Digital Accessibility and Information Mining of Dharmaśāstric Knowledge Traditions

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Abstract

The heritage of Dharmaśāstra (DS) carries extensive cultural history and encapsulates the treatises of Ancient Indian Social Institutions (SI). DS is reckoned as an epitome of the primitive Indian knowledge tradition as it incorporates a variety of genres for sciences and arts such as family law and legislation, civilization, ritualistic procedures, environment, economics, commerce and finance studies, management, mathematical and medical sciences etc. SI represents a distinct tradition of civilization formation, society development and community living. The texts of the DS are primarily written in the Sanskrit language and due to its expansive subject stream, it is later translated into various other languages globally. With the ingress of internet, development of advanced digital technologies and IT boom, information is accessed and exchanged via digital platforms. DS texts are studied not only by Sanskrit scholars but also referred by historians, sociologists, political scientists, economists, law enthusiasts and linguists worldwide. Despite its eminence, there is a major setback in digitizing and online information mining for DS texts. The major objective of the paper is to digitize and develop an instant referencing system to amplify the digital accessibility of DS texts. This will act as an effective and immediate learning tool for researchers who are keen on intensive studying of DS concepts.

Keywords: Information Extraction (IE), Online Indexing, Information Technology (IT), Heritage Computing, Cultural Tradition, Dharmaśāstra (DS), Manusmṛti (MS), Social Institutions (SI)

1. Background and Introduction

Ancient Bharata, a pseudonym for India, was a storehouse of indigenous knowledge tradition of various sciences and technology. The opulent knowledge system was documented in the Sanskrit language in the form of compendiums known as *śāstras*. Sanskrit is the classical language of Bharata. It is a language of learned treatises and an exquisite amalgamation of both arts and sciences. Indeed, Sanskrit as a language or a subject field is primitive in nature but scholars from all around the globe reckon Sanskrit as a lingua franca. As a language, it is used in an extremely limited and very specific context, yet, the socio-cultural value of the language retains its significance in the modern Indian milieu. Since the beginning, Bharata has achieved advancement in every aspect of intellectual traditions. The knowledge traditions of ancient Bharat have been cumulative and continuously expanding. It is intensively cohesive of many different fields of studies in ancient Indian texts ranging from the *Vedas*, *Brāhmaṇa*, *Upaniṣada*, *Dharmaśāstra* (DS), the six-fold Indian Philosophical tradition and so forth. Biswas and Banerjee (2016) highlighted the significance of Sanskrit texts such as *Caraka* and *Suśruta's* compendiums on medicine, *Āryabhaṭṭa's* work on mathematics, *Bhāskara's* astronomy, *Kauṭilya's* politics and administration and *Pāṇinī's* grammar by depicting the advanced scientific perspectives dexterously elucidated in them. They proclaimed these primitive texts as landmarks for the modern development of science and logic.

DS is a genre of Sanskrit compendium exclusively privé to dharma and an idiosyncratic writing style of Sanskrit texts depicting the Indian knowledge tradition. The term DS is composed using two words "*dharma*" and "*śāstra*". The word *dharma* originated from the "*dhṛ*" verb root in Sanskrit, which means to uphold, support or sustain, or to nourish, whereas, the word "*Sāstra*" derives from the root "*śas anuśiṣṭau*" with "*ṣṭrana*" suffix added to it. It literally means "which has been instructed and rescripted". It is one of the genres of Sanskrit texts devoted entirely to the ancient Indian tradition of social management through prescribed duties for every individual (Banerjee, 1999). It represents dharma as a right way of living (Dubey, 2012). They are part of Vedic literature. Vedas are considered to be the ancient text and the most credible source of DS. The four Vedas namely; *ṛgveda*, *Yajurveda*, *Sāmaveda*, and *Atharvaveda*, are considered the root of our ancient Indian religious and cultural prescriptions. In India, there is an exciting blend of scientific perspectives, artistic traditions, and philosophical perceptions. There is a multiplicity of ideas, manifold thoughts, disparate languages, substantial cultural heritage, exceedingly rich literature, sociological milieu, economic and political conditions, internal and external Epistemology (Phillips, 2014). Sociologist Bogardus (1924) defines Social Institutions (SI) as a structure of society that is organized to meet the needs of people through well-established procedures. It ensures the smooth functioning of the social structure, provides an established mechanism for positive growth and foundation for an organized society. SI organizes, directs and executes the multifarious activities required to fulfill the basic human needs which are essential for the proper working of society. India has been paramount in the field of primitive arts, ancient traditions, prescribed rituals and primordial scientific technologies. The DS texts are the oldest sources of the social phenomena, political scenarios, economic conditions, ethical norms and religious living of the primitive Indian society. The following section will briefly introduce various knowledge traditions and scientific perspectives conglomerated as Sanskrit literary heritage. These dimensions are as follows:

