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Indian Knowledge System: An Overview

LEARNING OUTCOMES



After finishing this chapter, you will be able to:

- ▶ Understand and appreciate the importance of ancient knowledge to a society
- ▶ Understand the term 'Indian Knowledge System' (IKS)
- ▶ Familiarise with the key components of the IKS
- ▶ Develop some appreciation of IKS historicity

Built by Raja Raja Chola I, The construction was completed in 1010. This is one of the earliest granite temples in the world. Around 60,000 tons of granite is said to be used to build the temple. It has one of the tallest vimānam (temple tower) and its kumbham (the structure on the top) weighs approximately 80 tons.



IKS IN ACTION 1.1

Do We Need Indian Knowledge System?

There is a question ruminating over our minds, why should we bother so much about Indian Knowledge System (IKS)? IKS is not about merely knowing about some ancestral knowledge. If we closely follow the emerging patenting regime and the economic power arising out of a knowledge society, it becomes clear that the issue merits serious attention. It is about protecting received wisdom, economic security, and national pride.

Efforts by an international coalition of environmentalists to get the US patents on products of the neem tree cancelled did not fructify. We all know that we use neem leaves to keep away insects from our kitchen garden. Every farmer in India knew for time immemorial that it was a good pesticide among other things. Yet, a few years ago, a US company was awarded a patent for neem as a pesticide. The company claimed it had developed an agent that would make the active pesticide an agent that would make the active pesticide an agent in neem last for more than the normal two weeks. Although our scientists had been tinkering around with research on neem for years, they had not applied for this specific process and the battle was lost. Nor we were able to bring our vast knowledge system to argue against the case. The patenting of traditional remedies from developing countries became a global issue after patents were granted for neem.

On the other hand, after a legal battle for more than a year India's Council of Scientific and Industrial Research (CSIR), has successfully forced the US Patent and Trademark Office (PTO) to revoke a contentious patent it granted two years ago to researchers in the United States on the use of powdered turmeric (*Curcuma longa*) for wound healing. The turmeric patent was granted in 1995 to two researchers, Soman K. Das and Hanhar Kohli of the University of Mississippi Medical Center. Their patent claims covered the oral and topical use

of turmeric powder to heal surgical wounds and ulcers.

Turmeric is a native Indian plant, and Indians have been using it for centuries for wound healing. With the support of several documents including books on home remedies and Ayurvedic texts, CSIR was able to argue the case. Das and Kohli contested CSIR's objections, but the patent office rejected all their claims. The patenting of indigenous knowledge by foreign corporations is a cultural threat to countries like India as well as an economic one. The case of turmeric is a perfect example since it plays such an extensive role in India's culinary and health practices, among its other uses.

As the turmeric patent case makes it evident, the current patent system seems to allow biopiracy. Patents on Neem, Amla, Jar Amla, Anar, Sals, Dudhi, Gulmendi, Bagbherenda, Karela, Rangoor-Ki-bel, Erand, Vilayetishsham, and Chamkura all need to be revoked based on the logic that these are part of Indian indigenous knowledge and 'prior art'.

India's fight for the turmeric patent was necessary to uphold 'national pride' and to dispel unfounded fears that India was incapable of protecting its traditional knowledge base. The then CSIR's director, Dr. Mashelkar highlighted the importance of documenting traditional knowledge. Our importance of evidence of prior knowledge. Our to provide evidence of prior knowledge. Our scientists and technologists need to wake up and focus their efforts on building scientific data on many of these traditional knowledge treasures that we possess and work towards getting them patented. Knowledge of IKS becomes critical in this journey.

Source: Jayaraman, K.S., US patent office withdraws patent on Indian herb. Nature 389, 6 (1997). <https://doi.org/10.1038/37838> and several other reports available on the internet.

or other civilisations such as the Chinese and the Egyptian, this also implies that all knowledge is of recent origin. This idea is counterintuitive and illogical.

