

To Design and Develop AI based Chatbot for College Assistance

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Abstract: *AI is the ability of a computer or a robot controlled by a computer to do tasks that are usually done by humans because they require human intelligence and discernment. Artificial intelligence and its applications are endless. In the simplest terms, machine learning (ML) is a subset of AI. Its core lies in the idea that computer systems can learn on their own from data obtained from performing previous tasks and past experiences. That means that you don't have to pre-program an AI device every time you need it to work on a job. This takes ML up a notch. This subset of AI refers to a system's ability to take unstructured data from multiple sources, analyze it, and apply it to solve new problems. Deep learning is also known as "differential programming." Artificial neural network refers to a system or an algorithm used in deep learning that mimics how the human brain's neural circuits function, such as when making sense of things and events.*

Keywords: College Assistance

I. INTRODUCTION

A chatbot is an artificial intelligence (AI) application that can imitate a real conversation with a user in their natural language. Chatbots enable communication via text or audio on websites, messaging applications, mobile apps, or telephone. Chatbots, also known as conversational agents, are designed with the help of AI (Artificial Intelligence) software. They simulate a conversation (or a chat) with users in a natural language via messaging applications, websites, mobile apps, or phone.

There are two primary ways chatbots are offered to visitors:

- Web-based applications
- Standalone applications

Chatbots represent a potential shift in how people interact with data and services online. While there is currently a surge of interest in chatbot design and development, we lack knowledge about why people use chatbots. When it comes to testing, we need to clearly understand that the flows are implemented properly in the Chatbot application. In short, we need to derive the use-cases that help users to understand the flows easily rather than referring to the Requirements Document.

As a tester, we will be looking out the functionality bugs at the initial releases, and then concentrating more on Usability & UI issues. Testing is not about finding and reporting bugs; we serve as the gatekeepers before the product releases. Hence, we need to shape the application according to the normal user perspective in terms of Design & Usability. Furthermore, live users expect the chatbot application to be responsive. So, we should perform compatibility testing across all browsers and devices. Once this is done, you need to perform "user testing" with a closed user group – perhaps, your company staff, client staff, or a subset of real users – to identify as many unexpected inputs as possible. Test automation may help with functional testing, but at the moment, there are no shortcuts for testing conversational logic against real humans.

II. RELATED WORK

It is an early natural language processing computer program created from 1964 to 1966 at the MIT Artificial Intelligence Laboratory by Joseph Weizenbaum. Created to demonstrate the superficiality of communication between humans and machines, Eliza simulated conversation by using a "pattern matching" and substitution methodology that

gave users an illusion of understanding on the part of the program, but had no built in framework for contextualizing events. Directives on how to interact were provided by "scripts", written originally in MAD-Slip.

ELIZA's creator, Weizenbaum, regarded the program as a method to show the superficiality of communication between man and machine, but was surprised by the number of individuals who attributed human-like feelings to the computer program, including Weizenbaum secretary. Many academics believed that the program would be able to positively influence the lives of many people, particularly those suffering from psychological issues, and that it could aid doctors working on such patients' treatment. While ELIZA was capable of engaging in discourse, ELIZA could not converse with true understanding. However, many early users were convinced of ELIZA's intelligence and understanding, despite Weizenbaum insistence to the contrary.

III. HOW DOES A CHATBOT WORK

Chatbots primarily use artificial intelligence to talk to people and give relevant content or suggestions. They can function based on a set of instructions or use machine learning. A chatbot that works based on rules is usually quite limited. That is designed to respond to fixed commands. So, if a person asks it the wrong thing, the bot will not understand what the question means, and therefore, will not provide an appropriate response. The intelligence of the bot solely depends on how it is programmed.

On the other hand, a chatbot that uses machine learning works better because it has an artificial brain. The bot understands not only commands but also language. The user, therefore, does not have to use precise words to get accurate or useful responses. Moreover, the bot learns from interactions it has with users and can deal with similar situations.

IV. COLLEGE ASSISTANCE

"Every college needs a campus guide."

The use of chatbots in engineering college helps the student in getting instant replies help for their queries.

