IMS Chatbot- An AI Powered Chatbot

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Abstract -All the foundations like universities send data like assignments to understudies separately. Once in a while the understudy can't get to it rapidly and redundancy of information is expanded. We intend to build a chatbot for communication by this work. Our chatbot diminishes the human task to send each detail and assignments to all divisions by email or printed media. In this work, scholarly data is fed into the chatbot which will be accessible for the long timespan. The scholarly information contains data about arrangement, exam time tables, subject notes and up and coming occasions. A Chatbot is a PC program or a man-made consciousness that leads a discussion by means of sound or text. The chatbot stores the information by keywords and when the client fed information is coordinated with the keyword, it answers the appointed information. The Chatbot is made by utilizing Java language and Natural language processing. Utilizing natural language processing the chatbot's AI comprehends the message sent by the client and answers with the coordinated key worth. With the assistance of this chatbot the understudy can without much of a stretch access anything they need and the information also does not need to be updated every time.

Key Words:NLP, Artificial Intelligence, Java Chatbot, Dialogflow, College Chatbot, Keyword Matching.

1.INTRODUCTION

Chatbots are commonly intended to mimic the way a person would act as a chat partner, by qualifying the Turing test. Chatbots are typically utilized in conversation systems for different pragmatic reasons, for instance, online assistants, enabling them to connect with the client. College Chatbot is a local Chabot which will examine and comprehend client's questions and answer properly. A local Chabot is a chatbot innovation which interfaces with clients in the web or an app. This framework is a platform oriented system that will give an appropriate reply to the questions of client queries.

Artificial intelligence/ Man-made reasoning is defined as the recreation of human knowledge handled by machines. AIML is a one of the most frequently used algorithms for the man-made consciousness in NLP handling.

Natural Language Processing or NLP is a piece of man-made reasoning which can be utilized to examine the client's inquiries. Understudies don't need to visit the college office every time to get their query resolved. The understudy simply needs to enlist themselves to our chatbot. After that point the client can ask college-related data, for example, timetables, assignments, and so forth. This framework likewise encourages the client to get refreshed data's about the college exercises. The question will be replied based on the information base. The match words will be gotten by the NLP algorithms and an applicable answer will be given to the client. On the off chance that the appropriate response isn't accessible in the information base or the inquiry is unrelated, at that point the default message will be displayed.

1.1 AIML

AIML is an acronym of Artificial Intelligence Markup Language. It consists of 3 parts-pattern, categories and template. Every category contains a pattern and a template. The user queries are the pattern and the reaction to those queries are the template. Template is tweaked to get unrefined information from the assessment If it's a zone related inquiry.

```
<aiml>
<category>
  <pattern>WHO ARE YOU</pattern>
  <template>I am a chatbot.</template>
</category>
<category>
  <pattern>WHAT ARE YOU</pattern>
  <template>
    <srai>who are you</srai>
  </template>
</category>
</aiml>
```

Fig-1: Simple AIML Code

1.2 Natural Language Processing

Natural Language Processing is concerned with the associations among PCs and human (natural languages), specifically how to program PCs to process and dissect a lot of natural language information. Natural language processing assists PCs with speaking with people in their own language and scales other language-related errands. For instance, NLP causes it feasible for PCs to understand content, to hear discourse, decipher it, measure assessment and figure out which parts are significant. In this chatbot Dialogflow handles the processing of natural language.

2. RELATED WORK

IBM Watson created a Mind browser [1] journal with the help of NLP (Natural Language Processing) and it used a kit for spontaneous answering which is Spontaneous answering software development kit.It is a go to platform. AIML is used to make chatbot. One of the many chatbots created with the help of AIML is CHARLIE [2]. It is used mostly to help students in their education process. CHARLIE helps students to connect with Intelligent Educational System (INES). It helps to make conversation about their learnings with the students. In the year 2014, Apple created a virtual assistant known as SIRI [3] which works based on Machine learning and ASR (Automatic Speak Recognition). Md. Shahriare Satu and Md. HasnatPrvez[4] have come to know that by integrating