2. Research Problem and Objective

DS texts have been studied and continuously iterated by scholars globally. The traditional concepts and literary heritage of DS have often seen a literary revival and now the world is striving forward in the direction of exploring scientific nuances and technological perspectives in the primitive DS. The major key texts of DS encapsulate a wide

range of subjects. To intensify our knowledge of traditions, culture, history and heritage, as well as to rehabilitate the prior wisdom on ancient scientific aspects, DS texts need to be read and studied thoroughly by the sanskritists, sociologists, experts of management sciences, political scientists, economists, legal experts, *āyurveda ācāryas* and various science experts. The opulent knowledge base in Sanskrit has been a source of attraction for both Indians as well as western intellectuals. In recent years, there has been a tremendous body of work which is being conducted on various scientific fields in lieu of DS such as computational linguistics (CL) and spatial data mining, medical sciences, military and mathematical sciences, environmental sciences, management studies, economics and commerce, legal prescriptions etc. The philosophical influence of Sanskrit is evidently visible in the field of psychological studies health and physiological sciences. The ancient asceticism and healing traditions of Sanskrit scriptures have found their way into modern health and clinical sciences. This paper focuses on the various different dimensions and scientific perspectives from Sanskrit literature, specifically DS. It further elucidates the impact of Sanskrit studies on the global platform in the field of world science.

Therefore, the accessibility of Sanskrit resources is of utmost importance in India and also in the world for the extensive knowledge discourse of Sanskrit. In the contemporary era of globalization, with the worldwide influx of internet and digital innovations, the entire universe has witnessed a major IT-boom. The entire world is connected by a click of a button, people of one city are associated with the citizens of another continent, every individual today, is a world citizen, the world news is generated, accessible and received through web consortiums, traditional classroom teaching methodologies and lecture-based pedagogies have pivoted to digital learning and electronic tools, primitive physical athenaeums have transformed into digital libraries, yet its cataclysmic that hitherto we do not have any instant information retrieval system or online indexing apparatus based on DS texts, where desired information appertained to this specific knowledge field can be attained. In today's era of IT and Globalization, when there is a continuous surge in demand for educational materials to be made available online the availability of Sanskrit texts in the form of e-content is extremely scarce. The major objective of the system is to develop a Web-based Search Mechanism and an IE Mechanism for DS texts.

3. Dharmaśāstric Knowledge Tradition

In this section, the focus is devoted on the brief discussion on all the major fields of DS knowledge tradition. DS are the prominent sources of dharma. Dharma is the most fundamental tool in shaping various streams of Indian Knowledge System. It is essential for better understanding of Indian spirituality and scriptures as well as the most important uniting force of ancient Bharata. India developed its own distinct systems of ethics and values. The exercise of reasoning and the practice of argument was recorded in the early texts of India. It became the basis of a very well-known tradition of *śāstrārtha;* an open enquiry and debate to investigate the truth. This tradition in DS was connected with the subject of ontology, epistemology and dialectics.

The classical systems of Indian philosophy such as; *vedāṃtā, nyāya* and *sāṃkhya* in continuation with *mīmāṃsā, vaiśeṣika* and Yoga, including Buddhism, Jainism and atheistic schools, is the major constituent of DS knowledge tradition. Other knowledge traditions such as, arts and aesthetics, theory of emotion, drama, poetry, music, folk culture, paintings, language, grammar and literature are the primitive knowledge traditions propounded in the DS. Though the elementary focus of DS is on traditional contents yet it is considered constructive in the following areas of discussion.

