



## THE IMPACT OF DIGITAL TECHNOLOGY IN THE ACADEMIC LIBRARIES

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### Abstract

*Libraries have long been endless sources of information for students - for centuries this involved row after row of books. However, the face of libraries is changing as content is moving toward a digital platform and Internet access is becoming more of a human necessity than a privilege. This article presents an evaluation of the impact of digital technologies in the transformation of academic library services. It begins with a brief overview of the historical development of academic libraries followed by a discussion of current challenges and opportunities for academic libraries. It also discusses innovative technological developments for learning, data management and the impact of these on the academic library sector, including the need for library staff to develop new skills and roles such as "embedded" librarian roles. The article concludes with reflections on future developments and the impact of digital technological utilities. It's clear that the library has been a valuable institution for academic purposes as long as pen has been put to paper. However, the library and its role in academic research are no doubt going through a clear transformation in the 21st century.*

**Key Words:** Information Society, ICT, Web Technologies, Dissemination of Information, Social Media.

### Introduction

The recent developments in technology have paved way for establishing a digitally advanced society. Information boom and easy access to it has a definite impact on the users of today. New technologies have changed the behavior and expectations of users. There is a paradigm shift in the communication and dissemination of information in view of the impact of ICT and Web technologies leading to digital transformation of the libraries of 21<sup>st</sup> century.

ICT have totally revolutionized the landscape of higher education so that sustainable development can be achieved in the global context. It can be said that education is not complete without good libraries and libraries enrich the learning process of learners. The aim of education is more or less the same-that is to achieve holistic development of mind and personality. Character building can be achieved by facilitating best teaching and learning conditions. Advancements in technology and communication skills have made this more precise and conducive to disseminate information instantly and inexpensively. Libraries too have to compete in the changing scenario. The challenges posed by the emerging technologies and their effects on the libraries are going to be very decisive in future.

Earlier libraries had physical parameters having shelved collection, brick and mortar walls and traditional mind set but they are now paving the way for new age libraries of 21<sup>st</sup> century which are an effective means for disseminating as well as creating and cultivating

information. This unequivocally requires harnessing of the recent trends and upgradation of ICT and its related technologies.

### **Understanding Digital Technology**

Digital Technology is an umbrella term for computer-based products and solutions. The word 'digital' comes from Latin—digitus, finger—and refers to one of the oldest tools for counting. When information is stored, transmitted or forwarded in digital format, it is converted into numbers at the most basic machine-level as 'zeroes and ones.', the term represents technology that relies on the use of microprocessors, computers and its applications and is dependent on the Internet. Anything that function through a binary computational code such as mobile phones, tablets, laptops, computers, etc are digital devices which comprise of Information and Communication Technology, Web Technology and the like.

According to Oxford English Dictionary, IT is the study or use of systems (especially computers, telecommunications, etc.) for storing, retrieving and sending information. Definition of information technology according to Merriam Webster Dictionary is 'the technology involving the development, maintenance, and use of computer systems, software, and networks for the processing and distribution of data'. The ALA Glossary defines information technology as the application of the computer and other telecommunication technologies to the acquisition, organization, storage, retrieval and dissemination of information.

The term ICT refers to computer and telecommunications technology combined together for collecting, storing, processing and communicating information. ICT includes any communication device or application encompassing radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as video conferencing and distance learning. ICTs are often spoken of in a particular context such as ICTs in education, health care, or libraries (1). ICT refers to technologies that provide access to information through telecommunications. It is similar to IT but focuses primarily on communication technologies. This includes the Internet, wireless network, cell phone and other communication mediums (2). Networks include fixed, wireless or satellite telecommunication and broadcasting networks. On the other hand, its well-known applications are the Internet, DBMS, Information Storage and Retrieval Systems and multimedia tools (3).

The method by which computers communicate with each other through the use of markup languages and multimedia packages is known as web technology, they are used in conjunction with one another, to produce dynamic web sites. Web technology is the establishment and use of mechanisms that make it possible for different computers and devices to communicate and share resources. Web technologies are infrastructural building blocks of any effective computer network.

### **Objectives of the study**

. To explore how librarians and library users interact with digital material, electronic resources, and online services and review their perceptions towards their benefits and challenges in academic libraries.

. To explore the use and impact of digital technology in Academic Libraries services and operations in India.

To study the different areas of library operations and services those are performed through Digital technology in academic libraries of India and operations in digital environment in academic libraries

To reflect and critically discuss the impact of these on the role and professional practices of academic library staff and, Finally, to consider what the future of academic libraries and academic librarianship will be.

