Computer Infrastructure Facilities and Services at National Institutes of Technology Libraries in India

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ABSTRACT

Computer infrastructure plays a critical role in the academic system for meeting teaching, learning and research needs. Libraries are an integral part of academic system. Adequate infrastructure facilities support academic libraries share their resources and services in an effective way. National Institute of Technology, erstwhile regional engineering college, are prime institutions and benchmark for technical education in India in the field of engineering, science and technology. This paper discusses the computer infrastructure facilities available at National Institutes of Technology across India and current status of computer-based library services offered by these institutions.

Keywords: Computer infrastructure, technical education, academic system, National Institutes of Technology

1. INTRODUCTION

The information revolution is the central phenomenon in the contemporary world comprising information profusion and computer technology. On one hand, creation and diffusion of information is largely fuelled by information profusion, on the other hand expansion of computer technology, seen as tool, has shaped the nature, scope, mode, and speed of information. Information is something that has value[1]. In essence, every bit of information available today is systematically codified, customised, and modified using computing technology. Massive production and acceleration of information has become overwhelming. The trend of information overload became apparent in the late 1980s when electronic information systems became common in organisations[2]. Information revolution opened new avenues for creation, production, and deliverance of information through various media, mode, and formats.

The information revolution determined change in academic settings and computer infrastructure (CI) became the supporting tool that revolutionised the information. In fact CI became a fundamental and developmental tool for shaping the academic system more efficient and accessible.

Infrastructure has many means. According to Lakos, infrastructure is: physical components (hardware and software), various equipment, communication lines, etc.[3] CI requires specialised skills and expertise to handle and manage these effectively. Strategic investments in computer and communication can significantly benefit enterprises, which will have the immediate effect of making the country more competitive[4]. The 1990s saw greater use of campus communication infrastructures and commercial communication systems to create and store information and then to deliver it from libraries to end users[5].

Academic library is an integral part of the academic system whose primary function is not only to provide resources but also to serve users (students, researchers, faculty and staff) to meet their information needs. Eternally, the libraries are beginning to be considered in terms of information access rather than information housing[6]. Technology has changed the entire concept of libraries from holding to access[7]. Today, the influence of CI facilities on academic library system is creating conducive environment for users to access, avail, read and share resources, experiences, and best practice. But the libraries often find difficulty in building CI facilities and provide effective services due to insufficient funds,

professional expertise, and skills to handle and manage these appropriately, though, these are basic tools to automate library functions and provide services easily and accurately. Besides, the users prefer to use and access CI facilities for optimum use of library resources and services for meeting the pre-eminent academic needs. These services support a large community of users in accessing large quantity of quality resources with minimum cost in a maximum beneficial way. It reduces time-consuming, frustrating, labour-intensive physical work in libraries.

2. NATIONAL INSTITUTES OF TECHNOLOGY

National Institutes of Technology (NITs), erstwhile Regional Engineering Colleges (RECs), are prime institutions and benchmarks for technical education in India in the field of engineering, science, and technology. During the second five year plan (1956-60), a number of industrial projects were contemplated in India. To ensure enough supply of trained personnel to meet the demand for these projects, the decision was taken to start RECs, in each major state, to churn out graduates with good engineering merits. Seventeen RECs were established from 1959 onwards throughout the country for regional development of technical manpower. These colleges were set up as joint and cooperative enterprises of the Central as well as State Governments. Subsequently, on the recommendation of a High Powered Review Committee and an Empowered Committee, these colleges were granted deemed university status with professional management structure. In 2002, the Union Ministry of Human Resource Development, Government of India decided to upgrade all 17 RECs as NITs. On 14 May 2003, all these 17 institutions were taken over as fully-funded institutions of the Central Government. These institutions are on the lines of the prestigious Indian Institutes of Technology (IIT) in terms of student quality, research, and placements. Later, three Government engineering colleges (Patna, Raipur and Agartala) were added to NIT family. Recently, an NIT Act 2007 has come into force with effect from 15 August 2007. As per the provision of this Act, these institutions run on non-profitable basis and are "institutions of national importance". All institutions have autonomy to draft curriculum and functioning policies. These institutions offer degree courses at various levels—bachelors, masters and doctorate—in various branches. Greater infrastructure facilities have been given to these institutions for development in teaching, learning, research, and dissemination of information across the country.

