

Ai and Ml Based Google Assistant for an Organization using Google Cloud Platform and Dialogflow



Chinnapa Reddy Kanakanti, Sabitha R.

Abstract: Many people adopting Smart Assistant Devices such as Google Home. Now a days of solely engaging with a service through a keyboard are over. The new modes of user interaction are aided in part by this research will investigate how advancements in Artificial Intelligence and Machine Learning technology are being used to improve many services. In particular, it will look at the development of google assistants as a channel for information distribution. This project is aimed to implement an android-based chatbot to assist with Organization basic processes, using google tools such as Dialogflow that uses Natural language processing NLP, Actions on Google and Google Cloud Platform that expose artificial intelligence and Machine Learning methods such as natural language understanding. Allowing users to interact with the google assistant using natural language as input and to train the chatbot i.e. google assistant using Dialogflow Machine learning tool and some appropriate methods so it will be able to generate a dynamic response. The chatbot will allow users to view all their personal academic information, schedule meetings with higher officials, automating the organization process and organization resources information all from within the chatbot i.e. Google Assistant. This project uses the OAuth authentication for security purpose. The Dialogflow helps to understand the users query by using machine learning algorithms. By using this google assistant we are going to use the Cloud Vision API for advancement. We will use Dialogflow as key part to develop Google assistant.

Keywords: Google Cloud Platform, Natural Language Processing, Actions on Google, Smart Assistants.

I. INTRODUCTION

This Google assistant helps users to interact with our product and services in any organization using in form of text-based and conversational interfaces such as voice by using the Dialogflow tool, that have the inbuilt machine learning algorithms to understand the users prompt and based

on the users query our chatbot will understand the training phrases and generates the dynamic response to user. In this paper we are going to study on Dialogflow, Actions on Google and Firebase Realtime Database. The academic organizations and other tech industries were one of the first

Industries to adopt new technologies. This integration has grown massively, helping organizations reach a wider customer base enabling them to perform their conveniently educational organizations are becoming ever more competitive with each other to adopt the newest advancements in technology to provide an improved delivery service to satisfy users. The Organizations are now enabling the use of technology so, customers can perform more tasks online using the voice based and conversational such as getting results, attendance, personal and academic information remotely and intelligent chatbots to increase customer service and assist employees & users. Generally, chatbots are a simple software programs that can respond to customer prompts. The focus of this project is to implement these new technologies to create an intelligent chatbot Google assistant to enable organizations to appeal to millennial and potentially gain a lifelong user.

The proposed system takes an educational institution as a reference.

II. METHODOLOGY

This proposed system is used to create a google assistant to simulate a human conversation to assist users with not only educational needs it can be applied to any organization, and to provide a more personal experience. In today's world there are so many advancements in artificial Intelligence, machine learning techniques, improved aptitude for decision making, larger availability of domains and corpus, have increased the practicality of integrating a chat bot into applications we can integrate the chatbot. Users will be able to ask any institution related queries in natural language that they are comfortable using such as view account information, grades, transactions and check balance, Subjects enrolled etc. details using the assistant. The chatbot will identify and understand what the user is asking and generate an appropriate response based on the conversational context. Immediate responses will be provided by the chatbot to redeem the need for the user to have to call or visit their college branch and wait in queue in order to get through to an advisor for assistance.

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* Correspondence Author

Kanakanti Chinnapa Reddy*, Department of Computer Science and Engineering (CSE), Saveetha School of Engineering, Chennai, India. Email: Kanakanti98@gmail.com

Sabitha R., Professor, Department of Computer Science and Engineering (CSE), Saveetha School of Engineering, Chennai., India. Email: sabithar.sse@saveetha.com

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In order to make the application more secure OAuth authentication protocol will be integrated and provides high security ensuring only registered users can gain access to their account preventing the risk of fraud.

We can use the Google Cloud API's for this project and we can develop many various features.

