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AGROCHATBOT: Understanding the Scope of Agriculture

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Abstract: *A chatbot is a conversational agent that communicates with the clients through dialogues in natural language. This paper discussed the development of chatbot in an intuitive inquiry replying (QA) framework. A discourse exchange interface empowers the chatbot to answer development and explanation questions, on a domain of interest. The universe of farming business is getting progressively serious. We report our experience on the plan, usage and assessment of a chatbot-based discourse interface for Agriculture domain. Bots are inconceivably valuable in information say businesses like agriculture. They can help streamline and mechanize errands that were beforehand just performable by exact checking and antiquated human analysis. The chatbot will talk with the assistance of characteristic language handling and AIML documents. Our aim is to design a chatbot using NLP where we can help to answer the queries of the farmers and the officials of the farming industry. In expansion to that we are also looking into the effects of corona virus on agriculture.*

Keywords: Chatbot, QA, Frameworks, NLP, Agriculture, Corona virus, Farmers.

I. INTRODUCTION

Agriculture is a vital a part of India's economy and at the present it's among the highest two farm producers within the world. The universe of farming business is getting progressively serious. In the present market, delivering an excellent item is just the main portion of the condition. The second is powerful, effective promoting, a now-fundamental segment of the formula for progress for any cultivating business.

A chatbot is a help or instrument that you can speak with by means of instant messages. The chatbot comprehends what you are attempting to state and answers with a rational, applicable message or straightforwardly finishes the ideal errand for you. In spite of the fact that AI and chatbots may sound intimidating, actually bots are an amazingly open type of AI innovation. For occupied ranchers who need to do all that they can to manufacture their business, a chatbot is the perfect arrangement. Developing a Bot that can understand human language is a task. This can be easily done with the help of Natural Language Processing (NLP). NLP [4] could be a technological process that enables computers to derive meaning from user text inputs. The ultimate objective of NLP is to read, decipher, understand, and be of the human languages in an exceedingly manner that's valuable. Most NLP techniques depend on machine learning to derive meaning from human languages. NLP is used to convert unstructured data to the form that computer can understand by applying it to algorithms and extract the language rules from them. The text provided will be used by computer. It will use algorithms to extract meaning related to every sentence and collect the essential data from them.

Syntactic analysis and semantic analysis are the most important techniques accustomed to complete NLP tasks. In NLP, we can find how natural language is aligned with grammar rule. This is called as syntactic analysis. The meaning conveyed in the text is called as Semantics analysis.

II. LITERATURE SURVEY

The concept of chatbot has come under light long ago. An earlier paper [3] defines chatbot as a computer software that conducts a conversation using audio or text method. This can be used to perform n numbers of task such as responding to customers, education, helping them to purchase good according to their need. It allows to provide better customer service. In this paper they are using Artificial Intelligence Mark-up Language and Latent Semantic Analysis with python platform to accomplish this work. Not only this there are many ways to make chatbot like using neural networks [5].

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Chatbot is not in growing in the field of product recommendation but also expanded to the field of medical. The paper [2] has a proposed system that help to get the right medicine and their dosage. This also tells about what is the availability of the medicine away from the hometown. In certain cases, some medicines are not available everywhere. In this case medobot will help to provide information regarding the medicine. This bot converse with the customer using AIML file and natural language processing. Unlike medical field, education field is also important to talk about. Paper [1] talks about the concepts of Computer Science using chatbot. It records the performance of students, their self-interest, participation. They came to certain conclusion regarding that the female participants are more interested than the male participants. The chatbot have conversation in natural language like English and Spanish. They also produce result according to their performance. All these fields are being growing but there is one more field that has to be taken care of is agriculture. This paper comprises of making a chatbot that will help in agriculture field.

III. APPROACHES

We are implementing chatbot using two approach, NLP and Chatterbot. These are two library that helps to create a chatbot. The detailed explanation of how these two-library works is:

A. Natural Language Processing

NLTK is a platform that work with human language data in python. It has an easy interfaces and text processing libraries for stemming, classification, tokenization and many more. Text Pre-Processing is an important part in NLP. Architecture [Figure A] of NLP gives us the detail of the task performed. There are 2 types of analysis done in NLP:

a. Syntactic Analysis

Syntactic analysis tells about the structure of the sentence. This also tells about the grammar of the sentence. By processing the sentence, we find out the subject and predicate and the place where noun, verb and many more. Providing the part of speech to the lexicon, the computer will be able to read the sentence and find out the structural description.

b. Semantic Analysis

This is the study the meaning of the language. When we enter a sentence in certain language it takes of the meaning of that with the help of phonology, syntax and lexicon.

