Annals of Library and Information Studies
Vol. 72, December 2025, pp. 343-348
DOI: 10.56042/alis.v72i4.25615

Indological Knowledge and its Syllogism

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Received: 16 February 2025; Accepted: 20 April 2025

The study of ancient and medieval history, culture, customs, art and science, languages and socio-economic knowledge of India is known as Indology. Ranganathan proposes Indology as an area study with above features. Indological knowledge system is vast and encompasses many areas of study, contrary to the knowledge systems of the West. Bacon, Kant, Hegel and Pearson identified only two or three categories of knowledge of their times, while the ancient Indian sources have enlisted as many as 64 Vidyas. The knowledge treasure of India made the foreign traveller Huen Tsang take back loads of writings on return home. Not speaking about 4 Vedas, 112 Upanishads, 6 Vedangas, Shastras and 18 Puranas which are still referred to as cues and that depict the holistic horizon of India's knowledge treasure. Max Muller a German scholar compiled 50 books entitled "Sacred Works of the East". A living example of one of India's famous treatise, is the 'Kautilya's Arthasastra' which dates back to 2nd Century BCE the MSS available in the Oriental Research Institute, Mysore was translated into English by Shamasastry, the then Curator of the Institute. One of the well known Oriental historian Basham lists 11 areas of knowledge attributed to well known Indian scholars like Aryabhata and Panini. The paper examines the vast knowledge treasure of India nested in Vedas and other numerous sources of the times immemorial. It primarily desires to focus more on the aspects of Space and Time knowledge and their implications in knowledge organisation.

Keywords: Indology, Knowledge Classification, Vedic Knowledge System, Space and Time Knowledge

Introduction

The term Indology is a combination of two phrases; Indo-means- Indian and logy – means a subject of study. Indology, therefore, means a study of Indian culture, history, languages, knowledge and customs. The knowledge in Indian context is summarised in a Bhagavad Gita Shloka " *Na Hi Jnanena Sadrusham pavitramiha vidyate tatswayam yogasamsiddahaha kalenatmani vindate"* [1] meaning 'there is nothing higher than knowledge which can purify your mind, your soul and your spirit. This, in fact, emphasises that knowledge has a potential power'. Many gods and goddesses are considered as icons of knowledge in India, so the Goddess Saraswati, who represents highest knowledge of Self and Lord Krishna the narrator of Bhagavad Gita, a work of holistic knowledge.

The knowledge, though, is a universal phenomenon, its roots have been grounded all over the globe in the times immemorial particularly in ancient and medieval civilizations. The great civilizations, Greek and Roman, have been known by their scholars like Plato, Aristotle and Socrates whose theories of knowledge in the then social and political system are reckoned and remembered and quoted even to this day. The communication model conceived by Aristotle is a foundation and succeeds even today to examine the other emergent later communication models. Knowledge was considered as part of philosophy and also a part of religion in many parts of the world and especially in the Indian context. In the West, scholars like Galileo, Kepler, Archimedes, Plato and Aristotle made key contributions to the fields of Astronomy, Planetary motion, Physics, Political Theory and Systems. In the medieval period many philosophers attempted to categorise knowledge into some broad disciplines to enable the then scholars interested in their areas of study. These were termed as 'Knowledge Classification Systems" and formed as basis for the Library Classification Systems later adopted by Dewey Decimal Classification System designed in late 19th Century. The philosophers who attempted to device knowledge classification systems were Francis

Bacon, Immanuel Kant, Wilhelm Friedrich Hegel and others. Some of these philosophers' knowledge schemes are presented later.

