

## IMPACT OF AUTOMATION ON THE LIBRARY SERVICES OF TECHNICAL INSTITUTIONS IN DELHI-NCR REGION

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The purpose of this study is to investigate the impact of automation on the services and operations of libraries of Technical Institutions of Delhi-NCR (India). The survey method has been used for collecting the relevant data through questionnaire and informal interviews from the randomly chosen samples from the selected libraries. The finding of the study reveals that Technical Institution Libraries have actively participated in the implementation of automation system in their libraries and moving towards the implementation of smart technologies like RFID Technology. Also, the current study highlights that few libraries are facing some constraints in the delivery of automated library services which includes paucity of space, lack of awareness about the available automated library services/facilities and lack of sufficient ICT skills etc. The overall results of the study shows that automation has positive impact in management and delivery of library resources in all the libraries under study.

**Keywords:** Library Automation, Library Management System, Technical Institutions, Information and Communication Technology, Library Services, Library Automation Software, RFID Technology and India.

### INTRODUCTION

The technical education plays a vital role in socio-economic development of any country. The focus of the technical education is to create skilled manpower, enhance industrial productivity and improve the quality of life of the people and to reduce the human efforts (MoE, 2020). The education system of Technical Institutions mainly focuses on research & development activities which require high imagination, judgement and reasoning ability (Vasishta, 2007). Hence, to conduct these research and development activities successfully; the demand for data and information always remain high in the Technical Education Institutions. Thus, the libraries of the Technical Institutions have the

responsibility to fulfill the need for data and information of their researchers/students.

The concept of library automation has been introduced and adopted by the libraries to manage the collection, keep library records updated, control the circulation of library resources and to provide varied services/facilities to the users in easy and speedy manner (Das & Chatterjee, 2015). It has been noticed in the library that a library staff performs various repetitive tasks and clerical jobs which consume lot of time of the staff as well as the users. To avoid such repetitive work and to provide quality & fast delivery of services to the library users; implementing automation has become the necessity.

### **NEED OF THE STUDY**

There are various renowned Technical Institutions located in Delhi-NCR; which are using automation-based library system to offer various services & facilities to their users. But there was no such study which showed the status of automation-based library services/facilities and the impact of automation on the services of Technical Institution Libraries located in Delhi-NCR. Thus, the present research study was undertaken to find out the current status of the automation in the Technical Institution Libraries of Delhi-NCR and its impact on the delivery of library services/facilities.

### **REVIEW OF RELATED LITERATURE**

In today's digital environment where the information is available in various formats, the libraries are not just the store house of printed

collection. The libraries have emerged with the help of latest trends and technologies available in the market to fulfill the needs and demands of their users. Thus, with the change in the technology; the roles of librarians are also changing (Verbeek & Rowe, 2000). The 'Automation of Libraries' is also a result of the various innovative technologies that have been developed and adopted in this ICT driven society. Therefore, through the below related studies, the authors will try to understand how automation has impacted the libraries and its style of serving its end users.

The research study conducted by Singh (2003) states that the automation has impacted library services and facilities in a better way and the libraries are doing efforts to make themselves updated with the latest trends and technologies. Acquisition is a time consuming process in a library thus, Line (2006) through his study shows how automation of acquisition has reduced the time spent on various clerical works. The study highlights that automated acquisition system has reduced the time spent on processing recommendation by 30 percent and accounting, printouts of orders, summary can be done automatically which saves time of the staff. The study conducted by Margam and Singh (2010) demonstrates that the circulation timing has been reduced after the implementation of RFID technology which have further increased the use of the library. The findings of the study conducted by Anas et. al. (2014) reveal that majority of librarians and library users believe that automation has improved the services and the automated library services are better than manual library

services. The maximum numbers of users are satisfied with the automated library services and only few users have showed dissatisfaction. Sekar and Majeed (2015) have investigated that some engineering college libraries affiliated to Anna University Thanjavur and Thiruvavur are facing problem of trained human resource, finance and good infrastructure for library automation. The author further states that the libraries can focus on the use of Open Source Software like KOHA, DSpace, e-granthalaya etc. which are freely available on internet for the automation of the college libraries who have lack of budget for the library automation. A reflective study conducted by Onuoha and Obialor (2015) show the impact of Information Technology on modern librarianship and the study reveals that the library housekeeping operations have been speeded up after the implementation of ICTs. The study also highlights that the ICT has made delivery of library service very easy as expected by the users in this electronic age.

