Preservation and protection of traditional knowledge – diverse documentation initiatives across the globe

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Traditional knowledge (TK) is the knowledge that an indigenous community accumulates over generations of living. A part of this knowledge is recorded in local languages and a major portion is still not recorded and remains confined to local communities. In the light of the prevalent loss and threatened future of TK, it is important to preserve it in a contemporary format that would be familiar to the future generation. Preservation also empowers the community/country to protect its knowledge from misuse and utilize it for better development. This study highlights some major documentation initiatives across the globe at the community and country levels that aim at preserving and safeguarding TK.

Keywords: Documenting TK, IP protection, preserving traditional knowledge, protecting traditional knowledge, traditional knowledge.

TRADITIONAL knowledge (TK) is a term generally applied for any knowledge generated outside the context of modern western knowledge and covers a large amount of distinct subcategories, which in extreme cases might have little or nothing in common[1]. TK can involve cultural expressions, ecology, agriculture, medicine, construction technologies, environment, etc. and have generally been passed on from generation to generation pertaining to a particular people or territory, and is constantly evolving in response to the changing environment. It may be written down or transmitted only orally. TK can be held by individuals, communities or society as a whole.

TK can make an important contribution to analyse the environmental conditions within a specific region as it is indigenous to specific geographical areas. However, TK is at the risk of becoming extinct because of the rapidly changing natural environments, fast-paced urbanization, invasion of technology, lack of awareness and language barriers. Preservation of TK is vital as it can contribute largely towards developing improved strategies by identifying cost-effective and sustainable mechanisms. Traditional knowledge can be integrated with scientific knowledge or it can be used as a basis for new research projects in the broad context of sustainable development. Modern technologies can be more successful and sustainable if TK is taken into consideration.

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In today's intellectual property regime, TK faces a greater threat of misappropriation and exploitation for commercial profit by filing of patents wrongfully. This threatens the sustenance of the community that is dependent on this knowledge. Traditional knowledge is the basis of livelihood of a very large population in the world, especially in developing countries. TK is used to sustain the community and biological resources necessary for the continued survival of the community. A WHO report estimates that 70–80% of the population in developing countries such as India is dependent on traditional medicines for their primary healthcare needs[2]. Therefore, although the primary need is to preserve traditional knowledge, protection against its misuse has also become critical.

Challenges in protecting traditional knowledge

A patent is given for the innovation or invention that is novel and commercially viable. TK is known for a long period of time and hence lacks novelty, involves no inventive step and the restriction of ownership within communities does not make TK commercially viable.

Traditional knowledge is created and owned collectively by the community and its use and transfer is guided by traditional laws and customs, whereas Intellectual Property Rights (IPRs)[3] are largely individual rights based on western legal and economic parameters as well as western property law that emphasizes exclusivity and private ownership, reducing knowledge and cultural expressions to commodities that can be privately owned by an individual or a corporation[4].

Today's IPR regimes also do not have any mechanism to protect or reward the public-domain foundations on which the innovations may be based[5]. For, e.g. a small change made in earlier art and a new use for an existing product are independently patentable.

The corporate and multinational companies, mostly from the developed world use TK of developing countries as a basis for their commercial products, which are then patented without sharing any benefit with the source of TK. The present patent system gives the entire economic benefit to those who have only slightly altered the TK and gives nothing at all to those who developed it over generations[6]. Worst of all is once such patents are granted, Trade Related Aspects of Intellectual Property Rights (TRIPS) obligates all signatory countries to enforce them upon their own people including the indigenous communities that developed and held the knowledge for generations thus restricting their free use and practice.

The 2009 UN report[4] on the status of indigenous people, highlights that foreign patents granted over TK can greatly affect an indigenous community's cultural practices as well as control of resources that are material to practising that TK. The report cites a study indicating that there are over 130 patents issued for clinically useful therapeutic drugs derived from plants of which at least 70% came to the attention of pharmaceutical companies due to their usage by indigenous people. The report shows that over 7000 patents had been granted for the unauthorized use of TK or the misappropriated use of indigenous medicines derived from plants.

