

## CHATBOT DEVELOPMENT USING MACHINE LEARNING ALGORITHMS

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### Abstract:

A chatbot is an artificial intelligence computer program which performs communication using audio and video system. A person can ask any questions and chatbot will answer accordingly. Nowadays a chatbot is highly popular and takes speed as a computer communication application. Chatbot system is in trend, thus it is being used on many websites. With the chatbot, one doesn't have to wait to talk to the customer helpline, they don't even have to search for shopping through Websites. A chatbot is used in many areas like order food, product suggestions, customer support, weather, personal finance assistance, scheduled a meeting, search and track flights, send money, and many more. The main objective that we will discuss in this paper is about creating a web API, and also about sample web and text messaging interfaces that demonstrate the use of API. In this research paper we are trying to understand these Chatbots and understand their shortcomings.

### Keywords:

Chatbot, Answeragent, Machine Learning, Intelligent, Natural Language Processing, Artificial Intelligence.

### Introduction:

Chat has become the center of focus in this current era, thus the bots are being utilized to deliver information engagingly and conveniently. A chatbot is standout amongst the most progressive and promising tools of communication among people and machines. Famous chatbots like Google Assistant, Amazon Alexa, Siri, Facebook, Slack, and many more are in trend. These are very much helpful, but in this era of enhancing technology, day by day technology gets updated, and accordingly, user expectations also increase. A user wants more automation in the chatbot. Although every system is not perfect there is always a flaw in the system, so as in the chatbot there are some problems that the user has experienced while using a chatbot. Chatbot can be described as an answering system where a system will be able to answer questions or statements submitted by users and allow users to control over the content to be displayed. A bot is trained on and according to the training, based on some rules on which it is trained, it answers questions. It is called ruled based approach. Using these ruled based approach, creation of these bots becomes relatively straight forward. But it is not sufficient for the bot to answer questions whose pattern does not match with the rules on which it is trained. The language by which these bots can be created are Artificial Intelligence Markup Language (AIML). It is a language based on XML which allows the developer to write the rules which bot will follow.

### Description:

A CHATBOT is a normal application which has a database, it has an app layer and APIs to call the other external administrations. However, bots cannot comprehend about what the customer has planned. It is a very much common problem that must be tackled. Bots are generally trained according to the past information which is only available to them. So in most of the organizations, chatbot maintains their logs of discussions so that they can understand their customers behavior. Developers utilize these logs to analyze what clients are trying to ask. Developers coordinate their with their client inquiries and reply with the best appropriate answer with the blend of machine learning tools and models. Training a chatbot is very much faster and also on a large scale as compared to human beings. A customer support chatbot is filled with a very large number of conversation logs which help the chatbot to understand what kinds of questions should be asked and answers should be given. While a normal customer service representatives are given manual

instructions which they have to go thorough with. The working of chatbots is based on three classification methods:

### 1. Pattern Matches:

The pattern matches to group the texts are utilized by the bots and it so it produces an appropriate response to the customers. The standard structured model of these patterns is “Artificial Intelligence Markup Language”.

### 2. Natural Language Understanding (NLU):

Finding the way to convert the user’s speech or text into structured data is called Natural Language Processing. It is used to get relevant answers for the customers.

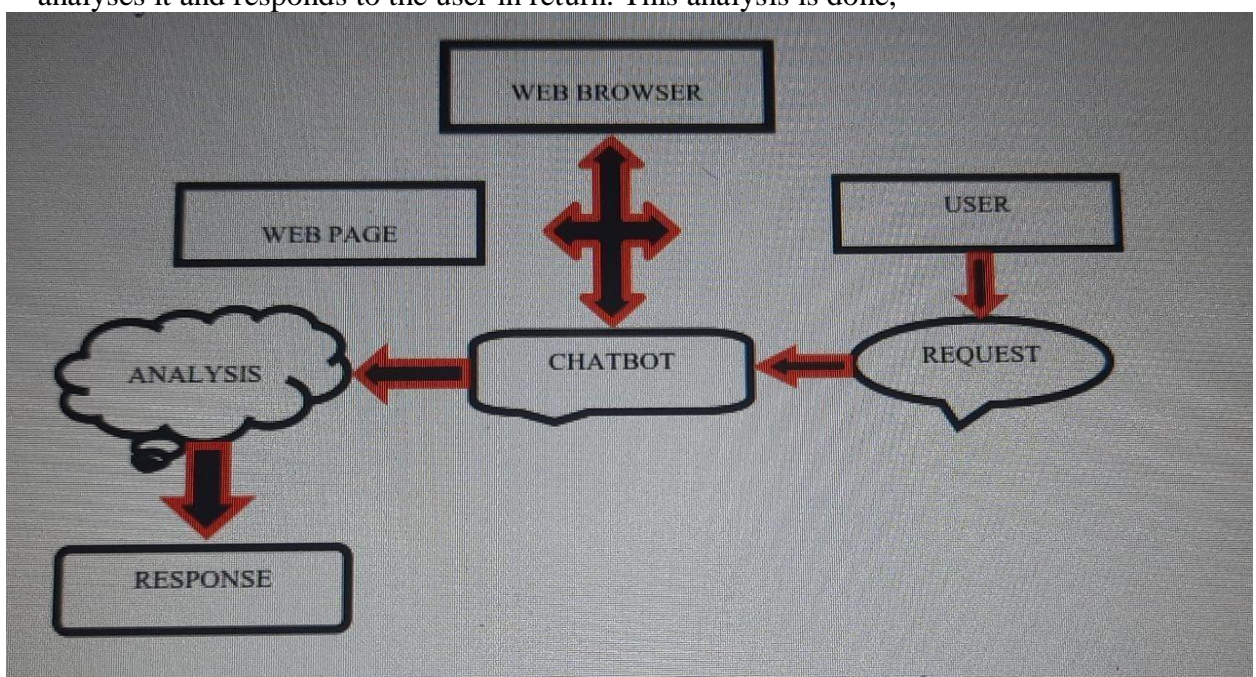
To develop a chat bot one must be very clear about what one wants from that chatbot. Often they are developed for business platforms like Net Banking sites to handle costumer Q&A. Another type of chatbots widely developed and used are smart assistants like SIRI, Google assistant, Alexa, Cortana etc.

