

A
Project Report
On
Chatbot for Customer Support

SUBMITTED BY

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INTRODUCTION

Artificial intelligence, which brings into play machine learning and Natural language Processing (NLP) for building bot or chatbot, is specifically designed to unravel the smooth interaction between humans and computers. Chatbots are everywhere, be it a banking website, pizza store, to e-commerce shopping stores, you will find chatbots left, right, and center. Chatbots provide real-time customer service assistance on a range of pre-defined questions related to the domain it is built on. It adapts natural human language and converses with humans in a human-like manner.

To simplify the chatbot's definition, we can say chatbots are the evolution of Question Answer systems employing natural language processing. As per sources by the year 2024, the global conversation market's size will grow to \$15.7 billion, with 30.2% being the annual growth rate.

It is a program designed to imitate the way humans communicate with each other. It can be done through a chat interface or by voice call. Developers usually design chatbots so that it is difficult to tell for users whether they are communicating with a person or a robot.

Chatbots helps any business/organization in accomplishing the following goals:

- Increases operational efficiency.
- Automating customer request fulfillment.
- Handling basic queries, which in turn free employees to work for complex & higher value inquiries.
- Saves time & effort by automating customer support.
- Improves the response rate as well as customer engagement.
- Personalization of communication

How Does a Chatbot Work?

Chatbots are nothing but software applications that have an application layer, a database, and APIs. To simplify the working of the chatbot, we can say it works on pattern matching to classify text and produce a suitable response for the questions/queries addressed by the user. The chatbot responds to the user as per the program that has been fed in it. Chatbots are of different types, depending on how they are used. Mainly there are three types of chatbots, and they are as follows:

Rule-Based Chatbot: This is the basic chatbot made, the user interacts with this kind of bot by using predefined options. To get answers from these bots, users need to click on certain options. These kinds of bots collect the user's request, analyze it, and then offer results in the form of buttons. These bots are commonly used to replace frequently asked questions when it comes to complex queries; they aren't always the best solution

Independent(Keyword) Chatbots: These are machine learning bots, unlike rule-based chatbots, they analyze what the user wants and respond appropriately. These chatbots use customizable keywords and machine learning to determine how to respond to users' requests effectively and efficiently.

NLP (Contextual) Chatbots: These are so far the most advanced chatbots. They are a combination of best from rule-based and keyword chatbots. These chatbots use NLP to understand the context and intent in users' requests and thus act accordingly. These chatbots can handle multiple requests from the same user at ease.

PROJECT AIM

Create Chatbot that can used to provide customer support. Chatbots boost operational efficiency and bring cost savings to businesses while offering convenience and added services to internal employees and external customers. They allow companies to easily resolve many types of customer queries and issues while reducing the need for human interaction.

PROBLEM STATEMENT AND SOLUTION

Quick issue resolution to simpler queries of customer is needed but without chatbot it will be not possible to resolve customers queries. One customer support person solve only one customers query.

Solution :

Chatbots are conversational robots programmed and designed to instantly answer users' questions.

Save money and time. Chatbots make it possible to automate conversations that used to involve specialists.

chatbot for customer support

1. Always Available
2. Generate Conversations
3. Handle Multiple people
4. Collect and analyse data
5. Personalized chats
6. Automate processes

Technology: Python 3.10

Design Details : Uses of Artificial Intelligence in Chatbots

Making the Rule-based chatbots also called decision-tree bots, or linguistic based bots, use algorithms to understand users' inputs and provide corresponding answers. They can only answer questions and handle tasks which have previously been programmed in the chatbot.

OBJECTIVE

Chatbots are mainly used to provide customer support. Chatbots are very intelligent. You train them once and they will communicate with your target audience in their language.

