

DIGITAL DISRUPTION IN SHAPING THE FUTURE OF LIBRARIES IN INDIA: CHALLENGES AND OPPORTUNITIES

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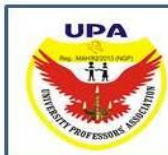
Abstract:

India has a rich tradition of culture, knowledge, customs and the best practices. The country takes pride in owning Nalanda, Takshshila universities wherein rare collection of books and reservoir of knowledge preserved. However, the several attacks of contemporary kings led to loss of such knowledge heritage. Still, India has been taking several initiatives to create, store, preserve the rare collections, researches, the best practices through digital libraries for future generations. The present paper aims to explore the scope and significance of libraries in future within the context of digitalization. Both challenges and opportunities are taken into consideration while considering the future of libraries in India. Loss of interest of readers, poor infrastructure, lack of technical expertise, outdated methods, limited funding, limited access to reputed databases, lack of research-driven tools are the major challenges. On the other hand, technologies like Artificial Intelligence, Software-as-a-Service (SaaS), free online open access platforms, community involvement, social responsibility, virtual book clubs, automation are likely to transform the libraries in future through competitive advantages. The integration of college libraries with universities, government agencies like UGC, AICTE will ensure more transparency to the great extent. The present study is significant keeping the sustainability, NEP 2020 educational reforms, research culture and changing scenario of Indian education in mind.

Keywords: *Library Science, Library, Sustainability, NEP 2020, Knowledge System, Digital Library*

Introduction:

India has a rich tradition of culture, knowledge, customs and the best practices. The country takes pride in owning Nalanda, Takshshila universities wherein rare collection of books and reservoir of knowledge preserved. However, the several attacks of contemporary kings led to loss of such knowledge heritage. Still, India has been taking several initiatives to create, store, preserve the rare collections, researches, the best practices through digital libraries for future generations. The present paper aims to explore the scope and significance of libraries in future within the context of digitalization. Both challenges and opportunities are taken into consideration while considering the future of libraries in India. Loss of interest of readers, poor infrastructure, lack of technical expertise, outdated methods, limited funding, limited access to reputed databases, lack of research-driven tools are the major challenges. On the other hand, technologies like Artificial Intelligence, Software-as-a-Service (SaaS), free online open access platforms, community involvement, social responsibility, virtual book



clubs, automation are likely to transform the libraries in future through competitive advantages. The integration of college libraries with universities, government agencies like UGC, AICTE will ensure more transparency to the great extent. The present study is significant keeping the sustainability, NEP 2020 educational reforms, research culture and changing scenario of Indian education in mind.

Background of Study:

The history of library science and library management is deeply rooted long back to Vedic period within the Indian context. The sages, gurus and contemporary writers have performed their duties to preserve and transcend the heritage of Indian knowledge system from one generation to another. Sometimes, it was in the forms of pictures, carvings on the stones / in the caves, on metal plates, contemporary scripts etc. There is a reference of the term 'Aksharasamamaya' in Rig Veda which was known as contemporary system of preserving knowledge and information of the age. One of the ancient universities in India known as Nalanda University had an extensive library named "Dharmaganja" is considered to be an epitome of the time and one of its kind housing large numbers of texts from science to philosophy, medicine, history, literature etc. Then British government established Calcutta Central Library. The post-independent era, many central, state government sponsored libraries, college and university library played an important role to cater the diverse needs of readers, researchers and academicians (Chowdhury & Chowdhury, 2003).

After 2000, the computerization took place wherein the desktop computers were set up with limited numbers. Then, the focus is shifted from paid access to open online access in the forms of software. The subscriptions are made available through databases and indexing journals. The journals, books, magazines and other resource material are integrated to serve as one stop solutions. The mobile applications are the user-friendly, customized platforms for accessing library information these days (Lesk, 2005).

