

Design of Chatbot System for College Website

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Abstract— Most of the time, Students need to visit college administration office to collect various information regarding college such as Tuition fees, Term Schedule, etc. during admission process or as per their daily needs. Hence, to overcome this problem, a chatbot can be designed and developed which can be easily integrated with any college website to provide necessary information regarding college. The goal of AI based chatbot is to make an efficient conversation between human and machine via auditory or textual methods. This project uses Natural language processing to process the user's query and generate a meaningful response. Based on the information stored in the database, bot itself determines appropriate response of a particular query fired by user. The Chatbot is based on an Artificial Intelligence algorithm, which analyses user's question and responds with a Naive Bayes' algorithm. This system will be a Web Application and can reduce work of college administration providing information to students. It also reduces the workload on the staff to answer all the queries of the students.

Keywords— Chatbot, Query, Graphical User Interface, Natural Language Processing, Artificial Intelligence.

I. INTRODUCTION

Chatbot is a computer application that mimics human conversations in its natural format along with textual or voice communication. In the utilization of AI techniques together with natural language processing (NLP) [1],[3] chatbot for college website can be designed. This system will be a web application, so it can give solutions to the analysed queries of the user. User simply need to raise the query to the chatbot and the system will reply to the users through the powerful Graphical User Interface (GUI) which is similar to messaging application interface, and provides a friendly environment to the user as they are much aware of operating messaging application[1],[2]. The user can submit the question about the college-related information or activities such as admission process, contact information, address, annual day, sports day, intake and other cultural activities of colleges. Developing a chatbot solves the problems that can arise in gathering required college information. This system can be accessible from anywhere and anytime. Chatbot will deliver efficient and relevant response to the user corresponding to their entered message. Chatbot system will be beneficial for students, parents, teaching and non-teaching staff as well. Presently, there are various chatbots available for the students like UNIBOT, ALICE etc. UNIBOT is designed for the students to ask university related question. For this system a new algorithm is developed to deliver an appropriate response to the user corresponding to their entered message[2]. ALICE is a rule-based chatbot based on the Artificial Intelligence Markup Language (AIML). This System uses NLP and Pattern Matching Algorithm [3],[6],[7] to process user's query[8].

This paper is divided into several sections, where Section I contains the introduction of chatbot system, Section II contains Related Work of chatbot system, Section III explains the Methodology with architecture diagram and flow chart, Section IV contains Results and Section V describes Conclusion and Future Work.

II. RELATED WORK

K. Bala, M. Kumar, S. Hulawale, and S. Pandit et al. [1] Project on Chatbot for college management is developed with the help of AI algorithms which can analyse user's queries. This is a web application that will give answers to the analysed queries of the user. Users will simply need to select the class for queries and ask the question to the bot. In this paper, they have used Porter Stemmer algorithm to answer the user' queries. The Users should register and login to the system. Once login, user can access the various helping pages through which the user can ask queries related to college activities.

P. Nikhila, G. Jyothi, K. Mounika, Mr.K. K. Reddy et al [2] The chatbot named UNIBOT is designed for the students to ask university related question. This system uses the concept of Artificial Intelligence and Machine Learning. The System uses PHP Language for the development of UNIBOT. The query is given as an input to the algorithm, which processes it and gives the corresponding response to the user. The GUI is similar to a Messaging Application. It delivers efficient and relevant response to the user corresponding to their entered query. New algorithm is developed for UNIBOT. It is very efficient, requires less memory and has minimal database hits.

B.Setiaji and F. W. Wibowo et al. [3] Chatterbot is designed with a powerful pattern matching algorithm. This project uses Indonesian conversational pattern and MySQL database. This application is based on a knowledge base which is maintained by admin. It can be miss in defining a sentence and how to response it while connecting chat application to the database. In the pattern-matching operation, knowledge representation and implementation of SQL are important. A data that has been created which is based on the pattern of the conversation must be tested by the help of a series of scenarios. The conversation should be crosschecked to the basic pattern so that it allows you to add some knowledge to the database which is not added before. If the input record in the database does not match, then it will be remodeled.

