

An Interpretation and Implementation of Chatbot Using Dialog Flow for an Education Domain

Kiran Kumar T.M¹, Sangeetha M R²

¹Assistant Professor, Dept of MCA, Siddaganga Institute of Technology, Tumkur

²Project Student, Dept of MCA, Siddaganga Institute of Technology, Tumkur

Abstract: A chatbot is a computer programme that interacts with users using natural language or text, giving the impression that the user is conversing with an assistant. In order to produce the necessary response, most chatbots use Artificial Intelligence (AI) techniques. Previously, chatbots merely gave the impression of intelligence by using far simpler pattern matching. However, in this paper the authors had been made an attempt to implement a chatbot using Dialogflow technology which will be helpful for implementing bot for an education domain specifically for the MCA Department. This bot will be useful for the students who willing to know the information about the MCA department.

Keywords: Artificial Intelligence, Chatbot, Dialogflow, Natural Language Processing.

I. INTRODUCTION

Chatbots, also known as chatter robots, are automated agents that use text or voice messages to replicate human communication. One of Chatbot's first and most important objectives was to imitate an intelligent person and make it difficult for others to understand their true existence. Chatbots are used in different scenarios such as Banking systems, Customer services, and Education domain nowadays. Education is an area in which chatbots have and can make a significant positive impact on students. In order to retrieve information, user(students) approaches Google, Yahoo or other information retrieving systems, but they retrieve documents or links which are not relevant or appropriate answer to their questions. With the need to solve such issues, the concept of a natural language dialogue system emerges, in which a user (student) asks a question in natural language, and the system responds with a succinct and reasonable response. [1]

In the absence of a Chatbot, if a user (student) needs to know anything about MCA Department information, he must go to the institute's website or by calling to the support desk. But sometimes searching information through websites becomes a tedious task and institute help desk may not be available for 24*7. This issue is resolved by the proposed solution called "MCA Department". It is enquiry Chatbot. It's similar to speaking to a customer support consultant. This chatbot for the MCA Department will serve as a virtual instructor who will be able to communicate with students. Pattern matching algorithms and Natural Language Processing techniques were used to build this chatbot in Dialogflow.

The remainder of this paper is structured in the following manner. Section II Literature Survey. Section III Methodology. Section IV The Work Flow of Dialogflow V Implementation of Chatbot. Section VI. concludes.

II. LITERATURE SURVEY

We have refereed some of the papers to understand the uses of chatbot in different domains and its uses of it. Some of them are listed below

II-A

The first chatbot is Eliza is considered as which works on the pattern matching system. It is developed by Joseph Weizenbaum. [2]. ALICE [3] is rule based chatbot based on the Artificial Intelligence Markup Language. It has more than 40,000 categories, where each category has combination of pattern and its response.

II-B

Md.Shahriare Satu and Shamim-AI-Mamun [4] showed the review of applications of the Chatbot which are developed using the AIML scripts said that AIML based chatbots are easy to implement, they are lightweight and efficient to work. Their paper gives the detailed information about the different applications of the chatbots.

II-C

Thomas N. T. and Amrita Vishwa [5] designed an AIML chatbot to provide the customer care over the E-commerce websites. Their approach shows they can improve the chatbot ability by adding other models to it. In android system, it can implement the chatbot using the various approaches. One of the approaches is shown by Rushabh Jain and Burhanuddin Lokhandwala in their Android based Chatbot [6] paper.

II-D

Dutta [7] proposed a web based chatbot tool that was developed for high school students. the chatbot was capable of engaging in the small talks with the learners.

III. METHODOLOGY

Knowledge abstraction and response generation are the two parts of methodology. The study of course material is known as knowledge abstraction (which called as data). Response generation, on the other hand, is dependent on the

characteristics of the data produced during the knowledge abstraction process, as well as the features of the tools available for Dialogflow and its various variants.

III-A Knowledge abstraction

Gathering, manipulating, and augmenting knowledge are the three stages of knowledge abstraction. These phases are largely unaffected by the Chatbot's content.

1) *Data gathering*: Data gathering is the method of gathering and measuring information on specific variables in a system, allowing one to answer pertinent questions and assess outcomes. Data gathering is an important part of research in all fields of study, including physical and social sciences, humanities, and industry. Although the techniques differ depending on the discipline, the focus on reliable and truthful data collection remains the same. The aim of all data collection is to capture high-quality information that can be analyzed to come up with compelling and credible answers to the questions asked.

