Intellectual Interactive System (a case study of NMIT)

Dr. Nalini N[1], Karthik P S[2], Nikhil Raj Koti L[3]

[1]Professor, Department of CSE, Nitte Meenakshi Institute of Technology, Bengaluru
[2]Student, Department of CSE, Nitte Meenakshi Institute of Technology, Bengaluru
[3]Student, Department of CSE, Nitte Meenakshi Institute of Technology, Bengaluru

ABSTRACT

Many individuals nowadays use smart phones with a plethora of new applications, demonstrating that technology is rapidly evolving. A chat bot contains information in its database that allows it to recognize phrases and make decisions on its own in response to a question. The college inquiry chat bot will be created using an algorithm that analyses questions and comprehends the messages of users. RASA is used to create this conversation bot. Rasa is a two-part open-source platform for creating AI bots that consists of Rasa NLU and Rasa core. Rasa core is the component that manages the framework's conversation engine and aids in the creation of more complicated chatbots with customization. Rasa's NLU provides developers with the technology and tools they need to capture and analyse user input, as well as determine intent and entities. To create a College Enquiry Chatbot that can answer students' questions in a matter of minutes. Rasa and Python 3.6 or above are software prerequisites. The goal is to create a chatbot that can answer questions from students, search for answers, and provide solutions. The enquiries will be handled by the Chabot, which will save time and effort for humans.

Keywords: **Rasa framework, Human- computer interaction, college information.**

INTRODUCTION

Students used to have to go to the institution to inquire about facts and other information about the college, which was a time-consuming and tedious process for both parents and students. With the assistance of modern technology advancements, numerous changes have happened in the educational system in recent years. Everything takes place without trouble through the internet. We had to visit that location in those days for filing a modest application as well, however as the days pass, it is gradually changing. Manually collecting applications is a time-consuming process that also requires people. Many gadgets or methods have arisen day by day to reduce that manpower and similar challenges.

An Intellectual Interactive System is a computer-generated person, animal, or other thing that converses with people. This can be a written dialogue, a spoken chat, or even a non-verbal conversation. The dialogue system may be used on local computers and phones, although it is usually accessible over the internet. A dialogue system is often thought of as an engaging software entity that humans can communicate with. It has the potential to be fascinating, motivating, and engaging. It may be found in a variety of places, from old HTML pages to new complex social networking websites, and from traditional desktops to trendy smart mobile gadgets. Dialogue systems can communicate in nearly any language. Their language (Natural Language Processing, NLP) abilities range from abysmal to brilliant, useful, and amusing. The same can be said of their visual style; at times, it resembles a child's drawing, but on the other hand, there are photo-realistic 3D animated figures available that are difficult to identify from humans.

2. RELATED WORK

The literature review is crucial because it explains how the planned study relates to previous statistical research. It demonstrates the uniqueness and importance of your research topic. Your research is distinct from that of other statisticians. It explains the methods you want to use.

A dialogue is a discourse between two or more agents, which might be humans or machines. Human-human dialogue and human-computer dialogue are the two main areas of dialogue research. The latter is a participant in a Dialogue System, a computerized system designed to engage with humans in natural language. Dialogue systems are evolving now in text, graphical, spoken, and multimodal systems.

Let us see an approach to this given by Ms.Ch. Lavanya Susanna [1]. A student chatbot project is created with the help of codeigniter, a php framework that analyses user queries and interprets user messages. If student or any other user provides input to the Chatbot then that input will be stored in the database, the answer related to the query will be displayed to the user. The entire background process will be done by the admin. The answers are relevant to the user's query. If the responses are discovered to be invalid or inaccessible, the queries are saved in the unrequited table, which is effectively created by the administrator.

In the next paper [2] submitted by Emanuele Haller and Traian Rebedea, many apps have a human appearance and seek to replicate human interaction, although in most situations, the conversational bot's information is maintained in a database established by a human expert. However, only a few people have looked at the feasibility of creating a chat-bot with an artificial personality and character utilizing online pages or plain text about a certain individual. This study offers a method for finding the most significant facts in texts describing a historical figure's life (including personality) in order to develop a conversational agent that might be utilized in middle-school CSCL situations.

