

Transformation of Libraries in the Artificial Intelligence Era: Emerging Roles and Opportunities for Promoting the Indian Knowledge System

Manisha Atul Samant

Librarian, B.P.C.A.'s College of Physical Education, Wadala, Mumbai, Maharashtra, India

samantmani@gmail.com

ABSTRACT

Artificial Intelligence (AI) technologies are developing rapidly, creating new opportunities for innovation in many fields, including libraries. As repositories and gateways to knowledge, modern libraries are shifting from traditional book repositories to dynamic, user-centred digital information centres. They are also becoming more sophisticated, technologically enabled knowledge ecosystems. AI offers unprecedented capabilities to automate routine tasks, enhance information retrieval, and personalise user engagement. The Indian Knowledge System (IKS) may libraries should treat AI-generated metadata created, organised, preserved, interpreted, disseminated, and made globally visible with the help of libraries in India thanks to this transition. IKS includes philosophy, literature, mathematics, astronomy, medicine, linguistics, arts, architecture, agriculture, environmental knowledge, and indigenous and community-based knowledge. This study explores how AI may change operational workflows, decision-making procedures, and library services, ultimately influencing the direction of librarianship. Library and information science is no exception to the new era of technological innovation brought about by the development of artificial intelligence (AI). Drawing on academic literature, professional recommendations, policy documents, and advances in AI and digital library technologies, this work uses a qualitative, descriptive, conceptual research approach grounded in policy document analysis. This study examines how Indian Knowledge Systems might offer methodological, ethical, and philosophical direction for the responsible advancement of artificial intelligence. The article analyses the historical foundations of Indian knowledge traditions, the evolution of AI technologies, and the potential to integrate traditional wisdom with modern digital tools. It supports the view that integrating IKS with AI can support sustainable development, cultural preservation, and ethical AI governance. The study concludes that India has a rare chance to create a technology future that is both human-centred and culturally grounded by fusing traditional knowledge with cutting-edge technologies—AI, libraries, information literacy, and education; professional guidelines; and pertinent literature.

Keywords: Artificial Intelligence; Indian Knowledge System; Cultural Heritage; Digital Libraries; Digital Preservation.

1. INTRODUCTION

Information production and consumption have changed radically in the twenty-first century. Digital technologies have recently transformed the traditional scopes of libraries, archives, museums, universities, and other knowledge institutions. This shift has been accelerated by the emergence of artificial intelligence, which offers new capabilities for processing massive amounts of structured and unstructured data, identifying trends, creating metadata, translating content, responding to natural language queries, and facilitating individualised knowledge discovery.

The world's information and knowledge landscape is changing rapidly because of artificial intelligence (AI), which opens new avenues for knowledge generation, organisation, preservation, discovery, and transmission. Libraries, which were once thought of as places to gather, arrange, preserve, and make information accessible, are becoming more and more sophisticated and digitally connected knowledge ecosystems. AI can help libraries move beyond their traditional role as repositories and become intelligent knowledge infrastructures that integrate fragmented IKS resources across languages, fields, institutions, and geographical barriers. This shift matters especially for the Indian Knowledge System (IKS), a multifaceted body of knowledge created and passed down through generations.

In India, this transformation matters because of the nation's incredibly rich cultural and intellectual legacy. The Indian Knowledge System comprises a vast array of knowledge traditions established over ages and passed down through manuscripts, books, oral traditions, inscriptions, artistic practices, scientific writings, educational institutions, communities, and lived activities. These traditions include Ayurveda, yoga, mathematics, linguistics, astronomy, logic, philosophy, literature, agriculture, architecture, environmental knowledge, performing arts, and many local and indigenous customs.