K. Shivam, K. Saud, M. Sharma, S. Vashishth, and S. Patil et al. [4] In this paper, for designing chatbot, Facebook Messenger is used which is source and uses artificial intelligence to communicate with the user and provide the required information. This Facebook API is integrated with Python backend, webhook is used to deliver the query of the user to the server. This system has used WIT and AI as a pre-trained artificial intelligence module so that one could use its pre-trained neural networks to answer the user's query with efficiency and accuracy.

E. Haller and T. Rebedea et al. [5] This paper describes the concept of identifying vital facts in texts describing the life of a historical figure for building a conversational agent that could be used in middle-school CSCL scenario. This paper presents a way for building a chat-bot that may simulate a historical figure. The system can receive "input" as an understandable text or a web page about the historical figure and has as "output" a trained conversational agent that is in a position to answer all reasonably questions about the life expertise of that user.

S. B. Sonawane, A. S.Badwar, R. H. Dalvi, G. N. More and S. A. Talekar et al. [6] This paper describes the concept of AI based chatbot which is designed for Student Counselling for career guidance. This system uses NLP and Keyword Matching Algorithm to process user's query. This System uses a modular architecture to respond to user input. Each module contains knowledge based initialization mechanism, and logic to handle user requests. The students are able to get proper guidance for career in the field of their choice, also the college list for the same is provided as per requirement.

III. METHODOLOGY

The proposed chatbot system is a web application which gives reply to the question of the user. This system is utilized for talking. A chatbot project is built using artificial algorithms i.e. Naive Bayes' algorithm that analyse user requests and understand the user's message[9]. The system uses Natural Language Processing (NLP) and built-in artificial intelligence to answer the queries asked

by the user. For the chatbot development, we have used Python programming language using Django framework and Chatterbot library. It makes it easy to generate automated responses to a user's input with the help of a machine learning algorithm to produce different types of responses. Students just have to query through the bot which is used for chatting purpose. Chatbot will reply to the query with the help of artificial intelligence.

The proposed system will reduce the administration burden and will be able to provide necessary details to students and parents online. Students do not have to visit college administration for every inquiry. Students will get their queries resolved without any hassle to reach out the college administration office. The System will be available for 24/7 to all students and parents [4].

1. User Login:

User just needs to submit his/her queries regarding the college to the bot. User can be student, teacher as well as parents.

2. Chatbot Responding System:

2.1 NLP Processing for Query Analysis :

When a user submitted the query to the system, NLP is applied and sense of the query is detected. Natural Language Processing (NLP) allows chatbot to understand user's messages and respond appropriately.

2.2 Search Questions in database:

Once the query is submitted, furthermore, we have to search the exact answer of the query in our pre-trained database. As the query description can change from person to person. The same question can be asked in different ways from multiple users. One user asks a question so simply and clearly, while another user may ask the same question with different format. So it is necessary to find out what is the correct solution of a submitted query.

2.3 Answer the Queries:

As described above, whenever user submits a complaint, then it is checked that is there such question registered in database. If the answer is matched, then that is sent to that User. If the answer of submitted query is not found in the database, then such questions are answered by admin person. Once he answered the query, the answer is sent to that user. And also it is stored in database so that whenever such questions will be asked they get answer of that query directly from the database. So admin doesn't need to answer the same query again and again. For this we are using powerful Naive Bayes' Algorithm[9].

3. Architecture Diagram of Chabot System:

Figure 1: shows the architecture of the chatbot system for college website.