Thus, TK needs to be protected in addition to preserving it. World Intellectual Property Organization (WIPO) clearly distinguishes preservation from protection[7] – wherein preservation means identification, documentation, transmission, revitalization and promotion of cultural heritage to ensure its maintenance. However, protection of TK may mean the protection of TK against misuse and misappropriation, such as copying, adaptation or use by unauthorized third parties. In the sense of IP, two paradigms can be employed to protect TK:

- Positive protection includes preventing unauthorized use and active exploitation of TK[7] by the original community itself or external actors to promote its application. Promotion generally refers to commercialization of TK. National laws, especially *sui generis* laws adopted by countries such as India, Brazil, Peru, Philippines, etc. are currently the prime mechanisms for achieving protection and practical benefits for TK holders.
- Defensive protection refers to a set of strategies to ensure that third parties do not gain illegitimate or unfounded IP rights over TK[7]. Development of TK databases may be used as evidence of earlier art to defeat a claim to a patent on such TK. The most famous example is India's Traditional Knowledge Digital Library.

Sources of traditional knowledge

Existence of TK can be broadly divided into two categories – recorded and oral knowledge. Recorded knowledge is often referred as codified and is available mainly in the form of ancient texts and books. Contemporary books, journals and reports that focus on TK are also the sources of recorded knowledge.

Another significant category of TK is the oral knowledge that is not recorded or codified anywhere. It is widely dispersed; remains confined to the local communities and is transferred only orally from generation to generation. Identifying and preserving oral knowledge needs utmost attention as it is the basis of livelihood for many indigenous communities and the threat is not only towards losing it but also because of its gross misuse by corporate and private parties.

Preserving codified traditional knowledge – examples

Traditional knowledge digital library

India is one of the largest TK holding countries in the world. India's effort on revocation of patent on turmeric and neem led to the genesis of Traditional Knowledge Digital Library (TKDL) (Figure 1), a knowledge repository on the Indian traditional system of medicine including Ayurveda, Siddha, Unani and Yoga. TKDL is a collaborative project between the Council of Scientific and Industrial Research (CSIR), and the Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH), and is being implemented at CSIR, India[8].

The TKDL project documents in digitized format, various Indian traditional systems of medicine available in the public domain in the form of ancient and other existing literature often inaccessible to the common man and rarely understood. TKDL contains information in five foreign languages for the ease of patent examiners in international patent offices and it precisely lists the time, place and medium of publication.

With TKDL, India is capable of protecting more than 2,90,000 medicinal formulations similar to neem and turmeric within a time range of days and weeks and without any cost. Thus, in the sense of IP, TKDL gives defensive protection to India's traditional medicinal knowledge. After TKDL, it is estimated that there is as much as 44% decline in patent claims filed on Indian systems of medicine[9].

At the international level, on average, it takes 5–7 years for opposing a granted patent which may cost 0.2–0.6 million US dollars[10]. It is estimated that it would cost the country more than $200 billion to defend the 2,90,000 formulations listed in TKDL. However, according to the

Figure 1. Traditional Knowledge Digital Library (TKDL). www.tkdl.res.in

2012 data, the total project cost of TKDL including recurring expenses is only around 16 crores[9].

TKDL had made a huge impact around the world and inspired many developing countries to protect their TK against wrongful exploitation, primarily in the pharmaceutical sector. However, TKDL is limited in its coverage as it does not include the non-codified or oral knowledge. It is also restricted to medicinal knowledge.

A significant aspect to be noted here is that whole of the TKDL database is not available in public domain. Only a representative database containing 1200 formulations is made available for public access[8].

Korean traditional knowledge portal

The Korean Traditional Knowledge Portal (KTKP) (Figure 2) was compiled by the Korean Intellectual Property Office (KIPO) and this database includes a vast amount of knowledge from documentation on old Korean and Chinese medicine. It also includes a wide range of articles and patent documents. The database currently contains around 3,50,000 entries on Korean medicine, traditional food and intangible cultural heritage. The database is available in Korean and English languages[11].

The KTKP database is basically an integrated system of content specific databases such as article, herb, prescription, disease databases and other supporting databases; all being interlinked to each other. When a user searches for a particular disease-related information, the information on the disease along with related herbs and prescriptions is displayed. Related patents and articles are also provided as separate links. While the herb, prescription and disease databases contain information recorded in the old document of traditional Korean medicine, the article database contains articles related to TK from *Korean Journal of Traditional Knowledge* and 47 other journals. Similar to TKDL, KTKP preserves only the codified knowledge and defensively protects Korea's TK.

KIPO has recently collaborated with research institutions in Korea for opening up its TK database for research to develop new drugs. It is expected that this database will also be actively opened up for the private sector in future.

