INSTENTIA-Chatbot For University

Sethu CS[1], Saranya Sasi[2], Nivedhya T[3], Anjana Suresh[4] ,Akhija Lakshmi R[5]

1,2,3,4B. Tech Students, [5]Assistant Professor

1,2,3,4,5Computer Science and Engineering,

1,2,3,4,5 Kottayam Institute of Technology and Science, Kottayam, India

Abstract- A chatbot is a computer program that can converse with humans using Artificial Intelligence in messaging platforms. Every time the chatbot gets input from the user, it saves input and response which helps chatbot with little initial knowledge to evolve using gathered responses. With increased responses, precision of the chatbot also gets increases. This project will investigate how advancements in Artificial Intelligence and Machine Learning technology are being used to improve many services. This project aimed to implement online chatbot system to assist users who access college website, using tools that expose Artificial Intelligence methods such as Transformers(machine learning model), allowing users to communicate with college chatbot using natural language input and to train chatbot using appropriate Machine Learning methods so it will be able to generate a response. The back end will be created using Djanjo and the front will be created using HTML & CSS.

Index Terms – Machine Learning(ML), Transformers , Artificial Intelligence(AI),

I. INTRODUCTION

Artificial Intelligence (A.I.) deals to create machines that can have human intelligence, with a lot of scope A.I. is now the new trend. Corporates are now trying to replace their human workforce with A.I. Informational chatbots is an integral use of A.I. Nowadays chatbots are trending topic applications that are built using the concept of artificial intelligence. A chatbot is a contrived material that is proposed to mimic humans. A chatbot is a computer program created to stimulate intellectual human language collaboration through text or speech and the aim is to participate in the conversation or to interact in proper chat messages between human assistants through their natural language. A chatbot is quite simply used in any business one has to train the bot by giving user responses. Chatbots are more promising when it arises to educational tenacity. Django is a new and popular framework for Chatbot implementation. The proposed system chatbot is designed using an open-source framework Django using connecting modules. This chatbot would be developed regarding KTU University, this project helps students to know about their college before admission. The students are able to check college details like scholarships, fees details etc... This will also help students o book an appointment for making an meeting at the college.

II. LITERATURE SURVEY

Jung Hoon Lee, Min-Su Jeong[1] presents a chatbot that helps the patients to consult the medical expert anytime without even going to the doctor. This system consist of the dataset that contains various answers to the queries that are related to the health. The Answer Generation module uses a deep learning-based model that generates answers to a query, as learned from the question-answer pairs of the data. The data contains frequently asked questions and their corresponding answers about macular degeneration, as prepared by the ophthalmologist participating in this research. The Context/Answer Selection module is responsible for answering general, factoid questions related to macular degeneration. Patients with no knowledge of the medical field often ask such general, factoid questions to better understand the disease. **Saksham Saraswat, Siddhartha Mishra [2]** In this work they show a chatbot that is capable to answer the queries of students related to college activities. The GALGOBOT proposes to solve various college related queries using various technologies in artificial intelligence. System design of GalgoBot consists of integration of multiple technologies. The system makes use of HTML, CSS, AJAX, jQuery, JavaScript for frontend and PHP, Python for backend. Rasa Framework provides services like Rasa NLU, Rasa Core. These bot services are used to create Galgobot. In addition, chatbot user interface is developed to host the application on the website. Firstly, A website is developed in which the chatbot GUI is built. The website having a login system which allows college student and faculties authorization only. **Prakhar Srivastava, Nishant Singh [3]** They built a diagnosis bot that engages patients in the conversation for their medical query and problems to provides an individualized diagnosis based on their diagnosed manifestation and profile. Their chatbot system is qualified to identify symptoms from user inputs with a standard precision of 65diagnosed symptoms correct symptoms were identified with a recall of 65returned the expected diagnosis for further more operations. This determines that a medical chatbot can provide a somewhat accurate diagnosis to patients with simple symptom analysis and a conversational approach, this suggests that an effective spoken language medical bot could be viable. Moreover, the relative effectiveness of this bot indicates that more proceeds automated medical products may flourish to serve a bigger role in healthcare.

