

Literature Review

Research says 60% of visits to a doctors are for simple small-scale diseases, 80% of which can be cured at home using simple home remedies. These diseases mostly include common cold and cough, headache, abdominal pains, etc. They may be caused due to the changes in the weather, intake of improper diet, fatigue, etc. and can be cured without the intervention of a doctor. There are a number of chatbots which provide services for the healthcare domain. But the problem with these chatbots is that they only provide answers for general healthcare FAQs. That is, these systems are unable to provide a natural communication with the user just as a doctor can. Work is being carried out to enable the chatbots to communicate in a way similar to the communication carried out between two humans. That is, the user must experience the feel of communicating to a person and not to a bot. This makes the chatbot a virtual communicating friend of the user. This type of smart communication (usually used in healthcare counselling) can be achieved by inclusion of NLU, NLP and ML techniques in the conventional scripted chatbots. There are a number of domains wherein the smart chatbots provide their functionalities. This paper briefs about the chatbot system for the healthcare domain. Also, it specifies various NLU, NLG and ML techniques to be incorporated in the chatbot and the comparison of the same.

S.N.	Authors	Problem discussed and solved	Method/ Algorithm/ Tools Used	Results
1	Mohammed Javed et al. [1] ,[15]	To implement word segmentation (tokenization)	Calculating all character spaces	It involves mathematical calculations hence proves to be slower than the others.
2	Naeun Lee et al. [2], [17]	To implement word segmentation (tokenization)	Using NLTK package which involves inbuilt tokenizer	Easy to implement, as does not require any coding. Faster and more accurate
3	Tao Jiang et al. [3], [11]	To implement word segmentation (tokenization)	Using Conditional Random Fields	This algorithm proves to be more accurate and less complex than the first but less efficient as compared to NLTK.
4	Jerome R. Bellagarda [4] ,[10]	To implement POS Tagging	Using the latent analogy algorithm	Requires training of large amount of data. Hence involves complexity.
5	Liner Yang et al. [5], [18]	To implement POS Tagging	Using neural network algorithm	As the algorithm works in layers, it provides high accuracy, but is not time efficient.
6	None	To implement POS Tagging	Using NLTK	Provides above average accuracy at minimum complexity.
7	Bo Chen et al. [6], [1]	To create a dependency parser	Using a dependency tree to understand the dependencies.	Traditional method. Accuracy depends on the training of the data.
8	Zhenghua Li et al. [7], [14]	To create a dependency parser	Using a graph data structure for the implementation of the parser	Improvised version of the above- mentioned algorithm. Provides higher visibility, understandability and improves accuracy.
9	LinHua Gao et al. [8],	Synonym detection and	Dictionary method	Traditional method. Requires to maintain a

