



## Artificial Intelligence as a Governance Tool for Traditional Knowledge: Strengthening TKDL, Preventing Digital Misappropriation, and Rethinking Benefit-Sharing in the Contemporary IP Framework

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### Introduction

The modern knowledge economy is increasingly influenced by artificial intelligence, the distribution of knowledge through platforms, and the extensive digitisation of cultural and scientific resources. These factors are changing the whole process of knowledge production, circulation, and monetisation worldwide. The developments are exerting a lot of pressure on IP frameworks formed by traditional methods based on visible authorship, separate innovations, and territorial enforcement, thereby disclosing their incapacity to regulate data-driven and non-conventional knowledge systems to a large extent<sup>2</sup>. This conflict is most clearly visible in the traditional knowledge (TK) context, which is a community-based and intergenerational type of knowledge that has always been outside the formal IP protection and hence, the monopolistic nature of the IP regime has not been able to capture it<sup>3</sup>. The digitization of TK in traditional medicine, agriculture and culture, which are often reused for AI training and digital content creation, has led to the global public having access to TK but at the same time, it has made misappropriation and exploitation of the digital content even more acute. The role of AI in governance assumes enormous importance in this situation where the mechanisms like the Traditional Knowledge Digital Library<sup>4</sup> are further strengthened and the contemporary IP framework is revisited to provide for sharing of benefits.

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<sup>2</sup> World Intellectual Property Organization, Traditional Knowledge and Intellectual Property: Background Brief No. 1, WIPO Pub. RN2023-5.1 (2023), <https://www.wipo.int/edocs/pubdocs/en/wipo-pub-rn2023-5-1-en-traditional-knowledge-and-intellectual-property.pdf>.

<sup>3</sup> V. M. Manu Krishna, Traditional Knowledge and Intellectual Property Assets, 3 E-J. Acad. Innov. & Res. in Intell. Prop. Assets 53 (Issue II, July–Dec. 2022), <https://www.cnl.u.ac.in/wp-content/uploads/2025/07/Traditional-Knowledge-and-Intellectual-Property-Asset-by-V.M.-Manu-Krishna.pdf>

<sup>4</sup> Council of Scientific & Industrial Research (CSIR), Traditional Knowledge Digital Library Unit (TKDL), <https://www.csir.res.in/en/documents/tkdl> (last visited Dec. 31, 2025).

Traditional knowledge has very little safeguarding from the conventional intellectual property system because of the fundamental doctrinal discrepancies. Copyright law is based on the assumption of identifying the creator and if the works are in a fixed form, whereas patent law depends totally on the novelty and inventive step that can be traced back to particular inventors, and trademark law is only concerned with the identification of the source as the commercial one<sup>5</sup>. In the case of such knowledge, however, the opposite is true, since it is usually very old, developed by the community and constantly changing, thus making it more or less outside the proprietary IP protection scope. Legal responses to the above-mentioned issue have mostly been centered around the development of defensive protection mechanisms that aim to stop the erroneous granting of IP rights over the already existing knowledge instead of creating exclusive ownership claims.

The Traditional Knowledge Digital Library (TKDL) of India is a landmark institutional response to the threat of the drawing of traditional medical knowledge into western world practices<sup>6</sup>. What started as a state-led defensive documentation project, turned into the TKDL that eventually transformed the written records of such medical systems as Ayurveda, Unani, Siddha, and Yoga into structured and searchable formats that are in line with the International Patent Classification. The empirical investigations have indicated that one of the results of this method was the withdrawal or rejection of many patent applications and, over time, a deterrent impact on further – mainly the ones relying on Indian traditional medicine – filings<sup>7</sup>. At the same time, scholarship has pointed out that translation and classification, such as these, are going to change the epistemic character of the conventional knowledge<sup>8</sup>. This raises the issue of loss of context and the replacement of the document-based state systems with the communities' custodianship.