Chinese traditional medicine database system

China is another important TK holding country in the world. The most important type of TK in China is Chinese traditional medicine (TCM), derived from ancient traditions and most of it is written down. Unlike in India where the codified TK is written down in various regional languages, TCM is recorded only in Chinese – thus it is widespread and highly accessible. TCM is also present in other Asian countries such as Korea and Japan and hence legal protection in one country becomes ineffective as it can be freely used in other countries. Therefore, China's

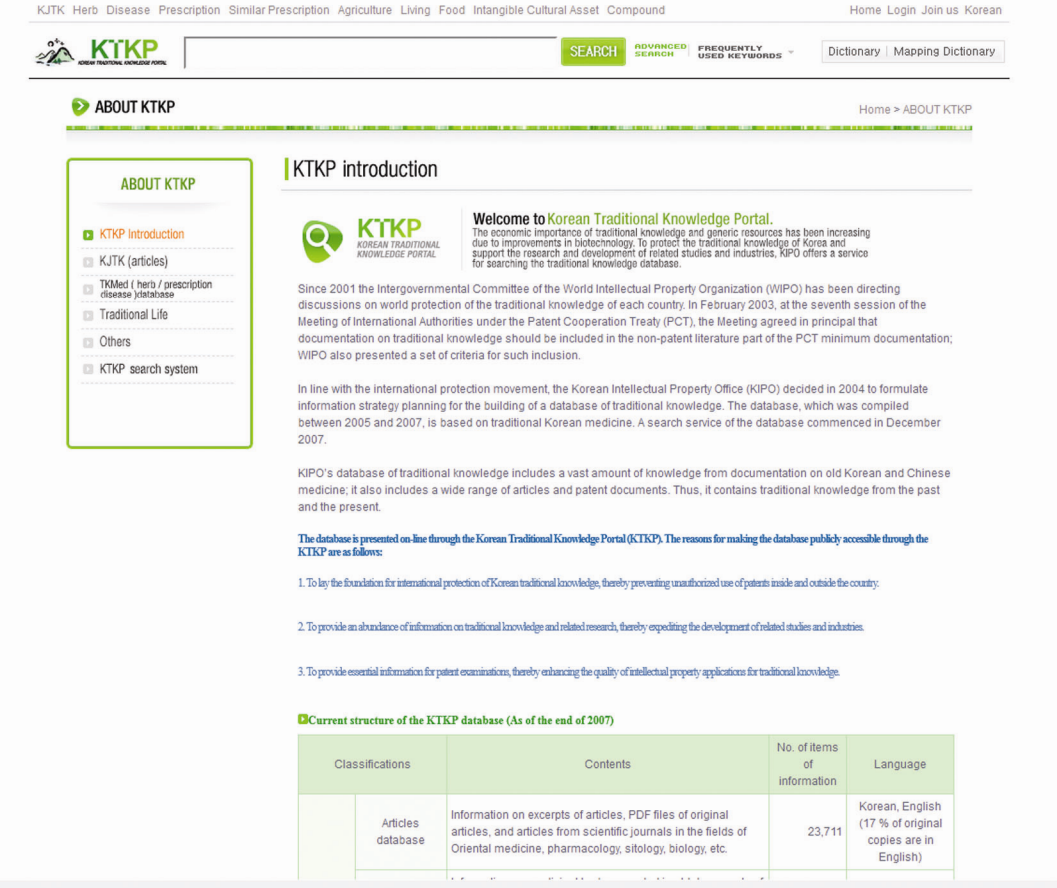

Figure 2. Korean Traditional Knowledge Portal (KTKP). www.koreantk.com

policies focus mainly towards positive protection of TK by promoting innovation based on TK and integration of TCM into modern western knowledge, rather than protecting TK itself[12].

China has created a series of online databases that record information related to TCM[13]. The Traditional Chinese Medicine Database System was set up by the Institute of Information on TCM. Currently, the system consists of over 40 categories of Chinese Medicine Databases, possessing 1,100,000 items[14]. Most of these databases are available in Chinese language and few in English. These databases are available in CD version as well and accessing these data-bases is chargeable. Some of the important databases include:

The Traditional Chinese Medical Literature Analysis and Retrieval Database in Chinese contains more than 6,00,000 references and abstracts to literature on TCM, including Chinese herbal medicines, acupuncture, qigong, Chinese massage, health promotion and other topics. The information is drawn from more than 800 Chinese biomedical journals published in China since 1984, of which over 100 are specialty periodicals in TCM. Its English version contains more than 1,20,000 references and abstracts[15].

