

Emerging ICT Technologies and the Academic Libraries In India

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Abstract

The primary objective of this research is to analyse existing research on the topic of new technology adoption by academic libraries. The major purpose of this research was to investigate the changing function of university librarians in today's technologically advanced libraries by reviewing the foundational literature on emerging technologies in academic libraries. Researchers also looked at librarians' perspectives on the new information landscape. The research findings are organised around four main topics: the "status of emerging technologies in university libraries," the "attitude of librarians towards the emerging technologies," the "technological compatibility among the professionals of the libraries," and the "barriers in the implementation of emerging technologies." Through the use of ICT, librarians and information scientists have been able to expand their service offerings and make library materials more accessible from farther away. With the use of ICTs, we can now access previously stored material much more quickly, transforming the library into a truly contemporary institution. Information and communication technologies (ICT) are used in libraries to describe the integration of computers and other technology with traditional library tasks including collecting, cataloguing, preserving, and disseminating knowledge. With the use of these new tools, librarians may improve library services for their patrons in significant ways and provide new opportunities for patrons and library staff to work together. A few examples of emerging technologies are those used in the sectors of education, information, nanotechnology, biology, robotics, and artificial intelligence. Many diverse library maintenance tasks, as well as library programmes and services, make use of information and communication technologies. The utilisation of modern technology, such as computers, barcode scanners, and library management software, greatly facilitates the efficiency and accuracy with which circulation tasks may be completed. Libraries use information and communication technology in a variety of ways to enhance their services for patrons. Some examples include the Online Public Access Catalog (OPAC), library databases, computerised circulation of library items, etc.

Keywords: *New technologies, Library technology, Academic libraries, Cutting-edge gadgets, Librarians at universities, People who work in libraries, Knowledge workers.*

Introduction

The field of information and communication technologies (ICT) is dynamic, with new developments appearing often. Because of this change, even university libraries are struggling. There are various ways in which information and communication technology (ICT) may improve academic libraries, from lowering overhead costs and making regular maintenance jobs easier for staff to increasing the size of the library's collection and improving its accessibility to students and faculty. Efficiency gains in academic libraries may be attributed to the growth of ICT. Thanks to the revolutionary developments in ICT, library materials may now be accessed remotely around the clock, every day of the year. In this article, we will examine the ways in which academic libraries have utilised or may use ICT to improve their patrons' access to and usage of web-enabled information services and internal efficiency. Increased reliance on the spread and implementation of new information is a key factor in the success of today's national and global economy. This has made the free flow of information an essential ingredient for a thriving economy. Businesses of all sizes and on all continents are benefiting from the increased availability of information thanks to developments in library and information science. Librarians are reliable resources, thus many people on a mission make a point of visiting libraries. Support provided by librarians who help entrepreneurs, researchers, students, and educators find, access, and make the most of information resources, particularly digital ones, is another important aspect of this field.

Review of Literature

Acharya, Hiremath and Lalasangi (2019) focus attention on how far along the cutting-edge library is in percentage terms. Therefore, in light of the current progressive circumstance, there are many adjustments to the library and data benefits, as well as the tasks and desires of the library professionals to fulfil the client data request in this period. There is a new school of thought in library and information science (LIS) thanks to the impact of digitalization, modernization, and digitization. It is widely acknowledged that computerised innovation has made space for itself in every conceivable industry and social context.

Abubakar and Attahir (2018) highlighted the importance of libraries, the skills needed by academic librarians to be creative and innovative, and the novel services they provide. They also addressed the challenges associated with developing and launching new services in the academic library. They also tried to clarify the skills necessary for 21st-century librarians to offer the greatest services in library and information science, especially in university libraries.

Boruah (2018) mentioned in his writing a research report that The key aims of the research were to analyse the prospects for expanding higher education in northeast India and to

evaluate the many challenges that now stand in its way. The research also provides recommendations for bettering the standard of higher education in India's remote northeast. There have been a number of challenges for India's universities, especially in the region of the country known as the Northeast. Additionally, every year a large number of students from North East India go to Delhi, Calcutta, and Bangalore to attend colleges and universities and get training for a variety of professions.

Chukwueke and Onuoha (2019) They reasoned that there is a great need for ICT applications in libraries due to the various advantages they provide. The library may save costs in a number of areas, including rent, shelving, and staff time spent searching for and retrieving materials. Many academic libraries still haven't completely incorporated these ICTs into their service offerings, despite the clear benefits.

