagree	16.67
	Neither Agree or Disagree	33.33
	Agree	8.33
	Strongly Agree	**41.67**
Inadequate Communication System	Strongly Disagree	0
	Disagree	**41.67**
	Neither Agree or Disagree	16.67
	Agree	**41.67**
	Strongly Agree	8.33
Lack of Documented Policy on resource sharing	Strongly Disagree	0
	Disagree	16.67
	Neither Agree or Disagree	0
	Agree	**41.67**
	Strongly Agree	**41.67**
Lack of Institutional Support	Strongly Disagree	8.33
	Disagree	16.67
	Neither Agree or Disagree	**41.67**
	Agree	25
	Strongly Agree	8.33

Problems	Level of Agreement	Per cent
Legally, we cannot involve in resource sharing	Strongly Disagree	8.33
	Disagree	**41.67**
	Neither Agree or Disagree	33.33
	Agree	16.67
	Strongly Agree	0
Lack of governmental support	Strongly Disagree	16.67
	Disagree	**33.33**
	Neither Agree or Disagree	**33.33**
	Agree	16.67
	Strongly Agree	0
Vast Distance	Strongly Disagree	8.33
	Disagree	**41.67**
	Neither Agree or Disagree	25
	Agree	16.67
	Strongly Agree	8.33
Uncooperative attitude of librarians	Strongly Disagree	8.33
	Disagree	8.33
	Neither Agree or Disagree	**75**
	Agree	8.33
	Strongly Agree	0
Inadequate security of materials	Strongly Disagree	0
	Disagree	**33.33**
	Neither Agree or Disagree	16.67
	Agree	**33.33**
	Strongly Agree	16.67
Inadequate available resources	Strongly Disagree	8.33
	Disagree	**50**
	Neither Agree or Disagree	8.33
	Agree	33.33
	Strongly Agree	0

Above table 4.19 discussed the perception of the librarians or library administrators on the problem of resource sharing among NIT libraries in India. Where total of 11 issues have been listed and were categorised the perception on five-point Likert scale on level of agreement. Here the response was presented in the percentage. In the problem inadequacy of funds of the library and it was found that 33.33% respondent disagreed with the problem. Which indicated that funds are not the major issues for the libraries of NITs.

The second problem was lack of trained staff in the selected NIT libraries, and the mode value is strongly agreeing having 41.67%. Which clearly shows that for resource sharing library staff should be well trained and updated with the use and incorporation of new technologies in the libraries.

The third problem was related to the inadequate communication with the libraries of NITs in India. Here responses showed a contradiction with this barrier. 41.67% of respondents agreed that lack of communication is the barrier in resource sharing. Similarly, 41.67% disagreed with the problem and thought that this could not be the problem in sharing the resources among libraries.

Next problem was related to the well-written policy on resource sharing and table disclosed that majority (41.67) of the respondents agreed and strongly agreed with the barrier. Which means more than half of the respondents agreed that lack of policy is the most significant barrier in resource sharing among NIT libraries.

Lack of institutional support was another problem to resource sharing and table showed that 41.67% of administrators were neither agreed nor disagreed with the problem, which indicated that administrator of libraries had neutral perception with the problem.

Legal issues were another problem which was listed, and the majority (41.67%) of responses disagreed with the problem. Lack of governmental support was the next problem, and it was viewed from the table that 33.33% of respondents disagreed as well as neutral with the barrier.

Another problem was the uncooperative attitude of the librarian, and respondents were neither agreed and nor disagreed with the statement. Total 75% of respondents gave their perception of the problem. This is quite an interesting fact that the majority of administrators doesn't want to disclose their opinion on the uncooperative attitude of professionals.

Inadequate security of the materials was the second last problem, and it was found that 33.33% of administrators were agreed that security is one of the issues for sharing the resources. Still, on the other hand, a similar number of respondents disagreed the problem.

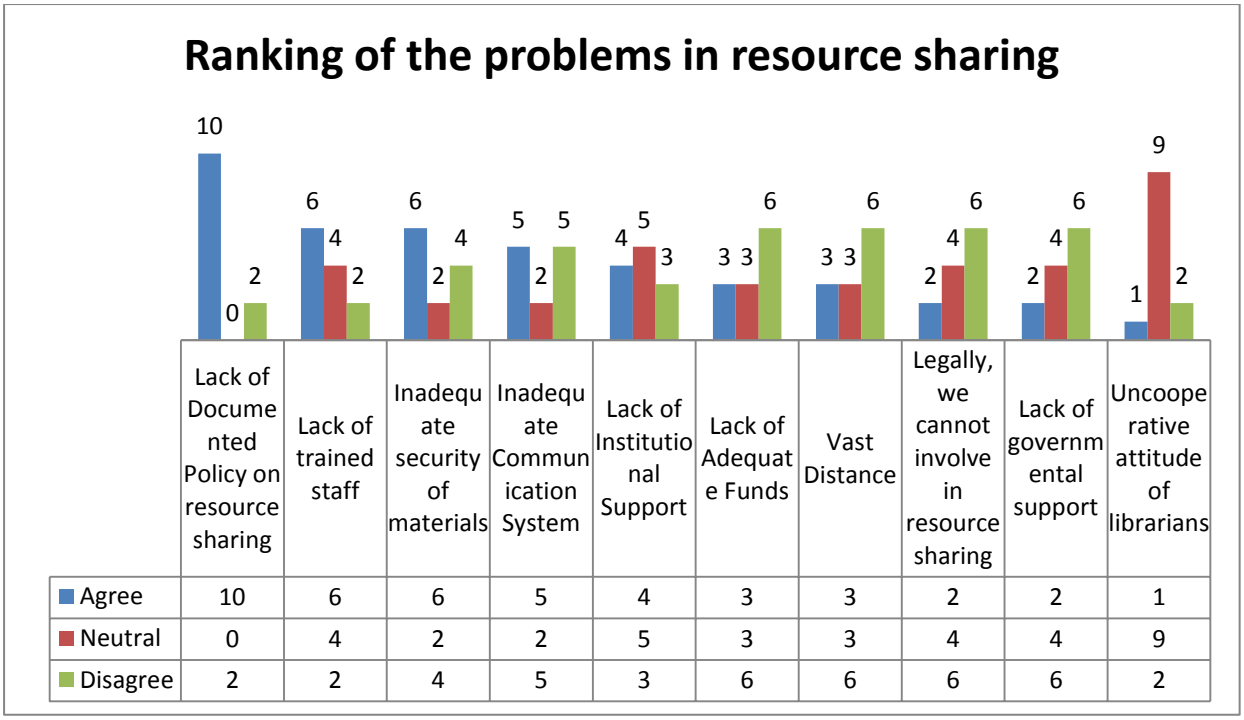
4.5.20.1 Ranking of Impediments to resource sharing

From the table 4.20, the ranking of the impediment to resource sharing was drawn. Since the data was collected on a five-point scale and here the ranking as calculated by addition of the values of strongly agree and agree into one column named agree. Similarly, after adding the value of disagree and strongly disagree we got the value of disagree. Value of neither agree nor disagree remained same here and named neutral.

Table 4.20 Ranking of Impediments to resource sharing

Problems	Satisfaction level			Rank
	Agree	Neutral	Disagree	
Lack of Documented Policy on resource sharing	10	0	2	1
Lack of trained staff	6	4	2	2
Inadequate security of materials	6	2	4	2
Inadequate Communication System	5	2	5	3
Lack of Institutional Support	4	5	3	4
Lack of Adequate Funds	3	3	6	5
Vast Distance	3	3	6	5
Legally, we cannot involve in resource sharing	2	4	6	6
Lack of governmental support	2	4	6	6
An uncooperative attitude of librarians	1	9	2	7

Table describes the ranking of impediments to resource sharing among NIT libraries. Out of 10 identified issues from the study, it was observed that the problem of lack of documented policy in resource sharing among NIT libraries was the major constraint and ranked top. Total ten respondents were agreed with the problem of documented policy on resource sharing. The table further points out that the lack of trained staff and the security of materials are the second major issue confronted by librarians. Results also revealed that not a single NIT had documented policy of resource sharing in their libraries. Based on the above table, a bar chart had been prepared for a better understanding of the ranking of the problems.



	Lack of Documented Policy on resource sharing	Lack of trained staff	Inadequate security of materials	Inadequate Communication System	Lack of Institutional Support	Lack of Adequate Funds	Vast Distance	Legally, we cannot involve in resource sharing	Lack of governmental support	Uncooperative attitude of librarians
Agree	10	6	6	5	4	3	3	2	2	1
Neutral	0	4	2	2	5	3	3	4	4	9
Disagree	2	2	4	5	3	6	6	6	6	2

Figure: 4.25

Above figure 4.25 portrayed the ranking of the data on impediments to resource sharing among selected NIT libraries in India. Here the bar chart displayed the ranking of the problems where blue colour bar shows the data of agreed respondents and green colour bars showed disagreed responses from the data.

4.5.21 Policy on Resource sharing

Table: 4.21 Policy on Resource sharing

S.No	Name of the Institute	Yes	No
1	MANIT	-	✓
2	NITD	-	✓
3	NITG	-	✓
4	NITKKR	-	✓
5	NITM	-	✓
6	NITP	-	✓
7	NITPDY	-	✓
8	NITR	-	✓
9	NITRKL	-	✓
10	NITS	-	✓
11	NITT	-	✓
12	SVNIT	-	✓

Above table has been formulated to calculate the presence and absence of the policy on resource sharing in NIT libraries in India and it was found that all the libraries responded no for the written policy on resource sharing. Which means there is no provision of resource sharing among NIT libraries in India; this is why the libraries do not have any written policy or document on resource sharing.

4.5.22 Strategies to enhance resource sharing

A number of factors were identified after doing an an extensive survey of literature as strategic for enhancing resource sharing among libraries of NITs. The library administrators rated them on five-pointer scale, which was strongly agreed, agree, neither agree nor disagree, disagree and strongly disagree. The responses were codified between one to five, where one stands for strongly disagree, and five stands for strongly agree as captured in table number 4.22.

Table 4.22 Strategies for resource sharing

S.N.	strategies to enhance resource sharing	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1	There should be proper planning and execution	0	0	0	4 (33.33%)	8 (66.67%)
2	There should be adequate funds to meet the library's part of the bargain	0	1(8.33%)	2 (16.67%)	3 (25%)	6 (50%)
3	There should be capacity building through staff training.	0	0	1(8.33%)	4(33.33%)	7 (58.33%)
4	There should be a documented policy on resource sharing	1(8.33%)	0	0	5 (41.67%)	6 (50%)
5	There should be a strong central coordinating body.	1(8.33%)	0	0	3(25%)	8(66.67%)
6	The libraries should be able to adopt right strategies for resource sharing	0	0	1(8.33%)	4(33.33%)	7 (58.33%)

The above table and figure represents the various strategies to enhance resource sharing among NITs. It points out there should be proper planning and execution as the most preferred strategy by library In-charges of NIT libraries. While regarding adequate funds, capacity building, and adoption of the right approach, library In-charges have not disclosed their opinion.

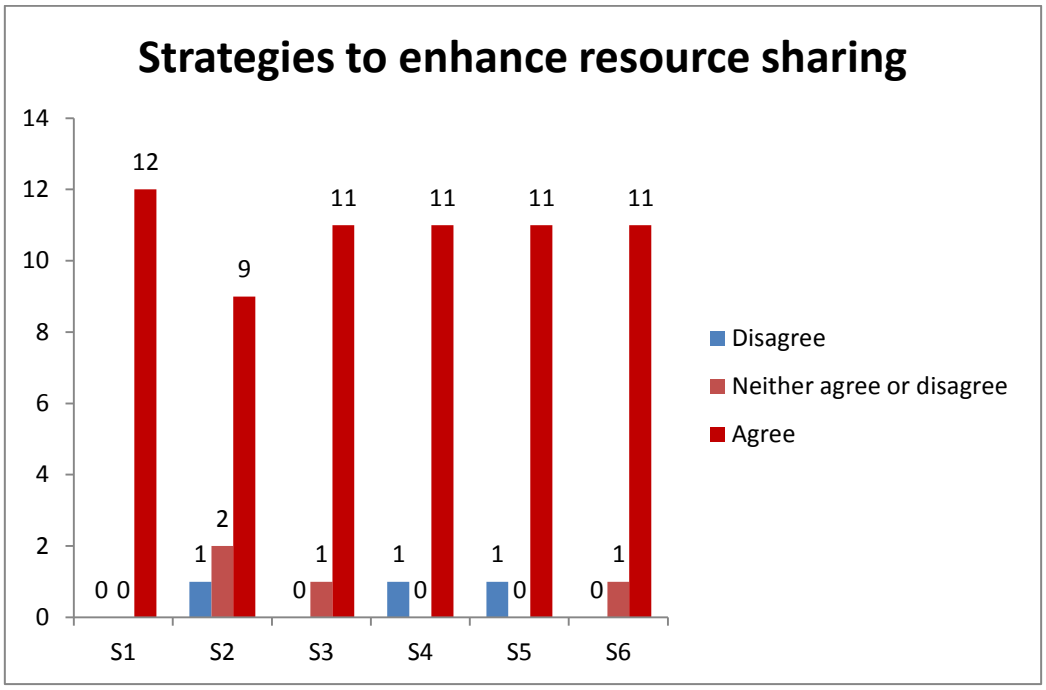


Figure 4.26

This collaborates with the conclusions from Igbo and Imo (2017) and Madumere et al. (2013). who in different studies indicated that those factors were challenges to resource sharing. All these suggested that the challenges of resource sharing are mostly administrative oriented.

