"CHATBOT DEVELOPMENT"

Report
Submitted By

PONNOJU RAKSHITHA 21MBMB04
MASTER OF BUSINESS ADMINISTRATION
(BUSINESS ANALYTICS)

Under the guidance of

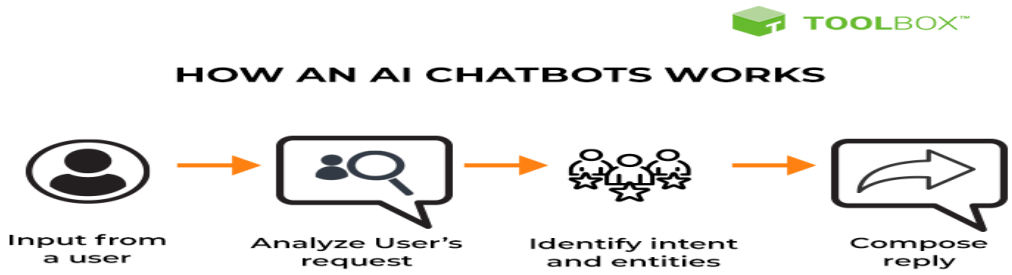
Dr. Varsha Mamidi **Assistant Professor**
School of management studies
University of Hyderabad

SCHOOL OF MANAGEMENT STUDIES
UNIVERSITY OF HYDERABAD
HYDERABAD - 500046(India)
2021-2023

1. Chatbot Fundamentals

1.1 What is chatbot?

A chatbot is a software application that mimics conversation with human in natural languages through various platforms like messaging, websites, mobiles etc. The chatbot responds by identifying the intent of the conversation and then responding accordingly.



Chatbots can be classified into two categories:

a) Rule Based Chatbot: This is a fundamental chatbot which works on "if-else" constructs. It can be responds to only predefined queries. The performance of this application depends on the programming skills of the developer.

b) Chatbots with Natural language Understanding: At the core, it has Language processing and understanding model with pre trained instances using Deep Learning. It can communicate through both text and speech.

1.2 Uses of Chatbots:

a) Can be used to answer FAQs.
b) Can be used for grievance handling.
c) Internal organizational automation.
d) To do any kind of bookings like flight, movie, hotel tickets etc.
e) Can guide the customer to buy the correct required product by answering their queries.
f) can be used for Customer relationship Management.

1.3 Advantages of Chatbots

a) We can provide 24/7 customer support.
b) Uniform customer experience
c) Cost efficient
d) We can built it once and can deploy everywhere.
e) We can integrate with various channels and platforms.
f) Can able to do better monitoring and generate insights.

2. Google Dialogflow

Dialogflow is a platform that simplifies the process of creating and designing a natural language processing conversational chat assistant which can accept voice or text data when being used either from the Dialogflow console or from an integrated web application.

2.1 Dialog Flow Terminologies

a) Agent

An agent on Dialogflow represents the chatbot created by a user to interact with other end-users and perform data processing operations on the information it receives. Other components come together to form an agent and each time one of these components is updated, the agent is immediately re-trained for the changes to take effect.

b) Intent

Similar to its literal meaning, the intent is the user's end goal in each sentence when interacting with an agent. For a single agent, multiple intents can be created to handle each sentence within a conversation and they are connected together using Contexts.

From the intent, an agent is able to understand the end-goal of a sentence. For example, an agent created to process food orders from customers would be to recognize the end-goal of a customer to place an order for a meal or get recommendations on the available meals from a menu using the created intents.

c) Entity

Entities are a means by which Dialogflow processes and extracts specific data from an end-user's input. An example of this is a Car entity added to an intent. Names of vehicles would be extracted from each sentence input as the Car entity.

By default, an agent has some System entities which have predefined upon its creation. Dialogflow also has the option to define custom entities and add values recognizable within this entity.

d) Training Phrase

The training phrases is a major way in which an agent is able to recognize the intent of an end-user interacting with the agent. Having a large number of training phrases within an intent increases the accuracy of the agent to recognize an intent, in fact Dialogflow's documentation on training phases recommends that "at least 10-20" training phrases be added to a created intent.

