Our Heritage

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Artificial Intelligence based Chatbot for Placement Activity at College Using DialogFlow

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Abstract
Chatbots work like virtual assistants, provide a platform for elevation of the products and services online. This paper reports design and development of Artificial Intelligence (AI) based Chatbot for handling placement activities in professional college. For this we have used DialogFlow, a Natural Language Processing (NLP) module to translate students' queries during conversation to structured data in order to understand the institute's service. This agent provides information related to placement activities to students.

Keyword's:- AI, NLP, Chatbot, Virtual Agent, DialogFlow

1. Introduction

Chatbot is a simple computer program that attempts to simulate human conversation using Artificial Intelligence.It uses to AI to simulate conversation with user throughmessaging chats or voice commands.These bots are used in many service areas as an information provider in online mode. Natural Language Processing made the Chatbots more sophisticated by means of not only pre-programmed responses to user questions but also improving their responsiveness. AI based Chatbots have the prospective to transform certain practices in educational organizations.

The present work is motivated by the various Chatbotprojects.The Chronicle of Higher Education, Inc elaborated how AI and Chabots support pedagogy in educational institutes [1]. This report explains the advantages of AI based Chatbots for teaching-learning process and administrative functions in educational organizations. Jayesh et al reported design and development of Andriod App for handling conversation [2]. This Chatbot is an intelligent voice recognition app interacts with user queries. Harshet al presented development of web application to handle students' enquiries using Microsoft Bot Builder [3]. The effective use of graphical user interface eases the conversation process. Yet another project by Arun et al explores AI based bot for management system at professional engineering colleges [4]. This is developed using Dialogflow provide auto response to user queries related to academics [5].

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In the absence of Chatbot, if the user wants to get any information related to Institute's Placement Activities he has to browse institute website or by calling to the institute help 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 "ALICE". It is aninstitute's Placement -Activity enquiry Chatbot. It's similar to speaking to a customer support consultant. ThisChatbotprovides virtual assistant type of service to students.

2. Chatbot Architectural Framework

This Chatbot is developed with the help of a Google owned DialogFlow interface which is commonly used to create Chatbots or NLP based Chatbots[5].NLP enables machines to understand instructions provided in normal English in order to make computers easier to understand. It is "Build-once and deploys everywhere development suite" for developing interfaces for business websites, mobiles applications, messaging platform and so on[5][8]. It also offers a new analytical tool that can help in assessing usage patterns, latency issues and high intents of the agent. Because of GUI (Graphical User Interface), users who are not from a technical background can also easily build AI based Chatbot using DialogFlow[5][6].

A. Components of DialogFlow

Following are the components of DialogFlow used for designing Chatbot:

- User: - User can be Humans or Machines
- Text Query/Voice Query:-The user interacts with an app like Facebook messenger / Googlehome to start the interaction with the bot.
- Dialogflow: -This is the Chatbot platform used to create Placement-Activity agent.
- Virtual Agent:A Virtual agent is AI virtual character which is a Chatbot.
- Intent: - Intent is a specific action that can be invoked by the user in the Dialogflow console using one of the defined terms
- Fulfillment: Fulfillment is a piece of code which is deployed as a web hook and DialogFlow interface agent calls the business on a per intent basis. During conversation this allows the user to use the information extracted from DialogFlow's NLP to generate the dynamic response or to trigger action at back end

B. Training Phrase

When a user queries the agent, the Chatbot will try to match the defined phrases to match the user's phrases[5].Based on these phrases the Chatbot will answer the user's queries. If these phrases are described in various ways, then Chatbot can respond effectively [6]. The process of Chatbot is depicted in Figure 1. Figure 2 shows diagrammatic representation of user and Chatbot interactions

