

Research Article

Traditional Knowledge Digital Library (TKDL) Initiative – Effectiveness & Impact assessment

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Abstract

This paper focuses on the Traditional Knowledge Digital Library (TKDL) initiatives of Government of India and focuses the impact and effectiveness of the initiative. TKDL is a pioneering initiative of Indian government to protect Indian traditional knowledge special medicinal knowledge. TKDL gains significance in the context of vast Indian traditional knowledge becoming prey to Bio piracy. TKDL as an essential source of traditional knowledge for advancing Indian knowledge frontiers needs specific protection and preservation mechanism. TKDL initiative answers vulnerabilities of patent if Indian Ayurveda and Unani systems through Protection, Preservation & Promotion of traditional medicinal practices and curative tradition globally. But effectiveness of this initiative is adjoined with several arguments. TKDL has come under public scanner for being limited to patents verification and information collection instead of a wider accessibility to Library collection. There is a need to emphasise on integrating Indian traditional knowledge with greater public involvement.

Keywords: Traditional Knowledge Digital Library (TKDL) Initiative , Effectiveness , Impact assessment.

Introduction:

Traditional Knowledge Digital Library (hence forth referred to as TKDL) is an Indian knowledge digital repository of the traditional medicinal knowledge especially about herbs and medicinal plants . It also serves as a library of innumerable medicinal formulations used in Indian medicine system. **TKDL** was set up in 2001 with collaboration from **Council of Scientific & Industrial Research (CSIR)** and **Ministry of Health & Family Welfare**.

Objectives of the Library

The objective of the library initiative is to protect the ancient and traditional knowledge of the country from exploitation especially through bio piracy and unethical patents. TKDL also aims to preserve Indian traditional knowledge by documenting it electronically and classifying it as per **Inter National Patent Classification Systems**. In one word this platform serves as a simplified access to vast Indian traditional knowledge on herbal medicinal remedies and curative practices.

TKDL library collection –

Since its inception in 2001 , the library is striving towards collecting various textual collections and palm leaf documents available in Indian medical tradition. Nearly 250 vary rare books on **Ayurveda , Unani , Rasa Shastra, Siddha & Yoga** have been conserved in this library. There are nearly 34 million pages of information translated into five foreign languages including **English, French, German, Spanish and Japanese**. There are nearly 80 thousand formulations

in Ayurveda 1,00,00,00 in Unani and 12 thousand in Siddha which can be directly accessed in TKDL. Data on 80 thousand medical formulations in Ayurveda have been available for digital users.

TKDL and Patent agreements - TKDL has patent agreements with European Patent office, United kingdom, Trademark and Patent office and United states Patent and trademark office to protect traditional knowledge from piracy. This has given **Inter National Patent Offices** to acquire access to TKDL data base.

Dealing with bio piracy- The issue of bio piracy and unethical bio prospecting is causing serious issues. This has resulted in the revoking of patents of **Turmeric, Basmati Rice & Neem**. Indian traditional knowledge is written in **Sanskrit, Hindi, Arabic, Urdu and Tamil languages**. This issue of language was claimed by several Inter National patent offices. Government of India created a task force of experts to solve the issue of language barrier in accessing library data base. This task force consisted of experts from traditional medicinal streams including **Ayurveda, Unani, Siddha & Yoga**.

Overcoming Language barriers - TKDL has successfully overcome the challenges of language barrier faced earlier by data users. TKDL has systematically converted the vast Indian traditional knowledge content into Inter National languages. It has made the accessing Traditional knowledge more methodical by providing the data digitally available. TKDL is supporting in integrating diverse disciplines such as **Ayurveda Unani** with modern science of medicine. TKDL has made vast volumes of books available in open domain and can be sourced by any individual.

