A Mini Project Report on

KALPAVRIKSHA ADMISSION CHATBOT

Submitted in partial fulfillment of the requirements for the award of the degree of

Bachelor of Computer Engineering

by

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Academic Year (2021-2022)

Project Report Approval

This Mini Project Report **entitled** ***"Kalpavriksha Admission Chatbot" Submitted by "Amish Nandu(18102048),Vinit Agivale(16102047),Akshen Dhami"(18102032),"Yash Pol"(19102068)*** is approved for the partial fulfillment of the requirement for the award of the degree of ***Bachelor of Engineering*** in ***Computer Engineering*** from ***University of Mumbai***.

Examiner Name Signature

1._____

2._____

Date:

Place:

CERTIFICATE

This is to certify that the mini project entitled "***Kalpavriksha Admission Chatbot***"submitted by "***Amish Nandu(18102048),Vinit Agivale(16102047),Akshen Dhami(18102032),Yash Pol(19102068)***" for the partial fulfillment of the requirement for award of a degree ***Bachelor of Engineering*** in ***Computer Engineering***,to the University of Mumbai,is a bonafide work carried out during academic year 2021-2022.

_____
Guide
Prof. Rushikesh Nikam

_____
Project Coordinator
Prof. Rushikesh Nikam

_____
Head of Department
Prof. Sachin Malave

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, We have adequately cited and referenced the original sources. We also declare that We have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

———————————————

(Signature)

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(Vinit Agivale 16102047)

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(Signature)

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(Akshen Dhami 18102032)

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(Amish Nandu 18102048)

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(Signature)

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(Yash Pol 19102068)

Date:

Abstract

A Chat-bot is a software application used to conduct an online chat conversation via text or text-to speech, instead of providing direct contact with a live human agent.
Designed to convincingly simulate the way a human would behave as a conversational partner.
In the proposed system, we presented a chatbot that generates a dynamic response for online client's queries.
Artificial intelligence based chatbots yields progressively reasonable results. Chatbot which gives responses reliant on the setting of conversation will when all is said in done be all the more simple to utilize. One of the noteworthy goals in the field of Human Computer Interaction (HCI) is the diagram of common and instinctive affiliation modalities.
The Proposed System is based on Artificial Intelligence-powered Chatbot.
This proposed chatbot identifies the user context which triggers the particular intent for a response.. The proposed system used machine learning algorithms to learn the Chatbot by experiencing various user's responses and requests.

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1.Introduction

A chatbot is an instance of emotional figuring system that mirrors human conversations to give instructive, esteem based, and conversational organizations. Despite that no matter how you look at it gathering, chatbots still experience the evil impacts of different execution issue as a result of imprisonments with their programming and training. Chatbots must destruction different issues, including flexibility, low-dormancy, and privacy.

Today time is having numerous electronic organizations like E-business, Entertainment, Virtual assistance and some more. There is radical augmentation in the domain of web organization, where everything is right now getting related with web. It is extremely simple to utilize approach to manage benefit everything to doorstep. There are different sorts of customer help open like live talk reinforce organization, phone (telephone) organizations. In any case, for all such assistance organizations given by human to human puts aside some push to respond to customer's question. As the amount of clients develops the holding time increases as well, which realizes poor client satisfaction. One of the critical goals in the field of Human Computer Interaction (HCI) is the system of run of the mill and natural affiliation modalities. Specifically, different endeavors have been centers around the improvement of structures to talk with the client in a trademark language.

The world is moving towards the automation of human effort with the help of machine learning, artificial intelligence and robotics. While there is a huge scope of improvement, some of the key areas that can be targeted for automation are responder system in education, healthcare etc. An artificial intelligence based bot can replace human efforts without compromising on the quality of response. Machine learning and artificial intelligence is used to implement chatbot along with python scripts.

Past chatbots, Conversational AI suggests the usage of illuminating applications, talk based partners and chatbots to automate correspondence and make modified customer experiences at scale. The term "ChatterBot" was at first initiated by Michael Mauldin (producer of the first Verbot, Julia) in 1994 to depict these conversational undertakings. Today, most chatbots are

found a good pace of remote partners, for instance, Google Assistant and Amazon Alexa, by methods for illuminating applications, for instance, Facebook Messenger or WeChat, or through individual affiliations' applications and locales. Chatbots can be organized into usage classes, for instance, conversational business (online business by methods for talk), assessment, correspondence, customer help, structure, creator gadgets, preparing, beguilement, finance, sustenance, games, prosperity, HR, publicizing, news, singular, productivity, shopping, social, sports, travel and utilities. Most of the chatbots are furnished with a task individual sort interface with a commitment from a customer and a yield from the chatbot. The chatbot structures the customer's data and yields an answer reliant on what the customer has as of late sent. It could be a welcome, conversation subject, or even an image. Chatbots are normally used in return systems for various sensible purposes including customer help or information acquisition. Most central chatbots work by organizing a customer's commitment with a predefined set of talk. For example, a customer saying "Thank you" will result in the chatbot saying "You're Welcome".

Chatbots continue creating in pervasiveness with 88% of associations planning to use one by 2024. Notwithstanding the way that it may feel like the term 'chatbot' has starting late entered the open word reference, they truly have a more drawn out history than you may foresee.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. 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 “APSIT Admission Enquiry”. It is enquiry Chatbot. It‟s similar to speaking to a customer support consultant. This chatbot for the APSIT 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.