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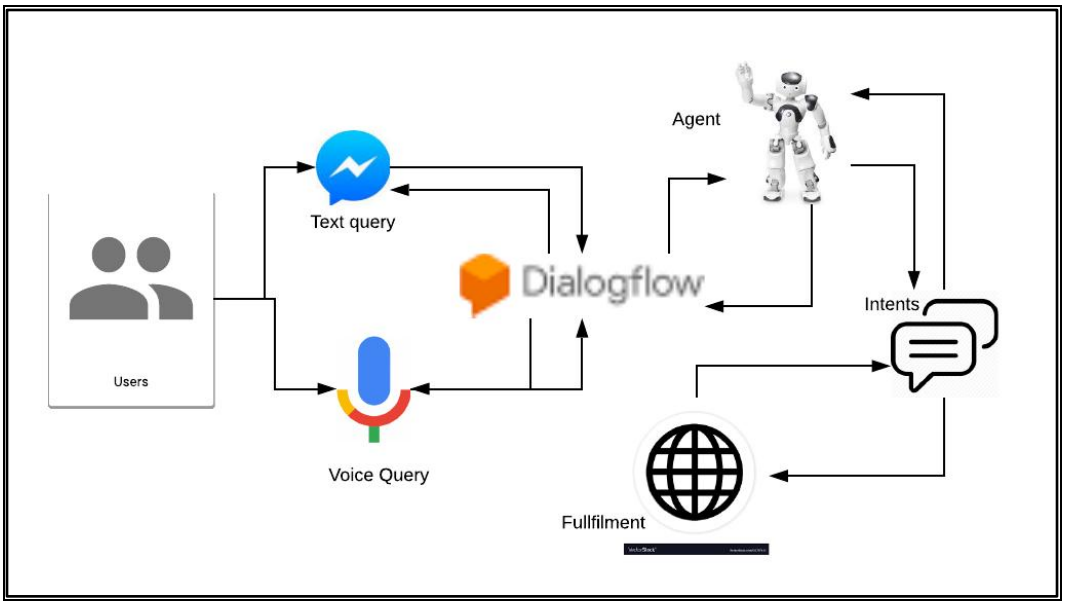

Figure 1: DialogFlow based Chatbot process flow[6]

