

CHATBOT FOR E-LEARNING USING MACHINE LEARNING

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ABSTRACT

A chatbot is a computer program that can converse with humans using Machine Learning in messaging platforms. Whenever a chatbot gets the input from end user, it saves the input query and response that is chat history which helps the chatbot with some initial knowledge. As the number of responses is increased, the precision and accuracy of chatbot also gets increased. Our project is focusing on creating a chatbot that can be used by the students to get their queries related to enquiry of college or related to their syllabus get answered from the college website itself. The College Enquiry option on the chatbot responds to course details, faculty details, admission related queries, information about the college facilities, or the frequently asked questions by the students. The E-Learning option on the chatbot can respond to all the questions related to syllabus of IT branch. As the search engine gives multiple answers, students gets confused therefore this chatbot is essential as it gives one accurate answer. The future work includes training our chatbot with more varied data of all the subjects of all the departments in our college.

Keywords: Chatbot, Databases, E-Learning, Machine Learning Algorithms, Natural Language Processing, Speech Recognition, Machine Learning, Response, Query.

I. INTRODUCTION

In the recent era, the Artificial Intelligent systems are used for human activities such as decision making at particular moment, performing our day to day tasks. In addition to the internet search engines, currently many applications are introduced which are commonly known as Chatbot but the word is derived from combination of Chatter Robot, which is generally made to give an automatic reply. A chatbot is a software application that is intended for an online chat conversation via text or speech. Generally, there are two types of chatbot; open domain and closed domain. Open domain Chatbots are for general use or for entertainment purpose but the close domain Chatbots are very specific to a particular domain. The work of this system is very easy because the knowledge is already provided in the database. It uses few methods to get the accurate reply from the database, that is speech recognition, natural language processing and pattern matching. The system will match the input sentence from the user with the pattern that is already existing in the knowledge base. Chatbots are recently very trending thing, most of the websites are having their chatbot for better user interaction. In the field of E-Learning, the application of a chatbot as part of the education has shown interesting potential, both as teaching and administrative tool. According to the studies, recently use of chatbot in education is very less but it has more possible features.

II. LITERATURE SURVEY

By using Artificial Intelligence field, we can develop many applications one of that is mentioned in this paper is chatbot for our college website. G. Hiremath, A. Hajare, P. Bhosale, R. Nanaware and Dr. K. S. Wagh [1] has implemented an automatic response giving system which gives reply to the students queries. In this, Artificial intelligence and machine learning is used to implement the system. This system takes user query in text form only. When the user types the query then the system will extract the proper keyword from the given query and produces the response. In case of noisy environment, this application is not recommended. So in this way she has implemented an automated response generation system.

Abdelhamid, S., & Katz, A [2] reviewed a related literature and presented a mobile application system, named Alpha, that utilizes chatbots as smart teaching assistants. They have integrated system into a first-year engineering course. There system consist of following main components: i) A mobile application that handles the user interactions and pass the requests to the system. ii) a chatbot service implemented using Dialog Flow framework that handles all the conversations. iii) a predefines set of rules that use machine learning to extract

intentions from student's conversation. iv) a cloud based database implemented using Google Firestore, that stores the parsed learning material and responds to the queries in real time. v) a parsing service that parses and imports the learning resources into database using Python programming language. vi) a speech/text, two-way conversion service that converts voice to text and text to voice.

Y. Wu, G. Wang, W. Li, and Z. Li [3] presented automatic chatbot knowledge extraction from online or rough set and ensemble learning. They have used the concept of ensemble learning. This classification constructs the results of learner to get the final result. Multiple rough set, classifier is constructed and trained first, and then all replies are classified with the classifieds. The final results are drawn from voting to the output of these classifiers and finally it is selected as knowledge database. The disadvantage of this system is that all replies are not related to root message so it decreases its accuracy.

M. N. Kumar, P. C. L. Chandar, A. V. Prasad and K. Sumangali[4] have proposed an android based educational chatbot for visually impaired people. Symbolic reduction, voice processing, keyword detection methodologies are used in it. In case of noisy environment this application is not recommended.

