

College Enquiry For Student using AI ChatBot

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ABSTRACT -

A chat bot is a computer program that may initiate conversations between users and other computers. A larger audience can use chatbot technology, which is text-based and safe to use.. Chatbots for university research are developed using AI algorithms that interpret user messages and assess user demands. The aims of the chatbot's responses is to match the user's input while avoiding making oneself physically available to the institution in response to queries. The program responds to the students' inquiries by applying its intelligence.

For using this type applications, natural processing language, command line, graphical user interface (GUI), menu driven, form-based, etc. that used in user interfaces TGUI and web-based user interfaces are the most typical types, however sometimes another type of user interface is required. This is where a conversational user interface based on chatbots fits in. One type of bot that has been present on chat systems is the chatbot. The user can interact with them via graphical interfaces, and the trend is in this direction. They often offer a stateful service, meaning that each session's data is saved by the application.

On a college's website, one frequently doesn't know where to search about some kind of information. Information about colleges might be hard to obtain for someone who isn't a student or staff member. A college inquiry chat bot is the result of solving these problems. It is a quick, easy-to-use, and educational widget that improves the user experience on college websites and gives users useful information. Artificial intelligence (AI) and natural language processing (NLP) algorithms are used to Designed the Chatbot for answering the user questions . It user interface that provides answers the queries related to examination cell, admission, academics, users' attendance and grade point average, placement cell and other miscellaneous activities effectively .

The chatbots is system that have integrated data that helps them acknowledge the user's question and gives responded to users. This method may be a internet application that gives answers to the student's question. Students want to talk and ask questions only through the bot. The program analyzes the question of users and answers it then. The machine gives responds to the question, as if the

person were asking it. The program responds to the students' question using the assistance of algorithms.

Key Words: Artificial Intelligence, Chatbot, Machine learning, College enquiry chatbot, Natural language processing.

1. INTRODUCTION

Computer program which is Chatbot used to conduct an online chat conversation via text or text-to-speech, instead of providing direct contact with a live human agent. designed to accurately mimic a human's behavior when engaging in conversation. Chat-Bots can be designed by using language like Artificial Intelligence and NLP, it allow developer's write rules for the bot to follow. other disadvantage is writing rules for different is very issues me consuming and it is impossible to write rules for every possible scenario. So these system can handle simple queries but fail to manage difficult queries is stated in paper. The chatbot is system that designed to provide students feel like conversations with the staff from college and their queries are addressed through the conversational text. answered can be provided to the user in text format, pictures and with many more features provided by the chat fuel. The chatbot AI feature makes the bot smart and answers the queries of user .

The purpose of developing this project is based on an intellectual chat-bot system which will deal with the academic activities like admission enquiry, fees structure, scholarship details, details of the documents required to attach etc. using this chatbot system it will be easy for the student to directly clear their doubts in few time. The user does not need go personally to the college for enquiry. The machine that detect the question which provide by user then to give answer. The user can also give their suggestions through the suggestion box.. This project is focusing on creating a chatbot to be used by students to get their queries responded easily from the college website.

Chatbot is a computer application which may speak to human beings naturally, the way we interact with one another . It can replace a users for several tasks of answering queries. A chatbot is an system that interacts with users using simple language. it had been built as an effort to humans. different applications of chatbots like

Customer Service, call centers etc. uses AI terminology to talk with user. one among the main goals of chatbots is to like an intelligent human and make it difficult for the system of the conversation to know the important working along side various architecture and capabilities for users usage has widely broadened. These chatbots are capable of providing enough information to trick the user into thinking they are "talking" to a real person, but they are unable to expand their knowledge base in real time and often have very little to no way of recording all the conversational data. Chatbots use of machine learning algorithm to overcome in AI helping them to know the user query and supply an appropriate response. The chatbots are developed using the synthetic Intelligence algorithm for communicating or interacting with the user to solve their query.

The implemented chatbot will solve queries of the users, provide information to users as they require, improve quality of service time and make customers happy by providing smart solutions. It also improves productivity by providing 24/7 service, reduces crowd at help desk and also reduces human efforts. Students can interact with chatbot on the web via laptop or smartphones. Students ask miscellaneous queries regarding admission details in natural language and both can respond to their queries with correct answers. Customers may simply access the proposed application, which responds to users at any time and from any location.