4.6 Analysis of data collected from the users of National Institute of Technology libraries

4.6.1 Response rate of users of NIT Libraries

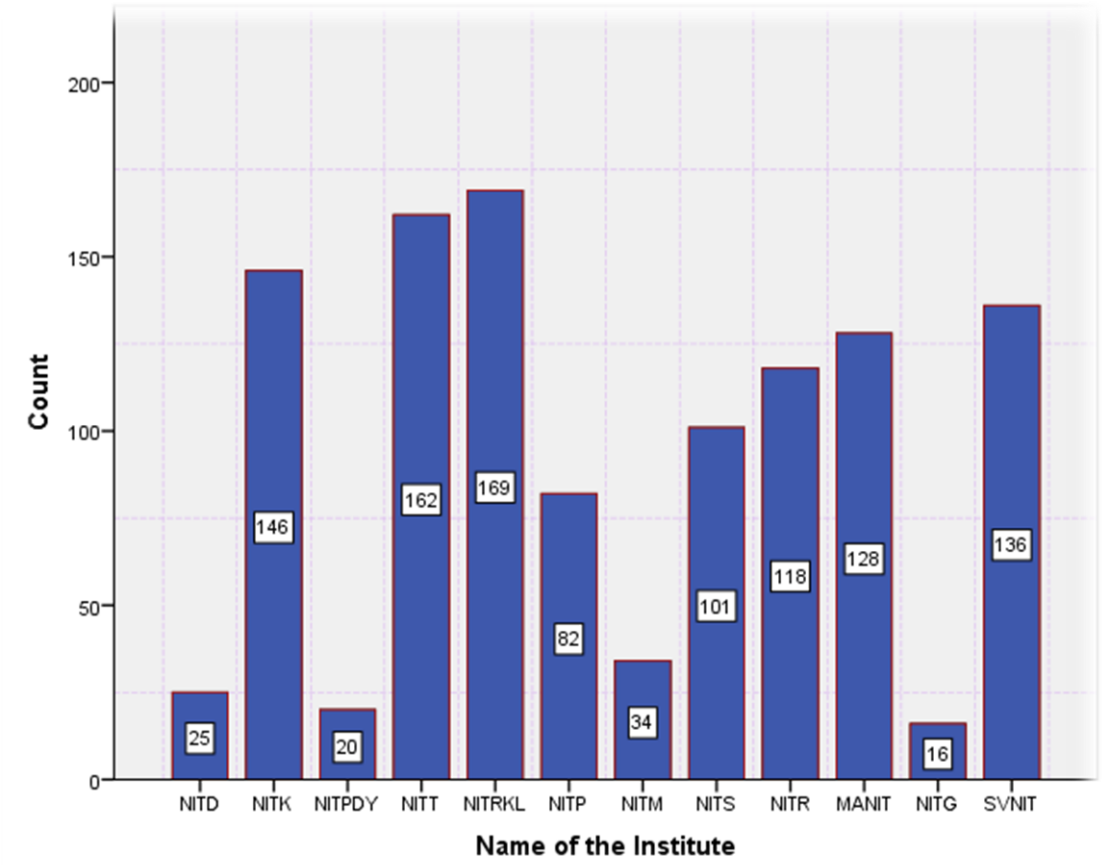


Figure: 4.27 Response rate of users of NIT libraries

Based on the table 4.1 above figure 4.27 depicts the response rate of the respondents involved in study. figure shows that total 1137 responses (86.26%) were received back out of 1318 distributed questionnaires in selected NITs. Among all NITs, NITD, NITG, NITM and NITPDY got the 100% responses while NITP got lowest response rate which is 78.84%.

4.6.2 Gender wise response

Table: 4.23 Gender wise response

Name of the Institute	Gender of respondents		
	Male	**Female**	**Total**
MANIT	95	33	128
NITD	20	5	25
NITG	12	4	16
NITK	119	27	146
NITM	23	11	34
NITP	71	11	82
NITPDY	11	9	20
NITR	86	32	118
NITRKL	122	47	169
NITS	71	30	101
NITT	124	38	162
SVNIT	98	38	136
Total	**852 (74.9%)**	**285 (25.1%)**	**1137**

This table shows the gender ratio of the received responses from NITs. As per the received responses (86.26%) there were 852 male respondents (74.9%) and 285 female (25.1%) were contributed in the study. Highest number of male responses got from NITP which is 86.58% (71 out of 82) while lowest from NITPDY is 55% (11 out of 20). Similarly in observing female response rate we observed that NITPDY got highest female responses with 45% (9 out of 20) while least female responses got from NITP with 13.41% (11 out of 82).

4.6.3 Course wise distribution of users

Table 4.24 Course wise distribution of users

Name of the Institute	Name of the course			
	UG	**PG**	**Research scholar**	**Total**
MANIT	94	34	0	128
NITD	23	2	0	25
NITG	14	0	2	16
NITK	78	65	3	146
NITM	22	3	9	34
NITP	51	25	6	82
NITPDY	1	10	9	20
NITR	76	27	15	118
NITRKL	76	68	25	169
NITS	66	35	0	101
NITT	92	49	21	162
SVNIT	87	40	9	136

This table represents the course wise received responses from NITs. In the context of Highest response in UG course, NITD respond highest 92% (23 out of 25) in PG course NITPDY respond highest 50% (10 out of 20) and in research scholar NITPDY respond highest 45% (9 out of 20). While in the context of lowest responses MANIT, NITD and NITS research scholars not contributed in study because of non-availability in the library.

4.6.4 Library Usage statistics

Here the usage of central library of NITs were categorised into two table where first one shows the frequency of library visits and second table depicts the reasons behind not using the library by the users. In other words, second table defines the basic problems of the users of NIT libraries for not using the library regularly.

Table: 4.25 Library Usage Statistics

Name of the Institute	Frequency of library visit				
	Daily	**Twice a week**	**Weekly**	**Monthly**	**When needed**
NITD	4	5	6	2	8
MANIT	19	15	13	10	71
NITG	4	2	2	1	7
SVNIT	40	29	27	6	34
NITK	63	25	10	3	45
NITPDY	4	4	2	0	10
NITT	10	17	15	21	99
NITRKL	50	34	17	13	55
NITP	52	10	5	1	14
NITM	11	6	3	0	14
NITS	48	13	7	1	32
NITR	31	32	17	4	34
Total	**336 (29.6%)**	**192 (16.9%)**	**124 (10.9%)**	**62 (5.5%)**	**423 (37.2%)**

Above table represents the respondents' frequency of library visit in selected NIT libraries. it was noted that majority of students visit the library whenever they require any information. They are not in habit of using the library regularly. Even more than 5 percent (5.5) of users visited their library once in a month. On the other hand, total 29.6% of users visits the library daily. In the question of library visit if any user selects these three options (weekly, monthly and when needed) he or she has to give their reason for not using the library regularly.

Table: 4.26 Reasons for not using the library regularly

Reasons behind not using the library regularly	**Frequency**
Sum of daily and twice a week	*528*
Shortage of time	202
Required information not available	83
information available on google	224
Inconvenient library hours	57
Any other	43
Total	1137

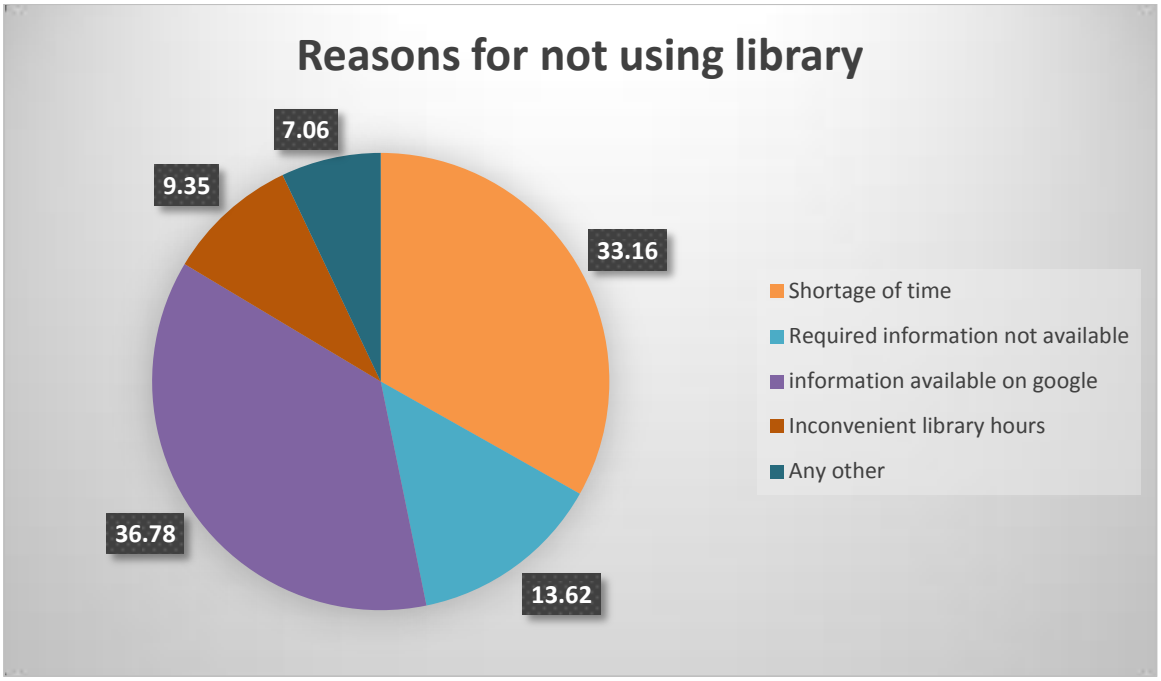


Figure: 4.28

From the table 4.26 it was observed that out of total sample 528 (46.4%) users of NIT libraries use their central library regularly either daily or twice a week while rest of the respondents visit the library weekly, monthly and when needed. It was viewed that 54.6% of the respondents were not using the library regularly and the distribution of the data had been discussed in figure 4.28. A total of 36.78% respondent accepted that information they require is already available on google, this is why they are not using the library regularly.

4.6.5 Satisfaction level of Users

To assess the service quality of any library the satisfaction level of their users play a significant role. Present study also examined the satisfaction level of NIT students regarding the available in their libraries and it was found that out of total sample of the study 38.08% respondents were satisfied with available collection in their libraries and rated it "Good". Table also shows that 67.72% of the responses lies with-in the good, very good and excellent category of the satisfaction level which clearly indicate

that above 60 percent users of the NIT libraries were satisfied with the available collection in their library.

Table: 4.27 Satisfaction level of Users

Name of the Institute	Satisfaction with the library collection				
	Poor	**Fair**	**Good**	**Very good**	**Excellent**
NITD	2	9	4	9	1
MANIT	35	27	39	15	12
NITG	2	5	7	0	2
SVNIT	11	25	58	28	14
NITK	6	26	59	36	19
NITPDY	2	6	9	2	1
NITT	15	40	61	38	8
NITRKL	21	34	57	41	16
NITP	6	15	31	17	13
NITM	3	7	18	4	2
NITS	16	23	32	18	12
NITR	14	17	58	23	6
Total	**133**	**234**	**433**	**231**	**106**

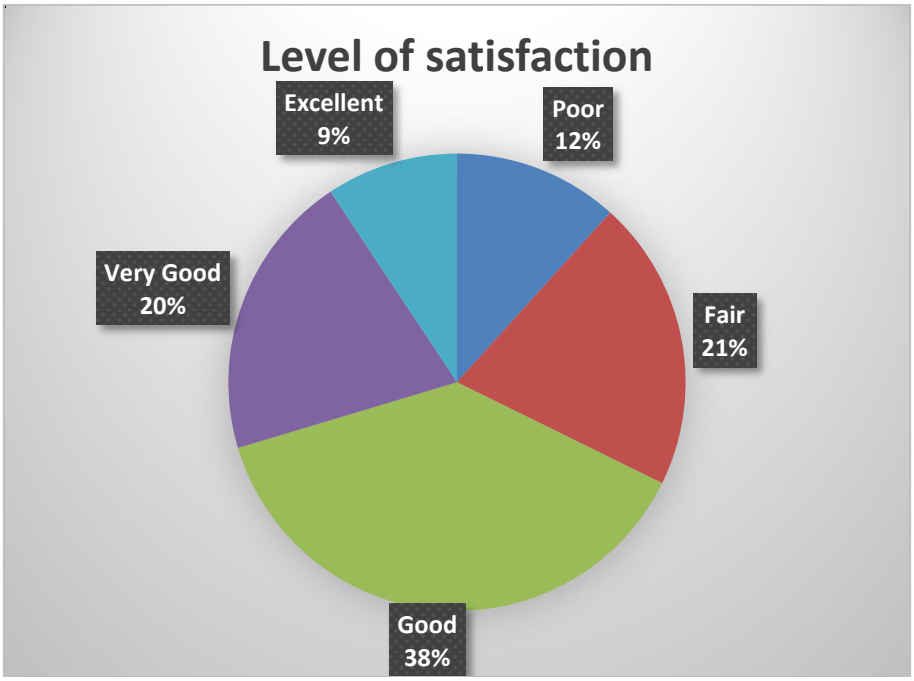


Figure 4.29

4.6.6 Purpose of Visiting Library

Table 4.28 Purpose of Library Visit

Purpose	NITD	MANIT	NITG	SVNIT	NITK	NITPDY	NITT	NITRKL	NITP	NITM	NITS	NITR	Total	Response ratio
for issue and return	18	78	11	56	78	17	92	71	42	23	36	28	**472**	41.52%
For reading general books	8	44	4	35	51	13	29	41	31	7	23	35	**321**	28.23%
newspaper/magazine reading	10	18	3	20	44	15	19	20	40	6	10	32	**237**	20.84%
Subject book reading	10	36	8	80	116	23	71	87	63	17	46	63	**620**	54.52%
For class assignment	5	10	2	25	41	4	19	27	38	7	12	14	**204**	17.94%
Any Other	0	0	1	8	7	0	18	8	2	2	8	8	**62**	5.45%

To find tout the major reasons for using the library from its users a multiple choice based question was asked and it was found from the table 4.28 that out of 1137 respondents 620 (54.52%) were saying that they are using their central library for reading their subject books. 41.52% of users using the library for issuing the books and return it back. Only 20.84% of users read the magazines and newspapers in the central libraries of NIT in India.

