

AI Based Student Bot for Academic Information System using Machine Learning

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ABSTRACT

In General all the institutions like colleges sends their notes and information to students individually. Sometimes the student can't access it quickly and repetition of data also increased. The realm of this work is to create a Chatbot for the college purpose. Our work reduces the human work to send every details and notes to all departments by email or some other medium. In this work, academic information's /details feed it to the database which will be available for the long time period. The academic information consists of information about placements details, exam time tables, semester notes and upcoming events. A Chatbot is a computer program or an artificial intelligence which conducts a conversation via auditory or textual methods. The chat bot stores the data by key words and when the user entered data is matched with the key it reply the assigned data for it. The Chatbot is created by using python language and Natural language processing. This project make use of the MySQL database to store the information. With the help of natural language processing the bot AI understand the message sent by the user and reply with the matched key value. In this Chatbot the user first need to login by their college roll number and Department. When the valid person asks about the particular information by text the information gets retrieved from the updated database that related to their department. Through this chat box the student can easily access whenever they want and the data need not to be update more than once.

Keywords : NLP, AI, Chatbot, MySQL

I. INTRODUCTION

Chatbot programs are often designed to convincingly simulate how a human would behave as a conversational partner, thereby passing the Turing test. Chat bots are usually used in dialogue systems for various practical reasons, for example, automated online assistants, giving them the ability to engage the customer. STUDENT BOT is a native Chabot that will analyze and understand user's queries and reply appropriately. A native Chabot is a Chat bot technology which interacts with users in the website browser or any application. This system is a web

service which will provide answers to the queries of the system user.

Artificial intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems. AIML is a one of the most commonly using algorithm for the artificial intelligence in NLP processing.

Natural Language Processing or NLP is a part of artificial intelligence that will be used to analyze the user's queries. Users won't have to go to the college office to make the inquiry. The user just has to register himself to the system. Then the user can ask

college-related information such as timetables, notes, etc. This system also helps the user to get the updated information's about the college activities. The query will be answered on the basis of the knowledge base. The keywords will be fetched from the natural language processing algorithms and a relevant answer will be provided to the user. In case the answer is not available in the knowledge base or the question is irrelevant then the default message will be displayed.

A. AIML

Artificial Intelligence Markup Language (AIML) [5] is a set of possible queries and their respective responses. AIML consists of 3 elements such as: categories, pattern and template. Every category consists of a pattern and a template. Patterns are the possible queries that the bot-user may type in and template is the response to the respective pattern. Here, the template is programmed to fetch the data accordingly from the analytics raw data, if it's a domain related query.

<p>Code:</p> <pre><category> <pattern> How are you </pattern> <template> I am fine </template> </category></pre> <p>Outcome:</p> <p>User: How are you</p> <p>Bot: I am fine</p>

Fig 1. Simple AIML Code

B .Natural language Processing

Natural Language Processing (NLP) is the area of research and application that investigates and analyse how the computational techniques can be used to perceive and alter the user's human language text or speech inputs. Natural Language Processing (NLP) techniques can be used in various applications such as machine translations, natural language processing, multilingual and cross language information retrieval (CLIR), speech recognition and Artificial intelligence

system [3]. For this chatbot natural language processing of text inputs are done by dialogflow.

RELATEDWORK

Md Md. Shahriare Satu and Md. Hasnat Prvez ^[1], gives us a review of systems which uses AIML based Chatbot to interact with user. He points out that by integrating such Chatbot to system, it can give service around the clock and is low cost. Priyanka Shetty, AdityaKotian^[2] developed PantoMath College Inquiry chatbot by using NLP and Dialogflow to analyses college event query for the user request.

Sarthak V. Dothi and his team ^[3] proposed an android application that uses AIML interpreter to interact with users using texts and voice responses by using NLP.

Rinkal D. Dharani and Dr. A. C. Suthar ^[4], proposed a model in which AIML based chatter bot is integrated with WhatsApp to receive news update. CHARLIE ^[5], is an AIML based chatterbot that is used in the field of education. CHARLIE connects students to Intelligent Educational System (INES). It is programmed to maintain general conversation with the students about the learning materials.

IJNTR ^[6]: April 2017 Intelligent behavior shown by Alice chatbot system by using AIML, DFS and Pattern matching algorithm for language recognition, implementation of ALICE Chatbot system as a domain specific chatterbox which is a student information system that helps users in various queries related to students and universities. Index al. Artyom keydunow ^[7], Robert shen-Statsbot for Personal analytics assistant using linear regression, K means and Decision trees to predict the personality behavior of a human.