This paper [3] proposes a revolutionary Java-implemented basic agent system for teaching introductory artificial intelligence (AI). The proposed agent framework's simplicity, a necessary feature for a tool aimed at teaching programming to beginners. This system is functioned only by specified organizations and only for educational purposes and nothing else. The simple agent framework (SAF) includes the ideas of concurrency, multiagency, and persistency and facilitates the construction of intelligent agent applications targeted at monitoring, collecting, and filtering relevant data from the internet. It lacks an object-oriented database and a system for making remote procedure calls because these features are not required for the creation of the intelligent agent applications in issue.

Similar to the previous paper, the new approach done by Tarun Lalwani and team [4], they proposed a method using artificial intelligence (AI). The method primarily does interaction with humans through three parts: context identification, AIML processes and query processing. Once the user is satisfied with the response of bot and does not wish to chat further, he/she has the option to log out of the system or simply exit.

This paper [5] provides a comprehensive assessment of currently accessible datasets suitable for data-driven dialogue system research, development, and evaluation. In addition to the datasets, this paper provided an overview of previous work on learning conversation system components and system strategies using various approaches, ranging from dialogue act categorization and state tracking models to full generative response and user simulation models.

We presented an interactive e-learning system with speech recognition approach [6] done by Sayaka Minewaki and Kazutaka Shimada. For technical college students, the work consists of exercises in Microsoft Excel functions. The proposed system was based on a five-stage state transition model. In the transition model, there were 186 states in the current system. They demonstrated that our system outperformed a self-instructional training strategy in the qualitative evaluation. They also looked at the kids' abilities to communicate. When a user's inquiry was ambiguous, we were able to increase the quality of our system by displaying question patterns.

The technology [8] allows users to access functionality from several apps on a single platform. Without any human participation, the program will function and provide profile management. The Time, Call, and Location based Reminders in this program will ensure that the user does not miss any critical chores in their daily routine by allowing them to keep track of everything. It would include Profile management, Reminders, and other features to help users with their daily duties.

This concept outlines the framework of the Next-Generation of Virtual Personal Assistants [9], which is a new VPAs system that is meant to speak with humans and has a logical structure. Speech, pictures, video, gestures, and other means of communication were employed in both the input and output channels of this VPAs system. The VPAs system will also be utilized to improve user-computer interaction by incorporating technologies like gesture recognition, image/video recognition, speech recognition, and the Knowledge Base. Furthermore, by utilizing the extensive discussion knowledge base, this system may facilitate a lengthy interaction with consumers.

PARI was created to assist Native Americans, particularly blind people, using voice commands. Personal Assistant with Voice Recognition Intelligence [10] can also recognize voice instructions without the use of an internet connection. PARI includes a number of mobile device features, including network connection and application management using voice commands. Contains essential functions such as Voice Pattern Detection, Keyword Learning, and others that assist end users use different mobile device functionality and services.

The College Enquiry Chatbot [11] was created with Rasa, an open-source platform that provides excellent functionality and an NLP toolset with its Rasa stack. It helps to concentrate, develop, and add various capabilities to Chatbot by making the deployment and server building process easier. As a result, Chatbot becomes completer and more intuitive to use. With the right setup, we can perform a good job at intent extraction and dialogue management to keep the user engaged in the conversation even with less data. This chatbot will not only help students find answers to their questions, but it will also help the school provide courses that are in high demand, track current trends, and manage intake seats accordingly.

Based on the excellent results from each assessment measure, the chatbot [12] was able to deliver the best performance in terms of intent class, entity class detection, and suitable answers from the chatbot's conversation policy. The dataset has room for improvement; we may add more training instances to improve the bot's accuracy in classifying a wide range of user remarks. We can also add new features, as the current bot only answers questions about timetables and syllabuses.

3. PROPOSED WORK
In this chapter we will be seeing the mathematical model, System Architecture of the project.

A. Mathematical model

Module 1: Bag of Words: A. Mathematical Model

BoW is a method of extracting characteristics/features from text for use in developing models, such as machine learning algorithms. The method is simple and adaptable. BoW is a word representation that consists of two parts: a document of known words and a frequency of known words. The difficulty of the BoW arises from how we manage both constructing the vocabulary of known terms and occurrences of known words. The first phase is to collect data, the second is to develop the vocabulary, and the third step is to create the document vector.

Collecting data is the first step. It may be any data provided by the user, and each line can be treated as a separate document.

Step 2: Creating a vocabulary list: We can compile a list of all the unique terms, ignoring case and punctuation, and store it in the model vocabulary.