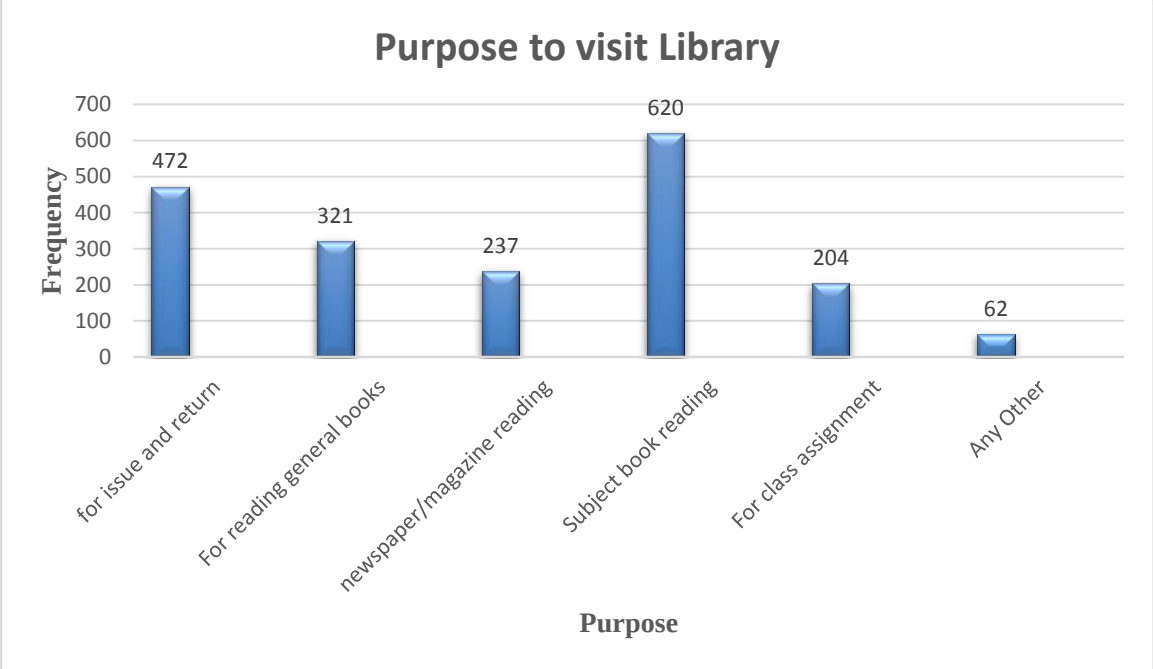


Figure 4.30

4.6.7 Users' Opinion regarding Resource sharing

a) Resource sharing awareness

Table: 4.29 Awareness of Resource sharing

Name of the Institute	Awareness of resource sharing	
	Yes	No
NITD	36.0%	64.0%
MANIT	28.1%	71.9%
NITG	31.3%	68.8%
SVNIT	47.8%	52.2%
NITK	50.0%	50.0%
NITPDY	45.0%	55.0%
NITT	35.2%	64.8%
NITRKL	47.3%	52.7%
NITP	63.4%	36.6%
NITM	41.2%	58.8%
NITS	49.5%	50.5%
NITR	50.0%	50.0%
Total	44.8%	55.2%

Table 4.29 indicated the users' awareness with the concept of resources sharing and assessed that less than 50% of the respondents of NIT libraries were aware with the concept of resource sharing. Among all these NITs the users of NITP were highly (63%) aware with the idea of resource sharing while only 28.1% students of MANIT were aware.

b) Perception on resource sharing

Table 4.30 depicts the users' perception on resource sharing among NITs could be cost effective and it was found that 42.7% respondents were strongly in favour of sharing the information among NIT libraries. and they admit the fact that this kind of sharing will be cost effective.

Table 4.30 Perception on resource sharing

Name of the Institute	**Strongly Oppose (%)**	**Somewhat Oppose (%)**	**Neutral (%)**	**Somewhat Favour (%)**	**Strongly Favour (%)**
NITD	0.0%	4.0%	8.0%	48.0%	40.0%
MANIT	2.3	1.6	28.9	29.7	37.5
NITG	0	0	31	25	43.8
SVNIT	2.9	1.5	30.9	22.1	42.6
NITK	1.4	0.7	13.0	30.1	54.8
NITPDY	0.0	5.0	15.0	10.0	70.0
NITT	2.5	4.3	30.2	34.0	29.0
NITRKL	0.6	1.8	25.4	24.3	47.9
NITP	2.4	0.0	13.4	35.4	48.8
NITM	2.9	0.0	23.5	23.5	50.0
NITS	2.0	2.0	19.8	37.6	38.6
NITR	4.2	0.8	29.7	28.0	37.3
Total	**2.1**	**1.8**	**24.1**	**29.4**	**42.7**
Chi-Square Calculated Value (X2) = 77.018, Degree of freedom = 44 and p value = 0.002(≤.05 significant) Chi-square Critical Value (Tabulated Value) = 60.48					

To find out the significant variation among the perception on resource sharing the Pearson Chi square test had been applied and it was found that the calculated value of Chi square is 77.018 with 44 degree of freedom and the p value is .002 with .05 alpha value. The tabulated critical value on 44 degree of freedom is 60.48 which is smaller than the calculated value. Since it has been proved that there is a significant variation among the perception on resource sharing with in the respondents of NIT libraries in India.

4.6.8 Users' reaction on not getting information

Likewise, in our everyday life when we do not get required information we take some actions such as discussing with seniors, colleagues, teachers or putting a query on social media. In the same way present study also examined the users, reaction after not getting required information from their library. Table 4.31 has been formulated for the same and it was found that 44.9% users take exit from the library without even saying anything. Whereas 41.2% users inform the librarian or library staff regarding their query. Interestingly table also depicts that only 126 respondents directly asks the library to make their information available.

Table: 4.31 Users reaction when not getting the information

Categories	**Frequency**	**Percent**
Inform the librarian/staff regarding your need	469	41.2
Ask them to make available	126	11.1
Take exit from the library without saying anything	510	44.9
Any other	32	2.8
Total	1137	100.0

4.6.9 Users' perception regarding library personnel

Library serves their users in terms of offering different types of services as well as provides new and updated services for its users. In order to analyse the users'

perception regarding the library staff two tables has been formulated and discussed below:

Table: 4.32 Library staff keeps me informed about new services & collection

Satisfaction Level	Frequency	Percent
Not at all satisfied	361	**31.8**
Slightly Satisfied	272	23.9
Moderately Satisfied	260	22.9
Very Satisfied	173	15.2
Extremely Satisfied	71	6.2
Total	1137	100.0

Table 4.32 describes the users' point of view in terms of satisfaction level that whether library staff keeps their users informed about the new services and collection or not, and it was viewed that 31.8% of respondents were denying the fact and saying they were not satisfied with the statement that library keeps them informed regarding new services or collection. On the other hand, table 4.33 shows that 30.1% of respondent were moderately satisfied with the behaviour of library staff and said that they are willing to provide the required information to their users. This table also depicts that 25.9% of users of NIT libraries were very satisfied with the statement that "staff are willing to provide the required information".

Table: 4.33 Staff are willing to provide required information

Satisfaction Level	Frequency	Percent
Not at all satisfied	133	11.7
Slightly Satisfied	240	21.1
Moderately Satisfied	342	**30.1**
Very Satisfied	294	25.9
Extremely Satisfied	128	11.3
Total	1137	100.0

4.6.10 Satisfaction regarding reprographic service

Reprography service is a very important and useful service from users' point of view. Table 4.34 represents that 38.5% of respondents were not at all satisfied with the existing reprography service provided by NIT libraries to their users. While only 15.7% of respondents are moderately satisfied with the available reprographic facility.

Table: 4.34 Satisfaction regarding reprographic service

Satisfaction Level	Frequency	Percent
Not at all satisfied	438	**38.5**
Slightly Satisfied	222	19.5
Moderately Satisfied	209	18.4
Very Satisfied	179	15.7
Extremely Satisfied	89	7.8
Total	1137	100.0

4.6.11 Satisfaction regarding research based collection

Since NITs in India are offering research program in various disciplines, therefore the libraries should be able to fulfil the research needs of its users. It is believed that if the researchers of any institutional library are able to fulfil their required information easily and accurately than it means the particular library is providing best services to their users. This research work also examined the satisfaction level of researchers of NIT libraries regarding their research based collection and it was found from the table 4.35 that 39.7% of the researchers are moderately satisfied with the available collection of their libraries.

To find out the significant variation among the satisfaction regarding research based collection the Pearson Chi square test had been applied and it was found that the calculated value of Chi square is 96.076 with 44 degree of freedom and the p value is .002 with .05 alpha value. The tabulated critical value on 44 degree of freedom is

60.48 which is smaller than the calculated value. Since it has been proved that there is a significant variation among the level of satisfaction of users with the research based of NIT libraries in India.

Table: 4.35 Satisfaction regarding research based collection

Satisfaction Level	**Frequency**	**Percent**
Not at all satisfied	133	11.7
Slightly Satisfied	238	20.9
Moderately Satisfied	451	**39.7**
Very Satisfied	260	22.9
Extremely Satisfied	55	4.8
Total	1137	100.0

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	96.076[a]	44	.000
Likelihood Ratio	97.261	44	.000
N of Valid Cases	1137		

a. 14 cells (23.3%) have expected count less than 5. The minimum expected count is .77.

4.6.12 Users' opinion on available space for reading

Table: 4.36 Users' opinion on available space for reading

Reading areas in library are adequate		
Satisfaction Level	Frequency	Percent
Not at all satisfied	287	25.2
Slightly Satisfied	230	20.2
Moderately Satisfied	275	24.2
Very Satisfied	247	21.7
Extremely Satisfied	98	8.6
Total	1137	100.0

An appropriate reading space in a library is one of the major factor which attracts the users towards library and promotes the healthy environment of reading and learning. To find out the satisfaction level of the users' regarding available reading space in the library table 4.36 has been formulated. It revealed that there was not a major

difference among the categories of satisfaction level. Approximately one fourth (24.2%) of the users of NITs were moderately satisfied with the available reading space provided by libraries.

4.6.13 Users' satisfaction with the accessibility of computers and internet connectivity

Table: 4.37 Satisfaction with the accessibility of computers and internet connectivity

Computers and internet are accessible in library		
Satisfaction Level	**Frequency**	**Percent**
Not at all satisfied	221	19.4
Slightly Satisfied	205	18.0
Moderately Satisfied	357	**31.4**
Very Satisfied	241	21.2
Extremely Satisfied	113	9.9
Total	1137	100.0

Above table (4.37) points out the users' satisfaction with the accessibility of computers and internet facility provided by their libraries and it was observed that 31.4% users were moderately satisfied with the facility. They were having little bit issues with the internet connectivity but overall results showed that users were moderately satisfied.

4.6.15 Digital collection usefulness

Table: 4.38 Opinion about usefulness of digital collection

Categories	**Frequency**	**Percent**
Not at all useful	76	6.7
Slightly useful	258	22.7
Moderately Useful	451	**39.7**
Highly Useful	330	29.0
Any Other	22	1.9
Total	1137	100.0

Now days, digital format of information has become a need of the students because of its various qualities like easy handling, accessibility from anytime or anywhere. Therefore, researcher tried to figure out the opinion of the users' regarding the usefulness of digital collection available at NIT libraries in India. It was viewed from the table 4.38 that 39.7 % of users of libraries thinks that digital collection is useful to them along with this 29% users agreed that digital collection is highly useful for them.

4.6.16 Usage statistics of E Resources

Earlier table discussed the usefulness of digital material in NIT libraries. Digital material comprises of electronic journal, e-databases, e-theses, e books and e scholarly content. For analysing the usage of electronic resources among NIT library users two question were asked first was related to the usage of e resource and second focussed on the preferred electronic resource.

a) Table 4.39 describes the respondents' consideration on the usage of e resources in the library users and it was found that 52.8% users said that they were not using the electronic resources and 47.2% considered the e resources in their studies.

Table: 4.39 Electronic resources usage

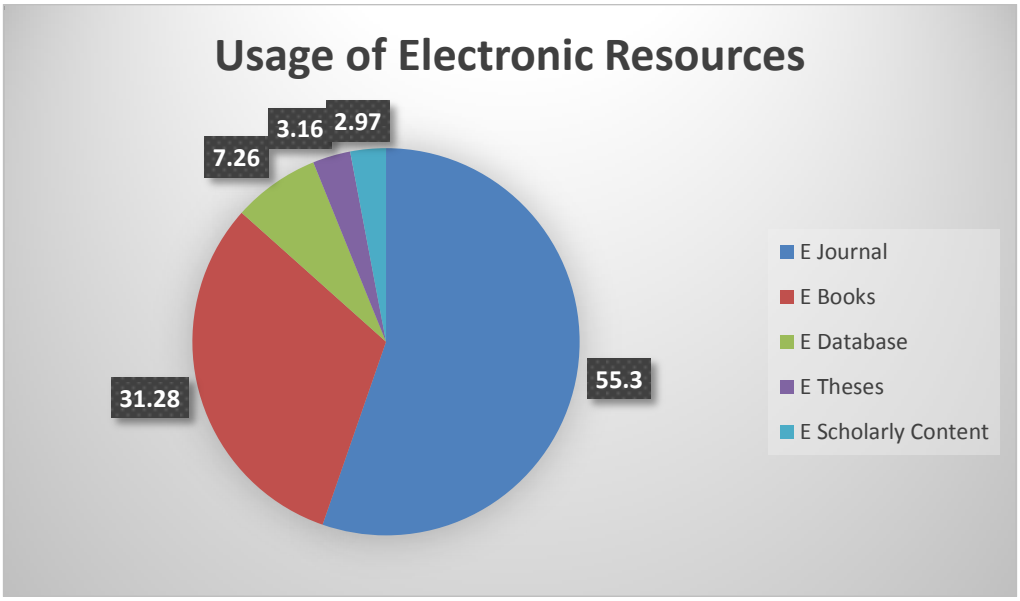
		Frequency	**Percent**
Valid	Yes	537	47.2
	No	600	52.8
	Total	**1137**	**100.0**

b) Table 4.40 elaborates the statistics of 47.2% of respondents accepted that they were using the e resources made available by their libraries. it is clearly visible from the table that e journal was the most preferred type of e resource having 55.3% responses, followed by e books (31.28%).

