

IMPLEMENTATION OF EMERGING TECHNOLOGIES IN THE LIBRARIES OF CENTRAL UNIVERSITIES IN NORTH EAST INDIA: A STUDY

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ABSTRACT

INTRODUCTION

Technology is rapidly changing. In today's world of the digital era, technology is the key factor that has changed the way people think, work, communicate, exchange ideas, search and create knowledge. Internet and web technology can be held responsible as the major reason behind this change that has occurred in this new age. Therefore, it becomes necessary for the library and information science professionals to understand the changes and different forms of emerging technologies so that they can provide a full-fledged service to their technologically updated users. Librarians also need to develop skills and strengths so that they can cope with the technological changes in the world.

Change is a reality, with which people must continuously fight to survive. For worldwide acceptance, it is necessary for people to understand and make changes accordingly in their attitude towards these technologies. These changes have ultimately led to the overall new form and nature of the library and library professionals.

Library plays an important and dynamic role in academic libraries. It helps to support the aims and objectives of the parent organizations. The libraries provide various kinds of collection of resources for their users. Libraries collect, store, and arrange numerous types of materials for their users. A library is a collection of printed and non-printed reading materials that are organized to provide a variety of services to users with the assistance of professional staff.

Central universities or union universities in India are established by an act of Parliament and are under the purview of the Department of Higher Education in the Ministry of Education. In General, universities in India are recognized by the University Grants Commission (UGC), which draws its power from the University Grants Commission Act, 1956. In addition, 15 Professional councils are established, controlling different aspects of accreditation and coordination. Central Universities, in addition, are covered by the Central Universities Act, 2009, which regulates their purpose, powers, governance etc., and established 12 new universities. As of 31

March 2021, the list of central universities published by the UGC includes 54 central universities (Wikipedia, Central University, 2021).

The North East part of India is comprised of eight states. These states form an influential geographic entity, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. The advancement of these regions is hindered by certain internal difficulties, such as inadequate infrastructure, unfavorable climatic conditions, and mountain scenery. The region, however, endures rich biodiversity and natural resources. In many of these regions, the literacy rate is higher than in the rest of the country. Quality higher education is a prerequisite for the creation of knowledge infrastructure which leads to the development of qualified and empowered human resources. Quality higher education in any region can be promoted by national institutions and universities, therefore here comes the role of libraries and information centres which act as an important component of any learning institution.

The central libraries of central universities are one of the predominant support services. The duty of central libraries of central universities is to provide information services and access to bibliographic and full text digital and printed resources to support the scholarly and informational needs of the students, faculty, and staff. The library offers books and reading materials. The present study focuses on the status and implementation of emerging technologies, digital resources and services used, technology-based infrastructure available, networking ventures, etc. in the central university libraries established in the North Eastern region of India.

NORTH EASTERN REGION (NER) OF INDIA

The Eastern most part of India is known as North East India (officially, North Eastern Region, or NER). The Indian government has become interested in the region's overall growth over the past 20 years. The seven states collectively known as the "seven sisters" make up the North Eastern Region, which recently welcomed Sikkim as one of its eight member states in 2001. These states are Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Sikkim.

There are eleven Central Universities in the North Eastern Region they are *Assam University, Silchar; Tezpur University, Tezpur; NEHU, Shillong; Nagaland University, Kohima; Mizoram University, Aizawl; Manipur University, Imphal;*

Central Agricultural University, Imphal; Rajiv Gandhi University, Arunachal Pradesh; Sikkim University, Sikkim, and Tripura University, Agartala.

Numerous insurgencies and ethnic conflicts in India's North Eastern Region generate headlines, but they hardly capture the range of problems these states face. Education, which is one of the core features of any state or country's infrastructure, is inadequate in these states (Naskar, 2009). In order to receive a regular, high-quality education, many students from North East India leave their homes and go to neighbouring states each year. The presence of students from throughout the nation is undoubtedly a source of pride for any institution, but the trend highlights the reality that some current institutions are unable to meet the academic and career goals of the region's young scholars.

Higher education underwent a dramatic transformation in the second half of the 20th century, displacing the colonial system of instruction where knowledge and higher education were kept in the hands of a select few people. According to many top academicians worldwide, there is a focused and highly motivated effort underway to create a "Knowledge Society" in which everyone has access to information and knowledge and where general and higher education is seen as a crucial instrument. Therefore, the North Eastern Region cannot remain isolated from this educational growth when India and other nations are also a part of it (Naskar, 2009).