To make training phrases more reusable, dialogflow gives the ability to annotate specific words within the training phrase. When a word within a phrase is annotated, dialogflow would recognize it as a placeholder for values that would be provided in an end-user's input.

e) Context

Contexts are string names and they are used to control the flow of a conversation with an agent. On each intent, we can add multiple input contexts and also multiple output contexts. When the end-user makes a sentence that is recognized by an intent the output contexts become active and one of them is used to match the next intent.

To understand contexts better, we can illustrate context as the security entry and exit door, while the intent as the building. The input context is used when coming into the building and it accepts visitors that have been listed in the intent while the exit door is what connects the visitors to another building which is another intent.

f) Knowledge base

A knowledge base represents a large pool of information where an agent can fetch data when responding to an intent. This could be a document in any format such as txt, pdf, csv among other supported document types. In machine learning, a knowledge base could be referred to as a training dataset.

An example scenario where an agent might refer to a knowledge base would be where an agent is being used to find out more details about a service or business. In this scenario, an agent can refer to the service's Frequently Asked Questions as its knowledge base.

g) Fulfilment

Dialogflow's Fulfilment enables an agent to give a more dynamic response to a recognized intent rather than a static created response. This could be by calling a defined service to perform an action such as creating or retrieving data from a database.

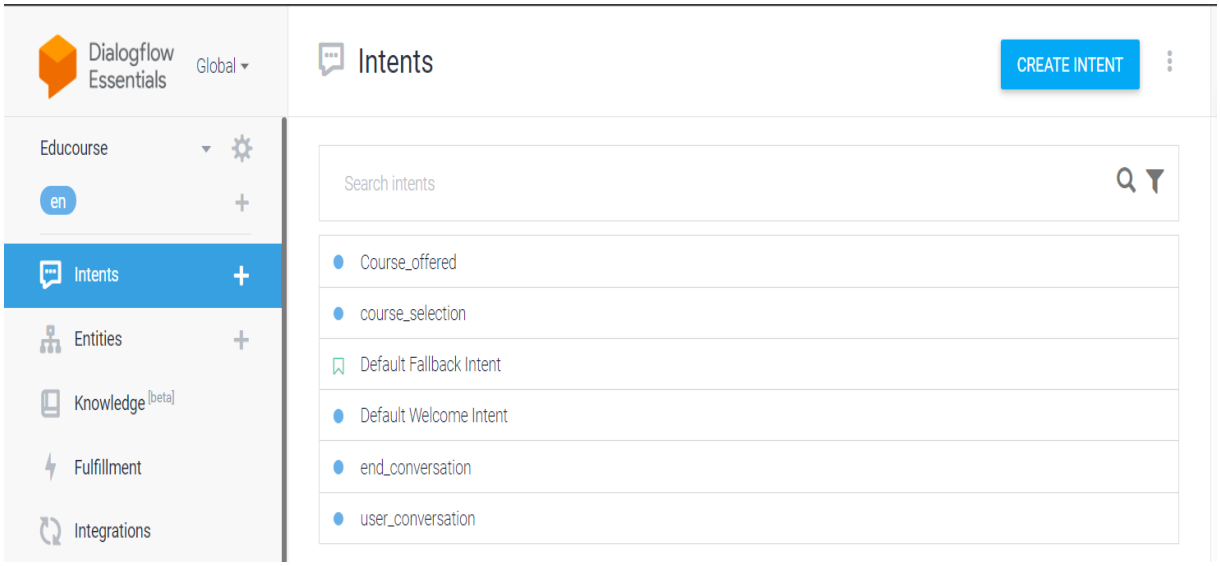
An intent's fulfilment is achieved through the use of a webhook. Once enabled, a matched intent would make an API request to the webhook configured for the dialogflow agent.