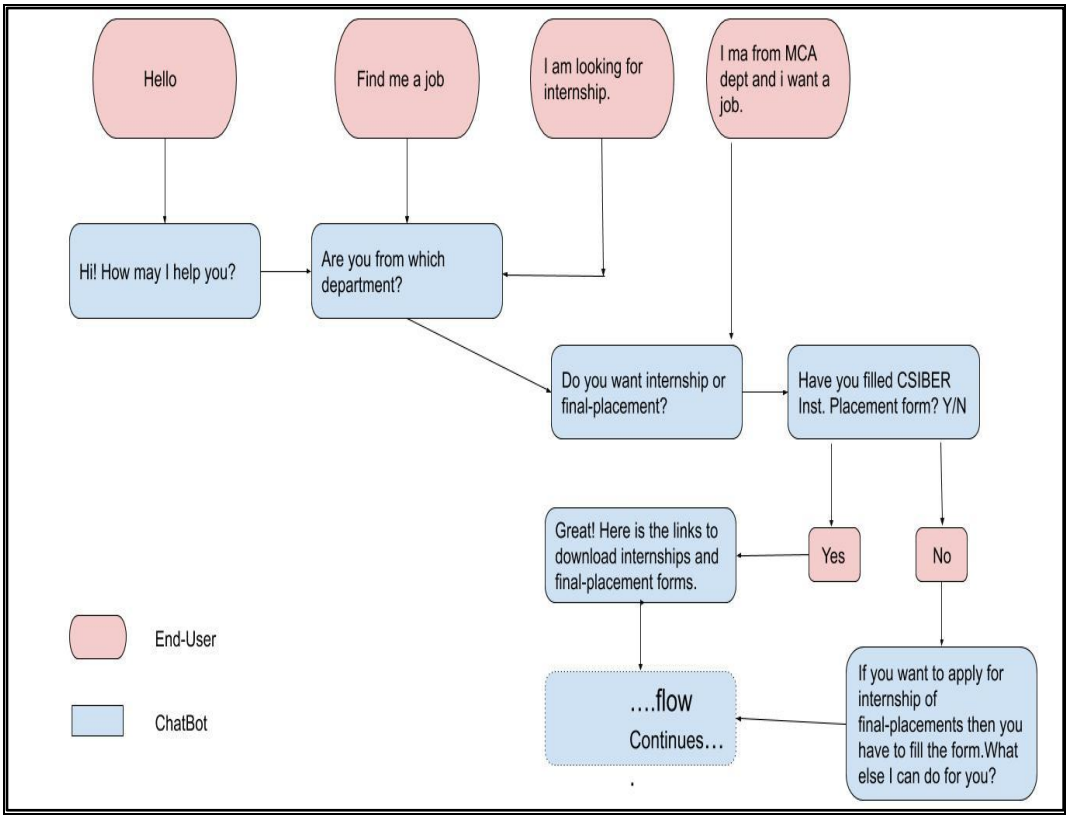

Figure 2: Flow of User and Chatbot interaction(One Protocol)

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3. Chatbot Components

This sections details Chatbot components of the present development.

A. Intent

Whenever the user raise an issue or ask a question, it'll attempt to match in corresponding Intent [5][6].In Dialogflow, intent contains elements and logic to analyze information on users request to answer their questions [5].For the better performance developer need to feed as much as more data with various variations to the Intent.Therefore, it's required to feed the same question with various variations. There are 5 intents developed in this Chatbot and one is provided by the DialogFlow interface, which is a welcome intent. The intents designed for the placement application is shown in figure 3.

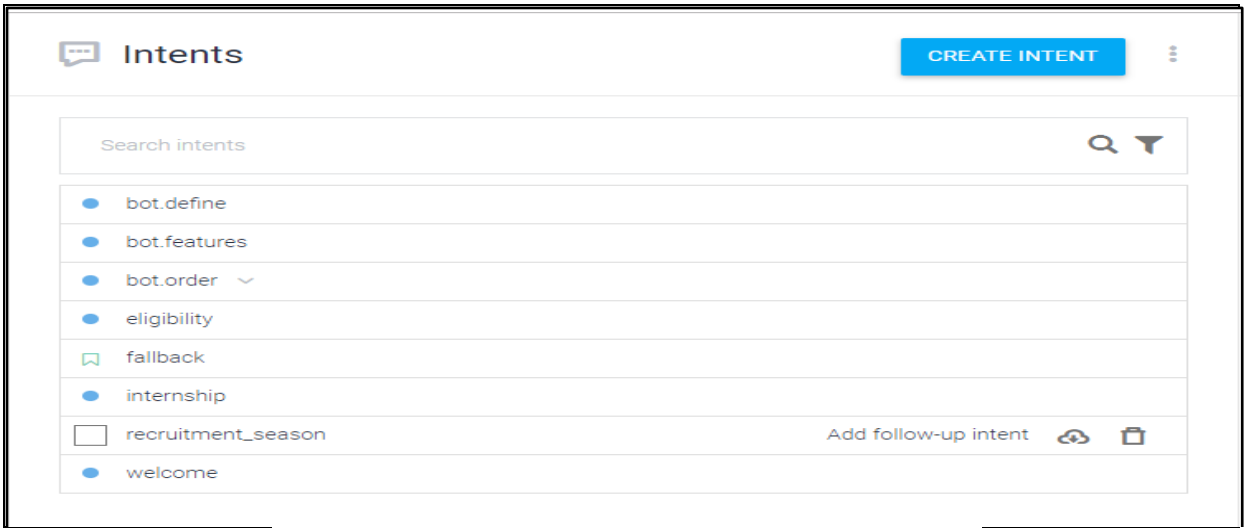

Figure 3: Intents designed for Placement application

Fallback intent is also handling the user's fallback request [5]. Fallback attempts typically re-prompt the user to provide user's action with the required input. Users may define re-prompt phrases in the response area or may use a webhook for re-answering that questions [5][6]. The Default Fallback Intent is automatically configured when user create an agent with a variety of static text responses, such as "I didn't get that. Can you say it again?" and "Sorry, what was that?" or user can define the message. This intent is matched when user's input doesn't match any other intent; in other words, it's a sort of catch-all for any unrecognized and unknown user input[6][7].