Importance of Study:

Through the revolution of conventional library practices and the enhancement of efficiency, digitalization plays a vital role in the administration of libraries in India. First of all, the shift to digital platforms makes it possible for library operations to be more automated and simplified. With the use of digital library management systems, librarians may effectively classify, arrange, and retrieve material while cutting down on human labor and error-proneness. In addition to saving time, this automation enables library employees to concentrate on other important facets of their jobs, including enhancing user experiences, developing digital collections, and doing community outreach. Staff and users alike eventually gain from the improved efficiency of library administration (Arms & Larsen, 2001).

Digitalization is essential for user experience and resource accessibility. The ability to search for and retrieve information at any time and from any location is facilitated for library users via digital catalogs, databases, and electronic resources. This degree of ease is particularly important in a nation the size and diversity of India, where physical distances can be a major obstacle. By enabling quick access to a multitude of information, digital libraries provide a way around these problems (Lynch, 1995). Digital systems also enable services like online



reservations, renewals, and interlibrary loans, which further improves customer pleasure and experience overall.

E-library makes it possible for libraries in India to collaborate and share resources. Libraries may join networks and consortia and exchange multimedia collections, research resources, and personnel by using digital platforms (Fox, 1998). This cooperative strategy fosters resource fairness throughout the nation's library landscape by giving smaller universities access to a wider variety of resources and services. Digital platforms also make it easier for best practices to be shared, which helps libraries learn from each other and solve problems together creatively. The synergy that arises from digital cooperation enhances corporate practices and library services in India overall. In summary, the integration of digitalization into library administration in India has resulted in increased productivity, ease of use, and teamwork, therefore revolutionizing the way libraries function and provide to their patrons. On the other hand, it has been discovered that e-libraries are limited, particularly at remote campuses, by cyber security, a lack of technological specialists, and inadequate internet access (LI & Liu, 2019).

Objectives of Study:

- To examine the present status of digital libraries in India
- To explore the various technologies adopted for digital libraries in India
- To identify the major challenged faced while adopting emerging technologies in India
- To demonstrate the potential of digital libraries and future scope in India

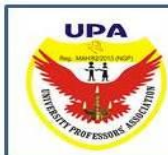
Review of Literature:

A. Trends and Practices:

According to Rathore et al., (2021), High-end technology is being used through a variety of trends and processes to improve connectivity, economy, and result-orientedness of e-library outputs. Libraries' futures are found in the same places. Electronic libraries, often referred to as virtual libraries or e-libraries, are developing quickly in response to new trends that will influence how knowledge will be accessed and shared in the future. The incorporation of machine learning and artificial intelligence (AI) into e-library systems is one notable development. Kiosk is yet another platform (Wani, 2019). These technologies enhance search algorithms, providing more accurate and personalized results for users. AI-driven systems can also analyze user behavior, making recommendations based on individual preferences and improving the overall user experience.

Rubin and Rubin (2019) observed that In India, one of the best practices that is most frequently used is the utilization of open educational materials. Open Educational Resources (OER) comprise publicly available, openly licensed educational assets such as course materials, manuals, and multimedia. OER is being added to e-libraries' collections more often in order to facilitate inclusive and affordable learning. This tendency makes high-quality educational resources available to a wider audience, which is consistent with the worldwide push towards open access and the democratization of education.

Fox & De Silva (2022) in their book found that the digital disruption is visible in the form of blockchain technology. Blockchain technology is starting to find its way into e-libraries,



providing enhanced reliability, security, and openness regarding the administration of digital assets. E-libraries may improve the provenance and attribution of digital content while also strengthening the integrity of their collections by utilizing blockchain technology. This is especially critical for academic and research libraries, where intellectual publications' legitimacy is paramount.

B. Opportunities through Digital Libraries:

Noh (2023) demonstrated the results of Library 5.0 in the study. For any company, user-friendliness is the key to success. More than ever, the users—the learners—are tech-savvy. As a result, the developers have given gamification their full attention. Another new trend that aims to engage users through interactive and game-like aspects is the stimulation of e-libraries. Users can be encouraged to explore library materials, take part in learning programs, and work with peers by using gamified interfaces. E-libraries have the power to change and enhance the learning process by adding aspects of matchmaking, incentives, and progression—especially for younger users.