chatbots to devices,it can improve the cost efficiency and can give services 24/7. They also gave a review about interacting with user with the help of AIML based chatbot. Rinkal D. Dharani and Dr. A. C. Suthar [5] researched about about integrating chatterbot with Whatsapp which can provide an option about receiving news update. MAC 304-2016[6]: Amazon's virtual assistant Alexa is very famous for interacting like humans utilizing natural language understanding and processing engine and AI helps to discourse and acknowledge the network support. Sarthak V. Doshi with his coworkers [7] gave their research about an app which utilizes AIML translator to connect with clients utilizing text and voice reactions by utilizing Natural Language Processing. IJNTR [8] April 2017 Smart conduct appeared by there chatterbot framework which utilizes Depth First Search, Keyword Recognition technique to understand natural natural inputs, usage of there framework as a space explicit chatbot that is an understudy data framework that helps clients in different inquiries identified with understudies and colleges. Priyanka Shetty, AdityaKotianzidove[9] made PantoMath Student query chatterbot using Natural Language Processing and Dialogflow to investigate school occasion

question for the client demand. Artyom keydunow[10] Robert shen-Statsbot for Personal investigation associate utilizing regression, Decision trees to anticipate there character conduct the client.

The Part 3. (PROPOSED SYSTEM), gives a view on framework engineering of every module. In Part 5. (IMPLEMENTATION), depicts the techniques used for making the chatbot and integrating it to other platforms. In Part 10. (RESULTS), the end product of implementation is displayed. In Part 11. (CONCLUSION), which summarize our chatbot. In Part 12. (REFERENCES), we mention the references we used to make this chatbot.

3. PROPOSED SYSTEM

In fig.2, client enter their question (query) on the UI. At that point the inquiry is gone for Pre-preprocessing in Dialogflow. For instance, if the inquiry is "At what place IMS belong", at that point the proposed framework going to expel phrases like 'what', 'at' utilizing preprocessing method. At that point the framework gets the catchphrases from the question and the caught keywords with the catchphrases in responses database (goals), and give an proper reaction. The coordinating of watchword is finished by the catchphrase coordinating calculation. After this procedure has been finished the framework restores the reaction as a yield to the client. In the given framework, it gives the reactions in the arrangement of content or sound.
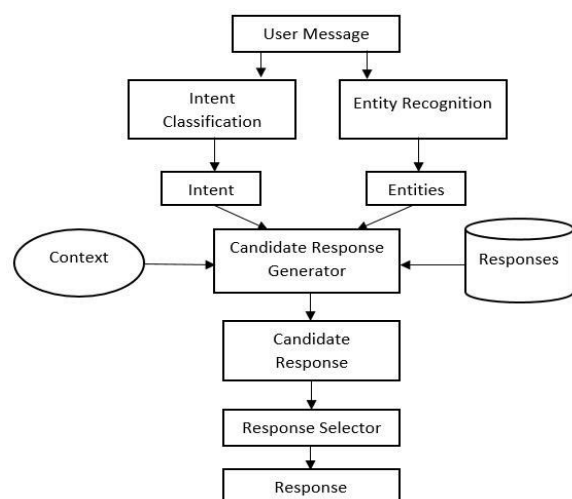

Fig-2: Architectural Diagram

4. WORKING OF MODULES

The COLLEGE CHATBOT has 8 Intents. When the bot is asked a query it is greeted by the Default Welcome Intent. The User can then inquire about different problems related to admission, placements, fee, transport etc. The bot uses the patten and keyword matching to provide with the best possible answer to the user. The user once starts a chat can ask as much questions as they like without having to start a new chat again and again. The chatbot can also be used directly through the facebook messenger. The questions whose answers complicated enough to be answered in a small text box are referred back to the college website with hyperlink to the page where the actual answer can be found. The chatbot can also be directly accessed using the google assistant where the same keyword matching is used to give the best possible answers.
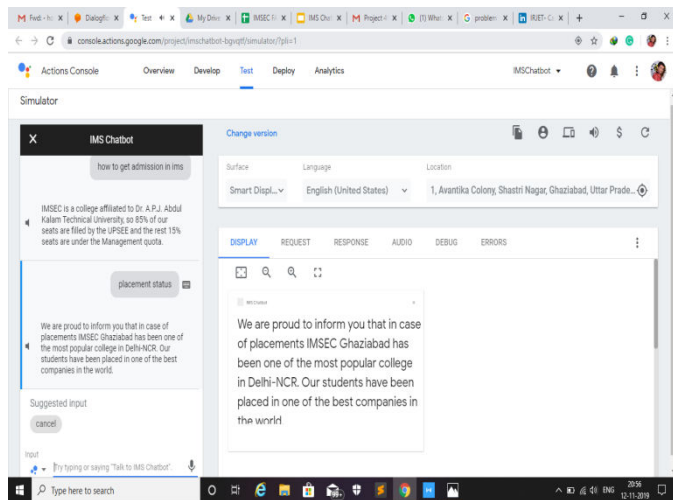

Fig-3: Chat Window

The interface shown in the above figure 3 shows a talk window. Here, the user can ask their queries and the chatbot will fetch the data from the database.