2. OBJECTIVES OF THE STUDY

- ✓ To examine the transformation of libraries under the influence of Artificial Intelligence
- ✓ To understand the concept and significance of Indian Knowledge Systems
- ✓ To identify the relationship between traditional knowledge and emerging AI technologies.
- ✓ To explore ethical, technological, cultural, and intellectual-property challenges associated with AI-enabled IKS repositories.
- ✓ To explore the potential applications of AI in the preservation and dissemination of the Indian Knowledge System.
- ✓ To examine the opportunities presented by AI for multilingual and interdisciplinary access to IKS resources.
- ✓ To examine the changing professional roles and competencies required by library and information professionals.
- ✓ To propose a conceptual framework for developing AI-enabled libraries for the Indian Knowledge System.

3. RESEARCH METHODOLOGY

This study uses a conceptual, literature-based research methodology. The study follows a descriptive and analytical approach to examine the relationship between traditional knowledge and emerging technologies. The study reviewed published literature on artificial intelligence; the transformation of traditional libraries into modern libraries due to

the advent of artificial intelligence; digital humanities; cultural heritage preservation; knowledge organisation; and the Indian knowledge system. In addition, the analysis considers legislative and institutional advancements in AI, education, digital knowledge infrastructure, and IKS in India. The discussion is interpretative rather than empirical, and it collects no primary data.

4. REVIEW OF LITERATURE

Chattopadhyaya (2011) examines ancient India's scientific achievements and how they connect with social and cultural advancement. The book shows how ancient knowledge systems shaped intellectual progress by highlighting early Indian scholars' contributions to mathematics, astronomy, medicine, and other sciences.

In his discussion of the value of IKS for LIS practitioners, Sarkar (2026) highlights key areas where traditional knowledge and contemporary LIS practices might converge, including digital preservation, knowledge organisation, community participation, and culturally relevant information services. From a digital preservation perspective, researchers are also investigating the link between IKS and modern LIS practice.

Ambika and Amudha (2024) investigated awareness, views, potential, and obstacles to AI adoption in libraries from the viewpoints of 282 Indian library professionals. To help libraries leverage AI technologies, the findings highlight the importance of institutional support and professional readiness.

Kattimani et al. (2026), in their study of academic librarians in Karnataka, evaluated librarians' knowledge, training needs, attitudes, and perceptions of AI's future effects on academic library services. These studies show that AI literacy is becoming a significant part of modern LIS professional development. Recent studies in India have begun examining AI literacy more broadly.

5. UNDERSTANDING THE INDIAN KNOWLEDGE SYSTEM

Modern education provides the skills and abilities essential to deal with a changing world, but it does not consider the academic heritage that shaped this reality. A society that is aware of its history will always be better able to think about and shape its future. Indian knowledge systems are among the world's oldest. Developed over ages, their multiple domains have enhanced human knowledge in disciplines like astronomy, mathematics, architecture, and medicine.

Indian Knowledge Systems (IKS) comprise the whole domain of education that has flourished for thousands of years across the Indian subcontinent. IKS includes a wide range of disciplines. Many of these academic fields focus on people, society, or the universe. Through investigation, discussion, and applying concepts, ancient Indians developed this knowledge. They applied this understanding to many facets of human life through discussion and real-world practice. They passed this information on through means other than printed textbooks. Beyond publishing textbooks, they transmitted this information in other ways. Ancient Indians preserved this knowledge for future generations through oral tradition, many schools of thought, conversations among religious leaders, merchants, and artisans within communities, and the teacher-student parampara.