Joshi (2015) released findings from a survey of university library IT services in the Indian states of Chandigarh, Himachal Pradesh, Haryana, Punjab, and Jammu & Kashmir. The survey and university websites show that eight of the twelve libraries have distinct names. Despite widespread apathy to the troubling situation of unfilled positions among administrators, the paper finds that university libraries have gained digital resources and Information and Communication Technology-based infrastructures, which eventually benefit them in offering ICT-based services.

Konwar (2015) investigated the various issues and difficulties connected with the deployment and digitization of ICT in the academic libraries of the Barak Valley, Southern Assam. The Barak valley, located in the heart of Assam and Northeast India, has not seen as much economic growth as the rest of the country. College libraries in the area are growing rapidly to keep up with rising student enrollment and rising needs related to a wide range of topics. The UGC's independent centre INFLIBNET has been making strides to promote library automation in the region with the use of their SOUL software and other resources. Academic libraries' struggles with ICT adoption and digitalization are also highlighted in the report.

Sinha and Gautam (2015) studied the challenges faced by academic libraries in the Barak Valley, Southern Assam, as they attempted to implement and digitise ICT. The Barak valley, in the centre of Assam and Northeast India, has lagged behind the rest of the nation in terms of economic development. To accommodate the increasing number of students and the expanding spectrum of research interests, local university libraries are expanding quickly. Using the SOUL library automation software and other tools, the UGC's autonomous centre INFLIBNET has been actively working to spread library automation across the area. The

research also highlights the challenges faced by academic libraries in adopting and digitalizing ICT.

Vijayakumar and Thomas (2012) Libraries are crucial in promoting the expansion of knowledge. Since the beginning of this age, individuals have had a lot of trouble trying to keep up with the rapid changes in information technology that have resulted in the "information explosion" and "information revolution."

Yuvaraj (2013) describes in detail the role that cloud computing technologies play in library services, as well as the duties and responsibilities of librarians at Indian Central Universities. As a result, the research shows that librarians heavily rely on cloud computing technology and various gadgets to provide superior library services. Economy, delivery methods, and service tiers, as well as customer desire for cloud computing, are nonetheless the primary drivers of this phenomena. However, most librarians voiced concerns about patron safety.

Purpose of the study: The study's overarching objective is to analyse the impact of information and communication technologies (ICTs) on academic libraries. The pros and cons of using ICT in university libraries are the primary subject of this research.

Scope of the study: The effects of information and communication technology (ICT) on academic libraries are the subject of this research.

Methodology: The information is collected from the secondary data i.e. Websites, newspapers, research articles for the study.

ICT and Academic libraries:

Academic libraries in India use ICT to better serve its clientele—primarily students and faculty—by meeting their research demands. Universities and colleges construct libraries to serve the academic missions of teaching, learning, and discovery. Therefore, the students, teachers, and staff of the institution should make up the bulk of the library's users. A wide range of services, including user education (orientation/instruction services), inter-library loan/connection services, abstracting and indexing services, referral services, and circulation services, are provided by academic libraries for the benefit of its clients. In addition to checking out books, users may do research, make copies, compile reading lists and annotated bibliographies, have access to the internet and CDs containing relevant material, and even publish their own works. Library activities like as collection creation, cataloguing, circulation, serials control, management statistics, and administrative responsibilities like budgeting have all been impacted by the widespread use of information and communication technology (ICT) in libraries. This improved the quality of service provided by libraries and other information

organisations to their users. If librarians are to meet the needs of their customers in the twenty-first century, they will need to master the new skills associated with the use of multimedia in information packaging, repackaging, and distribution. (Arora, 2009)

Everything from library collection growth strategies to library architecture to library cooperatives has been influenced by the proliferation of ICT in the academic library world. High-quality information services and a plethora of digitally-based information resources are two things that companies may provide their clients with the aid of ICT. Institutional repositories of digital local resources are being built, and digital libraries are being launched, all thanks to the use of ICTs in academic libraries.

The various benefits that ICT provides in terms of time, location, cost efficiency, speed, and convenience make it a great candidate for enhancing traditional LIS services. Services such as OPAC (open public access catalogue), reference, bibliographic, current awareness, document distribution, ILL (interlibrary loan), AV (audiovisual), and customer relations are all part of this category. The structure, content, and procedures involved in the creation and distribution of information commodities have all undergone changes as a result of ICT's influence on the information services industry. The internet has become the biggest reservoir of information and knowledge, while traditional information services have faded out and been replaced by new and creative web-based ones. Librarians and information scientists' traditional function as mediators has evolved into that of facilitators.