"What is the fee structure of college?"

"What are the branches available in college?"

"What are the academic requirements to qualify for the college?"

At the start of any academic year, newly enrolled students have a long list of questions. "When does the library open?"

"Where do I go for my AI class?" "How do I sign up for the cricket club?"

Usually, new students try and look for a faculty member for information, or work up the courage to ask a senior. What this means is that at the beginning of every academic year, the college faculty and staff members are burdened with the additional responsibility of showing new students the ropes and answering the same bunch of questions.

This is precisely why college needs campus guides and College enquiry chatbot development has created the perfect solution.

Over the past few years, leading colleges and universities around the world have been building College enquiry chatbots for their websites. These chatbots are able to function as round-the-clock campus guides, and at a fraction of the cost of hiring multiple human employees. They're also way more accessible than human guides, because students don't need to track them down. All they need to do is open the college website, and type their query into the live chat window. The college enquiry chatbot gives them an instant – and accurate – response. So when the student wants to know if the computer lab is open on weekends, they don't get vague answers like, "Yeah, I think so, but you should check with them."

Instead, the online chatbot tells them, "Yes, the computer lab is opens every day, from 02:30hrs to 05:30hrs. It is also available for use on Sundays, with prior permission from the dean's office."

The whole process can be repeated over and over again, and it'll always be just as effective as the first time.

V. INTERACTION

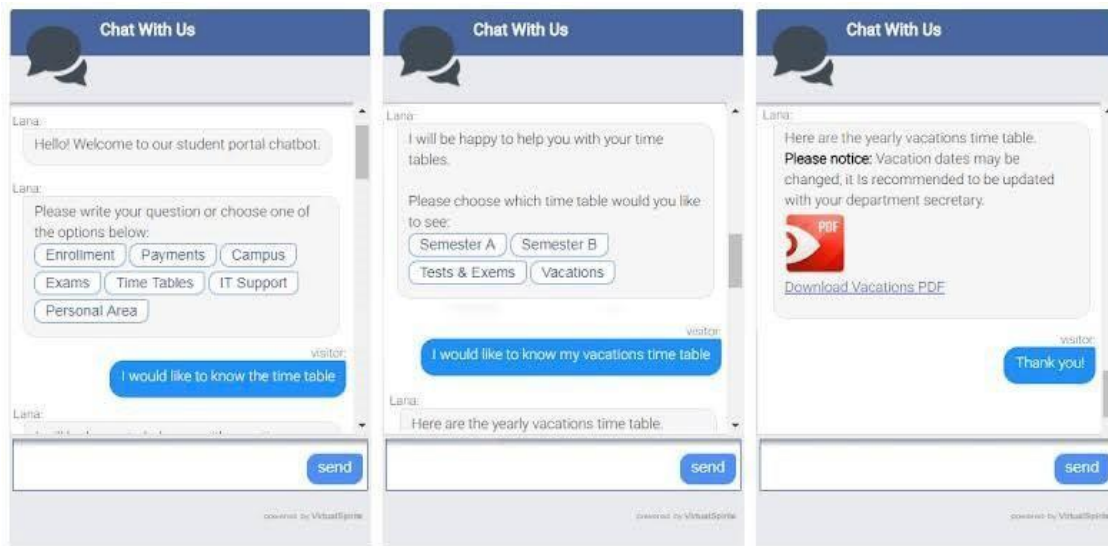


Fig 1: Sample ChatBot

Users primarily interact with the Google Assistant through natural voice, though keyboard input is also supported. In the same nature and manner as Google Now, the Assistant is able to search the Internet, schedule events and alarms, adjust hardware settings on the user's device, and show information from the user's Google account. Google has also announced that the Assistant will be able to identify objects and gather visual information through the device's camera, and support purchasing products and sending money.

