**Educational Chatbot With Nlp**

**ABSTRACT**

The growth of technologies like Artificial Intelligence (AI), Big Data & Internet of Things (IoT), etc. has marked many advancements in the technological world since the last decade. These technologies have a wide range of applications. One such application is “Chatterbot or “Chatbot”. Chatbots are conversational AIs, which mimics the human while conversing & eliminates the need of human by automating mundane tasks. In the study undertaken, we have created a chatbot in education domain & it is named as “College Chatbot”, This chatbot is a web-based application that analyses and understands user's queries and provides an instant and accurate response. Rasa technology is used to construct this chatbot. It's an open-source technology, which uses its two main packages i.e., Rasa Core & Rasa Natural Language Understanding (NLU) in order to build a Contextual AI Chatbot. NLU is used to infer the intent and to extract the necessary entities from user input & the Rasa Core provides the output by building a probabilistic model with the help of Recurrent Neural Network (RNN). Evaluation of the model is done by getting a confusion matrix and performance measures like Precision, Accuracy & F1 Score which come out to be 0.628, 0.725 and 0.669 respectively on average basis. This chatbot's accuracy, lack of dependability on human resources, 24 x 7 accessibility and low maintenance creates various opportunities for its implementation. This conversational agent can not only be used in educational institutions but also in places where enquiry becomes a tedious task.

**STATEMENT ABOUT THE PROBLEM**

The problem statement for the Educational Chatbot with NLP lies in addressing the limitations of traditional educational systems. Conventional methods often lack personalized assistance and struggle to engage students effectively. This educational chatbot aims to mitigate these challenges by incorporating Natural Language Processing (NLP) to comprehend and respond to user queries. The goal is to provide a dynamic, interactive learning experience, tailored to individual needs. The chatbot seeks to enhance accessibility, promote self-directed learning, and bridge gaps in understanding. The challenge is to develop an intelligent, user-friendly system that complements existing educational frameworks, fostering a more efficient and engaging learning environment.

**WHY IS THE PARTICULAR TOPIC CHOSEN?**

The topic of an Educational Chatbot with NLP is chosen to revolutionize learning experiences. By harnessing Natural Language Processing, the chatbot facilitates personalized, interactive, and efficient educational interactions. It tailors content to individual needs, fosters engagement through conversational interfaces, and enhances comprehension. This innovative approach addresses diverse learning styles, making education more accessible and enjoyable. The aim is to empower learners, foster a deeper understanding of subjects, and ultimately contribute to the evolution of education in the digital era.

**SCOPE:**

The scope of an educational chatbot with Natural Language Processing (NLP) is extensive, revolutionizing the learning experience. Through NLP, the chatbot can comprehend and respond to user queries, providing personalized assistance in real-time. It aids in curriculum navigation, offers instant clarification of concepts, and supports language learning. The chatbot's adaptive capabilities foster engagement, catering to individual learning styles. Additionally, it can assist in assessment and feedback processes, aiding educators in gauging student progress. The scalability of such a system allows integration with diverse educational platforms, making it a versatile tool for enhancing accessibility, efficiency, and the overall quality of education.

**OBJECTIVE OF THE PROJECT:**

The objective of the Educational Chatbot with NLP is to revolutionize the learning experience by leveraging natural language processing (NLP) capabilities. This innovative tool aims to provide personalized and interactive educational support, catering to individual student needs. Through intelligent conversation, the chatbot assists in clarifying concepts, answering queries, and fostering a dynamic learning environment. It adapts to diverse learning styles, enhances engagement, and offers real-time feedback. The primary goal is to augment the educational journey, making it more accessible, efficient, and tailored to each learner. By integrating NLP, the chatbot facilitates seamless communication, fostering a collaborative and responsive educational ecosystem.

**EXISTING SYSTEM**

In the existing system, if any student wants any information like College admissions, How many branches in college, Hostel fee structure, College fee structure, How many seats available for specific branch, About college environment, Available Specializations in a department like Data Science, Machine Learning in CSE , Infrastructure of college like labs, library, College placements, Internships and college professors, Special events that occur in our college i.e. college fests, College extra circular activities updates like annual day, sports events, technical events, Achievements of college, NIRF Ranking, Naas rating to college etc.., they have to go to the collage and meet the collage admin to know the all information about collage and facilities after that they have to go to the admissions. This is the time taking process also performance decreases.

**DISADVANTAGES**

**1. Time-consuming:** Requires physical presence and meetings for obtaining basic information.

**2. Inefficiency:** Manual process hinders quick access to essential details for students.

**3. Administrative burden:** Overloads college staff with repetitive inquiries and tasks.

**4. Lack of convenience:** Students face challenges in accessing real-time updates and information.

**5. Reduced performance:** Cumbersome procedures negatively impact overall system efficiency.

**PROPOSED SYSTEM**

Existing Systems were based on either rule based or neural networks but rasa brings best of both worlds. It uses both rule based engines and neural networks based models to deliver output and produce user-like conversations. In proposed system, the students no need to go to college to get the all information about collage and facilities. The web based Chabot can provide information anywhere anytime with the help of the internet. It takes less time to train as we are using pre-trained neural network and using transfer learning on them.

**ADVANTAGES**

**1. Hybrid Approach:** Integrates rule-based engines and neural networks for optimal performance.

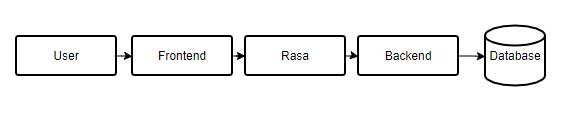
**2. Convenient Accessibility:** Web-based chatbot offers information anytime, anywhere, reducing the need for physical presence.

**3. Time Efficiency:** Utilizes pre-trained neural networks and transfer learning for faster training.

**4. Comprehensive Information:** Provides details on college and facilities without requiring students to visit the campus.

**5. Enhanced User Experience:** Delivers user-like conversations, improving engagement and satisfaction.

**BLOCK DIAGRAM**



**SYSTEM SPECIFICATIONS**

**SOFTWARE REQUIREMENS**

Operating System : Windows 7/8/10

Server side Script : HTML, CSS, Bootstrap & JS

Programming Language : Python

Libraries : Flask, Pandas, Mysql.connector, Os, Smtplib, Numpy

IDE/Workbench : PyCharm, VS-Code

Technology : Python 3.6+

Server Deployment : Xampp Server

Database : MySQL

**HARDWARE REQUIREMENTS**

# Processor - I5/Intel Processor

Hard Disk - 128GB

Key Board - Standard Windows Keyboard

Mouse - Two or Three Button Mouse

Monitor - Any

RAM - 8GB

**MODULES/IMPLEMENTATION**

**Modules:**

**1. User**

Testing

1.1 Send Query:

User will send Query to the system.

1.2 View Query Result:

User will view his query result.

**2. System**

2.1 Take Data:

System will receive data from the user.

2.2 Preprocessing:

The system will undergo for preprocessing.

2.3 Training:

The System will get trained.

2.4 Model:

The system will work based on model.

2.5 Results: The system will deliver the output to the user.