Table: 4.40 Type of Electronic Resources

		Frequency
Valid	E Journals	297
	E database	39
	E books	168
	E Thesis	17
	E Scholarly Content	16
	Total	**537**
Missing	**System**	**600**
Total		**1137**

Figure:4.31



4.6.17 Orientation program of library

Library orientation is a most important part of any academic library as it informs the new student of institute about their collection and services as well as elaborated the importance of library in their academic achievements.

Table: 4.41

Library Orientation Program

		Frequency	Percent
Valid	Yes	385	33.9
	No	752	66.1
	Total	1137	100.0

It was viewed from the table (4.41) that 66.1% of respondents were not aware with the library orientation program. While only one third users accepted that libraries were conducting this program regularly and to test the significant association with the opinion of users on orientation program the Pearson Chi square test had been applied and it was found that the calculated value of Chi square is 83.335 with 11 degree of freedom and the p value is .002 with .05 alpha value. The tabulated critical value on 11 degree of freedom is 29.59 which is smaller than the calculated value. Since it has been proved that there is a significant the significant association with the opinion of users on orientation program with in the respondents of NIT libraries in India.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	83.335[a]	11	.002
Likelihood Ratio	83.470	11	.000
N of Valid Cases	1137		

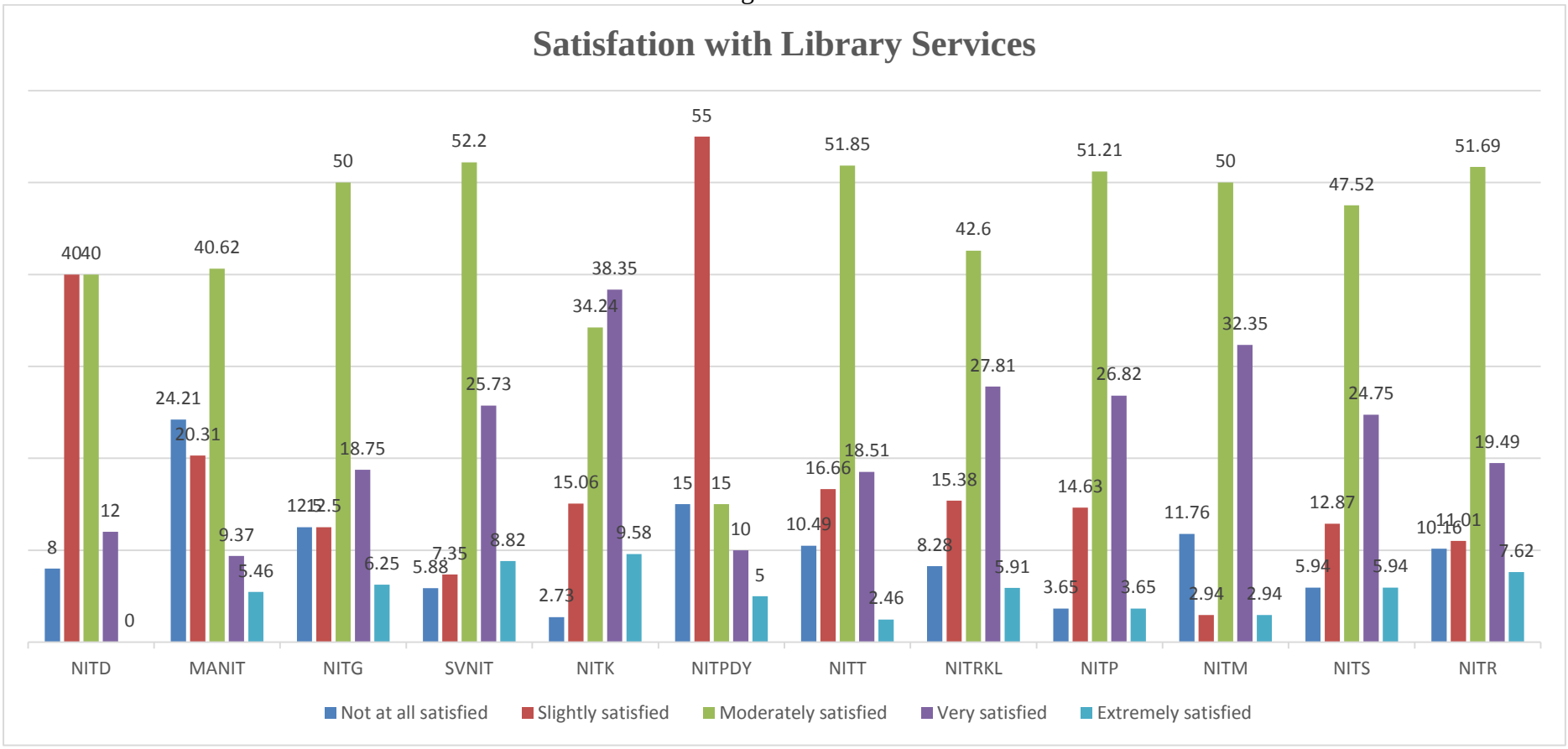
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.42.

4.6.18 Overall satisfaction with library services

Table: 4.42 Overall satisfaction with library services

Name of the Institute	Library service satisfaction level				
	Not at all satisfied	**Slightly satisfied**	**Moderately satisfied**	**Very satisfied**	**Extremely satisfied**
	Count	**Count**	**Count**	**Count**	**Count**
NITD	2	10	10	3	0
MANIT	31	26	52	12	7
NITG	2	2	8	3	1
SVNIT	8	10	71	35	12
NITK	4	22	50	56	14
NITPDY	3	11	3	2	1
NITT	17	27	84	30	4
NITRKL	14	26	72	47	10
NITP	3	12	42	22	3
NITM	4	1	17	11	1
NITS	6	13	48	25	6
NITR	12	13	61	23	9
Total	**106**	**173**	**518**	**269**	**68**

Figure: 4.32


Satisfation with Library Services
NITD
MANIT
NITG
SVNIT
NITK
NITPDY
NITT
NITRKL
NITP
NITM
NITS
NITR
Not at all satisfied
Slightly satisfied
Moderately satisfied
Very satisfied
Extremely satisfied

Above figure (4.32) indicated that among all the NITs majority of the students (45.55%) were moderately satisfied with their central library. It was noted that users from NITPDY were slightly satisfied (55%) with their library and the respondents of NITD were also slightly satisfied with their library services (40%). Further figure revealed that above the 50% users of SVNIT, NITP, NITT and NITR were moderately satisfied with their library services.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	94.613[a]	44	.000
Likelihood Ratio	94.346	44	.000
N of Valid Cases	1137		

a. 12 cells (20.0%) have expected count less than 5. The minimum expected count is 1.49.

Here to check the variation among the satisfaction level the Pearson chi square test had been implied and it was found that the calculated chi square vale is 94.613 at the rate of 44 degree of freedom and with 0.05 alpha and the tabulated value is 60.48 which is less than the calculated value. The decision can be stated that "there is a significant variation among the level of satisfaction of the users of NIT libraries".

4.6.19 Problem Faced by user with the e resources

Table: 4.43 Problem Faced by user with the e resources

Name of the institution	Inadequate resources	Poor Connectivity of Internet	Difficulty in finding relevant document	Any Others
NITD	32.0%	24.0%	44.0%	0.0%
MANIT	44.5%	19.5%	34.4%	1.6%
NITG	25.0%	43.8%	25.0%	6.3%
SVNIT	27.2%	18.4%	36.8%	17.6%
NITK	24.0%	24.0%	41.1%	11.0%
NITPDY	35.0%	5.0%	50.0%	10.0%
NITT	18.5%	27.8%	33.3%	20.4%
NITRKL	28.4%	31.4%	33.7%	6.5%
NITP	42.7%	14.6%	39.0%	3.7%
NITM	14.7%	44.1%	35.3%	5.9%
NITS	19.8%	27.7%	40.6%	11.9%
NITR	38.1%	16.9%	38.1%	6.8%
Total	29.1%	23.9%	36.9%	10.0%

Above table (4.43) showed the impediments to the usage of electronic resources in NIT libraries in India. It depicts that 36.9% of NIT students were facing problem in finding the relevant document followed by inadequate resources (29.1%). While individually we can say that it can be observed that the problem of poor connectivity of internet and difficulty in finding relevant documents were the major constraint in selected NIT libraries of India.

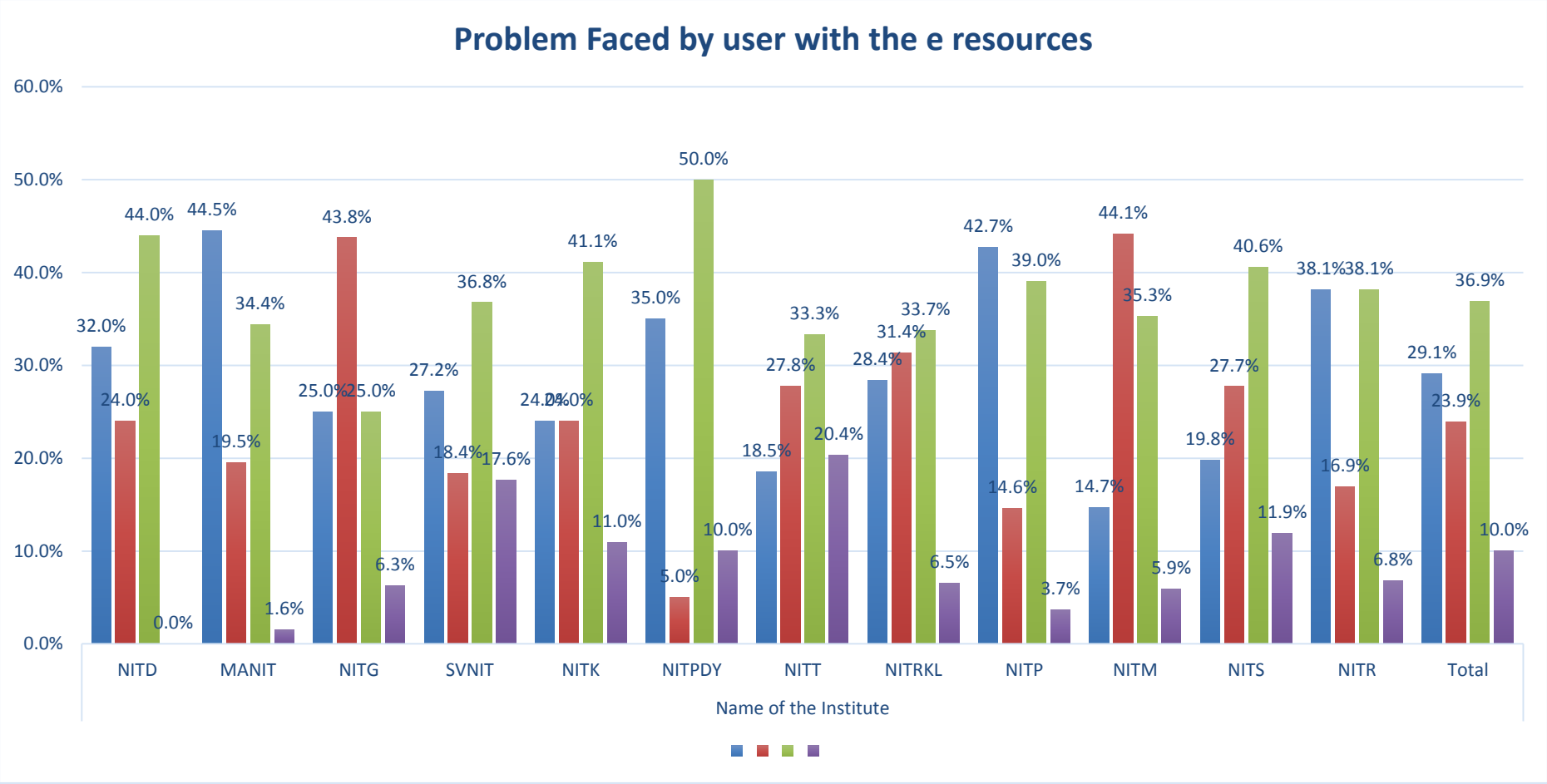

Problem Faced by user with the e resources
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
32.0% 24.0% 44.0% 0.0%
44.5% 19.5% 34.4% 1.6%
25.0% 43.8% 25.0% 6.3%
27.2% 18.4% 36.8% 17.6%
24.4% 24.0% 41.1% 11.0%
35.0% 5.0% 50.0% 10.0%
18.5% 27.8% 33.3% 20.4%
28.4% 31.4% 33.7% 6.5%
42.7% 14.6% 39.0% 3.7%
14.7% 44.1% 35.3% 5.9%
19.8% 27.7% 40.6% 11.9%
38.1% 16.9% 38.1% 6.8%
29.1% 23.9% 36.9% 10.0%
NITD MANIT NITG SVNIT NITK NITPDY NITT NITRKL NITP NITM NITS NITR Total
Name of the Institute

Figure: 4.33

4.7 Testing of Hypotheses

The hypotheses were formulated according to the objectives of the research to answer the research problem. They were tested using tables and figures with the help of SPSS and MS-Excel.

The first hypothesis of the study was "Lack of skilled library personnel is one of the major barrier faced by the NIT libraries in India."

The above hypothesis has been proved and accepted from the graphical and tabular presentation of the analysis in the table 4.4, 4.10, 4.19 and 4.20 discussed about the barriers of resource sharing in NIT libraries. The Pearson Chi square test was conducted to check the relevancy of the statement on trained library personnel as a barrier in resource sharing among NIT libraries. (For cross tabulation see the appendices)

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.000[a]	33	.330
Likelihood Ratio	30.865	33	.574
N of Valid Cases	12		

a. 48 cells (100.0%) have expected count less than 5. The minimum expected count is .08.