2.Literature Survey

In this research paper, [1] "Chatbot for Student Admission Enquiry" they describe about the software/tools used in it. They are using Rasa NLP, they have used dialogflow to make interaction with chatbot and also the NLP toolkit. This chatbot was developed using Machine Learning Algorithms. Chatbots are prepared to change UI design. Chatbots are programs that duplicate human conversation using Artificial Intelligence (AI). It is proposed to be an authoritative modest assistant, delight reason, helping one to complete tasks running from tending to questions, getting driving heading, turning up the indoor controller in sharp home, to playing one's favored tunes etc. Chatbots are exhibited on various techniques, for instance, data base, AI based.. In any case, chatbots are at present being grasped at a high rate on PC talk stages. The advancement at the focal point of the climb of the discussion bot is ordinary language processing. Most business chatbots are dependent on stages made by the development mammoths for their standard language dealing with. These fuse Amazon Lex, Microsoft Cognitive Services, Google Cloud Natural Language API, Facebook DeepText, and IBM Watson. Stages where chatbots are passed on join Facebook Messenger, Skype, and Slack, among various others.

In this research paper [2] AI and web-based interactive College Enquiry Chatbotis a straightforward web application that aims to supply knowledge regarding college. The chatbot created here may be a web-based application that uses tongue Processing Libraries and AI terminology to possess conversations with humans. “Eliza”and “Cleverbot” are several online applications that are created within the past. The College Enquiry Chatbot will engage in friendly conversations, respond to the course and college information, provide a link to the tutorial calendar, and answer frequently asked questions, among other things. This project is specialized in creating a chatbot to be employed by students to urge their queries responded to easily from the college website. A chatbot may be a program that may do real conversations with textual and/or auditory methods. Using AI, chatbots can simulatehuman conversations. Humans respond to others depending ontheir mood and emotions. Whereas chatbots are bound by somerules, resulting in them treating a customer most politely andperfectly. Students can

ask questions to the chatbot at any timeof the day and get a reply very quickly. At any time of day,chatbots can have simultaneous conversations with thousands ofpeople. A chatbot can work 24x7 without getting tired. It issubjected to minimal errors thus increasing productivity.

In this research paper [3] they have developed chatbot 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.

In this paper[4], A model for real-time response on admission related enquiries was developed in this research with the aim of bridging the lag usually experienced through the conventional approach of phone call and email. The model was implemented using IBM Watson to design a Chatbot for rapid response to admission enquiries. Botium was used to evaluate the performance of the Chatbot which gave an accuracy of 95.9% with instance of 212successful test cases and 9failed test cases. The approach introduces users to new and emerging technological solutions for optimal and rapid response in the educational sector. The Chatbot developed with the aim of assisting prospective students and parents on admission enquiries in a university is in a timely, reliable and efficient manner thereby, improving the existing system. The approach introduces users to new and emerging technological solutions for optimal and real-time feedback in the educational sector. With this solution, the cost of making enquiries is drastically reduced as information can be gotten instantly and anywhere; search engine on the university website is optimized as the chatbot narrows down one‟s search of information on the school‟s website through provision of direct link to the information. With the provision, admission officer‟s workload is reduced as the chatbot can respond to basic information thereby reducing the amount of calls and mails to be responded.

In this paper[5],their abstract that Students have to visit universities or colleges to collect various information like Tution fees, Term Schedule, etc. during their admission process or as

per their daily needs. This process is very tedious and time consuming, also it requires manpower in providing required information to visitors. Hence, to overcome the problems a chatbot can be developed. The project is about interaction between users and chatbot which can be accessed from anywhere anytime. The chatbot can be easily attached with any university or college website with few simple language conversions. Chatbot provides various information related to university or college and also students-related information. The chatbot can be used by anyone who can access the university's website. The project uses the concept of Artificial Intelligence and Machine Learning. PHP Language is utilized for the development of Chatbot. User can ask university-related questions, then the query is applied as an input to algorithm, which processes the message and displays the corresponding response to the user. The Project GUI is similar to a Messaging Application

3.Problem Statement

We propose a AI based chatbot system to which student/user will be able to ask various questions right from placements, courses ,fee structures, scholarships, etc and the chatbot will reply to all the user queries since College admissions are a time consuming process and students have to visit the college to enquire about details.

4. Objectives and Scope

4.1 Objectives

1) The chatbot will be designed in such a way to make the students feel like talking to the staff from college and their queries are addressed through the conversational text .

2)The AI feature makes the bot smart and answers the queries of user like academic activities ,admission enquiry, fees structure, scholarship details, time-table of every department, details of the documents required to attach etc.

3)With this chat-bot system it will be easy for the student to directly clear their queries in lesser time.

4.2 Scope

Artificial Chatbots, Chatbot & AI ,Google cloud are the latest machine learning program in the market. Some of the Big companies, Big businesses implemented chatbots for 24/7 customer support.AI chatbots are beneficial for students and people in general who want know information of college. The Conversation AI chatbots have many advantages for students with disabilities as well because we have virtual call agent who answer queries through speech