Packiyaraj et al. (2016) state that the library automation have a crucial role in the management of library as well as delivery of library services to its clients and library automation required good co-ordination between librarians and computer professionals. The study indicates that the future libraries will focus on the automation systems which are necessary to change the way libraries organize themselves. Atanda (2018) discusses about the impact of library automation in Nigerian Universities. The study focusses on the regular in-house ICT training so that maximum benefit can be gained from the automated library services. The study conducted by Nayana (2019) depicts

the status and problems faced during the implementation of library automation in aided degree colleges affiliated to Bangalore University, Bengaluru. The study states that 81.81% of libraries are automated and main problems for not being automated are inadequate staff, lack of infrastructure, insufficient funds and lack of training to library staff.

The research by Chitra and Kumbar (2020) provide an insight to the ICT infrastructure available for automation and constraints faced by librarians for automation of first grade college libraries affiliated to University of Mysore. The findings reveal that computers and internet connectivity are still entering at very slow pace in the academic library setup that helps in handling the various day to day routine activities. The major constraints in library automation includes the inadequate budget and lack of skilled manpower to automate and maintain up-to-date library services. The study conducted by Ajani and Buraimo (2021) aim at assessing the status of library automation, the impact of automation on library services and challenges faced by university library in the maintenance of automated system towards the delivery of effective library services. The findings reveal that library automation has a positive impact on library services. The lack of technical support from the vendor, lack of funding, attitude of library personnel and technophobia were among the various challenges faced by the library.

From the reviews it can be observed that many libraries have stepped into the automation process by using various library automation software (Open-source/Commercial) available in

the market. The studies show that delivery of services and time management have been improved with the introduction of automation in libraries. The libraries are improving & developing themselves by adopting and implementing various automation-based services. However, some libraries are still struggling with the problems like lack of financial support, trained staff, lack of ICT infrastructure etc.

### **STATEMENT OF THE PROBLEM**

The libraries of higher Technical Education Institutions serve the needs of specialized users and their objective is to support the academic programs of their parent institutions. Therefore, the library of Technical Institutions has become an important source of information for the academic community to fulfill the requirement of course curriculum, study and research (Vasishta, 2007). In the present computer driven society; the libraries have the challenge to provide the accurate information to its users but the growth and complexity of information in the field of Science & Technology pose a problem in the accumulation, storage and dissemination of information (Anas et al., 2014). Therefore, to organize the vast amount of information in order to provide effective services to the users; the library automation has become an essential tool for the libraries of technical education institutions (Rai & Kumar, 2011).

In India, it has been observed that many libraries are facing various challenges in the implementation of automation-based library services/facilities like lack of ICT infrastructure,

insufficient fund, and lack of skilled library staff etc. (Issa et al., 2011). There are various libraries where many services are still provided manually which need to be automated. Also, the library staff is reluctant to change from traditional ways of dispensing library services to application of modern Information Technology and due to this most of the library services which are available in the library software are remain unutilized (Gbadamosi, 2011). There are no such previous studies through which the status and impact of automation on the services of Technical Institutions libraries located in Delhi-NCR can be identified. Therefore, the current study helps to explore the types of automated library services being offered by the libraries of Technical Institutions and challenges faced by the libraries in the implementation of automated library services/facilities.

### **OBJECTIVES OF THE STUDY**

The main objective of the study is to explore the impact of automation on the services and operations of libraries of Technical Institutions in Delhi-NCR. More specifically, the objectives of the present study are:

1. To study the current status of various library operations which are performed through the library automation software in the libraries of selected Technical Institutions of Delhi-NCR.
2. To explore the new automated library services initiated/started by the libraries of the Technical Institutions.

