

INFLUENCE OF ICT ON ELECTRONIC INFORMATION RESOURCES AND SERVICES IN NORTH INDIA: A CASE STUDY OF NITS LIBRARIES

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Abstract

ICT is one of the key driving forces to speed up the economic growth, health conditions, and more rewarding workplace and to make government more responsive and accessible to citizens. ICT is employed to generate, collect, store, retrieve, large amount of data and for effective manipulation of data and information, thereby contributing in the sustainable development of a nation. ICT has completely revolutionized the information handling activities in the library and information centers in the digital era so as to provide best services to users. The librarian serves as the information broker, navigator, market negotiator and ICT expert whose total commitment is to be as a processor and disseminator of information.

Keywords: Information Communication technology, ICT, Library Science

INTRODUCTION

Libraries are the life-long companion of learned society and shoulder a well-defined and a highly valued responsibility of providing the right knowledge to right reader at right moment. Libraries are not only the places of mass storage of books but more importantly they are the hubs, happening places, from where the future revolutions and reformations be originated

ICT is one of the key driving forces to speed up the economic growth, health conditions, more rewarding workplace and to make government more responsive and accessible to citizens. ICT is employed to generate, collect, store, retrieve, large amount of data and for

effective manipulation of data and information, thereby contributing in the sustainable development of a nation.

Information is the power and an important resource needed to develop other resources. Information is ever growing, infinite, continuum, dynamic and multidimensional and has resulted into the information explosion creating challenges for library professionals to contribute in the education, research, knowledge creation, knowledge management and knowledge dissemination by applying technology to information storage and retrieval. With the consideration of information as the fifth basic need of human after food, cloth, shelter and water, library continues to be the indispensable part of modern, intellectual information society providing round the clock universal accessibility to end user through information and communication technology (ICT).

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

The term information and communication technology denotes to broad area of activities and technologies associated with the use of software and hardware i.e. computers, phones, scanners, printers, T.V., fax and other related peripherals. It also includes intranet and internet techniques. It implies the application of computers to procure, harvest, store, preserve, manipulate, process, retrieve and disseminate information. The term Information basically embodies events and data which define information; Communication is a process that allows organisms to exchange information by several methods and the term Technology is mostly used in three different contexts: when referring to a tool or machine, a technique, the cultural force or a combination of the three. The word communication is also used in the context where little or no feedback is expected such as broadcasting, or the feedback may be delayed as the sender and receiver use different methods, technologies, timings and means. In a simple model, information or content (eg. a message in natural language) is sent in some form (as spoken language) from the sender to receiver. In a slightly more complex form, a sender and a receiver are linked reciprocally. Communication requires that all parties understand a common language that is exchanged with each other and the technology is the relationship that society has with its tools and equipment's, and to what extent society can control its environment. Technology can be most broadly defined as the entities, both material and immaterial, created by the application of the mental and physical effort in order to achieve some value.

INSTITUTES OF TECHNOLOGY

Institute of Technology or University of Technology or Polytechnic University or Technikon is a designation employed for a wide range of learning institutions awarding different types of degrees and operating often at variable levels of the educational system. It may be an institution of Higher Education and Advanced Engineering and Scientific Research or Professional Vocational Education. It may also refer to a Secondary Education School focused in vocational training.

Technology: Meaning and Definition

Use of term **Technology** began with the conversion of natural resources into simple tools. Before 20th Century, this term was usually referred to the description or study of the useful arts, or technical education. The meaning of term technology started changing in the early 20th century due to second industrial revolution. In 1930s, technology referred not only to the study of industrial arts but to the industrial arts themselves².

In 1937, the American sociologist **Read Bain** wrote that "Technology includes all tools, machines, utensils, weapons, instruments, housing, clothing, communicating and transporting devices and the skills by which we produce and use them"³.

Technology can be most broadly defined as the entities, both material and immaterial, created by the application of mental or physical effort in order to achieve some value. Thus, technology refers to the tools and machines that may be used to solve real world problems.⁴

Technology is a means to fulfill a human purpose, to solve human problems, to make life comfortable, to fulfill needs, and to satisfy wants. Technology is supposed to make human life easier by accomplishing a task quickly and efficiently.

Science, Engineering and Technology -

Science, Engineering and Technology are distinct but interconnected and are essential to economic growth, innovation and global competitiveness. Science is the theoretical knowledge and deals with the formulation of theories and principles through pure research. It is concerned with discovering and describing the world around us by observing and experimenting.

Engineering is the goal-oriented applied science of acquiring and applying knowledge to design, analysis and or construction of works for practical purposes. Technology is a consequence of Science and Engineering to make product needed or wanted by the society.

FOUNDATION OF INSTITUTES OF TECHNOLOGY

The institutes of technology and Polytechnics have been in existence since at least in 18th century, but became popular after World War II with the expansion of Engineering and Applied Science education, associated with the new needs created by industrialization.

The world's first Institution of Technology, the **Berg-Schola** was founded by the Court Chamber of Vienna in Selmechanya, Kingdom of Hungary in 1735 in order to train specialists of precious metal and copper mining according to the requirement of the industrial revolution in Hungary. Today, its legal successor is the University of Miskolc.

Today, several countries have institutes of technology and, Polytechnics, and are accredited to award academic degrees and Doctorates. India has 16 autonomous Indian Institutes of Technology (IITs) and 30 National Institutes of Technology (NITs) which

are Government institutions. In addition to these, many other universities also offer higher technical courses. The authority over technical education in India is All India Council for Technical Education (AICTE). It is a statutory body and a national level council for technical education under Department of Higher Education, Ministry of Human Resources Development. Its objective is planning, formulation and maintenance of norms and standards, quality assurance through school accreditation, funding in priority areas, monitoring and evaluation, maintaining parity of certification and awards and ensuring coordinated and integrated development and management of technical education in the country as part of AICTE act No. 52 of 1987.