2) *Data manipulation*: The next move is to enter this data into a database. Developers would be able to manipulate data as a result of this. Developers may, for example, generate two spreadsheets: one with information organized by topics and followed by the most important concepts for each subject, and another with a collection of questions from a discussion forum and their answers. Then, by looking for keywords within the question or answer strings, they can identify each question with its corresponding subject. Technically, this entails the use of a classification algorithm to mark each question-answer pair. These labels must be given a level of trust before being double-checked by a person to ensure their accuracy. The database will contain questions with similar answers; this should indicate that these questions have the same objective or meaning, allowing them to be categorized and eventually transformed into Dialogflow intents. As a result, developers should assign a mark to each question-answer pair that identifies the purpose to which it belongs. This would make the process of transferring data from the database to Dialogflow much easier in the future. Since the degree of similarity between answers to different questions is not well known, human intervention is critical here.

3) *Data augmentation*: By incorporating data augmentation, data manipulation can be brought to a new stage. This will expand the number of training examples available for Dialog flow's natural language processing model. One can search for connections between questions and answers that belong to the same purpose by using the intents. These connections can be visualized as a generic set of keywords (also known as entities). They can also be extracted and used to create further training examples in the future. In other words, responses may often be used to generate questions, and these questions should all have the same purpose. Developers may create a new spreadsheet that contains intents and their associated entities. Dialogflow

detects entities, and the model knows better when those entities are present within a single entity.

III-B Response generation

There is a detailed overview of how entities and intents function in Dialogflow, but it is necessary to explain how the platform's current implementation will benefit the proposed approach. Contexts, training examples, and responses are the three basic components that make up a purpose. Contexts serve the function of layering the conversation in such a way that only such intents can be activated while they are present. Sentences are used as training examples, and they are divided into two categories: templates and examples. These sentences are labelled by each of them using entities or the simple intent in which they are contained. Since responses are the outputs of intents, they are activated if a user entry matches an intent. They come in a variety of formats, the most popular of which is plain text. However, Dialogflow allows for direct integration with apps that fit content into cards, tables, lists, and other content structures. As previously said, entities are keywords that can be categorized in a variety of ways. For educational purposes, creating an intent for each definition is an option; this way, data can be grouped from students' interactions with the bot not just using specific questions, but also using these wider constructs. Apart from the analytics value, there is also an advantage for intent detection, since any time an object is identified, the amount of potential intents that match the query is reduced. [8]

IV. THE WORK FLOW OF DIALOGFLOW

To know how the conversation will work, creating intents will map to answer for responds. It will have sent to the evaluate input so it will go to the entities it is like checking the exact word by using the natural language processing.

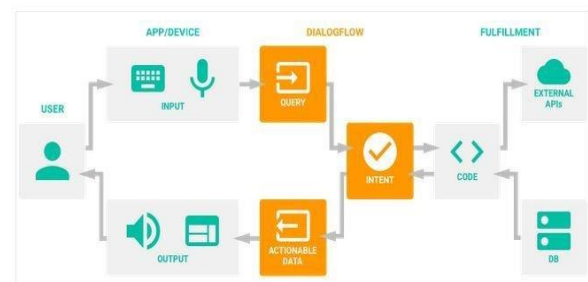


Fig.1 Schematic diagram of Chatbot

If entities were not given, if it did not match it will search for exact queries if it finds any entities found, then it will match with that word and will give responds. [9]

Here is how chatbot can be designed using Dialogflow AI technology and let's look at each of the components of this Dialogflow chatbot.

User

Qualifies for any human user or customer interacting with the business through chatbots.

Text/ Voice

Represents the user's preferred method of contact with the chatbot. When a user communicates with a chatbot via text messages in the messaging window, this is referred to as text-based communication. When a user communicates with a chatbot using natural language, this is referred to as voice-based communication.

Dialogflow

The chatbot platform used to process user input.

Agent

A Dialogflow module that uses NLP technology to understand the user request and provide an appropriate response or take suitable action. In other words, the agent converts the user request into actionable data.

Intent

A programmable code that determines what the user from the Chatbot system. The intent code is configurable by chatbot developers and can group different user expressions (in natural language) that basically means the same thing. An example of a MCA Department chatbot intent would be expressions such as,

“How many years MCA course is?” or “When do colleges starts?” or “What is the class timings?”.