1) AI Chatbot for student

2)Digital virtual assistant who will answer queries through speech

5. Experimental Setup

5.1 Hardware Requirements

1) i5 processor based Computer

2) Min 4GB-Ram

3) Hard Drive Storage

4)Seamless Internet Connectivity

5.2 Software requirements

1)GCP-Google Cloud Platform

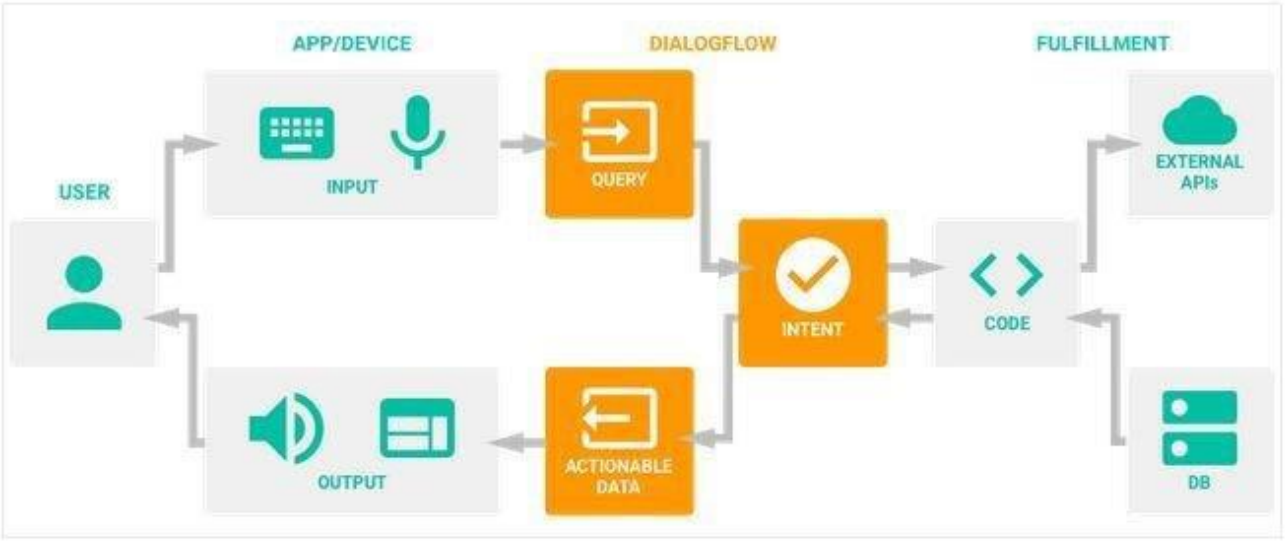
2)Dailogflow

3)Uneeq

4)Html,javascript,json

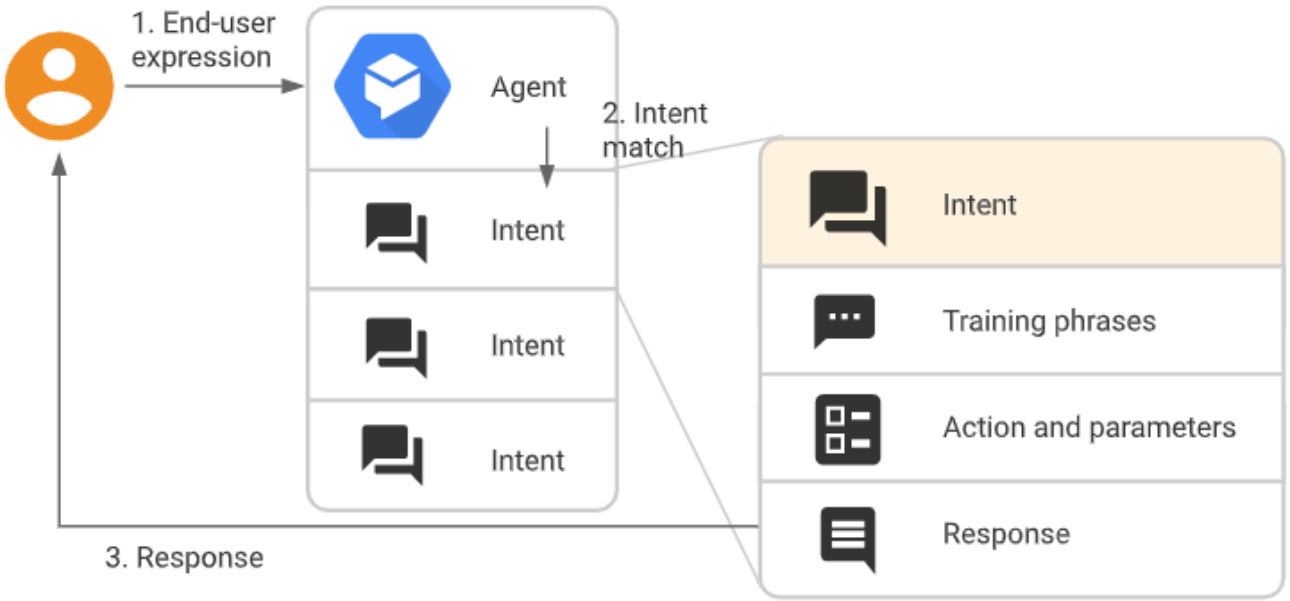
6. System Design

6.1 Dailogflow Architecture



6.2 Data Flow

basic flow for intent matching and responding to the end-user:



6.3 System Implementation:

System Implementation: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.

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 APSIT Admission Department Bot picked randomly when an expression is
entered. And custom response helps us to create a special welcoming response that suits Department bot.