NATIONAL INSTITUTE OF TECHNOLOGY

NITs are the India's finest Engineering Institutes which contribute immensely to shaping of India as knowledge superpower. NITS¹⁰ are a group of Public Engineering Colleges in India. During inception, all NITs were referred to as Regional Engineering Colleges (RECs) and were governed by their respective state governments. NITs were founded to promote regional diversity and multi-cultural understanding in India. Comprising thirty autonomous institutes, they are located in one each major state/territory of India. In 2007, the Indian government declared these schools as Institute of National Importance.

NITs offer degree courses at Bachelors, masters and doctorate levels in various branches of Engineering and Technology. All NITs are autonomous which enables them to set up their own curriculum.

Admission to NITs was done by the erstwhile All India Engineering Entrance Examination, now replaced by Joint Entrance Examination Main (JEE Main) conducted across India.

Historical Account

Pandit Jawaharlal Nehru, the then Prime Minister of India, sought to develop India as a leader in Science and Technology. The Government started Fourteen RECs between 1959 to 1965, at Bhopal, Allahabad, Kozhikode, Durgapur, Kurukshetra, Jamshedpur, Jaipur, Nagpur, Rourkela, Srinagar, Surathkal, Surat, Tiruchirappalli and Warangal. It established one in Silcher in 1967, and added two others located at Hamirpur in 1986 and Jalandhar in 1987. In 2002, MHRD issue NIT status to three more colleges, Bihar Engineering College, Patna; Government Engineering College, Raipur and Tripura Engineering College, Agartala. Based on the request of the 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 was planned in North-Eastern state of Manipur at an initial cost of Rs. 500 crores. In 2010, government announced setting up ten new NITs in the remaining states/territories.

NORTH INDIA

North India also Northern India consists of the Northern part of India. The dominant geographical features of North India are the Indus-Gangetic Plane and the Himalayas, which demarcate region from the Tibetan Plateau and Central Asia.¹⁴

According to 2011 census, the total area of North India is 726.1331 Km² with 543,937,430 population and Delhi as its largest city.¹⁵

States of North India

North India¹⁶ covers six states and one union territory namely Jammu & Kashmir, Uttarakhand, Himachal Pradesh, Punjab, Uttar Pradesh, Haryana and Delhi.

Jammu & Kashmir

Jammu & Kashmir¹⁷ was formed on 26th October 1947, and is located mostly in the Himalayan Mountains and shares a border with the states of Himachal Pradesh and Punjab to the south. Jammu & Kashmir has an international border with China in the north and east and the line of control separates it from Pakistani-controlled. Uttarakhand is emerging as an Education Hub, having notable higher education institutes and universities as Indian Institute of Technology, National Institute of Technology, Indian Institute of Management, AIIMS, Hemwati Nandan Bahuguna University (Garhwal University), G.B. Pant University of Agriculture & Technology, etc.

Uttarakhand

Uttarakhand¹⁸ formerly known as Uttaranchal is a state in the northern part of India, often referred to as Devbhumi which literally means, 'Land of the Gods'. It is the 27th State of Republic of India created on the 9th November, 2000 from the Himalayan and adjoining north-western districts of Uttar Pradesh as Uttaranchal and in January 2007, name officially changed to Uttarakhand. It borders the Tibet Autonomous Region, China on the north, the Mahakali zone of the Far Western Region, Nepal on the east and the Indian states of Uttar Pradesh to the South and Himachal Pradesh to the northwest. The state is divided into two divisions namely Garhwal and Kumaon, with a total of 13 districts. The interim capital of Uttarakhand is Dehradun, which is a rail head, and the largest city in the region. The judiciary capital is Nainital. As per 2012 census, its total population is 10.08 million.

Himachal Pradesh

Himachal Pradesh¹⁹ is a state in Northern India founded on January 25, 1971. It is bordered by Jammu and Kashmir on the North, Punjab on the west and south-west, Haryana and Uttarakhand on the south east and by the Tibet autonomous region on the east. Him means snow in Sanskrit and the literal meaning of the state's name is 'In the lap of Himalayas'. The Capital City of the Himachal Pradesh is Shimla having Nickname 'Queen of Hills'.

Himachal Pradesh has been ranked fourth in the list of the highest per capita incomes of Indian States. This has made Himachal Pradesh one of the most wealthiest places in the entire South Asia. Abundance of Perennial rivers enables Himachal to sell hydroelectricity to other states such as Delhi and Rajasthan. As per 2012 census, its total population is 6.856 million.

The standard of education in the state has reached a considerably high level with several institutes for higher studies as Indian Institute of Technology, Mandi, Himachal Pradesh University, Shimla. Institute of Himalayan Bio-resource, Technology (IHBT CSIR LAB), Palampur; National Institute of Technology, Hamirpour; Indian Institute of Information Technology, Una, The Central University, Dharamshala; the Jaypee University of Information Technology, Waknaghat etc. CSK (Chaudhary Sarwan Kumar) Himachal Pradesh, Krishi Vishwavidyalaya, Palampur is one of the most renowned hill agriculture institute in the world. Dr. Yashwant Singh Parmar University of Horticulture and Forestry has earned a unique territories of Azad Kashmir and Gilgit Baltistan in the West and Northwest respectively.

Jammu and Kashmir consists of three regions : Jammu, the Kashmir Valley and Ladakh, Srinagar is the summer capital and Jammu is the winter capital. It is the only state in India with a Muslim Majority population. According to 2001 census, the total population is 10,143,700.

Notable higher education and Research Institute include Sher-e-Kashmir Institute of Medical Sciences, Shri Mata Vaishno Devi University, National Institute of Technology, University of Jammu, University of Kashmir, Sher-e-Kashmir University of Agricultural Sciences and Technology, Islamic University of Science and Technology and Baba Ghulam Shah Badshah Universities.

Punjab

Punjab is a state in north India founded on January 26th, 1950. It is bordered by the Indian states of Jammu and Kashmir to the north, Himachal Pradesh to the east, Haryana to the South and Southeast, Rajasthan to the Southwest and the Pakistan province of Punjab to the west. The State Capital is located in Chandigarh. The word Punjab is Persian words 'Panj' meaning 'Five' and 'Ab' meaning water. Thus Punjab means five rivers. It is known as the 'Land of Five Rivers' namely Sutlej, Beas, Ravi, Chenab and Jhelum.