2. LITERATURE SURVEY

Title	Year	Author Name	Proposed Methodology
[1] Chatbot based College Information System	2019	Assistant Prof Ram Manoj Sharma	Technologies for natural language processing are used to filter, stem, and tokenize the content of complaints.
[2] AI Chatbot for College Enquiry.	2023	Tiwari R, Khandelwal R, Agrawal Y, Tiwari V, Bisen W.	Algorithm giving result using these strategies Tokenization, Extracting Entities and Word Embedding
[3] AI and Web-Based Interactive College Enquiry Chatbot.	2021	Phalle A, Kadam S, Sonphule S, Savant I.	Implementing machine learning framework to automate text-and voice-based conversations. Python's pytsx3 library should be sufficient for converting audio into text.
[4]Enhancing College Chat Bot Assistant with the Help of Richer Human-Computer Interaction and Speech Recognition.	2020	Kumari, S., Naikwadi, Z., Akole, A. and Darshankar, P.	Design voice command base chatbot in two mode manual mode and auto mode.
[5]College enquiry chat-bot system.	2020	Gawade H, Patil V, Vishe P, Kolpe S.	Created by using language like Artificial Intelligence Mark-up Language(AIML), a language based on XML that allow developer's write rules for the bot to follow NLP will provide a voice to the chatbot
[6] Implementation of a Chatbot System using AI and NLP.	2018	Lalwani T, Bhalotia S, Pal A, Rathod V, Bisen S.	The interface developed will have two parts, one for users and the other for the administrator.
[7] A Smart Chatbot Architecture based NLP and Machine Learning for Health Care Assistance.	2020	Ayanouz S, Abdelhakim BA, Benhmed M.	A chatbot or conversational agent is a software that can communicate with a human by using natural language.

A chatbot system for college inquiries that has been created using artificial intelligence algorithms was developed by Prof. Ram Manoj Sharma [1]. The bot interprets user communications and analyses user queries. The system includes modules such as online chatbots and noticeboards, among others [1].

Authors S. Kumari, Z. Naikwadi, A. Akole, P. Darshankar [4] implemented a voice and text-based chatbot which could answer admission-related queries. In addition to the previously implemented works, this chatbot allowed the users to express their satisfaction with the provided answers by pressing the like or dislike buttons. This data was stored at the backend which served as a guideline for the Administrator to improve the answers framed. However, it could not understand the user's query if there were any glitches in input due to human spoken language, like a grammar error or a context error. [4]

Using NLP (Natural Language Processing), which may be done in two ways—the first via written text, and the second by verbal or vocal communication—Nitesh Thakur, Akshay Hiwrale, Sourabh Selote, Abhijeet Shinde, and Prof. Namrata Mahakalkar presented an artificial chatbot. Verbal communication is far more difficult than written communication. The interest in certain newly developed understanding and processing speed capabilities for growing speed in virtual human dialogue systems is introduced in this research [8].

A chatbot was created by Harsh Pawar, Pranav Prabhu, Ajay Yadav, Vincent Mendonca, and Joyce Lemos utilizing knowledge from a database. The suggested solution includes an online inquiry and chatbot technology. A user-friendly graphical interface is developed utilizing a variety of computer languages to transmit and receive responses. The primary objective is to match patterns contained in the application using SQL (Structured Query Language) [9].

3. METHODOLOGY

3.1 Natural Language Processing (NLP) Algorithm

Natural language processing (NLP) is the ability of a computer program to understand human language as it is spoken and written referred to as natural language. One part of artificial intelligence (AI) is NLP.

How Does Natural Language Processing Work?

Natural Language Processing example -- the prediction algorithm in your email. The software is not just guessing what you will want to say next but analyze the likelihood of it based on tone and topic. By providing the machine with "NLP training," developers are able to do this. NLP acts as a fundamental pillar for recognition of

language, which is used by Apple's Siri and Google. It allows technology to recognize human natural language text and speech-based commands and include two major components natural language generation (NLG) and natural language understanding (NLU).

Basically, they provide the software with a large amount of data about language including sentences and phrases as well as transcripts from live conversations/emails. In this way, over time, computer program are able to learn how to pair words together. What it is and what we are trying to deliver, and what we need to get with that communication. commonly, assuming what you will type in a business email is significantly simpler to analyzing and responding to a conversation. However, the decoding/understanding of the text is, in both cases, largely based on the same principle of classification. Typically, a hierarchy of classification models is used to analyze text or speech input in order to get a "understanding" of natural language(NLU).

3.2 NLG (Natural Language Generation)

Natural Language Generation involves text realization and text planning to generate an understandable response. In simple words, language generation is responsible for the formation of grammatically correct sentences and phrases. The key challenge faced by NLP is to understand the complications of natural human language The structure of language is itself very vague regarding syntax and other components of speech such as similes. A word can be taken as either a noun or a verb; a sentence can be passed through in a number of ways; moreover, an input can have more than one meaning, etc.

