

Build a chatbot based on DialogFlow

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Natural Language Programming

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Abstract

In recent years, the demand for personalized fitness and nutrition guidance has grown significantly. Gym-goers and health enthusiasts often face challenges in structuring their workout routines and maintaining a balanced diet. To address this need, we present a Gym Workout and Nutrition Recommendations Bot, powered by Dialogflow, an advanced conversational AI platform. Dialogflow is a platform developed by Google, which has great potential. It is user-friendly and allows you to create a functional chatbot without prior programming knowledge. This presentation will describe its step-by-step usage, using the chatbot already developed by our team as an example.

Introduction

In this presentation we are going to describe the different aspects of the platform Dialogflow. In our case we are going to use as example a bot that we create ourself of gym workout and nutrition recommendations to show the different features that dialogflow has.

Development

Nutrition recommendations

The gym chatbot has been equipped with nutrition-related functionalities to offer users valuable information and assistance in making healthy food choices.

The following features have been implemented:

Entities:

- Food: This entity captures various types of foods mentioned by users, including fruits, vegetables, proteins, grains, and more.
- Meal Type: This entity identifies the type of meal the user is referring to, such as breakfast, lunch, dinner, or snack.
- Dietary Restriction: This entity helps understand specific dietary restrictions or preferences users may have, such as vegan, vegetarian, gluten-free, dairy-free, or nut allergies.
- Nutrient: This entity captures specific nutrients that users inquire about, such as protein, carbohydrates, fiber, vitamins, and minerals.

Intents:

- Nutrition Tips: This intent provides general nutrition tips and guidelines, emphasizing the importance of balanced meals, portion control, and hydration. It helps users understand healthy eating habits and encourages them to make informed choices.
- Meal Planning: This intent assists users with meal planning by suggesting sample meal ideas, recipes, and guidance on creating balanced meals. It offers options for different dietary restrictions, including vegetarian, vegan, and gluten-free.

- Healthy Snack Ideas: This intent offers a variety of healthy snack options aligned with users' fitness goals or dietary preferences. It suggests alternatives to unhealthy snacks and encourages the consumption of nutritious snacks for weight loss or general well-being.

Contexts:

- Input and output contexts have been utilized to ensure smooth and coherent interactions. For example, the "capture_dietary_restrictions" context is set in the dietary restrictions intent and carried over to the subsequent meal-related intents to provide personalized meal ideas based on the user's dietary preferences.

The incorporation of these features enables the gym chatbot to provide effective responses to user queries related to nutrition and dietary needs.

Injure recommendations

In this module we will give injury recommendations for aches that you suffer during your training sessions. In this we haven't used the entity function because, in our opinion, it wasn't necessary.

Intents:

- Injuries recommendations: This intent offers a variety of recommendations about what you should do if you get hurt during your exercise. In this type of intent you can say which part of your body aches and the chat will give you a custom recommendation depending on which part you've the pain. We have divided this intent in 2 types, one when in the first message the customer doesn't tell you where the problem is and the other when the customer tells you in which part the customer is suffering the pain

Contexts:

The only context that we are using is the “Saludnotedice-followup”. This context is used when a client tells to the bot that some part of his body is injured but he doesn’t specify which part exactly.

Exercises

The chatbot now has some exercises implemented to help users choose the best options to have the best routine in the gym.

The aforementioned features have been put into place:

Intents:

- Exercises for legs: This intents give some recommendations of exercises that you can apply in the days that want to do legs at the gym.
- Exercises for chest: This section offers some suggestions for chest exercises you can use when going to the gym.
- Exercises for back: This section offers some advice on back exercises you can do at the gym.
- Exercises general: This intent recommends a complete routine of all the exercises according to the days you decide to train.

Contexts:

Regarding the contexts implemented in the *Exercises* section, we have implemented the option to return another routine to all the inputs so that, in the event that we do not like the routine that has been given to us, we can have the option of obtaining another routine. In the case of “*Exercises*

general", we have applied the option that the user can decide how many days to train so that the chatbot returns a routine that matches the selected days.

Configuration of one intent

In this part of the report we are going to do the process of configuration of one intent and his entities.

First of all we have to create an agent by clicking on the option that is in the left bar that says “create new agent”. Then you will have to fill the form with the basic information of the agent such as his name, the time zone and which project belongs to. An agent is how Dialogflow call to the chats. Also there is an option while creating an agent that says “Set as Mega Agent” . This option is for creating an agent that is the combination of more than one agent, in this case we won’t select it, but it is good to know that it exists.

Agent name

CREATE

DEFAULT LANGUAGE ?