Punjab is one of the most fertile regions in India and is called 'Granary of India' or 'India's Bread-basket'. The region is ideal for wheat growing. Rice, Sugarcane, Gram, Oil Seeds, Pearl Millet, Maize, Barley, Fruits and Vegetables are also grown. In worldwide terms, Punjab produces 2% of the world's cotton and 1% of its rice. As per 2011 census its total population is 27,743,338.

Punjab is served by several institutions of higher education including 23 Universities providing undergraduate and postgraduate courses in all the major Arts, Humanities, Science, Engineering, Law, Medicine, Veterinary Science and Business. Punjab Agricultural University is a leading institution globally for the study of Agriculture and played a significant role in Punjab's Green Revolution in 1960s-70s. One of the oldest institution of Medical Education is the Christian Medical College, Ludhiana, existed since 1894.

Uttar Pradesh

Uttar Pradesh²¹ abbreviated as U.P. is the fourth largest Indian state by area and is located in Northern India. It was created on April 1, 1937 as the United Provinces, and was renamed Uttar Pradesh in January 25, 1950. On November, 9, 2000, a new state Uttarakhand carved out from the Himalayan hill region of Uttar Pradesh. The state is bordered by Rajasthan to the west, Haryana and Delhi to the Northwest, Uttarakhand and the country of Nepal to the North, Bihar to the east, Madhya Pradesh to the south and touches small areas of Jharkhand and Chhattisgarh to the South Eastern corner. Lucknow is the capital of Uttar Pradesh.

Uttar Pradesh holds the third largest economy (2011-12) in India with Agriculture as leading occupation. Wheat is the state's principal food crop and sugarcane is the main commercial crop. State industries are located in the Kanpur region. Major manufacturing products include engineering products, electronics, electrical equipment, cables, steel, leather, textiles, jewellery, frigates, automobiles, railway coaches and wagons. Maximum small scale industrial units are situated in Uttar Pradesh. As per 2012 Census, its total population is 204.2 million.

Uttar Pradesh has long tradition of education. Sanskrit based learning formed the major part of education from the Vedic to the Gupta periods. Uttar Pradesh has more than 30 Universities and several Polytechnics, Engineering Colleges and Industrial Training Institutes. Prestigious institutes like the Aligarh Muslim University, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Indian Institute of Technology (Kanpur), Indian Institute of Technology (BHU), The Indian Institute of Management (Lucknow), Indian Institute of Information Technology (Allahabad), Motilal Nehru National Institute of Technology (Allahabad) and the Harcourt Butler Technological Institute are known worldwide for their quality education and research in the respective fields. The presence of such institutions provides the students of the state with ample opportunities for higher education.

The integral university, a state level institution, was established by the Uttar Pradesh Government to provide education in different technical, applied sciences and other disciplines. The central institute of Higher Tibetan Studies was founded as an autonomous organization by the National Ministry of Culture, Jagadguru Rambhadracharya Handicapped University is the only University established exclusively for the disabled in the world.

Haryana

Haryana²² is a state in North India, forming part of the larger Punjab region. It was carved out of the former state of the East Punjab on November 1, 1966 on the basis of language distribution. It is bordered by Punjab and Himachal Pradesh to the north and by Rajasthan to the West and South. The River Yamuna defines its eastern border with Uttar Pradesh. Haryana surrounds the country's capital Delhi on three sides, forming the northern, western and southern borders of Delhi. Consequently, a large area of south Haryana is included in the National Capital Region for purpose of Planning for development.

Haryana is one the wealthier states of India now a leading contributor to the country's production of food grains and milk. Agriculture is the leading occupation for residents of the state with the flat arable land irrigated by submersible pumps and an extensive canal system. Haryana contributed heavily to the Green Revolution that made India self-sufficient in food production in 1960s. Since 2000, the state has emerged as the largest recipient of investment per capita in India. The city of Gurgaon has rapidly emerged as a major hub for the information technology and automobile industries. Gurgaon is home to Maruti Suzuki, India's largest automobile manufacturer and Hero MotoCorp, the world's largest manufacturer of two wheelers. Faridabad, Panchkula, Dharuhera, Bawal, Sonapat, Panipat, Bahadurgarh, Jamuna Nagar and Rewari are industrial hubs with the Panipat refinery being the second largest refiner in South Asia. There are long established Steel, Plywood, Paper and Textile Industries in the State. As per 2011 census its total population is 25.35 million.

Chaudhary Charansingh Haryana Agricultural University is the Asia's largest agricultural University. In addition Guru Jambheshwar University of Science and Technology, Lala Lajpat Rai University of Veterinary of Animal Sciences, National Research Centre on Equines, Central Sheep Breeding Farm, National Institute on Pig Breeding and Research, Northern Region Farm Machinery Training and Testing Institute and Central Institute for Research on Buffalos are the important institutes. Haryana boasts of some of the finest colleges in research, technology and management in the country such as National Brain Research Centre, NIT Kurukshetra, Management Development Institute and IIM Rohtak. The National Brain Research Centre is the only institute in India dedicated to Neuroscience research and education.