OBJECTIVES OF THE STUDY

The main objectives of the study are as follows: -

- To identify the status of emerging technologies adopted by the libraries of the central universities.
- To know the attitude of librarians towards the emerging technologies.
- To find out the level of technological compatibility among the staffs of the libraries.
- To explore the barriers to emerging library technologies.
- To assess the budget allotted for the digital technologies and resources to the libraries.

SCOPE AND LIMITATIONS OF THE STUDY

The term scope specifies the boundaries within which a study is performed. Basically, it defines the coverage area of the study and what the study is focusing on. The scope of the present study includes 8 Central Universities in the North East Regions of India. National Sports University (Manipur), Central Agricultural University (Manipur) and Nagaland University have been excluded from the study because these universities provide education in specific disciplines. The table below shows the state-wise distribution of selected Central Universities in the North East Region of India.

Table- 1.1: State-wise list of selected Central Universities in North East India

S.no.	State	Name of the Central University	Year of establishment
1.	Meghalaya	North-Eastern Hill University	1973
2.	Manipur	Manipur University	1980
3.	Arunachal Pradesh	Rajiv Gandhi University	1984
4.	Tripura	Tripura University	1987
5.	Assam	Assam University	1994
6.	Assam	Tezpur University	1994
7.	Mizoram	Mizoram University	2000
8.	Sikkim	Sikkim University	2007

HYPOTHESES OF THE STUDY

- The libraries in the North East Region have well adopted the emerging technologies.
- The library staff needs the opportunities to upgrade their technological understandings.
- Most of the central university libraries are facing budget crisis to upgrade themselves in this technological environment.

RESEARCH METHODOLOGY

Research methodology is the specialized procedures or strategies used to recognize, gather, process, and evaluate a subject data. The methodology chapter enables the reader to critically assess the general validity and reliability of a study in a study job. Two primary issues are answered by the methodology chapter: how information was gathered or collected and how it was analyzed.

Research methodology may be understood as a science of studying how research is done scientifically. In it, we study the various steps that are generally adopted by researchers in studying his research problem along with the logic behind them. Research in common parlance refers to a search for knowledge. The advance learner's Dictionary of current English lays down the meaning of research as "a careful investigation or enquiry especially through search for new facts in any branch of knowledge". In other terms, research is an in-depth study of the status, to find out inner truth, inner story, of any subject of interest and to solve problems that society confronts. It helps the administration to foresee the prospects and to take appropriate decisions. It improves the knowledge of the various aspects of society regarding the problems, and prospects in his field of activity. According to Clifford Woody, a research study includes problem definition and redefinition, formulation of assumptions or proposed alternatives, information collection, organization and evaluation, deduction, and conclusions, and finally closely assessing findings to determine if they are appropriate for hypothesis formulation. Research is a primary contributor to the advancement of the existing stock of knowledge. Research seeks the truth by means of systematic study, knowledge research through aims and a systemic approach to solving an issue. Research is also a systematic approach to generalization and the formation of theory.

Sample Size of the Study-

The type of research used for the present study is descriptive in nature which includes survey and fact-finding enquiries of different kinds. The major purpose of the survey is to identify the trends and technologies adopted by the libraries of the central universities.

In the present study the total population of the study is the central university libraries in North East India. There are 11 central universities in North East India out of which

08 have been selected for the study. The sample of the study includes the Librarians/ Deputy Librarians/ Assistant Librarians of the central libraries in the central universities of North East India.

Data Collection-

Data collection is the fundamental requirement of any research. Due to COVID-19 situations and lockdown the data for the present study was collected with the help of structured online questionnaire. It was distributed to the individual email IDs of Librarian/ Deputy Librarian/ Assistant Librarian.

NEED OF THE STUDY

The present study is useful in identifying the current technologies adopted by the libraries of the central universities of North East India. Also, the study helps to highlight the status of libraries of the North Eastern Regions amongst all in this digital age. Emerging technologies in this digital era play a major role in communication as well as dissemination of information to the users. This study also highlights the implementation of emerging technology applications in the North East central university libraries. It may be used as an irresistible urge for the other universities to implement Emerging Technology in their Libraries.

FINDINGS OF THE STUDY

- 100% of the responses have been received from the Librarians or Deputy Librarians or Assistant Librarians of the Central University Libraries of North East.
- Among all the respondents, 02 respondents were Librarian, 01 Librarian in-charge, 01 Deputy Librarian and 04 were Assistant Librarians.
- Among all the respondents from Central Universities of North East, 07 were male while one respondent was female.
- Out of the 08 respondents, 05 respondents were more than 40 years old, while 03 respondents were between 31-35 years old.