The chatbot for online Learning Platform called 'Educourse':

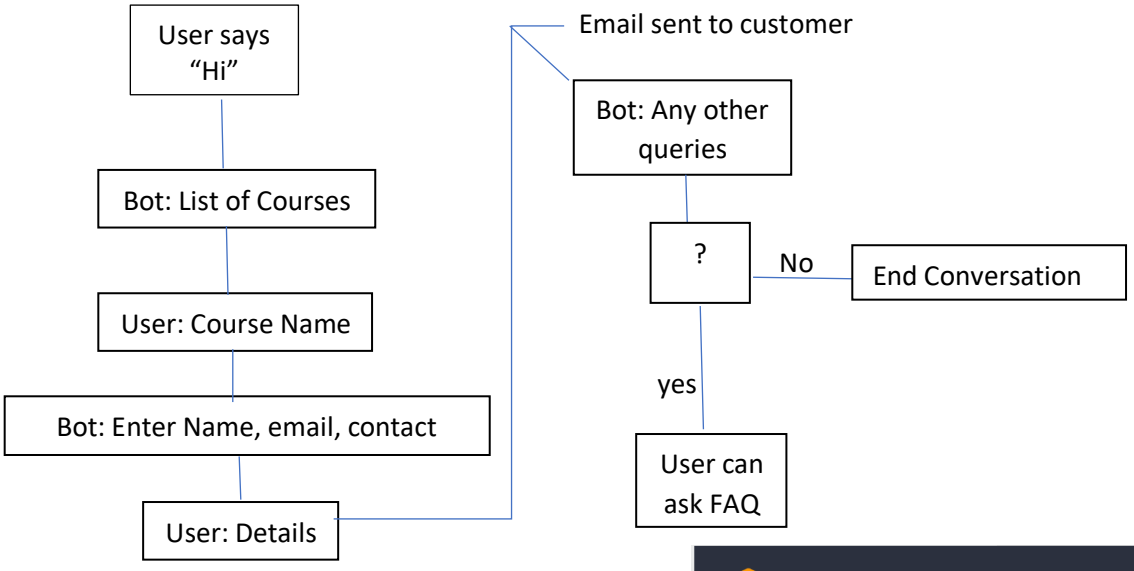
Dialogflow chatbot link: https://bot.dialogflow.com/deffb391-4cd1-423e-99e7-860daa830bac

Agent Created: Educourse

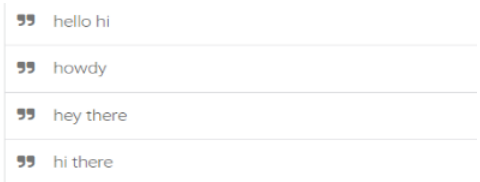
Intents created:



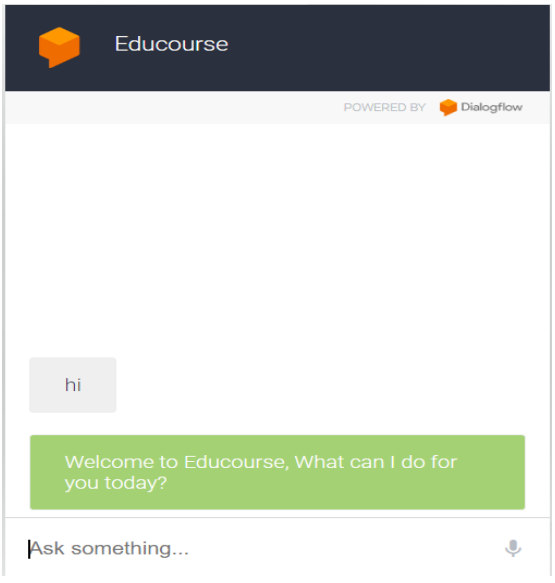
Flowchart of the chatbot



Welcome Intent: Training Phrases



welcome intent: text response

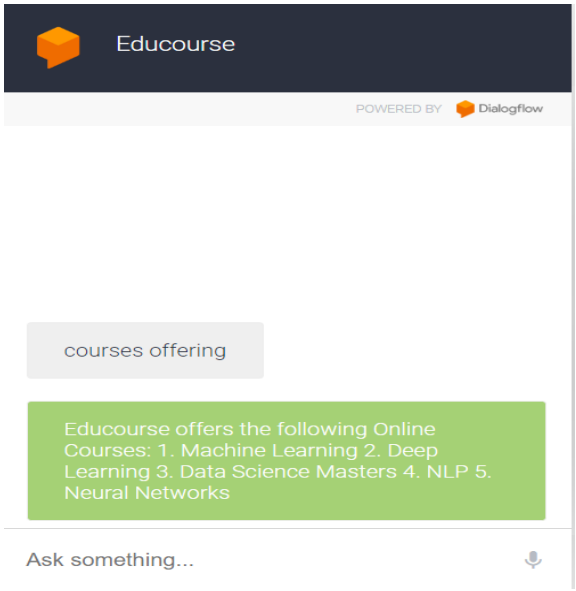


course_offered Intent: Training Phrases

- does offline course available?
- may I know what are the courses offered
- what are courses offered ?

course_offered Intent: Text Response

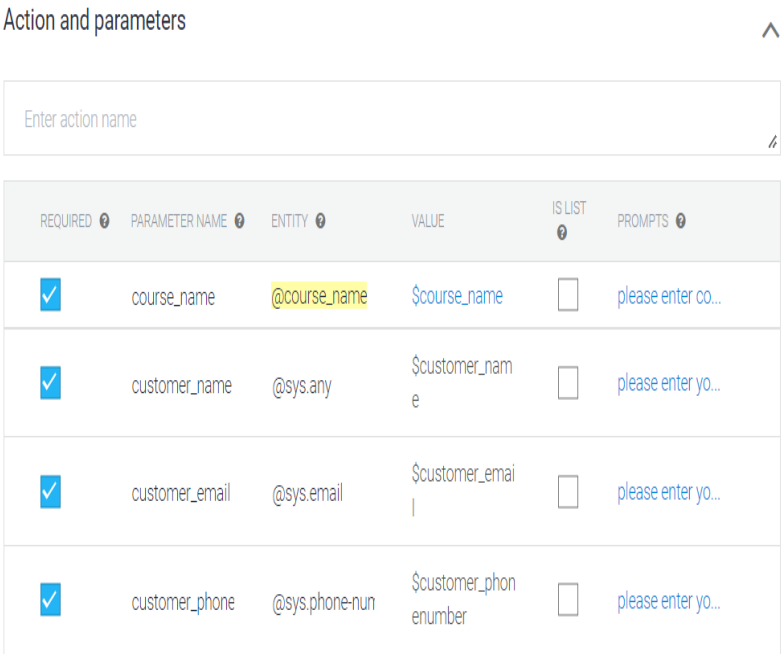
After knowing the courses offering by Educourse, we have an option to choose the required course from following courses offered.



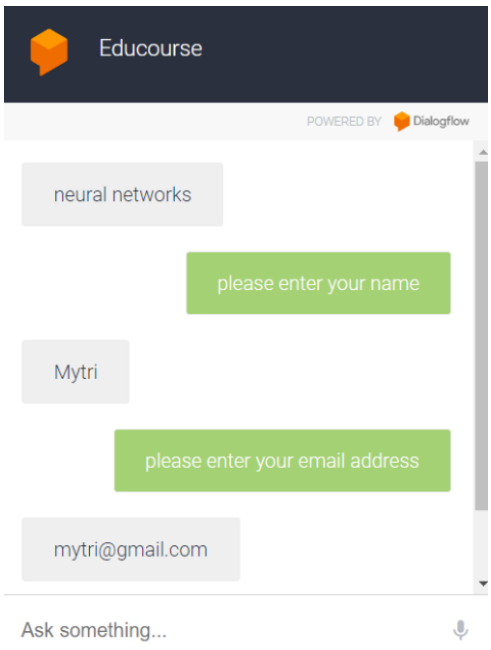
course_selection intent: Training Phrases

