

CHATBOT FOR COLLEGE WEBSITE USING DIALOGFLOW

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Abstract — The system helps the student users, faculty users and other users to ask their queries through the chatbot. Where they can enter their queries in the chatbot and would get a lively experience in clarifying their doubts. The system is built by using Dialogflow which is a service provided by the google. It is a natural language understanding platform which is used to design and integrate a conversational user interface into mobile applications, web applications, devices, bots, interactive voice response systems and related applications. Included the linked chain of data sets which would really make the users feel comfortable and give them a great clarity. It also uses NodeJs for backend data processing. It uses inbuilt AI tools for learning and recognizing different phrases which gives the same meaning and gives possibly relevant responses for the same. This chatbot also includes the Natural Language Processing (NLP) which allows the computers and algorithms to understand human interactions via various languages. NLP helps machine to understand human speech and spoken language.

Keywords — Dialogflow , Nodejs , Natural Language Processing (NLP).

I. INTRODUCTION

A chatbot is a computer program. It simulates and processes human conversation (either written or spoken), allowing humans to interact with digital devices as if they are communicating with a real person. Those are usually stateful services remembering previous commands. Is a type of software that conducts a conversation via auditory or textual methods. They can be as simple as rudimentary programs that answer a simple query with a single-line response, or as sophisticated as digital assistants like that of the google's alexa and the apple service called the siri and many others that learn and evolve to deliver increasing levels of personalization as they gather and process information. These are automated programs that interact with customers like a human would and cost little to nothing to engage with. There are two main types of chatbots namely Task-oriented (declarative) chatbots and Data-driven and predictive (conversational) chatbots. They do not make mistakes and they are intuitive and easy to use. Chatbots have wide range of applications in the fields like Retail and ecommerce, Traveling and hospitality, Banking and fintech, Healthcare, Media and entertainment and most importantly education.

Majority of us have interacted with chatbots while online shopping or planning a holiday. But now to be advanced they are made use in the educational field as well. Chatbot in educational fields are an excellent way to transform the way institutions interact with students today. The evolving use of technology in everyday life is changing the way students learn and absorb information. AI is letting educators provide a personalized learning environment to the students. In fact, it is now further easier for students to explore more about their options and things they can do in the institutions. Chatbots and other such Artificially Intelligent tools improve student interactions and act as game-changers in the innovative EdTech world. Chatbots are made use for Tutoring, Increasing student engagement, Efficient teaching assistants, Assisting students, Student support, Providing institutional informations, Data collection and API support, Helping with holiday homeworks and also in Assessments.

The College bot project is built using artificial algorithms that analyses user's queries, understands and replies to user's message. This System is a part of a college website which provides answer to the query of the candidates. The candidates may be either students or teachers. Candidates just have to query through the bot which is used for chatting. They can chat using any format, there is no specific format the user has to follow. The system uses inbuilt Artificial Intelligence tools to answer the query. The answers are appropriate to the user's queries. The User can query any college related informations, activities and achievements through the system rather than personally going to the college for enquiry. The System analyses the question and then answers to the user as if it is answered in person. The

student user queries may be anything regarding the admissions, the placement opportunities and the courses available etc. The teacher queries may be anything regarding the faculty recruitment details, the process and about the salary and allowances.

II. LITERATURE SURVEY

FLORENCE - Health Care Chatbot - Jahnvi Gupta, Vinay Singh, Ish Kumar, " *Florence- A Health Care Chatbot* ", 7th International Conference on Advanced Computing & Communication Systems (ICACCS), 2021 [1]. This health care chatbot is used for diagnosing the patient's health and gives the exact medication and treatment as in hospitals. It uses RASA frameworks. It also uses Artificial Intelligence. Here the doubts and queries are asked and are answered in text in the android application.

Software challenges of building smart chatbots - Gwendal Daniel, Jordi Cabot, " *SOFTWARE CHALLENGES OF BUILDING SMART CHATBOTS* ", IEEE/ACM 43rd International Conference on Software Engineering: Companion Proceedings (ICSE-Companion), 2021 [2]. Will start the pre-defined exercise sessions with a classical Hello World chatbot that replies to the user's greetings. While this simple initial exercise emphasizes some core aspects of chatbot development on

- Which platform should the bot listen to and reply?
- What is a user's intention and how to train the bot to recognize it?
- What should the bot do once it has answered the user?
- What if the bot doesn't understand the user input?