Because of its widespread use and the rapidity with which its definition shifts to accommodate developments in the field, the term "Information and Communication Technology" (ICT) lacks precision. IT encompasses everything from telecommunications to broadcast media to audio and video processing and transmission to network-based administration and monitoring (ICT). According to the definition given in 2, ICT includes everything that may be used to create, access, modify, transmit, or receive digital data, such as a computer, smartphone, tablet, smart TV, email service, library database, etc. This century's scientific and technical achievements peaked in its twilight. The author believes that information and communication technology has significantly impacted the economy in three primary ways. The availability of several new library-related programmes has resulted in a dramatic shift in how libraries are run. There is a plethora of software available nowadays that might be useful in arranging your cleaning tasks and other reference services in an efficient way. The Indian Statistical Institute (ISI) in Kolkata first adopted it in 1957. But it is not until the 1990s that it is first put to use in the discipline of Library Science. Logging in, saving data, accessing it when required, and modifying it are all aspects of data management that

may be facilitated by advances in information technology (IT). Information gathering, storage, and dissemination are also the subject of "communication technology," a field of study in its own right. The International Telecommunications Union (UNESCO) refers to the means of contemporary communication as "information and communication technology" (ICT).(Rehman & Shafique , 2011)

Emerging Technologies in Library Service for New Economic Era

Librarians may greatly benefit from the opportunities presented by the rise of new technology to enhance user-centered services and build stronger relationships with library patrons. Librarians play an important role in society by using developing technologies to find, gather, organise, personalise, and provide information goods and services in a wide range of forms and kinds to the user community on demand and in advance in both physical and virtual settings. New technologies may help libraries foster the collaborative and participative environment needed to provide patron-focused library services, as well as generate new resources and improve upon those already existing by tapping into the collective intelligence of its use community. Thanks to easily accessible technology resources, libraries may now deliver more user-centered services. With its widespread availability, the internet has revolutionised almost every element of human contact. The web unleashed the greatest driving force behind global progress: the world's human resource potential. Higher education must use new technologies in order to close the digital divide and help the underprivileged. It is impossible to overstate the importance of university libraries in the dissemination of knowledge and research. The proliferation of digital materials has brought with it a host of new challenges and opportunities for the librarians who work at academic institutions.(Bolan & Rob, 2009)

Impact of ICT to Change the Scenario of Academic Libraries

- The whole purpose of academic libraries has shifted due to the impact of information and communication technology. The academic library goes under several names, including hybrid library, digital library, and virtual library. A digital library is "a managed collection of information with related services where the content is kept in digital format and accessible across a network," according to the definition provided by the Library of Congress. To provide remote access to the content and services of libraries and other information resources, virtual libraries combine an on-site collection of up-to-date, heavily-used materials in print and digital formats with an electronic network that provides access to and delivers from external, worldwide library and commercial information and knowledge sources. You may

find both digital and physical materials at hybrid libraries. These criteria make it evident that the vast majority of modern academic libraries are hybrids. It's both easier and harder to find what you're looking for thanks to the advent of the internet. To better serve the end user, designers of information retrieval systems are making efforts to streamline the procedure. Nonetheless, the process gets convoluted as the user is presented with an excessive amount of information, resources, and options all at once.

Advances in information and communication technology allowed for the production of digital information. Thanks to advances in information and communication technology, we can now share files via the internet. Using ICT, people are now able to connect and pool their knowledge in new ways. (Madhusudhan & Nagabhushanam, 2012)

Libraries, research facilities, and other organisations with a direct hand in information processing are particularly vulnerable to the effects of the transition from printed to digital media. It is widely agreed that the convergence of the computer and telecoms sectors is to blame for this change. Recent and forthcoming developments in computing; telecommunications, networking, and resource sharing have made access to information possible at any time and from any location. This is largely due to the fact that computers can perform high-volume, error-free, repetitive tasks at much faster speeds than humans. The whole library landscape has shifted due to the rise and widespread use of information and communication technologies. We are seeing a transition away from the more conventional library model and toward hybrid library structures. Emerging in the knowledge world are libraries using a variety of cataloguing systems. There are several names for these establishments, but they all refer to the same thing: libraries that have been automated. The notion of "Library 2.0" has evolved among the online community. Every step of the library process, from collecting new resources to sharing what has already been gathered, is being carried out with the aid of some sort of information technology. (Sood, 2016)