The swift development of AI is a signal of the beginning of a new era in governance of traditional knowledge which is no longer a matter of static documentation but for dynamic analysis, translation and application. Recognizing the benefits and dangers of this change, international organizations like WHO, ITU, and WIPO have admitted that AI will play the role

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<sup>5</sup> Economic Advisory Council to the Prime Minister (EAC-PM), *Documenting Traditional Knowledge* (Dec. 2022), <https://eacpm.gov.in/wp-content/uploads/2022/12/Documenting-Traditional-Knowledge-2.pdf>.

<sup>6</sup> *Supra* note 3.

<sup>7</sup> Mohd Shoaib Ansari, Role of Traditional Knowledge Digital Library (TKDL) in Preservation and Protection of Indigenous Medicinal Knowledge of India, in *Herbal Medicine in India* 609–620 (Saikat Sen & Raja Chakraborty eds., Springer Singapore 2019) [https://doi.org/10.1007/978-981-13-7248-3\\_38](https://doi.org/10.1007/978-981-13-7248-3_38).

<sup>8</sup> Martin Fredriksson, India's Traditional Knowledge Digital Library and the Politics of Patent Classifications, 34 *Law & Critique* 1 (2023), <https://doi.org/10.1007/s10978-021-09299-7>.

of a facilitator in modern health systems' acceptance of traditional medicine by Indian/healers<sup>9</sup>. In addition, India's recent policy movement, especially through the Gyan Bharatam Mission<sup>10</sup>, has shown the awareness of the limitations of the old documentation methods and the advantages of AI-assisted cataloguing, multilingual access, and interoperable digital repositories for the heritage manuscript knowledge systems.

### **Research question and Methodology**

This article does not attempt to claim ownership of traditional knowledge through intellectual property rights, nor does it recommend artificial intelligence as a replacement for the current legal and regulatory frameworks. Rather, it investigates the possibility of AI acting as a governance facilitator and thus increasing the documentation, accessibility, and traceability of traditional knowledge in places like the TKDL. The research question this study try to evaluate is: *In what ways can artificial intelligence make the documentation and governance of traditional knowledge databases stronger while still being aligned with the current intellectual property and benefit-sharing systems?*

By taking a doctrinal and policy-oriented approach located at the technical–legal interface, by analysing the current legal frameworks, the article states that the future of traditional knowledge protection rests upon the creation of hybrid governance models that incorporate attribution, community participation, and sharing of benefits' considerations within AI architectures, without exacerbating the existing structural inequalities in knowledge governance.

### **Traditional Knowledge and the Limits of Conventional Intellectual Property Law**

Traditional knowledge (TK) not only displays various dimensions of legal nature but also resists being completely assimilated into the conventional intellectual property categories<sup>11</sup>. International legal literature has implicitly recognized the fact that TK is a sum of many things done by the people, passed along across generations, and through gently changing social

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<sup>9</sup> *Supra* note 1.

<sup>10</sup> Gyan Bharatam, About Gyan Bharatam, <https://gyanbharatam.com/about#gyanbharatam> (last visited Dec. 31, 2025).

<sup>11</sup> *Supra* note 1.

practices rather than through suddenly occurring moments of authorship or invention<sup>12</sup>. Unlike the case with proprietary knowledge, it is never the same at different points in time, and it is non-static but, rather, a living knowledge system whose power comes from the community's continued use and approval. Thus, due to their very nature, TK and proprietary knowledge are dichotomous. The first being shaped by a holistic approach of communal use and acceptance, while the latter by the concept of individual creative genius, the time of fixation, and exclusivity. From the viewpoint of legal reasoning this distinction provides justification for the fact that the increasing resort to digital forms of TK will not necessarily lead to legal wrongdoing but rather to governance challenges<sup>13</sup>. The challenge emanates from the existing functional dissonance between the cognitive structure of the TK and the design assumptions incorporated in contemporary IP regimes.