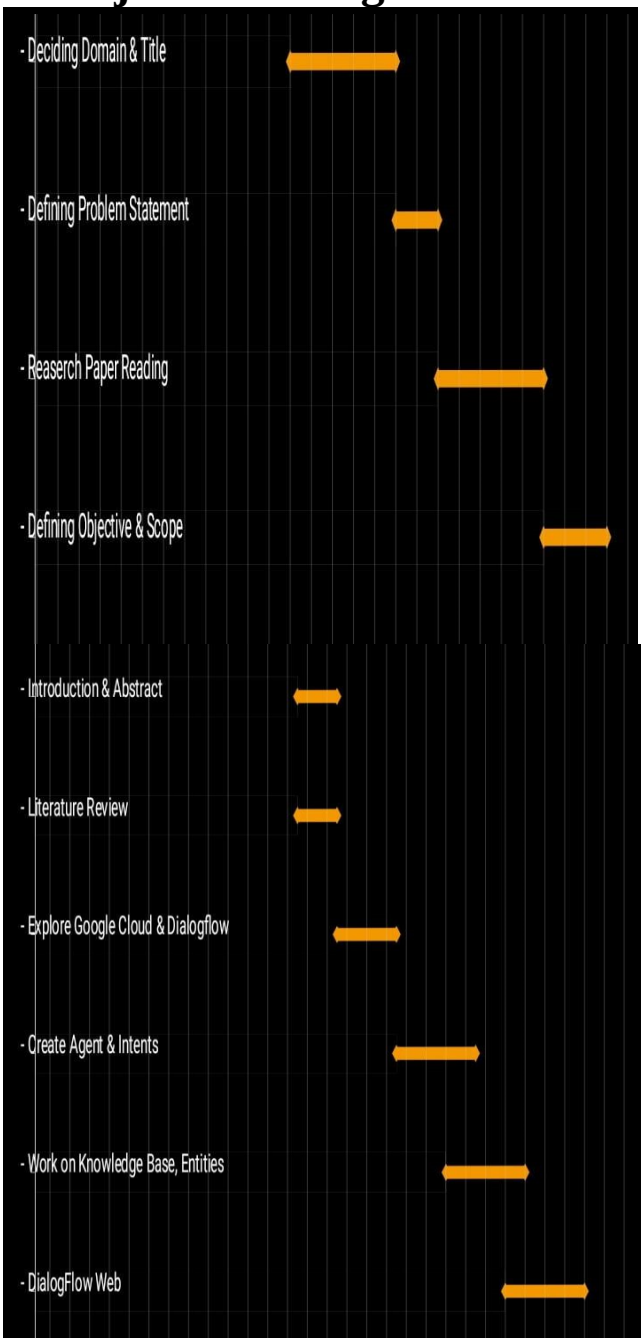
Step 3: Creating New Intents:
We're working on an APSIT Admission Department Bot to help users with
a few basic questions:
“How many years Engineering course is?”
“When do colleges starts?”
“What is the class timings?”
For each of these query forms, we'll build Intents and then
populate them with the necessary Expressions and Responses.
Simply click the '+' next to the 'Intents' button in the left

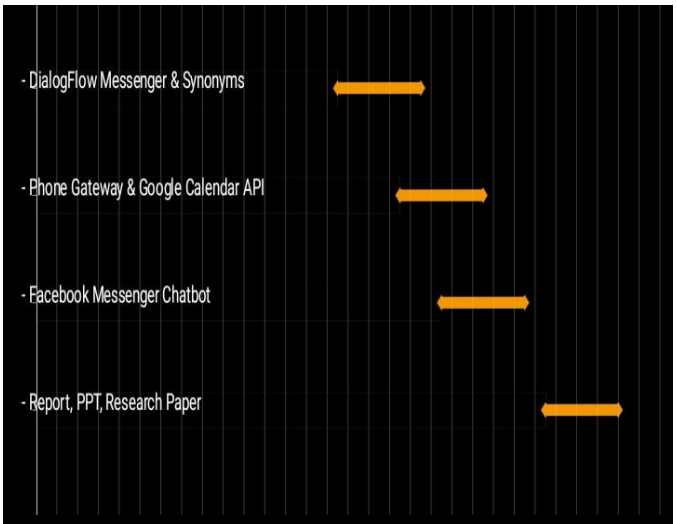
menu to construct a new Intent. When naming an Intent, be organised so that it is easy to
remember later.

Step 4: Adding the Response:
By adding the responses and expressions such as
“It is 4 years Course,
“we are open Monday through Sunday from 9AM -6PM”
“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
APSIT Admission bot:
To begin, go to the left column's "Integration" section and
toggle "Web Demo" On, then click it to enter.
Below Figures shows an illustration of APSIT Admission Bot
information virtual agent which is reported here. 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 APSIT 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 APSIT Department chatbot is beneficial for the students who is keen to know the information about the department.

7.Project Planning and Scheduling





← APSIT Admission Chatbot

Task	Link	ToDo

1.0 2022.2.10(Thu) ~ 2022.2.15(Tue)
Deciding Domain & Title 0.0 / 0.0 6 day
100% Vinit, Akshen, Amish, Yash

2.0 2022.2.15(Tue) ~ 2022.2.17(Thu)
Defining Problem Statement 0.0 / 0.0 3 day
100% Vinit, Akshen, Amish, Yash

3.0 2022.2.17(Thu) ~ 2022.2.22(Tue)
Reaserch Paper Reading 0.0 / 0.0 6 day
100% Vinit, Akshen, Amish, Yash

4.0 2022.2.22(Tue) ~ 2022.2.25(Fri)
Defining Objective & Scope 0.0 / 0.0 4 day
100% Vinit, Akshen, Amish, Yash

5.0 2022.2.28(Mon) ~ 2022.3.4(Fri)
Introduction & Abstract 0.0 / 0.0 5 day
100% Vinit, Akshen

6.0 2022.2.28(Mon) ~ 2022.3.4(Fri)
Literature Review 0.0 / 0.0 5 day
100% Amish, Yash

7.0 2022.3.4(Fri) ~ 2022.3.10(Thu)
Explore Google Cloud & Dialogflow 0.0 / 0.0 7 day
100% Vinit, Akshen, Amish, Yash

8.0 2022.3.10(Thu) ~ 2022.3.18(Fri)
Create Agent & Intents 0.0 / 0.0 9 day
100% Vinit, Akshen

9.0 2022.3.15(Tue) ~ 2022.3.23(Wed)
Work on Knowledge Base, Entities 0.0 / 0.0 9 day
100% Amish, Yash

10.0 2022.3.21(Mon) ~ 2022.3.29(Tue)
DialogFlow Web 0.0 / 0.0 9 day
100% Vinit, Akshen

11.0 2022.3.26(Sat) ~ 2022.4.3(Sun)
DialogFlow Messenger & Synonyms 0.0 / 0.0 9 day
100% Amish, Yash