Step 3: Creating a vector version of the document We examine the frequency of words in each text in this stage, and the main purpose is to convert each word into a vector so that it may be readily utilized as an input to subsequent machine learning methods. The simplest method of scoring is to assign a Boolean value to the existence of words, with 0 indicating absence and 1 indicating present and then convert it into a binary.

Conditional Randomness (Module 2) Fields are a type of discriminative model that may be used to predict sequences. They employ prior labels' contextual information to increase the amount of data the model has to produce a decent prediction.

B. SystemArchitecture
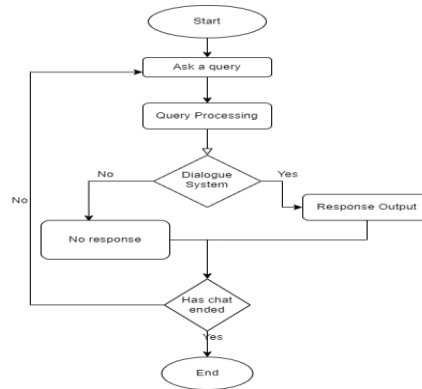The fig.1 shows the methodology of the proposed project.

Fig. 1 Flowchart of Intellectual Interactive System

The fig.1 explains the full system's procedure; the user starts to ask the query; the query will be processed to find keywords in the query. The answers to the query will be responded back to user. Later, the user may ask other queries or end the chat.

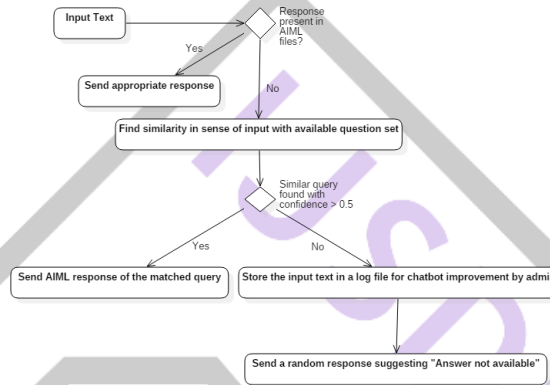The fig.2 shows the activity diagram of the proposed project

Fig. 2 Activity diagram of Intellectual Interactive System

From the activity diagram Fig 2, it is clear that, if student or any other user provides input to the system, then that input will be stored in the database and the query will be processed to match the appropriate answer in the database, the answer related to the query will be displayed to the user. If the answer is not available in the database, then it displays Answer not available. The entire background process will be done by the admin.

4. EXPERIMENTAL RESULTS & ANALYSIS

Algorithm:
Step1:Tokenizers:
The first stage is to break down an utterance into tokens, which are smaller bits of text. This must happen before text can be featured for machine learning, which is why a tokenizer is normally included first in a pipeline.

Step2:Featurizers
Machine learning models use Featurizers to produce numeric features.

Step3:IntentClassifiers
We can give it to an intent classification model once we've created features for all of the tokens and the complete phrase. Rasa's DIET model, which can handle both intent categorization and entity extraction, is recommended. It can also learn from both token- and sentence-level characteristics.

Step 4: Extracting Entities

Despite the fact that DIET can learn to detect entities, we don't necessarily advocate utilizing it for every form of object. Entities that follow a regular pattern, such as phone numbers, do not require an algorithm to be detected. Instead, you may use a RegexEntityExtractor to handle it.
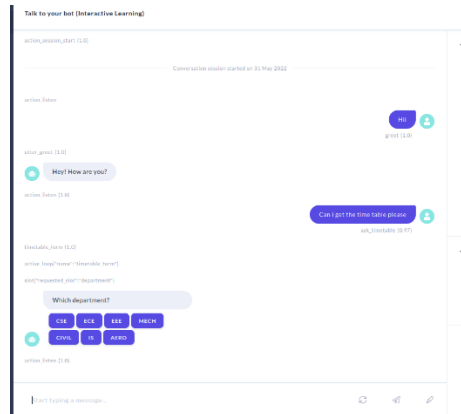
Results and Screenshots:

Fig 3. Timetable option

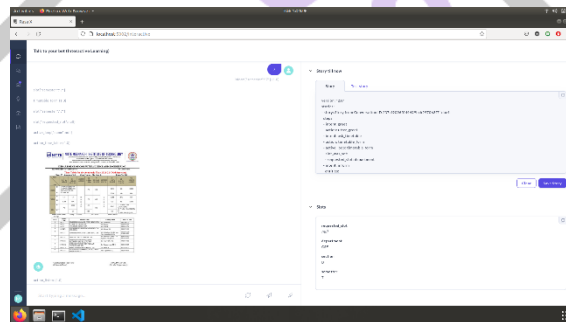In the above fig 3, we can get timetable of particular sections of various departments.