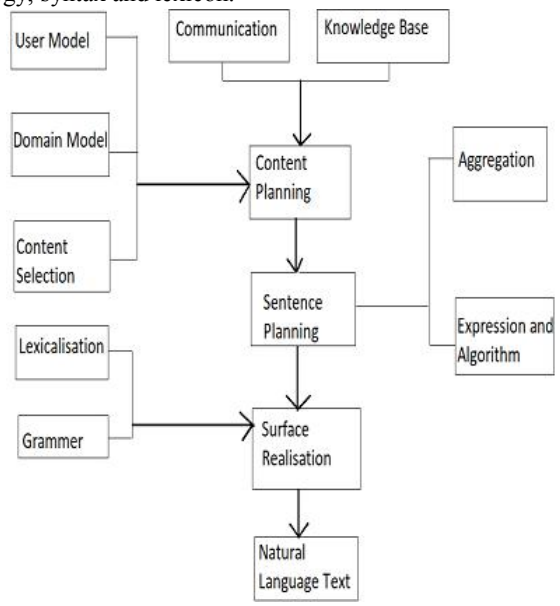

Figure A: NLP Architecture

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B. Chatterbot

Chatterbot is a library that takes input from user and generate automated responses. With the help of various machine learning algorithm, we generate variety of responses. For this logic adapter is used. So, with the help of this developers create user conversation and chat bot. Chatterbot has a unique feature of language independency (Figure B) and it also improves its own knowledge from the possible responses which it gets while interacting with humans. It even has the facility to connect with different databases. It has built in adapter classes that connect with databases. With the help of this module we can enter various language in the dataset.

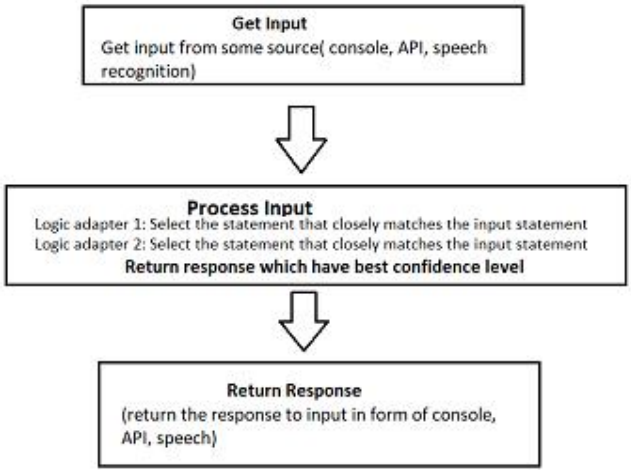

Figure B: Chatterbot Architecture

IV. PROPOSED SYSTEM

We are implementing chatbot using two approach, NLP and Chatterbot. In case of NLP, we are using website link as dataset. So, when the user fires a question then the bot will go to that website search the related information and respond according to that. If there are two response to the given question then it will provide the best related answer. It includes:

1. The first step is to convert all the upper case to lower case
2. Tokenization – With the help of tokenization we convert the string to words so that we can find what are the count of word in string entered.
3. Removing all the unnecessary things that is not letter or a number
4. Remove all the stop words. Some words often repeat that are not much use in the document and is not meaningful.
5. Lemmatization- To covert the word to root(base) word. Example: “running” is converted to “run”.

In Chatterbot module, we are providing question and answer dataset which we have collected. The query entered by the user will be searched and the output will be provided accordingly.

V. ARCHITECTURE

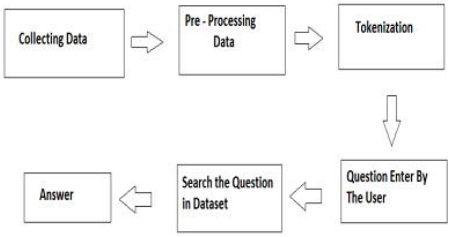

Figure C: Architecture of Implemented Module

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- Collecting data - Collecting lots of data is very important part of chatbot as it trains the bot according to that data. Pre-
- Processing data - When we collect data then there are lot of information that are irrelevant and needs to be cleaned up. Data pre- processing includes removal of stop words, special characters.
- Tokenization - After preprocessing of data we take the important words and creates token for each word. This process is done so that the question asked by the user can be easily be searched. We take out key word from the question and find out that related word in the dataset. From that word we can find out the entire paragraph related to the question.
- Question Enter by the User - We need to find out the keyword in the query entered by the user.
- Search the Question in Dataset - Now from the keyword searched we find the related answer from the dataset.
- Answer - Answer is displayed on the screen. The above steps are repeated until the user use words like "Bye" (Figure C).