3. To identify the provision of orientation and training programs for the library staff.
4. To study the challenges faced by the selected Technical Institutions in the delivery of automated library services to the users.

### **SIGNIFICANCE OF THE STUDY**

The present study will help to find out the current status of automation in libraries of the renowned Technical Institutions located in Delhi-NCR along with the impact of automation on the library services/facilities. The study will try to identify the challenges faced by the selected Technical Institutional libraries in the delivery of automated library services to their users. The study will also highlight the improvement in the delivery of services/facilities after implementation of automation in these libraries as well as the future plans of the libraries regarding implementation of new technologies available in the market. The current research study will definitely benefit the other libraries who are still using manual based library system and looking for the opportunities to implement automation in their current library system.

### **SCOPE AND METHODOLOGY**

The scope of this study has certain limitations like type of Institution/Libraries, automation software used by the libraries, ICT infrastructure and location (only Delhi-NCR). The current study will cover five renowned Technical Institutional libraries located in the Delhi-NCR region which are using library automation software for the management of its collection and

delivery of its various library services/facilities. The following Technical Institutional libraries have been selected for the study:

- i. Central Library, Indian Institute of Technology Delhi
- ii. Central Library, National Institute of Technology Delhi
- iii. Central Library, Delhi Technological University
- iv. Library & Information Center, Indraprastha Institute of Information Technology Delhi
- v. Central Library, Netaji Subhash University of Technology, Delhi

The data collected through survey includes the response received from the library professionals of the concerned libraries. The data has been collected through various formal and informal sources of data collection like questionnaire, observation and interview method etc. to determine type of ICT infrastructure and facilities, automation software and library services etc.

### **ANALYSIS AND INTERPRETATION OF DATA**

#### **Automation Software used by the Libraries**

The table 1 depicts that the two libraries i.e. IIT Delhi and NIT Delhi are using commercial library automation software i.e. Libsys while other three libraries i.e. DTU, IIIT Delhi and NSUT are using Open Source Library Management System.

### Factors that influenced Libraries for selecting their Current Automation Software

The table 2 shows the factors that influenced the libraries for selecting the current automation software used by them. The evaluation of each module, demo of the software by vendor, recommendation/feedback of other technical institution libraries and comparative evaluation of

various LMS are the common factors that influenced the library of IIT Delhi, NIT Delhi, DTU and IIIT Delhi for the selection of their current automation software. The cost effectiveness of the software helped DTU for the selection of their current automation software. The NSUT has selected its current automation software because it is a government supported software.

**Table 1: Automation Software used by the Libraries**

Sl. No.	Name of the Institute Library	Software Used	Version	Nature of the Software
1.	Central Library, IIT Delhi	Libsys	7	Commercial Software
2.	Central Library, NIT Delhi	Libsys	7	Commercial Software
3.	Central Library, DTU	KOHA	3.22.05.000	Open Source Software
4.	Library & Information Center, IIIT Delhi	KOHA	3.22.06.000	Open Source Software
5.	Central Library, NSUT	e-Granthalaya	eG 3.0	Open Source Software

**Table 2: Factors that influenced Libraries for selecting their Current Automation Software**

Factors that influenced Libraries	Name of the Technical Institution				
	IIT Delhi (Libsys)	NIT Delhi (Libsys)	DTU (Koha)	IIIT Delhi (Koha)	NSUT (e-Granthalaya)
Evaluation of each Module	✓	✓	✓	✓	--
Demo of the Software by vendor	✓	✓	✓	✓	--
Recommendation/Feedback of other Technical Institute Libraries	✓	✓	✓	✓	--
Comparative evaluation of various LMS	✓	✓	✓	✓	--
Cost effectiveness of the LMS	--	--	✓	--	--
Variety of Services offered by Automation Software	✓	✓	✓	--	--
Government Supported Software	--	--	--	--	✓

### Status of Operational Modules through the Automation Software

The table 3 highlights that all modules i.e. Acquisition, Cataloguing, Circulation, Serial

Control, Budgeting, OPAC, Library Administration are operational and used by the libraries except budgeting module in NSUT.

