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AI and Intellectual Property Governance in Revitalizing Indian Knowledge Systems for Global Sustainability

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Abstract

In recent years, the convergence of Artificial Intelligence (AI) and Intellectual Property (IP) governance has opened new pathways for re-evaluating the role of Indian Knowledge Systems (IKS) in addressing global sustainability challenges. India's traditional knowledge—encompassing domains such as Ayurveda, agriculture, ecological stewardship, and artisanal practices—has historically faced risks of misappropriation due to its collective ownership and oral transmission. The establishment of the Traditional Knowledge Digital Library (TKDL) marked a significant intervention by documenting and systematizing indigenous knowledge to prevent illegitimate patent claims. However, the emergence of AI introduces both transformative possibilities and complex legal-ethical dilemmas. On one side, AI facilitates large-scale digitisation, multilingual translation, and analytical interpretation of traditional knowledge, thereby enhancing its accessibility and scientific engagement. On the other, prevailing IP frameworks remain insufficient in addressing issues related to data ownership, algorithmic authorship, and community rights. By drawing upon theoretical insights from Foucault's notion of power/knowledge, postcolonial critiques of epistemic dominance, and commons-based governance models, this paper argues for a restructured and inclusive approach to knowledge governance. Incorporating contributions from Indian scholars and policy frameworks, the study demonstrates how India can evolve a hybrid model that integrates AI innovation with culturally grounded legal protections. Such an approach not only safeguards traditional knowledge but also positions it as a vital resource for achieving global sustainability.

Keywords: Artificial Intelligence; Intellectual Property; Indian Knowledge Systems; Traditional Knowledge; Sustainability

1. Introduction

The urgency of global environmental and social crises has led scholars and policymakers to revisit alternative knowledge traditions that offer sustainable modes of living. Indian Knowledge Systems (IKS), developed through centuries of interaction between communities and their environments, present holistic frameworks that differ fundamentally from dominant scientific paradigms. These systems prioritize balance, interdependence, and long-term ecological stability.

Despite their significance, IKS have often been excluded from mainstream legal and scientific institutions. As Kapoor observes, Indian epistemologies operate through integrative and experiential modes that resist easy codification (Kapoor 12). This mismatch with formal intellectual property regimes has contributed to their marginalization.

The growing integration of AI into knowledge infrastructures creates new possibilities for bridging this gap. However, without critical engagement, technological advancement may reproduce existing inequalities. Therefore, this paper situates AI-driven IP governance within broader theoretical and policy debates.

2. Theoretical Perspectives

2.1 Knowledge, Power, and Institutional Authority

Michel Foucault's analysis of the relationship between knowledge and power provides a useful lens for examining the status of traditional knowledge. He suggests that what counts as legitimate knowledge is shaped by institutional authority rather than inherent validity.

In the Indian context, Visvanathan critiques the dominance of modern scientific discourse, arguing that it has sidelined alternative ways of knowing (Visvanathan 165). This marginalization is not accidental but embedded within systems of governance that privilege certain epistemologies over others.

2.2 Postcolonial Critique and Epistemic Inequality

Postcolonial theory highlights how colonial histories continue to influence knowledge production. Gayatri Chakravorty Spivak introduces the concept of "epistemic violence," referring to the erasure or distortion of subaltern knowledge systems.

In legal contexts, Basheer demonstrates how traditional Indian remedies have been patented abroad, often without acknowledgment of their origins (Basheer 345). Such cases illustrate how global IP systems can enable the extraction of indigenous knowledge.

2.3 Indian Scholarly Interventions

Indian scholars have contributed significantly to debates on knowledge governance. Mashelkar advocates an "inclusive innovation" approach that integrates traditional and modern knowledge systems (Mashelkar 28). Similarly, Mohanty emphasises that traditional knowledge is adaptive and continuously evolving rather than static (Mohanty 44).