Delhi

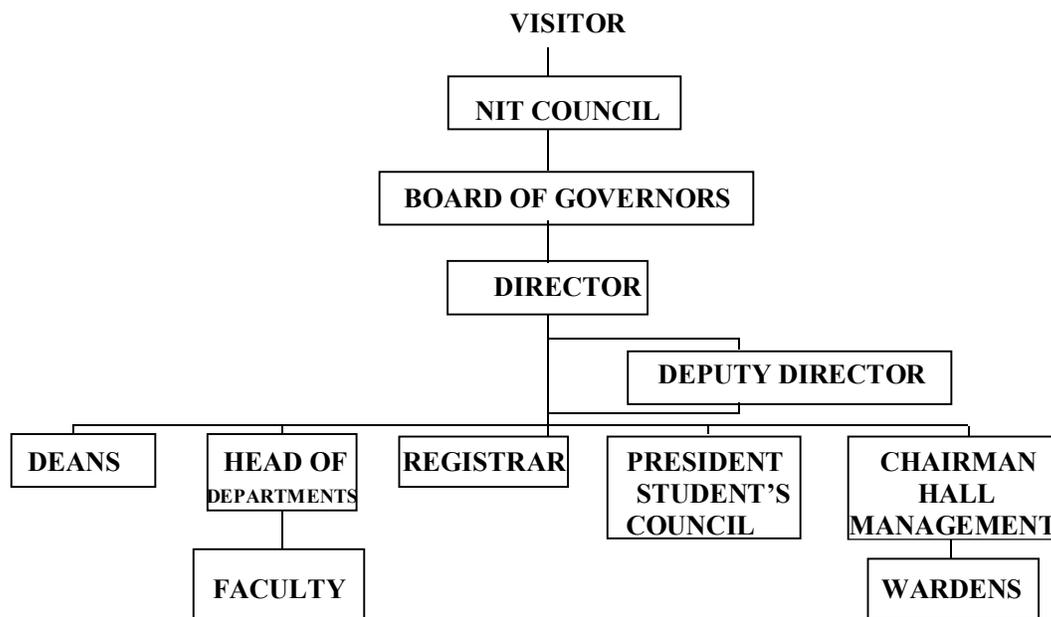
Delhi²³ is the National Capital Territory of India. It is bordered by Haryana on three sides and by Uttar Pradesh to the east. It has a population of about 16.3 million making it the second most popular city and second most popular urban agglomeration in India and 3rd largest urban area in the world. Such is the nature of urban expansion in Delhi that its growth has expanded beyond the National Capital Region (NCR) to incorporate towns in neighbouring states, like Faridabad, Gurgaon, Noida, Neharpar (Greater Faridabad), Greater Noida, Bahadurgarh, Sonapat, Panipat, Karnal, Rohtak, Bhiwari, Rewari, Baghpat, Meerut, Alwar, Bharatpur etc. New Delhi is jointly administered by the federal Government of India and the local Government of Delhi, and is the Capital of Delhi, and is the capital of the NCT of Delhi.

Delhi has many colleges and universities. The University of Delhi has been consistently ranked as India's best University. Two other central universities are Jawahar Lal Nehru University and Jamia Millia Islamia University. Indraprastha Institute of Information and Technology, Delhi Technological University, Guru Gobind Singh Indraprastha University and National Law University are the state Universities and Indira Gandhi National Open University is for distance education. Indian Institute of Technology, Delhi is ranked as Asia's best institute in Science and Technology in 1999. All India Institute of Medical Sciences is a global leader in medical research and treatment.

ORGANISATIONAL STRUCTURE

NITs are the institutes of national importance. The President of India is the ex officio visitor of all the NITs. The NIT, council works directly under him and it includes the minister-in-charge of technical education in Central Government, the Chairmen and the Directors of all NITs, the Chairman of University Grants Commission, India the Director General of CSIR, the directors of other selected Central institutions of repute, members of Parliament, Joint Council Secretary of Ministry of Human Resource and Development, nominees of the Central Government AICTE and the visitor.

Below the NIT Council is each NITs Board of Governors. The Director serves under the Board of Governors and is the school's Chief academic and executive officer. The Deputy Director is the sub ordinate to the Director. Together they manage the Deans, Heads of Departments, Registrar, President of the Student's Council and Chairman of the Hall Management Committee. Deans and Heads of Departments in NITs are administrative postings rather than career paths. Faculty members serve as Deans and Heads of Departments for limited periods, typically 2 to 3 years, then returning to regular faculty duties. The Registrar is the Chief Administrative Officer and oversees day-to-day operations. Below the head of Department are the various faculty members. The Warden serves under the Chairman of the Hall Management Committee.



Objectives -

- To provide best undergraduate engineering education in India.
- To provide high quality PG education and relevant research.

- To advance the knowledge and its application to fulfill the specific need of industry and society at large.
- To provide student centric teaching and learning by encouraging inquiry, invention, interactivity and learning by doing.
- To develop and deliver e-course materials using various platforms like Massively open online courses (MOOCS).
- To provide ICT based high quality learning through integration of audio-video stimulation and participation.
- To develop strong ICT infrastructure such as audio-visual systems, LCD projector, Internet etc. in the institute.
- To make extensive use of shared resources or content through National Knowledge Network (NKN) such as remote lectures, establishment of virtual classrooms, enhancing delivery of courses by incorporating MIT, open courseware, (NPTEL) National Program on Technology enabled learning.
- To establish global sharing and delivery of content, conducting quizzes and tests, evaluation and feedback, communication between learners, teachers and outside world, creation and delivery of presentations and lectures, academic research, administrative support and student enrollment.
- To improve pedagogy through ICT oriented interactive teaching methods, live delivery of high quality lectures through high speed internet and by establishing connectivity with NKN to best teachers from IITs and NITs.

Central Library

Library is an essential component of academic institution to promote quality teaching, learning and research activities. Library continues to be an essential component of its parent institution and also of the information society in the global era by switching over to latest ICTs, so as to establish a free flow of information among the users.

The Library of NIT is supposed to be the beating heart of the institution so as to serve as the knowledge centre of the Institution, supporting curriculum and also the research activities of faculty and students. NITs have a central library equipped with technical books, literature, fiction, scientific journals and other electronic materials. Most NITs have digitized their libraries. Some also provide Internet Library facility. Electronic libraries provide access to online journals and other periodicals through the AICTE-INDEST Consortium, an initiative by the Ministry of Human Resource development. Students also have the access to IEEE documents and journals.

Scope and Limitations of Study

The present study is devoted to the NIT Libraries of India. The present study has been conducted to analyze working pattern impact and effectiveness of Library resources and services of NITs. The study aims to present an analytical picture of ICT applications and its effectiveness towards better resources and services. The study is based on the data and information collected from NIT Libraries. The study is contemplated to review the entire situation and to provide useful suggestions for improvement. In all there are 30 NITs in India, listed below with their establishment year, short name, city and state/territory wise location and website.