Traditional Chinese Drug Database in Chinese contains over 11,000 records with each record representing a single herb, or mineral drug or other natural medicine, and provides the cited information. The data is derived from *Chinese Materia Medica Dictionary*, *Thesaurus of Chinese Herbs*, *Chinese Medicinal Materials*, *Manual of Composition and Pharmacology of Common Traditional Chinese Medicine*, etc. English version of the database contains 545 records[15].

The Database of Chinese Medical Formula is available only in Chinese and contains information on more than 85,000 medical formulae derived from more than 700 ancient medical books. *The Medical News Database* in Chinese contains more than 60,000 records of news drawn from newspapers related to Chinese medicine[15].

The China Traditional Chinese Medicine Patent Database (CTCMPD) (Figure 3) is compiled by the State Intellectual Property Office (SIPO) of China and contains TCM-related patent applications published from 1985 to the present in China. The Chinese version contains more than 22,000 TCM patent records and 40,000 TCM formulas. English language version of this database is a demo version. The TCM formulas in this database are patented

Figure 3. Chinese Traditional Medicine (TCM) Patent Database. http://chmp.cnipr.cn/englishversion/login/index.asp

information and hence are not available in public domain[16].

The other branch of TK in China is referred to as the indigenous knowledge or oral TK. Though little has been done so far, efforts are being made to codify and preserve this knowledge as well.

Preserving non-codified/oral traditional knowledge – examples

BioZulua Project of Venezuela

The BioZulua project records data on medicinal plants and food crops of the 24 ethnic groups living in Venezuela's section of the Amazonian jungle[17]. The database includes information on traditional indigenous medicine, traditional agricultural technologies, nutrition and conservation practices[18]. The information is collected by field researchers and stored in a searchable database administered by the Foundation for the Development of Mathematics and Physical and Natural Sciences[17]. The database provides genetic profiles of every plant entry and global positioning system coordinates of plant locations[19] and the entries are complemented with geographical references, bibliographies and digital images. The Biozulua database is a perfect example of preserving non-codified traditional knowledge.

The Biozulua database is not available for public access and has been kept undisclosed for possible positive legal protection through a *sui generis* system in the future. The content of the database is the intellectual property of the individual indigenous groups[20] and aims to curb biopiracy by encouraging the private players to foster the procurement of informed consent and broader engagement with the TK holders. The Venezuelan government also hopes to explore the possibility of raising money for the communities by charging the international pharmaceutical companies for accessing the database.

The Ulwazi programme of Durban

The Ulwazi programme (Figure 4) is an online indigenous knowledge database and the first of its kind in South Africa aimed at collecting and sharing indigenous knowledge and culture of local communities in the greater Durban area in English and local Zulu languages[21]. This programme collects and shares indigenous knowledge such as traditional celebrations, clothing, Zulu proverbs, folk tales, spiritual herbs and traditional agricultural methods, in the form of a wiki, a website designed to enable contributions and modifications from multiple users[22]. Ulwazi programme operates as an integral part of local public library network that provides a framework for a digital library of TK, in which the content is created and owned by the communities themselves with the libraries playing the role of moderator and custodians of knowledge[23].

The information is collected by the hired community fieldworkers who normally have strong ties with their community elders. These fieldworkers are trained in

recording audio and visual materials, as well as in basic writing and computer skills necessary for uploading of stories to the wiki. The wiki model also encourages the people connected with Durban to register and help improving the database by editing and adding articles. The content is organized through a series of categories and subcategories.

This programme is designed in such a way that the communities share benefits at every stage: the community youth is benefited by the IT skills training not only for collecting the indigenous knowledge but also finds them useful for better employment prospects; the ownership of the indigenous database lies with the local communities thus empowering them to preserve knowledge on their culture, history and environment; its availability in public domain promotes sharing of knowledge thus strengthening social coherence among communities.

The availability of this database in public domain is also said to be playing a considerable role in promoting tourism in and around Durban, by the amount of visibility it has generated. Another advantage of this programme is that it has kept its costs to the minimum with the use of open-source software and social media, existing library infrastructure and volunteers.

This model has certain limitations as its availability in public domain does not sufficiently address the issue of protecting the knowledge collected. The wiki model of this database allows all registered users to add or edit stories thus raising a question regarding credibility of the information and there is no mechanism to validate the collected information.