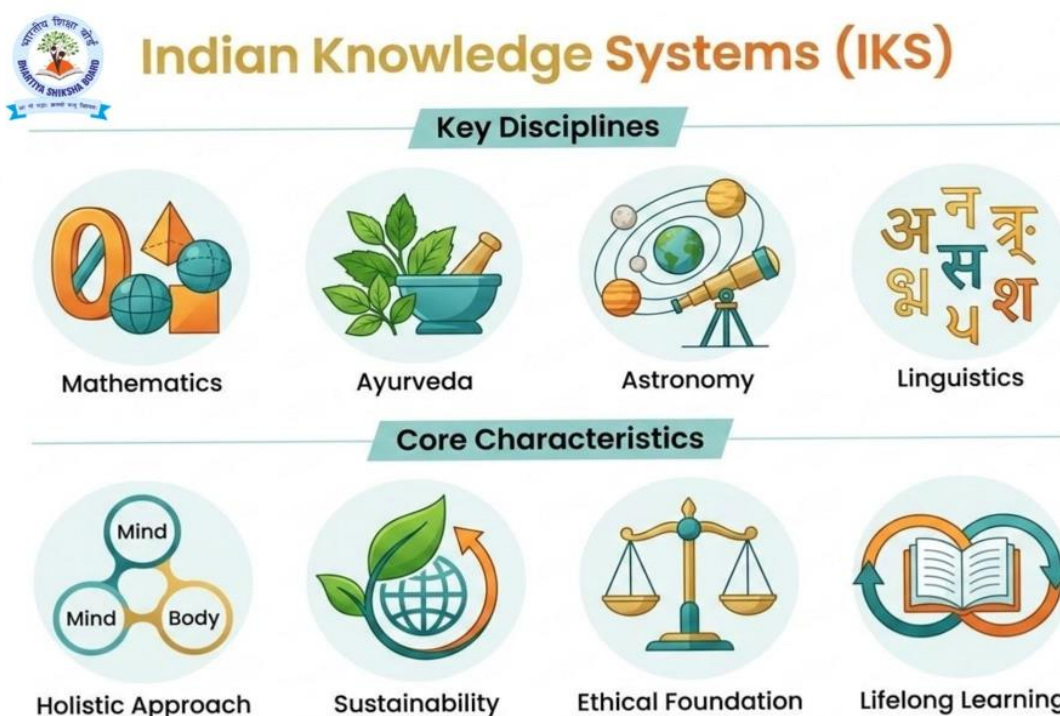


Figure 1. Understanding the Indian Knowledge System (Indian Knowledge System: History, Principles, & Relevance, n.d.)

6. WHY INDIAN KNOWLEDGE SYSTEMS ARE RELEVANT TODAY

Even as technology has advanced in the twenty-first century, numerous problems remain in health, society, and the environment. Even if the world continues to depend on scientific advancements, these obstacles require an approach that considers both the technological aspects of the problems and the technological solutions. Indian knowledge systems offer solutions to many of these problems today.