- **Data Pre-Processing:**
Data Pre-processing in Machine learning or Deep learning refers to the technique of cleaning and organizing the raw data to make it usable and appropriate for building and maintaining the Machine Learning models. It is a crucial step that involves enhancing the quality of data which also helps in reducing the errors after the development of the Chatbot
- **Text Case Handling:**
Text case handling refers to the correction of mistakes in the text. This involves converting the data that is coming into the Chatbot model as an input to either Lowercase or Uppercase. This would avoid the misapprehension and fabrication of data.
- **Tokenizing:**
For the algorithm to understand these sentences, require to get the words in a sentence and explain them individually to our algorithm. So, you break down your sentence into its constituent words and save them. This process is called tokenizing, and each word is called a token.

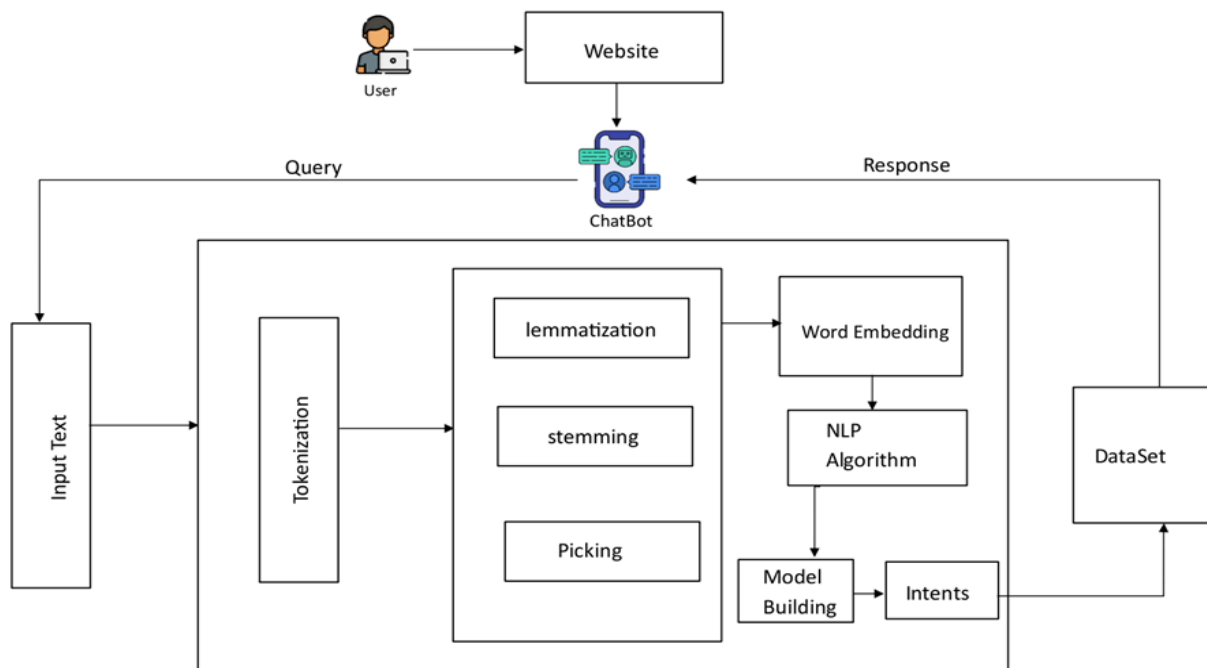


Fig.-1: System architecture

After applying tokenization to the example "what would you do with 1000000 \$", the outcome is that we obtain all of the different words as one string, as well as splitting the number here and even splitting the symbols and special characters in a particular sentence. Tokenization works and is used in the program in this manner.

- **Stemming:**
Stemming in creating the Machine learning model involves finding the connections or similarities between the words. This will reduce the abundance of words that must be stored by associating the similar words with their common word called "Root word". Stemming is a natural language processing approach that creates the root form of words; it's essentially a rudimentary heuristic that cuts off the ends of words.
- **Lemmatization :**
Lemmatization is a text pre-processing method that helps in natural language processing (NLP) models to break a word down to its root meaning to find similarities.
For example, The word "walk" might occur as "walked," "walking," or "walks." Words with inflectional ends like "s," "ed," and "ing" are eliminated. Lemmatization matches these words with their lemma, which is "walk."
- **Segmentation:**
The first step is to breakdown the entire document into its individual sentences. To achieve this, divide the text into sections and add punctuation marks, such as commas and full stops.