The Oriental knowledge was vast and extensive and was a subject of discussion by many Westerners like Max Muller who compiled "Sacred Books of the East" which ran into 50 volumes. The east, especially India has a very rich knowledge in the areas of Astronomy, Mathematics, Logic, Medicine, Linguistics, Physics and Chemistry and many other distinct areas. The scholars like Varahamihir, Aryabhata, Brahmagupta, Chanakya, Bharthari, Bhaskar-I and II, Susrutha, Charaka and Panini whose discoveries in their respective fields are referred to even in the modern period. Basham (2) has enlisted as many 11 subjects; Cosmology and Geography, Astronomy, Prosody, Weights and Measures, Coinage, Physics and Chemistry, Physiology and Medicine and so on, for which original Indian contributions are made by the respective scholars. The manuscripts of Kautilya's "Arthasatra" belonging to 2nd Century BCE are available even to this day in the Oriental Research Institute, Mysuru and its English version was authored by R. Shamasastry, the then Curator of the Institute. The knowledge systems which prompt their areas of study are found in the Vedic systems which are considered as the sources of ancient Indian knowledge. The four Vedas, Vedangas, Upanishads, and Puranas are the wings of ancient Indian knowledge and have been discussed and discoursed by scholars even today.

Before venturing to give a descriptive account of Indological Knowledge System, it would be desirable to explore in short the European Systems of medieval and modern times.

European Knowledge Systems - A Review

Parkhi [2] has succinctly presented a series of medieval and modern systems of knowledge descriptively as; the medieval European system known as "Scholastic System' categorise the knowledge into two-three-four groups and termed as; dichotomic, trivium and quadrivium. These systems follow the sequence of subjects in the universities of that age, and based on the arrangement of a universal bibliography brought by Konrad Zesner in 1548.

The modern European systems of knowledge were by Francis Bacon (1605) which had a triad of main subjects. Immanuel Kant (1781) proposed a dichotomic system and Georg Wilhelm Frederic Hegel (1812) followed a Triadic system. In fact, the inverted scheme of Bacon formed the basis for the Decimal Classification devised by Melvil Dewey in 1876. The bases of these systems were considered as Utility Centred (Greek), University Centred (European Scholastic) and Philosophy Centred (Modern European).

Indian Knowledge System

The Indian knowledge system encompasses the Vedas, known to have been compiled by Veda Vyasa Maharshi, who is said to have written the Mahabharata, the epic history of Pandavas and Kauravas that culminates in the Kurukshetra battle. The word *Veda* is derived from the Sanskrit verbal root 'vid' "to know" and is generally translated as the treasure of knowledge or the source or means of knowledge [3]. He further elaborates, "the fact is that the Vedas contain knowledge in every field of worldly science and come under the headings; the sadangas (six limbs) including Phonetics (Siksa), the code of Rituals (Kalpa), Grammar (Vyakarna) Etymology (Nirukta), Literature (Chandas) and Astronomy (Jyotisa). Along with these six branches, there are also the four Upavedas or sub-Vedas, consisting of four sciences which include Medicine (Ayurveda) Archery (Dhanurveda), Music (Gandharvaveda) and Architecture (Sthapathyaveda). They were compiled during the period, 1500-800 BCE and are in Hyms or in Verse form in Sanskrit, a collection called Samhitas. The Vedas are the part of Samhitas (Collection) and they are four in number Rig Veda, the oldest one, followed by Samaveda, Yajurveda and Atharvaveda. The Rig Veda is more so a religious discourse in verse form but other Vedas, followed later consisted of many subjects which are studied even today such as Vedic Mathematics, Astrological knowledge of Aryabhata and the Grammar of Panini.

Accordingly the four Vedas and Upvedas are;

Vedas		Upavedas
i)	Rig Veda	i) Ayurveda
ii)	Samaveda	ii) Gandharvaveda
iii)	Yajurveda	iii) Dhanurveda
iv)	Atharvaveda	iv) Sthapatyaveda

Vedas and other Scriptures of Indian Knowledge in gist

The following are the constituents of ancient Indian knowledge system comprising;