3.1 Society Management through Varṇāśrama System

Varṇa is considered as the classifications of the major responsibilities held by the individuals of the society in Ancient India. It basically manages the society through appropriate distributions of the duties to everyone ensuring their rights and safeguarding the interests of every individual in the society (Chaubey, 2005). In ancient Indian civilization, to make human life civilized, cultured and well-planned, *varṇaāśrama* system was introduced. The society was divided into four major *varṇas*: *brāhmaṇa, kṣatriya, vaiśya* and *śūdra* on the basis of the citizens bearing the corresponding social responsibilities. *Āśrama* is an important institution of Hindu social organization which is intimately associated with *varṇa*. The life of every human being is believed to be of training and self-governance. During this phase of training, humans supposedly pass through four stages. Just like the ancient Indian society was distributed into four *varṇas*. Similarly, an individual's life was divided in four stages known as *āśrama* system. According to the DS, an ideal life span of a human is a minimum of a 100 years. This period of 100 years is divided in equal parts of four. These were given the name of *āśrama*. It includes *brahmacaryā* (training and education period), *gṛhastha* (household), *vānaprastha* (retirement) and *saṃnyāsa* (life of renunciation). The concept of *āśrama* system in accordance with dharma is also very popular in ancient scriptures (Jayapalan, 2001). According to the AS, the strict observance of the duties of the four *varṇa* and *āśrama* system 'leads us to heaven' and bestows eternal bliss (Chander, 2015). The principle of *puruśārtha* is introduced to fulfil the human needs through dharma in ancient Indian society. The psychological-moral basis of the *āśramas* system is *puruṣārthas* namely the dharma-artha-*kāma-mokṣa* which helps in organizing and operating the individual's life through *āśramas*. *Āśramas* are considered to have a close relationship with *puruṣārthas*. The various efforts that a human undertakes to achieve his desires, is known as a *puruśārtha*. It makes a person aware of his ultimate goals and inspires him to perform their fundamental duties. Thus, *āśramas* and *puruṣārthas* are intimately associated with each other.

3.2 Society Management through Politics and Ruling

The concept of good governance in the ancient Hindu system is based on brahmanical notion of '*yogakṣema*' which means the wellbeing of people. The administrative system of ancient India can be traced back to Hindu jurisprudence texts, which describes the characteristics of a global society and the legal system. Distinct concepts and system of polity and governance developed in India over time and democratic mechanisms were put in place to

restrict or channel the ruler's powers. In all the scriptures like *Manusmṛti* (MS), *Yājñavalkya* and *Arthaśāstra* (AS), *rājadharma* has been a very crucial topic. Major topics which come under *rājadharma* are the concept of state and nation, concept of religion, art of governance, duties of ruler, democracy or public happiness (Nath, 2019), social philosophy of fundamental rights, art and science of governance, electoral reforms, national unity, religious minorities and secularism, *yogakṣema* and *paṃcāyatī rāja* etc. These topics are all included in *smṛtis* (Sankhder, 2003). AS, deals extensively with law and order, political and bureaucratic accountability, elaborate legal framework, human resource management and prevention of corruption. Traditional Indian culture and administration have laid emphasis on peaceful and harmonious social order, delivery of justice, checking corruption, citizen participation, maintaining a balanced environment and collective welfare. Similar issues are described in MS, *Yājñavalkyasmṛti*, *Atrismṛti* etc. MS and AS are two prime examples of the DS which deals with state policy and theory of punishment, so that the society does not deviate from the dharma.

3.3 Management and Economics

For every society, the vital task is to arrange and maintain the provision of food, clothing, and shelter for its members. Business management, finance psychology, accounting all are imperative for a country's economic condition. *Kauṭilya* in his prestigious text AS highlighted the relevance of economics and management science for the contemporary society. Its main subjects are economy, state, science of business management, financial management during Maurya period, education and training for effective governance, marketing strategy, management of political economy for contemporary society as described by Manu and *Kauṭilya* etc (Chamola, 2007). It deals with diverse economic affairs such as commerce, accounts and coinage (Irani and Silver 1995). Saputra and Anggiriawan (2021) explores the concepts of Accounting, Auditing and Corruption from *Kauṭilya's* point of view and also suggests ways to prevent corporate corruption and tax evasion as per the guidelines of AS. Donald (2017) imparted knowledge on business ethics, capitalism, livelihood, government, means of existence, trade and merchant world, production, commerce, ancient Indian economy and commercial exchanges on the basis of scriptures like *Mahābhārata*, MS, *Nāradasmṛti*, AS etc. therefore, to understand the proper way of conducting trade and commerce, the study of ancient scriptures is necessary for students engaged in the field of commerce, business studies, financial management, economics etc.