- **Word Embedding:**
Word Embeddings, also called word vector represent words in a form of numeric vector; this numeric vector helps to have a similar representation of similar words.

NLTK – Natural Language Toolkit :

NLTK is the most commonly used toolkit which available a free plugin for Python. The Natural Language ToolKit (NLTK) may be a set of commands which gets it and translates Common Dialect of people. It may be introduced into Python Libraries with the aid of pip command. It is made use of to break words in a string of content and disconnected the content into chunks of the input sentences by way of labelling word names acknowledging their roles and responsibilities inside the sentence. The coming nearly labelled words.

User can interact with the system with the help of GUI. He/she will enter the query or doubt in text box provided. Once the query is submitted, that request will be further handled by conversation interface.

Conversational interfaces are platforms that capable of carrying on human-like conversations.. computer then interprets the meaning of that command and perform the desired action. In case of Conversational interfaces the user can communicate with computer in their natural language instead of giving command or using GUI. For this to be possible, there is use of Natural Language Processing (NLP) so that the computer will be able to understand the meaning of the input given by the user and perform the task accordingly. Due to the ambiguous nature of languages it is difficult for computer to always understand the correct

meaning of the input given by human, which is known as Natural Language Understanding (NLU).

To create a chatbot we have used some deep learning methodologies and libraries like keras, tensorflow and so on. Keras is an open source software that acts as an interface for both tensorflow and artificial neural networks. Keras allows us to define number of input and output models that shares layers. In python keras is used for the purpose of numerical computation libraries.

Our collection of data, usually written in a tabular form, contains variables, and attributes corresponding to the rows and columns. It has all the required and specified outputs for the user and the administrator. It is mainly used because it can hold all the records and data to be used by a program either to get the model trained or simply retrieve the data.

Here in this project, the data set is written in the form of

human readable dialogues, technically called as intents. These intents are stored in a Json file (JavaScript object notation) for this project. The Json file is specifically used because it is best for transforming the human data to the web usage. These intents are then used for training the chatbot and then also getting responses for the user from the file.

This chatbot is trained using a Natural language Processing algorithm(NLP). The NLP is a layer of neural networks that is well functional in terms of Classifying, processing the text and making predictions from the given dataset

Machine Learning models are created or built using neural networks. Here in this work, it is built by the above-mentioned package called Keras. A neural network takes the inputs, which are then processed in hidden layers using weights that are adjusted during training. Then the model spits out a prediction.

