An Education Chatbot

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ABSTRACT

Students spend more time interacting with digital media than they do with physical media these days, which means that all of the material is accessible online; yet, there is not a suitable ChatBot that provides information about universities. The purpose of this project is to investigate the use of cognitive computing in blended learning settings and report its findings. We offer a modular cognitive agent architecture for instructional question answering that features social conversation (small chat), and it is enhanced for a particular knowledge topic. Students now have access to a personal agent in the form of this system, which was developed to help them learn more about the universities they are interested in attending. We make use of a ChatBot that is equipped with a set of predesigned questions that are reflective of those that the students are most likely to ask. The queries that the students have posed are answered by this ChatBot.

Keywords: Cognitive informatics, educational technology, human-computer interaction, machine learning, natural language processing.

1. INTRODUCTION

The field of cognitive computing has been expanding over the last several years, which has led to an increase in both academic and business interest in the subject [1]. Conversational agents have progressed from basic pattern-based programs into very complicated systems, integrating Natural Language Understanding and Machine Learning Techniques, which have enabled them to be more flexible when it comes to sustaining a conversation. Initially, these conversational agents were limited in their ability to understand human language. Chatbots are becoming more popular as a means for companies to communicate with customers and respond to inquiries and frequently asked questions (FAQs). Natural Language Interface (NLI) promotes user happiness and can help discover the information that is required in a more comfortable manner than other less complex and time-consuming search interfaces [2]. Natural Language Interface (NLI) can help find the information that is needed in a more comfortable way.

Cognitive systems, similar to humans, have the ability to apply their knowledge to derive meaning from input depending on context [3]. When it comes to completing a work like this, a system like this one, which has the benefit of having greater processing capacity, may be even more effective than a person.The insights that these systems give may be helpful, despite the fact that they do not grasp the meaning in the same way that people do. It is anticipated that they will acquire capabilities such as sensing and awareness as they

continue to mature over time [4]. The use of cognitive computing in the development of learning applications has a number of benefits, including the following: (1) They have the potential to actively improve students' performances [5], particularly in computer science classes [6]; (2) the study of cognitive computing behavior can lead to significant results in educational applications, particularly in AI-related research [6]; and (3) the implementation of a cognitive computing layer in students' digital interactions with one another can improve both their performances and the ease with which they complete their assignments.

When compared to more conventional forms of e-learning training, chatbots tend to elicit a more favorable reaction from participants [7]. In addition, there are benefits associated with this kind of education, such as engagement, active learning, and the opportunity to socialize [8].

In spite of these considerations, the educational sector has not yet broadly embraced these technologies, and the ones that have are often more rule-based and, as a result, less practical and useful. This article introduces a chatbot with a modular architecture called Jaicob. It has been tailored to the study of Data Science approaches, and its goal is to make use of all of the advantages for education that have been presented earlier. It is constructed in a modular fashion, which makes it possible for it to be adapted to different fields of expertise. It is simple to maintain and comes with a dialogue process that can be adjusted to suit your needs. This work has been reviewed in a Data Science class with actual users, focusing on a particular use case for the contribution. The remaining parts of the article are structured as described below. In the second section, we examine comparable works that discuss chatbots and the methodologies that were used in their creation. The many components of the architecture are discussed in Section III, along with their respective connections to one another. The assessment procedure as well as the outcomes are discussed in Section IV. In the last section, "Section V," a summary of the article's findings, including conclusions and a discussion of future efforts, is presented.

2. LITERATURE SURVEY

This latest study [9] offers an in-depth analysis and a systematically complete overview of the use of chatbots in educational settings. Following the theoretical paradigm of Technology-Mediated Learning (TML), the authors define three approaches for examining existing research [10], including structure (input), learning process (process), and learning output. (output). Regarding the input viewpoint, a few different factors have been recognized [9]: the student profile, the educational environment, and the chatbot technology.

The outputs of learning are dependent on the specific features of each student, such as their personality traits, technical abilities, as well as their educational and social background [9].

It has been suggested in a number of study studies that the chatbot technology would be so disruptive that it will do away with the need for websites and applications [11]. There are a variety of educational applications for chatbots, including language learning [12], health-related coaching agents [13], chatbots meant to provide feedback to students [14], learning programming language [15], providing administrative help [16], and increasing students' motivation [17].