4 Vedas – Rig Veda, Yajur Veda, Sama Veda and Atharva Veda,

6 Auxiliaries called Vedangas
- i) Siksha (Emphony or Pronunciation) (Phonetics)
- ii) Vyakarana (Grammar)
- iii) Chandas (Meter – Metrics)
- iv) Nirukta (Etymology)
- v) Jyotisha (Astronomy)
- vi) Kalpa (Procedures) (Ritual)

4 Subjects:
- i) Memoriser (Interpretation of Vedic texts)
- ii) Nyaya (Logic)
- iii) Puranas (Mythology)
- iv) Dharma (Codes of conduct)

4 Appendices (Upangas)
- i) Ayurveda (The science of healing, life and medical treatment)
- ii) Arthasastra (Science of Wealth)
- iii) Gandharva veda (Science of fine arts)
- iv) Dhanur Veda (Science of Weapons of warfare.)

18 Puranas which should be treated as repositories of oral history. In Brahadarnyaka Upnishad they are treated as 5th Veda. Vyasa categorised them as i) Satvika Purana ii) Rajasika purana, iii) Tamasika Purana. Among them the Skanda Purana is considered longest, with more than 80,000 shlokas (verses). And finally 112 Upanishads.

Vedangas: - limbs of Vedas or subsidiary sciences are necessary for proper understanding. There were six Vedangas – Kalpa- performance of sacrifice, Siksha – correct pronunciation or phonetics, Chandas – Prosody, Nirukta- etymology the interpretation of obscure words, Vyakarana – Grammar and Jyotisha – Astronomy or the Science of calendar. All Indian languages, from the Vedic period to modern vernacular contain a series of sounds or retroflex or cerebral consonants, which cannot be traced in any other Indo- European tongues not even in Old Iranian, which is closely akin to Sanskrit. The horse, cow, sheep had the currency value and therefore held sacred at that time and were given economic importance [4]. The times, therefore, followed pastoral and agricultural economy and cattle played a predominant part. The cattle as mentioned earlier, in fact had a sort of currency values.

Five Basic Elements (Pancha Mahabhutas)

Another notable thesis on Indian knowledge is the embodiment of 'Pancha Mahabhutas' – the Five Basic Elements. Interestingly, Ranganathan also ascribed the number 'FIVE' in his Five Laws of Library Science and the Five Fundamental Categories (PMEST) which seems to be a corollary to Five Basic Elements often considered as basis for all cosmic creation, the sources of fundamental knowledge. They are also termed as the basic elements that make up any living organisms on Earth or anywhere in the Universe (Wikipedia). The beginning of universe is attributed to the infinitesimal matter 'Kana' (the Atom) and to the 'Suksmajiva (the Microbe). The Table below shows these five elements and how they are related to the human body, the characteristic principles and the sensory organs. The Ranganathan Postulate of Five Fundamental Categories can be correlated to each of these five basic elements as shown in the last column of the Table added by the Authors of this paper.

Bhuta (Element)	**English equivalent Component**	**Associated Finger**	**Associated consort**	**Characteristic principle**	**Sense Organs**	**Five Fundamental categories**
Akasha	Aether	Thumb	Prithvi	Sound	Ears	P
Vayu	Air	Index Finger	Bharati	Touch	Skin	T
Agni	Fire	Middle finger	Svaha	Sight	Eyes	E
Apas	Water	Ring finger	Varuni	Taste	Tongue	S
Prithvi	Earth	Little finger	Akasha	Smell	Nose	S & M

Interestingly, another theory shows a similitude between the five fundamental elements and '"Shiva Tandav" (A dance form of Lord Shiva). It is said that the *'Tandav'* represents *'shrishti* (creation) *sthiti* (condition, existence) and *'laya'* (destruction, universal dissolution). By performing the Tandava Lord Shiva will complete the five elements of nature "*'shrishti* (creation) *sthiti* (condition, existence) and *'laya or samhara'* (destruction, universal dissolution), 'tirobhava (last days of one's life) anugraha/moksha (grace, liberation, salvation). Further, the creation refers to Earth, growth of organisms by Water, destruction by Agni, life will be moved by Vayu (Air) and then settle or grace in Anugraha/Akasha (Aether) [5]. In fact, Lord Shiva is known as bundle or treasure of knowledge of all kinds, as he is designated so as "Parameshwar".