3.4 Cleanliness and Environmental Awareness

The social scientists of the ancient period were fully aware of the importance of environment. Cleanliness, sanitation, purification of mind, body, soul and the various social rules and methodologies related to it are discussed in DS key texts. Cleanliness of the surroundings and the hygiene of the body has always been the priority. Protection of natural resources such as water, land, forests as well as, the preservation of water sources such as rivers, lakes, ponds etc. has been of major concern in the DS texts. Throwing of waste and filth in these natural water resources were declared as punishable offenses. This indicates that the primitive sages were extremely aware of the necessity of various natural resource and cautious of the complications of the scarcity of the water. The DSs always deliberated on the issues such as how much water to be used for various essential needs like bathing, cleaning utensils and clothes, drinking and various other purposes such as sweeping the floors, in agriculture, gardening etc., how to keep our water sources pristine, which type of water is fit and suitable for consumption. Similarly, the concept of sanitation and method of defecation is widely propagated in DS. It throws light on subjects like the importance of yoga and exercises, the benefits of a nutritious, healthy and balanced diet, the direction in which the defecation spot must be constructed. MS promotes sustainable community living and harmony with the environment and ecology (Bobade, 2019). DSs presented a unique perception on viable environmental perspectives. It explores new approaches and dimensions to enhance the knowledge on ancient aspects of environmental science, natural healing techniques, conservation, climatology, preservation measures of natural resources.

3.5 Health Care and Management

Ancient India is considered to be the emanation of many advanced sciences. All the ancient civilizations of the world have developed their own specific medicinal systems, but the ancient Indian system of medicine is considered to be the most systematic and the most holistic system, both in its ideas and remedial measures. Apart from the sacraments, the management of human health has also been done under the *āśrama* system in MS. In old age, it is natural for the physical and mental health of man to deteriorate. Texts like *yogadarśana*, *upaniṣada*, *āyurveda* etc., disperses the importance of yoga and yoga asanas for elderly people. *Acārya* Manu manages the human health in two ways; first is by the division of *saṃskāras* and the second is through *āśrama* system. *Saṃskāras* are a central concept in the field of social science. They play an important role in the society. DS elucidates *saṃskāras* as the basis for a man to live a better life. *Saṃskāras* are a religious medium which sanctify the body, mind and intellect. DS corroborated the *saṃskāras* as a foundation for neonatal health, child's immunity development and elementary nutrition. The Indian health system emphasizes on lifestyle changes, purification treatments, spiritual and mental health, positive attitude, season specific diet, exercise and yoga for healthy living (Tiwari and Pandey, 2013).

4. Data Mining and Indian Dharmaśāstric Knowledge Traditions

Information or data mining is a process used to search and extract desired information from big data. It can be implied by analyzing data patterns or using a set of rules of data using one or more software. It involves efficacious data collection and specific patterns or conceptual tagging. Information Mining is also known as Information Extraction or Data mining process. It is the process of searching large-scale documents or unstructured text to mine relevant information, ideas and content. Sanskrit has the biggest literary tradition. Many texts are also available on the web. So mining the specific information from these texts are very essential. Therefore, an online web-based system is being developed to access the content and extract information from DS texts. The information of various DS

knowledge traditions embedded in MS is to be extracted. The Sanskrit texts are enormously huge and contain opulent information on knowledge traditions. But the access to authentic information from the humongous database is a very challenging task.

Concept mining is the process of searching documents or unstructured text for ideas and topics. Similar to text mining and data mining, concept mining involves creating a mining model and applying artificial intelligence (AI) to it. However, concept mining focuses on finding intent and deep-rooted meaning rather than extracting explicit information. Text mining is the process of extracting important information and knowledge from unstructured text. This was first proposed by Feldman and Dagan (1955). Till date, not much work has been done in this area of information mining and data extraction for Sanskrit literature.

In Bharata, the leading institutes working in the area of computational Sanskrit are School of Sanskrit and Indic Studies, Jawaharlal Nehru University, New Delhi[1], The Department of Sanskrit Studies, University of Hyderabad[2] and Department of Sanskrit, University of Delhi[3]. They have been carried R&D in the field of information mining and searching for Sanskrit such as online indexing and instant search or immediate referencing system for AS[4], *Amarakośa*[5] (Khandoliyan 2012), *Mahābhārata*[6] (Mani 2010), *Nirukta, Vedāṃta*[7], *Maṃkhakośa*[8], *Śrīmadbhagavadgītā*[9], *Āyurveda*[10], *Medinīkośa*[11] and *Bṛhadāraṇyakopaniṣad*[12], manuscripts catalogue[13]. Sinha and Jha (2020) have presented exemplary work in the field of text summarization for Sanskrit.