Above table of chi square test shows the calculated value of chi square is 36.00 at 33 degree of freedom and p value is .330 with 0.05 alpha value. The tabulated value of chi square is 47.40 which is greater than the calculated value. **Hence it is proved that there is an insufficiency of skilled manpower in the libraries of NIT and this become an impediment to resource sharing and networking among NIT libraries in India.**

The second hypothesis of the study was "Application of IT tools is being effectively incorporated in all NIT libraries for enhancement of resource sharing."

This hypothesis has been based on the implementation of information technology in the library. It was found from the analysis of the table 4.9, 4.10, 4.12 and 4.13 that all NIT library fulfils the basic demand of tools for the enhancement of resource sharing. The graphical presentation of data from the figure 4.11 to 4.22 supports the hypothesis and make it accepted.

The Third hypothesis of the study was "The users of NIT libraries have yet to achieve satisfaction with the technical facilities provided by the libraries."

To test the above hypothesis two statistical hypothesis were framed on the variable Computers and internet facilities accessible in the library.

H_0 Users are satisfied with Computers and Electronic equipment which are accessible in library.

To test the above hypothesis Pearson Chi square test has been performed.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	147.003[a]	44	.000
Likelihood Ratio	145.230	44	.000
N of Valid Cases	1137		

a. 12 cells (20.0%) have expected count less than 5. The minimum expected count is 1.59.

Here the Pearson chi square calculated value is 147.003 at 0.05 alpha with 44 degree of freedom (For cross tabulation see the appendices). The tabulated chi square value is 60.48 which is less than the calculated value of chi square and rejects the Null

hypothesis and accepts the alternate hypothesis which was users of NIT libraries are not satisfied with computers and internet facilities provided by the libraries.

The last hypothesis of the study was "There are no policies as well as appropriate rules for resource sharing in the NIT libraries of India."

For the above hypothesis the **Pearson Chi Square test** was conducted to check the level of agreement of the respondents on the policy on resource sharing and the null hypothesis was there are policies on resource sharing in the NIT libraries.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.000[a]	22	.347
Likelihood Ratio	25.861	22	.258
N of Valid Cases	12		

a. 36 cells (100.0%) have expected count less than 5. The minimum expected count is .25.

The test statistics from the table shows that the calculated value of chi square is 24.00 at 0.05 alpha with 22 degree of freedom (For cross tabulation see the appendices). The tabulated chi square value is 33.92 which is greater than the calculated value of chi square and rejects the Null hypothesis and accepts the alternate hypothesis of the study.

Hence it is proved that there are no policies as well as the appropriate rules for resource sharing in the libraries of NIT in India.

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Chapter V

Proposed Model for NIT Library Network for Resource Sharing

Chapter V

PROPOSED MODEL FOR NIT LIBRARY NETWORK FOR RESOURCE SHARING

5.1 Introduction

Library resource sharing specialists work to connect people with the information they need to enhance their lives and contribute to their communities, regardless of the location or format of that information. It is because this work is so important to individuals and so beneficial to our shared global society, that librarians collaborate, both within and among institutions, to find new and better ways to share information and resources as efficiently and effectively as possible. In conjunction with rapidly developing technologies that support the sharing of information and resources on behalf of our library users, librarians today can facilitate access to more resources for more information seekers than ever before possible. To satisfy the increasing demands of the user's libraries have been compelled to adopt resource-sharing wherein a resource sharing group of participating libraries share documents, manpower, facilities, services, building space and equipment, etc., on the principles of mutual cooperation.

A network usually consists of a formal arrangement whereby materials, information, and services provided by a variety of libraries and other organizations are available to all potential users. Libraries may be in different jurisdictions but agree to serve one another on the same basis as each serves its own constituents. Computers and telecommunications may be among the tools used for facilitating communication among them (Prabhu,2011). Various projects have been initiated worldwide among them Information delivery service is an innovative project/ model for library resource

sharing and day by day it has developed many tools for logical workflow of 100 libraries across the United States over the 13 years of span. Under this project library have to work on a same moto "my library is your library and your library is my library". Recently IDS has developed a server level add-on having a new module named Article Gateway System (figure 5.5.1), which connects libraries to proper utilisation of staff's skills and improvise the services to their users (Litsey, 2017).

Image: 5.1 Article Gateway System (*Source*: (Litsey, 2017)**)**

5.2 Requirement of the Model

It has been observed that unparalleled fast growth of publication, shrinking resources, escalation of prices and ever-increasing expectation of users are few of the challenges encountered by the libraries. The researcher feels confident that after implementation of the proposed model, the libraries will function effectively to a large extent, and it may lead the libraries to come together and initiate co-operative activities, which are required to day.

5.3 Policies and regulation

As per the IFLA guidelines for resource sharing and best practice for interlibrary loan there should be well defined policies for sharing.

"*Requesting libraries should be aware of existing regulations and agreements on inter lending. [State here any specific codes, manuals, etc that should be known.] Supplying libraries should make available on request a statement of their inter lending policy and charges. Permanent acquisition of the item may be more appropriate than obtaining the item through ILL. It is legitimate to request any kind of library material, but rare, fragile, or bulky items, or items that cannot be photocopied and are in high local demand, are less likely to be readily supplied. The supplying library has the ultimate right to decide whether to supply any requested item.*" (IFLA -- Model National Interlibrary Loan Code, Updated on 2019)

1. Establishment of a proper resource-sharing network for libraries of NITs, with all libraries' consent to basic terms and conditions.
2. Since All the libraries are automated but automation software is different. For uniformity all the libraries should follow MARC 21 so that exchange can be possible.
3. All the participating libraries must share their resources with other with the terms and conditions.
4. Agreement of all libraries of NIT regarding division of responsibilities on acquisition keeping in view the types of publication and subject areas.
5. Effective agreement on document description in all libraries of the network system to follow the same classification scheme and cataloguing rules for easy access to information.

6. A financial plan including distribution of work for each library and complete network system should be prepared at the preliminary stage itself.
7. Additional agreements are required about some activities like loan period, payment of materials, etc.
8. Provision of more than sufficient funds for establishment of latest working computer system and its peripherals (hardware, software, database, networking, etc).
9. Organization of training programmes at regular intervals for library professionals and also education in IT for the working staff which leads to suitable professional development and ensures competency in the field.

To implement the NIT library network policy in India, a calibrated approach is essential. To achieve this, a pragmatic framework should be structured (Chatterjee & Kumarkar, 2018). Basing on this framework, the centralised body should proceed to materialize the goal with contribution of resource sharing in all relevant fields.

5.4 Required hardware and software

Each of the member libraries must have at least some of the following hardware. However, he main library (Central Host) may require most of the hardware mentioned below, but with additional disk space. Hardware specifications are given below:

1. One Server/Computer
2. One Printer
3. One Scanner
4. Operating System
5. Telecommunication Network, Telephone, Internet ,LAN,WAN, Switches etc

6. Web Based Library Software

5.5 Proposed Model

Resource sharing and networking among the NIT libraries in India requires the nodal centre for the network from there it will get operated. Since the organisational structure suggests that chairman of the council has all decision making rights with the concern of senate and board of librarian. Among 31 NITs which one will be the nodal centre for network will completely decide by the council. On the basis of the finding of the study researcher suggest that the old NITs can be the nodal centre as they have rich printed collection and enough staff in comparison to the newly established NIT. The strongest motive of the network is based on the sharing in terms of cost and resources and the foremost logic behind cost sharing is that higher education costs in general are rising faster than the available public resources (Cuhadar and Cimen, 2019).

In order to achieve the goals and objectives of the proposed model a Central Network facility with high end servers will need to be established at the network hub in nodal centre. This will be connected to all the libraries of the NIT through internet as per the predefined architecture.

- **Aims**

The objectives of the present network are influenced with vision and mission of NIT consortium. With some modification of those objectives, they are listed below:

1. To provide a platform to collaborate the procurement of e-resources.

2. Along with the encouragement to the interlibrary loan practice, to promote resource sharing in many other areas such as cooperative acquisition, cooperative processing and distributed utilization.
3. To negotiate with publishers and/or their representatives for better pricing and/or enhanced content.
4. To formulate a model license agreement for the procurement of e-resources.
5. Create databases for projects, specialists and institutions to provide on-line information services.
6. To facilitate orientation and training of users and library professionals in the use of e-resources.
7. To work towards the growth and development of library professionals.
8. To promote the sharing of the research outputs among the NITs.
9. To work towards the development of manpower roadmap for libraries.
10. Create a centralised procurement and access policy for electronic databases and journals.

- **Organisational structure**

Organisational structure of the proposed network for NIT libraries should be properly organised and well defined (as in figure 5.1) so that workflow of the hierarchy can be maintained. Network will be centrally governed and the governing body will be the chairman of NIT council. We can define this body as a steering committee for the network.

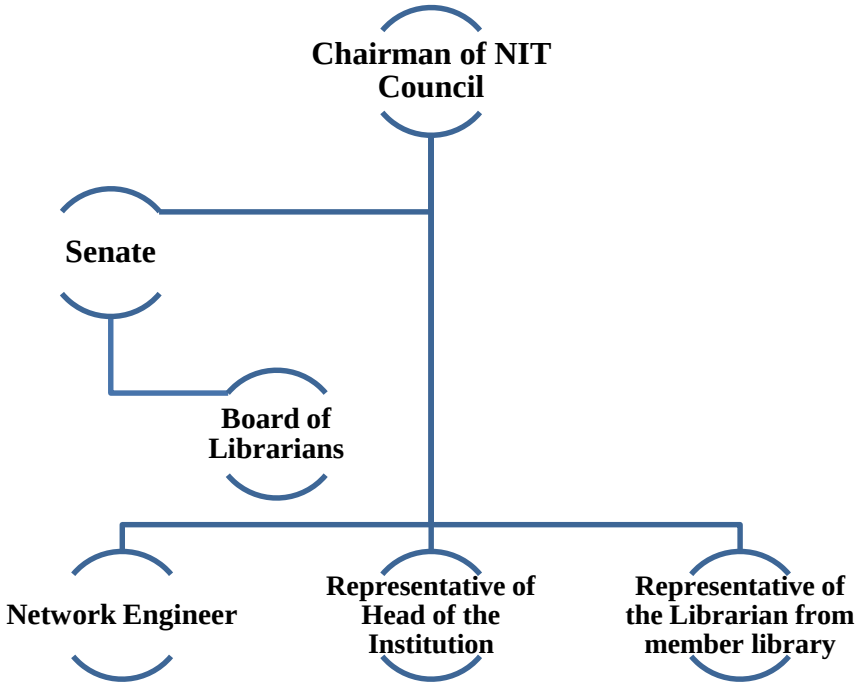

Figure 5.1 Organisational structure of the NIT library Network

- **Characteristics**

- Equal opportunities of access,
- Reduction in time, physical space and language barriers,
- Large databases and independence,
- Better searching and retrieval facilities,
- Efficient use of resources,
- Appropriate mechanism,
- Global infra-structure.

- **Activities**

- Capture, store, manipulate information and provide access to a large collection.

- Improve the cost-effectiveness of library operations.
- Access national and international journals which are being published only in machine-readable form.
- Enable greater access to information
- Provide means to enrich the teaching and learning environment
- Support all sorts of library operations or functions and develop in-house databases.
- Manage contents from multiple location.
- Make information available for a longer time.
- Support advanced search and retrieval to enable greater access for information.
- To protect owners of information.

- **Utility**

- Access to the union catalogue ϖ Access to one or more external databases
- Downloading metadata or the full text of the records.
- Requesting acquisition of new publications from their library itself on interlibrary loan.
- Access to their circulation records through the internet
- Accessing electronic journals across all the libraries in the network.

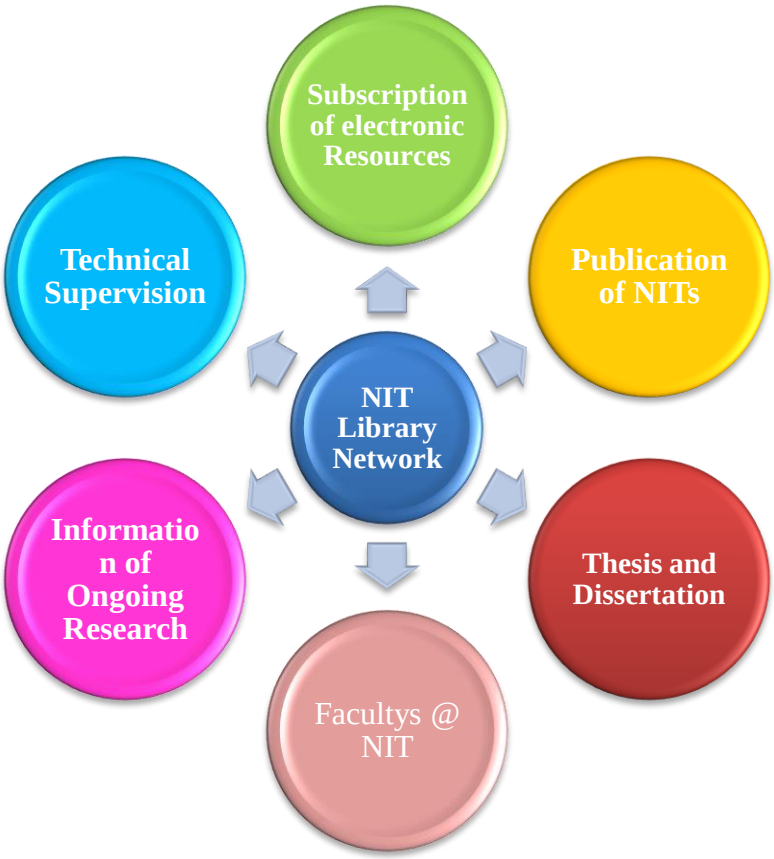

Figure 5.2 Utility of Resource sharing

The framework should have six salient circular factors providing the pillars with two horizontal intersections like standard and governance. Library network will work majorly in the field of subscription of electronic resources where on a single platform all relevant information material will be available for each library. Secondly this platform will provide the details about the in-house publication of NIT so that information can be circulate. Through this network each member library users will get befitted by the current information on on-going research at NITs in India.