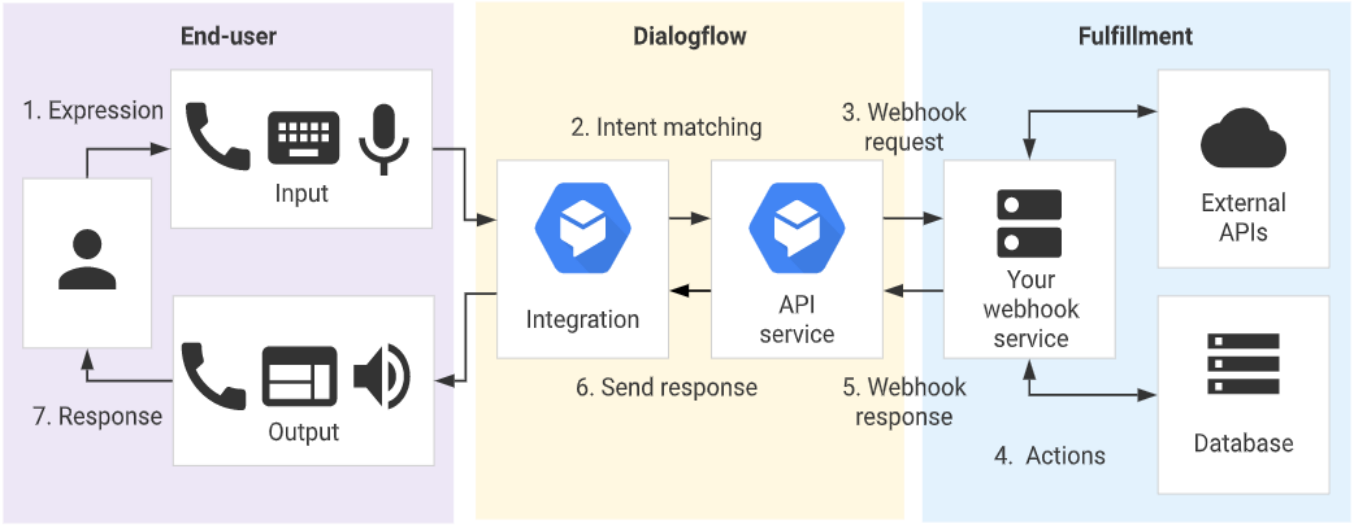
12.0 2022.4.1(Fri) ~ 2022.4.9(Sat)
Phone Gateway & Google Calendar API 0.0 / 0.0 9 day
100% Vinit, Akshen

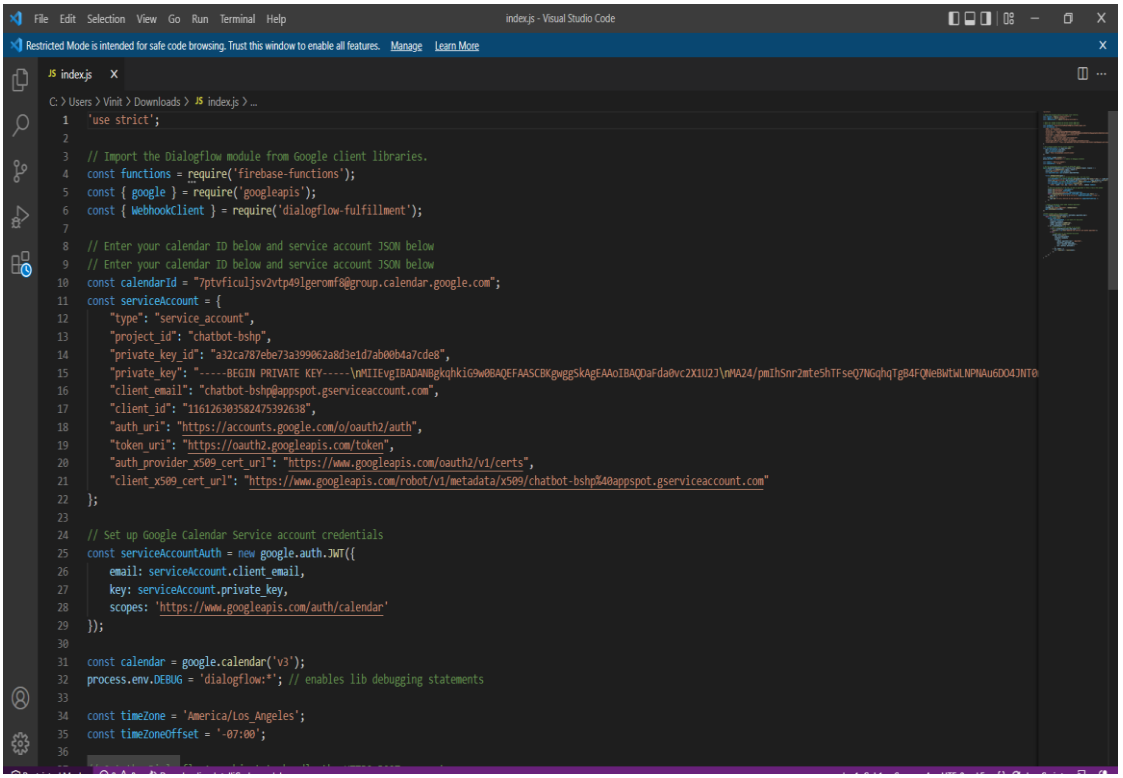
13.0 2022.4.5(Tue) ~ 2022.4.13(Wed)
Facebook Messenger Chatbot 0.0 / 0.0 9 day
100% Amish, Yash