Human beings are inherently knowledge generating in nature endowed with unique capabilities. By using the power of discrimination, reasoning, and rational thinking, human beings constantly process the newly acquired knowledge. Therefore, it is not surprising that a rich repository of knowledge accumulated in the Indian subcontinent and manifested in terms of traditions and practices. One or two examples help us understand this aspect. Indians were good in steel making until the 17th century. The Indian 'wootz' steel was used to manufacture what was famously known as 'Damascus blades' and despite several attempts by the metallurgists in the past, it was not possible to replicate the properties of the wootz steel. Indian's contributions in the fields of Number Systems, Mathematics, and Astronomy in the first millennia of CE contributed to several other developments. These ideas were percolating into the West via the Arabic countries, and they ought to have influenced the scientific development in the West beginning 15th century CE. Unfortunately, in our current educational system, we do not have an inkling of the nature of the contributions made by the Indians. This raises several questions. Where has all this knowledge gone today? Have we lost this knowledge totally? Is it of no use or interest to us today? Is there a sudden loss of continuity? What has caused this?

As many of us are aware, the ancient knowledge in India was preserved and transmitted 'orally' until a few centuries back. There was an uninterrupted lineage of 'Guru-Sisya' that took responsibility for the preservation and transmission of knowledge down the generations. Quite often, the teacher-student was a father-son combination and a group of related family members. These people formed a clan, who preserved the knowledge, practiced it by making a living, and transmitted it to their offsprings. The use of print media in recent history and the palm leaf scripts earlier have served to formally capture this oral knowledge and store it.

Unfortunately, due to major changes in the educational system introduced in India about 200 years back, there was

- ◆ Indians were extraordinary in steel making until the 17th century. The Indian 'wootz' steel was used to manufacture what was famously known as 'Damascus blades'.
- ◆ Due to major changes in the educational system in India introduced about 200 years back, there was a rather abrupt end to the process of knowledge transmission.

1.1 IMPORTANCE OF ANCIENT KNOWLEDGE

Ancient knowledge is the accrued knowledge over several generations and preserved in formal and informal means. Formal means include documented knowledge and informal means include shared values and practices through oral traditions. Sadly, as explained above, ancient Indian knowledge has been relegated to millions of palm manuscripts lying scattered all over the country and it is gathering dust. While several scholars are engaged in the process of bringing the hidden knowledge out of these manuscripts by researching and republishing such works, it does not match the scale required to make a meaningful impact. It is a herculean proposition to uncover the knowledge and bring it to the attention of modern society. On the

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- Ancient knowledge provides a head start to a society to march on the highway of innovation and new knowledge creation.

other hand, the oral traditions continue in some rural pockets and are at the threat of getting extinct for want of patronage. The question in front of us is, "Does any society need to preserve, protect and pass on the ancient knowledge to the future generations?"

The thinking patterns and the repository of knowledge created by the forefathers in any society enable the current generation to understand the thought processes and frameworks of the previous generations. It will allow them to assimilate the accrued wisdom and synthesize new knowledge. Therefore, keeping the current generation in the dark about the contributions of the ancestors is an inefficient, and a short-sighted option for society. Ancient knowledge serves multiple roles for society. Figure 1.1

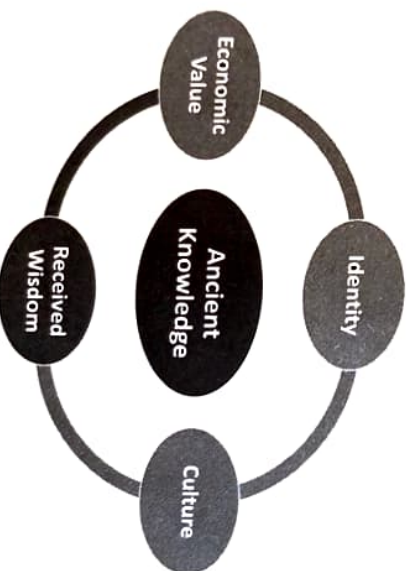


FIGURE 1.1 Importance of Ancient Knowledge

Identity

The quintessential value that ancient knowledge brings to society is the identity it provides to fellow members of the society. Essentially it defines the context for several aspects of the day-to-day living of every individual. The social practices and norms have continuity as most

of them are transmitted from generation to generation through practices and supporting knowledge repositories. Therefore, preserving this knowledge and baton passing them on to the next generation is an important step for contemporary society. In the absence of this continuity, individuals lose their conviction on several living practices. They lose their ability to 'meaning making' of much of the knowledge. Eventually it challenges one's own identity and that of the society.