- 05 respondents out of the 08 Universities were Ph.D., 01 was M.Phil. and 02 were Postgraduate.
- 03 respondents have professional experience of more than 25 years, 02 respondents have experience between 16-25 years and 03 respondents have professional experience between 06-10 years.
- Tezpur University, Assam has maximum number of sitting capacities of 200, available in its central library for the users followed by 250 sitting capacities available in Tripura and Assam University Library, 200 sitting capacity in Rajiv Gandhi University, Arunachal Pradesh, 100 sitting capacity each in Mizoram University and Sikkim University.
- Tezpur University has the maximum number of total users (5000) followed by least number of 2500 total users available in Rajiv Gandhi University, Arunachal Pradesh.
- Out of 8 Central Universities, North-Eastern Hill University, Shillong (NEHU), is the oldest Central University which was established in 1973 and Sikkim University (A Central University), Sikkim is the newest Central University established in 2007.
- North-Eastern Hill University, Shillong has maximum number of library professionals 29, working in its library including 1- Deputy Librarian, 3- Assistant Librarians, 1- Information Scientists, 1- Professional Assistant, 3- Semi-Professional Assistants, 5- Library Attendants and 15- other staffs. On the other hand, Rajiv Gandhi University, Arunachal Pradesh was found to have the least number of library professionals 04 working in its library which includes 1- Assistant Librarian, 1- Professional Assistant and 2- other staff working.
- Out of 08, 04 Universities TU, Tripura; RGU, Arunachal Pradesh; TEZU, Assam and MZU, Aizawl have found that adequacy of library budget for the implementation of Emerging Technologies in their library is not sufficient. However, the other 02 universities AUS, Silchar and CUS, Sikkim find the adequacy of budget sufficient for their Libraries.

- 05 Universities of RGU, Arunachal Pradesh; TU, Tripura; AUS, Silchar; MZU, Aizawl and CUS, Sikkim are found to have fully automated status in their library whereas rest 3 Universities of NEHU, Shillong; MU, Manipur and TEZU, University have partially automated library.
- 07 out of 08 Universities are using KOHA Integrated Library Management Software for their Library while the other MZU, Aizawl University is using TLSS software in its Library.
- With respect to the list of 14 emerging technologies mentioned in the table-5.4.1 most of the respondents (06 out of 08 respondents) from the MU, Manipur; TU, Tripura; AUS, Silchar; TEZU, Assam; MZU, Aizawl and CUS, Sikkim universities are fully aware of the 14 technologies mentioned in the list.
- Most of the libraries 06 out of 08 have fully adopted technologies such as WebOPAC, integrated library management systems, RFID, remote access to e-resources, smart card discovery services and barcode technology.
- WebOPAC, integrated Library Management Systems, barcode are being used by the university libraries since more than 10 years.
- Almost all the technologies (11 out of 14) from the list are being very frequently used by the university libraries such as integrated library management software, RFID, WebOPAC, remote access to e-resources, barcode, smart card, etc.
- Maximum number of (07 out of 08) respondents strongly agree to the point that emerging technologies leads to advanced/ better library services as well as it also speeds up the library operations. 06 respondents strongly agree that emerging technology improves the image/ reputation of the library and also it brings coordination in the routine work of the library.
- According to the table 5.4.7 maximum number of university libraries (06 out of 08) make use of social networking sites for enhancing their library activities and events.

- 05 out of 08 university libraries are using digital/ institutional repository services. However, the software being used by the university libraries for this purpose is D-Space.
- Security systems used by most of the libraries (06 out of 08) is RFID, followed by CCTV, and smart cards.
- Most of the university libraries (04 out of 08) frequently conduct user education and orientation programmes for newcomers/ new users in the library. Whereas 04 university libraries also conduct such programmes for old students and research scholars.
- Most of the respondents (05 out of 08) are satisfied with the emerging technologies being used in their libraries.

Findings based on the objectives of the study

Objective 1: To identify the status of Emerging Technologies adopted by the Libraries of the Central Universities.

Most of the libraries 05 have fully adopted technologies such as Integrated Library Management Systems, barcode, smart card, remote access to e-resources, WebOPAC, ask-a-librarian, RFID, discovery tools/ services. (Table- 5.4.3)

Objective 2: To know the attitude of Librarians towards the Emerging Technologies.

It was found that Librarians of the Central University Libraries are very much aware of the Emerging Technologies. 06 out of the 08 respondents have full awareness regarding the new technologies. (Table- 5.4.1) Their self-learning/ self-motivated attitude made them aware of these technologies, formal training/ workshop/ conference being one of them. (Table- 5.4.2)

Objective 3: To find out the level of technological compatibility among the staff of the libraries.

