

Hexabot: A Text-Based Assistive Chatbot To Explore Library Resources

Sorna Shanthi.D, Keerthana.S, Nandha Kumar.PK, Nithya.D

Abstract— Building customer support is one of the major workflow for any business happening around the world. The growth in technology has leveraged the customer expectations like need for a 24/7 service customer support, instant response and answers for even simple queries which requires huge manpower and knowledge. Chatbots are solutions build based on adapting AI technology to reshape the customer service domain. Imagine for a minute, where instead of a human being at a customer support, Chatbots will help us provide the service for the customer. In this project a chatbot coined as 'Hexabot' is built to explore library resources. It enhances an easy way to access the university library to ascertain the availability of books for the convenience of students and faculties without visiting the library. The student can explore the library resources with the help of this chatbot which makes the student to be connected with the library at anytime and anywhere. The chatbot is built using Dialogflow and is integrated with Facebook messenger for the satisfaction of users to reach through mobile phones, laptops and more handheld devices.

Keywords— Chatbot, Artificial intelligence, neural network, dialogflow, Facebook messenger.

I. INTRODUCTION

A Library maneuvers with a social thought of providing valuable information resources to people who can't afford an extensive collection of books for professional assistance. It is one of the major assets in a college. Thus a college focuses on maintaining and managing the details of the library data with at most efficacy. The value of any information resource can be judged based on its knowledge and utility and not on monetary. Hence it is necessary for an institution to take care of providing the required support to teachers and students to effectively use the resources in a library. The main objectives of this project are,

Explore the Library resources to the users by adapting an Artificial Intelligence Technology (CHATBOT) □ □ Enable easy communication between the user and the chatbot-Anytime and Anywhere.

In recent times, chatbots have reduced the need for human intervention. Artificial intelligence and machine learning have accelerated the evolution of chatbots to blur the line between human and bot style of interaction [1]. A chatbot is a computer program or artificial intelligence which conducts

a conversation via auditory or textual methods [2]. Chatbots are generally used in systems which involves chatting with users to either acquire information or provide the service as information to them. In certain Chatbots natural language processing is used, but many of the Chatbots have their reply stored in database which they retrieve when they receive an input from user [2]. According to Finance Digest, AI will handle 95% of the customer interactions by 2025, which will free up the need for human interaction. Such advanced AI technology would create a self-learning system for chatbots, where chatbots can learn to respond without any scripts for every instance of a conversation [1]. Chatbot's helps people by reducing the time they navigate in Web by easily providing the information they search [9].

II. RELATED WORK

In recent times there are many applications that endeavor the intervention of chatbots in place of human interaction with users requesting any service, a chatbot for college management system model is a simple system where the data is already programmed in advance. The methods used are pattern-matching, natural language processing, data mining. The input sentence from the speaker or user will be matched by the Chatbot with the pattern existed in the database [5]. Another web based chatbot for College Enquiry, has a provision of marking the answer given by chatbot as invalid, if the answer is not related to the query. In addition to this, some bots are trained with application which will provide response to several analyzed queries of the user. [6]. Education, business and online chatting are some of the domains where chatbots are used. It can be used as a learning tool [7]. Currently chatbots have limited language support. Hence there is a great scope for removing such language barriers in future chatbots.

III. METHODS AND MATERIALS

Hexabot: The Library Chatbot is built using intelligence that analyses user requests and respond accordingly. It is used to ensure the availability of books to the students and faculties of various academic years and departments without visiting the library. Dialogflow is used as a platform/tool to build user queries and responses. It is integrated with the facebook messenger and response is viewed in facebook messenger. The dialogflow is where the analysis of the user query takes place and then answers are fetched and replied back to the user by the chatbot. The system replies using an effective chat interface which implies that as if a real person

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is talking to the user. The user can request for information about the library related activities through online with the help of this bot. Hexabot supports the user by saving their time and provides data related to library resources and answers to simple queries. User does not have to go personally to library to ensure the availability of books.