Google Assistant, in the nature and manner of Google Now, can search the Internet, schedule events and alarms, adjust hardware settings on the user's device, and show information from the user's Google account. Unlike Google Now, however, the Assistant can engage in a two-way conversation, using Google's natural language processing algorithm. Search results are presented in a card format that users can tap to open the page. In February 2017, Google announced that users of Google Home would be able to shop entirely by voice for products through its Google Express shopping service, with products available from Whole Foods Market, Costco, Walgreens, Pet Smart, and Bed Bath & Beyond at launch, and other retailers added in the following months as new partnerships were formed. Google Assistant can maintain a shopping list; this was previously done within the note taking service Google Keep, but the feature was moved to Google Express and the Google Home app in April 2017, resulting in a severe loss of functionality.

VI. AI AND WEB-BASED HUMAN-LIKE INTERACTIVE UNIVERSITY CHATBOT

The project deals with user's request in form of question-based message and processes it to deliver a desired response in form of message. It solves the process of visiting colleges and gathering related information as per the needs, as it is time consuming. Also, the user can communicate to admin office with telephone number provided but doesn't receive a positive feedback. The project is a web-based chatbot. Graphical User Interface (GUI) is much similar to messaging application, which provides a friendly environment to the user as they are much aware of operating messaging applications. The user types a question and on performing submit, the message is preprocessed and the most relevant information from the database is provided as a response in similar way of messaging. Developing a chatbot solves the problems that can arouse in gathering required information. It can be accessed from anywhere at anytime. In various websites, users are not able to find the required information on website which in turn end up closing the websites, which can be fulfilled by using chatbot.

6.1 Design

The chatbot is also known as “UNIBOT” i.e. “University Chatbot”, the design is shown in Figure. Graphical User Interface (GUI) is an important component of any system. The front- end is developed using HTML, CSS and jQuery. Ajax is used to call and get response from PHP file, whereas, jQuery is used to display the messages to the user.



Fig 2 : Design of UNIBOT

Weizenbaum originally wrote ELIZA in MAD-Slip for the IBM 7094, as a program to make natural-language conversation possible with a computer. To accomplish this, Weizenbaum identified five "fundamental technical problems" for ELIZA to overcome: the identification of critical words, the discovery of a minimal context, the choice of appropriate transformations and the provision of an ending capacity for ELIZA scripts. Weizenbaum solved these problems in his ELIZA program and made ELIZA such that it had no built-in contextual framework or universe of discourse. However, this required ELIZA to have a script of instructions on how to respond to inputs from users. A "keyword" is a word designated as important by the acting ELIZA script, which assigns to each keyword a precedence number, or a RANK, designed by the programmer. If such words are found, they are put into a "key stack", with the keyword of the highest RANK at the top. The input sentence is then manipulated and transformed as the rule associated with the keyword of the highest RANK directs.

For example, when the DOCTOR script encounters words such as "alike" or "same", it would output a message pertaining to similarity, in this case “In what way?”, as these words had high precedence number. This also demonstrates how certain words as dictated by the script, can be manipulated regardless of contextual considerations, such as switching first-person pronouns and second-person pronouns and vice versa, as these too had high precedence numbers. Such words with high precedence numbers are deemed superior to conversational patterns and are treated independently of contextual patterns.