List of NITs in India

Sl	Name of NIT	Establishment year	Short Name	City/ Town	State/ UT	website
1	NIT Kurukshetra	1963 (2002)	NITKKR	Kurukshetra	Haryana	nitkkr.ac.in
2	NIT Calicut	1961 (2002)	NITC	Kozhikode	Kerala	nitc.ac.in
3	NIT Delhi	2010	NITD	New-Delhi	Delhi	nitdelhi.ac.in
4	NIT Agartala	1965 (2006)	NITA	Agartala	Tripura	nita.ac.in
5	NIT Durgapur	1960 (2003)	NITDGP	Durgapur	West Bengal	nitdgp.ac.in
6	NIT Goa	2010	NITG	Farmagudi	Goa	nitgoa.ac.in
7	NIT Puducherry	2010	NITPY	Karaikal	Puducherry	nitpy.ac.in
8	Maulana Azad National Institute of Technology, Bhopal	1960 (2002)	MANIT	Bhopal	Madhya Pradesh	manit.ac.in
9	Malviya National Institute of Technology Jaipur	1963 (2002)	MNIT	Jaipur	Rajasthan	mnit.ac.in
10	Motilal Nehru National Instt. of Technology Allahabad	1961 (2001)	MNNIT	Allahabad	Uttar Pradesh	mnnit.ac.in
11	NIT Manipur	2010	NITMN	Imphal	Manipur	nitmanipur.ac.in
12	NIT Meghalaya	2010	NITM	Shillong	Meghalaya	nitm.ac.in
13	NIT Mizoram	2010	NITMZ	Aizawl	Mizoram	nitmz.ac.in

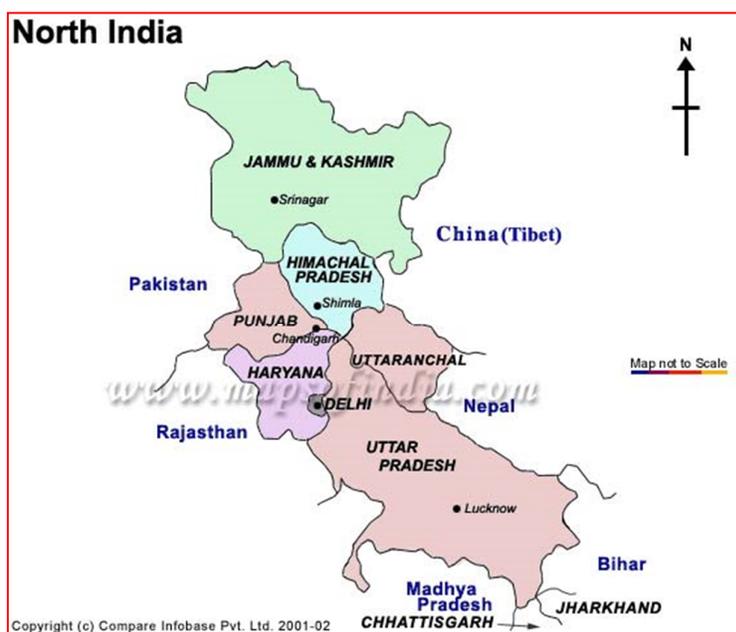
Sl	Name of NIT	Establishment year	Short Name	City/ Town	State/ UT	website
14	NIT Nagaland	2010	NITN	Dimapur	Nagaland	nitnagaland.ac.in
15	Dr.B.R.Ambedkar National Instt. of Technology, Jalandhar	1987 (2002)	NITJ	Jalandhar	Punjab	nitj.ac.in
16	NIT Jamshedpur	1960 (2002)	NITJSR	Jamshedpur	Jharkhand	nitjsr.ac.in
17	Visvesvaraya National Institute of Technology, Nagpur	1960 (2002)	VNIT	Nagpur	Maharashtra	vnit.ac.in
18	NIT Patna	1886 (2004)	NITP	Patna	Bihar	Nitp.ac.in
19	NIT Raipur	1956 (2005)	NITRR	Raipur	Chhattisgarh	nitrr.ac.in
20	NIT Rourkela	1961 (2002)	NITRKL	Rourkela	Odisha	ntrkl.ac.in
21	NIT Sikkim	2010	NITSKM	Ravangla	Sikkim	nitsikkim.ac.in
22	NIT Silcher	1967 (2002)	NITS	Silcher	Assam	nits.ac.in
23	NIT Srinagar	1960 (2003)	NITSRI	Srinagar	Jammu & Kashmir	nitsri.net
24	Sardar Vallabhbhai National Instt of Technology, Surat	1961 (2003)	SVNIT	Surat	Gujarat	svnit.ac.in
25	NIT Surathkal	1960 (2002)	NITK	Manglore	Karnataka	nitk.ac.in
26	NIT Tiruchirappalli	1964 (2003)	NITT	Triuchirappalli	Tamil Nadu	nitt.edu
27	NIT Uttarakhand	2010	NITUK	Srinagar	Uttarakhand	nituk.com
28	NIT Warangal	1959 (2002)	NITW	Warangal	Telangana	nitw.ac.in
29	NIT Arunachal Pradesh	2010	NITAP	Yupia	Arunachal Pradesh	nitap.in
30	NIT Hamirpur	1986 (2002)	NITH	Hamirpur	Himachal Pradesh	nith.ac.in

The present study is limited to North India. The term North India officially refers to six North Indian States of Punjab, Jammu and Kashmir, Delhi, Haryana, Himachal Pradesh and Uttarakhand. Though Uttar Pradesh is not formally part of North India and belongs to overlapping neighbouring region, called North Central India, but it traditionally, culturally and linguistically seen

to be so is also included in the study. Thus, the present study is limited to total seven NITs.

List of NITs under Study

Sl.	Name	Short Name	State/ UT
1	Motilal Nehru National Instt. of Technology	MNNIT	Uttarpradesh
2	NIT Kurukshetra	NITKKR	Haryana
3	NIT Hamirpur	NITH	Himachal Pradesh
4	Dr. B.R. Ambedkar National Instt. of Technology, Jalandhar	NITJ	Punjab
5	NIT Srinagar	NITSRI	Jammu & Kashmir
6	NIT Uttarakhand	NITUK	Uttarakhand
7	NIT Delhi	NITD	Delhi



Aims and Objective of the study

1. To study infrastructure in NIT libraries under study.
2. To access the existing library resources and services of NIT libraries under study.
3. To know the ICT literacy among LIS professional of NIT libraries under study.
4. To find out the problems faced by LIS professionals in providing ICT oriented services.
5. To provide useful suggestions.
6. To examine, promote and develop library and information services and resources.
7. To meet information requirement of users of NIT Libraries under study.