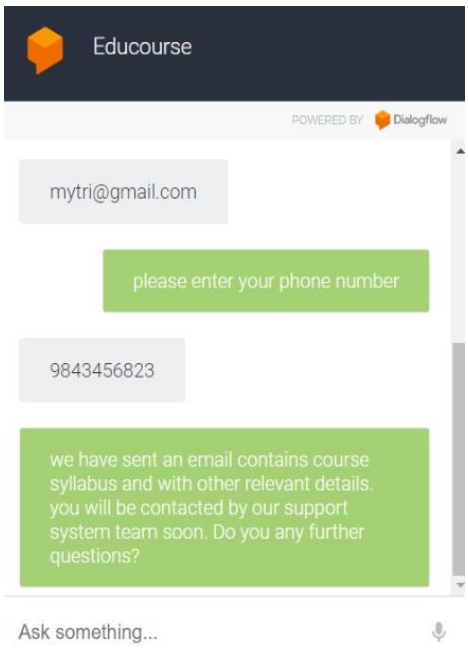
- Datascience
- NeuralNetworks

Parameters Created: course_name, customer_Name, customer_email, customer_phonenumber. Now the system collects details of the customer and send an text response where Educourse support sent response mail which contains the course syllabus and other related details.



Course_selection: Text Responses

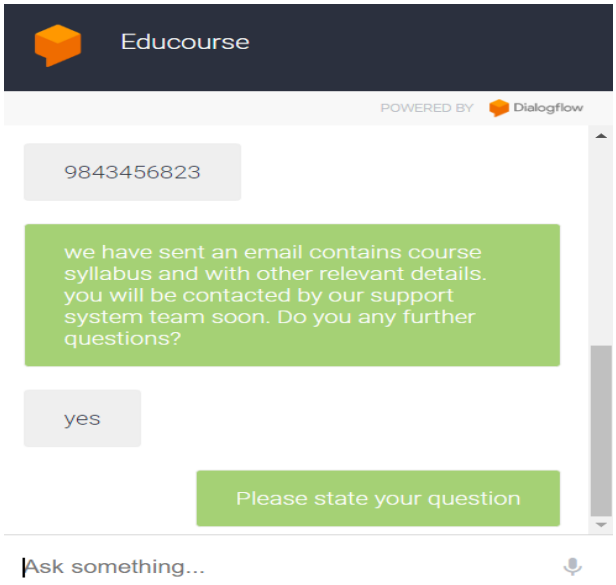




Now if the User have any further FAQs he/she will continue the conversation with the help of User_conversation Intent, if not the user end his/her conversation by end_conversation intent created. From below Figures we could see the training and text responses in the chatbot.

User_conversation: Training phrases

- yes I have
- yes

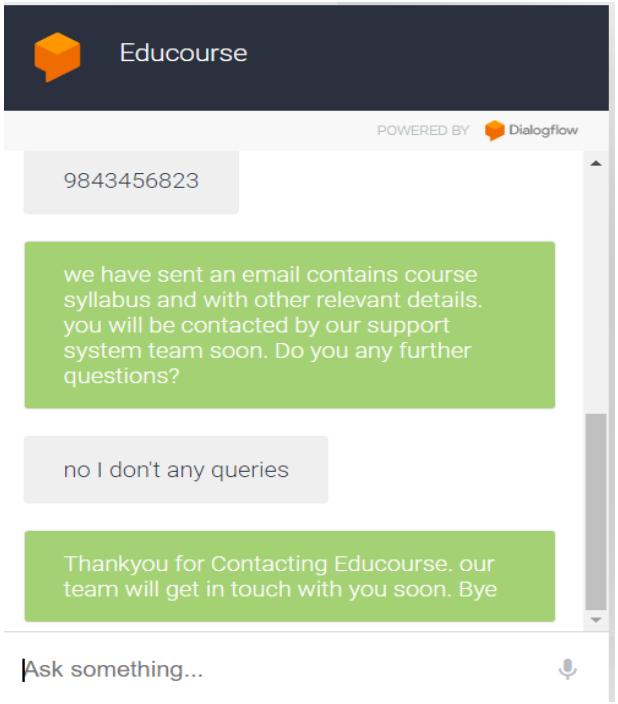


User_conversation: Text Response

Here the queries answered according to the data file sent by Educourse which contains an excel file with two columns of questions and related answers. This file is uploaded in the knowledge base so the system train itself with relevant answers if user has any further queries.

End_conversation: Training Phrases

- I don't have any questions
- I don't have any queries
- no I don't have any queries
- no



End_conversation: Text Response

The conversation ends with given text response once the user finished with his/her queries.