III. METHODOLOGY

Traditional machine learning algorithms, such as decision trees, support vector machines (SVM), logistic regression, and k-nearest neighbors (KNN), are based on statistical and mathematical principles. They rely on manually engineered features extracted from the input data to make predictions. These algorithms often require extensive feature engineering, where domain knowledge is used to select relevant features and transform the input data into a suitable format for the algorithm. Traditional machine learning algorithms are generally efficient and interpretable, making them suitable for small to medium-sized datasets with relatively simple patterns.

Transformers excel at capturing long-range dependencies in sequential data, making them highly effective for tasks such as language translation, sentiment analysis, and text generation. Transformers learn feature representations directly from raw data, eliminating the need for extensive feature engineering efforts. Transformers can be scaled to process large datasets and complex patterns, making them suitable for big data and complex tasks. Traditional machine learning algorithms are often suitable for small to mediumsized datasets with simple patterns, and they are generally interpretable and efficient. On the other hand, transformers excel at capturing long-range dependencies and sequential patterns in large datasets, but they can be computationally expensive and lack interpretability. The choice between traditional machine learning algorithms and transformers depends on the specific problem, dataset size, availability of data, interpretability requirements, and computational resources

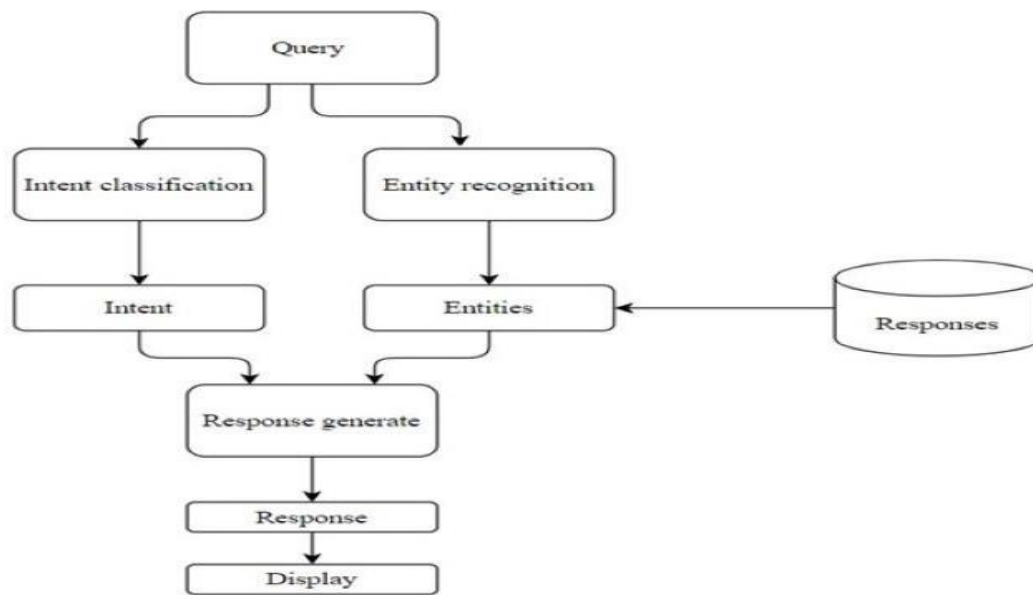*(1) Architecture of Proposed System*

Fig 1: Architecture of Proposed System

The proposed machine learning based chatbots architecture is consciously developed to respond to user queries. In the first phase pre-processing of the query is taken place, the second phase contains the working of transformers, third phase contains the training of dataset, and at last the user interface. Each phase is described in details as follows. In the pre-processing phase the query is being processed and remove errors in the sentences like spelling mistakes, grammars, stop words. This is one of the most important phases in the chatbot which will allow the chatbot to recognize the intent of the user.IN the second phase the working of transformer neural network take place. A transformer neural network can take an input sentence in the form of a sequence of vectors, and converts it into a vector called an encoding, and then decodes it back into another sequence. An important part of the transformer is the attention mechanism. The attention mechanism represents how important other tokens in an input are for the encoding of a given token.