The dissonance becomes apparent when TK is compared to the doctrinal requirements of copyright, patent, and trademark law. In India copyright law, TK is not given protection, since only “original literary, dramatic, musical and artistic works” fixed in a tangible medium are protected (Copyright Act 1957, ss. 13–14)<sup>14</sup>, which is quite similar to the provisions of Article 2 of the Berne Convention<sup>15</sup> and Article 2 of the EU Information Society Directive<sup>16</sup>. Being in a way co-created by the community and often transmitted orally, TK does not meet either the criteria of fixation or individual authorship. The same applies to patent law, which similarly imposes restrictions. Section 2(1)(j) of the Indian Patents Act, 1970<sup>17</sup>, mandates disclosure of the inventor's identity as a condition for patentability based on novelty and inventive step while Article 52 of the European Patent Convention classifies non-technical novelty<sup>18</sup>, thus barring from patenting any human or natural discovery or knowledge. Traditional knowledge is, by its very definition, a cumulative and pre-existing body of knowledge and thus does not meet these requirements. The patenting standards in Indian trademark law, covered under Section 2(z)(b) of the Indian Trade Marks Act 1999<sup>19</sup> and Article 4 of the EU Trade Mark Regulation<sup>20</sup>, are

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<sup>12</sup> *Supra* note 6.

<sup>13</sup> World Health Organization (WHO), Technical Brief: Second WHO Global Summit on Traditional Medicine – Parallel Session 4.D, (2025), <https://iris.who.int/server/api/core/bitstreams/6779075c-c354-4a76-acc-4ae635dee436/content> (accessed Dec. 31, 2025).

<sup>14</sup> Copyright Act, 1957, §§ 13–14, No. 14 Act of Parliament, 1957 (India).

<sup>15</sup> Berne Convention for the Protection of Literary and Artistic Works art. 2, Sept. 9, 1886, as revised at Paris July 24, 1971, 1161 U.N.T.S. 3.

<sup>16</sup> Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society art. 2, 2001 O.J. (L 167) 10.

<sup>17</sup> Patents Act, 1970, § 2(1)(j), No. 39 Act of Parliament, 1970 (India).

<sup>18</sup> Convention on the Grant of European Patents art. 52, Oct. 5, 1973, 1065 U.N.T.S. 199.

<sup>19</sup> Trademarks Act, 1999, § 2(z)(b), No. 47 Act of Parliament, 1999 (India).

<sup>20</sup> Council Regulation (EC) No. 207/2009 on the Community Trademark art. 4, 26 Feb. 2009, O.J. (L 78) 1.

focused on distinguishing signs which can serve economically for trade and this is not the case with knowledge systems like traditional medicine or agricultural practices which have no such commercial orientation. WIPO and OECD analyses, and the like, consistently observe that these limitations are a reflection of the historical conception of IP law and not the normative exclusion of TK<sup>21</sup>.

The doctrinal consequence of the stated limitations has been the shift in policy from proprietary protection to defensive protection mechanisms. Defensive protection prevents the mistaken award of IP rights over knowledge that is already in the traditional or public domains, thus preserving the integrity of the patent and copyright systems. The classic cases involving turmeric and neem patents are consistently mentioned as typical examples where the lack of available prior art documentation allowed the misrepresentation of traditional knowledge as new<sup>22</sup>.

The international organizations and national governments have, in this regard, pointed out the presentation of TK in satisfactory formats to the IP examiners as a way of protecting the public domain without changing the ownership structures<sup>23</sup>. Such mechanisms do not give a monopoly over the rights, nor do they change TK into marketable assets; they just serve as governance tools that operate within the existing IP frameworks. It is in this doctrinal context that the state-led documentation initiatives like India's Traditional Knowledge Digital Library have been developed as governance instruments instead of rights-conferring regimes.

### **TKDL as a Defensive IP Mechanism: Achievements and Structural Constraints**

India's Traditional Knowledge Digital Library (TKDL), which was created in the year 2001<sup>24</sup>, is an example of an institutional response to the limitations of the intellectual property law that have been discussed in the preceding section. The initiative was taken by the Council of Scientific and Industrial Research (CSIR) and later on, the Ministry of AYUSH provided its support to the TKDL project<sup>25</sup>. The main aim of the project was to stop the issuing of patents

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<sup>21</sup> *Supra* note 1.