This system uses Firebase Real time Database we can build rich, collaborative applications by allowing secure access to the database directly from client-side code. Data is persisted locally, and even while offline, real time events continue to fire, giving the end user a responsive experience.

This system also uses the advanced technologies like Google Cloud Platform, Dialog flow, Actions on Google and Google Cloud vision API i.e. Cloud Vision API allows developers to easily integrate detection features within applications, including image labelling, face and landmark detection, optical character recognition (OCR), and tagging of explicit content. Google Cloud Auto ML Vision API enables you to create a custom machine learning model for image labeling.

The system is linked with Google Assistant to provide wonderful experience to user, this project is available to every user where ever the google is there. The users of this project are no need to install app in their device, Only users need to call the project by using the invocations like "Talk to saveetha.com", When we call the invocation this app asks to you sign in to app using various methods like Sign in with google, Facebook, LinkedIn and manual username and password method.

III. SYSTEM ARCHITECTURE

The system architecture consists of Java Script programming language, Actions on Google, Dialogflow, Firebase Realtime database. The Dialogflow which is an integrated development environment from Google is used to develop chatbots using various programming languages.

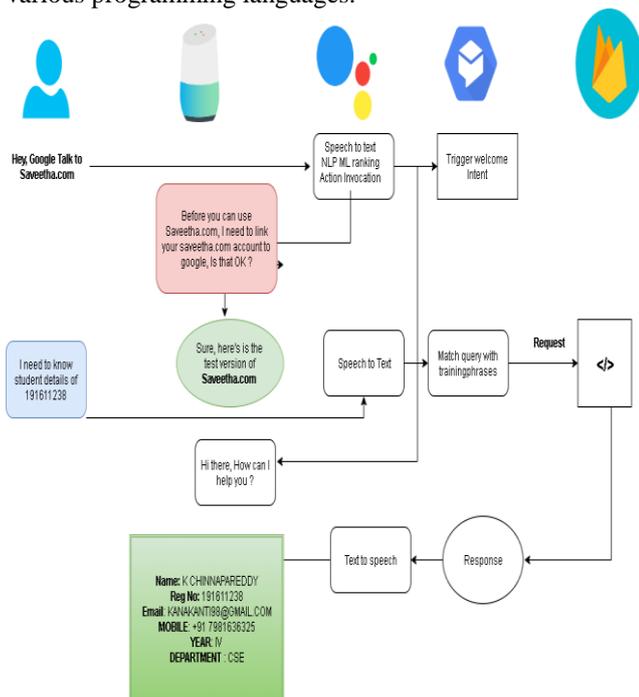


Fig 3.1 System Architecture

IV. RESULTS AND DISCUSSION

4.1 AUTHENTICATION

In this project, we are going to create an OAuth authentication for accessing the google assistant. The OAuth authentication is a standard protocol helps to provide the secure delegated access to client applications. This OAuth works over http protocol and authorizes devices, API's, servers and applications with access tokens rather than credentials. In this project, we have integrated the Sign In with google, Microsoft and LinkedIn and also provided the normal username and password. We need to create the authorization URL and token URL for setting up OAuth authentication.