### **Impact in Academic Libraries**

Academic Libraries are an important component of academic institution be it school, college or university. They are regarded as the heart or nerve-centre of academic set-up and play an important role in providing information service to the students, scholars and faculty. As Tikekar, A. C. has put in libraries in their entirety serve as an extension of class rooms and teacher rooms and for researchers they are their invisible guide, friend and philosopher (4).

Today the libraries are equipped with broadband access, computers, printers, scanners, and bar code readers, videos, compact discs, hard discs, RFID (radio frequency Identification Device) and in house and commercially available databases to provide information to the readers through the net. The Online Public Access Catalogue (OPAC) has changed the shape of the traditional card catalogue (5). There is no need for readers to check the catalogue physically; instead they can enjoy remote access to the catalogue with click of the mouse from any part of the world. Libraries are providing information not passively through books and printed material but have taken an active role as knowledge providers through every conceivable format such as Institutional Repositories, Open Access Initiatives, Open Educational Resources, Social Media Platforms and Value-added Services which include state-of-the-art websites.

The convergence of IT, digital and web technologies form the basis for an advanced information society. The main influence of information technology which has a direct impact on information society is- increased computer power leading to faster and cheaper computer processing which paved way for digitization of all libraries even with low budget, with the latest telecommunication technologies like ISDN (Integrated Service Digital Network) the data transmission capacity can be increased and facilitated with introduction of varied new services such as e-collection, e-journals, e-mail teleconferencing, e-clippings and e-publishing and networks. The optical storage media, which is the cheapest data storage device, has increased the storage capacity of the libraries (6).

The Internet has given rise to the development of electronic versions of printed library reading materials like books, journals, reports, conference proceedings, monographs, etc., which have brought changes in the collection development policies of academic libraries and the role of librarians is vital in the selection and procurement of relevant electronic resources judiciously within limited available finance. Electronic resources include e-journals, e-books, CD-ROM/DVD Databases, On-Line Databases, etc. There has been a trend in academic libraries for adopting consortia model for accessing to electronic resources over Internet. The consortia approach for subscribing to e-journals and databases has been gaining momentum and different models are coming up and some are running successfully (7). Internet resources are at the service of all but it is said that librarians use them as tools in a better way to serve their users (8).

Availability of digital information through laptops and cell phones has provided the students an alternative means of study and research. Web 2.0 tools such as facebook, twitter, blogs, online groups which are also known as social media have made it possible for people to actually connect to one another through the internet (9). Librarians have to maintain their traditional core values of the profession and at the same time manifest library services in new ways addressing the constantly changing needs of user communities. (10).

Knowledge construction in electronic format is made convenient by using digital technology which can be used 24/7. Learning, sharing information is made easy, OPAC search, reserving library resources through apps like IOL, Android is possible, and RFID protects resources from thefts. Archives of e-journals serve the purpose of bound volumes of journals which can be accessed from anywhere. E-books, ETDs are an effective source of information – all these can be accessed through digital technology comprising of cell phones, smart cards, social networking, etc. (11)

**Need for the Study:** In the present ever changing information environment, libraries are encountering both opportunities and challenges. Information technology has introduced many changes in the way information is identified, procured, processed and disseminated to library clientele. Furthermore, digital technologies have created a sense of urgency among library users and librarians themselves. Academic Libraries are witnessing new paradigm shifts. These shifts include:

Transition of information sources and systems from paper to electronic media. Complexity in information needs of highly demanding clientele. Increase in the cost and quality of information. It is an accepted fact that the Digital technology has influenced all the components of a library system: information sources, services, human resources and users.

**Academic Libraries in Digital Era:** In the 21st century, academic libraries have a new role in sharing information. Libraries are not piles of books anymore; the general library environment has been changed from analogue to digital. Library automation systems have helped libraries to provide easy access to their collections through the use of computerized library catalogues (On-line Public Access Catalog – OPAC) which more recently led to

digital libraries (IFLA,2013). Dissemination of knowledge has always been one of academic libraries primary goals as long as they have served as learning institutions, cultural repositories and research centers but in this digital age of knowledge, they have to expand these roles and stop being passive repositories for printed material. To the contrary, academic libraries should upgrade their services and providing education of high quality by storing resources in various forms and maintaining easily accessible for online use among academic community. This would be possible by implementing a digitization project. Hughes (2004) reported to concept of digitization as “the process by which analogue content is converted into sequence of 1s and 0s (these ones and zeros are called bits) and put into a binary code to be readable by a computer” (p.4). So, we could generally say that the digital material is every computer readable material.

