

# Survey on Natural Language Processing and its Applications

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**Abstract** – Processing Natural Language such as English has always been one of the central research issues of Artificial Intelligence, both because of the key-role language plays in human intelligence & because of the wealth of potential applications. Moreover, Language processing for native languages help to analyse and idealize the programming logic aspects for non-programmers so that it would be easy to achieve machine translation. It also helps to make much easier user interfaces. NLP is used to analyse text, hence allowing machines to understand how humans speak. In this paper, we give an overview of NLP from the scratch. We also briefly discuss some of its major applications.

**Index Terms** – NLP, survey, review processing, analysis

## I. INTRODUCTION

NLP is all about making computers to understand the human language as communicated. Mainly it is an area related to literature and linguistics. Most of the time it has links with language theory, psychology, cognitive science [1]. It is one of the main branches of Artificial Intelligence and computational linguistics. Many branches do exist in NLP such as machine translation where one natural language is been converted to the other, speech recognition, identification of voice signals from the human to machines, text processing and so on [2]. Much research has happening in NLP towards machine translation, transcription and tagging that explores how computers can be used to understand natural language text or speech to do useful things [3].

## II. LITERATURE SURVEY

According to survey in [4], the difficulty in text analytics is unstructured and unsuitable data. There are many grammatical corrections and abnormalities in the existing system. In another survey there was a huge repository of data for processing. They may generate false positive results; accuracy may not be efficient and results into lot of ambiguous data [5].

According to researchers, machine translation has a major challenge towards accurate translation into natural language [6].

## III. APPLICATIONS OF NLP

The applications of NLP can be divided into two categories as follows: Text-based applications: This science deals with data mining, using web crawlers to extract the data from the document and voice to text

converters. Sentiment analysis is also the part of text-based application towards NLP [7].

Dialogue-based applications: This techniques deals about voice communication between human and machines involving chatbots, question-answering sessions, voice assistants such as Alexa, Siri [8].

#### IV. METHODOLOGY

The general methodology of any proposed NLP architecture is as follows in fig 1.

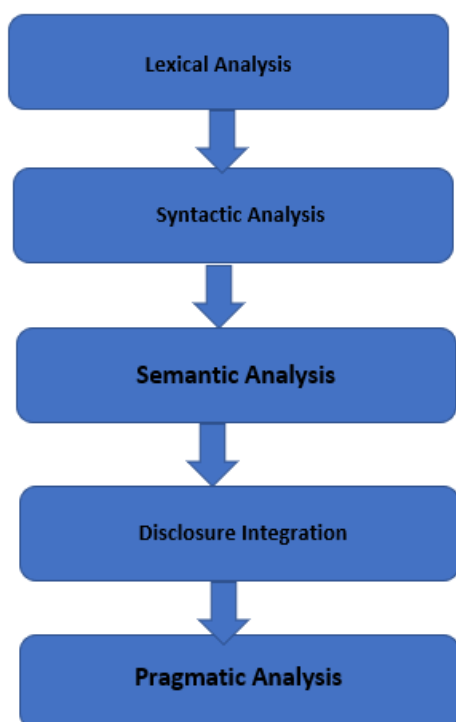


Fig 1: Architecture flow of General NLP process

Steps in NLP There are generally five steps:

a) Lexical analysis: It contains identification and analysis the structure of words. The given sentence is divided into paragraphs, sentences and then words.

b) Syntactic analysis (parsing): This phase involves construction of parsing tree there by realizing the relation between words to generate tree.

c) Semantic analysis: This phase is to understand the proper context of the word that is expressed. Logic reasoning must be quoted while generating the language.

d) Discourse integration: This involves how sentences are connected to each other with the proper sense of previous statements linked to current.

e) Pragmatic analysis: It involves deriving those aspects of language which require real world knowledge. During this, what was said is re-interpreted on what it meant.

NLP's language processing problem can be divided into two chores:

Lexical analysis where written text can be processes and syntactic and semantic analysis is carried out.

Analysing natural language can be done by step-by-step processing like voice receiver, understanding sounds of voice and generating the language.

The main phases of NLP system includes i) user input ii) Natural language Interface iii) Output (language generated by system)

#### V. CONCLUSION

The impact of computer use of Natural Languages will have a profound influence on society as would the multitude of latest technologies in artificial Intelligence added to it. The impact of NLP by machine will be greater than the impact of microprocessor technology in the last 20 years, because Natural Language is fundamental to almost all business, military & social activities. Therefore, the application of NLP has no end.

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