2.1 Computer-based Library Services

Libraries are service-oriented vehicles, mostly fueled by user demand and expectations. Moreover, vital library services are technology-driven and are in continuous demand in the academic environment for enhancement of teaching, learning, and research. In NITs, the number of users (especially students and faculty) and their expectations and information needs are high. For the last five years, the student intake among NITs has increased from 49,185 to 76,000[8]. The student and teacher ratio is also steadily increasing. Students as well as faculty prefer to use and access computer-based information services, and demand timely information, properly packed, and delivered. Therefore, many NIT libraries have been ornamented with computerised systems and kiosks. Transactions of the library have been enhanced from man-assisting to self-service systems. Users are able to browse and search catalogues, access databases, perform real-time interactions, avail electronic document deliver/inter-library loan, etc. The computer-based services have increased the efficiency and effectiveness of these libraries, and are not only attracting wider community of users to access, search, and retrieve resources but also reducing cost, time, and replication works in the libraries.

Table 1 shows, majority (90 per cent) of NIT's libraries prefer to provide online (e-journals) followed by open access online journals, and e-books, etc. Around 85 per cent of the libraries indicated that, they provide ECAT services, CD-ROM and audio/video services frequently. Nearly 70 per cent of libraries prefer to provide support services (orientation programmes and training users and staff). The provision of virtual reference, e-current awareness, electronic/web-based document delivery, electronic theses and dissertations, and e-publishing services among NIT libraries are at below the average. Apart from those services, majority of the libraries have the facilities of accessing communication network services. No library among the NITs across the country provides videotext/teletext and video/teleconferencing facilities.

3. OBJECTIVES

The main objectives of the study are:

✄ To examine CI facilities available at NIT libraries.

✄ To study the electronic equipment available at NIT libraries.

✄ To evaluate zone-wise performance with respect to CI facilities.

✄ To identify the current status of computer-based library services offered by the NIT libraries.

4. METHODOLOGY

The questionnaire method was used for collecting data for the study. The choice of selecting questionnaire method was survey-based, and questionnaire was designed in structural form. The sample size was 20 NITs.

Table 1. Computer-based services among NIT libraries in India

S. No.	Computer-based services		Frequency (20)	Percentage
1.	Electronic data interchange		11	55
2.	E-catalogue services	Online public access catalogue	17	85
		Both (OPAC/WebOPAC)	10	50
3.	E-circulation services	Check-out, check-in, renewals	11	55
4.	Virtual reference service	Online/e-mail assistance	8	40
5.	Online services	E-books	8	40
		E-journals	18	90
		Abstracting databases	8	40
		Open access journals (free)	12	60
6.	Multimedia database services	Networked CD-ROM	7	35
		Audio and video cassettes	17	85
7.	Communication network facilities	Internet	19	95
		E-mail services	17	85
		Telephone	20	100
		Facsimile (fax)	5	25
		Video and teleconferencing	0	0
		Videotext or teletext	0	0
8.	E-current awareness services	Current contents/SDI/alert/ new arrivals/ newspaper clipping	9	45
9.	Electronic/web-based document delivery services		7	35
10.	Electronic theses and dissertations		6	30
11.	E-learning and education services		17	85
12.	E-publishing services	E-library News Bulletin/Newsletter	3	15
13.	Support services	User Orientation/education/ conventions	14	70
		Training user in the library	11	55
		Training staff	13	65

The questionnaire was served to administrators of these libraries (librarians). The data (*Annexure 1*) for this study was quantified using numerical scales (i.e. 0-1, 1-2, 1-5) for the purpose of analysis.

5. SCOPE AND LIMITATIONS

The present study is confined to 20 NIT libraries in India, concerning only the library CI facilities and services. The data received from the respondents was authenticated and assumed to be factual. User interview/ opinions and their degree of satisfaction through user survey would have added more value to the present study.