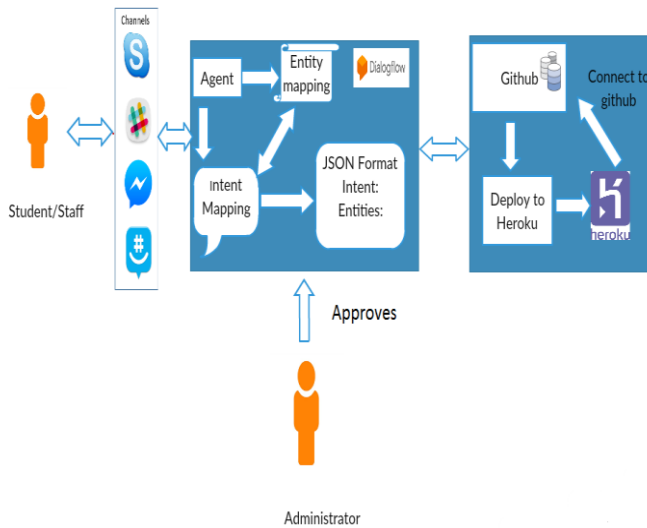


Figure1: Architecture of the proposed system

The procedure that was implemented for working of this chatbot system is as follows:

Step 1: Start.

Step 2: Train the phrases by adding the user expression in the intents e.g. For a user expression “List the subjects for CSE first year” removal of stop words will be done by Entity mapping in the dialogflow tool.

Step 3: Add the respective responses for the phrases trained during the intent creation.

Step 4: Get the user query (INPUT).

Step 5: In the query Remove stop words and fetch the keywords.

Step 6: Match the fetched keywords with the keywords in intent, if matched go to step 8, the bot will provide an appropriate response. A keyword matching algorithm will be applied to identify the matching. Otherwise go to step 7.

Step 7: If no matched keyword then the new phrase is added to the training and mapped to a specific intent.

Step 8: Return the response as an output to the user.

Step 9: Exit.

A. AGENT AND INTENT CREATION

This module consists of 1) Agent creation 2) Intent creation

Agent Creation:

Agents are platform agnostic. Agent processes the request of the users which are in the form of natural language. It transforms user’s natural language request into actionable query and are used to manage conversation flow in a specific way. It must be designed by an agent once and then it can be integrated with a variety of platforms using SDKs and integrations, or download files compatible with facebook messenger, slack etc.

Intent creation:

It epitomizes the mapping between what a user request and what response should be taken. The main task is to train the phrases by adding the user expression with several informal contexts, short forms etc. The actions and parameters enable us to do entity matching by mentioning its parameter name, entities, prompts and values. The text responses are given as output by the bot which can be given in two forms such as output with default response in the dialog flow and the conversation that is made through facebook messenger. The default responses are a kind of normal text. Facebook responses can be displayed with an image, cards and quick replies.

B. TRAINING THE BOT AND DATABASE CREATION

This module involves creating entities for the easy reference to intent and training the bot to learn from its mistakes. For every conversation initiated by the user that is not specified in the intents gets saved in the ‘user says’ column in the training block. To approve the informal contexts used by the user select the ‘click to assign’.

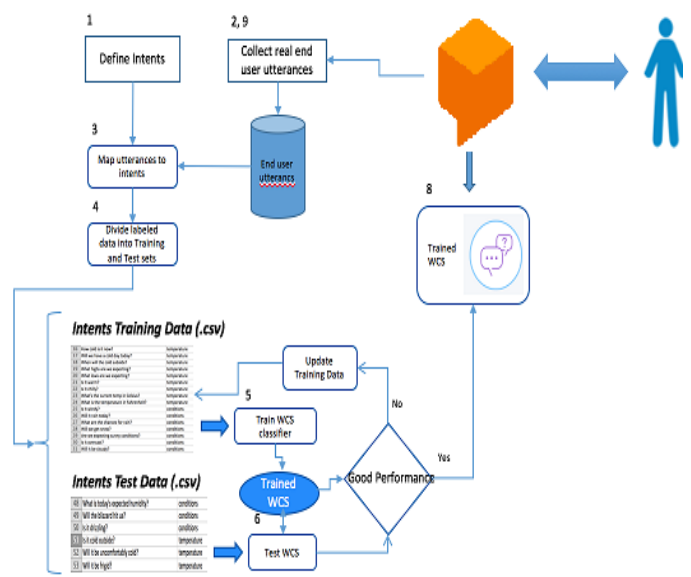


Figure 2. Flow of actions [3]

