Educational Chat Bot Using Rasa

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Abstract: A chatbot is a software that is used to develop interaction between a user/human and a computer/system in a natural language like human chats. Chatbots chat with the user in a discussion according to the input of a human and answer to the user. It makes the user think that it is chatting with a human being where as they're chatting with the computer. The chat bot application helps the student to know about the admission process of the college from anywhere with internet connection and receive fast replies. This chatbot system reduces the work of admission process department by providing the required information to the students or parents and also reduces the workload of the department to keep on answering all the queries of the students.

I. INTRODUCTION

A chatbot is a computer software that helps in developing a conversation with the user in a natural way. The continuous development of Information Technology and communication has made artificial intelligence more complex. Artificial Intelligence systems are using human activities such as taking a decision at a particular moment, performing day to day tasks, replying to the users quickly and solving the queries in the same way as the humans would do. There are numerous electronic organizations like E-business, Entertainment, Virtual assistance and some more. Everything in this generation is getting related with the web. It's extremely efficient to utilize approach to manage benefit everything at your doorstep. The chatbots are sufficient to fool the users in believing that they're talking to a human being, they've a very limited knowledge base at runtime and have no means to keep track of all the conversations. Chatbots uses machine learning to reach AI for helping them to understand the user queries/doubts and provide the user with an appropriate response. They are developed using the Natural Language Processing for communicating or interacting with the user. Chatbots are often known as answering engines. This application 0n work in a very simple way because the knowledge is already programmed in advance. Few methods used in the application are pattern-matching, natural language processing and data mining. Chatbot matches the input sentence from the user with the that of the existed pattern in the knowledge base. Each pattern taken is compared with the knowledge of chatbot and this knowledge has been taken from various sources.

II. LITERATURE SURVEY

This section of this study explains the project's conceptual justification, commencing with a description of Natural Language Processing and deep learning and probabilistic models, relevant surveys, and challenges faced by sight-challenged individuals.

The first era of this technology concentrated on short task-oriented dialogue [1], such as music playback (e.g."Alexa, play music") or information retrieval. The current challenge in this area is to maintain a continuous, coherent, and attractive dialogue, as current software is still far from being capable of natural everyday conversations with humans.

The E. Kasthuri and S. Balaji [2] discuss the advantages of using chatbot in education. This model refers to, how students and teachers can both use chatbot. Teachers would train the chatbot with predefine set of questions and answers and thus when students ask questions the chatbot can respond with the exact answer of the asked question. The authors have used Natural Language Understanding and DL for the development of this model. The drawback of this model is that it can answer only a defined set of questions and is not interactive.

The authors [3] analyzed Rasa platform in detail and based on that they built a chatbot integrating with API and database. However, this system was built using basic capabilities of Rasa platform, without using the advanced functionality of the platform.

Prof. Ram Manoj Sharma [4] proposed a college enquiry chatbot system which has been built by using Artificial Intelligence algorithms. The bot learns from user's query and extract important features from user messages. The system has modules like online chatbot, online Notice boards etc [4].

Natural language processing (NLP) is a technique used for understanding natural language i.e. human language [5]. To understand human language, the machine needs to separate the whole text into paragraphs, sentences, and words. It should recognize the relationships between the different words, extract the exact meaning from the text, and understand sentences [6].

The Authors introduce [7] a chatbot which can answer all frequently asked questions (FAQ's) is designed. The model uses neural network Sequence to Sequence model based on RNN encoder decoder. Major disadvantage of this model is that it provides less accuracy.

Rasa NLU is used to build a conversational AI. It comprises of modules which contain several NLP and ML libraries in a consistent API system [8].

III. PROBLEM STATEMENT

Taking admission into a new program is a big deal. Major problem faced by students is absence of an enquiry person as well as not getting a solution in real time and waiting for days for getting a response to a simple query.
The best solution to this problem is creating chatbot they are AI based conversational bots which can provide response to student's queries with high accuracy in real time.

The following are the goals:
1) To build a model that takes queries as input from user and interprets the meaning inside it.
2) The objective is to build a chatbot which can give response to users in real time.
3) To develop a system this is available to take user's queries anytime from anywhere.