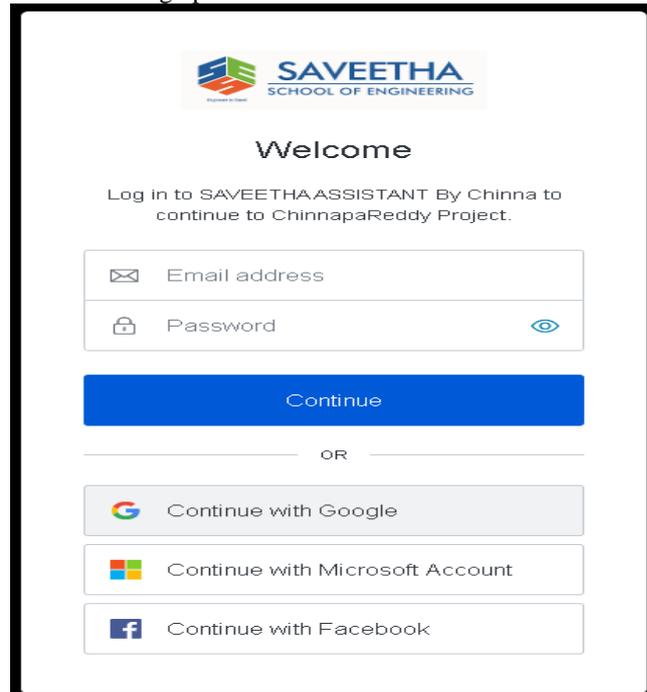


Fig 4.1 Login Page

4.2 STUDENT

The student modules can help the students for accessing their academic data over the voice and conversational based system, for example when a user says "I want to know my grades or result" it will generate response based on the trained phrases and uses the machine learning strategies. This module will be shown when user logins with the college UserId and college MailId like in similar way it gets do all the basic process.

The basic process of this project is shown in the below diagrams so, we can visualize the working process of the project.