<sup>22</sup> Rachel Wynberg, *Biopiracy: Crying Wolf or a Lever for Equity and Conservation?*, 52 Res. Pol. 104674 (2023), <https://doi.org/10.1016/j.respol.2022.104674>.

<sup>23</sup> World Intellectual Property Organization (WIPO), *Composite Study on the Protection of Traditional Knowledge*, WIPO/GRTKF/IC/5/8 (Apr. 28, 2003).

<sup>24</sup> *Supra* note 3.

<sup>25</sup> Ministry of AYUSH, *Traditional Knowledge Digital Library, Factsheet* (Sept. 1, 2022), <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/sep/doc20229199001.pdf>.

that were based on misunderstandings of traditional medical knowledge. The main reason for its existence is that it reframes the codified traditional knowledge to be legally recognized as prior art and this is done by the patent examination processes rather than that of creating proprietary entitlements. In practical terms, the TKDL transcribes knowledge from the various authoritative texts written in Sanskrit, Arabic, Persian, Urdu, and regional languages to the structured formats which are corresponding with the International Patent Classification (IPC). The database is accessible to specific patent offices under controlled agreements, which is in line with the narrowly defined preventive mandate of the library. This design of the library directly corresponds to the doctrinal constraints that were identified in Section II, where traditional knowledge falls outside the limits of novelty, authorship, and inventorship that are required for proprietary IP protection.

The existing empirical evidence suggests that the TKDL has successfully operated as a protective prior-art repository within the global patent systems. Reports from the government and documents from WIPO show that the patent offices of the European Patent Office (EPO)<sup>26</sup>, the United States Patent and Trademark Office (USPTO)<sup>27</sup>, and the United Kingdom Intellectual Property Office (UKIPO) are among those which, during the examination of applications dealing with traditional medicinal formulations, constantly refer to the TKDL<sup>28</sup>. Report<sup>29</sup> says, the use of TKDL-based citations has played a significant role in the withdrawal, amendment, or rejection of many patent applications that were based on knowledge that was already available in traditional sources. Scholarships also highlight a deterring effect that is shown by a decrease in patent filings connected with Indian traditional medicine after the establishment of structured access to TKDL. This effect can be characterized as a reversal of the information gap between the applicants and examiners, in which the administrative efficiency was enhanced but the standards of patentability remained the same.

The TKDL, however, suffers from the drawbacks of its defensive design and thereby also has the advantages of the same. Its main limitation is that it is text-centric, a static database that is dependent on the translations of the codified sources rather than real-time or continuous knowledge import. The reach of its operations is still limited to the patent examination process,

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<sup>26</sup> European Patent Office (EPO), About Us, <https://www.epo.org/en/about-us> (last visited Dec. 31, 2025).

<sup>27</sup> United States Patent and Trademark Office (USPTO), About Us, <https://www.uspto.gov/about-us> (last visited Dec. 31, 2025).

<sup>28</sup> *Supra* note 6.

<sup>29</sup> Martin Fredriksson, Balancing Community Rights and National Interests in International Protection of Traditional Knowledge: A Study of India's Traditional Knowledge Digital Library, 43 Third World Q. 352 (2022), <https://doi.org/10.1080/01436597.2021.2019009>.

with patent office's being the main entity who have access to it and besides, it has no means to check the downstream digital distribution or the secondary use of the knowledge that has been documented. Not only that, but the TKDL also does not have any frameworks for benefit-sharing, consent management, or attribution<sup>30</sup>. It rather shows the intention of the body preventing the IP grants from going to the wrong hands than it does of regulating the future practices. The times when knowledge ecosystems were mostly non-digital and non-algorithmically mediated seem to recede as these structural constraints are pointed out, thus, emphasizing the need for AI-enabled governance tools as the static documentation approach becomes less relevant amidst the growing complexity.