**Table 3: Status of Operational Modules in Libraries**

Modules of Library Automation	Name of the Technical Institution				
	IIT Delhi	NIT Delhi	DTU	IIT Delhi	NSUT
Acquisition	✓	✓	✓	✓	✓
Cataloguing	✓	✓	✓	✓	✓
Circulation	✓	✓	✓	✓	✓
Serial Control	✓	✓	✓	✓	✓
Budgeting	✓	✓	✓	✓	--
OPAC/WebOPAC	✓	✓	✓	✓	✓
Administration	✓	✓	✓	✓	✓

### Comparison of Services/Facilities Offered, Before & After Implementation of Automation in Libraries

The table 4 clearly indicates that various services has been introduced after implementation of automation in the libraries which was not possible in manual system. The books circulation is a common facility that is provided in all libraries before as well as after

implementation of automation system. The IIT Delhi is offering maximum no. of services to its users before implementation of automation except federated search facility. While in other libraries, various services/facilities like bibliographic search facility, renewal facility, book recommendation facility is also offered to the users before implementation of automation system in libraries. While the other services like

**Table 4: Comparison of Services/Facilities Offered, Before and After Implementation of Automation**

Services/Facilities	IIT Delhi		NIT Delhi		DTU		IIT Delhi		NSUT	
	Before	After	Before	After	Before	After	Before	After	Before	After
Books Circulation Facility (Check In/Check Out)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bibliographic Search Facility	✓	✓	--	✓	✓	✓	--	✓	✓	✓
Federated Search Facility	--	✓	--	✓	--	✓	--	--	--	✓
Renewal Facility	✓	✓	✓	✓	--	✓	--	✓	✓	✓
Books Reservation Facility	✓	✓	--	✓	✓	✓	--	✓	--	✓
Library Alerts/SMS Service	✓	✓	--	✓	--	✓	--	✓	--	✓
Current Awareness Services	✓	✓	✓	✓	--	✓	--	✓	--	--
Book Recommendation Facility	✓	✓	✓	✓	✓	✓	--	✓	✓	--
User's Feedbacks/ Suggestion Facility	✓	✓	--	✓	--	--	--	✓	✓	✓

Email/SMS alert, federated search facility, reservation facility, user feedback and suggestion facility was started after implementation of automation System in library. Thus, the implementation of automation system in libraries has improved quality of services in libraries.

### Status of RFID Technology in Libraries

The table 5 shows that IIT Delhi, NIT Delhi and IIIT Delhi have implemented RFID based automation system while DTU and NSUT are currently not using RFID system in their library. The IIT Delhi has implemented RFID system in all areas while in NIT Delhi RFID based stock

verification is not yet implemented. The IIIT Delhi has installed RFID based Circulation (Self Check-In/Check-Out) system and RFID sensor gates only.

### Status of OPAC Facility in Libraries

The results in the table 6 reveal that all libraries provide Open Public Access Catalogue (OPAC) facility to access and retrieve the bibliographical details of library collection. All libraries are providing OPAC facility through intranet (IP based access) as well as internet. Also, the libraries have installed separate computer terminals for using OPAC facility in the library.

**Table 5: Status of RFID Technology in Libraries**

Status of RFID Technology	Name of the Technical Institution				
	IIT Delhi	NIT Delhi	DTU	IIIT Delhi	NSUT
Does RFID system is compatible with your current Automation System (Yes/No)	Yes	Yes	Yes	Yes	Yes
RFID Implemented (Yes/No)	Yes	Yes	No	Yes	No
Areas of RFID Implementation					
RFID based Self Check-In/Check-Out system	✓	✓	--	✓	--
Sensor Gates (for theft control of library material)	✓	✓	--	✓	--
RFID Smart Cards (for easy and faster circulation)	✓	✓	--	--	--
Stock Verification	✓	--	--	--	--

**Table 6: Status of OPAC Facility in Libraries**

Status of OPAC Facility	Name of the Technical Institution				
	IIT Delhi	NIT Delhi	DTU	IIIT Delhi	NSUT
OPAC facility through internet (WebOPAC)	✓	✓	✓	✓	✓
Availability of separate computer terminals for OPAC facility (Yes/No)	Yes	Yes	Yes	Yes	Yes
No. of separate computer terminals in library for using OPAC	10	02	07	01	01



The result shows that the IIT Delhi has the maximum number of computer terminals while IIT Delhi and NSUT have installed only 01 separate computer terminal for using OPAC facility.