MAC 304-2016^[8]: Amazon Alexa which is a most popular Chatbot for the human conversation using NLP, NLU engine and machine learning for text to speech converter and recognition with network

support. SIRI by [9] Apple in 2014 by using Machine Learning and Automatic speak recognition (ASR) for intelligence behavior. Mind browser^[10] journal of go to platform by IBM Watson by using Natural Language processing and Spontaneous answering software development kit for spontaneous answering.

The section II (PROPOSED SYSTEM), describes about the system architecture in detail and working of each modules. The section III (IMPLEMENTATION) describes the tools used for front-end, back-end & integration process. The section IV (RESULTS) shows the output of the implementation process. The section V (CONCLUSION) concludes the working system. The section VI (REFERENCE) are the IEEE papers we referred to create our project>

II. PROPOSED SYSTEM

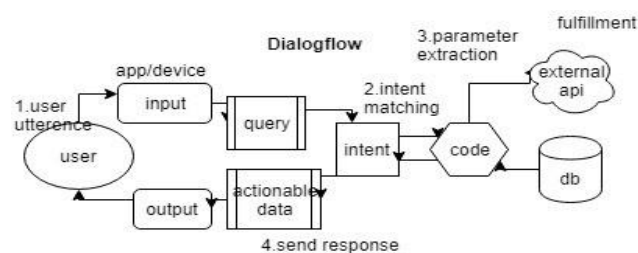


Fig 2. Architecture Diagram

In Fig 2, first the user need to enter his query (input) on the user interface. Then the query is passed to the dialogflow for Pre-processing of the query. For example, if The query is “what are the subjects for CSE first year”, then the proposed system going to remove phrases like 'is', 'the' using preprocessing technique. Then the system fetches the keywords from the query and Matches the fetched keywords with the keywords in Knowledge base (intents), and provide an appropriate response. The keywords will be matched with the help of keyword matching algorithm. After this process has been completed the system returns the response as an output to the user. In this proposed system gives the responses in the

format of text. For notes it's provide a links for the corresponding document so students can click that to access the notes.

WORKING OF MODULES

The StudBot has 3 modules and there are two types of users. one user is a student and another is an administrator. There three modules in this work. The three modules are login window, Database window and chat window. In the login window the user need to login by their mobile number verified by OTP number. Once they logged in they can access it anywhere at any time. For the administrator special permission for inserting notes and information's over database. In the database window the staff can login and can add academic information's like notes, department updates, events notification and timetables.

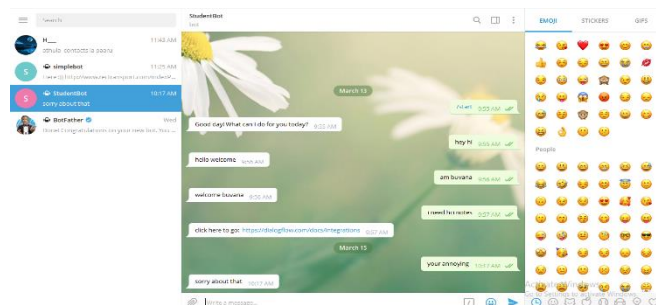


Fig 3. Chat Window

The chat UI shown in the fig 3. and used in chat. In this chat window the user can raises their queries and details that they want and it retrieved from the database for their response. The responses are the immediate reaction over the internet.

III. IMPLEMENTATION

For the implementation of our chatbot here we used the dialogflow AI that provided by google.

DIALOG FLOW [2] provides a natural language processing service, gives user new ways to interact

and to build engaging voice and text based conversational interfaces powered by artificial intelligence. It does all the heavy lifting of parsing user's text or voice and identifying user's intention. It uses machine learning to identify the user is chatting or talking. Here we used the dialogflow for the backend process of our process. Machine learning is a field of computer science that gives computers being explicitly programmed and machine learning system improves with experience. The dialogflow has five main parts in it for the implementation of any bot.

INTENT

To define how conversations work, you create **intents** in your agent that map user input to responses. In each intent, you define examples of user utterances that can trigger the intent, what to extract from the utterance, and how to respond. Intents consist of four main components that allow you to map what your user says to what your agent responds with. These components include the following:

Intent name: The name of the intent. The intent name is passed to your fulfillment and identifies the matched intent.