English — en

Primary language for your agent. Other languages can be added later.

DEFAULT TIME ZONE

(GMT+2:00) Europe/Kaliningrad

Date and time requests are resolved using this timezone if not provided in the API requests.

GOOGLE PROJECT

Create a new Google project

Enables Cloud functions, Actions on Google and permissions management.

AGENT TYPE




☐ Set as Mega Agent

Combine multiple Dialogflow agents (i.e. sub agents) into a single agent (i.e. [mega agent](#)).

Once we have created our intent we are going to create the entities for our chatbot. An entity is a way to make our chatbot identify different types inputs should expect our chatbot. There are two kinds of entities, default entities that are Dialogflow natives like the days of the week and custom entities that are the ones that you create manually because Dialogflow doesn't have them by default. To create a custom entity you have to go to the entities tab and press create entity. The next step is to put the necessary information to create an entity like his name and the values of that entity. We also recommend pressing the define synonyms to make the chatbot recognize these entities and introduce some synonyms and also to activate the Fuzzy matching function because this allows the chatbot to recognize miss-spelled words. Here is an example of configuration.

Food

SAVE

☒ Define synonyms  ☐ Regexp entity  ☐ Allow automated expansion ☒ Fuzzy matching 

apple	apple, fruit, red apple, green apple
chicken breast	chicken breast, chicken, poultry, grilled chicken
brown rice	brown rice, rice, whole grain rice, long grain rice
spinach	spinach, leafy greens, spinach leaves
banana	banana, fruit, yellow banana, potassium-rich fruit
salmon	fish, grilled salmon, omega-3 fatty acids
oats	oats, oatmeal, whole grain oat, breakfast cereal
broccoli	broccoli, vegetable, green vegetable
avocado	avocado, fruit, healthy fat, creamy fruit
quinoa	quinoa, grain, protein-rich grain, gluten-free grain
almonds	almonds, nuts, crunchy snack, vitamin E-rich nuts
Greek yogurt	Greek yogurt, yogurt, high-protein yogurt, probiotic-rich yogurt

The last step will be to create our intent, to do that you must click inside the intents tab and press the create intent button. Once you are in the intent creation page you have to set the name and its context. The context is the way to indicate if an intent has to go before one intent specific or after him. One example will be the next one.

--First intent: Client: Can you give me a good meal schedule?

Chatbot: Yes, do you have any food restrictions?

– Second intent: Client: Yes, I'm vegetarian.

Chatbot: Okey, so eat carrots

To connect this intent we will use the context options, for the first intent we will put as output context the same context as the input context of the second one. Here is an example.

Meal planning

SAVE

Contexts ?

Add input context

2 Mealplanning-followup ⓧ Add output context ✕

The next thing we have to do is to set the training phrases of this intent.

” Can you suggest some quick and easy meal ideas?

” I want to create balanced meals

” Can you suggest a meal plan?

” i need meal ideas

” Help me with meal planning

As you can see there are some words that are marked, that is because they are words that belong to entities that we created earlier, so if the client instead of saying that word he says another word that belongs to the same entity the bot will recognize as well.

Action and parameters

REQUIRED ?	PARAMETER NAME ?	ENTITY ?	VALUE	IS LIST ?
<input type="checkbox"/>	dietary_restrictions	@Dietary_Restrictions	\$dietary_restrictions	<input type="checkbox"/>
<input type="checkbox"/>	meal_type	@Meal_Type	\$meal_type	<input type="checkbox"/>
<input type="checkbox"/>	Enter name	Enter entity	Enter value	<input type="checkbox"/>

[+ New parameter](#)

That was the list of the entities that the bot is recognizing.

The last step is to configure the response that the bot will be giving when the intent is trigger with some of the intent's training phrases. To do it you just have to put the answer at the bottom of the configuration panel. Also you can use a webhook, which is to ask to external application for the answer but we didn't use it in this case.

Responses ?

[DEFAULT](#) +

Text Response

1

Sure! What's your dietary preference? Are you looking for vegetarian, vegan, gluten-free, no restrictions?

2

Enter a text response variant

Summary

We could say that the project was a success, because we could make an easy chatbot using the dialogflow platform. During the making of this project we have learned that dialogflow is a very powerful tool to make a chatbot even if you don't know how to program. This platform has a lot of potential and has a lot of ways to integrate it in a professional environment because of its easy integration with other apps. We have learned about how to do our own intents, entities and all the features that dialogflow can bring us. To sum up, dialogflow is an application that everybody that is interested in the creation of a chatbot should check.

Bibliography

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