Concept of Space and Time

Indian knowledge system has covered many disciplines; Astronomy, Medicine, Language and Literature, Mathematics, Political Science and Economics . In this context again the contributions of Kautilya, Charaka, Panini, Aryabhata, Lilavati can be examples. It requires a detailed extensive study to discuss and deliberate on their contributions and also to exemplify their role in the present knowledge organisation systems. Hence, only two concepts – Space and Time are considered for further elaboration. It is well known that 'Space and Time' have been integral components of every classification systems, even before Dewey's Decimal Classification system emerged. In consideration of their integral inclusion, the paper highlights the Indic knowledge syllogism related to Space and Time.

Both space and time tend to co-exist, and often quoted in mutual. There are arguments, such as whether the beginning of universe had in time or the universe was in existence before time. The latter is termed as empty time. The space in its earliest summation was rather deceptive to modern thinking as compared to its ancient, logical and ontological perception [6]. Such idea of space has unlimited expansion and it could be infinite space when space is not limited by matter (Bramhanda). But the limitations with matter bring it to the finite space like earth and other planetary bodies.

The cognition of space has been different in different periods of human civilization. Its demarcation derived and also varied from time to time with different area comprehension and one such geographical phenomenon is the "Continental Drift" which has been altering and distancing the space from one another. Aristotle contends that time is "continuous quantity" and as quantity it is measurable, as past present and future. Another attribute inherent in the above statement is continuity which implies its divisible nature. Similarly, other quantities of time are also subjected to division.

The modern concept of space has come to be understood since 1600 A.D. John Locke has dealt space as matter, and thus earth aspect as matter in the broad meaning brought it closely in relation with space. Kant also brought into light earth space relation. Thus, space comprises all descriptive elements which relatively coexist since ancient to modern times

The space and time in Indology are considered as eternal or ancient concepts. Space refers to the tangible cosmology and the time as intangible. The most general aspect of space emerges from the earliest concept of "cosmological world". The philosophical content of the 'Cosmology' has been both space and time – that includes finite and infinite (limitless) world. The finite quantity might be related to the earth and the limitless to the space and beyond earth. So the idea space in Indic knowledge is restricted to Earth or Sun or the planets but beyond those and is termed as "Bramhanda or Universe or Cosmic egg". There are contrasting differences in the knowledge of "Universe" between Indology and the West. Accordingly the 'Indian ideas on the origin and evolution of the universe are rather a matter of religion, than of science [7]. According to Western concept, it is a subject of physics or metaphysics and there are two theses to the fact that "Universe had a beginning, this has contradiction that it had existed forever, the idea complex discussed in Kant's "Critique of Pure Reason" [8] . A vivid picture on the beginning or its pre-existence is narrated and proposes also what is popularly known as "Big Bang Theory". The further discussion on this would need more deliberations, but Indological idea or the knowledge of universe is more ancient than West because the study of Astronomy attributed to "Aryabhata and Brahmagupta" of 5th Century A.D. It is astonishing that their calculations of planetary movements were very accurate measurements without the use of the then non-existing 'Telescope'. In fact, Aryabhata was also a mathematician and an astronomer.

Though the concept of time is universal, its applications and methods (Chronology) vary across different nations. Though India has been following the "European chronology" of twelve months – January to December, but all festivals, rituals and other religious and customs' performances follow the Indian calendar "Chaitra to Phalguna" and observe the "Paksha - Shukla or Krishna", Nakshatra and Tithis which are part of "Panchanga" or Five components of a day – tithi, vara, nakshtra, yoga and karna". Even when most of the Indians know that a day is auspicious for the ceremonies like marriage or birth or the naming of child, they consult a panchanga and denote the Indic chronology and its equivalent of European calendar. Time is also considered as a biological entity, human body's internal clock functions to keep the human response or attitude to expression. The authors have traced two important works in the context of Indian Calendar and Indian Chronology which are designated also as 'Forgotten Books and Indological Truths" [9,10]. However, "there

are several calendars in use in India, although broadly these are either the Solar calendars or the Lunar calendars. With a recorded history of over 5000 years, Indian cultures, religions and philosophies have thrown up an extremely rich collection of time related concepts [11].

