

# SANSKRIT LANGUAGE AS IN PROGAMMING (NLP)

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*Abstract— As we know that, Sanskrit is our Vedic first programming language. Which utilize commands in Sanskrit. Sanskrit language is world's oldest language when nobody knows about another language. Sanskrit is also the most suitable language to develop computer programming for latest techniques like Artificial Intelligence program. The grammar of Sanskrit is rule bound, formula bound, logical, which makes it highly appropriate to an algorithm. Sanskrit will be a future computer language. You will be shocked to know that Sanskrit is very interesting natural language. Anyways many languages are interesting in their own way but when we talk about the Sanskrit language they beat differently from programming languages. Sanskrit language is the best language for learning coding. Sanskrit language that could be used for computer programming because of its logical grammar and rich scientific history. One question always surrounds in my mind, "why Sanskrit language for Computer programming?"*

*IndexTerms— Sanskrit Language, Logical grammar, computer programming, natural language processing, A.I, origin of Sanskrit. (Keywords)*

## I.INTRODUCTION

As I spend a lot of time on the internet for searching interesting thing to learn about Sanskrit language use in computer programming language. I too was shocked to know that NASA uses Sanskrit as a program for Artificial intelligence and is a good programming language. There was a paper by Rick Briggs, a NASA researcher published a paper entitled, "Knowledge Representation in Artificial Intelligence." All we know that the humans who spoke the language, wouldn't find it hard to understand what was actually meant, but computers would. Natural language is to work as an Artificial one. To know about natural language, have some characteristics:

1. This language should be break down into a sematic net or an array of sematic data.
2. Natural language is an easily compiled statement from a data array and it will be converted into human readable form and comprehensible.

Sanskrit language has an extremely logical structure. Sanskrit grammar rules allow a kind of exact unmatched by other languages. Future almost depends on Artificial Intelligence and NASA also claims that Sanskrit – the ancient Hindu language- is most suitable language to develop computer programming for their AI program.

**II. HISTORY OF SANSKRIT:** Sanskrit has always been an important language in intellectual communities. It is the primary sacred language of Hinduism, and it has been used as a philosophical language in the religions of Hinduism, Buddhism, and Jainism. It was originating as Vedic Sanskrit as early as 1700-1200 BCE. Vedic Sanskrit is the language of Vedas. It is the most ancient Hindu scripts compiled in 1500-500 BCE. The Vedas contains hymns, incantations called Samhitas, and theological and philosophical guidance for priests of the Vedic religion. Vedic Sanskrit was orally preserved as a part of the Vedic chanting tradition, predating alphabetic writing in India by several centuries.

Around 500 BCE, the ancient scholar Panini Standardized the grammar of Vedic Sanskrit including 3,959 rules of syntax, semantics, and morphology. Panini's Astadhyayi is the most important of the surviving texts of Vyakarana, the linguistics analysis of Sanskrit.

Sanskrit is the vital important to Indian Culture because of its extensive use in religious literature, primarily in Hinduism, and because of its modern Indian languages have been directly derived from, or strongly influenced by Sanskrit. Sanskrit is still the official language of India. In present time, Sanskrit has become a language of worship and rituals instead of the language of speech.

Pali and Prakrit were first to develop from Sanskrit. Pali was taken as means for exposition of Buddhistic idea and Prakrit was used for the spread of Jain doctrines Sanskrit is rich in Vocabulary, phonology, grammar, syntax. It consists of 52 letters in total, 16 vowels and 36 consonants.

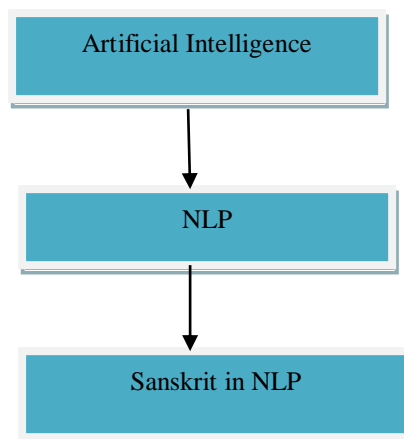
Vedic Sanskrit an ancient Indo-Aryan language doesn't have a direct role in mainstream computer history. However , its influence can be seen in fields like computational linguistics, artificial intelligence and formal languages theory.

1) Influence on Formal Languages and Programming:-

- a) Panini's Grammar (Ashtadhyayi) :- The ancient linguist Panini, who lived around the 5<sup>TH</sup> to 4<sup>TH</sup> century BCE, created a formal system to describe Sanskrit. His grammar , composed of about 4,000 rules, is highly structured and systematic.