VI. Effects of Corona Virus on Agriculture

The Corona virus have adverse effect on the horticulture segment of entire world. This has also affected India very badly. Indian agriculture sector has suffered bad monsoon this year and now it will face another hit due to the virus. Growth of Crops - As Rabi gather season draws near, ranchers stress over their standing yields. Ranchers developing wheat, mustard and heartbeats previously whined about their harvests harm because of unfavorable and overwhelming precipitation as of late. This prompted ranchers fixing their yields however in the midst of Corona virus lockdown the vast majority of the workers accessible fled to their homes.

Hamper on Movement of Goods – Corona virus lockdown has affected the store network of horticultural items. By negatively affecting the stacking and emptying of rural produce. Likewise, the lockdown has hampered the development of trucks conveying fundamental wares. A few cold stock piling and stockroom proprietors whined in regards to the deficiency of workers. Reluctance to work dreading police beating, numerous workers are remaining at home or leaving for their old neighborhood.

Selling the grown raw agro-products has become a challenge for the farmers. Price fixing has traditionally been mostly by the middlemen who are trying to take advantage of the situation. Due to hampered transportation goods are left to decay at some remote locations. Even when government has come up with dynamic schemes to help the farmers its reachability is a question. We propose to extend our chat botbased knowledge dissemination system to answer queries related to farmer complaints. At the background our bot is also searching for suitable government authorities or sales platforms to divert the dialogues once the farmer clarifies his troubles. The whole knowledge dissemination system could also perform additional data analysis based on the accumulated information to the help the government look into the severity and scale of the problem.

VII. Result

We ran two module and we got the results as follow:

A. Chatterbot

Data Input: - Listed below is some sample question and answer (Figure D) pattern used for this module.

'What is Digital Farming', 'What is smart agriculture', 'How good compost is prepared', 'Are organic yields lower'.

Figure D: Output from Chatterbot

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B. Natural Language Processing

Agriculture in India (Dataset): - We have set of questions asked in the chatbot – 'Irrigation in India', 'Sugar Industry', 'Productivity', 'Marketing in India', 'Dairy Industry'. Answer (Figure E) to these questions are produced as output of chatbot.

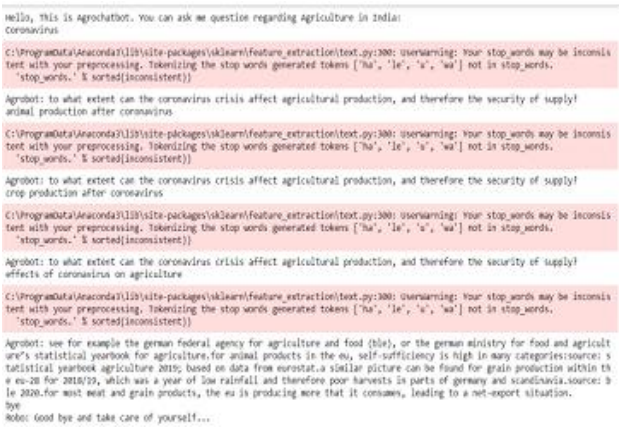
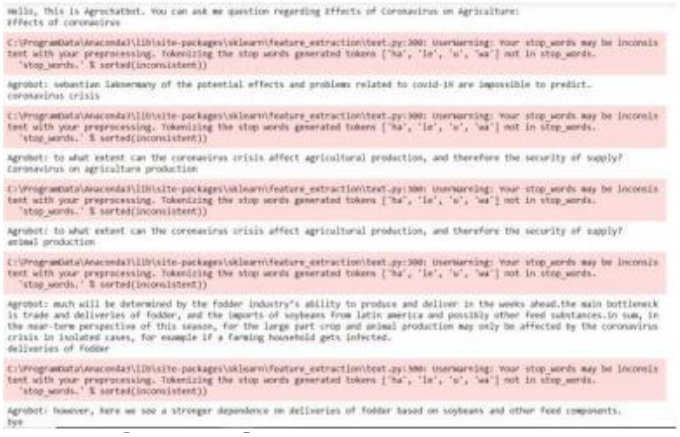


Figure E: Output from NLP

Coronavirus (Dataset): - Sample questions for coronavirus dataset are – 'Coronavirus crisis', 'animal production', 'deliveries of fodder'(Figure F).



VIII. Conclusion

This paper comprises of chatbot created using two different modules. This research suggests that for chatbot NLP is better module as compared to chatterbot as it contains more features. Agriculture chatbot have lots of importance when it comes to industrial purpose. This will help to find out the queries of the farmers as it is difficult to reach them. We have also added effects of Coronavirus on agriculture and suggested extensions to chatbot to help farmers and the government. For the future use we can make an android application and install them in various places where we can reach the farmers and take their queries regarding the issues, they the facing.

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