The Online Multilingual *Amarakośa* system is based on the archaic text *Amarakośa*, the Sanskrit thesaurus ascribed to *Amarasiṃha*. It is developed using RDBMS techniques. The system facilitates storing up to 50 synonyms with category, gender, number information and detailed glosses, with cross-referencing among synonyms, search capability in the supported Indian languages and ontology display. Any word found in the text of *Amarakośa* can be searched online[14] using this system (Khandoliyan 2012). Likewise, *purāṇas* are reckoned as eminent texts in the Indian knowledge system. Digitization and online search for *Purāṇa* is a major contribution to the field (Anju and Chandra 2017) of Sanskrit CL. *Sāṃkhya-yoga* technical terms database and online search are also important to work in the field of digitization and search (Anju and Chandra 2018).

Despite the recent development in the field of Sanskrit CL, there is no work in sight where the information can be searched from the DS texts. The only way of accessing and studying the MS as of today is using the print medium. But the MS in the format of hardcopies, pose some gruesome challenges as these books are not very durable and instant search is definitely out of question. To study a particular concept the whole book needs to be read or studied. This is very time consuming and yet not accurate. It might also have typing, printing and editing errors. Apart from these, the print medium has physical inhibitions such as it is not feasible to carry the books around and there is surety of the availability of books at all times. To surpass the aforementioned shortcomings, the digital platform incubated with the technology of online indexing and concept tagging gives rise to the information mining techniques. It helps the researchers to immediate search the particular concept they wish to study. If scholar wishes to pursue a deliberation for the concept of *āśrama* in MS. The single word input will provide a tabular list of outcomes related to *āśramas*. Therefore, the system provides immediate, appropriate and reliable intelligence information to the scholars and enable them to quantify the direction, enhance their assessment of the subject theme and provide objectives for the further research work.

5. Data, Data Collection and Research Methodology

In computational terminology, a database is an organized collection of data stored and accessed electronically. Small databases can be stored on a file system while large databases are hosted on computer clusters or popularly known as cloud storage. Digital Databases are a set of computerized collection used to record and store information digitally and accessible through the computer program for specific purposes. These are comprehensive, sometimes exhaustive, collection of computer files or computer records pertaining to a specific subject. Thus, 2703 verses in 12 chapters of MS were collected and digitized in text file in Devanagari script. MS of *Kauṇḍinnyāyana* (2014) and *Viśuddha Manusmṛti* of Prof. Surendra Kumar (1996) are selected as the primary texts of MS for data Collection. Shivraj Acharya *Kauṇḍinnyāyana* (2014), Pravin Pralayankar (2010) and Surendra Kumar (1996) has been considered for Hindi translations. Likewise, for English translation Buhler (2004) has been considered. The exegesis of all the "*ślokas*" has been done on the basis of *Medhātithi's Manubhāṣya* (Jha 2016) and *Kullukabhaṭṭa's Manavarthamuktāvali (Kauṇḍinnyāyana* 2014). Other eminent key texts in this field are http://sanskrit.jnu.ac.in/omacs/index.jsp MS authored by Rajvir Shastri (2000) and Pt. Rameshwar Bhatt (2015). MS With *Manavarthamuktāvali* composed by Rakesh Shastri (2005) and Conceptualizations in the *Manusmṛti* by Parnasabari Bhattacharya (1996). Data of original *śloka* and translations were preserved in separate text files in the UTF-8 *Devanagari* format. Later the data shall be kept in proper designated database.

The MS instant referencing system is an input-output generating system. It takes input from the user and generates the corresponding output. The researcher can give the input in either roman or Devanagari based upon his or her language convenience. The Quantitative methodology is used for data collection, analysiss and digitization. The objective of quantitative research methodology is to observe, collect and build databases. Information extraction methodology, web technology and web searching methods have been primarily used to data mining. Based on this tagging information those verses are mined where the direct searched word doesn't appear.

Once the input is provided, multiple exiguous programs work simultaneously to give the output such as; the pre-processor runs the initial query at back end syncing it with the digital information indexer. The script validator checks the input language, concept indexer matches the tags of the respective verses with the given input query, meaning generator furnishes the exegesis of the *ślokas*, then the following query is searched one by one from different databases and corresponding result is generated by the output generator. The generated result is formatted according to the users query input and then displayed on the clients end. Thus, this system is a cohesive mechanism working with the help of multifarious digital components. The major components are User Interface, Preprocessor, Information extractor, Information generator, Meaning generator, concept generator, script validator and output generator.