### **Automation based Services & Facilities Introduced/Implemented by the Libraries**

In today's digital environment the libraries should keep them updated with latest trends and technologies and should introduce some latest automation based digital services & facilities to grab the user's attention towards the library. Therefore, the Table 7 shows that IIT Delhi, NIT Delhi and NSUT have started some new

automation-based services and facilities while the other two libraries i.e. DTU and IIT Delhi have not started any new services in their library.

### **Future plans of Libraries for implementing Automation based Services/Facilities**

Keeping in view the current trends & technologies available in the market, it can be clearly seen in Table 8 that NIT Delhi wants to implement RFID based Stock Verification system and user's feedback and suggestion facility through LMS, while DTU and NSUT want to implement RFID technology and SDI service respectively.

**Table 7: Status of Automation based Services/Facilities Introduced/Implemented by the Libraries**

Status of Services/ Facilities	Name of the Technical Institution				
	IIT Delhi	NIT Delhi	DTU	IIT Delhi	NSUT
Yes/No	Yes	Yes	No	No	Yes
Name of Service/ Facility Introduced	1. News Alert Service related to academic affairs	1. Book Reservation 2. Overdue Reminders	--	--	1. Email Alerts Service

**Table 8: Future plans of Libraries for implementing Automation based Services/Facilities**

Name of the Technical Institution	Service/Facility (1)	Service/Facility (2)
IIT Delhi	--	--
NIT Delhi	Stock Verification through RFID system	User Feedback & Suggestions through LMS
DTU	RFID	--
IIT Delhi	--	--
NSUT	SDI	--

### **Provision for Orientation/Training Programme in Libraries**

The table 9 indicates that all the libraries organize training programme for their staff

members for handling the Automation System. All the libraries organize the orientation/training programme for their users in the beginning of each academic session except NSUT library.

**Table 9: Provision for Orientation/Training Programme in Libraries for using Automation based Services/Facilities**

Provision for Orientation/ Training Programme	Name of the Technical Institution				
	IIT Delhi	NIT Delhi	DTU	IIIT Delhi	NSUT
For library Staff	✓	✓	✓	✓	✓
For library Users	✓	✓	✓	✓	--
Does Automation have reduced the time devoted by library staff on various repetitive work as well saved time of users (Yes/No)	Yes	Yes	Yes	Yes	No

### Impact of Automation on various Library Activities/Services/Facilities

The table 10 reflects that user satisfaction, increase in number of circulation transactions at desk, better time management of library routine

activities, increase in number of user's visit to the library, easy accessibility (24x7), modernization of the library and increased security of documents are the common areas where impact of automation can be seen in all respondent libraries.

**Table 10: Impact of Automation noticed on various Library Activities/Services/Facilities**

Impact	Name of the Technical Institution				
	IIT Delhi	NIT Delhi	DTU	IIIT Delhi	NSUT
Enhanced user's satisfaction	✓	✓	✓	✓	✓
Increased number of Circulation transactions at desk	✓	✓	✓	✓	✓
Helpful in building appropriate collection	✓	✓	✓	--	✓
Enabled self Check-In/self Check-out	✓	✓	--	✓	--
Better Time Management of library Routine Activities	✓	✓	✓	✓	✓
Increase in no. of user(s) visit to the library	✓	✓	✓	✓	✓
Easy Accessibility (24x7 from anywhere any time)	✓	✓	✓	✓	✓
Better library Resource Management	✓	✓	✓	--	✓
Facilitated in Networking with other Libraries	✓	--	--	--	✓
Helped in Digitization of library resources	--	--	✓	--	--
Helped in the adoption of innovative practices in library	--	--	--	--	✓
Modernization of the library	✓	✓	✓	✓	✓
Increased security of Documents	✓	✓	✓	✓	✓
RFID Implementation	✓	✓	--	✓	--

### Challenges Faced by Libraries in the Delivery of Automated Library Services

The Table 11 identifies that IIT Delhi and IIIT Delhi is not facing any challenges in the implementation and delivery of automation-based library services and facilities. The NIT Delhi has

paucity of space as the library is located in a temporary campus. The lack of awareness about the available automated library services/facilities is the major barrier faced by the DTU while NSUT has lack of sufficient ICT skills and staff support for delivering automated library services & facilities.