(2) Activity Diagram of Proposed System

An activity diagram is a type of diagram used in software engineering to represent the flow of activities or actions within a system. The diagram consists of a series of rectangles, called" activities," connected by arrows. Each activity represents a specific action or task that needs to be performed, and the arrows show the sequence in which the activities will be performed. Activity diagrams can be useful for understanding the different steps involved in a process, and for identifying potential bottlenecks or inefficiencies in the process. The activity diagram shows four phases of the chatbot user, chatbot, database, natural language processing. User phase shows the whole area that a user can access and jobs that the user is capable of doing in the chatbot. Those include the entering of information, viewing the responses and ending the conversation. This all are the role of user in the chatbot. User is not capable of making any changes in the system. The chatbot classifies the intent and entity recognition this helps the chatbot to understand the intent
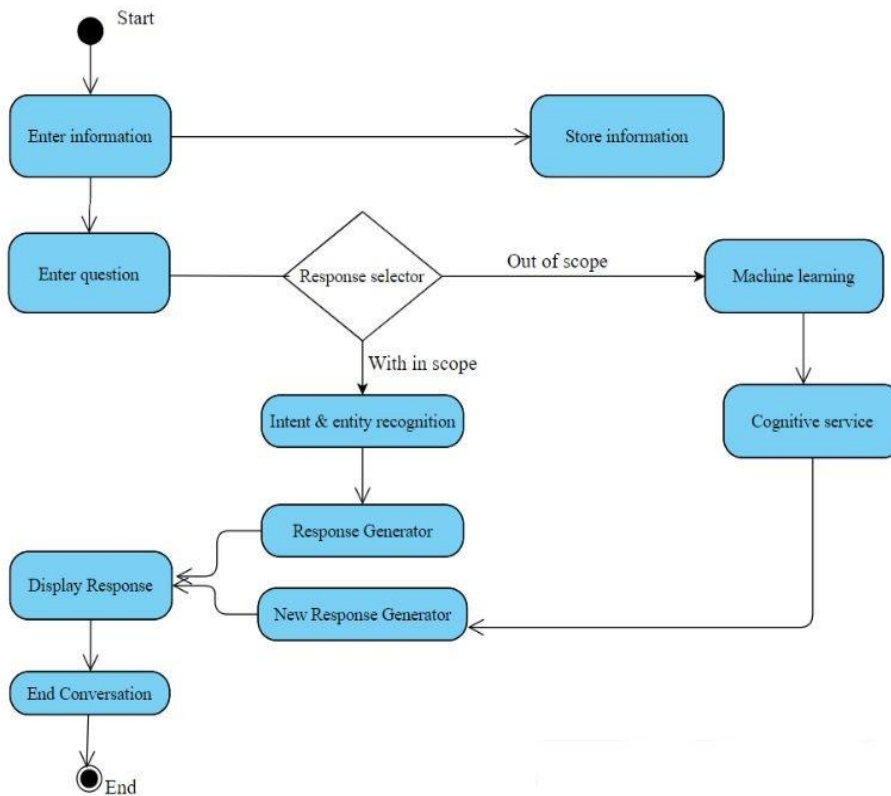
Fid 2: Activity Diagram Of Proposed System

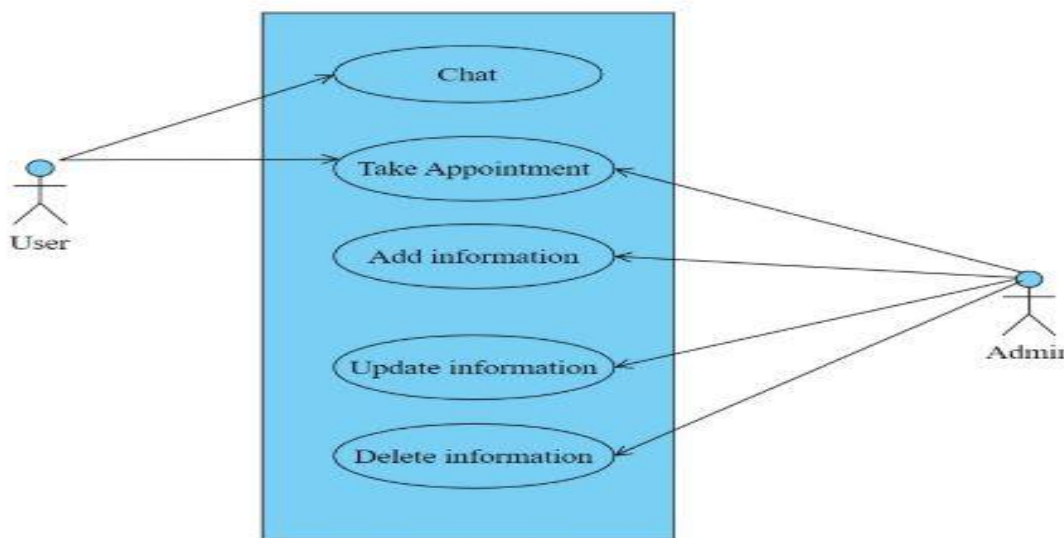*(3) Use Case Diagram of Proposed System*