8. To identify the modern technologies of acquisition, processing and storage, retrieval and dissemination of information.
9. To access the overall effectiveness of library and information services of NIT under study.

Research Methodology

Research Methodology involves systematic procedure starting from the initial identification of problem to its final conclusion. The present study is survey based analytical study. It is non-experimental, descriptive study, beginning from data collection through questionnaire, interview and personal observation. Review of literature is also done to understand, enhance and consolidate the knowledge base and to integrate the findings with the existing body of knowledge. The data collected are analyzed through tables, graphs and bar diagrams as per need, and interpreted. Finally conclusions are drawn.

The Hypotheses

Hypotheses is supposition or preposition. According to Good and Scates, "A hypothesis is a shrewd guess or inference that is formulated and provisionally adapted to explain observed facts or conditions and to guide in further investigations"²⁴.

Thus hypothesis is a tentative suggestion, a preliminary imagination or a primary thought which is unverified. Hypothesis is a supposition made with or without evidence in order to deduce from its conclusion in accordance with the facts which are known to be real²⁶.

1. NIT Library professionals are enjoying to serve in a SMART library.
2. NIT libraries are providing ICT oriented services.

Data Analysis

Out of 7 NITs under study, 05 NITs were established as Regional Engineering Colleges and acquired the status of NITs afterwards, whereas two NITs are of recent origin and established in 11th five year plan.

- NITSRI is the oldest RIE established in 1960, followed by MNNIT (1961) NITKKR (1963), NITH (1956) and NITJ (1987).
- MNNIT is the oldest NIT established in 2001 followed by NITKKR (2002), NITH (2002), NITJ (2002), NITSRI (2003), NITUK (2009) and NITD (2010).
- Among 25 Best Engineering Institutes of North India, MNNIT ranked 9th NITJ- 14th and NITH- 15th. NITH ranked best NIT in infrastructure.

- Among top 100 Engineering Institutes of India for research and training, MNNIT ranked 23rd, NITJ 42nd, NITKKR 48th NITH 51st, NITSRI 61th and NITD 92nd.
- Out of 07 NITs under study, all the NITs except NIT are ranked among top 100 Engineering Institutes.

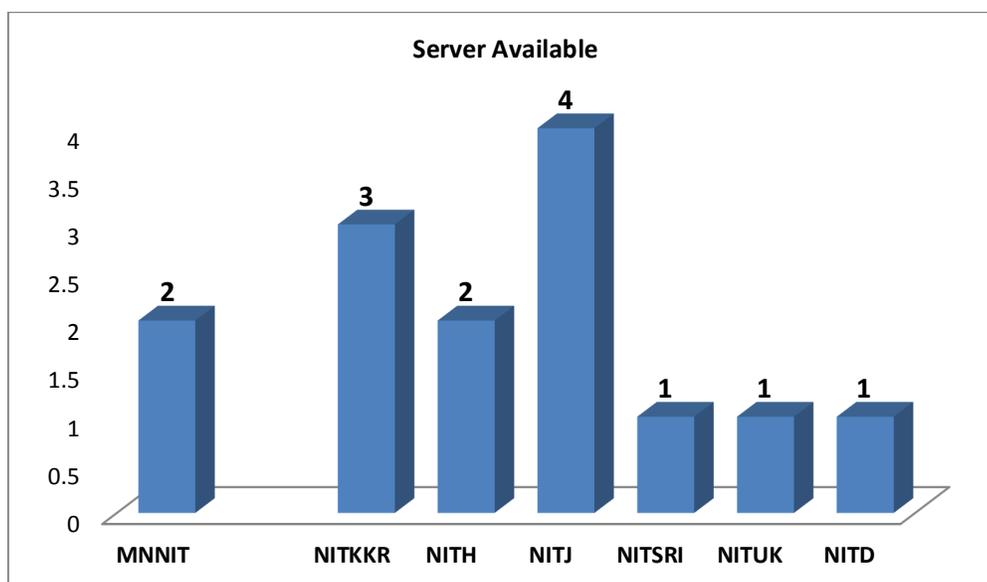
Table 3
Courses offered at NITs under study

Sl.	NITS	Courses Offered			Remarks
		Bachelor	Masters	Doctoral	
1	MNNIT	09 B.Tech	19 M.Tech MCA MBA MS MSW	Ph.D.	First in India to start U.G. Prog. in Computer Science
2	NITKKR	B.E. B.Tech.	M.Tech. MBA MCA	Ph.D	Started full time M.Tech. Degree course in Water Resources (Civil Engg. Deptt.) in 1989-90
3	NITH	B.Tech B.Arch.	M.Tech M.Arch. MBA	Ph.D.	
4	NITJ	B.Tech.	M.Tech. M.Sc.	Ph.D.	
5	NITSRI	B.Tech	M.Tech	M.Phil Ph.D.	
6	NITUK	B.Tech.	M.Tech.	Ph.D.	
7	NITD	B.Tech.	M.Tech.	Ph.D	

The above table no.3 clarifies that – All the NITs under study are running UG, PG, and Doctoral Programme. NITSRI is also running M.Phil. Programme. In addition to Engineering, the NITs are offering PG Courses in Management, Computer Application, Social Work. NITH is running B.Arch. and M.Arch. Courses.

- All libraries remain open on all the working days, Saturday, Sunday and Holidays except Five holidays of National and social importance, whereas NITD Library remains closed on Sunday and holidays. MNNIT, NITKKR library provide reading facility for 24x7 days, NITH Library from 9.00 am to 12 am, NITSRI from 8.45 am to 9.30 pm, NITJ 9.00 am to 9.00 pm, NITUK from 8.00 am to 8.00 pm and NITD from 9.00 am to 6.00 pm.