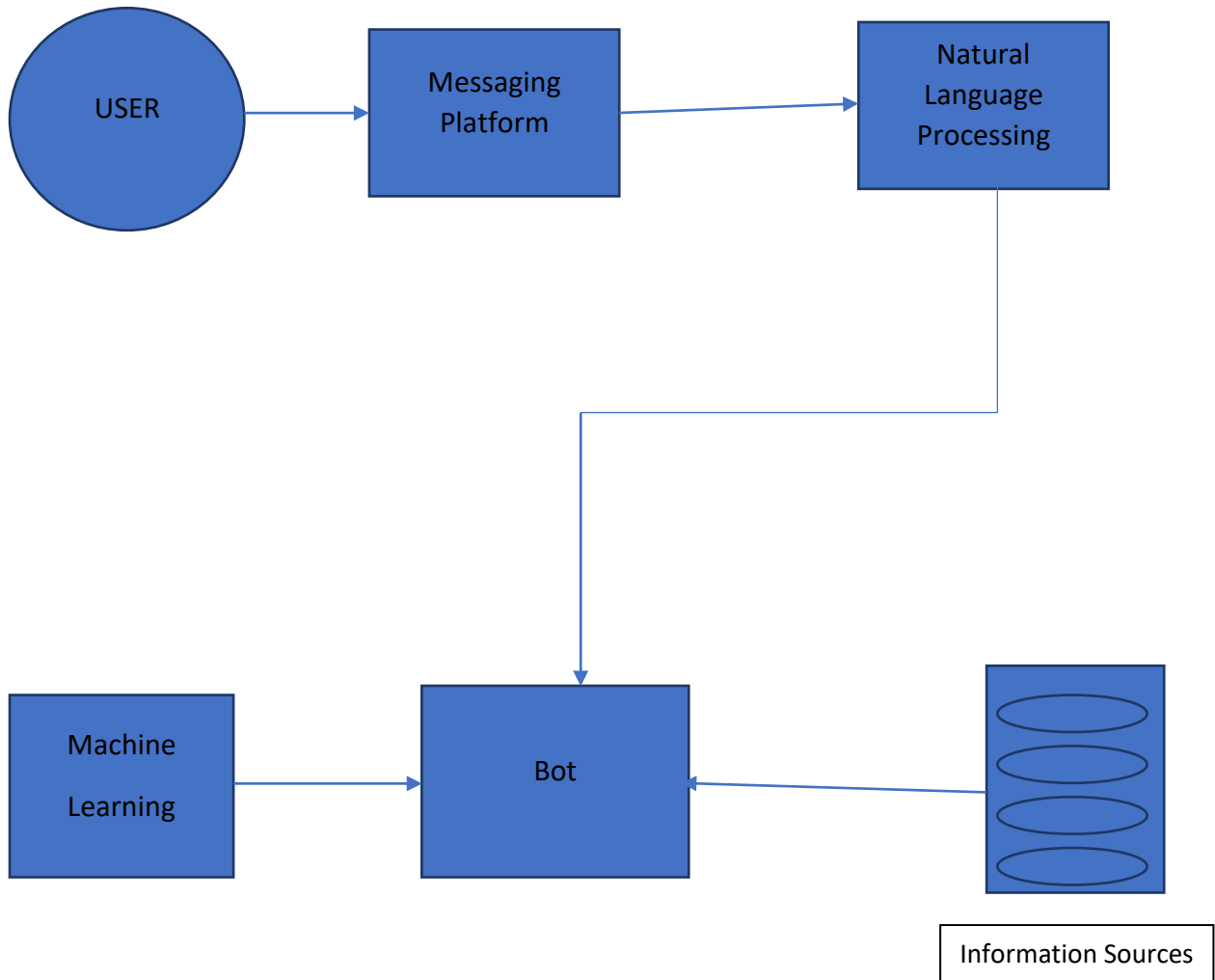


WORKING

CHATBOTS - Using Natural Language Processing and TensorFlow

Use Case :Chatbot For Customer Support

Working of Chatbot (design details)



