



# DIGITAL INNOVATIONS FOR SAFEGUARDING AND DISSEMINATING THE INDIAN KNOWLEDGE SYSTEM

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## ABSTRACT

The integration of digital technologies into the preservation and dissemination of Indian Knowledge Systems (IKS) represents a pivotal advancement in safeguarding and promoting India's rich cultural heritage. By leveraging digital platforms, traditional knowledge encompassing areas such as Ayurveda, Yoga, classical arts, and indigenous sciences can be systematically documented, preserved, and made accessible to a global audience. These knowledge systems, which have been transmitted orally and through ancient scriptures for centuries, are now being revitalized and preserved through modern technology. Digital tools and platforms have played a crucial role in ensuring that this wisdom remains accessible, adaptable, and relevant in contemporary education and research.

**Keywords:** Indian Knowledge System, digital technology

## INTRODUCTION

The Indian Knowledge System (IKS) is a vast and interdisciplinary body of traditional knowledge that has evolved over thousands of years. Rooted in ancient texts, oral traditions, and experiential wisdom, IKS encompasses various disciplines, including philosophy, science, mathematics, medicine, architecture, arts, agriculture, and governance. Unlike modern Western knowledge systems, which emphasize empirical and reductionist approaches, IKS integrates spiritual, ethical, and holistic perspectives in understanding the world. IKS is deeply embedded in India's cultural and civilizational ethos, drawing from texts like the Vedas, Upanishads, Puranas, Smritis, and various regional traditions. It emphasizes practical application and sustainability, offering solutions to contemporary global challenges such as climate change, mental health, and alternative medicine. With globalization and technological advancements, IKS is being integrated into modern education, healthcare, and sustainable development. The Indian government's National Education Policy (NEP) 2020 emphasizes the inclusion of IKS in the curriculum to promote indigenous knowledge and innovation. Additionally, disciplines like Ayurveda, Yoga, and Vedic mathematics are gaining global recognition for their practical applications. The integration of technology with Indian Knowledge Systems (IKS) has opened new avenues for the preservation, research, and application of ancient wisdom in modern contexts. With advancements in digital tools, artificial intelligence (AI), blockchain, virtual reality (VR), and e-learning platforms, traditional Indian knowledge is being revived and made more accessible. This synergy is crucial in ensuring that the vast repository of India's intellectual heritage remains relevant in the 21<sup>st</sup> century.

## IMPORTANCE OF USING DIGITAL TOOLS

Digital tools enable the systematic storage and protection of valuable data and knowledge from loss or degradation while ensuring easy and widespread access across geographical and social boundaries. They support faster communication, accurate analysis, and innovative learning through interactive and multimedia formats,

making information more engaging and inclusive. In fields such as education, research, governance, healthcare, and cultural preservation, digital tools promote transparency, collaboration, and informed decision-making. Overall, the use of digital tools is essential for sustaining knowledge, improving productivity, and ensuring relevance and continuity in the modern era. The rapid advancements in digital technologies have revolutionized the way knowledge is preserved, disseminated, and accessed. Indian Knowledge Systems (IKS), which encompass traditional sciences, philosophy, arts, medicine, and linguistic heritage, require urgent preservation and modernization to remain relevant in today's world. Digital tools play a crucial role in safeguarding, promoting, and integrating IKS into contemporary education and research.

## **NEED FOR DIGITAL TOOLS IN PRESERVING AND TEACHING IKS**

### ***Risk of Knowledge Erosion:***

The Indian Knowledge System faces a serious risk of knowledge erosion due to the gradual loss of traditional manuscripts, the decline of oral transmission, and the decreasing number of trained scholars and practitioners. Many ancient texts are written on fragile materials such as palm leaves and birch bark, which deteriorate over time if not properly preserved. Additionally, knowledge that has been passed orally across generations is increasingly endangered as younger generations move away from traditional learning systems.

### ***Global Accessibility:***

Global accessibility is a crucial reason for using digital tools in preserving and teaching the Indian Knowledge System, as they enable knowledge to reach audiences beyond geographical, linguistic, and institutional boundaries. Through digital archives, online learning platforms, and open-access resources, scholars, students, and practitioners across the world can access ancient texts, commentaries, and traditional practices without physical constraints. Digital translations, subtitles, and interactive content further reduce language barriers, allowing global learners to engage meaningfully with IKS.

### ***Integration into Modern Education:***

Integration into modern education is essential for ensuring the relevance and continuity of the Indian Knowledge System, and digital tools play a key role in achieving this goal. By incorporating digital resources such as e-content, virtual classrooms, interactive modules, and multimedia presentations, IKS can be aligned with contemporary curricula and teaching methodologies. Digital platforms make it easier for schools and universities to blend traditional knowledge with modern subjects, encourage interdisciplinary learning, and engage students through experiential and technology-enabled approaches.

### ***Protection from Misappropriation:***

Traditional Knowledge Digital Library (TKDL) protects indigenous knowledge from unethical patents and biopiracy by digitally documenting ancient medicinal practices and formulations. Digital tools such as secure databases, digital documentation, and technologies like blockchain help establish clear records of origin, authorship, and community ownership of knowledge. By creating authenticated and time-stamped digital evidence, these tools support legal protection and ensure proper recognition of traditional knowledge holders. This safeguards cultural integrity while promoting ethical use and responsible sharing of IKS in academic, commercial, and global contexts.