Fulfillment

The programmable code used to deliver the user request from the chatbot and return an appropriate response back to the user. For any chatbot using Dialogflow AI, its primary objective is to provide or fulfill the user’s intent with an accurate response. [10]

V. IMPLEMENTATION OF CHATBOT

Dialogflow is the amazing platform since it supports inclusion into the Assistant app and also supports inclusion into more than 20 plus platforms such as Web Demo, Facebook, Slack, Viber, Kik, Twitter, etc. This Chatbot is integrated to institute’s website by clicking the Integrations choice in the left panel to generate a web demo for present agent. [11]

The steps to create a chatbot as follows:

Step 1: Examining the Preset Intents

Basic presets such as a Default Welcome Intent and a Default Fallback Intent are available in Dialogflow. This is simply asking the bot what to do when they are welcomed or when the bot is unable to answer their query. Select ‘Default Welcome Purpose’ from the drop-down menu.

Step 2: Creating Default Welcome Purpose, you can create a custom answer.

In ‘Responses’ section, the different responses for MCA Department Bot picked randomly when an expression is

entered. And custom response helps us to create a special welcoming response that suits Department bot.

Step 3: Creating New Intents

We're working on an MCA Department Bot to help users with a few basic questions:

“How many years MCA course is?”

“When do colleges starts?”

“What is the class timings?”

For each of these query forms, we'll build Intents and then populate them with the necessary Expressions and Responses. Simply click the ‘+’ next to the ‘Intents’ button in the left menu to construct a new Intent

When naming an Intent, be organised so that it is easy to remember later.

Step 4: Adding the Response

By adding the responses and expressions such as

“It is 3 years Course and 2 years lateral entry”

“we are open Monday through Sunday from 6AM -11PM”

“Classes starts at 8 Am and leaves at 5PM”. at the Training phrases, after that, set the Intent to "end of conversation."

Step 5: Integration

The information below demonstrates how to incorporate MCA Department bot:

To begin, go to the left column's "Integration" section and toggle "Web Demo" On, then click it to enter. [12]

Below Figures shows an illustration of MCA Department information virtual agent which is reported here

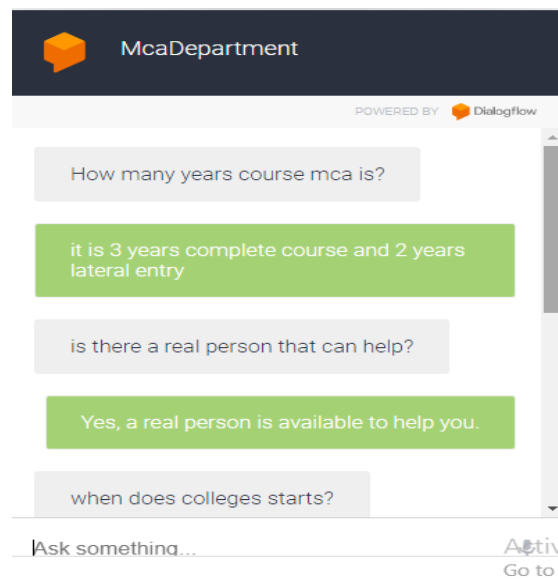


Fig.2Virtual Assistant of MCA Department

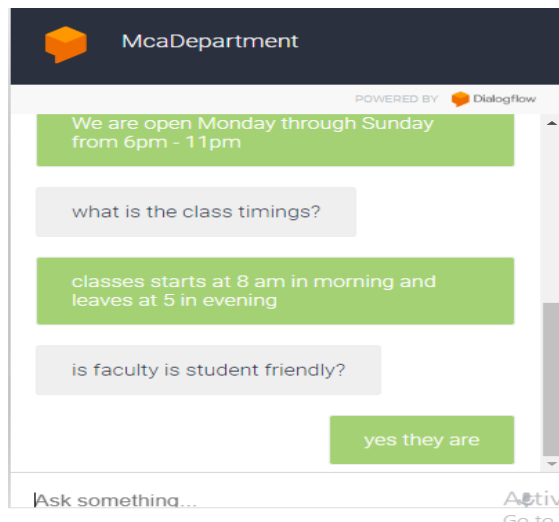


Fig.3 Example of an Integrated Dialogflow Chatbot

VI. CONCLUSION

Chatbots are now commonly used for a variety of corporate, personal, and educational purposes. With the aid of digital technology like Artificial Intelligence, they created a new way to connect with their customers. Chatbots are user-friendly, and anybody who is capable of typing in their language on a desktop computer or in a smartphone application may use them. An intelligent conversational agent based on a robust system was introduced in this paper using Web Demo and Google DialogFlow. The MCA Department chatbot combines the advantages of similar systems such as Speech Recognition, Context Recognition, and an Easy-to-Use Interface. And the author would like to conclude that by implementation of MCA Department chatbot is beneficial for the students who is keen to know the information about the department.

The drawback of this paper:

In these study, MCA Department chatbot can respond to English language only but, in the future, these chatbot can be implemented in other few languages

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