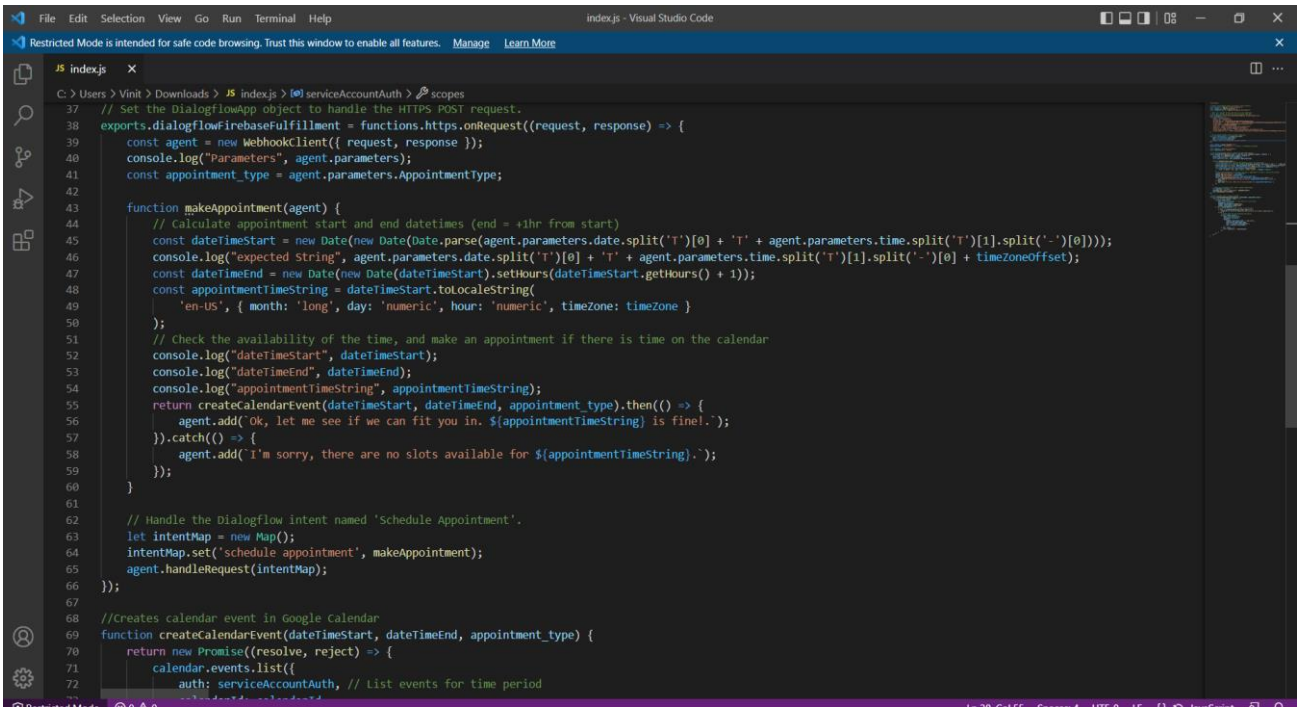
14.0 2022.4.15(Fri) ~ 2022.4.22(Fri)
Report, PPT, Research Paper 0.0 / 0.0 8 day
100% Vinit, Akshen, Amish, Yash

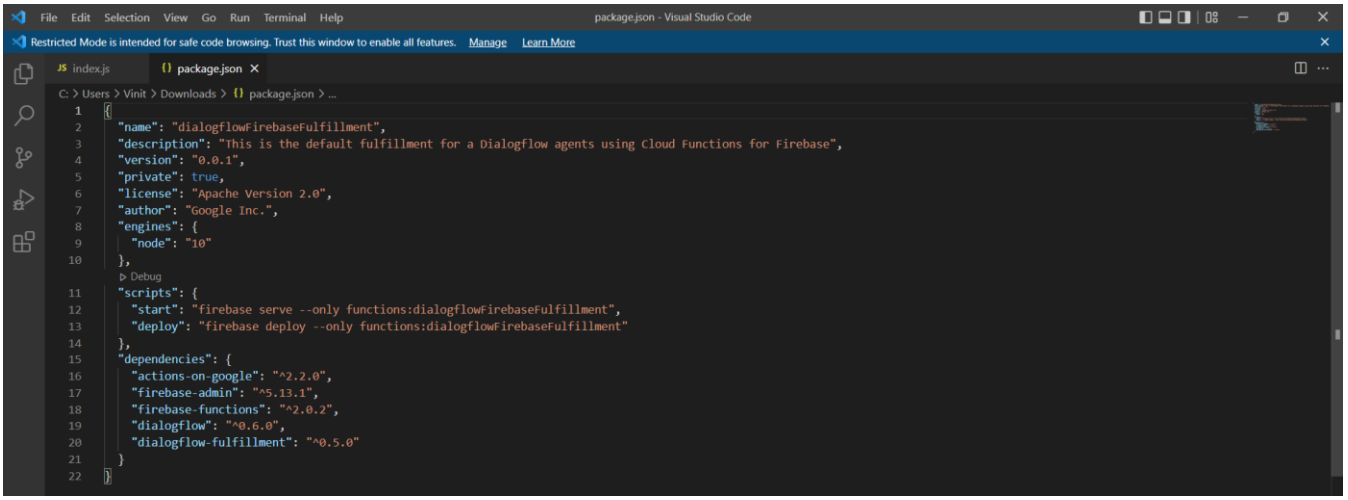
8. System Design/Code and Implementation