Culture

Culture has several dimensions. In a direct sense, it is the manifestation of human intellectual achievement regarded collectively by society over time. From a social perspective, culture is nothing but the set of ideas, customs, and behaviour of society. In other words, culture provides a sense of identity at a societal level by providing a common medium for communication and the transaction of ideas. The prevailing knowledge and the literary traditions play a significant role in shaping the culture of the society. If the underlying knowledge systems are abruptly withdrawn from society, the cultural practices will be rudely jolted. It may create distortions and discontinuities in societal progress.

Received Wisdom

Knowledge and innovation are in a continuum. Innovation and new knowledge creation in any society is 'path-dependent'. What it essentially means is that the road travelled so far determines the future path. Without the continuity of thoughts, it is very difficult to make further progress in terms of new ideas. The other equally important issue is the risk of reinventing the wheel. When the benefit of prior knowledge and the thought process is lost by society, it will lead to reinventing the wheel, making innovation and new knowledge creation inefficient. In this context, ancient knowledge plays the valuable role of 'received wisdom' and provides a head start to a society to march on the highway of innovation and new knowledge creation.

Economic Value

One of the compelling arguments in support of the ancient knowledge systems is the huge potential it offers from an economic value standpoint. The emerging world order puts greater emphasis on knowledge society. The prevailing 'military power' will give way for 'knowledge power' and such nations who demonstrate the superiority of knowledge traditions are bound to lead the rest of the world. Transforming knowledge into economic value has been fully formalized with the global intellectual property rights regulations and patent laws. Therefore, the ancient knowledge system will be beneficial to a country like India (see IKS in Action 1.1 at the beginning of the chapter for an illustration of this idea).

Let us see an example to understand this aspect. The US patent and trademark office granted patent rights on knowledge of the usage of pigeon pea extracts for treating diabetes, hypoglycemia, obesity, and artho-sclerotic cardiovascular disease (clogged arteries) to Insmed Inc, based in Richmond in Virginia. The company claimed its novelty in the invention of pigeon pea extracts for treating these diseases. In the patent applications, Insmed

- ◆ The prevailing 'military power' will give way for 'knowledge power' and such nations who demonstrate the superiority of knowledge traditions are bound to lead the rest of the world.
- ◆ Unless we preserve the ancient knowledge, we will not be able to prevent the spillover of our economic value arising out of our ancient knowledge.

acknowledged only a handful of uses of pigeon peas in traditional medicines by citing some references of journal articles that appeared in 1957 and 1968 that describe the effects of pigeon pea and its extracts on blood sugar. The patent application did not include references to the traditional use of pigeon peas in the treatment of the mentioned diseases.

Pigeon pea (botanical name *Cajanus cajan*) is commonly known as arhar or red gram in India. There are several instances of the use of pigeon pea extracts in traditional medicines in India. A study of plant medicines by researchers in the department of pharmacology at the All-India Institute of Medical Sciences (AIIMS) tested pigeon pea extracts as they are used to treat diabetes in Ayurvedic medicines. The scientists at the Council of Scientific and Industrial Research (CSIR) observed that there is a need to gather strong evidence from our traditional texts to challenge such patent rights. Unless we preserve and be aware of the ancient knowledge, we will not be able to prevent the spill over of our economic value arising out of our ancient knowledge¹.

1.2 DEFINING INDIAN KNOWLEDGE SYSTEM

Indian Knowledge Systems (IKS) is a generic phrase that covers practically everything about India. For a nation with more than 5000 years of recorded history, abundant cultural and archaeological artifacts, literature, and social and community practices defining what constitutes Indian Knowledge is itself a huge challenge. Literature, cultural and social practices, historical evidence, and other such knowledge assets available in all Indian languages, dialects, and geographical regions will all technically fall under the ambit of IKS. The other aspect of the issue is the time dimension. Knowledge is continuously synthesized by any society. Knowledge

The Indian subcontinent, born and lived there, and are part of the knowledge system in an integral fashion. This is especially important because India witnessed several foreign travellers who visited its universities, stayed for some time and wrote about the country, the knowledge, and cultural practices. These have significantly contributed to the export of this knowledge to the west and other parts of the world. For example, some reports have extensively studied the use of such authors in taking mathematical thinking to the west via the Arab world². These are considered as 'about IKS' rather than IKS itself.