Gopalakrishnan further argues for legal frameworks that recognize the collective nature of traditional knowledge, proposing alternatives to conventional IP regimes (Gopalakrishnan 213).

2.4 Knowledge Commons and Collective Ownership

Elinor Ostrom's work on commons governance offers a valuable framework for understanding traditional knowledge as a shared resource. Unlike private property models, commons-based systems rely on collective stewardship and community regulation.

This perspective aligns closely with Indian traditions, where knowledge is often transmitted across generations without exclusive ownership.

3. Indian Knowledge Systems and Legal Protection

One of the most significant challenges facing IKS is the risk of misappropriation. The creation of the Traditional Knowledge Digital Library (TKDL) represents a strategic effort to address this issue by documenting traditional knowledge in a format accessible to international patent offices.

Gupta notes that TKDL has successfully prevented numerous illegitimate patent claims by establishing prior art (Gupta 56). However, its primary function remains defensive, focusing on protection rather than active promotion or benefit-sharing.

Dutfield cautions that documentation alone cannot ensure justice for knowledge-holding communities, highlighting the need for broader institutional reforms (Dutfield 112).

4. AI and the Transformation of Knowledge Governance

AI technologies have the potential to significantly reshape how knowledge is preserved, analyzed, and disseminated. In India, policy initiatives such as NITI Aayog's AI strategy emphasize the role of technology in inclusive development (NITI Aayog 34).

Through machine learning and natural language processing, AI can:

- Convert oral traditions into digital formats
- Translate texts across languages
- Identify patterns within traditional medicinal or agricultural practices

However, Chander warns that digital systems may reproduce unequal power relations if data governance is not carefully regulated (Chander 78). In the case of IKS, this raises concerns about who controls and benefits from digitized knowledge.

5. Emerging IP Challenges in the AI Era

The integration of AI complicates existing IP frameworks in several ways:

- **Authorship:** AI-generated outputs challenge traditional notions of authorship
- **Ownership:** Collective knowledge does not fit easily within individual-based legal systems
- **Data Rights:** Indigenous communities may lose control over their knowledge once digitized

Although Indian patent law excludes traditional knowledge from patentability, it does not fully address these emerging issues. Basheer highlights the need for more proactive legal reforms to keep pace with technological change (Basheer 352).

6. Towards a Hybrid Governance Framework

Addressing these challenges requires a multi-layered approach:

- **Legal Innovation**
  Developing sui generis systems tailored to the unique characteristics of traditional knowledge.
- **Ethical AI Integration**
  Ensuring that AI systems respect cultural contexts and incorporate community participation.
- **Community Empowerment**
  Creating mechanisms for benefit-sharing and decision-making by knowledge holders.
- **Policy Alignment**
  Integrating IP laws with national AI strategies and sustainability goals.

7. IKS and Sustainable Futures

Indian Knowledge Systems offer valuable insights into sustainable living. Dharampal's historical research demonstrates that pre-colonial Indian practices were deeply aligned with ecological balance (Dharampal 89).

Today, such practices are increasingly relevant in areas like:

- Climate adaptation
- Biodiversity conservation
- Holistic healthcare

AI can enhance these contributions by enabling data-driven analysis and global dissemination. However, its use must be guided by ethical considerations and equitable governance structures.

8. Policy Recommendations

1. Expand TKDL through AI-enabled documentation
2. Establish community-centric IP frameworks
3. Promote interdisciplinary research on IKS and AI
4. Strengthen international advocacy for traditional knowledge rights
5. Develop ethical guidelines for AI use in cultural contexts

9. Conclusion

The intersection of AI and intellectual property governance presents both opportunities and risks for Indian Knowledge Systems. While technological advancements can facilitate preservation and innovation, they also raise critical questions about ownership, equity, and cultural integrity.

By drawing on theoretical insights and Indian scholarly contributions, this paper argues for a balanced approach that combines legal reform, ethical AI practices, and community engagement. Such a framework can ensure that IKS not only survive but actively contribute to global sustainability efforts.

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