- Only 03 NIT libraries namely NITKKR, NITSRI and NITJ are having Librarian whereas MNNIT library has officiating librarian. Only MNNIT has a Deputy Librarian. Four NITs namely NITSRJ, NITH, NITUK and NITD have Assistant Librarian. Three NITs – MNNIT, NITKKR, NITUK have Technical Assistant. Five NITs-NITKKR, NITSRI, NITH, NITJ, NITD have library assistants.
- All the NIT libraries under study have print and electronic collection. MNNIT has highest no. of Print Books, and NITD has lowest number of print books.
- All the NIT libraries are providing circulation services, book bank facility, Bibliographical services, references service. All the NIT libraries provide reprography services. On line services are available at all the libraries. MNNIT and NITUK are providing indexing services. NITUK is providing abstracting services.



Above graph reveals that All the NITs under study have server availability. NITJ has 04, NITKR 03, MNNIT has 2 server. NITSRI, NITU, NITD have 01 server

- All the NIT libraries under study have clients/ computer work station availability. NITKR has highest number of 40 workstations, NITKR 45, NITH 30, NITJ and NITSRI 15 each, NITD 05 and NITUK has 04 workstation. NITKKR and NITJ have IBM, HCL and Lenovo Brand. NITUK has Dell Computer and NITD has HP.
- All the NIT libraries have Printer. NITJ has highest number of Printer 12. NITD has least number of Printers 02
- All NIT Libraries except NITSRI have scanner available for digitization. Except NITSRI and NITD all libraries also have Barcode Scanner. NITJ has highest number of Scanners.

- All the NIT Libraries have xerox machine. MNNIT and NITJ have 02 xerox machine, rest have 01
- None Library has fax machine.
- Only three libraries MNNIT, NITKR, NITJ have two LCD Projector each.
- Only three libraries NITKKR, NITJ and NITD have one web camera.
- 05 libraries have security system except NITH and NITSRI. MNNIT has the highest number of CCTV i.e. 8.
- All the NITs have leased line internet connectivity. Internet service providers differ, three have MTNL, while four have Airtel, Radio Link, BSNL and Reliance respectively.
- All the NITs have consortia membership through INDEST AICTE. MNNIT has also got DELNET and NIT consortium.
- None NIT library has its separate website. All the NIT libraries are having a link in the website of Institute. All the NITs maintain a library profile explaining library rules and regulations and services available.
- All the NIT libraries are using Internet for Library operations and Services. All the libraries using internet for classification. NITUK is using Internet for maximum services.
- All the NIT libraries are subscribing e-resources. IEL online, Springer Link, Emerald, Science Direct are widely subscribed.
- Libraries are using ICT for communication. NITD informs users within an hour about new arrivals followed by NITKKR, NITH, NITJ informing in three days followed by MNNIT, NITSRI, NITUK informing in a week time. Six libraries use Notice Board as mode of Communication, four libraries put the information on website, and two libraries use email. NITD is the only library communicating also through direct contact. NITH is using SMS based notification to inform and alert the users about overdue books, fine and other relevant information.
- All the libraries are providing ICT oriented library services and the hypothesis II is proved. OPAC and Barcode are the most popular services. NITKKR and NITJ are maintaining partial Institutional repository. No library is providing Translation services.
- Four libraries namely MNNIT, NITKKR, NITH and NITJ are using shared cataloguing through MARC-21 format whereas three libraries namely NITSRI, NITUK and NITD do not have any provision.
- All the libraries except NITUK have digital resources. NITKKR is the only Library Creating Metadata for Digital resources. Four Libraries namely, MNNIT, NITKKR, NITJ and NITUK create link to free full text resources.
- All the libraries except NITD are facing the problem of lack of skilled manpower. NITUK is facing the problem of lack of strong network. MNNIT is facing the problem of lack of sufficient infrastructure. MNNIT is the only library facing psychological barrier also. NITSRI is the only library facing the problem of

administrative support. NITD is not facing any problem or difficulty to serve in the ICT environment.

- All the libraries accept ICT as a boon for easy, enhanced, increased and remote access of resources. The hypothesis-2 is proved.

FINDINGS :-

The major findings of the study are as follows –

1. Out of seven NITs under study, five NITs were established as Regional Engineering Colleges and later on acquired the status of NITs. The remaining two NITs were established in 11th Five Year Plan. The NITSRI is the oldest and NITD is the youngest NIT under study. The MNNIT has been ranked as best Engineering Institute of North India. NITH has been ranked as best NIT in infrastructure.
2. All the NITs under study are running U.G., P.G. and Doctoral Program. In addition to Engineering, B.Arch., M.Arch., PG Courses in Management, Computer Application and social work are also provided.
3. All the NITs under study have a central library facility with open access system. NITKKR, NITH, NITJ and NITSRI have separate library building, NITH and NITD have Air Conditioned Library, NITH and NITSRI have Modular planning.
4. All NITs have provision of Library services on all working days, Saturdays, Sundays and holidays, except holidays of National and Social importance, whereas NITD keeps library closed on Sundays.
5. MNNIT and NITKKR provide reading facility for 24x7 days. NITH library remains open from 9.00 am to 12.00 midnight, NITSRI from 8.45 am to 9.30 am to NITJ from 9.00 am to 9.00 pm, NITU from 8.00 am to 8.00 pm and NITD from 9.00 am to 6.00 pm.
6. Only three NIT libraries namely NITKKR, NITSRI and NITJ are having librarian. MNNIT library has officiating librarian.
7. Only MNNIT has a Deputy Librarian, whereas NITSRI, NITH, NITUK and NITD have Assistant Librarian.
8. All the NIT libraries have print and electronic collection.
9. All the NIT Libraries are providing reprography services, circulation services, bibliographical services, reference service, book bank facility and online services.
10. Only two libraries namely MNNIT and NITUK are providing indexing services, whereas only one library NITUK is providing abstracting services.
11. All the NIT libraries have server availability.
12. All the Libraries have client/ computer workstation availability NITKR has highest 40 work stations and NITU has least 04 work stations.
13. All the libraries have Printers and xerox machine.
14. All NIT libraries except NITSRI have scanners for digitization.