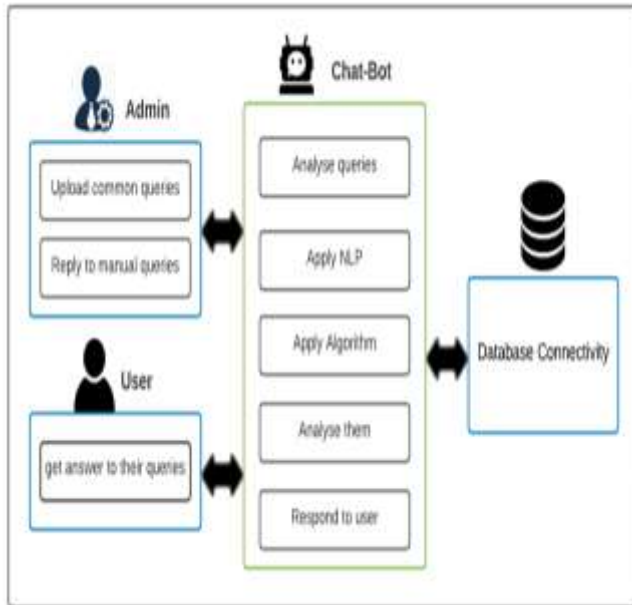


Figure 1: Architecture Diagram of Chatbot System

4. Flowchart of Chatbot System:

The flowchart of the system displays how the chatbot performs. Initially, the user message is pre-processed and connectivity to the database is obtained. Then, based upon conditions satisfied, the chatbot process flows and provide response to the user. If the user cannot find the answer for a query then in such condition chatbot will provide admin’s contact details to the user. Admin can view and answer the corresponding query.

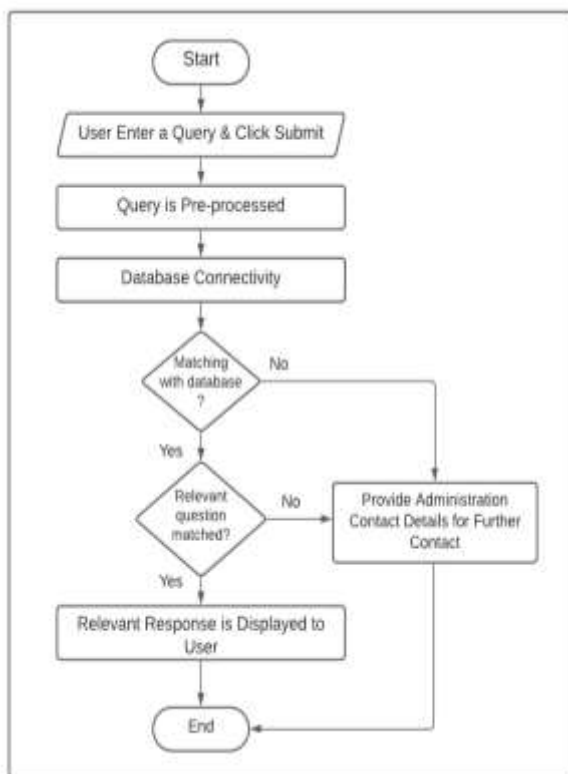


Figure 2: Flowchart of Chatbot System

5. Algorithm Implemented

Naive Bayes’ is a powerful algorithm for text classification problems. It is a probabilistic machine learning algorithm which is based on Bayes’ theorem[9]. This classifier assumes that the presence of a selected function in a category is unrelated to the presence of another function. In this algorithm a closed domain dataset containing questions/user-responses and corresponding answers is made, which every question is given a label, this will relate the question to its answer. Due to multiple questions could have the same response, there can be multiple questions having the same answer.

The Formula for Naive Bayes’ Algorithm is as follows:

$$P(A | B) = \frac{P(B | A) * P(A)}{P(B)} \tag{1}$$

Where,

P (A | B) = Probability of ‘A’ occurring given evidence of ‘B’ has already occurred.

P (B | A) = Probability of ‘B’ occurring given evidence of ‘A’ has already occurred.

P (A) = Probability of ‘A’ occurring.

P (B) = Probability of ‘B’ occurring.

6. Different Algorithms Used for Chatbot System:

Some of the most popular algorithms for chatbots are Porter Stemmer[1], Naive Bayes’[9], Support Vector Machines, K-means and atural language processing (NLP). Chatbots mainly use classification algorithms to recognize intent in phrases. Every algorithm has its own advantages and disadvantages according to its working method. Table 1 shows comparison of different algorithms WRT to Naive Bayes’ algorithm.

Table 1: Comparison of Different Algorithms

Sr. No.	Porter-Stemmer Algorithm	K-Means Clustering Algorithm	Naive Bayes’ Algorithm
1.	The stems generated are not always real words.	Different partitions can result into different final clusters.	Naive Bayes’ classifier performs better than other models with less training data if the assumption of independence of features holds.
2.	It has five steps and sixty rules. And takes more time.	Difficult to predict K-Value, hence it is time-consuming.	The algorithm works very fast and can easily predict the class of a test dataset.