### **Role of Artificial Intelligence in Enhancing Documentation, Detection, and Traceability of Traditional Knowledge**

The correct positioning of Artificial Intelligence (AI), as an iconography infrastructure for the informational governance, can easily handle many functional limitations of the static documentation systems such as the Traditional Knowledge Digital Library (TKDL). AI does not create new legal rights or change the underlying intellectual property doctrinal framework. Instead, it increases administrative capacity through the use of automation, pattern recognition, and semantic processing while still depending on human oversight and current IP examination regimes<sup>31</sup>. So, AI is a layer that enhances capacity and at the same time keeps the defensive character of the TKDL system.

If we want to figure out the exact point of AI intervention, we need to clearly describe the current step-by-step process of TKDL documentation. The first step is the identification and sourcing of classical texts in Indian systems of medicine, which consist of various prescriptions and formulations written in Sanskrit, Arabic, Persian, Urdu, and regional languages<sup>32</sup>. The next step involves the transcription and translation of these texts into structured digital entries by multidisciplinary teams. After that, the new entries are assigned codes according to the Traditional Knowledge Resource Classification (TKRC)<sup>33</sup>, which is compatible with

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<sup>30</sup> *Supra* note 1.

<sup>31</sup> Abha Nadkarni & Shardha Rajam, Capitalising the Benefits of Traditional Knowledge Digital Library (TKDL) in Favour of Indigenous Communities, 9 NUJS L. Rev. 183 (2016), <https://nujlawreview.org/wp-content/uploads/2017/01/2016-9-1-2-Abha-Nadkarni-Shardha-Rajam-Capitalising-the-Benefits-of-Traditional-Knowledge-Digital-Library-TKDL-in-Favour-of-Indigenous-Communities.pdf>.

<sup>32</sup> *Ibd.*

<sup>33</sup> *Ibd.*

international patent classification (IPC)<sup>34</sup>, thus making it easy for patent examiners to access prior art in the categories they are familiar with. Finally, the structured database gets opened up for use the current scenario is that it is accessed by several international patent offices via controlled access agreements, so that patent examiners can check applications against documented TK.

Stepwise AI can drastically reduce the manual work done at each point. For giving documents in several languages, natural language processing (NLP) along with optical character recognition (OCR) are the two methods that lessen the manual labour done on getting text in large amounts transcribed and translated<sup>35</sup>. On the other hand, AI-assisted semantic indexing is more than just connecting words through the same surface; it links meanings that are similar across languages and dialects which in turn makes knowledge systems more interoperable. This is not only true but also a big need because of the vastness and the numerous languages used in India's traditional knowledge where sometimes unstructured texts are written using script that patent examiners are not familiar with.

Machine learning algorithms can find hidden connections and functional resemblances that usually are overlooked by the traditional keyword searches in the area of prior-art and similarity detection, particularly where the formulations have been paraphrased or recontextualized to meet the novelty thresholds. This is a help to patent examiners in marking the relevant prior art, however, the final legal decision is still in the hands of humans.

AI also helps to keep an eye on electronic repositories plus the new AI-generated content that might be TK-related. Besides, automated alerts and pattern detection systems can monitor patent databases, research articles and digital content that is being produced, spotting areas where traditional knowledge has been documented. This practice of risk identification and early warning goes hand in hand with the governance not censorship objectives highlighted by UNESCO and WIPO<sup>36</sup>.

AI is the technology that can provide better methods of provenance tracking and metadata creation, such as tagging entries with contextual markers that strengthen the traceability, attribution, and cross-repository integration. But AI lacks the ability to encode free, prior, and

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<sup>34</sup> World Intellectual Property Organization (WIPO), About the Traditional Knowledge Digital Library (TKDL), [https://www.wipo.int/meetings/en/2011/wipo\\_tkdl\\_del\\_11/about\\_tkdl.html](https://www.wipo.int/meetings/en/2011/wipo_tkdl_del_11/about_tkdl.html) (last visited Dec. 31, 2025).