Knowledge

The second component of IKS is the 'knowledge', which is always tacit. It primarily arises in the form of the wisdom of the knowledge seekers. It is obtained by the insights gained by personal experiences with life situations, facing problems, and coming up with means of solving them. At other times, one obtains knowledge by means of intense observation of events, experimentation, conjecturing, and analysis. Knowledge may or may not be converted to a literary format. The tacit knowledge can be preserved and transmitted through an oral tradition without loss. India has a rich tradition of folklore practices even to date, that belongs to this category. While both these forms of knowledge are equally important and valuable it is impossible to formally study knowledge transmitted through oral traditions. Therefore, by 'knowledge', we mean in this book, a formal repository of knowledge available in literary sources.

The tacit knowledge gained by a seeker is owned by that

Yoga, Vāstu, Śilpa Śāstras, Āyurveda, Buddhism, and Jainism to define IKS. Another approach is to select phrases such as Indian Psychology, Indian Arts, Dance, and Architecture and put together related works into it to construct IKS. These examples bring out the components of IKS. However, whether they will qualify to be a good framework for IKS depends on their ability to meet the requirements of a classification framework for IKS.

The usefulness of a classification framework depends on three factors: completeness, compactness, and inter-connectedness.

- *Completeness* ensures that all important components of the IKS are included in the proposed framework. If significant omissions are found in the classification, it makes the IKS non-exhaustive and non-representative.
- *Compactness* indicates the efficacy of the grouping of various topics in IKS in a congruent and logical fashion. This makes the representation simple, concise, and easy to understand and remember.
- *Inter-connectedness* brings logical relationships among the various sub-classifications. The classification framework will identify how the different components are logically connected. Thus, it presents a unified picture of the entire knowledge.

Closer scrutiny of the IKS knowledge repository provides us the following details:

- (a) As already noted, the knowledge is available in both formal literary sources and informal non-literary sources.
- (b) Among the literary sources, we can broadly identify three categories. One of the major sources is the Vedic and allied literature, which we shall designate as Sanātana-dharma literature, presented mainly in the Sanskrit language. This comprises the religious and philosophical part consisting of the Vedic and allied corpus, which forms the core and a good repository of other literature spanning areas such as sciences, architecture, and aesthetics. The second major source is the literature on other dharmic traditions. The third group is a large repository of knowledge in other Indian languages and dialects.
- (c) The non-literary source is predominantly available through a rich set of oral traditions found throughout the country.

Figure 1.2 pictorially presents the classification scheme based on the above observations. Let us see some details of these categories.

Sanātana-dharma – Core Literature

This comprises a vast repository of knowledge starting with the Vedas, known as Śruti. Although the Vedic corpus is oral in nature and is still transmitted using oral methods, these have been later systematically documented in written form. The Vedas are considered foundational by the Indian society and several important literary works were developed later, which substantially added to the Vedic corpus by facilitating better understanding and implementation of the ideas presented in the Vedas. This literature owed its allegiance to the Vedas and extracted their cardinal assumptions and principles from the Vedas. For example, six schools of philosophical thought, known as Darśanas developed their basic assumptions from the Vedas while stating their prescriptions. The Vedic and allied repository has several sub-components and divisions and is best understood from a classification methodology adopted, which we will see in the Section 1.4.