IV. SYSTEM ARCHITECTURE

- **User**: user sends natural language queries to rasa platform through web interface.
- **Web interface**: It acts as an interface between RASA API and front end, it transfer the user queries
- **Agent**: Agent are the computer servers which can interact with the customer or users and provide responses to users using rasa NLU and core components.
- **Expressions**: Expressions Phrases are the dialogues that people have said when they interact with a bot. Expressions represent a user's desire and they are often present in the form of a question.
- **Intent**: 'Intents' are how a chatbot can understand Expressions. The use of Intents provides an advantage as you don't have to teach your chatbot how to respond to every Expression. Instead, we can just categorize the Expressions into Intents that can be easily handled by bot.
- **Responses**: This is the chatbot's output that aims at satisfying the user's intent.
- **Entities**: 'Entities' are the term which are used for identifying and extracting useful data from natural language inputs.
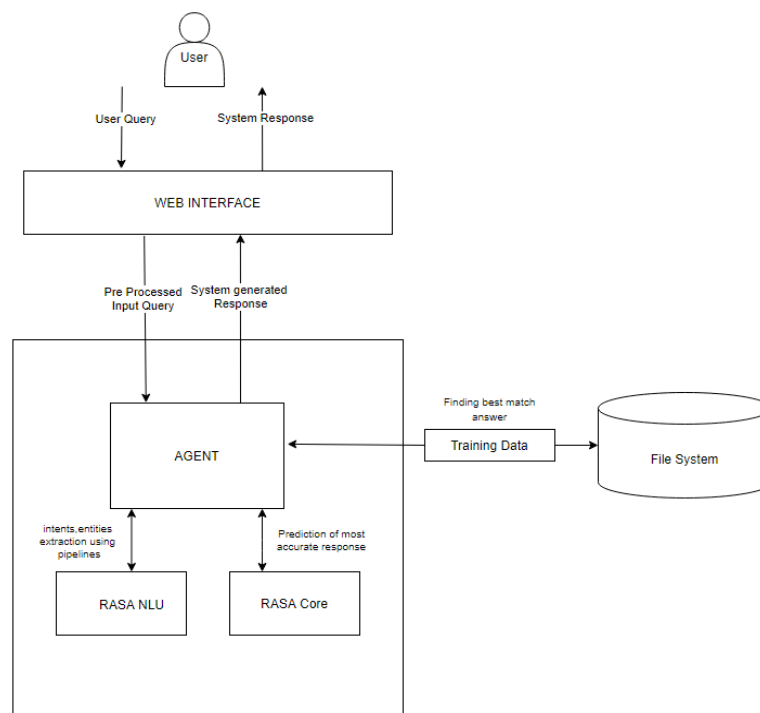
Figure 1: System Architecture

V. METHODOLOGY

For building the required chatbot we have use RASA framework. Rasa provide us

- Easy to integrate and customize

Rasa is an open-source platform that can be used for developing conversational AI chatbot. Open-source platforms are software where source code are present that can be inspected by anyone or one can modify or enhance. As Rasa is open-source it allows the developers to integrate additional features and functionalities as per user's requirements.

- No state machines
A state machine is used to data or instructions that you feed it. It then provides the result as per the instructions. Rasa does not function like a state machine. Rasa being an AI Chabot, it will be conversing with human beings. The conversations will also be acting as data for the Chabot.
- Integrate into existing systems
Another advantage of open-source platforms is that they can be integrated into existing systems without any difficulty.
- Run it on your favorite's
By using Rasa for your AI bot development, there is an option for you to run the chatbot on your preferred platform. Our AI bot can deploy the chatbot application on the cloud easily. Hence, the conversational AI can run on whichever infrastructure user prefer.
- Supports various intents
Using Rasa to develop an AI chatbot will make sure that bot actually understands messages rather than just replying with answers that have been fed to it. It allows to turn free-from text in preferred language into structured data.