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B. Entity

An entity reflects a word or object applicable to intent and providing a particular content for intent.[5]It's required to list the probable values and synonyms that users may enter for each entity.[7]The assumption here is that this Placement-Activity agent is running and may receive users' messages about courses. Users may ask the same queries using different words and phrases for each course [7]. There are built-in-Entities which are provided by DialogFlow for dates, currency and many more and the developer can define new entities like departments, colors, models, food-menu, etc. Figure 4 and Figure 5 shows the entities created in this Chatbot application [5][6].

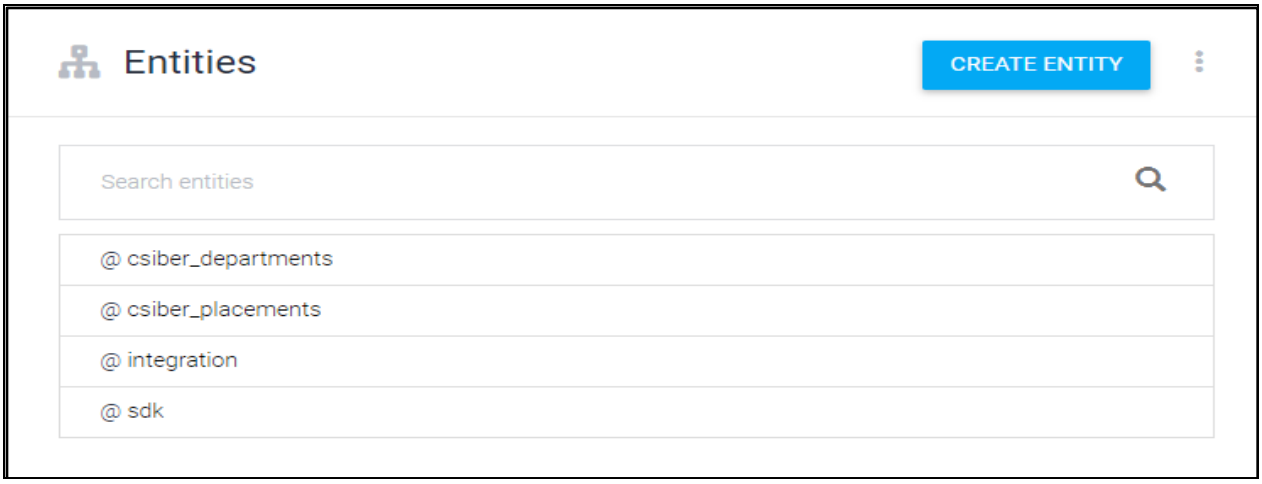

Figure 4: List of entities of Placement-Activity Chatbot

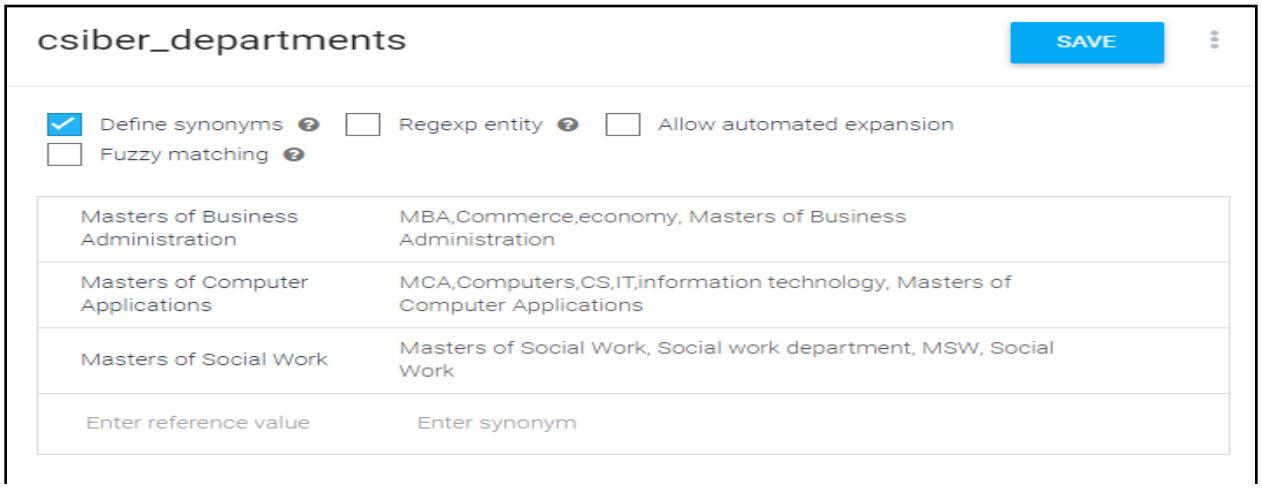

Figure 5: Departments entity elements

C. Fulfillment

Fulfillment is code that's deployed as a webhook that lets the **Dialogflow** agent call business logic on an intent-by-intent basis [9]. A webhook is an HTTP request which is automatically sent when certain conditions are fulfilled [5][9]. In any server-side languages such as Python, PHP or

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Node.js a webhook can be created.During a conversation, **fulfillment** allows to use the information extracted by **Dialogflow** natural language processing to generate dynamic responses or trigger actions at back-end.If any request triggers intent, then DiaolgFlowhandles that request with a functionswritten in fulfillment [5][6][7]. This is shown in figure 6.