Progressive developments of TKDL-

1. **Integration of AI** - TKDL have currently integrated with AI mechanism which has assisted in gaining WHO recognition. In 2025 TKDL has acquired recognition as the **World's First AI Powered Digital Library for Traditional Medicines**. This has enabled automated translation and digitization of knowledge from systems into five Inter National languages making global accessibility easier.
2. **Integration of ML** - AI applications have been supporting the **Automate Search Functionalities** and it is currently using Machine learning (ML) for **Pattern Recognition**. This has addressed the earlier limitations of prior manual querying in the original data base. It has also sidelined all delays and hurdles in understanding manual writing.
3. **Integration of minor medicinal practices to digital library** - TKDL is looking forward to integrate several minor streams of medicinal practices into this repository. Several ancient books on Indian **Bhuta Vidya** which deals on possession by spirits and its pacification modes, **Vishagara Tantra Vidya** meaning toxicology including epidemics toxins in vegetables **Rasayana Tantra** meaning tonic for increasing life span intellect and strength **Vajikarana Tantra** meaning treatments for increasing sexual pleasure and infertility problems are being added to TKDL repository. The ancient collections of **Sushruta, Charaka, Mitakshara**, have been taken up on war footing.
4. **Protecting intellectual Property rights** - Keeping the Indian intellectual property rights integral is a complex issue with vast Indian traditional knowledge bases. TKDL has successfully supported the medical world with predictive disease markings by processing vast data bases of textual content in the digital library.
5. Work towards digitization of **Traditional Agricultural Practices** and traditional metallurgical knowledge of India into the data base of TKDL is also initiated. This is the core area as ancient Indians called it as **Rasa Shastra** and the knowledge was passed onto generations orally.

6. The TKDL has also set International specifications and standards for setting up **Traditional Knowledge Data Bases** since 2003. In 2024 the WIPO treaty has been concluded. Intellectual property and genetic resources treaties are also signed. This has given TKDL global reckoning.

TKDL Effectiveness and impact assessment:

1. **Sidelining oral traditions**- There is an argument that TKDL's scope remains very limited because it focuses primarily on codified texts from ancient Ayurveda systems but it has completely excluded vast oral traditions of medicinal practices. India is a land to numerous oral and local oral practices especially in tribal communities and hilly regions. As oral knowledge lacks written documentation this has been completely neglected by TKDL. A library of this huge stature needs measures to include modern digital applications to digitalize oral medicinal practices and curative methods which are not documented so far.
2. **Lack of ethnographic field work** - There is a lack of ethnographic field work in collecting oral traditions in remote and hilly regions. This lacuna is creating a wider gap in linking well-known herbal therapeutic and curative practices with modern health care needs. Indian hilly communities and other indigenous cultures had developed sophisticated plant based healing systems through careful observation and generational wisdom. Mutts, monasteries and temples preserved herbal knowledge by documenting plant properties and cultivation methods. This has supported in bridging the ancient wisdom toes with modern botanical medicine. But only through specific ethnographic field work this indigenous knowledge can be preserved.
3. **Lack of stringent measures to curb piracy**- TKDL often urges on patent management and focuses mainly on erroneous patents but there is a need to take up strict actions against proactive commercialization, benefit sharing and illegal bio tech marketing. TKDL has come out with flying colours in making interventions in 250 patent cases across the world which has led to several withdrawals, amendments and revocations, But the TKDL also needs modern adaptability mechanism to make misuse of patents at incremental stages of medicine preparation.
4. **Limited Library Usage Awareness** - Another debate is the TKDL provides very minimal support to indigenous communities for sharing their traditional knowledge. The local indigenous communities who have shared their traditional knowledge by documenting their rare and precious practices have very less interference in the economic benefits of TKDL or very less library usage awareness.
5. **Limited usage rights** - Centralized government control over the TKDL data base is in contrast to the community ownership tag because indigenous communities are not consulted during documentation of their traditional knowledge. They have no decision making authority in the way their traditional knowledge is used by Government. Digital libraries face the challenge of making collaborative partnerships with IITs and IIMs to aggregate and digitalise medicinal knowledge for educational and academic purposes. Patent application are calling for a quick requirement to TKDL's search algorithms to flag inventions derived from or conflicting with documented traditional knowledge amid rising AI assisted filings.

Conclusion - Thus the TKDL initiative is an ambitious and forward looking measure by the Government of India. TKDL is supporting in furthering digital research, development and innovation based on India's heritage. Indian credibility at global level is also rising as it has envisaged inculcating traditional thoughts and promoting knowledge leadership. Even though AI driven patent application represents key challenges, the initiative can become a dream

come true for young Indians in coming years by opening the doors of research and development. TKDL offers immense potential to serve national and global needs. It also provides societal benefits and boost Indian economic growth at global level. TKDL is thus an important and essential source of traditional knowledge for advancing Indian knowledge frontiers, but there is a need to emphasise on integrating traditional knowledge with current practices towards enhancing innovation and digital marketing by widening the library access.

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