Fig 3: Use Case Diagram of Proposed System

A use case diagram is a type of diagram used in software engineering to represent the different interactions that a system has with its users. The diagram typically consists of a rectangle, called the" system," with lines connecting it to various" actors," which are people or other systems that interact with the system. Each line represents a different" use case," or a specific way that the actor can interact with the system. Use case diagrams are useful for understanding the different ways that a system can be used, and for identifying the requirements for the system. Here we can see that the user has the access to chat with the chatbot like sending queries to the system. And also, we are providing the user with the access to take an appointment to set an meeting with the college admission officers. The user has only access to these things isnd he or she can't do any changes in volume system. Admin has the access to edit all the system, he is able to see the users' details and queries that didn't get the answer. Admin can add in information, update information and delete information.

IV. IMPLEMENTATION

The chatbot consist of four modules user interface, pre-processing, transformers and training. The User Interface consist of input and output processing which is responsible for which can come in various forms, such as text, voice, or images. It may involve techniques such as natural language processing (NLP) and speech recognition to understand user queries accurately.

Pre-processing involves tokenization, spell checking and correction, stop word removal, stemming and lemmatization, part of speech tagging.

The transformer module in a chatbot is a type of neural network architecture that is used to process natural language input and generate responses. The transformer module is based on the concept of attention, which allows the model to focus on specific parts of the input sequence when generating a response. it consists of an encoder and a decoder, each of which contains multiple layers of self-attention and feed-forward neural networks. Encoder processes the user's input sequence and generates a representation of the input the decoder generates the chatbot's response based on the input representation and a partial sequence of the response generated so far. During the self-attention step, the transformer module calculates a weighted sum of the input sequence based on the similarity between each element in the sequence and a query vector. This allows the model to focus on the most relevant parts of the input when generating the response.

V. RESULT ANALYSIS

This project will investigate how advancements in Artificial Intelligence and Machine Learning technology are being used to improve many services. This project aimed to implement online chatbot system to assist users who access college website, using tools that expose Artificial Intelligence methods such as Natural Language Processing, allowing users to communicate with college chatbot using natural language input and to train chatbot using appropriate Machine Learning methods so it will be able to generate a response. Till now we have done the examining of papers related to our work and have done a abstract design of the project. Through the developed designs we intend to create the chatbot in an effective manner to meet all the needs of students.

VI . REFERENCE

[1] Prof.K.Bala, Mukesh Kumar, SayaliHulawale, SahilPandita,"Chat-Bot For College Management System Using A.I" International Research Journal of Engineering and Technoloy

[2] J. W. Barrett and J. F. Blowey (1997), Naeun Lee, Kirak Kim, Taeseon Yoon, "Implementation of Robot Journalism by Programming Custombot using Tokenization and Custom Tagging" International Conference on Advanc

[3] J. W. Barrett and J. F. Blowey (1999a), Setiaji Bayu, Wibowo Ferry "Chatbot Using a Knowledge in Database: Human-to-Machine Conversation Modeling" 7th International Conference on Intelligent Systems, Modelling and Simulation (ISMS)

[4] Guruswami Hiremath, AishwaryaHajare, PriyankaBhosale, RasikaNanaware, Dr. K. S. Wagh, "Chatbot for education system" International Journal of Advance Research, Ideas and Innovations in Technology

[5] Bocklisch, T., Faulkner, J., Pawlowski, N., Nichol, A. (2017). Rasa: Open source language understanding and dialogue management. arXiv preprint arXiv:1712.05181.

[6] Urohit, J., Bagwe, A., Mehta, R., Mangaonkar, O., George, E. (2019, March). Natural Language Processing based Jaro-The Interviewing Chatbot. In 2019 3rd International Conference on Computing Methodologies and Communication (ICCMC) (pp. 134-136). IEEE.

[7] Lee H. L., Lo, W. K., Lui, K. F. A. (2018, July). Developing a chatbot for college student programme advisement. In 2018 International Symposium on Educational Technology (ISET) (pp. 52-56). IEEE