Figure 6: Logic to process the user input

D. Context

Context performs an important part in agent achievement.Context enables the assistant to speak more like humans by maintaining the context and responding to end users[7].This agent uses contexts to track a communication state and controls the intent and conducts a conversation based on a user's previous answers[5][6]. Figure 7 shows an example that uses context for Placement-Activity agent.

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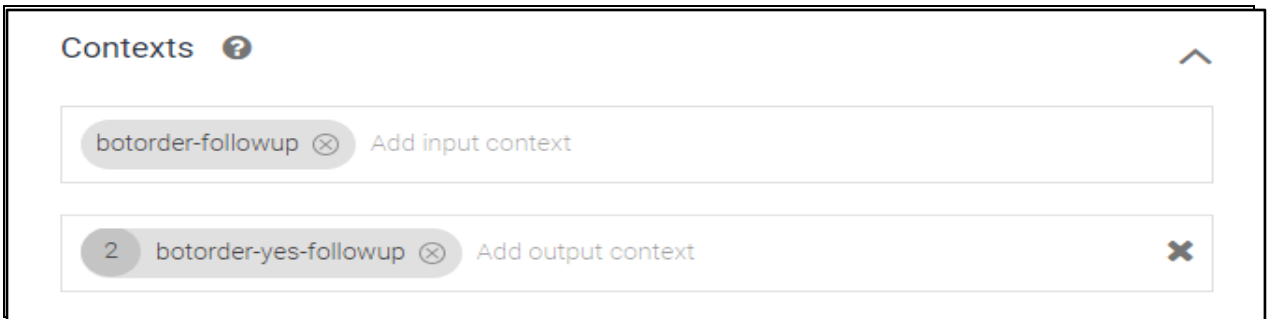

Figure 7: Context declaration in DialogFlow

UsingcontextsDialogFlow to manage interaction state, flow.This agent uses contexts to keep track of a conversation's state, it directs the conversation based on a user's previous responses. Context also holds the values of entities and parameters, based on what the user said earlier.[7] Here is an instance of Placement-Activity context-driven dialog:

User: "I am looking for final-placement for MBA department?"
Agent: "have you filled up final-placement form?"
User: "Nope"
Agent: "It's OK no problem!, would like to download this forms?"
User: "yes, want to download this form."
Agent: "Great! Here is the link you can download it using this link"

