

A Case for Sanskrit as Computer Programming Language

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Abstract

This paper briefly enlists the features of Sanskrit language and suggests the use of the same for Natural Language Processing studies and applications. The potential predicted has to be verified by computer experts. Certain advantages of Sanskrit mentioned may find use in some of the frontier areas of Computer Engineering Research, notably in AI and Knowledge-based systems.

The view-point expressed here is that a Sanskrit-based Compiler or interpreter may have to be developed to unearth the hidden treasures in Sanskrit technical literature. Other countries in the West also, of late, have undertaken similar studies and it would only be appropriate if Sanskrit gets the type of recognition that it so richly deserves in its own land even in areas of advanced technological research, for which it is undoubtedly suited intrinsically.

Hardware and Software aspects involved in translating the suggestions contained here is for the Computer experts to consider while the Author would remain at the disposal of such interested researchers/organisations for further inputs and/or discussions/clarifications etc.

I. Introduction

Transaction Processing involves Receipt, Storage, Manipulation/Processing, Transfer and Retrieval of Information. Electronic Data Processing has a wide range of applications these days owing to the enormous strides the field has taken in recent years, both in terms of hardware & software developed and available to common man. Speed, flexibility, computing power, peripherals and interfaces have virtually extended the scope of computers to almost every facet of human endeavour.

Routine (mechanical) processing functions have given way to intelligent processing systems and high level languages are nearing natural language-like structure ceaselessly. Object-oriented programming languages are turning even symbolic programming languages obsolete. Programs tend towards expert systems. Such is the galloping progress of Computer Engineering (hardware & software) that, it is the time to think of an almost as-old-as-the-world language of the Orient, namely, Sanskrit, in all its majestic glory, to be considered as a candidate for computer programming, in the fields of Natural Language Processing & Artificial Intelligence.

Be it knowledge representation or speech synthesis, natural language processing or machine translation, intelligent tutoring systems or unambiguous semantic extraction, study of complex mathematical problems or linguistics, in virtually any field, one can think of utilising the richness, strength, accuracy, efficiency, structure, flexibility and the extant works available in the Sanskrit language.

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One of the prerequisites for such an ideal blend of the oldest and gramatically best structured natural language and the newest of the emerging topics of computer world is an appreciation of the real potential of both sides of the equation. In fact, recent efforts at bringing together Sanskrit and computers show encouraging results. In 1984, Dr. Rick Briggs of USA highly recommended Sanskrit as 'the' candidate for machine translation interlingua. In 1985 & 1986, conferences were held at Bangalore to correlate data on perception, knowledge representation & inference, as found in science and shastras through Sanskrit. Ever since, many institutions at home and abroad, have engaged in research in this area and have brought new ideas to the fore.

In a recent national conference on "Samskritam and Computers" held at New Delhi, the signal was clear that concerted efforts to enlist all interested persons from scholarly and computer backgrounds for a national directory to be prepared to ultimately create computer programming environment using Sanskrit extensively, was very desirable.

In a paper presented at the said conference, the author had dealt with the concept of using Sanskrit as the natural language for AI-related, particularly, knowledge based systems, citing the case of determining sentential import.

A few fundamentals of the suggestion would be described here. The fundamentals dealt are: Definition & characteristics of knowledge, Phonetics, Analysis of parts & forms of speech, Flexibility in word formation, structure of Grammar, Disambiguation rules/procedures/criteria, variety and richness of technical literature and Etymological & exegetical aspects, as found in oriental works.

II. Definition & Characteristics of Knowledge

Knowledge is of two types, i.e. knowledge about self and that about other (non-self) things. The former is termed as "Consciousness" while the latter is a quality of it. Generally, the latter is meant when we talk of knowledge since the former is not a subject of anything other than itself. The Consciousness is sentient, i.e. possesses knowledge, animate, i.e. takes on inanimate bodies, and always aware of itself as one in number and pleasant and favourable to itself. That is to say, for any living being, the self is known automatically always, the Self or life is most desirable and all actions are intended to make the Self happy. This Consciousness is also called variously as Awareness, I-ness, Self, Soul etc.

Knowledge is an attribute of sentient (conscious or living) being. It is a matter existing in the dual forms of particle and waves (like light). It manifests in many forms. Scriptures list many 'states' of knowledge like Cognition, Inference, Happiness, Sorrow, Wish, Love, Hate, Envy, Effort, Determination, Doubt, Mistake, Decision, Religious Belief, Courage, Shame, Intelligence, Fear, Emotion, Avarice, Ignorance, Arrogance, Tranquility, Comprhension, Retentivity, Recollection, Logic, Devotion and Science. Knowledge always goes with its subject, i.e., knowledge of 'what?'. The subject of knowledge may be any object described by a name and form.

'Illumining' with an agent or object is an essential characteristic of knowledge. So also are unsurpassed Speed, Subtlety, Lightness and self-luminence while presenting objects. Knowledge is non-sentient, i.e. it does not possess knowledge. That is to say that knowledge does not know itself. The two concepts of self-illuminating and sentience are to be clearly understood. A lamp is self-illuminating in that it does illuminate itself as well as other objects. But it does not know itself, which is sentience, and hence we say lamp is non-sentient.