Rasa is a tool which is used to build custom AI chatbots using Python and natural language understanding (NLU). Rasa also provides you with a framework for developing AI chatbots that uses natural language understanding (NLU). It also permits the user to train the model and add custom actions. The Dual Intent and Entity Transformer (DIET) model for natural language processing (NLP) is used in RASA. [9]

Rasa Component
Rasa NLU: Rasa NLU is an open-source natural language processing tool that is used in chatbots to classify intent, extract entities, and sentiment analysis. Rasa NLU interprets the user message and extracts intent and entities using the help of various pipelines. Rasa NLU process is done using, custom or prebuilt pipelines which controls the tokenization of the text (i.e., splitting each word as a token), frequency count for the tokenized input text, intent classification, and entity extraction [9]
Natural language understanding is a topic which deals with an interaction between humans and computers. Natural language understanding and natural language generation are the subtopics of natural language processing which handles the unstructured user language and convert it into structured machine understanding language to have the interaction between them. [9]
Rasa Core:Rasa core takes the user's input and generates a response accordingly using various pipelines. It takes the structured input from the NLU and predicts the next best action using a probabilistic model like LSTM neural network. [9]

VI.RESULT ANALYSIS

The proposed system was successfully tested to show its effectiveness and achievability. It reduces the manpower, time of college administrators and paper work. It also reduces the efforts of the students to travel all the way to college for enquiry purposes. In this paper we have a developed a