<sup>35</sup> *Supra* note 6.

<sup>36</sup> *Supra* note 12.

informed consent or replace community governance; such normative functions need to be embedded through policy and institutional frameworks that go beyond technical systems.

The new Gyan Bharatam Mission is a clear sign of the state's acknowledgment of these capacities on a larger scale<sup>37</sup>. This project is going to be a huge one, as it plans to document and digitize more than one crore manuscripts by integrating AI, OCR, and blockchain for transcription, provenance tracking, and smart access (Ministry of Culture, 2025)<sup>38</sup>. The mission, which makes the whole Indian subcontinent's intellectual property area accessible through AI helpful tools, shows how AI can effectively enlarge documentation of different kinds of traditional knowledge, to an extent that the linguistic diversity and the large number of documents do not pose a problem, as these can be handled through automated processes only.

While AI can strengthen documentation, detection, and traceability, its governance implications ultimately depend on how such technical capacities are embedded within legal and policy frameworks that address community consent, benefit-sharing, and ethical use.

### **Benefit-Sharing, Community Interests, and the Role of AI-Assisted Governance**

The issue of benefit-sharing is at the basis of the norm in traditional knowledge governance but is still only partially covered by conventional intellectual property systems. On the international stage, the CBD and its related protocols mainly deal with the topic of benefit-sharing, the former being the Convention on Biological Diversity<sup>39</sup> and the latter the Nagoya Protocol<sup>40</sup>. These two agreements have set up a legal obligation requiring the obtaining of consent and the agreed-upon terms for the use of genetic resources and the traditional knowledge related to them. The Nagoya Protocol has clearly stated that the benefits which come from the exploitation of both genetic resources and associated traditional knowledge need to be shared

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<sup>37</sup> Government of India, Press Information Bureau, Gyan Bharatam Mission, Press Note (Oct. 9, 2025), <https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=155185&ModuleId=3&reg=3&lang=2>.

<sup>38</sup> Government of India, Ministry of Culture, Gyan Bharatam Mission, <https://www.culture.gov.in/gyan-bharatam-mission> (last visited Dec. 31, 2025).

<sup>39</sup> Convention on Biological Diversity, June 5, 1992, 1760 U.N.T.S. 79, <https://www.cbd.int/convention> (last visited Dec. 31, 2025).

<sup>40</sup> Convention on Biological Diversity, Access and Benefit-Sharing (ABS), <https://www.cbd.int/abs> (last visited Dec. 31, 2025).

in a fair and equitable manner<sup>41</sup>, and thus benefit-sharing has been, such to say, ‘loathed’ in a more extensive access and compliance framework rather than in IP law.

Setting aside this framework, intellectual property law is still structurally incapable of ensuring fair sharing of benefits. The IP systems give importance to the exclusive rights, novelty criteria, and the claim of individuals or corporations, whereas the sharing of benefits under ABS regimes<sup>42</sup> proceeds through governmental authorizations and contract negotiations that may be done beforehand or upon use. The situation of biopiracy as illustrated by empirical studies shows that the primary reasons of provider countries and communities being unaware of when traditional knowledge has been used commercially and thus being unable to impose ABS obligations are the lack of effective tracing and monitoring mechanisms<sup>43</sup>.

From this perspective, the issue is not only a matter of principle but also one of the practical applications: if the use in the downstream market is not visible, the sharing of benefits becomes an aspiration rather than something that can be enforced.

AI-assisted governance will not be able to close the gap in a very meaningful way. AI will not create any rights, but it will help provide a stronger base of information, which is the backbone of ABS frameworks. AI traceability tools can be used to find the commercial uses of traditional knowledge by looking at patent databases, scientific papers, and online platforms together. This analysis may open up regulatory or contractual reviews in the context of ABS regimes at the national level. Besides, such systems can facilitate the process of making things clear and open by giving audit trails, finding out the origin, and providing metadata that show the link of current usage back to the documented sources of traditional knowledge. These functions are significant because they are in line with the compliance-focused reasoning of the Nagoya Protocol, which imposes obligations on users to prove legal access and benefit-sharing instead of placing the burden on communities to monitor and stop misuse<sup>44</sup>.