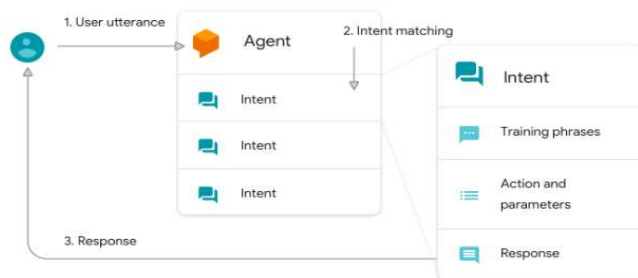


Fig.4 Dialogflow Agents

Training phrases: Examples of what users can say to match a particular intent. Dialogflow automatically expands these phrases to match similar user utterances.

Action and parameters: Defines how relevant information (parameters) are extracted from user utterances. Examples of this kind of information include dates, times, names, places, and more. You

can use parameters as input into other logic, such as looking up information, carrying out a task, or returning a response.

Response: An utterance that's spoken or displayed back to the user

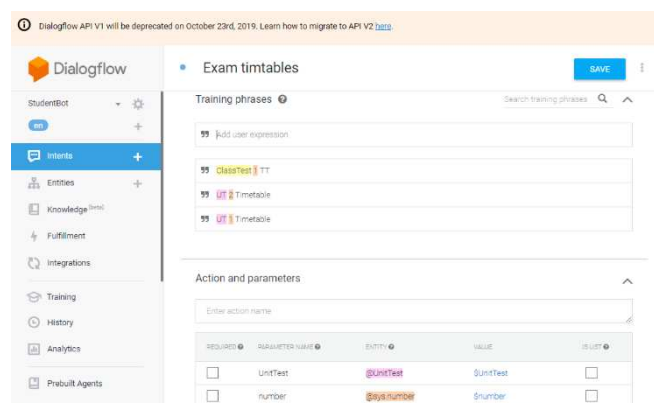


Fig .5 Intent Training

ENTITIES

Entities are Dialog flow's mechanism for identifying and extracting useful data from natural language inputs. While intents allow your agent to understand the motivation behind a particular user input, entities are used to pick out specific pieces of information that your users mention — anything from street addresses to product names or amounts with units. Any important data you want to get from a user's request will have a corresponding entity.

Entity type: Defines the type of information you want to extract from user input. For example, vegetable could be the name of an entity type. Clicking **Create Entity** from the Dialogflow console creates an entity type. When using the API, the term entity type refers to an Entity Type object.

Entity entry: For each entity type, there are many entity entries. Each entity entry provides a set of words or phrases that are considered equivalent. For example, if vegetable is an entity type, you could define these three entity entries:

Carrot, scallion, green onion, bell pepper, sweet pepper

When editing an entity type from the Dialogflow console, each row of the display is an entity entry. When using the API, the term entity entry refers to an **Entity** object. Entity Entry would be a better name than Entity for this object, but we need to maintain backwards compatibility when improving the API.

CONTEXTS

Contexts represent the current state of a user's request and allow your agent to carry information from one intent to another. You can use combinations of input and to control the conversational path the user takes through your dialog.

EVENTS

Events allow you to invoke intents based on something that has happened instead of what a user communicates. Dialogflow supports events from several platforms (like Google Assistant, Slack, and more) based on actions users take on those platforms. You can also create your own custom events that can be triggered via fulfillment or the detect Intent.

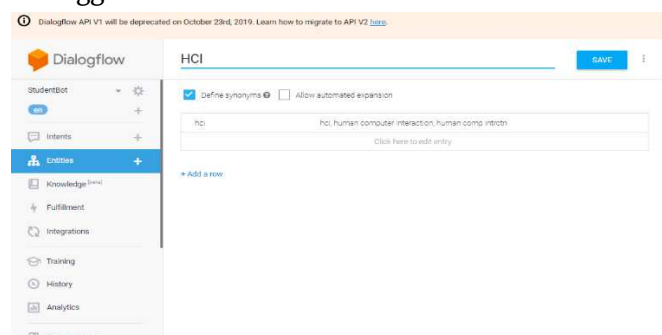


Fig 5. Entity Training

FULFILLMENT

Fulfillment is code that's deployed as a webhook that lets your Dialogflow agent call business logic on an intent-by-intent basis. During a conversation, fulfillment allows you to use the information extracted by Dialog flow's natural language

processing to generate dynamic responses or trigger actions on your back-end.

Most Dialogflow agents make use of fulfillment. The following are some example cases where you can use fulfillment to extend an agent: To generate dynamic responses based on information looked up from a database. To place orders based on products a customer has asked for. To implement the rules and winning conditions for a game.