5. IMPLEMENTATION

We use Dialogflow for implementation of college chatbot.

5.1 Dialogflow:

Dialogflow is an Independent and free to use platform for people(developers). It gives an NLP(Natural Language Processing) services to provide conversational interfaces like voice and text with the use of AI(Artificial Intelligence). It provides a way to understand the questions (user's query) or to identify the voice in the form of text for pre-processing. Here, it uses M.L. (Machine Learning) to interact with user(student), it helps for backend processes to provide an appropriate

response to user query.ML is a branch of computer science which helps the devices(computers) to improve with the time and it also programmed explicitly. Dialogflow contains five building blocks for the use or implementation of our college chatbot(or any other bot).

To understand how interaction work with the user, intents and entities come into play which helps the agent to get the appropriate response for the student query. In each intent, user query are defined which may initiate the intent, things to fetch in query, and an appropriate response. There are 4 things in intents which help to match the keyword with an appropriate response.

5.2 Intent Name:

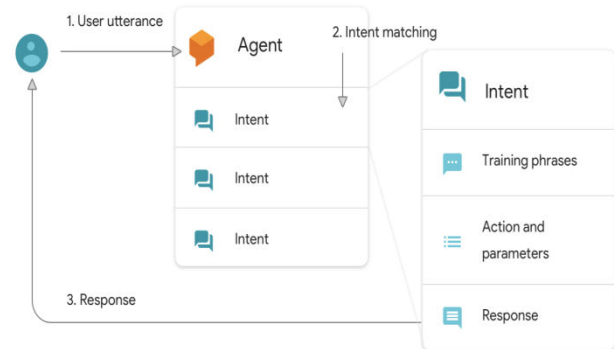It is the name we give to intents which helps to fulfill or to identify the same keywords.

Fig-4: Dialogflow Agents

5.3 Training Phrases:

Training Phases are sample message that customer can feed to facilitate a particular intent. Dialogflow matches these expressions to their desired intents.

5.4 Action and Parameters:

Characterizes how important data (parameters) are fetched from client expressions. Instances of this sort of data incorporate date, times, names, area etc. Parameters can be utilized as contribution to other logic, for example, looking into data, completing an assignment, or restoring a reaction.

5.5 Response:

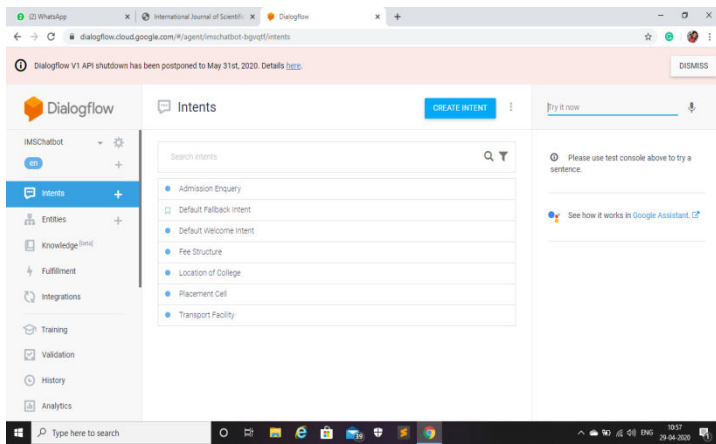It is the answer displayed to the user query.

Fig-5: Intent Training

Fig-6: Entity Training

6. ENTITIES

Entities are used by Dialogflow for recognizing and separating valuable information from human language inputs. While intents are used by agents to comprehend the inspiration driving a specific client query, Specific pieces of information that your users mentions is picked up by the entities, anything from roll number to department or subjects. Any important data to be retrieved from a client's inquiry will have a related entity.

6.1 Entity Type:

Characterizes the sort of data you need to retrieve from client's input. E.g., fruits can be an entity type. An entity type can be created by clicking **Create Entity** in the Dialogflow console.