3.	This System is limited to English words only.	Doesn't support categorical data.	The algorithm performs well with categorical variables in comparison to numerical variables.
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IV. RESULTS AND DISCUSSION

The Chatbot is to carry out a conversation between both human and machine. Figure 3: shows the simple and attractive pop-up Interface for College Chatbot System. Firstly, chatbot will print a welcome message then a user can type and submit the query and bot will provide an appropriate answer to the user's query. In figure 4 'What is college full name?' this question is asked by the user and correct answer is given by the chatbot. The User can query any college related activities through the chatbot system.



Figure 3: Chatbot Interface-1



Figure 4: Chatbot Interface-2

V. CONCLUSION AND FUTURE SCOPE

The aim of the system is to provide a user-friendly and efficient chatbot system for College. The chatbot will be very useful in guiding students to get correct and up-to-date information source. This system will be fruitful for students, teachers as well as parents. They can get information at any time without having to visit the college administration office every time. In the future scope of this project, the system will include voice-based requests and responses. Users are required to provide voice input and the system will output in the form of text. Chatbot will be able to provide a voice output as well, with the help of text to speech or speech to text conversion.

REFERENCES

- [1] K. Bala ,M. Kumar, S.Hulawale, and S. Pandita, "Chat-Bot For College Management System Using A.I", International Research Journal of Engineering and Technology (IRJET), Vol. **04**, Issue.**11**, pp.**2395-0072**, **2017**.
- [2] P. Nikhila, G. Jyothi, K. Mounika, Mr.K. K. Reddy and Dr. B.V. Ramana Murthy, "AI and Web-Based Human-Like Interactive University Chatbot (UNIBOT)", In the Proceedings of the Third International Conference on Electronics Communication and Aerospace Technology[ICECA 2019], pp.**1-12**,**2019**.
- [3] B.Setiaji, F. W. Wibowo, "Chatbot Using A Knowledge in Database- Human-to-Machine Conversation Modeling", In the Proceedings of the 2016 International Conference on Intelligent Systems, Modelling and Simulation, pp.**2166-0670**, **2016**.
- [4] K. Shivam, K. Saud, M. Sharma, S. Vashishth, and S. Patil, "Chatbot for College Website", International Journal of Computing and Technology, Vol.5, Issue.6, pp.**2348-6090**, **2018**.
- [5] E. Haller and T. Rebedea, "Designing a Chat-bot that Simulates a Historical Figure", Faculty of Automatic Control and Computers university of Bucharest, IEEE 978-0-7695-4980-4/13, **2013**.
- [6] S. B. Sonawane, A. S.Badwar, R. H. Dalvi, G. N. More and S. A. Talekar, "Design of Chatbot System for Student Counselling", International Journal of New Innovations in Engineering and Technology, Vol.13, Issue.3, pp.**2319-6319**, **2020**.
- [7] P. Jain,"College Enquiry Chatbot Using Iterative Model", International Journal of Scientific Engineering and Research (IJSER),Vol.7, Issue.1, pp.**2347-3878**,**2019**.
- [8] N. Hatwar, A. Patil and D. Gondane, "AI BASED CHATBOT", International Journal of Emerging Trends in Engineering and Basic Sciences (IJEEBS) ISSN (Online) 2349-6967 Volume 3, Issue 2 (March-April **2016**).
- [9] A. Prajapati, P. Naik, S. Singh and A. Kale, "Android Based Chatbot For College",International Journal of Scientific & Engineering Research, Vol.9, Issue.4, pp.**2229-5518**, **2018**.
- [10] A. Ohm, K. Bhavani,"Chatbot for Career Guidance Using AI", International Journal of Computer Sciences and Engineering (IJCSE), Vol.7, Issue.6 ,pp.**2347-2693**, **2019**.
- [11] K. G. Yohandi, M. I. Sani, "Designing a Mobile Chatbot For Elementary School Vocabulary", International Journal of Computer Sciences and Engineering(IJCSE), Vol.8, Issue.7, pp.**2347-2693**, **2020**.

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