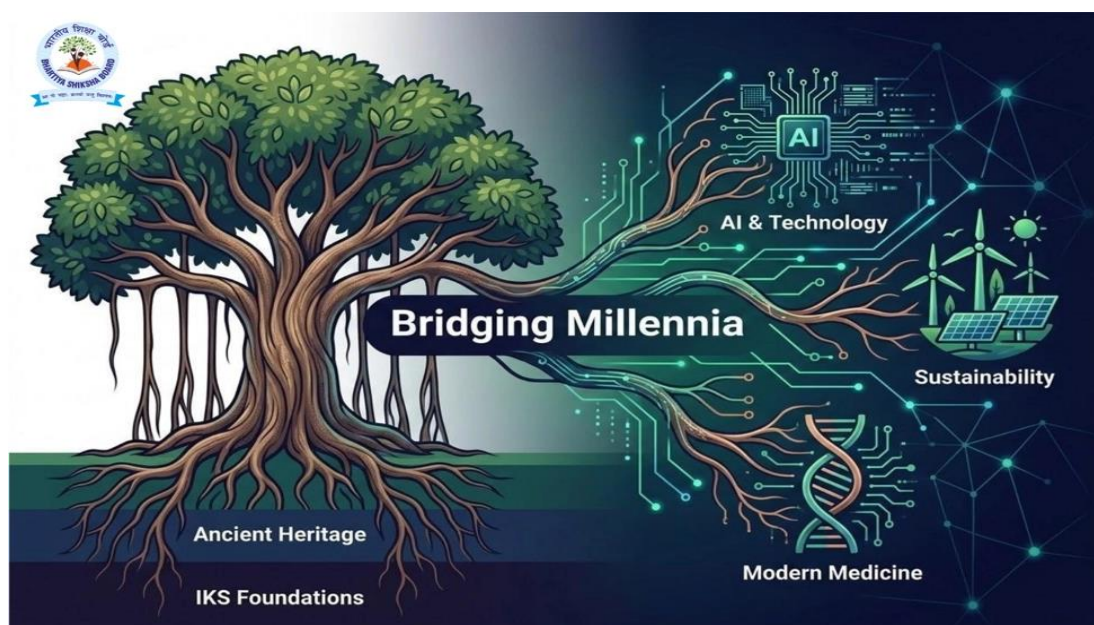


Figure 2. Why Indian Knowledge Systems Are Relevant Today (Indian Knowledge System: History, Principles, & Relevance, n.d.)

7. INDIAN KNOWLEDGE SYSTEM AND LIBRARIES WITH APPLICATION OF ARTIFICIAL INTELLIGENCE (AI)

Libraries can take a long time to adopt new technologies, resulting in inadequate training, delayed services, and difficulty keeping up with cutting-edge tools such as artificial intelligence. Libraries must make significant changes across their facilities as AI tools continue to emerge. Librarians will teach people how to use AI technologies. These tools allow you to find subjects, analyse digital collections, add information, and increase search retrieval and accuracy. Throughout the institution's history, library administration systems have evolved to keep up with technological advances.

One of the biggest challenges to making library resources internationally discoverable is their diversity. One institution may have a manuscript, another a translation, a third a catalogue record, and a community may have relevant oral information. Furthermore, different languages, historical periods, educational institutions, and geographical regions may refer to the same things in different ways.

Traditional library systems can catalogue these resources, but AI may add another layer of conceptual connection. For example, a knowledge graph could connect a historical text to its author, subject, language, script, origin, similar manuscripts, translations, scholarly interpretations, and associated concepts. Thus, AI can help libraries create a more consistent representation of IKS while preserving the source and its provenance.

8. TRADITIONAL LIBRARIES TRANSFORMED TO MODERN LIBRARIES WITH THE HELP OF ARTIFICIAL INTELLIGENCE (AI)

The traditional functions of collection development, cataloguing, classification, preservation, reference, information retrieval, and user services are slowly being supplemented by AI-enabled technology. According to the International Federation of Library Associations and Institutions (IFLA), AI can assist with activities including optical character recognition, classification, search and discovery, information organisation, translation, and user services. IFLA also emphasises ethical issues, professional values, privacy, and human oversight.

8.1 From Repository to Intelligent Knowledge Ecosystem

The traditional library paradigm prioritises collection development, cataloguing, categorisation, preservation, reference, and circulation. In the AI era, these professions remain vital, but computational tools are increasingly helping them. Libraries can offer AI-enabled services such as natural language search, recommendation systems, automated document classification, multilingual retrieval, entity recognition, virtual reference services, and text and data mining.

8.2. Automating Tasks and Optimising Workflows

AI is improving libraries' operational efficiency by optimising cataloguing, acquisition, circulation, reference services, and data management. By automating repetitive tasks, librarians can dedicate more time to complex, value-added responsibilities such as research assistance, teaching data literacy, curating digital content, and improving the user experience. AI can automate routine tasks, freeing library employees to focus on more important duties. This enables librarians to focus their skills on enhancing the library experience.

8.3 Personalised Recommendations

AI analyses user behaviour and preferences to recommend relevant books, articles, or digital resources. AI algorithms that analyse user activity to generate personalised recommendations can introduce customers to new and helpful resources. This will expand their intellectual horizons and promote deeper engagement with the library.

8.4 Intelligent Search and Discovery

Search engines with advanced AI features can deal with complex searches, providing more relevant and tailored results. This will ensure seamless browsing of the enormous library resources and prevent frustration. Frequently, keyword-based searching does not work when readers are unfamiliar with the particular terminology used in a publication. AI-based search engine semantics can identify links between topics rather than relying only on exact keyword matches.