**Table 11: Challenges Faced by Libraries in the Delivery of Automated Library Services**

Challenges/Barriers	Name of the Technical Institution				
	IIT Delhi	NIT Delhi	DTU	IIIT Delhi	NSUT
Lack of sufficient ICT infrastructure and facilities	--	--	--	--	--
Lack of sufficient ICT skills and staff support	--	--	--	--	✓
Poor Internet Connectivity	--	--	--	--	--
Lack of awareness about the available Automated library Services	--	--	✓	--	--
Lack of Budget/Funds	--	--	--	--	--
Paucity of Space in Your library	--	✓	--	--	--
No Barrier faced	✓	--	--	✓	--

### Satisfaction Level of Librarians with Current Library Automation Software

The librarians have a responsibility to supervise and manage the overall library resources and system for the smooth delivery of services

to the users. Thus, it can be seen in the Table 12 that all the librarians are satisfied with their current automation software and no one has responded about dissatisfaction towards the automation software used in their libraries.

**Table 12: Satisfaction Level of Librarians with their Current Library Automation Software**

Level of Satisfaction	Name of the Technical Institution				
	IIT Delhi	NIT Delhi	DTU	IIIT Delhi	NSUT
Strongly satisfied	--	--	--	--	✓
Satisfied	✓	✓	✓	✓	--
Neither satisfied nor dissatisfied	--	--	--	--	--
Dissatisfied	--	--	--	--	--
Strongly Dissatisfied	--	--	--	--	--

## CONCLUSION

The findings of the present study reveals that the Technical Institutional libraries covered under study are actively involved in the automation of their library as all the libraries have completely implemented automation in all the housekeeping operations and have adopted various new services/facilities like book reservation, email/SMS alert, current awareness service etc which were not possible in the manual-based library system. The internet & intranet based OPAC facility has played a very crucial role to access and retrieve the bibliographical details of library collection. Along with OPAC, the libraries are moving towards the implementation of smart technologies like RFID system as IIT Delhi, NIT Delhi and IIIT Delhi have already implemented RFID technology-based automation system while DTU wants to implement RFID system in future. The libraries of Technical Institutions are keeping themselves updated by implementing various new automation-based services/facilities like IIT Delhi has initiated 'News Alert Service related to academic affairs', NIT Delhi has started book reservation & overdue reminders and NSUT has introduced 'Email Alert Service' in the recent past years. All the libraries under study organize orientation/training programs for library staff as well as users (except NSUT) for handling and using automation-based services/facilities. The study also demonstrates that some libraries are facing major constraints in the delivery of automated library services which includes paucity of space in NIT Delhi, lack of awareness about the available automated library services/facilities in DTU and sufficient ICT skills & staff support at NSUT.

Finally, from the findings; it can be concluded that automation has a positive impact in management and delivery of library resources and all the libraries are satisfied with their current automation software.

## SUGGESTIONS FOR FURTHER RESEARCH

With the above findings, it has been observed that various latest trends and technologies have been taken place in the libraries of Technical Institutions. The libraries are continuously working for the improvement of the library services/facilities and implementing various latest automation-based technology to maximize the user's satisfaction. The end users are the actual consumers of various library resources, services & facilities, therefore a detailed study is required where the actual needs of the users can be identified and keeping in mind those needs, library automation software should be customized and developed accordingly. Also, a detailed study of various challenges/constraints faced by the libraries in the implementation of automation can be done so that necessary steps may be taken for the improvement of the same.

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