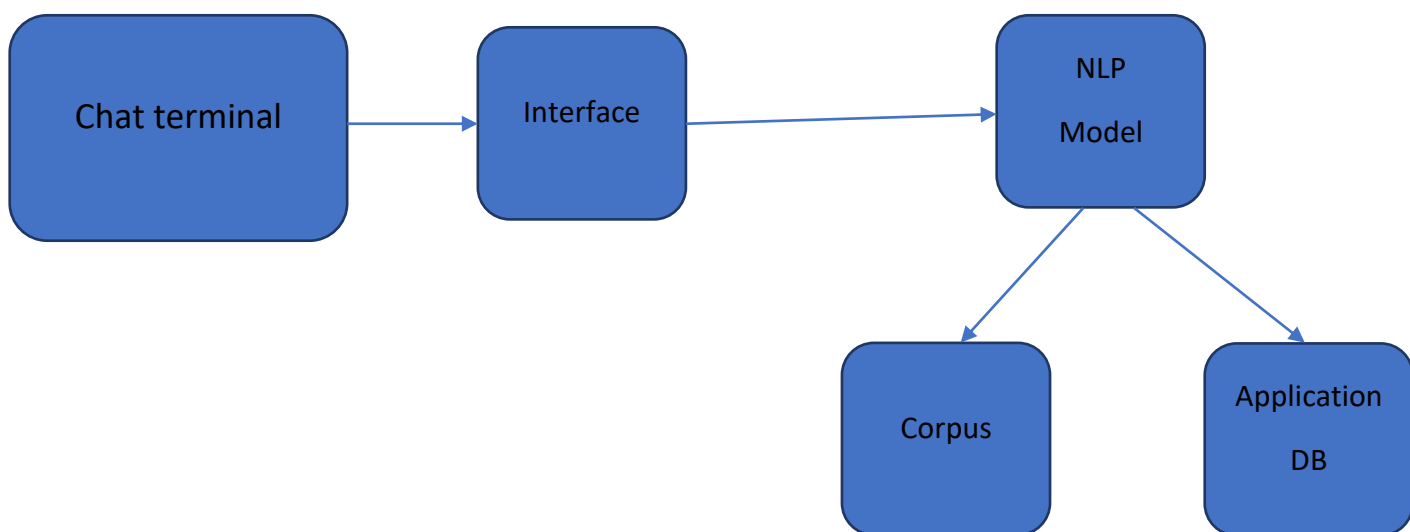
>Request analysis of User

First action that a chatbot performs.

It analyses the user's request to identify the user intent and extracts the meaningful attributes and entities.

>Response back to User

As user context and intent is verified or identified, the chatbot provide the most appropriate response for the user's request.



Corpus is the training data needed for the chatbot to learn.

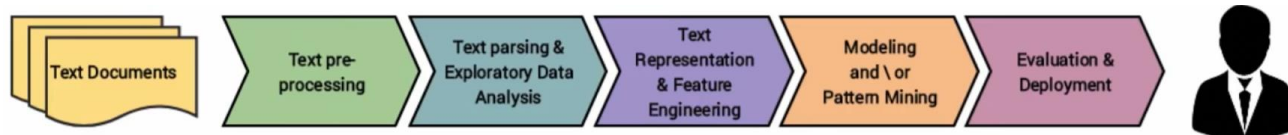
Data Pre-processing – text case handling

Convert all the data coming as an input to either upper or lower case.

How Does a chatbot work?

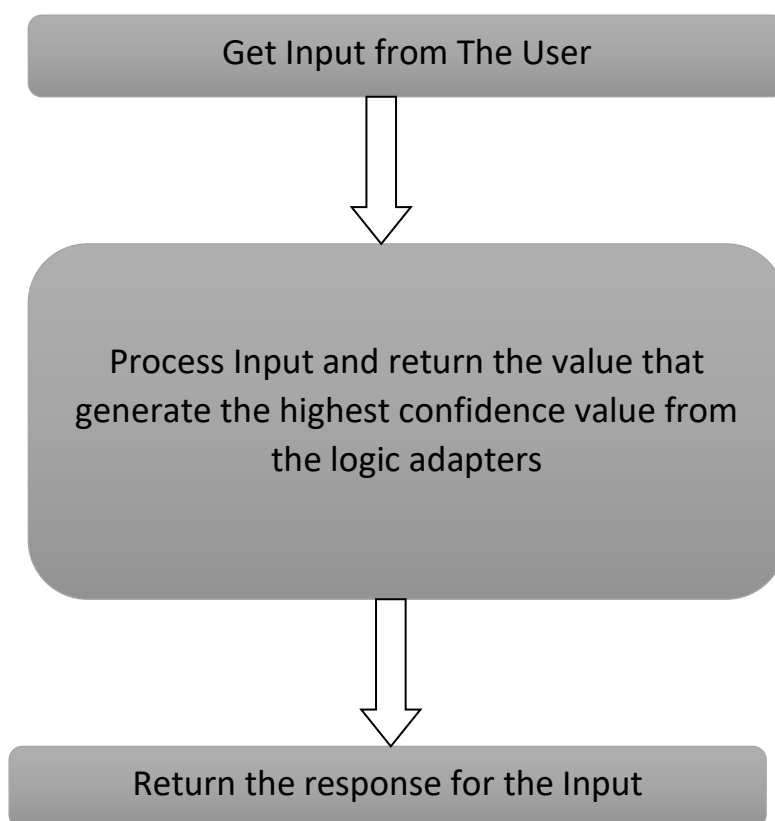
Given an 'input' word, tell us the probability of these other words showing up nearby

Standard NLP Workflow



Intents

- Intent Name
- Training Phrases
- Response



Tokenization Process :

Transform a text file (string) into a list of words (tokens), so that the algorithm understands the text better and extracts the correct answers. using the NLTK library modules.