VII. COLLEGE CHATBOT SYSTEM ARCHITECTURE

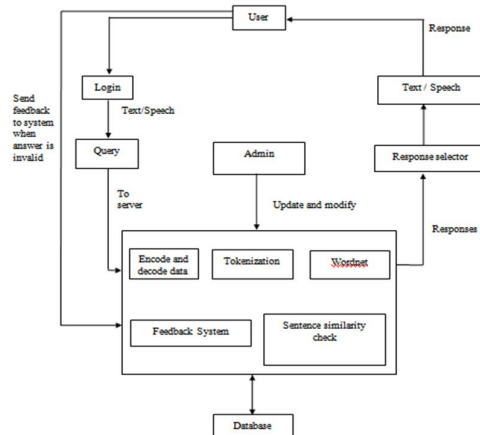


Fig 3: College ChatBot System Architecture

VIII. METHODOLOGY

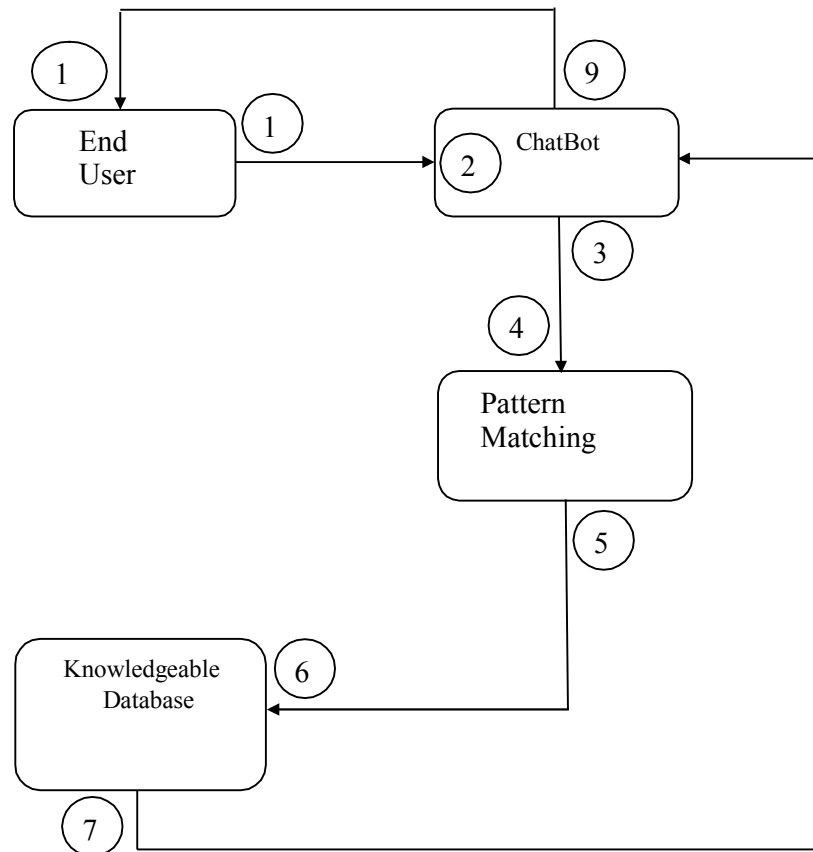


Fig 4 : Overview of algorithm

The functions of the user are to ask queries, provide feedback and so on. All the functions to be performed by the user are outlined above in detail.

Login: After clicking on the chatbot provided in the college website. The chatbot system greets the user and requests the user to provide the mail id. After which the chatbot starts chatting with the user.

Asking Queries: If the user is not satisfied with rule based response, then the chatbot system requests to enter his/her query in words and the suitable response is given

Flowchart for User Module the chatbot. User's query is first checked in database. If the query is valid then suitable response is given to the user. If the query is invalid then chatbot requests user to ask queries regarding the college.

Providing feedback: After the chat, the chatbot takes feedback from the user. Feedback is taken in order to know the users experience with the chatbot. If the user gives feedback positively then the bot thanks the user and provides a box to enter any further queries. If the user gives feedback negatively then bot asks the user to elaborate his/her query in order to respond. Username of the user is also stored and helps admin to track user actions.

IX. FUTURE SCOPE

The project can be integrated with any university or college website. Along with educational information, the chatbot can be extended by providing other relevant information. It will be helpful to students as well as other visitors. Thus, the chatbot can provide a wide range of information as per developer's configuration. Natural Language Processing (NLP) can also be integrated to enhance the chatbot.

OUTCOMES



Fig 5 : Home Page 1

X. CONCLUSION

In this project we made a college specific chatbot system that can be custom fitted to education domain chatbot. The addition of this chatbot system in the college website will make the webpage more user interactive as it responds to the user queries very accurately as it is a domain specific chatbot system. Furthermore we had investigated our college chatbot system design stages and a few different techniques by which the precision of the chatbot system can be made much better. To make the responses given by the chatbot system more meaningful and accurate the administrator has to train the chatbot system with more information regarding to college and increase the scope of knowledge base. Nevertheless, gathering feedback from the potential user can be helpful in developing the college Chatbot system, ultimately servicing the user queries.

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