- b) Panini's use of meta rules, transformations and recursion resembles the principles used in computer programming languages today. His work influenced modern computational theories, especially informal grammars and machine language.
- 2) Early Computational Linguistic: - The structured nature of Sanskrit makes it easier to create precise, rule based algorithms for Natural language Processing(NLP). Some researchers have explored Sanskrit as a potential language for AI communication because of its clear syntax and lack of ambiguity.
- 3) Notable Connections in Computer Science:-
- Noam Chomsky's Formal Grammar:- The Linguistic Noam Chomsky developed generative grammar in the 20<sup>TH</sup> century , which form the foundation of modern computer science, particularly in compilers and language parsing. His work was partly inspired by Panini's system.
  - IBM Research:- in the mid-20<sup>TH</sup> century , researchers like Leonard, Bloomfield studied. Panini's work, recognizing its relevance to modern computational models.
- 4) Modern Applications and Research:-
- NLP: - Vedic Sanskrit is studied to develop better language models, because of its well defined grammatical rules.
  - AI:- AI researchers have considered Sanskrit logical structure as a basis for machine language designed for reasoning and communication.
  - Digital Preservation:- Efforts are underway to digitize Vedictexts, using OCR(Optical Character recognition) and NLP tools to preserve and analyze ancient manuscript.
- IV. **NLP for Sanskrit Language:-**It is the subfield of AI devoted to make computer understand statements or word written or spoken in human language. The two major parts of natural language processing include natural language understanding at the input side and the natural language generation at the output side. Natural language understanding involves:-
- Mapping the given input in natural language into useful representation.
  - Analyzing different aspects of the language.
- Natural Language Generation Involves:-
- Text Planning: - it includes retrieving relevant content from knowledge base.
  - Sentence Planning: - it includes required word and forming meaningful phrases.

#### Sanskrit for Natural Language Processing:-



In Natural Language Processing, knowledge Representation is the primary step to make machine understandable Natural language. This is possible with semantic Nets.

#### Semantic Nets:-

The main idea behind the semantic Net is, the meaning of a concept comes from the way in which its connected with other concepts. Through semantic Nets concept in AI, if the information are symbolized as a group of nodes connected to each other by a set of labeled arcs which depicts associations or relation among the nodes. The concept of semantic nets is mainly employed to symbolize semantic associations / relation b/w or among the concepts by using undirected or directed graphs.

**As we given an example.****Sita gave a pen to Sriram**

In this sentence, there is only one verb, it considered as primary element and set of triples for that sentence are formed.

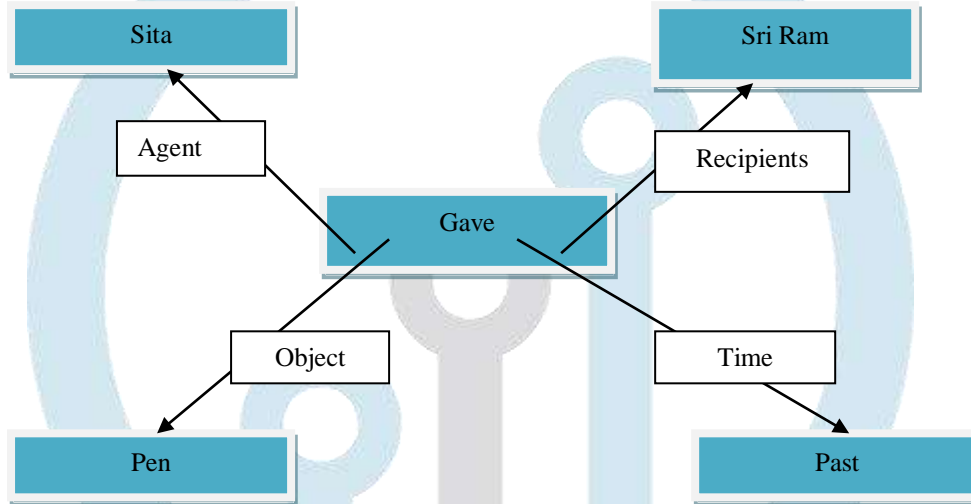
Gave, agent, Sita

Gave, Recipient, Sriram

Gave, Object, Pen

Gave, Time, Post

If in this there more number of verbs, it forming triples and mapping them becomes difficult and complex. This is another problems what English language faces when it is used in knowledge Representation.

**Word structure and Inflection concept:**

When we say about Sanskrit word structure the format as below <prefix><dhatu><suffix> but when use table about English language, if we want to change the meaning of sentence, then we introduce with new words in the sentence unlike English ,most of the sentence in Sanskrit , only require addition of prefix or suffix of a word.

For example :-

- I. "Gachaami" means "Going"
- II. "aagachaami" means "coming back"
- III. "Pathami" means "studying"

**Conclusion:-**

The specific and unambiguous nature and at the same time, the vast literature and vocabulary of the Sanskrit language, it will provide a gateway for implementation of language in that way, in which computer can understand NASA Scientist believe that Sanskrit language empower the AI with more randomness. As, I study Sanskrit language is often called as the language of goods; it finding renewed relevance in AI and Machine learning though this paper, we will understand the importance of language in programming, Sanskrit language itself has strong means of Abstraction – which means that the process of reducing the object to its essence so that only the necessary characteristics are exposed to the user. Sanskrit language is the oldest language because it is very perfect in its structure, morphology, semantics, etc. Which have not changed over thousand years only a good linguist will understand this that a perfect language can't be created by human beings.

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