6.2 Entity Entry:

There are numerous entity entry for every entity type. Every entry gives a lot of keywords and expressions which can be viewed as proportional. E.g., if fruits are entry, we can have entries like, Apple, Mango, Banana.
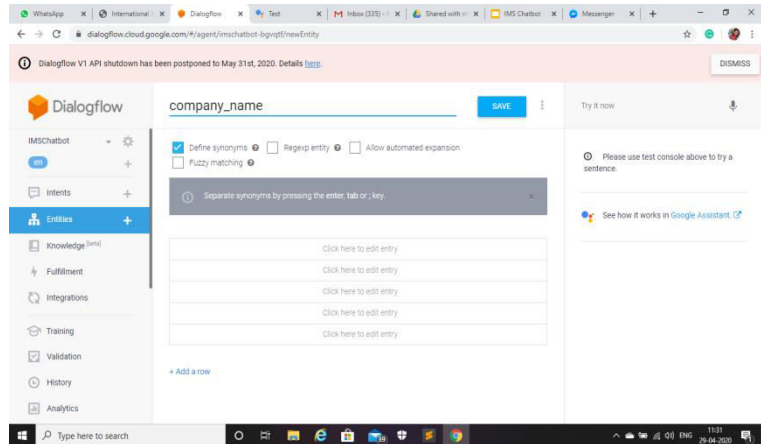
7. CONTEXT

The present condition of a client's solicitation is represented by Contexts and it permit your agent to convey data starting with one intent then onto the next. You can utilize blends of information to control the general way the client communicates.

8. EVENTS

We can invoke intents using Events in light of something that has occurred rather than what a client imparts. Several platforms are supported by Dialogflow (like Google Assistant, Messenger, etc.) in light of moves clients make on those platforms. Your own custom events can also be created which could be activated using fulfillment.

8.1 Fulfillment

The logic(code) which we used to instruct Dialogflow to use intent by intent business logic is called Fulfillment. During an ongoing conversation (query and responses), it helps us to extract information by using natural language processing (NLP) provided by Dialogflow to get dynamic responses based on user's query.

Approximately every chatbot agent use fulfillment to get dynamic responses by triggering actions in the back-end. For example, we can use fulfillment to generate responses which depends on information provided in the database like providing the guidelines and the victory conditions of a virtual game.

After that, when student(user) asked his/her query from raw data, it provide an structured data format to generate the response of the given query by using key and value parameters.

If the key parameter matched, then the responses (value parameters) will generate on the window screen. And In case, the keyword isn't in the knowledge base then, it will give response from Default Fallback Intent.

9. INTEGRATION TOOLS

At the point when our chatbot is prepared and all the information is coordinated in it, it can be used with better User Interface. We can integrate our college chatbot with so many tools such as telegram, Facebook messenger, Amazon Alexa, Slack etc.
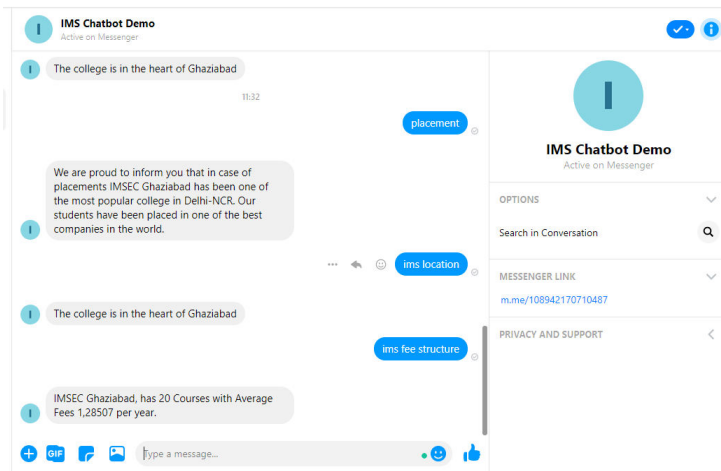