- Computers and the Future of Library Collection Management:
- The proliferation of electronic resources in the modern day has made collection management a daunting endeavour. There is a limited budget, several different file formats, and ever-evolving user requirements. Handling a collection means taking part in activities including requirements assessment, contract negotiation, and resource appraisal.
- Digital Collections: How Information and Communication Technology (ICT) Has Influenced Academic and College Library Collections. The days when the physical holdings of a library were used as a measure of its importance in the academic world are over. Access to electronic

resources that are available on a global scale has supplanted physical resource ownership in the current, networked technology age.

- E-Journals, or electronic journals, are an electronic counterpart of the classic print journal that is sent to readers over the internet. In spite of the fact that the printed magazine has been the principal channel for communication among academics and researchers since its establishment in 1665, subscription costs have increased dramatically in recent decades. The average price of a journal subscription increased by 147% between 1986 and 1996. With the rise of the internet came a new era of low-cost, high-volume publishing. The Internet's widespread availability also contributed to this change.
- Electronic books, or "E-Books," are digital versions of previously printed books or scholarly works that may be read on a computer or other electronic device. Libraries may save money by switching to e-books because of the reduced need for storage, binding, circulation, late notifications, and the administration of penalties. Additional benefits include accessibility through the internet, the ability to search for certain terms, etc.
- In the context of electronic databases, a database is any structured grouping of information for use in making decisions. Libraries provide access to a variety of full-text materials and bibliographical databases, often arranged to reflect salient features of reality and facilitate procedures that depend on it. Computers have made it possible to store large amounts of data in organised lists, called databases. Articles from scholarly journals that have been peer reviewed are acceptable inclusions if they are catalogued in a style that allows for easy searching. The time spent looking for anything is cut down significantly.

Significance Of ICT Based Resources And Services In Libraries

Unlike in the past, when users were required to physically visit a library to access its collection, today's libraries no longer have such strict physical restrictions. Due to rising costs and limited availability, printed collections have fallen out of favour. As technology has advanced, the information processing landscape has shifted dramatically. No library in the information age can meet the needs of its patrons with books alone. People rely on it heavily as their main source of knowledge these days. The internet is useful for finding information quickly and fulfilling research requirements. All library types now recognise the critical nature of ICT-based resources, and a growing percentage of their budgets are being reallocated to support these services. They're put to heavy usage. The issue of limited room is now moot, thanks to these materials. (Jagjeevan , 2017)

Research in any field would not be possible without the help of academic libraries. According to Ahmad and Fatima, the accessibility of the internet has altered the services provided by academic libraries. Because of this, libraries no longer provide their patrons with information in the same way they formerly did. Users may now easily access academic articles and other types of information online. (Bhardwaj & Kaushik, 2013)

Libraries may have a small number of books and periodicals, but the internet has an abundance of information. The library now offers a wide variety of electronic resources, such as electronic versions of periodicals, books, encyclopaedias, academic databases, conference proceedings, theses, dissertations, and more. Electronic journals, together with databases that compile electronic journals, now make up the bulk of libraries' digital holdings, and their popularity is skyrocketing. E journals have several advantages over their print counterparts and are increasingly replacing them. Other names for e-journals include electronic serials, online journals, and electronic periodicals. Since 2010 (Sreekumar), As a result of financial constraints, no one library can hope to subscribe to all relevant publications in a given field. CD-ROMs, floppy discs, and the internet are only few of the formats used to publish scientific and intellectual periodicals. Distributing an electronic journal, or e-journal, involves the use of both CD-ROM and the web. CD-ROMs are just as easy to work with as paperbacks or hardcovers. Numerous peer-reviewed periodicals may be accessed online at no cost. The internet is increasingly being used by publishers as a distribution channel for their works. Many open access journals are available online without subscription fees or other barriers (such as copyrights). (Mittal, 2017)