After completing all this we get our agent ready. When the user enter his query from the raw data the structured data is derived and its match with the key value and parameters.

When the key is matched the defined responses is will generated on the chat window. If the key parameter value is not matched it return the default value. The key and parameter value are scanned from the entity field.

INTEGRATION TOOLS

When our agent is trained all the data's it is integrated for the better user interface. In Dialogflow so many integration tools are there such as with Facebook Messenger, Telegram, webhook, web demo, slack and amazon Alexa and etc. In our chatbot we integrate our bot with Node.js with angular js framework.

ANGULAR JS

AngularJS is a **JavaScript framework**. It can be added to an HTML page with a `<script>` tag. AngularJS extends HTML attributes with **Directives**, and binds data to HTML with **Expressions**. In this work, The AngularJS and NodeJS is used in UI implementations.

AngularJS is a structural framework for developing dynamic web apps. It allows developers to use HTML as template language and lets HTML's syntax to express application's components briefly but clearly. It is a full-featured JavaScript framework, with the primary goal of simplification. It provides support for

developing dynamic, single page web apps and supports the (MVC) programming structure.

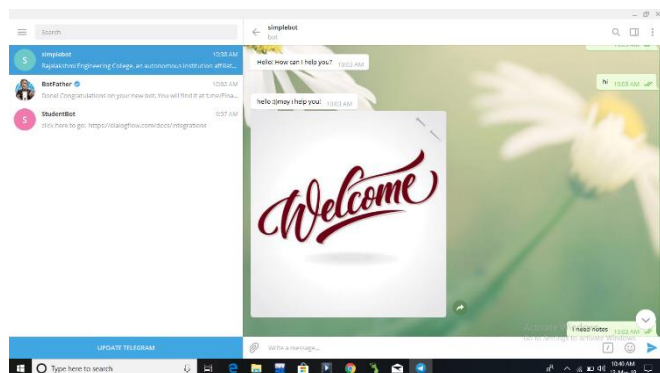


Fig 6. Basic Conversation

NODE.JS

Node.js is an open source, cross stage platform built on Google chrome V8 JavaScript runtime engine for developing fast, scalable and lightweight web applications. Node.js applications are written in JavaScript. This application can runs within the Node.js runtime on Linux and Microsoft Windows. This framework offers a rich library of various JavaScript modules to simplify web development process. The runtime condition translates JavaScript with use of Google's V8 JavaScript motor. Node.js is highly scalable because it is capable of handling a large number of simultaneous connections with high output. APi.ai (Dialogflow) package allows integrating agents from the Api.ai natural language processing service with a web application.

IV. RESULTS

The fig 6 shows the implementation of the successful basic conversation of the bot with the user. Initially StudentBot welcomes the user with welcome message as shown in fig 6. The responses from this proposed system are in the format of text as well as hyperlink. The hyperlink responses provide additional information about the particular query from the google feed. The Hyperlink response shows

the .pdf files links for the notes provided by the Student Bot. When student clicks on the link, the system redirect to the notes with the supported application that can open the particular document.

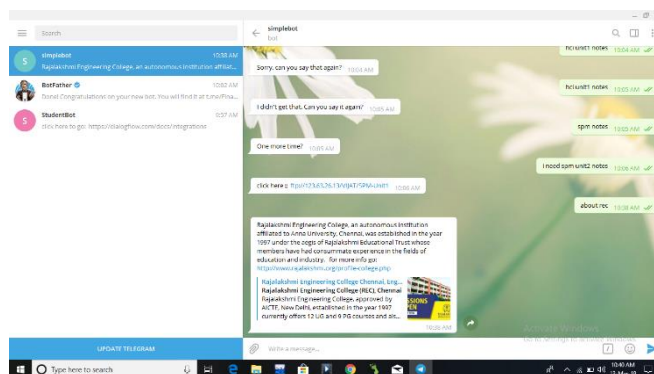


Fig 7. Hyperlink Response

V. CONCLUSION

In this work, the proposed StudentBot would enable bot users to just type the query related to their college and department and will get response immediately. The proposed system needs to develop a database where all the related data will be stored and to develop a web interface or app interface for the user to access it. The tool was evaluated based on the quality of response and it performed well.

As a future work, this system can extend to be developed as an application on the mobile OS as well as computer system (Web Based) for the better use. It is planned to implement further that to get the user input in the text format and convert it into text to give replay. By using this application even parents can know their wards marks and exam details. Also we can extend this work to help to others like Police station, Railway Station, etc., for their easy search and response for their application.

VI. REFERENCES

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