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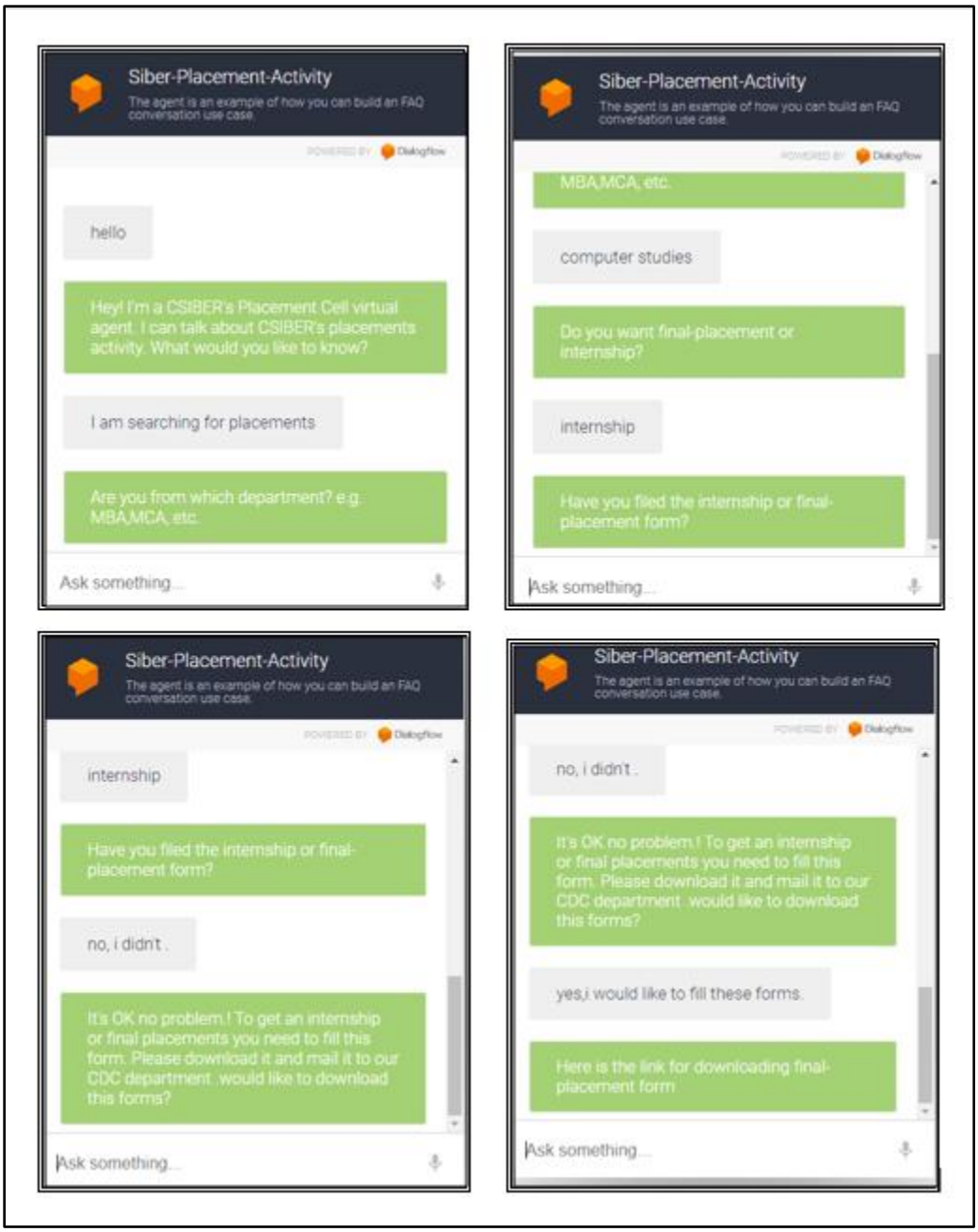

Figure 8: Screenshot of Placement Activity virtual agent

4. Platform Integration

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 twitter, Facebook, Slack, Viber,Kik,Twitter,etc[5][7].

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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 and then press the Web Demo tile button. Figure 8 shows screenshot of placement activity virtual agent which is reported here.

5. Conclusion:-

Authors have reported design and development of AI based Chatbot for handling placement activities in professional college. This agent provides information related to placement activities to students. NLP module of DialogFlow translates students' queries into structured data in order to understand institute's service.

The advantages of this Chatbot are listed here:

- This system helps new students to get information related to institute's placements easily and quickly.
- This Chatbot provides very rich and wealthy interface to users as they feel chatting with real person.
- Students need not to physically visit the institute for inquiry because this Chatbot can answer most of their queries.
- Rather than the using traditional and old ways students/users are more curious to use new technologies like Chatbots and messaging apps and Chatbot is the cutting-edge Technology so this is the perfect solution in our case.

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