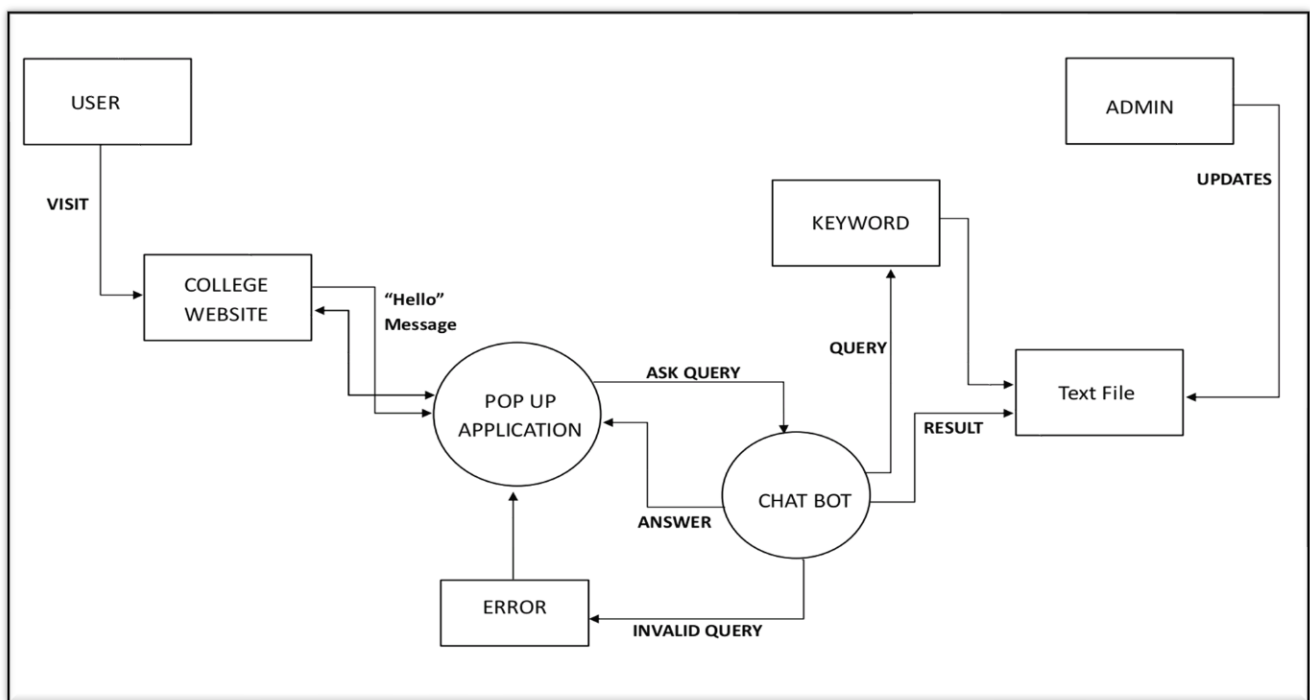


Fig. 2-: Process Flow

3.3 Sequence-To-Sequence Algorithm

Based on the nature of this project, which is generating a proper response to every customer query in social media, Applying sequence-to-sequence learning is required due to the nature of this project, which is to provide an appropriate answer to each user query on social media. Also, sequence-to-sequence refers to the mapping of one set of words that represents a query to another set of words that represents a response, the length of queries and responses may be different. NLP and deep learning approaches can be used to apply this.

Sequence-to-sequence models are used in many fields, including chat generation, text translation, speech recognition, and video captioning, a sequence-to sequence model consists of two networks, encoder, and decoder. The input text is entered into the encoder network in reverse order. It is then transformed into a fixed-length context vector sequence, which the decoder uses to produce the output sequence.

The word sequence must be transformed into a numerical representation before being inserted into the encoder model; NLP methods can be used to do this. The most popular conventional vector format for text-generating models is Bag of Words, or BoW, vector representations,

and that was the focus of our current study. BoW is used to turn the text into a dictionary with every word that appears in the text. For every sentence, it then generates a collection of real-number features inside a vector.

4. CONCLUSION

Our college inquiry chatbot helps students by providing correct information. It is useful for queries about fees, list of courses and Branches, admissions, canteen operations, stationery, and libraries, among other issues. Students get the information at their device rather than visiting college. It improves efficiency by taking over tasks for which humans are not essential. It takes less time to respond. When student want to know information regarding college there is no need to go to college physically. He can know information from anywhere and using any device.

REFERENCES

- [1] Assistant Prof Ram Manoj Sharma, "Chatbot based College Information System", RESEARCH REVIEW International Journal of Multidisciplinary, ISSN: 2455-3085 (Online), Volume-04, Issue-03, March2019, pp 109-112..
- [2] Tiwari R, Khandelwal R, Agrawal Y, Tiwari V, Bisen W. AI Chatbot for College Enquiry. Available at SSRN 4422268. 2023 Apr 14.
- [3] Phalle A, Kadam S, Sonphule S, Savant I. AI and Web-Based Interactive College Enquiry Chatbot. Int. Res. J. Eng. Technol. 2021.
- [4] Kumari, S., Naikwadi, Z., Akole, A. and Darshankar, P, 2020, July. "Enhancing College Chat Bot Assistant with the Help of Richer Human-Computer Interaction and Speech Recognition". In 2020 International Conference on Electronics and Sustainable Communication Systems (ICESC) (pp. 427-433). IEEE.
- [5] Gawade H, Patil V, Vishe P, Kolpe S. College enquiry chat-bot system. International Journal of Engineering Research & Technology (IJERT). 2020 Sep;9(09):741.
- [6] Lalwani T, Bhalotia S, Pal A, Rathod V, Bisen S. Implementation of a Chatbot System using AI and NLP. International Journal of Innovative Research in Computer Science & Technology (IJIRCST) Volume-6, Issue-3. 2018 May 31.
- [7] Ayanouz, Soufyane, Boudhir Anouar Abdelhakim, and Mohammed Benhmed. "A smart chatbot architecture based NLP and machine learning for health care assistance." Proceedings of the 3rd international conference on networking, information systems & security. 2020.
- [8] Thakur, Nitesh, et al. "Artificially intelligent chatbot." Universal Research Reports 4.6 (2017): 43.
- [9] Pawar, Harsh, et al. "College enquiry chatbot using knowledge in database." International Journal for Research in Applied Science & Engineering Technology (IJRASET) 6.IV (2018): 2494-2496.