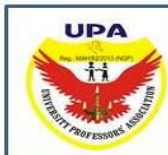
C. Challenges of Digital Libraries:

Shah et al. (2023) discussed that developing economy like India has a series of challenges to be overcome. Education is in the concurrent list meaning the responsibility of both central and state governments. Higher education is diverse since there are multiple disciplines, levels, courses, mediums of instructions as well. In addition, some are government, while some are private and rest others are self-financed.

According to Jena and Mishra (2019), there are a number of important obstacles that the use of technology in Indian libraries must overcome in order to successfully integrate and apply digital solutions. The digital gap, which still exists in India across many areas and demographic groups, is one major issue. Rural and isolated locations may lack the required connectivity and resources, even if larger areas may have better access to broadband and technological facilities. The uneven adoption and utilization of technology by libraries is impeded by the digital divide, making it more difficult to provide knowledge and instructional materials in an equal manner.

The adoption of new technology may be impeded by the deeply embedded nature of traditional library procedures and practices. To adjust to digital cataloging systems, database management, and other technology-driven procedures, librarians can need training. Similar to this, individuals who are used to traditional library services might find it difficult to switch to digital ones. It takes efficient training programs, user education campaigns, and a methodical approach to technology integration to overcome reluctance to change (Arms & Larsen, 2001).

Infrastructure limitations pose a significant obstacle to the adoption of advanced technologies in many Indian libraries. Inadequate funding and outdated physical infrastructure can impede the installation of necessary hardware and software. Insufficient resources for regular maintenance and upgrades can result in technology becoming obsolete quickly. Moreover, power fluctuations and unreliable electricity supply in some regions can disrupt the continuous operation of digital systems. Addressing these infrastructure challenges requires strategic investment, capacity building, and collaboration with government and private



entities to ensure sustainable technology adoption in libraries across the country (Lesk, 2005b).

D. Digital Libraries and Their Role during COVID-19 Pandemic Outbreak:

Around the world, the COVID-19 epidemic interrupted the conventional teaching and learning process. It significantly altered digital libraries in India, quickening the adoption of online resources and changing the accessibility and distribution of knowledge (Mehta and Wang, 2020). The demand for digital information increased when physical libraries closed during lockdowns and social distancing measures. As a lifeline for scholars, students, and the general public, digital libraries were essential in guaranteeing continuous access to research and instructional resources. To satisfy the growing demand for remote study and research, the epidemic encouraged a fast proliferation of digital categories, including digital books, online publications, and educational tools. Additionally, the epidemic encouraged the creation of novel services and solutions for India's digital libraries.

According to Tammaro(2020), In order to preserve community ties, librarians and information specialists used virtual engagement techniques, holding webinars, online events, and online book clubs. Digital libraries developed become central locations for carefully chosen COVID-19 data, providing the public with trustworthy sources and research updates. The epidemic made clear how important it is to have a strong digital infrastructure, which prompted investments in new technologies and the creation of user-friendly interfaces to improve the entire experience of using digital libraries. Therefore, the COVID-19 issue acted as a trigger for India's libraries to undergo a digital transition, demonstrating the institutions' flexibility and tenacity in the face of hitherto unheard-of difficulties.