A vivid picture of knowledge of time (Kalajnana) is given by Kashyapa, an Astrologist and a Vastu expert. He states the Vedas recognise time from micro-level to macro-level, that comprised of 'anu, paramanu and trasarenu' to Yuga. Accordingly, 3 trasarenu is equal to 1 Truti and One Truti is equated to 1/2000 seconds which might be equal to two milliseconds in the modern computer measurements [12]. In Indian context the Time is reckoned on the basis of movement of Sun and Moon – the Solar and Lunar system of reckoning time. The following table gives the Time frame identified by him, which is a rare source of Indic knowledge of time.

1	15 Days = Paksha (A Fortnight)
2	2 Paksha = 1 Maasa (1 Month)
3	3 Maasa = 1 Ritus (Season)
4	3 Ritus = 1 Ayana (Half-year)
5	2 Ayanas = 1 Samvatsara (1 Year) (1 human Year)
6	360 Human years = 1 Deva Year (Uttarayana (Day) and Dakshinayana (Night)
7	4,32.000 Years = 1 Paada or Charana
8	10 Charan = 1 Mahayuga (So far Four Mahayugas are identified)
9	i) Kaliyuga 1 Charan – 4,32,000 Years. ii) Dvaparayuga 2 Charan – 4,32,000 x 2 =8,64, 000 Years iii) Tretayuga 3 Charan – 4,32,000 x 3 = 12,96,000 Years iv) Krutayuga 4 Charan – 4,32,000 x 4 = 17, 28,000 Years.

In South India a device known as "Galige Battalu" was used to reckon time. It consisted of a Copper Pot with a measure of water filled. A small bowl of standard size with a standard diametric hole at the bottom of the bowl is made to float on the surface of the Copper Pot filled with water. When the bowls is full and submerges is measured as a 'Galige" and recorded along with other components of Panchanga-Vaara, Tithi and Nakshta. The above system of knowledge of time presented in the form of Table is complementary to the versions given by [4]. He states, no uniform system of eras were in existence in India, such as Christian era. Many of them are named after the ruling kings of time. The following two are the most common eras now in India. They are;

i) The Vikrama Era (58 B.C.) Founded by a King named Vikramaditya.
ii) Saka Era (A.D. 78) (also known as Shalivahan Saka) was according to tradition founded by a Saka King who occupied Ujjaini- It is reckoned 137 years after Vikrmaditya
iii) Era of Kaliyuga (3102 B.C.) - Marks the beginning of Kaliyuga and is used for the religious purposes and none for political or administrative purpose.

A system of computation and conversion of these eras to Christian era is given to know the dates according to Christian era, which has become a universal system of chronology. But for the religious purposes the ancient Indian eras are reckoned to fix the muhurta or auspicious day for the performances.

The above descriptive account in brief is syllogism of Indian knowledge system pertaining to space and time, but it is not the ultimate. There might be other theoretical accounts on space and time which need to be explored.

Conclusion

The term syllogism implies 'deductive reasoning' and applying this concept an attempt is made in this paper to highlight some of the aspects of Indian knowledge. It is very difficult to perceive a deterministic approach to caricature Indic knowledge. By research and pursuance and referring to different sources we have tried to synchronise and synthesise an idea complex. However, the Vedas have been considered as bases for all Indian knowledge, but because of some biases there are some contradictions to consider them as only chief sources of knowledge. The space-time knowledge as knowledge concept has demonstrated the variations in this context, so the paper has tried to overcome some of the inducements.

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