## **DIGITAL INITIATIVES FOR PRESERVING AND TEACHING INDIAN KNOWLEDGE SYSTEM**

### ***Digital Repositories***

Digital repositories serve as centralized platforms for storing and sharing indigenous knowledge. The Indian Knowledge Systems (IKS) Division, under the Ministry of Education, has established initiatives to promote interdisciplinary research and disseminate IKS for societal applications. One significant effort is the Vedic Heritage Portal, launched by the Indian government to digitally archive ancient texts, including the Vedas and Upanishads. This portal provides over 550 hours of audio-visual content, ensuring that these foundational

scriptures are preserved and accessible for educational and research purposes. The National Digital Library of India (NDLI) serves as a comprehensive virtual repository, offering a vast array of learning resources across disciplines.

### ***AI and Machine Learning in IKS Research***

AI and ML have been used to analyze ancient Indian texts, identify linguistic patterns, and create automated translation tools. These technologies help researchers interpret and decode ancient knowledge by enabling faster script recognition, semantic analysis, and cross-referencing of concepts across large textual corpora. Machine learning models can detect recurring philosophical ideas, scientific methods, and medicinal formulations that may not be easily noticeable through manual study. By assisting scholars in organizing, comparing, and contextualizing vast bodies of traditional literature, AI and ML significantly enhance the depth, accuracy, and efficiency of Indian Knowledge System research.

### ***Online Courses and E-Learning Platforms***

Online courses and e-learning platforms play a crucial role in making the Indian Knowledge System accessible to learners worldwide. Through interactive modules, video lectures, quizzes, and simulations, these platforms offer structured and engaging ways to study subjects like Ayurveda, Yoga, Indian mathematics, classical arts, and philosophy. They allow students, researchers, and enthusiasts to learn at their own pace, irrespective of location, and often provide multilingual support to overcome language barriers. By combining traditional knowledge with modern pedagogical tools, e-learning platforms help to preserve IKS, promote global awareness, and encourage intergenerational transmission of India's rich intellectual heritage.

### ***Virtual Reality (VR) and Augmented Reality (AR) Experiences***

Virtual Reality (VR) and Augmented Reality (AR) experiences offer immersive ways to engage with the Indian Knowledge System, bringing ancient traditions, architecture, and practices to life. Through VR, users can explore historical sites, ancient universities like Nalanda and Takshashila, and cultural rituals in a fully interactive 3D environment, while AR can overlay digital information onto real-world objects, such as temple structures, astronomical instruments, or medicinal plants. These technologies make learning experiential, helping students and researchers visualize complex concepts, understand traditional practices in context, and connect more deeply with IKS.

### ***Mobile Applications for Language Preservation***

Mobile apps are developed to teach and preserve indigenous languages, ensuring the survival of linguistic heritage. These applications often include features like interactive lessons, pronunciation guides, and cultural stories.

### ***Big Data and Analytics in Traditional Farming***

Big data and analytics are increasingly enhancing traditional Indian farming by blending age-old agricultural wisdom with modern digital technologies. Practices like Vrikshayurveda, which focus on natural soil health, plant nutrition, and ecological balance, are being revitalized through data-driven insights. Initiatives such as Digital Green use digital platforms, data analytics, and AI to disseminate knowledge on traditional organic farming methods, enabling farmers to make informed decisions based on localized data and peer learning. Similarly, startups like Kheti Buddy combine AI-based weather forecasting, soil data, and crop analytics with indigenous farming knowledge to optimize sowing cycles, irrigation, and pest management.

### ***Digital Platforms for Promoting Indian Knowledge Systems (IKS)***

Social media platforms have emerged as powerful tools for spreading awareness about Indian Knowledge Systems (IKS) by making traditional wisdom accessible and engaging for a wider audience. Through short videos, tutorials, and interactive content, these creators present complex traditional knowledge in an easy-to-understand and relatable manner. This digital outreach not only helps preserve India's rich intellectual heritage but also encourages younger generations to learn and apply ancient techniques in modern education and daily life.

## CHALLENGES IN INTEGRATING TECHNOLOGY INTO IKS

### *Limited Documentation and Digitization*

A major challenge in integrating technology into Indian Knowledge Systems is the limited documentation and digitization of traditional knowledge. Many ancient texts, manuscripts, and practices are preserved in fragile physical forms or passed down through oral traditions, making them vulnerable to loss and deterioration. The lack of standardized formats, inadequate archival infrastructure, and limited expertise in digitizing ancient scripts further slowdown the process.

### *Language and Interpretation Barriers*

Indian Knowledge Systems are largely recorded in Sanskrit, Prakrit, and various regional languages, which limits accessibility for wider audiences. Accurate translation is challenging because many traditional concepts do not have direct equivalents in modern languages or scientific terminology. Misinterpretation can occur if cultural context, symbolism, and philosophical depth are not properly understood.

### *Risk of Misrepresentation*

There is a significant risk of oversimplification and distortion when Indian Knowledge Systems are adapted for digital platforms or modern technological frameworks. Complex philosophies, holistic practices, and culturally rooted concepts may be reduced to superficial content for wider appeal, leading to misunderstandings.

### *Sustainability and Technological Changes*

Rapid technological evolution means digital platforms may become outdated, requiring constant updates and funding.

### *Over-Reliance on Digital Tools*

The essence of IKS, which includes experiential learning, meditation, and practical applications, may be lost if students rely only on digital tools instead of real world practice.

## CONCLUSION

In order to successfully integrate digital technologies in preserving and teaching Indian Knowledge Systems (IKS), it is essential to actively involve indigenous communities in the development and implementation process. Ensuring ethical practices, respect for intellectual property rights, and cultural authenticity is crucial while digitizing traditional knowledge. Promoting sustainable and culturally sensitive digital solutions can help protect the philosophical depth of IKS. Encouraging hybrid learning models that combine digital tools with traditional teaching methods allows for better knowledge transmission. Additionally, developing more IKS- focused digital platforms and open-access resources can enhance accessibility, preservation, and responsible dissemination of indigenous knowledge.

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