6. FINDINGS

The data has been described and analysed based on the objectives. The CI encompasses mainly computers and other electronic peripherals such as digital scanners, barcode scanners, printers, audio/video cassettes, television set, etc. The study also highlights the computer-based library services offered by the NIT libraries in India.

6.1 Computers Infrastructure Facilities

Adequate CI supports academic library system largely to utilise resources, services, and facilities. In this study, the number of computers available in the libraries of various NITs across the country were counted. Figure 1 shows that, 10 per cent of libraries have < five computers. One-fourth of libraries have 11-20 computers, eight (40 per cent) libraries have 21-30 computers. Other one-fourth of libraries have more than 31 computers.

6.2 Electronic Equipment Facilities

Electronic equipment comprised digital scanners, barcode scanners, printers, TV and VCR/VCPs sets at NIT libraries across the country. Table 2 indicates that, three-fourth of libraries have digital scanners and barcode scanners. Majority of libraries (80 per cent) have $\geq$ five
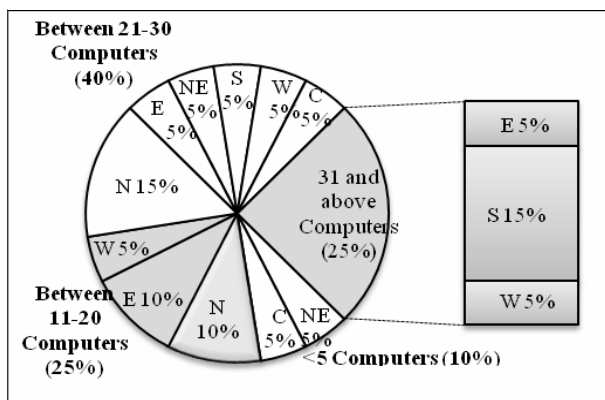
Figure 1. Computer infrastructure facilities.

printers whereas, 20 per cent of libraries have < 5 printers in the library. Around 50 per cent of libraries indicated that they have ≥ three TV and VCP/VCRs sets.

6.3 Zone-Wise Computer Infrastructure Facilities

The CI facilities at NIT libraries have greater influence on academic system towards the development of teaching, learning, and research. Table 3 shows zone-wise CI facilities available at NIT libraries. Table 3 shows that the South zone libraries (81 per cent) are ahead of others followed by the North, West, East, North-East and Central zone libraries, respectively.

7. FINDINGS

✂ Sixty-five per cent libraries have >20 computers whereas, 35 per cent of libraries have < 20 computers at their end.

✂ With respect to electronic equipment, three-fourth of libraries they have digital and barcode scanners.

Table 2. Electronic equipment facilities

Electronic equipment		North	East	NE	South	West	Central	Frequency (20)	%
Digital scanners	Available	4	1	1	4	3	2	15	75
	Not available	1	3	1	0	0	0	5	25
Barcode scanners	Available	4	3	0	4	3	1	15	75
	Not available	1	1	2	0	0	1	5	25
Printers	<=5	2	3	2	4	3	2	16	80
	>5	3	1	0	0	0	0	4	20
TV sets	<=3	2	2	1	3	2	1	11	55
	>3	3	1	1	1	0	0	6	30
	Not available	0	1	0	0	1	1	3	15
VCR/VCPs	<=3	2	3	0	2	1	2	10	50
	>3	3	0	1	2	1	0	7	35
	Not available	0	1	1	0	1	0	3	15

Table 3. Zone-wise computer infrastructure facilities at NIT libraries

S. No.	Zone	Name of the library	Score achieved	Zone-wise total score	Zone-wise total ideal score (13)	Percentage
1	North	MNNIT Allahabad	12	50	65	77
2		NIT Hamirpur	11			
3		NIT Jalandhar	7			
4		NIT Kurukshetra	10			
5		NIT Srinagar	10			
6	East	NIT Durgapur	10	31	52	60
7		NIT Jamshedpur	7			
8		NIT Patna	6			
9		NIT Rourkela	8			
10	North-East	NIT Agartala	3	13	26	50
11		NIT Silchar	10			
12	South	NIT Calicut	11	42	52	81
13		NIT Surathkal	10			
14		NIT Tiruchirapalli	11			
15		NIT Warangal	10			
16	West	MNIT Jaipur	8	26	39	67
17		VNIT Nagpur	7			
18		SVNIT Surat	11			
19	Central	MANIT Bhopal	8	13	26	50
20		NIT Raipur	5			

Eighty per cent of libraries have ≤ five printers whereas, 20 per cent of libraries have > five printers in the library.