H. Gawade, P. Vishe, V. Patil, S. Kolpe [6] proposed a system that has following two modules: i) Online Enquiry: In this students can enquire about facilities and query related to fee structure, academics, exams, etc. ii) Online Chatbot: In this the results are displayed in the form of images and card format or in text format. Students who would like to enquire about the college at the time of admission or any competition held in the college or event can query to the chatbot.

III. PROBLEM STATEMENT

The aim of our project is to develop an automated system for our college website which replies to a user query on behalf of a human such as admission enquiry, syllabus related doubts, etc. To use this chatbot for E-Learning purpose, which gives a reply to a user queries related to programming languages included in syllabus of IT branch. The main function of the project is to reduce manual paper work and developing system which gives a single output of a query which is accurate and learn from its previous responses.

IV. GOALS AND OBJECTIVES

- 1) Adding data of all the subjects is a challenging task.
- 2) It should be used by our college website is our ultimate goal.
- 3) Thus, the main objective of this research work was to enhance the education system by using Chatbots.
- 4) Generate one output for one input otherwise it would be same as Search engine.
- 5) Save the previous responses in database and learn from it.

V. PROPOSED METHODOLOGY

The idea of the proposed model is that it answers the queries of user with a single accurate answer. Simultaneously the machine should learn itself. In this proposed research work our aim is to implement the proposed approach. Also, we plan to explore the implications of voice recognition. In our proposed system we will use JavaScript, HTML, PHP and CSS and we will create a webpage where we will implement our chatbot. But we will use Ajax that will take users input and parse it to RESTapi, and RESTapi will call Python program where we will implement our Machine Learning Algorithms, that will do the text classification & intent identification. Our Database is MySQL that would be connected using Python; we will use our local database for storing queries and responses in one table and chat history in another table. User communicates with the chatbot through user interface. This can be using text-based or audio based. The interface gets the query and does the pattern matching of the input with the database and fetches the most likely output.

The conversation of user and bot will be backed up by saving it to the database so that the chatbot can continue conversation later with user related to topic previously discussed. This chat history can also help teachers monitor the most asked questions to the chatbot regarding a particular subject. This can aid teachers with providing better education. The chatbot will occasionally ask for user's feedback, so that it can confirm that whatever responses it is providing is correct and beneficial to user.

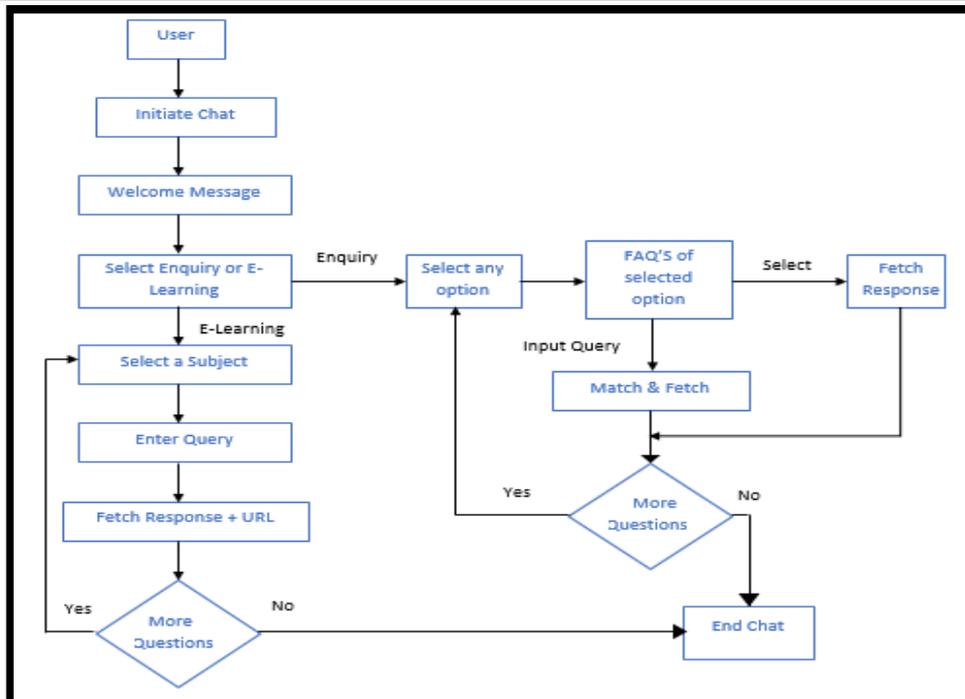


Figure 1: Flowchart of AISSMS POLY Chatbot

Algorithms used in our project are:

1. Natural Language Processing:

The word itself implies that it tries to understand the natural language that is human language. It extracts the intentions of user from the given phrase. This algorithm attempts to learn through machine learning and an abundance of conversational data, the intricacies of human language. Even if there are spelling mistakes or grammatical errors still our bot will try to understand the intention of the user and will match it with database accordingly and give the appropriate response.

2. Speech Recognition:

It is a capability which enables a program to process human speech into a written format. Speech recognition focuses on the translation of speech from a verbal format to text one. This technique will expand the capability of our bot. Because many times user is tired to type all that questions, therefore speech recognition would be helpful.

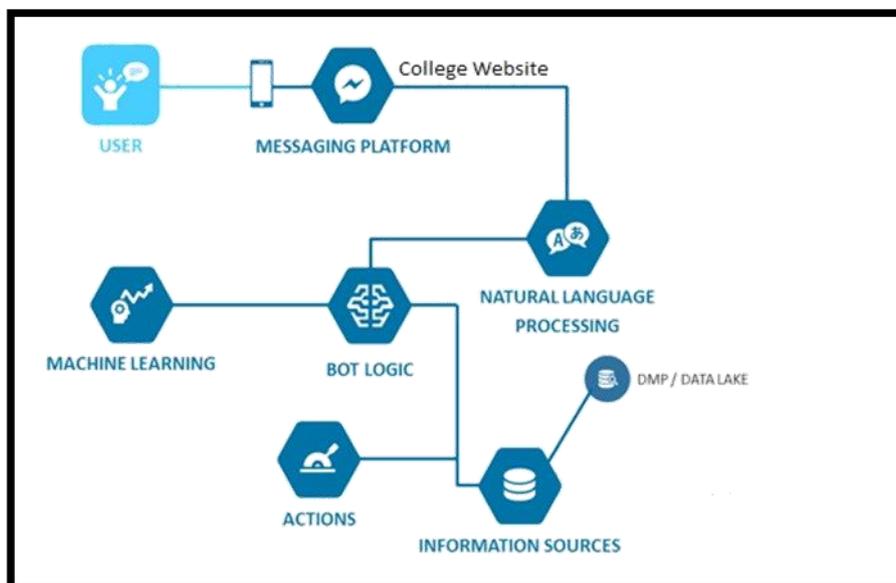


Figure 2: Architectural diagram of AISSMS POLY Chatbot

VI. CONCLUSION

In this paper we have implemented a Chatbot for E-Learning using Machine Learning for AISSMS's Polytechnic which will reply to the user query in minimum time and more accurate. The machine learning algorithms are used for implementing it. The user will ask his/her queries either related to College Enquiry or E-Learning and then the system will identify the intent of user by NLP and will produce the output. The main motive of the project is to reduce the work load on the college's office staff as many students ask the same questions to them every year, and reduce the response time for user. The future scope of this project can be: If the data is not available in the static database, then it should be fetched from online resources. With the help of machine learning and knowledgeable database we can make some transformation in the pattern matching.

ACKNOWLEDGMENT

This is a great pleasure and immense satisfaction to express our deepest sense of gratitude and thanks to everyone who has directly or indirectly helped us in completing our paper work successfully. We express my gratitude towards guide Mrs. Varsha R. Palandurkar ma'am who guided and encouraged us in completing the work in scheduled time. We are very thankful to Mrs. A. S. Khandagale ma'am (HOD, Information Technology). We present our sincere thanks to Mr. S.K. Giram sir, Principal for moral support and providing excellent infrastructure in carrying out the paper work. We are also grateful to all of our friends for being a constant source of support.

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