According to the Librarians of the Central Universities only the majority of library staff are efficient in handling Emerging Technologies. Table 5.5.1 shows the efficiency of library staff. 02 Central University libraries have all efficient and

technologically compatible library staff whereas 03 Central University libraries have majority of their staffs efficient and compatible technologically. However, there is also some requirement of technical training for handling Emerging Technologies. Most of the libraries 06 out of 08 require technical training for the same. (Table- 5.5.4)

Objective 4: To explore the barriers to emerging library technologies.

02 University Libraries out of 08 have strongly agreed with the barriers faced such as scarcity of funds, lack of ICT infrastructure, inadequate knowledge, and technical skills among library professionals, increasing cost of hardware software, data security concerns and poor internet. The other 02 were found to have agreed with all the barriers such as lack of awareness among users, non-availability of consultancy services, scarcity of funds etc. (Table- 5.5.7)

Objective 5: To assess the budget allotted for the digital technologies and resources to the libraries.

Table 5.3.2 clearly depicts the budget details of the 04 university libraries. Whereas the rest 04 university libraries did provide these details. Although 04 universities did not provide the details but from Table- 5.3.4, 05 university libraries mentioned that the budget provided to them is not sufficient.

CONCLUSION

Information Technology plays a vital role in all the branches of knowledge. The library and information science are not exceptional. Information Technology (IT) entered libraries, especially academic and research libraries, during the 1960s. Libraries employed Information Technology to speed up their daily actions and reduce their functioning costs. In the digital era, bulk reading material is available in electronic form which can be accessed through the internet as well as intranet. The libraries are utilizing Information Technology for the modernization of housekeeping operations as well as library resources and services. Advancement in Information Technology has changed the scenario of libraries in the digital environment. Library professionals should use Information Technology as a tool to facilitate library services for their users.

Central Universities have given due recognition and importance to their libraries. Libraries form an important integral part of central university education system in India. Basically, the main function of a university library is to provide suitable information materials useful for study, teaching, research, and education purposes in a university. The Central University libraries, in general, are better placed in terms of its resources i.e., collection, staff, budgets, users and infrastructural facilities. The major reasons for using emerging technologies are to improve access to the collection, to improve the quality of existing services and to reduce routine and time-consuming clerical options.

Emerging technologies like Web 2.0, Web 3.0, and social media have made it possible to advertise information resources and services and reach the target audience with a variety of tools and methods. The idea that librarians do not showcase what they do in libraries and what amenities they provide for users has been disproved by their adoption of web-based technologies. In an effort to draw people to the library, the original source of information, libraries should make an effort to bring their information resources to platforms where users are already present and engaged in conversation with them. The Internet is full of tools that libraries can employ to offer their library materials and services, including social networking sites, instant messaging, vodcast, RSS feeds, mobile technology, and QR codes. Therefore, understanding new technologies and how they are utilised should be a top priority for librarians, along with choosing the best tools to use and determining the target audiences.

STRUCTURE OF THE THESIS

Present study is divided into following chapters:

Chapter- 1: Introduction

In the first chapter, following points have been discussed such as background of the study, libraries and Information Technology, Information and Communication Technology, applications of Information and Communication Technology, Emerging Technologies, objectives of the study, scope of the study, hypotheses, research methodology, sample size and significance of the study.

Chapter- 2: Review of Literature

The second chapter, review of literature, discusses all recent study on Information and Communication Technologies in libraries and services in different institutions or universities of national and international level. It encompasses such as general studies on ICT, studies on ICT infrastructure, studies on e-resources, studies on library automation, studies on web 2.0, studied on software, studies on internet, studies on RFID, studies on web OPAC, studies on cloud computing, studies on mobile devices and studies on current trends.

Chapter-3: Emerging Technologies in University Libraries

This chapter describes Current Trends in Information and Communication Technology Applications in Libraries. This chapter also discusses the use of ICT in library automation, library services, library collection, information retrieval, library security, promotional activities, library management and library networking.

Chapter-4: Profile of the Libraries of North East Central Universities

This chapter presents the brief introduction of Central Universities of North East along with the profile of their central libraries which are included as scope of the study.

Chapter-5: Analysis and Interpretation of Data

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

Chapter-6: Findings, Conclusion and Suggestions

This chapter presents the findings and suggestions of the study and concludes with suggestions in future to improve the Information and Communication Technologies applications and uses in the university libraries. It offers a conclusion based on the findings.

Bibliography: refers to the citations which are used in the text of the thesis.

Appendices: encloses the questionnaire which was designed and used as data collection for the survey and list of publications.