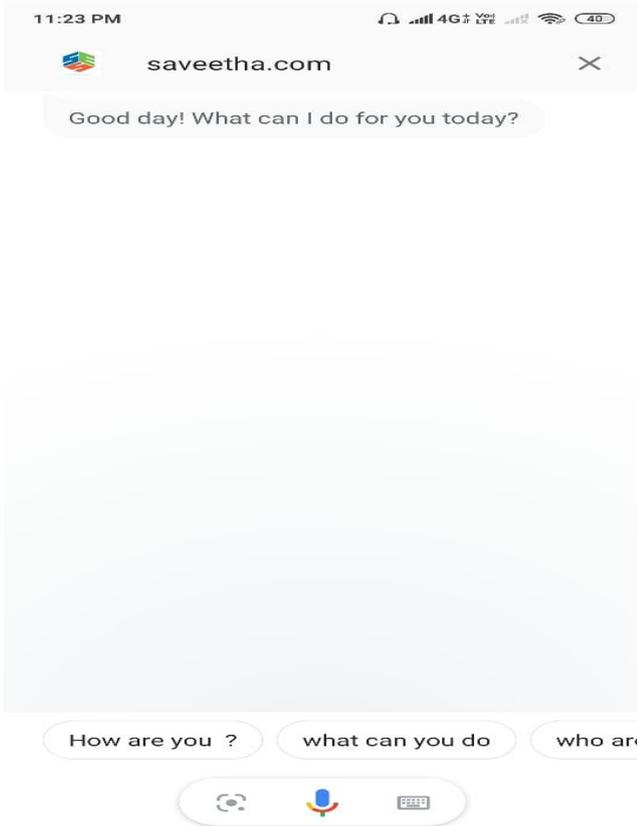


Fig 4.2 Welcome Page

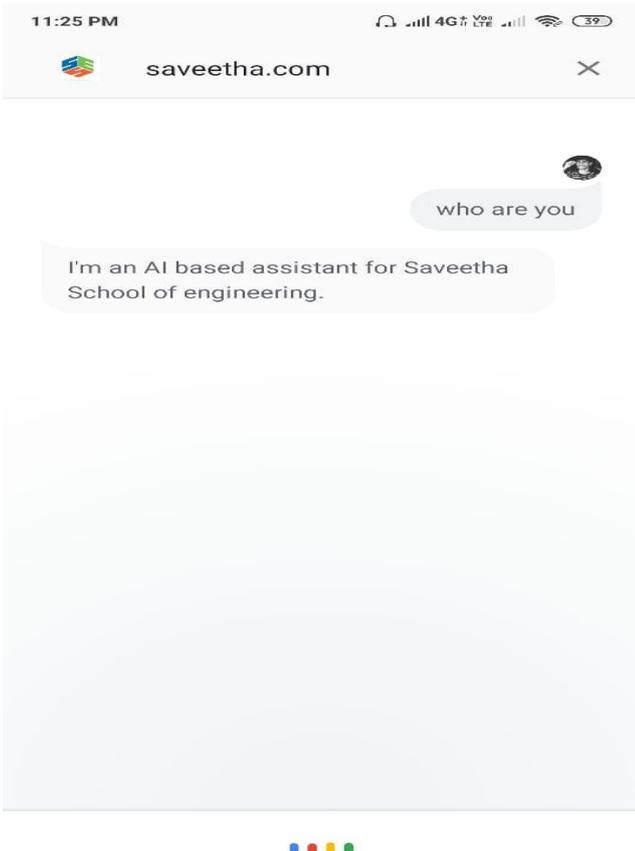


Fig 4.2.1 Asking Query



Fig 4.2.2 Response page

4.3 ADMIN

Admin page in this project enables for easy supervision of all administrative activities of the institution. All the information and functions of the management can be operated from the admin panel, it provides access to new users of the organization, and also take care of account roles and privileges, and their logging activity, etc. features.

We can also notify the users with the notification option like Assignment deadlines, Fee dues and various tasks in any organization. Admin can manage all the profiles of organization users.

4.4 FACULTY

The Faculty module can help the teachers to do basic processes such as getting student details using Register number, Mobile number and also, they can give the assignment status and provide grades for students and when faculties says over voice it can be automated such as scheduling meetings with HOD and department head.

4.5 GOOGLE CLOUD VISION API

Google cloud Vision API is a Pre-Trained Machine Learning model that helps to derive insights from pictures and videos. You can get insights including image labelling, face detecting and landmark detection, optical character recognition (OCR), and tagging of explicit content. In this project we can detect the faces of students and take their details within seconds of processing the data. We can also take the attendance by recognizing the faces of students and their activity. The Cloud Vision API is the best features and we will be utilizing this feature in this project.

ACTIONS ON GOOGLE:

Actions on Google could be a development platform for the Google Assistant. It permits the third-party development of "actions"—applets for the Google Assistant, that give extended functionality. The actions platform supports "direct" actions, still as "conversational" actions for a lot of advanced applications. We can build the extradayatory applications using the actions on google console. The Actions on Google enables us to seamlessly integrate our services with Google Assistant and we can reach users across 500M+ devices, including smart speakers like Google Home, phones, cars, TVs, headphones and more.

V. WORKING

Open Android mobile or Google home or smart devices that has google assistant i.e. Open google assistant and just say "Talk to saveetha.com". Then it will be asked you to link your account to saveetha.com organization if you are okay with that proceed for OAuth authentication. After successful authentication it will be redirected to app and It will say greetings to user and asks how can I help you with organization resources. Then the user will interact with this google assistant project and for example if a faculty asks like this "I need to get student details ", then app asks you enter the register number of the student after entering it will fetch and give the dynamic response to user. Like this in similar way it can do all tasks.

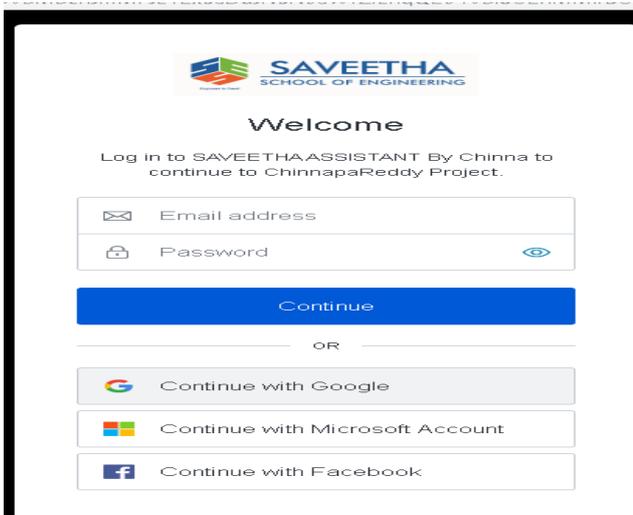


Fig 5.1 OAuth Authentication

Whenever if we say over voice to the app i.e. Dialogflow will convert the speech into text and understand and compare the trained phrases with help of Intents and Agents and if in case we enable the webhook the query will be sent to database,

here I have used Firebase Realtime Database will send response to user by converting the text in to speech by the Google Assistant. With help of Google Cloud Vision API, we can detect faces of students and take any organization to next level of the advanced technology.