8.1 System Design and Code



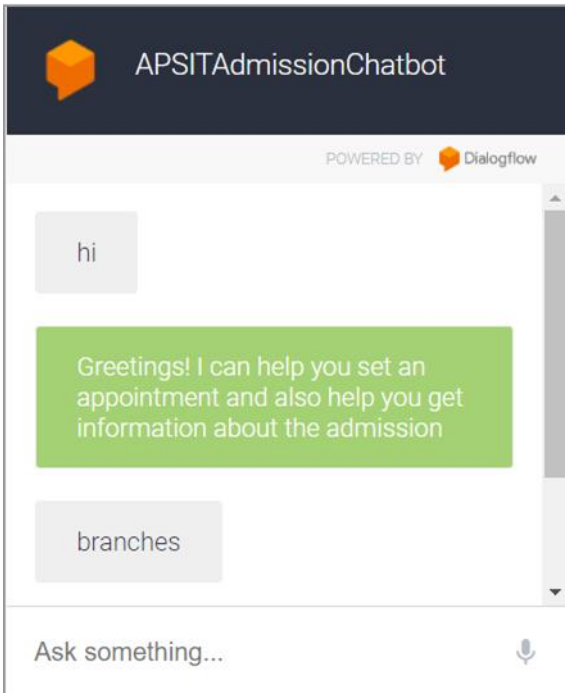



File Edit Selection View Go Run Terminal Help
index.js - Visual Studio Code
Restricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
index.js
C: > Users > Vinit > Downloads > index.js > serviceAccountAuth > scopes
// Set the DialogflowApp object to handle the HTTPS POST request.
exports.dialogflowFirebaseFulfillment = functions.https.onRequest((request, response) => {
const agent = new WebhookClient({ request, response });
console.log("Parameters", agent.parameters);
const appointment_type = agent.parameters.AppointmentType;
function makeAppointment(agent) {
// Calculate appointment start and end datetimes (end = +1hr from start)
const dateTimeStart = new Date(new Date(Date.parse(agent.parameters.date.split('T')[0] + 'T' + agent.parameters.time.split('T')[1].split('-')[0])));
console.log("expected String", agent.parameters.date.split('T')[0] + 'T' + agent.parameters.time.split('T')[1].split('-')[0] + timeZoneOffset);
const dateTimeEnd = new Date(new Date(dateTimeStart).setHours(dateTimeStart.getHours() + 1));
const appointmentTimeString = dateTimeStart.toLocaleString(
'en-US', { month: 'long', day: 'numeric', hour: 'numeric', timeZone: timeZone }
);
// Check the availability of the time, and make an appointment if there is time on the calendar
console.log("dateTimeStart", dateTimeStart);
console.log("dateTimeEnd", dateTimeEnd);
console.log("appointmentTimeString", appointmentTimeString);
return createCalendarEvent(dateTimeStart, dateTimeEnd, appointment_type).then(() => {
agent.add(`Ok, let me see if we can fit you in. ${appointmentTimeString} is fine!.`);
}).catch(() => {
agent.add(`I'm sorry, there are no slots available for ${appointmentTimeString}.`);
});
}
// Handle the Dialogflow intent named 'Schedule Appointment'.
let intentMap = new Map();
intentMap.set('schedule appointment', makeAppointment);
agent.handleRequest(intentMap);
});
//Creates calendar event in Google Calendar
function createCalendarEvent(dateTimeStart, dateTimeEnd, appointment_type) {
return new Promise((resolve, reject) => {
calendar.events.list({
auth: serviceAccountAuth, // List events for time period

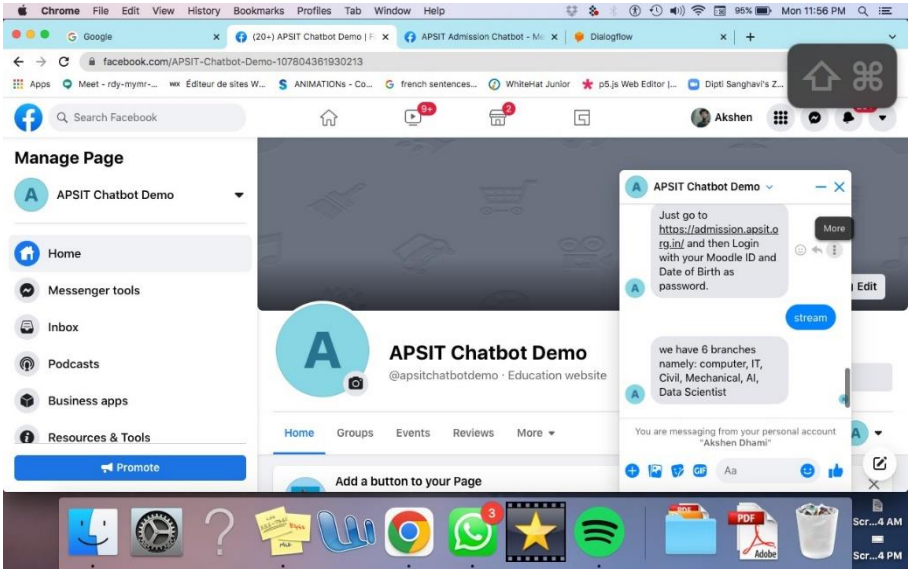

File Edit Selection View Go Run Terminal Help
package.json - Visual Studio Code
Restricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
index.js
package.json
C: > Users > Vinit > Downloads > package.json > ...
{
"name": "dialogflowFirebaseFulfillment",
"description": "This is the default fulfillment for a Dialogflow agents using Cloud Functions for Firebase",
"version": "0.0.1",
"private": true,
"license": "Apache Version 2.0",
"author": "Google Inc.",
"engines": {
"node": "10"
},
Debug
"scripts": {
"start": "firebase serve --only functions:dialogflowFirebaseFulfillment",
"deploy": "firebase deploy --only functions:dialogflowFirebaseFulfillment"
},
"dependencies": {
"actions-on-google": "^2.2.0",
"firebase-admin": "^5.13.1",
"firebase-functions": "^2.0.2",
"dialogflow": "^0.6.0",
"dialogflow-fulfillment": "^0.5.0"
}
}