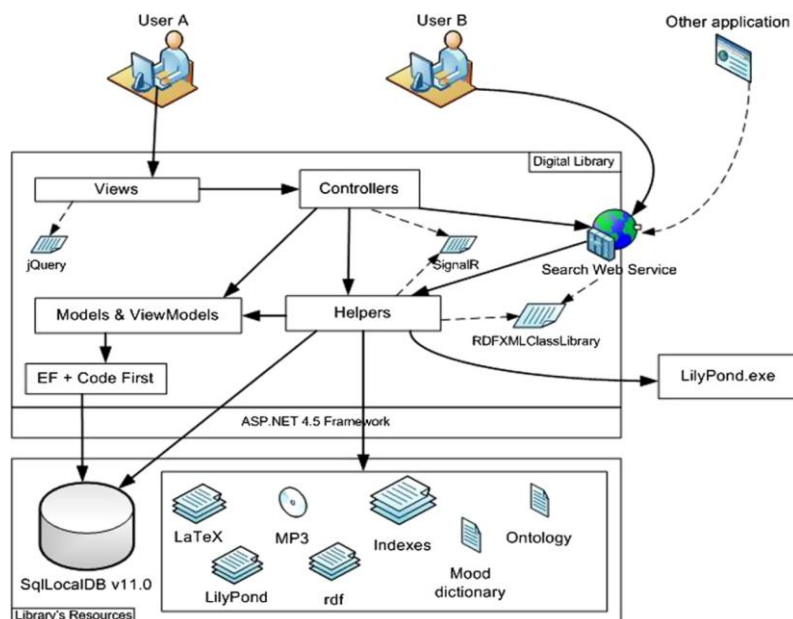
Discussion and Analysis:

The way that libraries operate is changing due to the incorporation of virtual and augmented reality technology. Using VR and AR apps, visitors may investigate historical sites, act out scientific experiments, and lose themselves in made-up worlds. These innovations provide a peek of what's to come and improve medication, learning, and engagement. Libraries continue to be essential hubs for communities in an age of digital connectivity. They provide venues for in-person encounters such as book clubs, workshops, conferences, and cultural activities. The combination of in-person and online interaction guarantees that libraries will always be essential for fostering social cohesion.

- **Digital Disruption of E-Libraries through Artificial Intelligence:**

Digital libraries are about to undergo a revolution thanks to artificial intelligence (AI), which will bring in a new era of improved accessibility, tailored experiences, and effective information management. Artificial intelligence (AI)-driven innovations like machine learning and natural language processing will change how people utilize digital libraries. More accurate and pertinent search results will be obtained by using more focused and context-aware queries made possible by advanced search engines. Furthermore, AI-powered recommendation systems will provide users with customized content selections based on their past interactions and choices, resulting in a more customized and engaging experience.

Figure 1: Transforming Digital Libraries through Integration of AI, IoT



(Source: Nisheva-Pavlova, Mariaa; b; * | Shukerov, Dichoa | Pavlov, Pavela, 2015)

The automation of metadata management and cataloging procedures is one of the biggest changes brought about by AI in digital libraries. Large-scale datasets may be analyzed by machine learning algorithms, which can then automatically classify and identify digital resources with pertinent metadata. In addition to expediting the cataloging process, this guarantees correctness and uniformity in the information organization process. This frees up librarians to work on more strategic projects, and users gain from a smoothly functioning digital library with rich metadata that makes finding materials and navigating it easier. All things considered, the incorporation of AI into digital libraries holds the potential to transform the information access scene, rendering libraries more adaptable, user-focused, and effective in satisfying the various demands of their clients.

Findings of Study:

- Technology works like an invisible hand to transform the existing process.
- As there are two sides for every coin, technology also has pros and cons. However, if there are more pros, then it is worth to use with care.
- Digital disruption is feasible by adopting the high-end technology for libraries in India.
- There are various challenges noticed in the form of poor digital infrastructure, lack of high tech expertise, limited funding, digital divide, internet speed problem, data insecurity and others.
- The digital disruption in the forms of artificial intelligence, internet of things, virtual reality, augmented reality are the future of digital libraries.
- Automation, integration, customization, database management, extensive user interface are the competitive advantages available after adopting digital library advanced technologies.



Conclusion:

All of the above discussion shows that digitalization is the key to success. It is also applicable to the higher educational institutions in India. Libraries are the backbones of Indian knowledge systems. They preserve the rich heritage of information for researchers, students, academicians etc. The future of digital libraries lies in the forms of artificial intelligence, internet of things, virtual reality, augmented reality, internet of things etc. One hand, it offers the competitive advantages such as customization, integration, automation, accessibility etc. To the other hand, there are challenges like digital infrastructure, lack of funding/expertise. However, the government, colleges need to understand the growing importance and adopt them in the changing scenario to create the win-win situations for sustainable education.

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