- **Policies and regulation**

Malviya & Kumar (2007) described the organisational models for library network and categorised into four parts; loosely knit federation, multi- type/ state network, tightly

knit federation and centrally funded state ide consortium. Present model will include two types of major activities as centralised and decentralised, where the centralized activities will include: standardization of record formats, quality control monitoring, distribution / dissemination of full text, data integrity for the central server, access authorization to document delivery, and management and maintenance of the central server. Decentralized activities will include: data entry and editing, quality control, storage, archiving and preservation, copyright and IPR control for full text, and other duties. The model has been defined to keep in mind the UGC regulation 2005, where open archive initiative compliant repositories for information resources and metadata harvesting services at national level. Under this centralised network each institute would have to send the metadata to a centralized agency to be named by the MHRD (Ghosh, 2009). The framework of proposed network for NIT libraries have been described in figure 5.3.

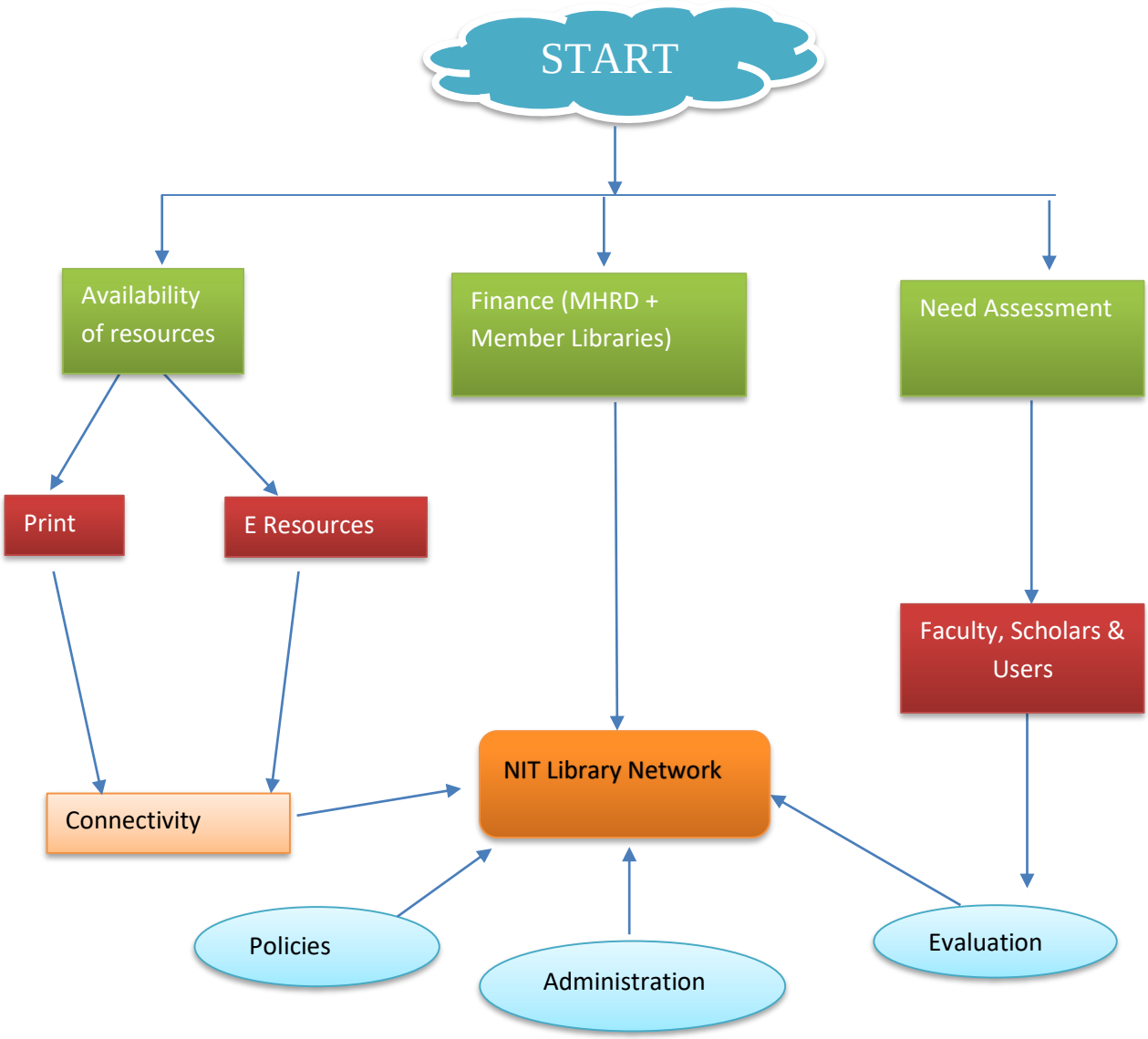

Figure: 5.3 Proposed Model for NIT Library Network

5.6 Conclusion

Above chapter discussed the detailed suggestive model for library network for NIT libraries in India. On the basis of the inferences drawn from the analysis above model has been framed and aims towards the evolution of standards and uniform guidelines in techniques, methods, procedures, hardware and software, services and so on which promotes the adoption in actual practice by all libraries, in order to facilitate pooling, sharing and exchanging resources among libraries.

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Chapter VI

Findings, Conclusion and Suggestions

Chapter VI

FINDINGS, CONCLUSION & SUGGESTIONS

6.1 Introduction

The study was conducted to find the current trends in information communication technology applications in the central libraries of Indian Institutes of Technology. This chapter explains the findings of the study concerning objectives of the survey with testing of hypothesis, conclusions and suggestions that can be drawn from the analysis and interpretation of data. It also presents a real picture of the central libraries of National Institutes of Technology. This chapter concludes with suggestions and recommendations based on users' feedback for further research in the context of central libraries of NITs. The following findings are purely based on data collected through questionnaire and observations from the librarian/library in-charge of National Institutes of Technology.

6.2 Summary of the findings with discussion

This study finds several results, and these are summarised as under various headings:

6.2.1General Findings

Gender wise respondents

100% responses have been received from In-charge of the central library or Librarians or Deputy Librarian or Assistant Librarian of selected National Institute of Technology in India.

In the present study, it was found from the data that 75% librarian/ library in-charge were male and 25% librarian/ library in- charge was male. Only NIT Silchar and NIT Thiruchirapalli (NITS & NITT) have a female library in charge of managing and handling their libraries.

Educational qualification of the Respondents

It was revealed from the analysis that in all 12 selected NIT libraries there was equality between the qualification of the librarian or library in charge, which means 50% staff is having the postgraduate degree and remaining 50% is having a doctorate in library and information science.

Designation of the Respondents

It is seen that the overall designation of respondents from 12 central libraries, most (67%) of respondents are Assistant Librarian, 3 (25%) respondents are Deputy Librarian, and only 1 (8%) respondent is Librarian. At the time of interview researcher figure out the reason behind this, and it was found that in National institute of technology in India there is no provision of promotion in the libraries instead of having qualification and ability to hold the designation.

Professional Experience of the Respondents

The study found that only 8% of respondents have less than five years' experience, whereas 34% of professionals have experienced between five to ten years. The experience of ten to fifteen years is recorded only in 8% professionals while the expertise of professionals between fifteen to twenty-five years and above than twenty-five years is 25% (3 out of 12).

Registered users and their sitting Capacity in the libraries

It was found from the analysis that NIT Rourkela has the maximum (6000) number of registered students, whereas NIT Goa is having minimum (470) registered user in their library. It seems that the newly established NIT libraries were facing the sitting arrangement as per the number of registered users in the institute. The non-availability of appropriate space for the central library can be the reason behind this finding. Finding declares that NIT Kurukshetra has the best sitting arrangement as per the number of users. NITKKR has the maximum sitting ratio 12.7, followed by NIT Silchar (9.61), NIT Rourkela (9) SVNIT (8.38) and NIT Tiruchirappalli (8.18). As per the registered users, NIT Raipur has the minimum sitting capacity ratio, which is 1.70.

6.2.2 Library Collection

Printed Materials

NIT Kurukshetra has the maximum amount of printed books collection in their library. They had approximately 169439 books in their central library, whereas NIT Puducherry has the least number (4123) of printed books in their central library. This finding of the study shows that the year of establishment played a significant role in the number of the printed collection of the library. NIT Delhi, NIT Goa, NIT Meghalaya, NIT Puducherry they are newly established institutes, and at present, they are working on their collection development and managing the library.

NIT Tiruchirappalli is having the maximum (164) number of print periodicals available in their library, whereas NIT Raipur has the minimum (50) number of print periodical available in the library. While NITPDY, NITM, NITD, NITG has not

printed periodical available in the library. MANIT and NITP do not respond to the question.

With this sequence, the availability of printed bound volume in libraries only in SVNIT, NITRKL and NITS had printed bound volumes available in their libraries. Among these NITs, NIT Rourkela has the maximum number of print volume available in its library. Whereas the remaining nine libraries said they do not have printed bond volumes in their library.

6.2.3 Electronic Collection

E-Books provided by the libraries

NIT Patna has the highest number (34588) of EBooks available for their users, followed by MANIT (26025), NITR (17000) and NIT Rourkela (15000). Whereas NITD, NIT Puducherry and NITS did not respond to have a collection separately in eBooks. They replied for the query that they are a member of EShodhsindu.

CD- ROM books available in the libraries

It was found from the study that SVNIT has the maximum number (15774) of books in CD format is available in the library, whereas, NIT Goa is having least number (305) of CD ROM books available in the libraries. While NITR, NITM, NITD and NITPDY did not have CD ROM collection available in the library.

Electronic periodicals provided by the libraries

The study showed that SVNIT was having the highest number (8488) of the collection in electronic periodical available in their library followed by NIT Tiruchirappalli

(8000), NITR (6922) and NITD (6500). In contrast, six NITs (NITD, NITPDY, NITM and NITR) libraries did not responded to the query.

6.2.4 ICT Equipment available in the libraries

- It was found from the study that NIT Thiruchirapalli has the highest number (110) of machines available in the library for the library staff as well as for users also.
- Study revealed that maximum libraries had one server machine in the library for the library routine work and NIT Kurukshetra provides the highest number of server machines to the library (3) followed by NIT Silchar (2).
- In case of availability of photocopy machine NITT and SVNIT are having three photocopy machine available in the library. Remaining 9 NIT libraries were having a single photocopy machine available in the library whereas NITPDY doesn't have any photocopy machine available in the library.
- NIT Kurukkhsetra has the maximum number of overhead scanner available and being used for the document scanning followed by NIT Thiruchirapalli.
- NITKKR has the maximum number (6) of barcode scanner available in the library. Whereas, NITT and NITR have a single unit of the scanner available in the library.
- it was viewed from the data that NITM has the maximum number of CD/DVD writers available in the library.
- It was revealed from the study that six NIT library (NITG, NITKKR, NITM, NITRKL, NITS and NITT,) has the LCD projector.

6.2.5 Services offered by the libraries

- It was inferred from the analysis that 12 (100%) central libraries provide lending services to their, followed by reprographic service (83.33) and web OPAC service.
- it was found that only 16% of libraries having mobile-based applications in their libraries. While 84% of libraries are not using any mobile-based form for their library service.
- NITRKL provides access to the exclusive collection based on Odia language to their students as well as they were creating an institutional repository for its users where they can get access to the information.
- Mobile-based services are the most popular technique to provide speedy service to its users. Only NIT Delhi was using the mobile app for providing information services to their users by using Knimbus mobile-based service.

6.2.6 Problems during IT application

- It is found from the analysis that only 5(MANIT, NITR, NITRKL, NITS and NITT) NIT Libraries faced multiple problems in the implementation of IT application in their libraries on the other hand majority of libraries (07) accepted that they do not face any difficulties in implementation of IT application.
- Only five libraries faced problems in the implementation of IT applications in their libraries. Still, present table explored the kind of barriers which those libraries faced as inadequately trained library professionals (4 out of 5) followed by lack of ICT infrastructure and increasing cost of hardware and

software (3 out of 5). At the same time, only MANIT faced the problem of lack of support from authorities and lack of coordination among staff.

6.2.8 Areas of Resource sharing among libraries

It was found that on a formal platform no NIT library is sharing their resources with others by stating the common reason that "the need of the users is not same they are different from each library as every NIT is offering different courses." Another reason quoted by the respondent was "there is a consortium for NIT libraries named NIT Consortium working for resource sharing as providing negotiated price of electronic resources but due to lack of communication and regular meetings it was not fully executed". Still, based on the provided data by the in-charges of libraries it was found that Mostly libraries (09) responded for interlibrary lending and document delivery, followed by shared access to an electronic database and information service and training resources & expertise.

6.2.9 Consortium based practice and its impact

The study revealed that 100% of libraries were the member of E Shodhsindhu consortium of India. Along with this 66.67% libraries were the member of J Gate plus. Only three libraries, namely NITD, NITKKR and NITRKL, were also a member of NIT consortium.

To find out the impact of Information technology on resource sharing an opinion based open-ended question had been asked, and it was found that all respondent has different views on resource sharing and consortium-based practice in library services. Where the most popular answer was cost savings. Every librarian/ library in-charge had accepted the fact that consortium based practice gave them the solution of the

budget crisis and also found it the best platform for the negotiation of prices by the statutory body. Centralised resource selection was another factor which respondents agreed and recommended other libraries to adopt these types of platforms for their collection development of electronic resources. Some other factors had been pointed out by the librarian as the impact of consortium-based practices. They are as follows;

- increase breadth and depth from access to the shared collection,
- Lessening the burden of price negotiation to individual libraries
- Reducing the burden of licensing negotiations to individual libraries
- Elimination of unnecessary duplication of documents among libraries
- Increased access to the needed information by the users of libraries.

6.2.10 Problems that hinder resource sharing

Out of 10 identified issues from the study, it was observed that the problem of lack of documented policy in resource sharing among NIT libraries is the major constraint and ranked top. The table further points out that the lack of trained staff and the security of materials are the second major issue confronted by librarians. Results also revealed that not a single NIT had documented policy of resource sharing in their libraries.

6.2.11Strategies to enhance resource sharing

The study pointed out there should be proper planning and execution as the most preferred strategy by library In-charges of NIT libraries. While regarding adequate funds, capacity building, and adoption of the right approach, library In-charges have not disclosed their opinion.