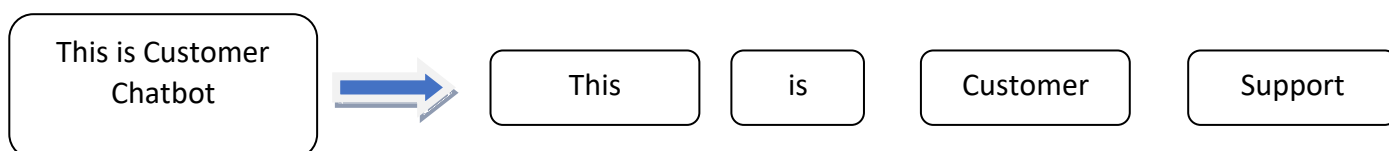
In this step we will normalize the tokens, we will consider ONLY the root of each word, "Playing", "Plays", "Played" the result would be a single word "Play".

is to remove everything that is not in a standard digit or letter. suppression of stop-words: we delete extremely common words

This is the process of converting strings (a text) into a list of tokens.

- Automatic focus on the most 'common' cases (instead of deciding where to focus)
- Robust to unfamiliar input (e.g. misspelled or accidentally omitted words)
- Accuracy can be improved by providing more input data (easier than increasing the complexity of a system)

Tokenization:



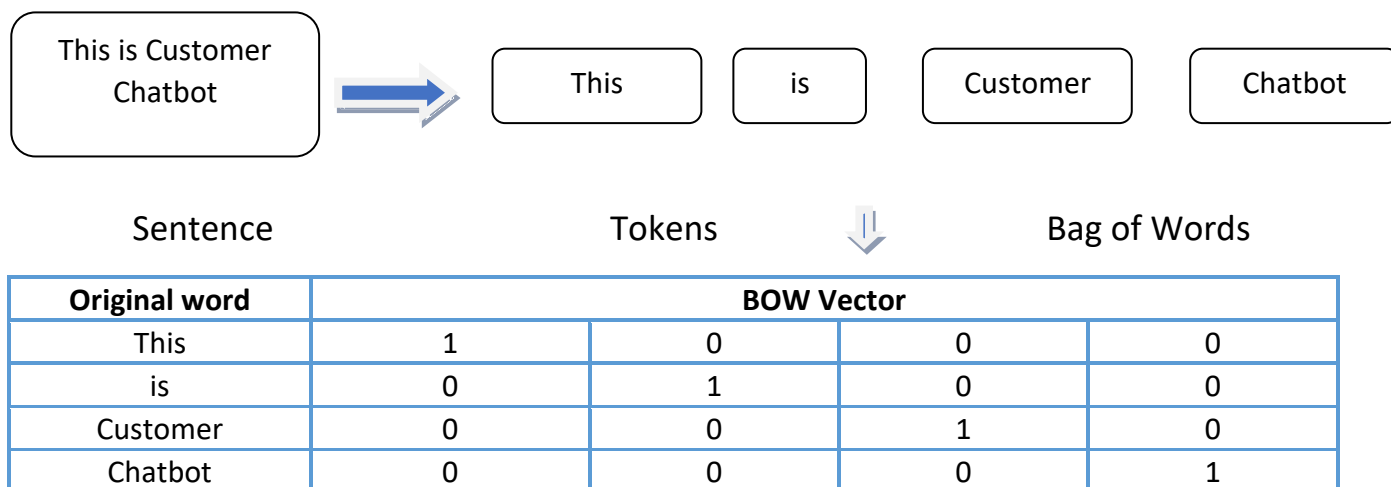
Tokenization is the structured process of converting a sentence into individual collection of words.

Stemming

Original word	Root word	Similar words
Jump	Jump	Word with similar root word i.e. JUMP
Jumped	Jump	
jumps	Jump	
Jumping	Jump	

Stemming is a Process of finding similarities between words with the same root words.

Generating Bag Of Words (BOW):



Process of converting words into numbers by generating vector embeddings from the tokens generated.

1. Import corpus
2. Preprocess the data
3. Test case Handling
4. Tokenization
5. Stemming
6. Bag of Words (BOW)
7. One hot encoding

ADVANTAGES OF CHATBOT

- **Make Customer Service Available 24/7**

Unlike your support team, chatbots don't need any sleep. When a customer needs assistance, your company can be there, even outside of normal business hours.

This facilitates greater customer satisfaction as people can get help without waiting around for a reply to an email or voicemail.

- **Save Time and Money**

- **Reduce People-to-People Interactions with Customers**

The massive savings come from slashing the time your staff normally spend dealing with customer queries.

By phasing out customer support staff to bring in chatbots, you can dramatically cut interaction times on all channels, including phone calls, social media, and messaging apps. This is one of the most prominent chatbot benefits.

- **Reduce Stress for Consumers**

"Reducing Stress" is one of the greatest advantages of chatbots.

CONCLUSION

Chatbots Can Bring Customers and Companies Together

The potential for AI-powered chatbots is almost limitless, which makes them an incredible addition to any business.

For small businesses, chatbots are crucial as it saves time and resources, offers a better return on investments, and helps you offer exceptional customer service the benefits of chatbots are clearly visible here.

REFERENCES

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