Fig-7: Integration with Facebook Messenger

10. RESULTS

As per the given fig.8, you can see the chat of our college chatbot with the user. The conversation (chat) is in the form of text. Initially, college chatbot greets the user with the use of Default Welcome Intent which is based on conversational text. It provides the results (responses) in the form of text or hyperlink. For simple queries, it shows the response in the form of text and for some additional information, it also gave an hyperlink of a webpage about the user queries solution provided by responses in college chatbot.
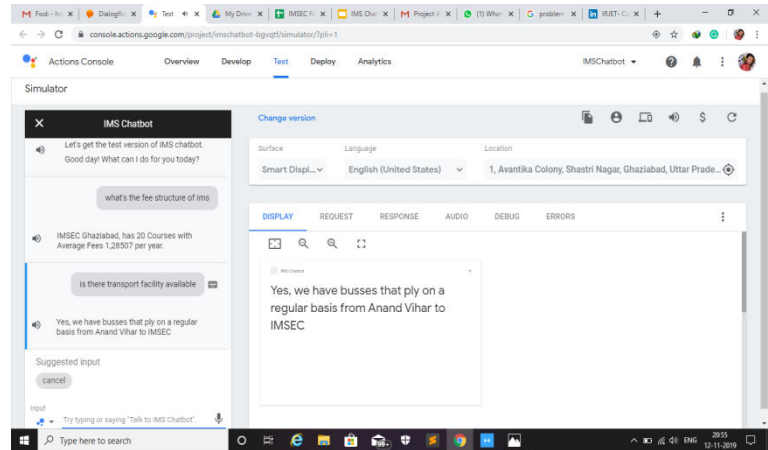

Fig-8: Basic Conversation

11. CONCLUSION

The College Chatbot will empower clients to simply enter their inquiry identified with their department, division and serve the response right away. In this framework, there is a requirement to build up a database. It can be used to help a number of students at the same time which is a better alternative from the conventional methods used. Our chatbot can act as a bridge between the college and students providing a better way of communication.

In future work, the given framework can stretch out to be created as an android app or as PC framework (Web Based) for a superior use. The college portal can be integrated with the chatbot. Reminders for last date of submission of projects and assignments can also be made using this chatbot. We can also expand the chatbot for faculty use.

Acknowledgments

12. REFERENCES

[1]. Phippen, I. Sheppard, and S. Farnell, "A practical evalution of web analytics," in mind browser, Internet Research, 284-294, 2004.

[2]. Mikic, Fernando A,juan C. Burguillo,MartinLlamas,Daniel A. rodriguez and Eduardo Rodriguez,"CHARLIE: An AIML-based chatterbot which works as an interface among INES and

Humans."EAEEIE Annual Conference 2009.

[3]. Maria das Gracas Bruno Marietto, Rafael Varago de Aguiar, Gislene de Oliveira Barbosa, Wagner Tanaka Botelho, Edson Pimentel, Robson dos Santos Franca and Vera Lucia da Silva, "ARTIFICIAL INTELLIGENCE MARKUP LANGUAGE: A BRIEF TUTORIAL" International Journal of Computer science and engineering Survey (IJCSES), July 2013

[4]. MD. Shahriare Satu, Md. Hasnat Pervez, and Shamim-Al-Mamun" Review of integrated applications with Aiml-based chatbot," 1st international Conference on computer and Information Engineering,November 2015.

[5]. Rinkal D. Dharani, and Dr. A.C Suthar, "INTEGRATION OF AIML CHATTER BOT FOR   NEWS APPLICATION ON WHATSAPP" International Research Journal of Engineering and Technology (IRJET), MAY 2016.

[6]. Thomas N. T, "An e-business chatbot using AIML and LSA", International conference on Advances in Computing Communications and Informatics (ICACCI), September 2016.

[7]. Sarthak V. Doshi,Suprabha B. pawar, Akshay G. Shelar and Shraddha S. Kulkarni. "Artificial Intelligence chatbot in Android System using Open Source program-O", International Journal of Advanced Research in Computer and Communication Engineering, April 2017.

[8]. Vibhor Sharma, Monika Goyal, Drishti Malik, "An intelligent behaviour by alice chatbot" International Journal of new technology and research, ISSN: 2454-4116, Volume-3, Issue-4, April 2017

[9]. Priyanka Shetty, Aditya Kotian, DhanshreeNarsale, prof. ChhayaNarvekar" International journal of research in applied science and research" for phantomath Chatbot in Volume 6 issue III, march 2018.

[10].Artyom Keydunow, Robben shen, "International Journal of pure and applied mathematics" for alexa volume 119 no. 12 2018,229-238

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