A Look At How Information Technology Is Changing Data Centers

Proliferation of digital gadgets, online learning platforms, and file-sharing platforms made available by the Internet all contribute to better digital education. At first, the libraries will only be accessible digitally, with a central collection and access to worldwide information resources via a consortium. Nowadays, library automation systems are a need. With WebOPAC, library users may do research from any computer connected to the internet, and effective ICT techniques are used in circulation, a crucial part of library services. The library's mobile app, which is free to download on all major mobile platforms, makes it simple and convenient for patrons to place holds on items. Some automation software includes visual representations of available resources playable on various devices. A possible solution to the problem of high-priced goods going missing is RFID tagging. Mechanization also allows for

the possibility of self-circulating systems being used by the public. OCLC Worldcat, Classification Web, Web Dewey, the Catalog Calculator, and many more are all examples of helpful ICT apps for libraries. The recent surge in the use of computers and other ICTs to administer library services and disseminate knowledge has placed a pressure on the library industry. Instead, this underscores the importance of information and communication technology (ICT) in bolstering library operations and enhancing user service. (Reddy , 2013)

The Effect of New Information and Communication Technologies on Library and Information Science (LIS) Personnel

Changes in library usage have occurred as a result of the proliferation of computers and other information technologies. Thanks to advances in information and communication technology (ICT), librarians and information scientists have been able to provide a wider range of services and make library resources more widely available. Thanks to advances in information and communication technology (ICT), we can swiftly retrieve documents from the library's archives. Recently developed technologies have an impact on several facets of the library and information science sectors. Digital information sources and digital media are increasingly replacing and becoming the major way of storing and retrieving information due to technical improvements and widespread use. Information and communication technologies are flourishing and moulding Library Science practises. Common library sayings include "Every reader his or her own book/information," "Save the reader's time," and "Library is a growing organism." The great information sources, rapid transmission speed, and easy access made possible by today's information and communication technologies not only satisfy the user's multifaceted demand, but also eliminate the impediment of physical distance, drastically reduce the amount of time needed, and ensure that the correct information would reach the correct person at the correct time. The library may now expand its collection without incurring any further costs. It's a priceless asset for places like libraries and universities where research is conducted.

For librarians and other LIS workers, the emergence of new types of information technology has presented considerable challenges. In order to succeed in the modern day, librarians and other LIS professionals need to adopt new ways of thinking and use innovative information and communication technology into their daily operations. Staff members at libraries should update their knowledge of current ICT in order to better serve patrons. (Tiwari & Sharma, 2015)

Changing Role of the Librarian in the ICT World:

A librarian has to be adaptable in today's fast-paced, unpredictable environment so that they can keep up with the ever-changing information landscape, user preferences, and accessible resources. Today's librarians are responsible for more than just keeping books and other media in order; they also have to provide lightning-fast, individualised information services, both online and off, to meet the needs of their diverse clientele. Librarians' continued existence and professional success depend on their ability to adapt to the ever-evolving needs of their customers. Nowadays, librarians are expected to act as both information knowledge navigators and information distillers. The role of the librarian has evolved to accommodate the many challenges posed by the rapid development of information and communication technologies (ICT) in the modern day.

- The Role of the Librarian in Administration
- The librarian's role as an interactive communicator
- The Librarian as a Descriptor
- The Librarian as Data Hoarder
- Definition of a Librarian: Knowledge Organizer
- Information retrieval as a librarian's responsibility
- In addition to traditional library duties, today's librarians are increasingly involved in online development and data analysis.
- To do research as a librarian
- The Librarian as a Knowledge Manager
- The role of the librarian in the digital library as an information scientist
- As custodians of digital resources, librarians play an essential role in the modern information ecosystem.
- The Librarian as Information Broker

Conclusion

In this study, we look at how different libraries are using new library technology. I have mentioned how the proliferation of various types of technology has resulted in novel approaches to library management. In order for library users to reap the benefits of these new technology, however, librarians will need to be well-versed in and accredited by these tools. However, not all libraries can implement these changes because of limited funds and inadequate training for library employees. The library field still has room to grow and develop its own distinct identity in today's society. Those employed in libraries, in my opinion, should

all take part in some kind of ongoing education plan. Having experts take part by giving talks, holding seminars, and other such activities. Possible informational benefit to the library community. Libraries can't function without reference and other user services. Academic libraries are making efforts to maintain customer satisfaction by delivering web-enabled information services. Web-enabled information services are vital for academic libraries because they help patrons get easier access to, evaluate, and make use of information. Libraries help "digital natives," people who were born and raised in the digital age, have access to the information they need via the use of cutting-edge tools. The rapid use of new forms of information technology has prompted this investigation about the library sector's future. However, librarians need to learn how to effectively incorporate new technology if libraries are to survive in the digital era.

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