The international policy consensus has also warned against the belief that technology is the only answer in this field. AI systems will not be able to represent community consent, negotiate fair terms or take the place of participatory governance. The legal enforceability of benefit-sharing depends on the domestic ABS laws, contracts, and the institutions' capacity. AI will

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<sup>41</sup> Maria Serena Beato & Valentina Veneroso, The Nagoya Protocol on Access and Benefit Sharing: The Neglected Issue of Animal Health, 14 *Front. Microbiol.* 1124120 (2023), <https://doi.org/10.3389/fmicb.2023.1124120>.

<sup>42</sup> *Supra* note 1.

<sup>43</sup> S. Kumari & P. Shree, Impact of TKDL on Patent Applications in the Field of Bio-resources, 29 *J. Intell. Prop. Rts.* 133 (2024), <https://or.nisicpr.res.in/index.php/JIPR/article/view/3373/2747>.

<sup>44</sup> *Supra* note 40.

thus not solve the fundamental issue; it will rather enable governance by making detection, accountability, and transparency easier. The question of who gets what in terms of benefits remains a legal and political one. The regulatory frameworks surrounding AI-assisted governance can allow the achievement of benefit-sharing goals without the technical capability being confused with the legal right.

### **Ethical and Cross-Jurisdictional Challenges in AI-Driven TK Protection**

The use of artificial intelligence in the documentation and governance of traditional knowledge brings up heavy ethical issues, especially regarding the consent of the communities, their data sovereignty and the control over knowledge. International legal texts are starting to more and more emphasise that traditional knowledge is not only data to inform about a certain topic but also a part of social, cultural, and spiritual contexts<sup>45</sup>. The process of digitising and algorithmically processing this kind of knowledge, particularly when it is done with the help of state or platform infrastructures will probably take away the community's right to decide how the knowledge will be accessed, interpreted and reused<sup>46</sup>. The international policy frameworks proposed by UNESCO and WIPO state that AI systems with a training basis of cultural heritage data have to abide by the FPIC principle (free, prior and informed consent) and should not turn culturally bound knowledge into decontextualised data assets<sup>47</sup>. Thus, the ethical problem does not rest in the documentation as such but rather in the commitment to creating a non-extractive repository for AI's active role and technology's passive.

Another thing related to the previous point is the limitation of AI systems structure and biases. The machine learning models are based on training data, classification choices, and optimisation objectives that might not capture the dynamic, pluralistic, and non-codified aspects of traditional knowledge<sup>48</sup>. Misrepresentation, over-standardization, or extinction of

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<sup>45</sup> World Health Organization (WHO), *Ethics and Governance of Artificial Intelligence for Health: WHO Guidance* (2021), <https://iris.who.int/server/api/core/bitstreams/f780d926-4ae3-42ce-a6d6-e898a5562621/content>.

<sup>46</sup> Mira Burri, *The Governance of Data and Data Flows in Trade Agreements: The Pitfalls of Legal Adaptation*, 51 UC Davis L. Rev. 65 (2017).

<sup>47</sup> World Intellectual Property Organization (WIPO), *WIPO Conversation on Intellectual Property and Frontier Technologies*, [https://www.wipo.int/en/web/frontier-technologies/frontier\\_conversation](https://www.wipo.int/en/web/frontier-technologies/frontier_conversation) (last visited Dec. 31, 2025).