chatbot which will interact with the users and provide all the college related information. The student/parent and the college admin are interacted through a chatbot. The questions which are not answered by the chatbot will be updated by the college admin.
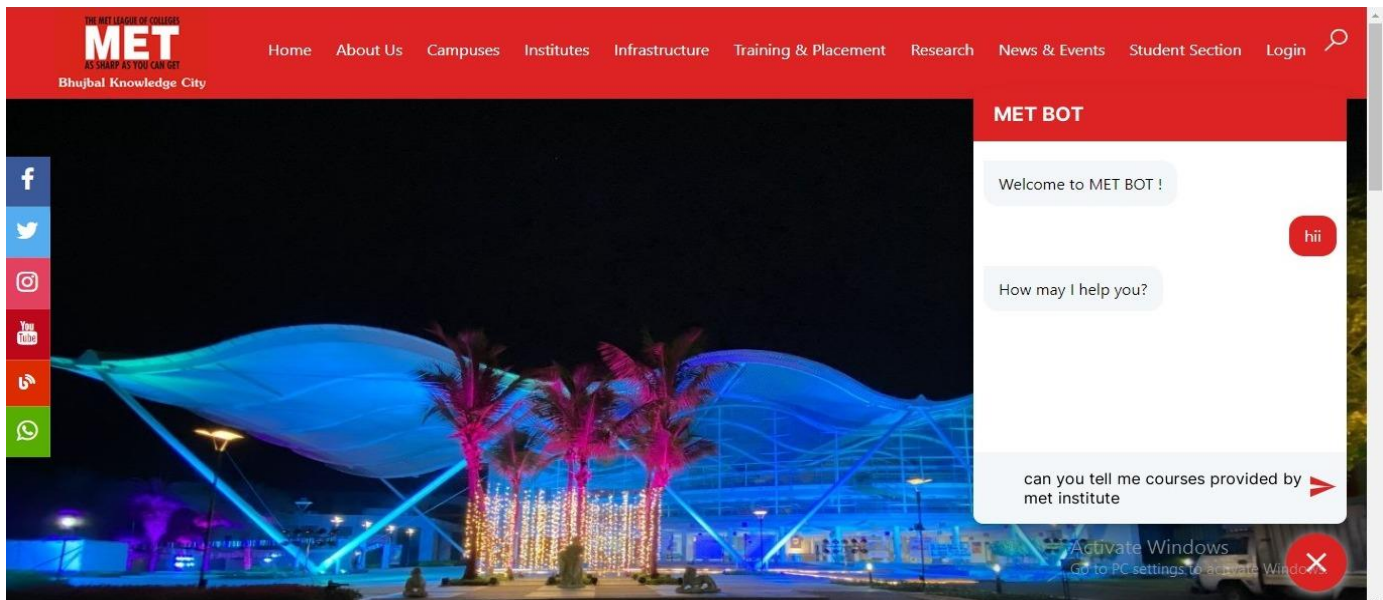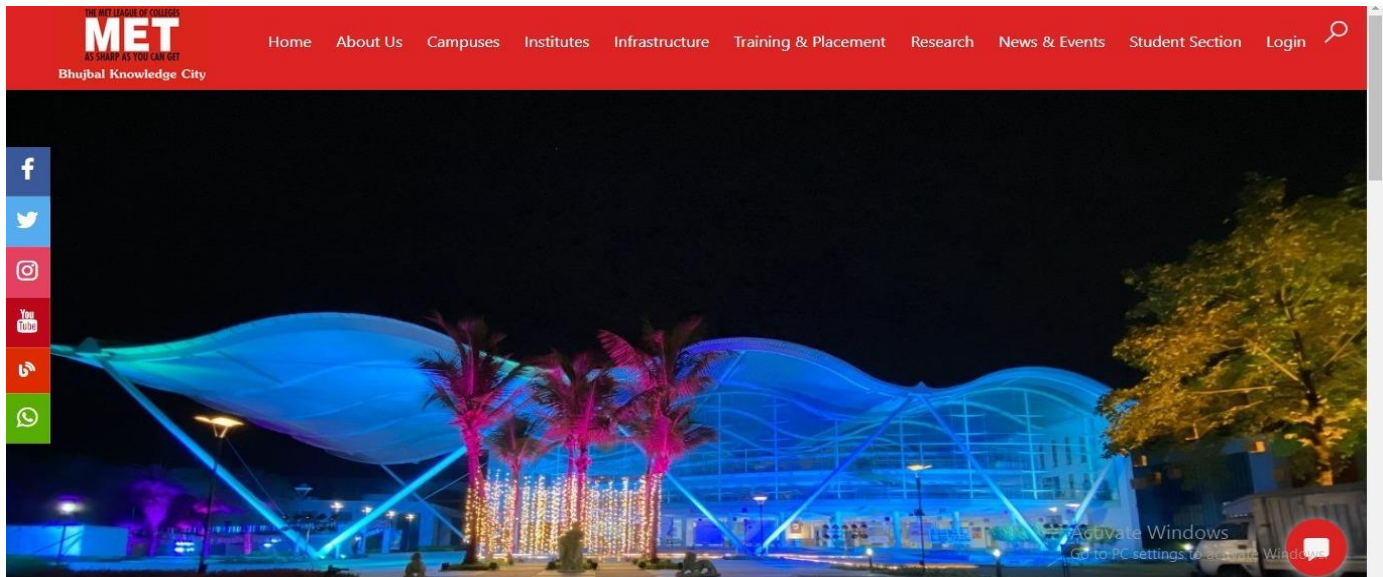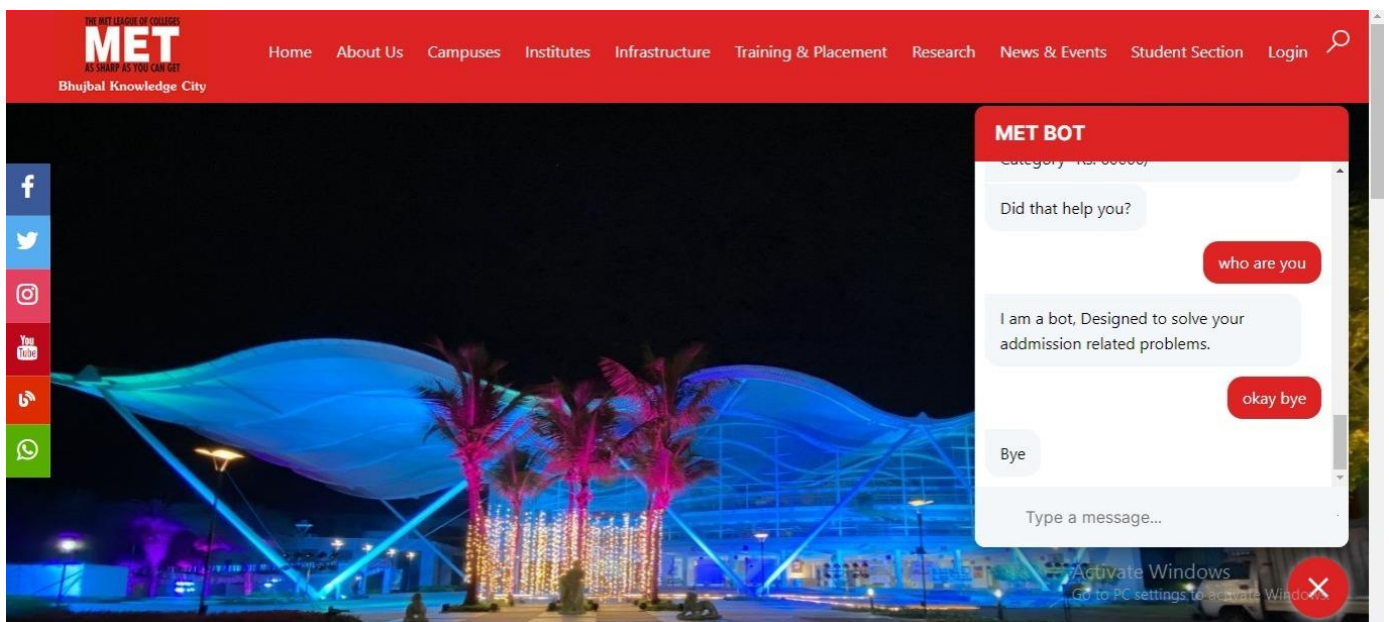
1.After opening the Chatbot it will first greet the user.
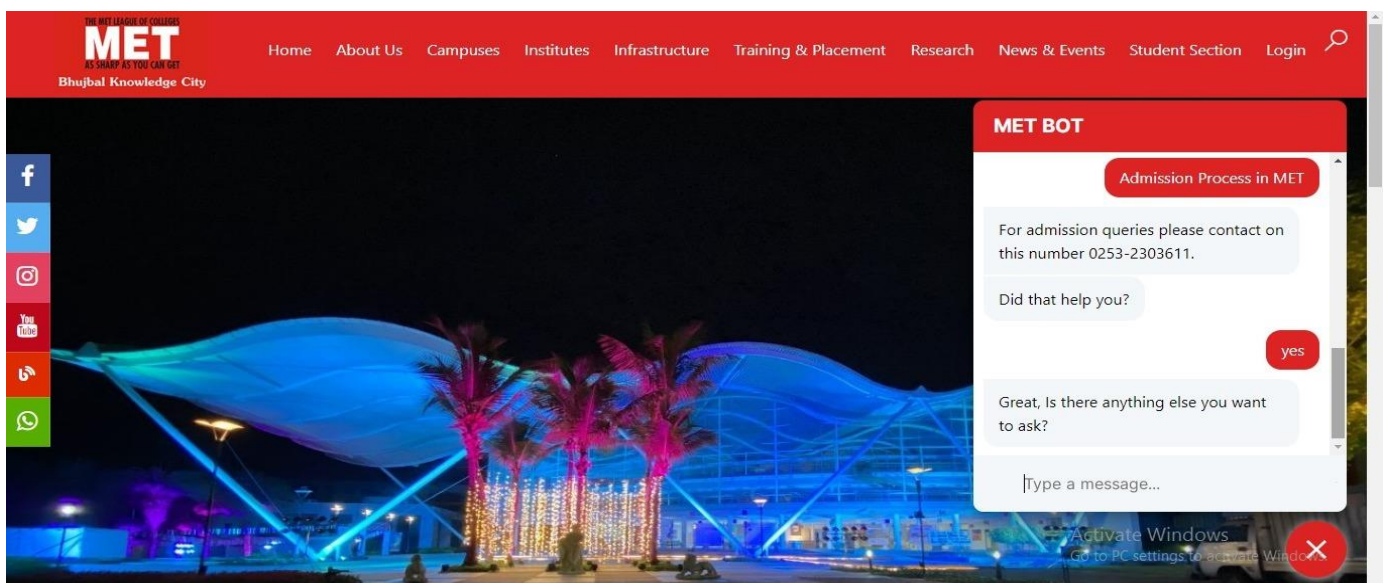
2.user hits the query and chatbot answer accordingly
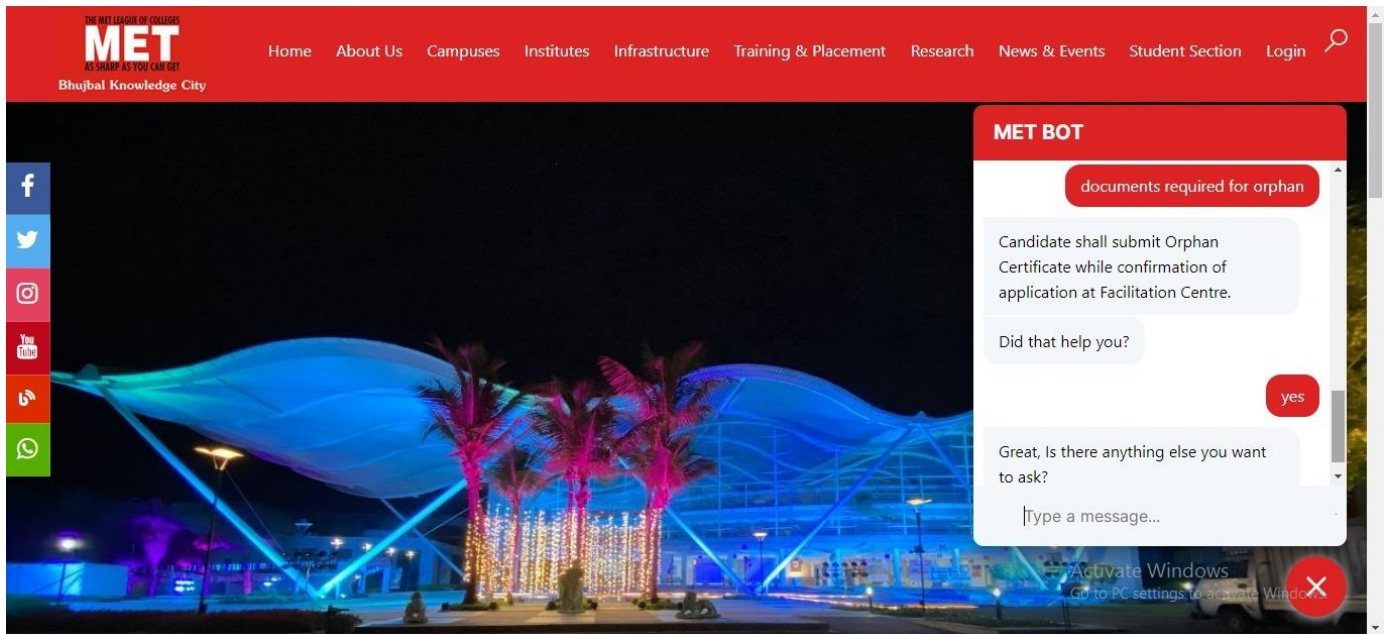
3. Users entered query related to documents and chatbot gives the list of documents.

4.The last Image shows how chatbot exits the conversation with user/student.

VII. FUTURE SCOPE

In the future enhancement of our enquiry chatbot, we can make it more interactive in various languages for users located in different regions. we can include speech-based questions and responses for people who cannot read and type their query. The future chatbot should not only provide the answer but also the solution to the problem of the users.

VIII. APPLICATIONS

- College enquiry chatbot helps students to get the right source of information.
- College enquiry chatbot helps students to get the right source of information.
- AI based Chatbot system can be used by colleges and businesses.

IX. CONCLUSION

The main objective of this chatbot was to develop an algorithm which will identify the user questions or queries and answer according.

To store the fallback queries of users. We successfully developed a chatbot in which the student or parents can ask a query related to the Enquiry process, course details, eligibility criteria description and Admission. The chatbot analyses the question and gives the response accordingly.

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