This ability is especially beneficial for IKS resources, since the same basic concept can be presented in Sanskrit, Hindi, Tamil, Telugu, Marathi, Bengali, Pali, Prakrit, Persian, English, or other languages. Semantic retrieval enables users to search for a concept in one language and locate appropriate content expressed in another language, subject vocabulary, or historical terminology.

8.5 Digitisation of Manuscripts and Rare Materials

India has enormous collections of rare manuscripts and books. Digitisation makes it possible to create digital versions for instruction and learning without excessive handling of the originals. Through standard image sharpening, page-layout checks, script spotting, handwriting recognition, and OCR, AI can support this work. It streamlines the entire procedure. Training AI to read ancient handwriting styles and Indian scripts has the greatest promise. Digital materials would be much more accessible with improved OCR for Sanskrit, regional languages, and historical scripts. This would increase access to the important writings our ancestors left behind in the Indian Knowledge System.

8.6 OCR and Handwritten Text Recognition

It is not possible to search a scanned manuscript automatically. OCR makes indexing, searching, translation, and computational analysis possible by transforming an image into machine-readable text. This is especially crucial for IKS, since many resources are available only as scanned images. AI-based handwritten text recognition could soon make it possible to do computational searches on vast manuscript collections.

Libraries should therefore maintain both the original image and the machine-generated transcription and clearly show the transcription's reliability. Digitisation is essential to offering IKS resources to both current and future generations. AI can identify deterioration in images of library items, enabling prompt intervention and preventative measures.

8.7 Digital Preservation

By identifying damaged materials, spotting unusual features in photos, monitoring digital collections, and supporting automated quality assurance, artificial intelligence (AI) can help preserve materials. AI-generated digital content, however, also needs preservation and maintenance. Document models, training datasets, metadata, software dependencies, and provenance information to help future researchers understand how a digital representation was created. Digital preservation, however, must safeguard not just the digital image but also its origin and context.

Transformation of Libraries in the Artificial Intelligence Era: Emerging Roles and Opportunities for Promoting the Indian Knowledge System

8.8 AI for Multilingual Access to Indian Knowledge

A wide range of Indian languages provides academic institutions both advantages and disadvantages. Much of India's intellectual legacy is in languages that were previously inaccessible in the global digital information system. Translation, transliteration, speech recognition, optical character recognition, and AI-powered multilingual information retrieval can all help close this gap. These techniques increase access to IKS resources for researchers worldwide without appreciably diminishing the importance of mastering the original language. AI must therefore serve as a tool for access and discovery, with academic validation to ensure reliable, precise translations.

8.9 Knowledge Graphs and Semantic Representation

One of the most promising uses of AI in IKS libraries is creating knowledge graphs.

A knowledge graph can depict relationships between entities, such as:

Person → Text → Concept → Discipline → Language → Manuscript → Institution → Place → Historical Period

For example, a digital representation of a classical work may relate the work to its author, different manuscript versions, translations, comments, subjects, related academics, places, and other resources. This may help libraries conduct historical research, find relevant sources, create educational programs, and collaborate with scholars worldwide and digital humanities initiatives.

8.10 Automated Creation of Metadata

Extensive digitalisation creates a vast quantity of digital items. Manually preparing detailed metadata for each object can be expensive and time-consuming. AI can help libraries identify authors, titles, dates, organisations, subjects, and more. However, because it is not inherently authoritative, libraries should treat AI-generated metadata as assisted metadata. Expert evaluation remains vital, particularly for historical texts, culturally delicate topics, and ambiguous language.

CONCLUSION

Artificial intelligence is transforming libraries from simple information storage facilities into dynamic, intelligent, interconnected knowledge environments. For India, this evolution offers a significant opportunity, as libraries can serve as key institutions for preserving and disseminating the country's rich intellectual and cultural heritage. The Indian Knowledge System encompasses a wide range of textual, linguistic, scientific, philosophical, artistic, ecological, and community-oriented information. Much of this heritage remains fragmented, hard to access, linguistically challenging, or at risk of physical decay. AI can help mitigate these issues through digitisation, optical character recognition (OCR), multilingual search capabilities, semantic search, automated metadata generation, knowledge graphs, recommendation algorithms, and intuitive user interfaces.