However, this model is one of the fine examples of well-organized collection of oral knowledge with active community participation, supported by a government framework. This database as of now does not contain much information on medicinal knowledge, whose misuse is the basis for major country-level initiatives in developing countries. However, a proper protection mechanism may be felt necessary depending on the nature of information collected over a period of time.

Preserving both oral and recorded TK through community archives – example

Ara Irititja Project

The Ara Irititja Project (Figure 5) is a community-based, multimedia digital archive[24] aimed at repatriating materials of cultural and historical significance to Anangu, an indigenous community in the desert regions of western and central Australia. The project was developed to collect the vast amount of historic and culturally significant materials including photographs, films, videos, sound recordings, documents and artefacts, etc. held in private and public collections. Priority has been given to recording, transcribing and translating the stories of elderly Anangu, i.e. the oral knowledge. To ensure the longevity of the collected materials and the widespread land area of the community, an online mechanism was developed rather than providing access to physical materials. The original physical materials are also archived and protected.

Ara Irititja tracks down and negotiates for the retrieval of significant material, archives them physically, creates digital copies of these materials and returns the archived material to the Anangu community not only to view, but also for them to create, manage and control their own archive. Ara Irititja software also functions as a metadata collector that allows the community members to enter information about each item such as dates, names of people, places in photographs, the stories that accompany it, etc.

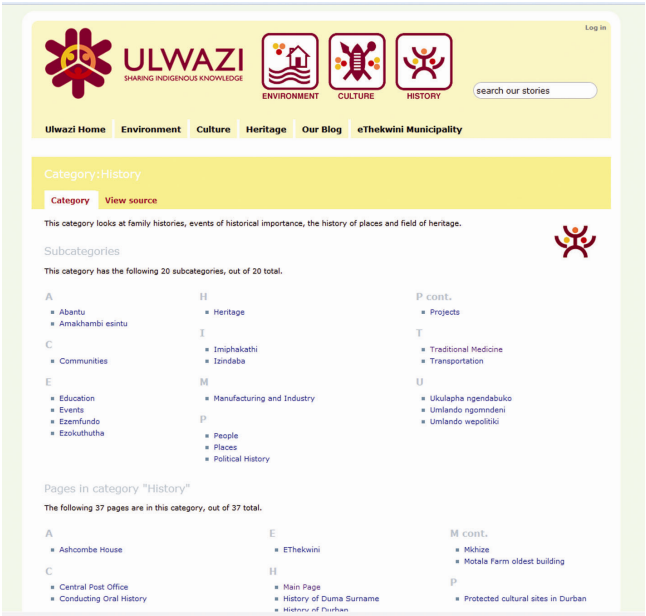

Figure 4. Ulwazi Programme. (http://www.ulwazi.org)

Figure 5. Ara Irititja Project. (http://www.irititja.com/)

The software that forms the core of the project has been carefully developed in consultation with Anangu and reflects many of their linguistic, social and cultural conventions. For example, the programme enables files to be sorted into open access, sensitive and sorrow – the last category indicates that the persons seen, heard or named in the files are recently deceased. There are also divisions between men's and women's materials, sacred and secular, and so on. This has resulted in the living archive that is responsive to the needs and concerns of present-day Anangu community[25].

The project currently consists of 1,30,000 digital records. Ara Irititja is unique, responding directly to the needs and expectations of community members, participating in contemporary efforts to preserve language, traditional cultural protocols and elders' knowledge, and making these relevant and available in the present. Ara Irititja has policies and protocols in place to ensure respect for the intellectual and moral rights of the material. All contents in this archive are subject to Australian copyright law with the intellectual and moral rights lying with the Anangu community.

Ara Irititja can be called as a complete initiative in the sense:

- It preserves both recorded and oral knowledge of the community.
- It is community owned and controlled.
- It is fully protected.
- It is available back to the present generation of Anangu for its own development.

Conclusions

Preserving and safeguarding TK has assumed great significance in the recent past and a variety of initiatives are being made across the globe towards achieving it. In view of the wider misuse of TK, preservation and protection should work hand-in-hand. Documenting non-codified knowledge is not very successful in a larger perspective because of the variety of issues involved. However, urgent measures are required to preserve oral knowledge as it faces a greater risk of loss and misappropriation.

Also, documentation of medicinal knowledge has gained prominence in many countries in their fight against biopiracy. However, TK involves various sectors such as agriculture, environment, architecture, culture, heritage, etc. that are interlinked and applied to daily living. All this knowledge needs to be preserved in order to achieve inclusive development.

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