Fig 4. Timetable of 7th Sem

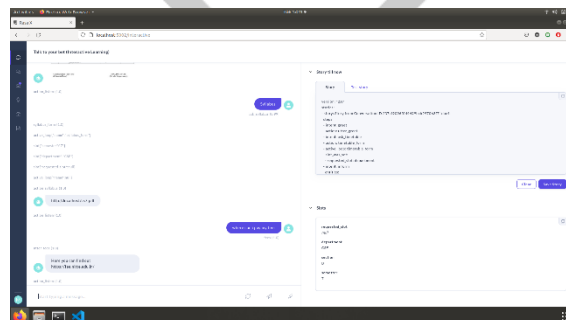Here in fig 4, we have got timetable of 7th Sem c sec of cse department.

Fig 5. Fees payment option

Here in fig 5, we have provided the link for the users to pay the particular fees.

CONCLUSION AND FUTURE SCOPE

The project's major goals were to create an algorithm that would be able to recognize answers to questions supplied by users. The conversation bot provides rapid and effective responses to questions and obtains important connections to their query. The system's purpose is to keep students up to speed on what's going on at their campus. The main intension of this project is to lessen the workload of the college's office personnel and the time it takes to respond to a user's enquiry.

5. REFERENCES

[1] "COLLEGE ENQUIRY CHATBOT", Ms.Ch. Lavanya Susanna, R Pratyusha1, P Swathi2, P. Rishi Krishna3, V. Sai Pradeep4. International Research Journal of Engineering and Technology (IRJET) Volume: 07 Issue: 3 | Mar 2020

[2]. "Designing a Chat-bot that Simulates an Historical Figure", Emanuela Haller, Traian Rebedea, IEEE Conference Publications, July 2013.

[3]. "Teaching Introductory Artificial Intelligence Using a simple Agent Framework", Maja Pantic, Reinier Zwitserloot, and Robbert Jan Grootjans, , IEEE Transactions On Education, Vol. 48, No. 3, August 2005.

[4]. Implementation of a Chatbot System using AI and NLP Tarun Lalwani, Shashank Bhalotia, Ashish Pal, Shreya Bisen, Vasundhara Rathod International Journal of Innovative Research in Computer Science & Technology (IJIRCST) Volume-6, Issue-3, May 2018

[5]. A Survey of Available Corpora For Building Data-Driven Dialogue Systems, Iulian Vlad Serban fIULIAN.VLAD.SERBANg , AT UMONTREAL DOT CA DIRO, Universit´e de Montr´eal

[6]. "Developing of Interactive e-Learning, System with Dialogue", Sayaka Minewaki, Kazutaka Shimada 2012 IEEE/ACIS 11th International Conference on Computer and Information Science

[7]. A Systematic Literature Review of Intelligent Tutoring Systems With Dialogue in Natural Language IEEE/ACIS date of publication September 3, 2020.

[8] Smart Personal Assistant using Machine Learning, Prajyot Mane *, Shubham Sonone, (ICECDS-2017).

[9] Next-Generation of Virtual Personal Assistants (Microsoft Cortana,

Apple Siri, Amazon Alexa and Google Home), Veton Këpuska, Gamal Bohouta, IEEE, Jan,2018

[10] Personal Assistant with Voice Recognition Intelligence,Dr. Kshama V. Kulhalli, Dr.Kotrappa Sirbi, Volume 10,Number 1 (2017) © International Research Publication House

[11] S. Meshram, N. Naik, M. VR, T. More and S. Kharche, "College Enquiry Chatbot using Rasa Framework," 2021 Asian Conference on Innovation in Technology (ASIANCON), 2021, pp. 1-8, doi: 10.1109/ASIANCON51346.2021.9544650.

[12] T. Dinesh, A. M. R, T. T. Newton and S. G. R, "AI Bot for Academic Schedules using Rasa," 2021 International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems (ICSES), 2021, pp. 1-6, doi: 10.1109/ICSES52305.2021.96337