Nonetheless, relying solely on technological advancements does not ensure effective preservation. Indigenous Knowledge Systems (IKS) should be represented accurately, contextually, and ethically, while respecting intellectual property and community rights. Information generated by AI needs to undergo professional validation, and culturally sensitive knowledge demands appropriate governance. Thus, the future library should not merely be (Placeholder1)perceived as an “AI-driven library.” It should be envisioned as a human-centred, ethically managed,

culturally aware, and technologically enhanced knowledge ecosystem. Within this ecosystem, librarians serve as knowledge curators, digital stewards, AI literacy educators, knowledge architects, and facilitators of interdisciplinary research.

REFERENCES

- [1] Bhoje, H. (2026). The Role of Artificial Intelligence in Modern Library Services. IJSR. G. S., Chandrashekara, and Mulimani, Mallikarjun. The Impact of Artificial Intelligence on Library and Information Science (LIS) Services (May 01, 2024). International Journal of Innovative Practice and Applied Research (IJIPAR), 14(5), 50-56.
- [2] Davis, J. (2024). Artificial intelligence (AI) and academic libraries: A leadership perspective. *College & Research Libraries News*, 85(8), 347. <https://doi.org/10.5860/crln.85.8.347>
- [3] IFLA FAIFE (Committee on Freedom of Access to Information and Freedom of. (2020). IFLA statement on libraries and artificial intelligence. International Federation of Library Associations and Institutions (IFLA). <https://repository.ifla.org/handle/20.500.14598/1646>
- [4] Killedar, Lata N. (2026). *Indian knowledge systems in the age of artificial intelligence: Bridging traditional wisdom with emerging technologies*. <https://doi.org/10.5281/ZENODO.20046466>
- [5] Kumar, P., & Jyoti, J. (2024). Reshaping the library landscape: Exploring the integration of artificial intelligence in libraries. *IP Indian Journal of Library Science and Information Technology*, 9(1), 29. <https://doi.org/10.18231/j.ijlsit.2024.005>
- [6] Le, T., & Zhai, C. (2021). Artificial Intelligence in Library and Information Science: A Review. *Journal of Information Science*, 47(1), 3–19
- [7] Laxmanra, P. P. (2023). Role of artificial intelligence in modern libraries. *ShodhKosh: Journal of Visual and Performing Arts*, 4(1). <https://doi.org/10.29121/shodhkosh.v4.i1.2023.5387>
- [8] Libraries in the AI era: Transforming academic and research information services (Short version). (n.d.). Retrieved September 30, 2026, from <https://www.linkedin.com/pulse/libraries-ai-era-transforming-academic-research-short-uzwyshyn-ph-d--dc11e>
- [9] Miao, F., Shiohira, K., & Lao, N. (2024). *AI Competency Framework for Students*. UNESCO.
- [10] Molaudzi, A. I., & Ngulube, P. (2025). Use of artificial intelligence innovations in public academic libraries. *IFLA Journal*, 51(3), 660–670. <https://doi.org/10.1177/03400352241301780>
- [11] Narendra, A. P., Dewi, C., Gunawan, L. S., & Ardi, A. S. (2025). *Artificial Intelligence Implementation in Library Information Systems: Current Trends and Future Studies*. *Vietnam Journal of Computer Science*, 12(03), 209–233. <https://doi.org/10.1142/s2196888824300023>
- [12] Ram, B. (2024). Transforming libraries: The impact of artificial intelligence. *IP Indian Journal of Library Science and Information Technology*, 8(2), 74–75. <https://doi.org/10.18231/j.ijlsit.2023.012>
- [13] Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education*, 16, 39.