Finally the informal contexts get approved and the bot is trained. In order to store all the details of the book in our university library we must create a database table using rows and columns. .CSV (Comma separated values) file is used for storing and retrieving the information such as book_id, book_name, author_name, subject_name, and publication of the book, position of book in the rack and to ensure the availability of the book in library.

C. INTEGRATION TO FACEBOOK MESSENGER USING FULLFILLMET

The bot is integrated to Facebook messenger using webhook and fulfillment for the better user interface. A POST request from Dialogflow will be received by the web service, in the form of the response to a user query matched by intents with web hook enabled. Ensuring that our web

service meets all the webhook requirements specific to the API version enabled in this agent. The code that's deployed as a webhook allows the Dialogflow agent calls business logic on an intent-by-intent basis. At the time of a conversation, fulfillment consents to use the data extracted by Dialog flow's natural language processing system to generate dynamic responses or trigger actions on the back-end. Fulfillment generally extends an agent such as to generate dynamic responses based on data looked up from a database.

D. DEPLOYMENT THROUGH HEROKU SERVER

The deployment of the system is done in the Heroku cloud. Heroku is a cloud server where applications can be built, deployed and scaled. To deploy the application through heroku server, a new app is created and deployed in it. The webhook sample had a one-click deploy to the Heroku cloud, and to example up and running in practically no time.

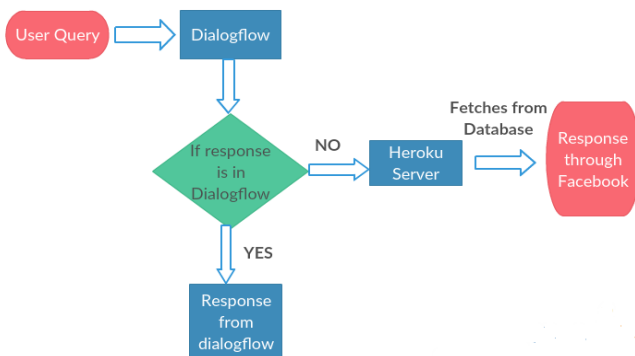


Figure 3. Selection of response

Since Heroku is very much user friendly when compared to the Google Cloud, which makes it particularly well suited for developers who are just experimenting in API.AI to evaluate its capabilities.

IV. ASSESSMENT RESULTS

Scalability:

More than one user can access the bot at the same time. So that many users can make a conversation with the chatbot and it is scalable. As we integrated with the help of Facebook messenger, it is very easy for the common people to access the library including the students and staffs. The bot can be linked with several social networking sites such as twitter, slack, common websites and college web portal.

Accessibility:

In order to be more scalable for the usage of bot in colleges, it will be very much easy when it is integrated with the college web portal. Each student can access with the help of their own username and password.

Usability:

We have created a bot to get more than 100 books of the CSE departments. More than one department book can be retrieved easily without making any changes in the flow. In the near future, there will be more advancement so that the library can exist without any man power and the simpler chatbots are going to dominate with more rule based

development. While we conclude, it is imperative to note that the chatbots will come into existence in the field of marketing, big hospitals, institutions and will even replace the BPO industry in future. The combination of chatbots and robots will automate the process in various fields with very less man power and in specific fields without even single manpower. This will also minimize the cost of operation

V. CONCLUSION

We have created a Library Chatbot using api.ai (Google) with the help of dialogflow for the Students, Faculties, Staffs and others. The Library can be accessed by using Facebook Messenger to know their requirements of books without visiting the Library physically. The Library bot saves time and replaces the human-human interaction into human-bot interaction. The chatbot is still in its early days, but growing very fast. The main goal of creation of our library Chatbot is to allow the end user to have a conversation with a bot, without considering a task oriented scenario and that we've succeeded in our project.

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