8.2 System Implementation

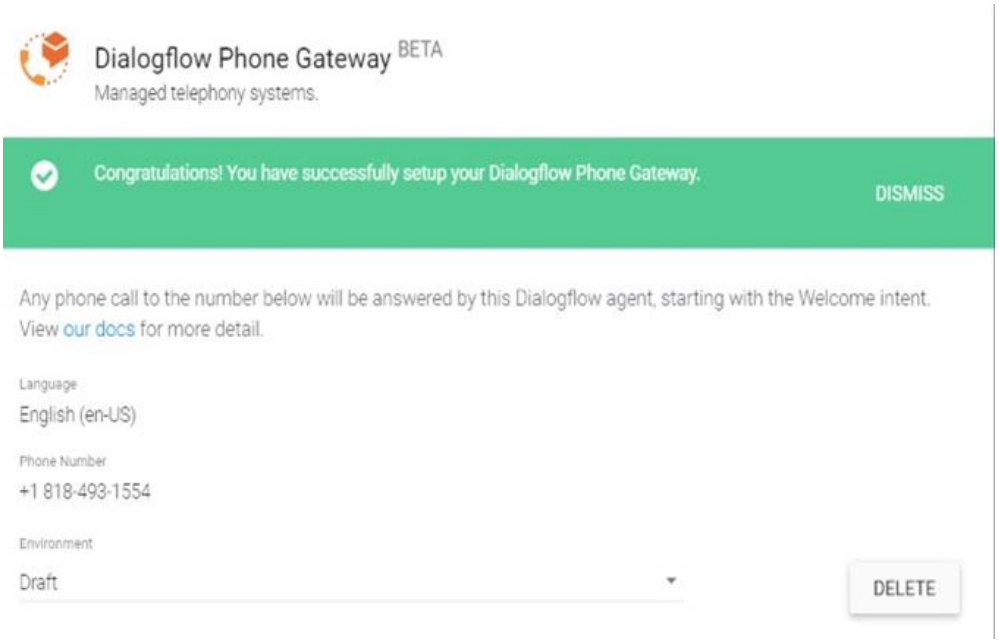
Web based Chatbot



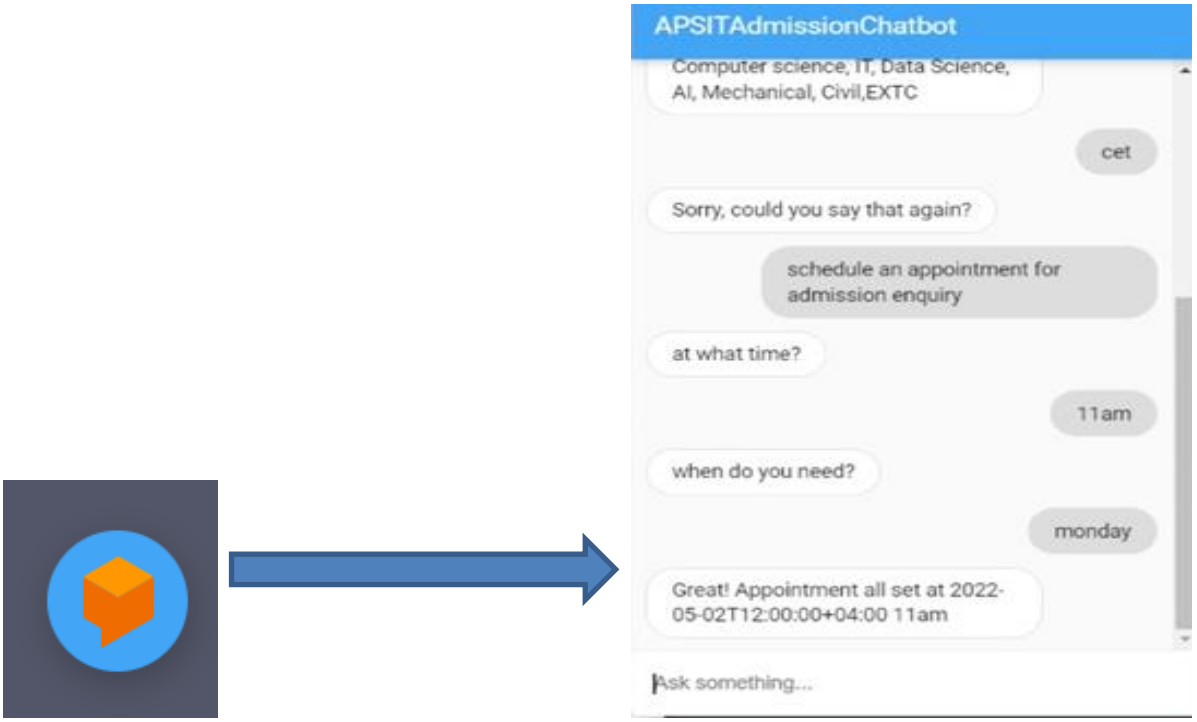
FB messenger Chatbot



Call Assistant Chatbot



Dailogflow messenger bot



9.Results

The main objectives of the project were to develop an algorithm that will be used to identify answers related to user submitted questions.
A usable system was designed, developed and deployed to the web server on two occasions. An evaluation took place from data collected by potential students of the University. Also after received feedback from the first deployment, extra requirements were introduced and implemented.

Our final decision was to use dialogflow as a module of GCP to make use of prebuilt packages and use the indents and knowledge base to build an admission enquiry chatbot.

10.Conclusions

The main objectives of the project were to develop an algorithm that will be used to identify answers related to user submitted questions. To develop a database were all the related data will be stored and to develop a web interface. The web interface developed had two parts, one for simple users and one for the administrator.
A background research took place, which included an overview of the conversation procedure and any relevant chat bots available. A database was developed, which stores information about questions, answers, keywords, logs and feedback messages. A usable system was designed, developed and deployed to the web server on two occasions. An evaluation took place from data collected by potential students of the University. Also after received feedback from the first deployment, extra requirements were introduced and implemented.

References

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