15. All NIT libraries except NITSRI and NITD also have barcode scanner.
16. No library has Fax Machine.
17. 03 Libraries namely MNNIT, NITKKR and NITJ have LCD Projector.
18. 03 Libraries namely NITR, NITJ and NITD have web camera.
19. All the libraries except NITH and NITSRI have CCTV security system.
20. All the NITs have leased line Internet connectivity. Three NITs have MTNL and four NITs have Airtel, Radio Link, BSNL and Reliance respectively.
21. All the NITs have consortia membership through INDEST- AICTE. The MNNIT has also got DELNET and NIT Consortium.
22. The widely used Internet Browsing Software in NITs are Mozilla, Firefox, Internet Explorer and Chrome.
23. None NIT library has its separate website. All the NIT libraries are having a link in the website of the institute.
24. All the NITs maintain a library profile explaining library rules and regulations and services available.
25. All the NIT libraries are using Internet for library operations and services. Classification, Bibliographical databases, Classification, Cataloguing, CAS, SDI, etc.
26. All the NIT libraries are subscribing e-resources. The most widely subscribed e-resources are IEL Online, Springer Link, Emerald, Science Direct, etc.
27. All the NIT libraries are using ICT for communication. The information is communicated through website and email.
28. NITH has also started SMS based notification to inform and alert the users about overdue books, fine and other relevant information.
29. All the NIT libraries are providing ICT oriented library services. The most popular services are Barcode and OPAC.
30. Two libraries namely NITKKR and NITJ are maintaining partial institutional repository.
31. No library is providing translation services.
32. Only four libraries namely MNNIT, NITKKR, NITH and NITJ are using shared cataloguing through MARC 21 format.
33. All the NIT libraries except NITUK have digital resources.
34. NITKKR is the only library creating metadata for digital resources.
35. Four NIT libraries namely MNNIT, NITKKR, NITJ and NITUK create link to free full text resources.
36. All the NIT libraries except NITD are facing the problem of lack of skilled manpower.
37. NITUK is facing the problem of lack of strong network.
38. MNNIT and NITUK are facing the problem of lack of sufficient infrastructure.

39. MNNIT is the only library facing psychological barriers also.
40. NITSRI is the only library facing the problem of administrative support.
41. NITD is not facing any problem or difficulty to serve in the ICT environment.
42. All the NIT libraries agree with the impact of ICT towards easy, speedy, increased and remote access of resources. The hypothesis-2 is proved.
43. All the NIT Libraries are enjoying to serve in SMART library by providing satisfactory services. The hypothesis-1 is proved.

SUGGESTIONS:-

- All the libraries should have a centrally located, separate air conditioned library building with modular planning.
- Library building should have sufficient infrastructure.
- Keeping in view the library timings, the library staff should be increased in number so as to serve in two shifts.
- Regular in service training programs should be arranged for the staff with intensive practice on hand training.
- Mobile phone services should be used for instant messaging.
- Social network media should be used for communication.
- Regular updating of ICT skills through expert lectures followed by practice.
- There is a need to create more awareness about sources by organizing regular workshops.
- E-information literary programs can further strengthen the services and resources through latest ICTs.
- Remote login facility should be provided to users so that they can log in the relevant information anytime, anywhere while travelling also.
- Vacant positions should be filled up. Regular librarian should be appointed at all the NITs.
- Facilities for researchers should be increased by making available more e-journals according to their field of specialization.
- More high speed computer terminals should be installed.
- The library should introduce electronic document delivery services for the benefit of the users.
- The research scholar's requirements and opinion should be taken into consideration on priority basis while subscribing to the e-resources.
- Bandwidth of internet connectivity should be increased.
- User training program should be conducted from time to time to make the users aware for use of information sources, library services and e-resources.

- There should be security surveillance as well as the use of closed circuit television monitoring system to curb the excesses of users in terms of book mutilation, material theft and stealing etc.

CONCLUSION:-

The present study clarifies the picture of NIT Libraries in North India, their resources and services, and the impact of ICT on library resources and services. NITs are the India's finest Engineering Institutes which contribute immensely to shaping of India as knowledge super power. The library of NIT is supposed to be the beating heart of the institution, serving as a learning resource centre, supporting curriculum and also the research activities of faculty and students. Thus, central library of NIT should be equipped with technical books, literature, fiction, scientific journals and other electronic resources, internet and consortium facility. Today, information is considered as a valuable commodity for taking a right and timely decision for productive and gainful operation. Information is growing infinitely in various formats. The rapid advances in ICTs have resulted in a constantly changing environment. Internet has completely revolutionized the way of working and communication. The internet is used as an information resource and the www has rapidly become the most useful means of providing Internet resources combining hypertext and hypermedia to provide a huge network of educational, governmental and commercial resources. The publishing industry also has started web based publishing. Today, web based electronic database have become important resources for education and research. Thus, the use of ICT has a great impact on information resources and services of library. The use of internet and the power of search engines have changed the role of libraries to serve in a borderless global environment to access digital resources and to provide online services. The libraries of NITs are of utmost importance to fulfil the intellectual needs of its users by making 24 x 7 days availability of global information. The present study clarifies that NIT libraries are providing satisfactory services to users using ICTs. Keeping in view the exponential growth in ICT, more and more information availability for scholars, library timings of NITs, the staff in sufficient quantity and quality, improved infrastructure facilities, regular updation of ICT Skills, Strong network connectivity and systematic and continuous user education programs are some of the major issues to be considered for quality services, which in turn will help in producing quality output of Engineering for better India.

AREAS FOR FURTHER RESEARCH –

The present research study is the need of an Hour. During research progress, it was felt that the area needs many more researches to be conducted in future. Some of the related areas may be as under:-

1. Information needs of the users of NIT libraries in ICT era.
2. Use of e-resources by research scholar and faculties in ICT oriented libraries : A Case Study of NITs in India.
3. Information seeking behaviour of users in NIT Libraries of North India.
4. Faculty attitude towards ICT oriented services in NIT libraries of India.
5. Impact of ICT on information resources and services of the libraries of NITs : A comparative study of North and South India.

6. Impact of ICT on information resources and services of the libraries of NITs : A comparative study of East and West India.
7. Consortium development among the NIT libraries of India.

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