Predicting Frequently Asked Questions (FAQs) on the COVID-19 Chatbot using the DIET Classifier - Wistiani Astuti, Desy Pratiwi Ika Putri, Aji Prasetya Wibawa, Yulita Salim, Purnawansyah, Anusua Ghosh, " *Predicting Frequently Asked Questions (FAQs) on the COVID-19 Chatbot using the DIET Classifier* ", 3rd East Indonesia Conference on Computer and Information Technology (EIConCIT) April 09-11. 2021, ISTTS Surabaya, Indonesia, 2021 [3]. Uses the RASA framework. Rasa core.test and rasa nlu.test are used in Diet classifiers (DIET - Dual Intent and Entity Transformation)

Development of an e-commerce Sales Chatbot - Mohammad Monirujjaman Khan, " *Development of An e-commerce Sales Chatbot* ", IEEE 17th International Conference on Smart Communities: Improving Quality of Life Using ICT, IoT and AI (HONET), 2020 [4]. Uses ML for Natural language Understanding. Developed on modular chatbot framework

STEP1: Web based natural language training platform

STEP2: A microservice to classify input texts and extract entities

STEP3: A framework which routes user request to specific controller for processing and server the response

A Chatbot for Changing Lifestyle in Education - E.Kasthuri, Dr.S.Balaji, " *A Chatbot for Changing Lifestyle in Education* ", Third International Conference on Intelligent Communication Technologies and Virtual Mobile Networks (ICICV), 2021 [5]. Here the questions in text, processed using Natural language processing and deep learning. Lemmatization - widely used content preparing procedures utilized in NLP.

[illegible]

Dialog Manager - The back-end includes the development of Dialog Manager of the Application. For the purpose of developing a Natural Language Understanding Platform for the Application we used the Google Dialogflow's ES (Standard) version which handles all the conversations and actions given by the user. It provides the following features:

Dialogflow Agent : It is responsible for handling of the user conversations and converting the voice command given by the user into the text or the text command into Structured Data that is understandable to the application. Each of the Agents consists of Intents and Entities.

Intents : It takes care of matching the user expressions obtained from the previous step to the best intent in the agent. This matching of intent is also known as Intent Classification.

A basic Intent contains the following:

1. Training Phrases : These are sample phrases for what end-users might say.
2. Action : It triggers certain actions for each intent when activated.
3. Parameters : When an intent is matched at runtime, Dialogflow provides the extracted values from the end-users expression as Parameters. Each parameter has a type, called the Entity Type, which dictates exactly how the data is extracted.
4. Response: It provides the user with the responses for their queries. Figure 2 shows the basic flow for intent matching and responding to the end-user.

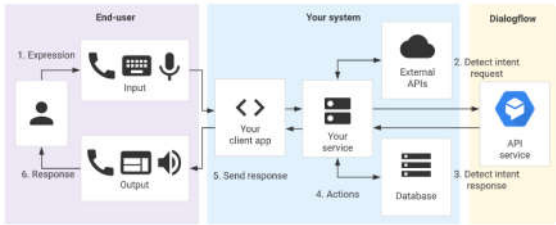


Fig. 2 Intent Matching

Entities : Pre-defined System Entities are provided by Dialogflow for matching dates, times, email addresses and so on. Entities can also be user-defined depending on the type of data handled by the system application[6]. The creation of this entity aims to identify and extract data spoken by the user. The entities menu functions to create your own entities that do not yet exist in system entities. In system entities, there is already automatic data extraction in the form of time, date, place, weather, country, etc[7].

User Interactions with the API : For interacting with the Dialogflow API Service, a code must be written for direct interaction. Figure 3 shows the processing flow when interacting with the API Service.

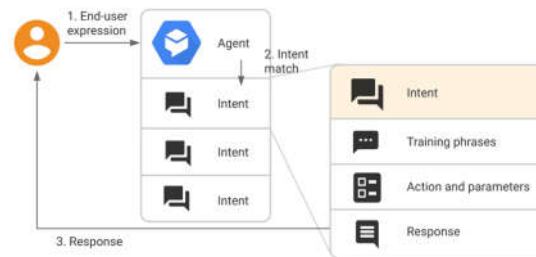


Fig. 3 Interaction with the API

1. The end-user will type or will speak an expression.
2. The service then sends this end-user expression to Dialogflow in a detect intent request message.
3. Dialogflow sends a detect intent response message to your service. This message contains information about the matched intent, the action, the parameters, and the response defined for the intent.
4. The service performs actions as needed, like database queries or external API calls.
5. The service sends a response to the end-user.
6. The end-user sees or hears the response The feature of Text-to-Speech of the system is developed by 'flutter_tts', a Text-To-Speech Package provided by Flutter. Helped in providing answers to the queries of the user in audio format. Thus, improving the usability of the Application.

Dialogflow Console : Is a web user interface that enables us to create, build and test agents. Dialogflow APIs help in building agents for advanced scenarios.

Benefits and Limitations - The most important benefit of Dialogflow is its connection with Google. The platform uses inbuilt Machine Learning Algorithms which helps in understanding natural language that is the user's expression with the help of agents. Each Agent contains Intents which are matched with the user's expression and action is performed as a response to the query. It not only provides answers to customers but also enables agents to carry out small talks with the users. The Platform also provides pre-built templates that developers can use it as foundations for their project[6].