✄ Majority of libraries (85 per cent) respondents indicate that they have TV and VCP/VCRs sets.

✄ Concerning the zone-wise performance, the South zone (81 per cent) is ahead of others, followed by the north (77 per cent), west (67 per cent), east (60 per cent), north-east (50 per cent), and central zone (50 per cent).

✄ Nearly, all the libraries have the facilities of accessing communication network services such as telephone, internet, e-mail, etc., apart from the preferred library services such as online (e-journals), OPAC, CD-ROM, audio/video and support, etc.

8. CONCLUSION

Teaching, learning, and research are the main concerns of higher education system. Academic libraries are one of the main supports to achieve this end. To meet this challenge, academic libraries require good CI facilities. The study was undertaken to identify the current state of CI facilities at NIT libraries. The study indicates that the South zone libraries are richer than the other zone libraries with respect to CI facilities. From the observations, it is concluded that, many NIT libraries could expand their infrastructure capacities to offer better services to students, researchers, faculty, and staff. However, the influence of CI facilities on library services clearly indicates that further improvement is needed. NIT libraries should put more emphasis on online (e-journals), OPAC, CD-ROM, audio/video, communi-cation and support services rather than virtual reference, e-current awareness, electronic/web-based document delivery, electronic theses and dissertations, e-publishing etc. Further, the libraries require proper initiation, planning, management, and expertise to build their system and provide value-added services to users for meeting their information needs. Future studies may be conducted in other universities on infrastructure development in Indian context. The study can also be extended to other technical universities on financial implications for building up infrastructure facilities.

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Computer Infrastructure Facilities at the NIT Libraries–Rank Wise

S. No.	Zones	Library	No. of computers					No. of scanners	No. of barcode scanner	No. of printers		No. of TVs		No. of VCP/VCRs	
			<5	6-10	11-20	21-30	31 and above			≤ 5	>5	≤ 3	>3	≤ 3	>3
			(1)	(2)	(3)	(4)	(5)	(1)	(1)	(1)	(2)	(1)	(2)	(1)	(2)
1	North	MNNIT Allahabad	x	x	x	?	x	?	?	x	?	x	?	x	?
2		NIT Hamirpur	x	x	?	x	x	?	?	x	?	x	?	x	?
3		NIT Jalandhar	x	x	?	x	x	x	?	?	x	?	x	?	x
4		NIT Kurukshetra	x	x	x	?	x	?	?	x	?	?	x	?	x
5		NIT Srinagar	x	x	x	?	x	?	x	?	x	x	?	x	?
6	East	NIT Durgapur	x	x	x	?	x	?	?	x	?	?	x	?	x
7		NIT Jamshedpur	x	x	?	x	x	x	?	?	x	?	x	?	x
8		NIT Patna	x	x	x	x	?	x	x	?	x	x	x	x	x
9		NIT Rourkela	x	x	?	x	x	x	?	?	x	x	?	?	x
10	North East	NIT Agartala	?	x	x	x	x	x	x	?	x	?	x	x	x
11		NIT Silchar	x	x	x	?	x	?	x	?	x	x	?	x	?
12	South	NIT Calicut	x	x	x	x	?	?	?	?	x	?	x	x	?
13		NIT Surathkal	x	x	x	x	?	?	?	?	x	?	x	?	x
14		NIT Tiruchirapalli	x	x	x	?	x	?	?	?	x	x	?	x	?
15		NIT Warangal	x	x	x	x	?	?	?	?	x	?	x	?	x
16	West	MNIT Jaipur	x	x	?	x	x	?	?	?	x	?	x	?	x
17		VNIT Nagpur	x	x	x	?	x	?	?	?	x	x	x	x	x