2021 Asian Conference on Innovation in Technology (ASIANCON)
Pune, India. Aug 28-29, 2021

College Enquiry Chatbot using Rasa Framework

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2021 Asian Conference on Innovation in Technology (ASIANCON) | 978-1-7281-8402-9/21/$31.00 ©2021 IEEE | DOI: 10.1109/ASIANCON51346.2021.9544650

***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 Enquiry 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.**

Keywords—Chatbot, AI, Rasa, Rasa NLU, Rasa Core, NLP, Web Application, Enquiry Chatbot

I. INTRODUCTION

Chatbots are software-based applications with embedded knowledge, that aids in stimulating conversations with human users via textual or auditory methods [1-3]. Extending Applications of Chatbots to domains like education has become the need of the hour in today's fast-growing era of technological world [4]. Today, institutes have started designing their own enquiry bots to automate their conversations with the students. These chatbots act as a campus guide by helping the users find an accurate response to their queries.

This paper is based on College enquiry chatbot built using Rasa Framework, made with an objective of helping students with their admission related queries. RASA is an open-source technology, that uses packages like RASA Core & Rasa Natural Language Understanding (NLU) to build a Contextual AI Chatbot [5], [6]. It is known to have significant effect on chatbots and contextual assistants. Rasa makes the chatbot more dynamic as compared to the conventional chatbot as it can understand the user's input and data over a wider domain as compared to the conventional chatbot [5]. Since, it requires less dataset as compared to conventional chatbot the model will take less time to train itself, hence reducing the system complexity.

Rasa framework develops chat-bot with artificial intelligence and has capability to train itself with very less data. Rasa being open-sourced, gives user the scope to customize things according to their needs. Such chatbots can have multiple integrations and can connect number of data sources at a time [7].

II. LITERATURE SURVEY

For the study undertaken we reviewed some papers & have presented them as follow: Introduction of pair of open-source python libraries which are Rasa NLU & Rasa Core, which can be used to build conversational agents is presented in this paper [8]. They curated these libraries so that any person with minimal knowledge of programming can develop a chatbot. They also demonstrated their 'probability of selecting action' part of Rasa Core by asking it some questions. These libraries are still under active development & support for reinforcement learning, making NLU robust to typos and slang, and supporting more languages are some of the topics under development.

A chatbot is developed is developed by the authors D. Prakash [9] which collects data related to student's attendance & marks. This chatbot was created using Rasa platform & user interface is developed using Django. This helper bot is trained to answers queries pertaining to student's academic performance & attendance. This bot provides good accuracy with queries related to student's marks & attendance, but the queries outside this aren't answered with great accuracy. The efficiency of this chatbot can be increased by training it using some complex data & feature like voice recognition can also be implemented.

In [10], a functional framework has been designed for a chatbot, which integrates Rasa NLU & neural networks. Intent Recognition & entity extraction is implemented in this system. The system is developed using two different methods, by Rasa NLU & Neural Networks (RNN). This