IV. IMPLEMENTATION

Chatbot Architecture designing - Creating different possible Intents for our chatbot. Adding contexts, events, actions and parameters, responses and fulfilments for each intents created. Defining the Entities and its meanings in a computer understandable way.

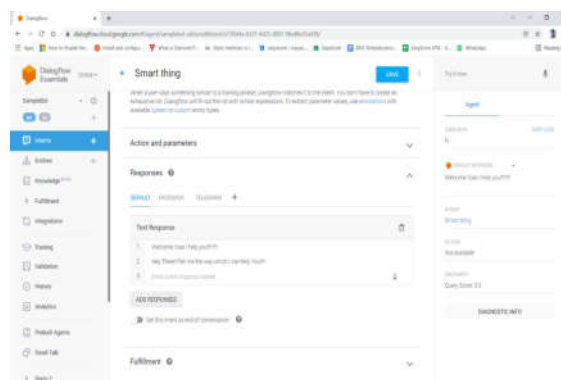


Fig. 4 Google Dialogflow Console

Chatbot Training with sample phrases - Different sample phrases should be added for a single question or statement for getting a better understanding for the Chatbot. The sample phrases mentioned in the above point can be 'n' number of statements which results in a common meaning.

The figure shows the making intent of a console dialogflow agent. In intent, there is a collection of several questions from users that contain the same topic. If the user sends a question, the agent will match the question that entered the data with the intents. Then, the agent will send the correct answer. If a question is sent that does not match or does not match the intent that was made, then the agent will send an answer from the fallback intent[7].

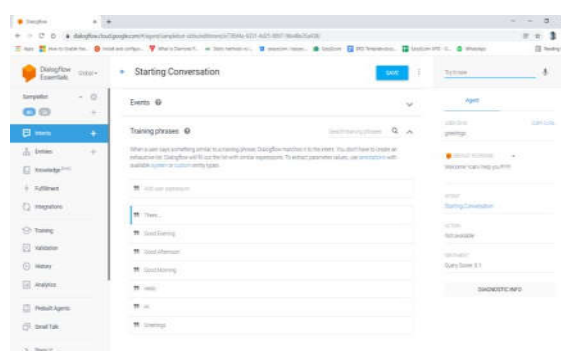


Fig. 5 Intents and Entities

Integrating with web and other possible services - After the creation of the chatbot with needed architecture and design, we can start integrating it with different sources. We can integrate it in our website and also other possible services like Facebook, Telegram, Viber, etc.. We also have Telephony based chatbots.

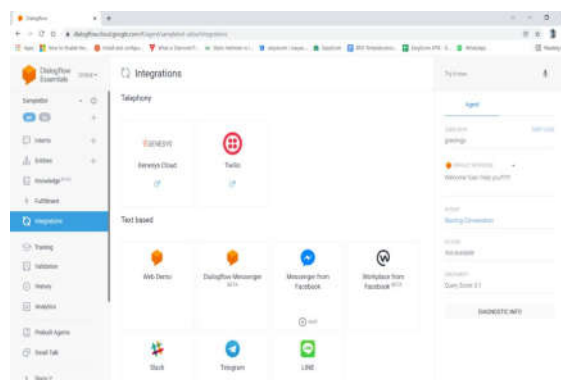


Fig. 6 Integration with other services

Debugging and Result - This chatbot grabs the attention of the users browsing through our web page as they get instant automated human a-like responses. This makes their involvement time lesser and also minimizes the human power for interaction purpose. All the questions and responses will be checked here.

Web demo - Figure 7 is a web demo located on the integration menu in the Dialogflow console. This web demo will be used as a simulator or platform to be tested on users so they can interact with chatbots that have been made. The testing mechanism is the user will get as many as 12 web demo links. As previously explained, there will be 12 agents according to the number of scenes. So, each agent has a different demo web menu

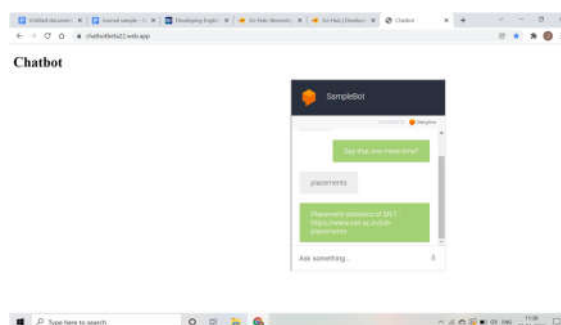


Fig. 7 Web demo

V. CONCLUSION

The college website chatbot using speech recognition and artificial intelligence technology with Dialogflow platform as the artificial intelligence engine has been developed and evaluated. From the results of this research, it can be identified that through storyline design and branching conversations, making chatbots, and testing, the level of accuracy of the response of an agent increases if the variation of the vocabulary data set is increased, and the conversation branching path is expanded more. This media can be utilized by users to clarify their queries related to the college. Besides, there is still a space to further develop this application.

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