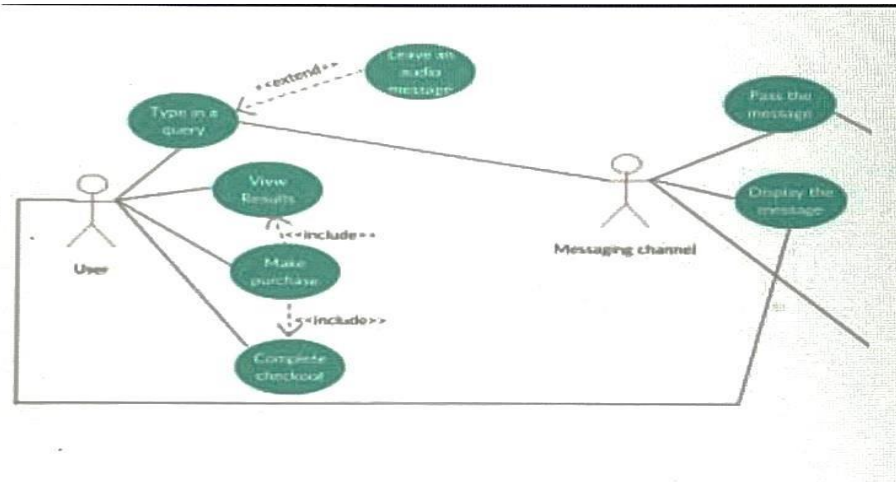
Following is a simple class diagram of chatbot showing basic functionalities of it

The above image clearly explains how a chat chatbot handles costumer Question Answer in a business platform. With the help of following class diagram we can understand the functionalities of a chat.

### System Architecture:

The main purpose of this chatbot is to respond to user queries without man power. User can work with the chatbot in any web browser. The chatbot receives the request sent by the user, analyses it and responds to the user in return. This analysis is done,





**Figure 2: General Architecture of the Propose System**

using the machine learning algorithm. The queries are predefined with a particular tag for each set. This tag is nothing but a keyword that helps the chatbot to analyze the user request. After the analysis, the chatbot responds to the user with required reply. If the user request is not clear to the chatbot, the response will be a default message defined by the developer. Almost all the queries from the user will be clearly responded, only few are exceptional cases. **Implementation:**

This section describes the working of the system on an overall basis and further with specific focus on the software part of the chatterbot and the predefined query data set. An algorithm of the process, proceeded by a design motive of the system is also included.

#### Design Motive:

- **Reduce man-power:** The user can easily be clarified with all his FAQ's within few minutes with the help of the chatbot.
- **Accessibility:** Any user can easily access the chatbot from any web browser.
- **Overall friendliness:** Ultimately, the chatbot is a userfriendly artificial machine that satisfies the user query at faster rate.

#### Conclusion:

The goal of the project is to reduce man-power and to respond to user query at faster rate. Early days, the user's use to send a query mail to the particular site administrator and it would take few days for the site administrator to reply to the mails. Chatbots can overcome this delay, chatbot satisfies the user request or query immediately with relevant responses. These days many websites of banks, educational institutions, business sectors have developed their chatbots to satisfy user request in a faster time. Chatbots are userfriendly artificial machines. This paper presents the overall development and working of the chatbot.

#### Future Scope:

This project can be developed even more by adding multi languages, speech recognition. We can add many more tags to the data set, as the website gets developed. The chat history of a particular user can be sent as a mail to him/her after the conversation is over. This can be done by authorizing the users and receiving their mail id's. This project is a small initiative to make the website user-friendly and easily understandable by the user.

**References:**

- † The Stanford NLP (Natural Language Processing) Group. [Online] Available:  
<http://nlp.stanford.edu/software/CRF-NER.shtml>.
- † Maria Joao Pereira and Luisa Coheur Just. Chat – a platform for processing information to be used in chatbot.
- † A. M. Rahman, A. A. Mamun and A. Islam, "Programming challenges of chatbot: Current and future prospective," 2017 IEEE Region 10 Humanitarian Technology Conference (R10-HTC), Dhaka, 2017, pp. 75-78.
- † <https://www.irjet.net/archives/V6/i11/IRJETV6I1174.pdf>.
- † <https://www.ijrte.org/wpcontent/uploads/papers/v8i4/D8396118419.pdf>.
- † <https://www.geeksforgeeks.org/python-gui-tkinter/>