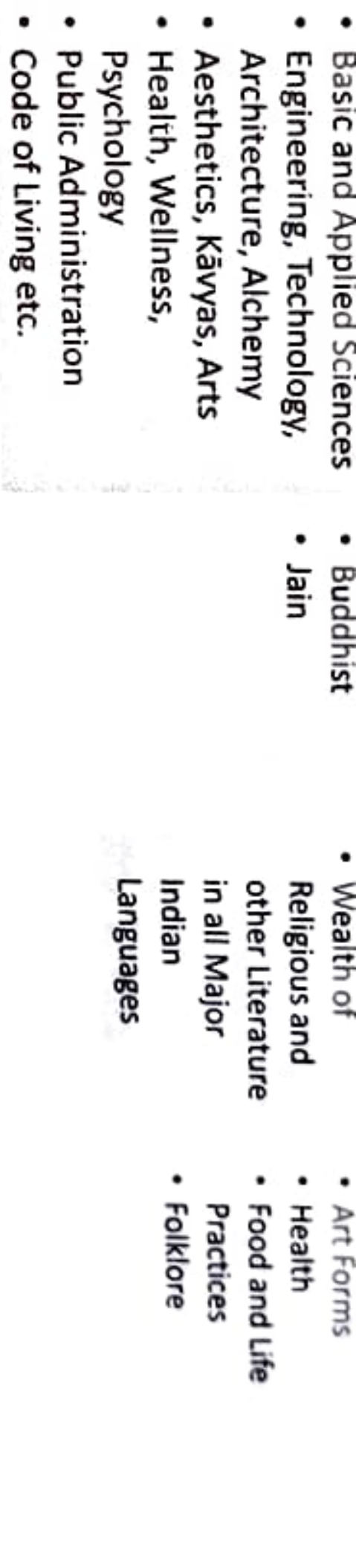


FIGURE 1.2 The IKS Corpus – A Classification Framework

- *Health, Wellness, and Psychology* addressed the crucial issue that we face in contemporary society. Three important works on Āyurveda (Caraka-saṃhitā, Suśruta-saṃhitā, and Aṣṭāṅga-hrdaya) provide a wealth of information on health and wellness. Other related works dealing with alchemy such as Rasaratna-samuccaya provide information on āyurvedic formulations. The philosophical systems such as Yoga and Sāṃkhya and the Upanisads have discussed the issue of psychology. Chapter 13 of the book discusses the issues related to this theme.
- *Nīti-śāstras* is a collection of literature that informs the society of the good living through poetic verses and stories. The sāmānya-nīti deals with elements of good living, and the role of ethics and morality in life. Several life situations and wide-ranging topics are addressed through stories, parables, and short poetic works. The famous pañcatantra and the works of Bhartṛhari are some representative examples of this category of literature. An extensive collection of such ideas scattered in the various works is compiled into what is known as subhāṣitas. Chapter 4 of the book introduces glimpses of this literature. Another aspect of nīti-śāstra is the Rāja-nīti, dealing with public administration and governance.
- *Public administration* deals with the idea of governance of state and public policy measures required for administration. Manu-smṛti provides rich information on governance and administration. Arthaśāstra compiled during the 3rd century BCE is a seminal work and it triggered further works in the area. Notable among them is the Nīti-sāra of Kāmandaka. Chapter 14 of the book takes up this issue for discussion.
- *Aesthetics, Kāvya, and Performing Arts* is another area with rich contributions. The Sanskrit language is the vehicle through which the entire knowledge corpus of the Sanātana-Dharma (both the core and the other) is presented. Linguistics and phonetics of the Sanskrit language is a fundamental work that sets the stage for rich literature development. Chapter 5 of the book introduces some concepts related to the Sanskrit language. Works of great poets such as Kālidāsa, Daṇḍin, and Bāṇabhaṭṭa, works such as Kāmasūtra of Vātsyāyana, and Nāṭyaśāstra of Bharata are some of the examples.

Other Dharmic Traditions

Other dharmic traditions have stayed out of the Vedic framework but have immensely contributed to IKS in the religious, philosophical, and other domains. Two of them, the Buddhist and the Jain literature are noteworthy, and they have contributed right from 500 BCE to IKS. While the religious and philosophical part of the literature is based on the respective tenets of the school of thought, other literature has applications in areas of science, technology, and

Regional Literature

The separation of regional languages in this figure is only convenience. Ideally, it could be included under Sanātana-dharma. Indian subcontinent has a rich and diverse mix of cultural and linguistic variations. The 8th schedule of the Indian constitution has listed 22 languages of the country. In each of these languages, there is a huge corpus of religious, philosophical, and other literature. For example, Tamil literature has several contributions in the Sangam period (first millennium BCE). Several of the works in the regional literature have drawn from the Sanskrit resources and have either explained them in detail in the chosen regional language or extrapolated them further with some more ideas. The new literature created broadly follows the Sanātana-dharmic literature and utilises the basic framework laid in the Sanātana-dharma literature. The sheer volume and vastness of the regional literature introduces constraints in drawing substantially from this corpus for the present book.

Oral Traditions

The diversity of cultural practices and regional preferences have paved the way for oral traditions to preserve and transmit knowledge across generations. These have been primarily in the form of folklore artistic endeavours, skilful jobs, food and life practices, and health. The 64 Kalās mentioned in the IKS literature are mostly skill-based and artistic chores that are orally transmitted.