<sup>48</sup> *India Takes a Lead in the World by Digitizing Traditional Medicine Using an AI-Based Library*, *The Economic Times (India)*, July 22, 2025, <https://economictimes.indiatimes.com/ai/ai-insights/india-takes-a-lead-in-the-world-by-digitizing-traditional-medicine-using-an-ai-based-library-/articleshow/122833583.cms>.

knowledge forms that do not fit into the dominant linguistic or epistemic frameworks might be caused by errors in translation, semantic reduction, or contextual tagging. The literature in ethics regarding AI governance makes it very clear that biases in AI systems are not just unintentional errors but rather are indicative of the entire design process that has distributive effects. In the case of traditional knowledge, uncertainties are worse since inaccuracies can affect patenting, moderation of digital content, or even the commercial use of the material without any effective means for the community to rectify or compensate for the situation<sup>49</sup>.

Moreover, the cross-border differences create an even more difficult situation for traditional knowledge protection based on AI technology. It is possible for traditional knowledge to be stored in a country's repository or to be subject to the access and benefit-sharing regulations of a particular country, but that still does not prevent the operation of AI systems utilizing the worldwide mixed datasets and beyond the control of the applicable territory's regulations. Knowledge that was initially in one country may get processed, used commercially, or even be part of AI works created in another country, thereby creating the need for jurisdiction, authority, and platform responsibility questions to be answered. WIPO also remarked that the present international regimes of IP and data governance are not prepared to cope with the situation of using traditional knowledge through transboundary algorithms. Such a situation where jurisdictions do not overlap emphasizes the necessity for the establishment of international standards that are consistent with AI governance, platform regulation, and traditional knowledge protection without the assumption of homologous legal recognition or enforcement capacity among the states involved.

## **Conclusion**

The article has delved into the issue of escalating conflicts between the older knowledge systems and the newer IP regimes in a world dominated by AI, digital platforms, and widespread data sharing. It has pointed out that India's Traditional Knowledge Digital Library is a practical and smart way to deal with the problems that come with these conflicting areas and at the same time, it works as a correction of the patent system's information imbalances rather than taking away traditional knowledge and erecting proprietary rights over it. With the help of the AI tools like the multilingual documentation, semantic indexing, and prior-art

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<sup>49</sup> *Supra* note 46.

similarity detection, the ability of TKDL to prevent wrong patent grants and to enhance the administrative process can be greatly improved. The use of this technology does not interfere with the IP doctrines but rather improves the documentation, access, and evaluation of the knowledge.

The analysis, however, also warns against giving AI normative and distributive functions that the latter cannot rightfully perform. The use of AI does not eliminate the basic questions of ownership, consent, or benefit-sharing that need to be addressed, and it does not lessen the need for community-based governance and legal supervision either. AI can help with making traditional knowledge visible, support monitoring in digital and cross-border environments, and facilitate the disclosure of knowledge transactions, but the fairness of the outcomes is still largely determined by the design of the institutions, the frameworks for access and benefit-sharing, and the regulatory arrangements that are enforceable. Viewing AI as a law replacement puts one at the risk of hiding the political and ethical choices that are still prevailing in the matter of traditional knowledge governance, and which are still determining how it is being governed in practice.

The future of the protection of traditional knowledge will not be based on technological determinism but rather on a well-calibrated integration. The slow-moving legal reform, international standards, and AI-assisted governance structures that are well thought out and designed carefully are the paths that offer more credibility than the arguments of technological transformation alone<sup>50</sup>. The article presents a slow but positive vision: where technology is an infrastructure that provides support and not as a rights creator or a self-regulating solution, it will still enhance the existing protective mechanisms while keeping the community's ability to exercise their rights, the legal accountability, and the epistemic integrity in the global knowledge ecosystems that are increasingly driven by data.

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<sup>50</sup> Viswajanani J. Sattigeri, Documentation of Traditional Knowledge and the Traditional Knowledge Digital Library (TKDL), 3 J. Indian Med. Heritage 58 (Apr.–June 2024), [https://journals.lww.com/jimh/fulltext/2024/04000/documentation\\_of\\_traditional\\_knowledge\\_and\\_the.2.aspx](https://journals.lww.com/jimh/fulltext/2024/04000/documentation_of_traditional_knowledge_and_the.2.aspx).