6.3 Findings from the users' responses

Response Rate of Users:

Total 1318 questionnaire was distributed among selected NIT Libraries, and 1137 responses were received back. This leading to a response rate of 86.26%.

Reliability and consistency:

The Cronbach alpha reliability test is done to determine whether the instruments used in the collection of data, in this case, questionnaires, were reliable and without errors. A reliability test results in a Cronbach alpha with a value ranging from 0 to 1, and in the present study, the calculated alpha value is .618.

Gender wise response

The study showed that there were 852 male respondents (74.9%) and 285 female (25.1%) were contributed to the study. The highest number of male responses got from NITP, which is 86.58% (71 out of 82) while the lowest from NITPDY is 55% (11 out of 20). Similarly, in observing female response rate, we found that NITPDY got highest female responses with 45% (9 out of 20) while least female responses got from NITP with 13.41% (11 out of 82).

Course wise distribution of data

In the context of Highest response in UG course, NITD responds highest 92% (23 out of 25) in PG course NITPDY reply most top 50% (10 out of 20), and in research scholar, NITPDY respond highest 45% (9 out of 20). While in the context of lowest

responses, MANIT, NITD and NITS research scholars not contributed in the study because of non-availability in the library.

Library Usage statistics

It was found that majority of students visit the library whenever they require any information. They are not in the habit of using the library regularly. Even more than 5 per cent (5.5) of users visited their library once in a month. On the other hand, a total of 29.6% of users visits the library daily.

It was viewed that 54.6% of the respondents were not using the library regularly, and the distribution of the data had been discussed in figure 5.6.4.1. A total of 36.78% respondent accepted that information they require is already available on google. This is why they are not using the library regularly.

Satisfaction level of Users

It was found that out of a total sample of the study, 38.08% of respondents were satisfied with available collection in their libraries and rated it "Good". The table also shows that 67.72% of the responses lies with-in the good, very good and excellent category of the satisfaction level which indicate that above 60 per cent users of the NIT libraries were satisfied with the available collection in their library.

Purpose of Visiting Library

It was found from the table 5.6.5 that out of 1137 respondents 620 (54.52%) were saying that they are using their central library for reading their subject books. 41.52% of users using the library for issuing the books and return them. Only 20.84% of users read the magazines and newspapers in the central libraries of NIT in India.

Users' Opinion regarding Resource sharing

a) Resource sharing awareness

It was found that less than 50% of the respondents of NIT libraries were aware of the concept of resource sharing. Among all these NITs, the users of NITP were highly (63%) aware of the idea of resource sharing while only 28.1% of students of MANIT were aware.

b) Perception of resource sharing

It was found that 42.7% of respondents were strongly in favour of sharing the information among NIT libraries. And they admit the fact that this kind of sharing will be cost-effective. Since it has been proved that there is a significant variation among the perception of resource sharing within the respondents of NIT libraries in India.

Users' reaction on not getting information

It was found that 44.9% of users take the exit from the library without even saying anything. Whereas 41.2% users inform the librarian or library staff regarding their query. Interestingly table also depicts that only 126 respondents directly asks the library to make their information available.

Users' perception regarding library personnel

Users' point of view in terms of satisfaction level that whether library staff keeps their users informed about the new services and collection or not, and it was viewed that 31.8% of respondents were denying the fact and saying they were not satisfied with the statement that library keeps them informed regarding new services or collection.

30.1% of respondent were moderately satisfied with the behaviour of library staff and said that they are willing to provide the required information to their users. This table also depicts that 25.9% of users of NIT libraries were very satisfied with the statement that "staff are willing to provide the required information".

Satisfaction regarding reprographic service

Regarding satisfaction with reprographic services study revealed that 38.5% of respondents were not at all satisfied with the existing reprography service provided by NIT libraries to their users. While only 15.7% of respondents are moderately satisfied with the available reprographic facility.

Satisfaction regarding research-based collection

It was found that 39.7% of the researchers are moderately satisfied with the available collection of their libraries.

Users' opinion on available space for reading

For finding out the satisfaction level of the users' regarding the availability of reading space in the library, the study revealed that there was not a significant difference among the categories of satisfaction level. Approximately one fourth (24.2%) of the users of NITs were moderately satisfied with the available reading space provided by libraries.

Users' satisfaction with the accessibility of computers and internet connectivity

It was observed that 31.4% of users were moderately satisfied with the facility. They were having little bit issues with internet connectivity, but overall results showed that users were moderately satisfied.

Digital collection usefulness

It was viewed from the table 5.6.15 that 39.7 % of users of libraries think that digital collection is useful to them along with this 29% users agreed that digital collection is highly helpful for them.

Usage statistics of E-Resources

For finding out the usage of electronic resources among NIT library users, two questions were asked first was related to the usage of e-resource and second focussed on the preferred electronic resource. It was found that 52.8% users said that they were not using the electronic resources and 47.2% considered the e-resources in their studies and E-journal was the most preferred type of e-resource having 55.3% responses, followed by ebooks (31.28%).

Orientation program of library

Library orientation is an essential part of any academic library as it informs the new student of an institute about their collection and services as well as elaborated the importance of library in their academic achievements and it was found that 66.1% of respondents were not aware with the library orientation program. At the same time, only one-third of users accepted that libraries were conducting this program regularly.

Overall satisfaction with library services

It was found that majority of the students (45.55%) were moderately satisfied with their central library. It was noted that users from NITPDY were slightly satisfied (55%) with their library, and the respondents of NITD were also somewhat satisfied with their library services (40%). The further figure revealed that above the 50% users

of SVNIT, NITP, NITT, and NITR were moderately satisfied with their library services.

Problem Faced by the user with the e-resources

Study revealed that 36.9% of NIT students were facing problem in finding the relevant document followed by inadequate resources (29.1%). While individually we can say that it can be observed that the problem of poor connectivity of internet and difficulty in finding relevant documents were the major constraint in selected NIT libraries of India.

6.4 Suggestions and Recommendations

The administrators concerned with National institute of technology library have conveyed that they faced several constraints while developing the IT-enabled services in their libraries. These difficulties can be listed as IT infrastructure, lack of proper technical support including staff, poor maintenance, slow internet speed, limited working hours.

1. Libraries of the institutions must be enriched with more library professional staff with full amenities for introducing more innovative services for the users of the library.
2. The success of any new system or service must be based on the adequate knowledge, skills of staff members. Therefore, the librarians and library staff should be trained appropriately when a new service or technology is introduced in the libraries.
3. The library must be provided with the latest equipment/computer peripherals to operate its management effectively.

4. All the available information should be quickly and effectively shared, that will save multiple efforts.
5. NITs caters the needs of research scholars, by considering this point library should provide more quality journals of the subject and in allied fields.
6. Non-book collections such as on-line databases, on-line journals, CD-ROM facilities should be encouraged.
7. There should be a common platform where each library administrator of NITs can communicate with other for sharing their ideas and problems so that the new NIT library professionals (working on the collection development) can be benefited with others experience.
8. It is also suggested to the library administration to do more emphasis on developing a habit to use the library by their users more. For this, they should recreate their services.
9. Libraries should provide a separate space for the users where they can sit and do their work and allow the users with their writing material. Most libraries don't let the users with their notebook or writing material instead of notebook users can bring some papers for creating the notes, which is not much convenient for them.
10. Information about famous and useful websites of subject areas with full detail should be displayed on notice boards of the library.
11. The uniform rules should be followed by all the participated libraries for effective resource sharing.
12. Some workshops, seminar and training programmes must be conducted for resource sharing and networking.

6.5 Conclusion of the study

The 21st century has witnessed a great explosion of knowledge and information during its last few decades. Thousands of journals publish more than ten million articles which include news items, editorials and reading materials in popular print media, as well as, electronic media. The information centres and libraries in present times primary sources of knowledge and information, and these are two reliable components of modern society.

Resource-sharing through Consortia is a sharing arrangement of resources of one library by one and all participating libraries under kernel term of the document collections. Library professionals, technical facilities and mechanical and instrumental aids of the participating libraries are central points of references co-operative. While using the consortium on such an arrangement helps the process of providing information sources to a substantial user community basis in a minimum possible time and at a bearable price by, sharing of the resources through computer access to the vast amount of literature etc. Now, the resources-sharing has turned out to be a need-based activity on giving and take principle.

In the present study, the researcher has considered the ever-changing form of resource sharing/consortia that is transforming at a fast rate. The critical dimensions of network developments relate to access and delivery of data and documents through multiple media in NIT Libraries. So, the present work will benefit professionals of Library Science, network staff and act as a stimulating guide for the librarians and managers of NIT libraries in India.

National Institutes of Technology are the institutes of national importance in India. These institutions are playing a vital role in the promotion of engineering education and research. The libraries are changing their shape and size due to information technology. To cope up the information need of the users, library and information centres are modernising their infrastructure, collection and services. Information technology is used as a tool by the library professional for collection, organisation, process and dissemination of knowledge. To create new services and update existing services, one has to develop proper ICT based infrastructure in the libraries and information centres.

The analysis covers users' details on various aspects based on the responses communicated by librarians and users analysed statistically. In the last part of the section, the problems faced in a routine manner and suggestions rendered by the respondents have been compiled and analysed.

In the same context, the researcher is determined to propose an ideal resource sharing network model to suit the current demands of the users. It covers all the networking aspects mainly a relevant requisition list of hardware, software and other requirements, characteristics, objectives, policy issues, functions, funding issues and administrative support and demands of the end-users and all other networking related issues.

The study has focused on a new area of interest; hence, it would be a welcome addition to the growing literature in the library and information science.

The study will throw light on the recent expansions in the area of resource sharing and networking. Therefore, it is hoped that it will be of use to the library and information

professionals. The study has a practical orientation. Therefore, it may act as a guide to the information professionals in planning and establishing an information network.

6.6 Areas for Further Research

In view of foregoing discussions, it is apparent that libraries in present centuries will become the centres of resource sharing with no boundaries, words so ever. Library networks are expected to play major roles as partners in global networking of information centres. Since the present study is limited to selected libraries of National Institute of Technology in India, so it can be possible to extend the coverage area of the research and conduct another study.

NIT libraries are the member of ESS, so there is scope to conduct a study on the regular usage of ESS among the libraries. This study will be quantitative, which can draw some different statistically acceptable inferences and can be useful to the libraries as well as the team of ESS for making the policies on resource sharing. Some other areas of research are given below:

- Use of Open Access Resources by the of Central Libraries of National Institutes of Technology in India: A Study
- Use of Research Data Management by the Central Libraries of National Institute of Technology in India: A Study
- Role of library network in special libraries: a comparative study
- Assessment of Benefits drawn from Consortia mergers on Special Libraries: A Study

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Appendices

APPENDICES (A)

QUESTIONNAIRE ADMINISTERED TO LIBRARIAN/ LIBRARY IN CHARGE

Section 1

Personal Profile

(1) Gender:

Male [ ] Female [ ]

(2) Qualification:

Post Graduate [ ]

M. Phil. [ ]

Ph.D. [ ]

Any other.....

(3) Professional Experience (in years):

<5 [ ]

5-10 [ ]

10-15 [ ]

15-25 [ ]

>25 [ ]

(4) Designation: .....

Section 2

About the Library

(5) Name of the Library (if any) :

.....

(6) Year of Establishment of Library :

..... **(7) Sitting**

Capacity for Users

Reading Room :

.....

Cyber Lab :

.....

Reference Section :

.....

Other section :

.....

(8) Total No. of Users

Under Graduate :

.....

Post Graduate :

.....

Research Scholar :

.....

Teaching :

.....

Non- Teaching :

.....

(9) Library Collection (Please write below) :

Sl.	**Collection**		**Print Form (No.)**	**E-Form (No.)**	**CD-Rom (No.)**	**Total**
(i)	Books					
(ii)	Periodicals	Indian				
		Foreign				
(iii)	Bound volume					
(v)	Theses					
(vi)	Dissertations					
(viii)	Standards/Patents					
(ix)	Others					
Total Collection						

(9.A) Online Database (No.)

Full text

:……

Bibliographic

:……

(10) Please specify the details of Library Personnel

Sl.	**Designation**	**No.**	**Sl.**	**Designation**	**No.**
(i)	Librarian		(ii)	Deputy Librarian	
(ii)	Assistant Librarian		(iv)	Senior Library & Information Assistant	
(v)	Junior Library & Information Assistant		(iii)	Professional Assistant	
(vii)	Semi Professional Assistant		(vi)	Graduate Trainee	
(ix)	Any other (please Specify)				

Section 3

Impact of IT Based Practices in Library

(11) Does your library use any Library Management Software? Yes [ ] No [ ]

If yes, please specify the name,

(a) Koha [ ] (b) Libsys [ ]

(c) SOUL [ ] (d) VTLS [ ]

(e) Any other.....

If not automated, please specify the reasons: (Multiple Choices)

(a) Lack of computer facilities [ ] (b) Lack of trained manpower [ ]

(c) Management is not interested [ ] (d) Library collection is very less [ ]

(e) Inadequate fund [ ]

(f) Any other…….....

(12) Please provide the details of available equipment and instruments in the Library:

Sl.	**Items**	**Numbers**	**Sl.**	**Items**	**Numbers**
(i)	Computer		(ii)	Server machine	
(iii)	Photocopy Machine		(iv)	Flatbed Scanner	
(v)	Overhead Scanner		(vi)	Barcode Scanner	
(vii)	Hand-held Scanner		(viii)	Laser Printer	
(ix)	Digital Camera		(x)	LCD Projector	
(xi)	CD/DVD Writer		(xii)	Storage devices	
(xiii)	UPS Back- up Facility		(xiv)	Others (Please specify)	

(13) Which of the following IT based services are offered by your library? (Multiple Choices)

(a) Lending Service [ ] (b) Remote access to e-resources [ ]

(c) Current Awareness service[ ] (d) Reprographic Service [ ]

(e) Inter Library Loan [ ] (f) User Education / Orientation [ ]

(g) Alerting Service [ ] (h) Document Delivery Service [ ]

(i) Web OPAC [ ] (j) Online Database search Service [ ]

(k) CD- ROM Database Service[ ] (l) Digital Library Service [ ]

(m) Institutional Repository[ ] (n) Ask Librarian [ ]

(o) Any other…….....