These are some instances if we don't take into consideration open-domain solutions like Amazon's or Google's [18], which attempt to provide a response to any sort of inquiry rather than a particular topic of expertise. Despite the fact that these kinds of chatbots are breathtakingly ambitious and can work with an accuracy that is almost on par with that of humans, they may often come at a very steep cost. Closed-domain question answering systems have the advantage of being able to reply with deeper and more particular information [19], and they also have the capacity to achieve excellent quality at a reduced complexity cost. Certain characteristics of chatbot designs have the potential to impact how they are taught. Flow-based chatbots, such as [20]–[22], also known as rule-based chatbots, might need a huge database of questions and answers. They also need to have a clear flow of communication, which can result in a negative experience for the user if they choose not to follow the flow. A research on chatbots of this kind [23] came to the conclusion that they are very dependent on human guidance and control. It is possible to construct them using frameworks such as Landbot.ai,

1 or with rudimentary coding talents; nevertheless, in order for them to function successfully, a high level of complexity is required. There in resides one of its primary limits. Button-based bots, such as the one used by HelloFresh2, are an evolution of this kind of bot that eliminates the chance of the user departing from the pre-planned flow. These strategies may be effective, but their breadth and depth may be somewhat restricted.

On the other hand, chatbots powered by artificial intelligence can comprehend the intentions of students more effectively. Even the simplest non-rule-based approaches for natural language processing 1https://landbot.io and 2https://chatfuel.com/bot/HelloFreshus perform much better than the most meticulously built rule-based systems [24]. The reason for this is because, owing to the methods of machine learning, they are able to obtain a more thorough comprehension of both the purpose and the information that is being sought [25]. Intent-entity and Knowledge Base are the foundations of the methodology [26] that is considered to be the most common and successful method, which is discussed in further depth in Section III. (KB). One last thing to take into consideration is whether or not they are text-based or voice-based. Users have a tendency to utilize more complete phrases when interacting with voice-based chatbots, and they enjoy reading enlarged replies in a way that is similar to reading text. Text-based and voice-based chatbots, on the other hand, are not significantly different from one another in terms of their perceived efficacy, learnability, and humanness [27].

3.PROPOSED SYSTEM

The conversational virtual assistants known as chat bots are responsible for automating users' interactions with the system. Chat bots are driven by artificial intelligence, which use methods from machine learning in order to comprehend natural language. The primary purpose of the article is to be of assistance to the users with reference to some basic health facts. When the user first enters the website, they are prompted to register themselves, and they are then given the ability to ask the bot questions. In the event that the question cannot be answered by the information included in the database, the system will consult an expert system. In this section, the subject matter experts should also register

themselves by providing a variety of information. The information gathered by the chatbot is saved in the database in the form of pattern-template combinations. In this instance, SQL is utilized for the management of the database.

4. RESULTS

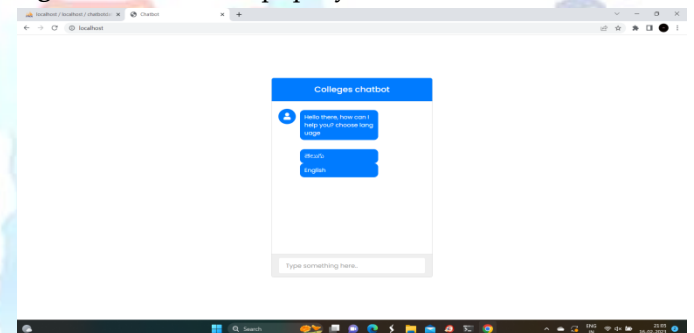**Figure 1:** Data in the phpMyAdmin

Figure 2: Final output of Chatbot

5. CONCLUSIONS:

This paper presents a proposal for an improved version of the chatbot system. The level of accuracy of this project is far higher than that of any prior effort. It includes extra functionality than prior initiatives, such as the ability to change languages and the provision of information through photographs. It would be beneficial for students who want to know what stream they need to pick after finishing a certain degree and what universities are ideal for them to apply to depending on their rank. Despite the fact that the first chatbots were built sixty years ago, the field has continued to evolve and bring new and intriguing difficulties. To overcome these gaps, models that are more compact, versatile, and reliant on fewer domains might be advantageous. A number of different models are dependent on human review, despite the fact that human evaluation is costly,

time-consuming, difficult to scale, biased, and devoid of coherence. To get beyond these limitations, a fresh and dependable method of automated assessment should be developed. In addition, recent research has shown that there is a dearth of data on the most current advancements in language models that may be used in chatbots such as Transformers. As a consequence of this, it is really important to investigate and investigate the data that was utilized to educate the different models. The outcomes of the various models may be compared and contrasted with greater precision thanks to this sort of investigation. In point of fact, it is difficult to differentiate between the applications of chatbots and the social or companion chatbots that are available.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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