5.1 Digital Platform

The online indexing and concept mining system for MS is a web-based system. A user interface has also been developed for the purpose of searching for the user to interact and submit their query. The system facilitates two kinds of input options and furnishes analysed output in the corresponding format. The first input mechanism is 'Direct Search' where the user can enter any keyword in Devanagarī UTF-8 or in Roman IAST and receive all the references, translations and exegesis from the MS of the input word. The second input option is a 'Dropdown Menu' facility where one can just select the keyword from the list of pre-created concepts of MS and quickly obtain accurate information related to it. Clicking on an indexed word, the system displays the details with the *śloka* in which it occurs. The user interface accepts the input given by the user, pre-processes it and produces the corresponding output on the same page.

Accessibility and Information Mining for MS is a web based online system. A web-based system contains two major parts: Front-End and Back-End. Front-end is developed using HTML (Hyper Text Markup Language) along with CSS (Cascading Style Sheets) and JS (Java script). The back-end contains programming language, databases and servers. For this, the programming language Python is used, data is stored in Text files and Flask is used as server which is supported by Python.

6. Features of the System for MS

The web-based system is designed in such a manner that it has an interactive data search, which gives the system a very user-friendly and easy-to-navigate approach. The system can mine the information from MS in Multiscript (Devanagari and Roman). It also provides the options of

keyword searching, concept or Phrase searching for the feasibility of the user through a dropdown menu. The system exhibits output in the searched scripts and translations in English and Hindi also be produced. It is web-based, hence widely accessible. The system produces information in two ways, one is instant indexing and the second is concept mining. In some cases, instant indexing does not produce complete information. It is unable to generate those *ślokas* where the searched word isn't visible directly in the verse. In this case, concept mining works.

Conceptual searching is a special feature of this system. Therefore, Information retrieval is quick and error-free. The feature of referencing index is very useful as it provides the researcher with accurate reference numbers of all the *ślokas* of MS. Downloading option of the results as a text file/ pdf is also available.

7. Result and Discussions

The system is developed by the Computational linguistics R&D, department of the Sanskrit University of Delhi. It is designed in such a way that it is able to produce output analogous to the user's query. As previously discussed, since, the system accepts input in the two major scripts namely; Devanagari and roman (IAST), the result is also generated in the corresponding script. The multitude of DS concepts, disparate *ślokas*, or words in MS can be easily searched using information mining, online indexing and tagging techniques. Thus, the system dispenses keyword, concept and phrasal searching using the online indexing modules. The result engendered by the system includes complete information regarding the searched query. It includes the *mūla* (original) *ślokas* along with its complete accurate reference. The referencing index exhibits the serial number of the chapter, followed by the verse number of that particular *śloka*. Each *śloka* is hyperlinked to determine the word meanings and complete exegesis. On projecting the cursor over the *śloka*, a bilingual explanation of that verse appears. By clicking on the particular *śloka*, the interpretation of that verse will be automatically obtained in Hindi and in English. Getting complete information of any concept with original *ślokas*, its bilingual translations and interpretation prove the utility of the developed system.

8. Conclusion and Future Directions of Research

Although this system is currently under development, the prototype of this system has been developed and is under the testing phase. This system will make a significant impact on Sanskrit studies and DS on the global platform in the field of science and technology. Digitization of MS and making its availability online can play a very important role to protect and access the knowledge tradition as described in DS texts. The extent of global access to these texts can be increased and the critically correct knowledge of the subject be made available to everyone. In the future, it is planned to digitize the other major texts of DS like *Nāradasmṛti Yājñavalkya Smṛti Arthaśāstra* etc. And all the concepts mentioned in these *smṛti* can be searched online using this system. The input-output methods of this system can also be made multilingual such as; Punjabi,

Sanskrit, Bangla, Telugu, Tamil, Kannada etc. It is further planned to tag scientific concepts namely; environment, military, third gender, management, medical sciences, commerce, economics etc. as propounded in MS. It will prove to be very useful for teachers, students and especially for researchers in the field of Sanskrit and e-learning, as at present, there are no efficient online tools developed to access Indian knowledge tradition.

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