(14) Do you have any mobile applications for providing library services?

Yes [ ] No [ ]

If yes, please mention the name

…….....

....

(15) Do you face problems during implementation of information technology applications in the library?

Yes [ ] No [ ]

If yes, what type of problems do you face? (Multiple Choices)

(a) Scarcity/Paucity of Funds [ ]

(b) Lack of ICT Infrastructure [ ]

(c) Inadequate Trained Library Professionals [ ]

(d) Increasing Cost of Hardware and Software [ ]

(e) Lack of co-operation and co-ordination among staff [ ]

(f) Lack of support from higher authority [ ]

(g) Non Availability of Consultancy Services [ ]

(i) Local Server vs. cloud computing technology [ ]

(j) Implementation of latest device and gadgets [ ]

(k) Any other…….....

(16) After providing I T based services what are the major changes you notices in the library?

……

……

Section 4

Financial resources

(17) What are the Financial Resources of your library?

S. No	**Sources / Grants**	**Please (Tick)**
(a)	UGC	
(b)	State Government	
(c)	Trust/Management Grants	
(d)	Donations/ Endowments	
(e)	Over Charges, Sale of Old Newspapers, Xerox charges, Membership Charges, Etc.	
(f)	Any Other (Please specify)	

(18) Kindly provide allocation of library budget.

S. No	Budget Head	Library Budget (Approximate)Rs						
		Below 50,000	**50,000-1,00,000**	**1,00,000 - 10,00,000**	**10,00,000 - 20,00000**	**20,00,000-30,00,000**	**Above 30,00000**	**No Budget**
(a)	E-Journals							
(b)	E-Books							
(c)	Repositories							
(d)	Databases: CD ROM, ONLINE							
(e)	Audio/Video Cassettes, VCD'S DVD'S							
(f)	Any Other …… ……							

Section 5

Library Resource Sharing and Networking

(19) In what area, your library shares its resources with other NIT libraries.

Sr. No.	Areas of Resource Sharing	Yes	No
1	Inter-library lending and document delivery.		
2	Shared access to electronic database and information service.		
3	Training resources and expertise.		
4	Co-operative acquisition.		
5	Co-operative cataloguing.		
6	Sharing of human resources.		
7	Electronic content licensing.		

8	Directory of Resource Persons/Experts		
9	Troubleshooting		
10	Directory of Research		
11	Any Other ……		

(20) Does your library provide any information resources to its users through any consortium?

Yes [ ] No [ ]

If yes, Please tick (Multiple Choices)

a) DELNET [ ]

b) DelCon [ ]

c) National Knowledge Resources Consortium (NKRC**)** [ ]

d) J-Gate Plus [ ]

e) E-Shodhsindhu (INDEST) [ ]

f) Any other

……

(21) Does your library provide any information resources to its users through any Information centers/ Network?

Yes [ ] No [ ]

If yes, Please give the detail:

……

……

(22) What are the impact/ changes you felt after participating in consortium.

……

……

(23) Please mention the Problems that hinder resource sharing among the NIT Libraries.

Sr. No.	Problems that hinder resource sharing	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1	Lack of adequate funds.					
2	Lack of trained staff					
3	Inadequate communication system					
4	Lack of documented policy on resource Sharing					
5	Lack of institutional support					
6	Legally, we can't involve in resource sharing					
7	Lack of governmental support					
8	Vast distance separating the libraries					
9	Uncooperative attitude of Librarians					
10	Inadequate security of materials					
11	Inadequate available resources					
12	Our library system is not well developed					
13	Any Other ……					

(24) Does your library having any documented policy for resource sharing.

Yes [ ] No [ ]

If yes, please mention the major points

…….....

…….....

(25) According to you what should be the strategies to enhance resource sharing? (Please tick as per your opinion)

Sr. No.	**strategies to enhance resource sharing**	**Strongly disagree**	**Disagree**	**Neither agree or disagree**	**Agree**	**Strongly agree**
1	There should be proper planning					
2	There should be adequate funds to meet the library's part of the bargain					
3	There should be capacity building through staff training.					
4	There should be a documented policy on resource sharing					
5	There should be a strong central coordinating body.					
6	The libraries should be able to adopt right strategies for resource sharing					
9	Any Other ……					

Suggestions/ Comments on Resource Sharing and Networking :

……

……

……

……

…….....

Thank you so much for your kind help. After filling up please return to

Shikha Awasthi

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Mob. No.-
7376817878

Signature

(Seal of the Library/Librarian)

QUESTIONNAIRE ADMINISTERED TO THE USERS OF LIBRARY

Dear Sir/Madam,

I am requesting your good self to kindly spare few minutes to fill up this questionnaire on the topic **"*Impact of Information technology on changing ethos of resource sharing and networking in the Libraries of National Institute of technology in India: A study.*"** All information/data provided by you will be remained confidential and shall be used for thesis/research purpose only.

I solicit your kind co-operation.

Thanking you

Please tick mark [√] to indicate answers wherever mentioned.

1) User Profile

Name (Optional) : .....

Name of Institute : .....

Course : .....

Sex :Male [ ] Female [ ]

Age : .....

E-mail Id. :.....

2) How often do you visit the library?

(a) Daily [ ]

(b) Twice a week [ ]

(c) Weekly [ ]

(d) Monthly [ ]

(e) When needed [ ]

In case, you select weekly, monthly and when needed, please indicate the reasons. (Multiple Choices)

(a) Shortage of time [ ]

(b) Required information not available [ ]

(c) Information available on Google [ ]

(d) Inconvenient library hours [ ]

(e) Any other (please specify).....

3) Please indicate the purpose of visiting the library. (Multiple Choices)

(a) To borrow and return the books [ ]

(b) To read general books [ ]

(c) To read newspapers/magazines [ ]

(d) To read subject books [ ]

(e) To complete class assignments [ ]

(f) Any other (please specify).....

4) How satisfied are you with the Library collection available in your library?

(a) Poor [ ] (b) Fair [ ]

(c) Good [ ] (d) Very good [ ]

(e) Excellent [ ]

5) When you not get the required book/information in your library, what do you do?

(a) Inform the librarian/ staff regarding your need [ ]

(b) Ask them to make that document available [ ]

(c) Take exit from library without saying anything [ ]

(d) Any other (please specify).....

6) Does your library response positively on your query?

Yes [ ] No [ ]

7) Do you know about the concept of resource sharing?

Yes [ ] No [ ]

8) "Collaboration and sharing the resources with other NIT libraries would be the best and cost-effective solution for getting missing and required information in your library". What do you think about it?

(a) Strongly oppose [ ] (b) Somewhat oppose [ ]

(c) Neutral [ ] (d) Somewhat favour [ ]

(e) Strongly favour [ ]

9) Please indicate your level of satisfaction with the following facilities on 5 point scale, where 1 stands for not at all satisfied and 5 stands for extremely satisfied.

Sr. No.	**Services**	**Not at all satisfied**	**Slightly satisfied**	**Moderately satisfied**	**Very satisfied**	**Extremely satisfied**
1	Computers and electronic equipment are accessible in the library					
2	Printing and photocopying services are adequate					
3	Library's collection meets my research needs					
4	Group study areas in library are adequate					
5	Library staff keeps me informed about new services and collection					
6	Library staff are willing to provide required information					
If Any other …… ……						

10) Are you satisfied with the library services?

Yes [ ] No [ ]
If yes, please specify,

(a) Not at all satisfied [ ]

(b) Slightly satisfied []

(c) Moderately satisfied [ ]

(d) Very satisfied [ ]

(e) Extremely satisfied [ ]

11) What is your opinion about the usefulness of digital collection in your library?

(a) Highly useful [ ]

(b) Moderately useful [ ]

(c) Slightly useful [ ]

(d) Not at all useful [ ]

(e) Any other(please specify) ……....

12) Do you use E-resources provided by your library?

Yes [ ] No [ ]

If yes, which type of e-resources do you use? (Multiple Choices)

a) E-journals [ ]

b) E-Databases [ ]

c) E-Books [ ]

d) E-Theses [ ]

e) E- Scholarly Content [ ]

f) Any other (please specify).....

13) Does library provide an orientation programme for using library services?

Yes [ ] No [ ]

If No, do you feel there should any orientation programme for using the library?

……

……

14) What kind of problems do you face while using the e-resources of your library? (Multiple Choices)

(a) Inadequate resources [ ]

(b) Poor connectivity of internet [ ]

(c) Difficulty in finding relevant document [ ]

(d) Any other (please specify).....

15) Please give your valuable suggestions to improve the Library Services provided by your library?

.....

.....

.....

.....

Thank you so much for your kind help.

After filling up please return to
Shikha Awasthi
Research Scholar
DLIS, BBAU, Lucknow
Email-shikhaawasthi1991@gmail.com
Mob. No.- 7376817878

Appendices (B)

Rank	Problems	Agree	Neutral	Disagree
1	Lack of Documented Policy on resource sharing	10	0	2
2	Lack of trained staff	6	4	2
2	Inadequate security of materials	6	2	4
3	Inadequate Communication System	5	2	5
4	Lack of Institutional Support	4	5	3
5	Lack of Adequate Funds	3	3	6
5	Vast Distance	3	3	6
6	Legally, we cannot involve in resource sharing	2	4	6
6	Lack of governmental support	2	4	6
7	Uncooperative attitude of librarians	1	9	2

5.6.14 Mode of the responses

Statistics	Mode
Computers and Electronic equipment are accessible in library	3
Printing and photocopying service are adequate	1
Library's Collection meets my research needs	3
Group Study areas in library are adequate	1
Library staff keeps me informed about new services & collection	1
Library staff are willing to provide required information	3

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AN INTERNATIONAL BILINGUAL PEER REVIEWED REFEREED RESEARCH JOURNAL

RESOURCE SHARING CHALLENGES AND PROSPECTS IN NATIONAL INSTITUTE OF TECHNOLOGY LIBRARIES IN INDIA

Shikha Awasthi*
R. K. Choudhary **

ABSTRACT

The present study aims to investigate the impediments to resource sharing and networking among the National Institute of Technology (NIT) libraries in India. The article explores the areas of resource sharing among NIT libraries and the effective strategies to enhance the resource sharing and networking among the library of NITs across the country. This study is a survey-based work in which a structured questionnaire has been used for data collection and revealed that the possibilities of resource sharing and networking in National Institute of Technology are high. The result of the study shows that missing documented policy in NIT libraries regarding sharing of resources is one of the significant constraints. The present paper also highlights the challenges in resource sharing faced by the technical libraries in India. It encourages library professionals to embark on developing the potential of impactful resource sharing. The findings of the study have both theoretical and practical implications. The conceptual understanding of the sharing of resources will help the central body in policy-making for premier services of the library. In contrast, practical implications will help the librarians in enhancing the utilisation of their resources among libraries.

Keywords: *Electronic resource sharing, Library cooperation, Technical Libraries, Interlibrary lending, Problems of resource sharing, Academic libraries*

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Introduction:

The dawn of this century brings a significant revolution in society, namely the information revolution/ digital revolution. In this era, information has completely changed and available in different shapes and sizes. The rapid growth of information, coupled with the advent of information services, is termed as networked information services. The escalating price in electronic resources was the prime factor for offering collaborative information services because no single library can meet the information needs of the users on its own. All over the world libraries have banded together in both national and

ATTITUDE TOWARDS ACCESS AND RESOURCE SHARING: A CASE STUDY OF SELECTED NIT LIBRARIES OF INDIA

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Abstract
This article includes a brief profile of National Institutes of Technology in India and discusses the salient issues related with the cooperation among those libraries. Author surveyed 12 NIT libraries in India to get an idea about the current status of library as well as to figure out the possibilities of forming a centralised networking model for sharing their resources among all libraries. Questionnaire method has been used to collect the data and inferences has drawn which indicates that NIT Kurukshetra has a very strong and vast collection available in their library. Study also revealed that inadequacy of skilled manpower in the library is an impediment of implementation of information technology application in libraries.

Keywords *Information Technology, Academic Libraries, Resource sharing, Consortia***,** *Mobile based application in Libraries.*

Introduction

There have been many efforts cooperatively managed by Indian libraries for resource sharing during last three decades, but it is very hard to state that one is a successful model which could set a benchmark. In late 80s and early 90s many local, metropolitan, regional and national library networks in India has been established. The national information system for science and technology (NISSAT), Department of Scientific and Industrial Research initiate to design and development of library network in India in the year 1965 for sharing the resources (Ghosh, 2002). Considering the potential benefits of technical education in country's development in terms of growth in economy and research, India has taken a big initiative in the field of technical education. In the year 2007 an act named NIT Act was implemented by the government of India and under the act the regional engineering colleges were converted into the institute having national importance named National Institute of Technology. Although the growth of these institutions has increased over the years, and the growth of libraries are also going towards the right way. Present study focusses on the current status of library and the level of satisfaction of users regarding the resource sharing and networking. Study aims towards ascertaining the content availability of as well as the user satisfaction with that collection. Further study examines the implementation of information technology application in their libraries as well as their role in cooperative activities.

Literature of Review

Pereira and Franco (2020) reviewed the consortium perspective of libraries and pointed out the various reasons to form library consortia to allow the resource sharing so that efficiency of libraries can increase and they can smoothly satisfy their users' information needs. Major reasons are: to improve the education system and to economise on financial resources, to share the technical service like physical description of the available library resources, and collaborative acquisition of the information resources. Study found that inter-lending and document supply was the most relevant information source where majority of papers on resource sharing got published. Study also contributed in the area of library consortia by revealing the paths followed by scientific literature on consortia also pointed out the open access contracts and their challenges.

Dempsey (2019) strongly supports library collaboration especially in trying environments where scale is important for generating the capacities and its impact on the library services. Author supported the scale and also quoted some examples which underlines the importance of scale in a network where libraries are devoted to collaboration. Author commented on the lack of appropriate

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