Sanskrit has been the dominant language for transacting knowledge for a long time in India. Therefore for the purpose of the book, the main sources of knowledge are the IKS literature.

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- ◆ The Buddhist and the Jain literature have contributed significantly to IKS right from 500 BCE.
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FIGURE 1.3 A Pictorial Representation of Caturdaśa-Vidyāsthāna

Vedas

The Vedas are the primordial source of knowledge in the scheme of the Sanātana-dharma literature. They are also known as Śruti as it is not authored by anyone but heard by the seers of the Vedic lore. The mantras that were revealed to them were later orally passed down the

- The Vedas are the primordial source of knowledge in the scheme of the Sanātana-dharma literature.
- Purāṇas contains a rich repository of ideas that seek to explain various aspects of the Vedic thoughts, several socio-cultural ideas and practices for living.

generations through a lineage of ‘Guru-Śiṣya’. The other sources of knowledge are considered secondary to the Vedas. The primary purpose of the other knowledge is to expand the ideas contained in the Vedas so that it has practical applications and relevance. The other purpose is also to clarify the Vedic intent by way of stories, explanatory notes, and operational guidelines for daily life. The Upaniṣads, and operational guidelines for daily life. The Upaniṣads are typically associated with the Vedas on account of the material being found in the respective Vedas. In this sense, they are integral to the Vedas.

Since the primordial source of the Sanātana-dharma literature is the Vedas, it provides the overall defining framework for living. The larger issue of meaning and purpose of life as stated in the Vedas need to be understood clearly. Therefore, there is a need to expand the ideas contained in this framework. Detailed explanations in terms of ‘how-to’ aspects of the ideas expressed in the Vedas is also required. Moreover, whenever conflicting situations emerge in the applications of the principles, we need to know how to resolve them. Some of the other components of caturdaśa-vidyāsthāna serve to address these requirements in the context of the Vedic repository.

Vedāṅgas

To benefit fully from the Vedas some complementary tools and skills are required. These help to understand the exact meaning and intent of what is presented in the Vedas and follow Chapter 2 of the book has more details on the Vedas and the Vedāṅgas.

Darśanas

It is a natural quest for everyone to understand three forces that operate and interact with one another: an individual (jīva), the Universe (jagat), and a larger force governing the other two (variously referred to as Īśvara, Brahman etc.). Establishing the connection between these three becomes an issue of philosophical thinking. Darśana essentially means a philosophical thought or view. There are six schools of philosophy in the Sanātana-dharma literature and other schools outside the realm of this. These are discussed in some detail in Chapter 3 of the book.

Purāṇas and Itihāsas

Purāṇas contains a rich repository of ideas that seek to explain various aspects of the Vedic thoughts using detailed stories and anecdotes. They present several socio-cultural ideas and practices for living. Furthermore, they address some of the common issues that mankind faces and provide answers using the overarching framework of the Vedas. The stories in the Purāṇas relate to pre-historic events and the subject matter discussed follows a set pattern⁵. Itihāsas, on the other hand, relate to historical events that have taken place which can be associated with specific timelines. As we know, Mahābhārata and Rāmāyaṇa are two well-known itihāsas. In some sense, this literature represents the wisdom that we have accrued through the ages. Chapter 4 of the book discusses these aspects in some detail.

Dharma-śāstras and Smṛtis

Let us think for a moment about what we practice in our modern-day work life. For example, if we need to be part of a company as an employee, we are supposed to know the rules and norms of the organisation, the do's and don'ts, expectations on the part of the employer and the co-workers, social etiquettes, our limits and entitlements and the consequences of wrong actions. If this clarity is not there, there will be chaos and we will end up with unproductive work. If this is the situation in an office, such norms and rules are essential in a society where several entities have complex interactions among them, both in structured and unstructured ways. In other words, a guide to lead a dhārmic life based on the principles of the Veda is required.

The dhārmic principles engrained in the Vedic corpus are presented in multiple formats in our knowledge traditions. Smṛtis are rule books with specific operating guidelines of how to put the dhārmic principles into action and what are the consequences of not doing so. Itihāsas demonstrate dhārmic principles 'in action', through case studies and real-life situations. Niti-śāstras and Subhāṣitas are pearls of wisdom articulated by learned people in the society, clearly showing the value of adhering to the dhārmic principles in life. A discussion of some of these topics is available in Chapter 4 of the book.