Academic libraries have gradually been completed many criteria for their development of better products and services which are the follows: a. Effectiveness: to well operate the digital library system. b. Efficiency: at what cost does it operate? (costs can be either financial, temporal or related to effort) c. Usability: services & products utilization d. Accessibility: characteristics of the digital system (technology performance, speed, time, error rate) e. Quality: qualitative material f. User's satisfaction: users interact with the digital library system. The methodology for digitization in academic libraries changes according to policies of each educational institution. Different institutions have different views of the material to be digitized depending upon the mission and vision of the parent institution. Brindley (2009) pointed out that academic libraries serving digital duties should position their role as strategic guides upon formal learning settings, academic programmes and research by providing teachers and learners with broader, faster and better information as they noted the heart of the entire educational institution and the only root of knowledge. She also emphasizes the need for planning, vision, and strategy. Librarians in the Digital Era: Academic librarians are supposed to have various technological skills in order to provide services to students. We will present the most important skills that librarians need to have according to us. But in the new digital era when we talk about information literacy we mean teaching skills that include computer skills. According to Kulkarni “there is a need for the library professionals to play significant role in promoting information literacy in digital environment.” (2014, p. 199) Information literacy in the digital environment means: “The ability to use digital technology,• communication tools or networks to locate, evaluate, use and create information. The ability to understand and use information in• multiple formats from a wide range of sources when it is presented via computers. (Kulkarni, 2014, p. 198)

### **Challenges for Academic libraries in Digital Era The following are the Challenges for Academic libraries in Digital Era**

1. Making services engaging to researchers and students: Google is not the answer to everything. As a result, the librarian fully absorbs the needs and wants of students and researchers to make a substantial and engaging difference in their work moving forward.
2. Handling research data management tools: Libraries should be the place on campus for data curation and research management. Librarians need the support of their faculty and



administrators to make this happen, but librarians also have to keep themselves well-versed in the advancements of data management so research doesn't become stale.

3. Demonstrating the value of Librarian: Academic libraries are always on a budget. This means that month after month, year after year, libraries have to come up with compelling examples of how valuable their work is - often with a looming bottom line. However, according to the American Library Association, research has proven a connection between student grade point averages and library material usage. Staff needs to communicate this connection and demonstrate why libraries require more attention and public engagement.

4. Preserving material on a digital scale: Not only are there excellent products available that can help libraries achieve this - even with the biggest of collections - it's becoming the norm.

5. A growing and diverse spectrum of customers: The 20th century underwent a massive shift in technological innovation that impacted people of all ages. On any given day, a librarian might have to help customers from six different generations, from baby boomers to millennial, according to 21st Century Library.

6. Nailing down library policies: With the increased usage of online tools, there are many questions that might need to address to the administration. For instance, if the university should be purchasing ebooks alongside traditional print sources. Or, as many modern academic research centers are discovering, there may not be a need for purchasing textbooks at all. These are just some examples of library policies that staff and the administration need to pinpoint moving forward.

7. Role development: Open Access has required librarians to become knowledgeable in a growing number of subjects on an astounding scale. While no institution is going to process information at the pace of a computer, it might feel that way sometimes. Adding budgeting and resource constraints can contribute to this problem as well.

8. Digital licensing: Although every academic research facility is different, College and 1 which means that digital licensing agreements should become more sustainable and easier to understand.

9. Subject-matter expertise: With so much information pouring into libraries at a fast pace, academic institutions need to take an active role the management of libraries. There have already been great strides taken on a national scale, such as National digital Library of India.

10. Becoming familiar with a wide range of digital content: By clearly seeing what kinds of articles, published works and e-books are being used the most by students and researchers, librarians can fully digest what types of content they need to become familiar with in a global, digital world while still providing high quality sources. With academic libraries, the challenges of role development, digital licensing and research tools are shaping the way that librarians provide quality content to students and researchers

## **Conclusion**

Students as well as faculty members are using ICT more prominently to acquire, enhance and update their knowledge and skills so that they remain connected with their contemporaries. They do not want to miss out on the opportunities provided through the digital media. The impact of new developments in ICT and digital technologies is seen in all walks of life. It has changed and revolutionized services and resources of libraries too. Information collection, preservation and dissemination are done with the help of ICTs



making the libraries more accessible and user-friendly. Librarians should aim for continuous education and update their skills according to the changing requirements. Libraries should reach out to the new-gen users who are savvier with the digital technology by packaging their resources in an electronic format, provide easy access and retrieval and notify the same through institutional websites. This will no doubt strengthen the libraries and help to respond to global challenges more strongly than ever before.

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