For using the google API library scopes, we need to <https://console.cloud.google.com/apis/credentials?project=Project name> , We need to fill the Consent screen for verification by Google Security team, If they approve only we need to use their scopes such as Scheduling meetings with some libraries, Contacts i.e. People API and there are lot of API's are available to use. With that API's we can create a super AI & Machine Learning Model and do lot more with technology. For approving our Google Assistant project, we also need to host a Privacy Policy for that App in our own Domain. Like I have hosted it on my domain <https://googlee.technology/PrivacyPolicy.html> . In google Cloud Platform we can manage all the application insights such as API requests, responses and errors etc. In Actions on Google Console we can test the app in simulator over the voice and text based and also, we can use our app in our mobile before publishing it. For that we need to Sign In with same account in our mobile for Google Assistant.

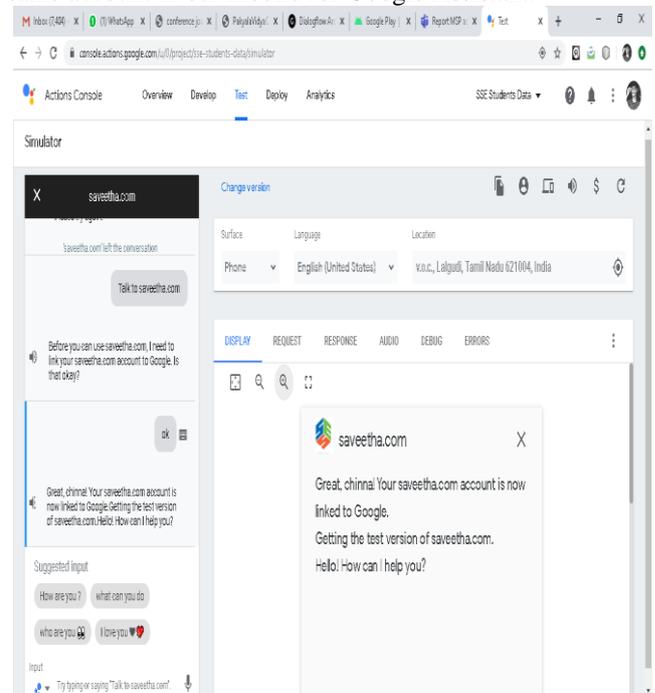


Fig 5.2 Google Actions Console

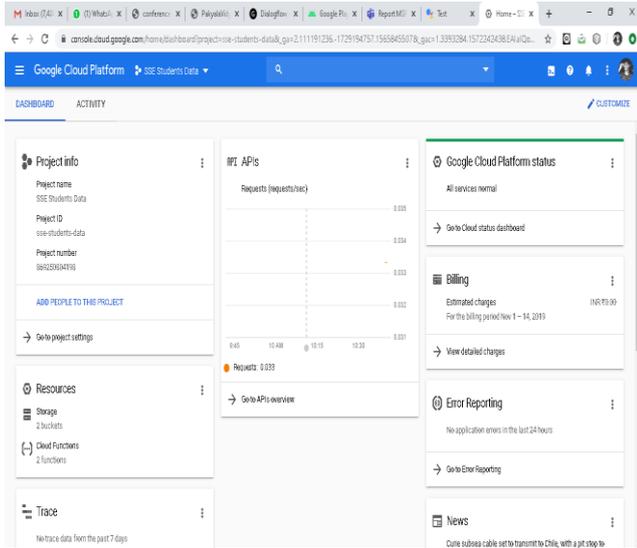


Fig 5.3 Project Overview Details

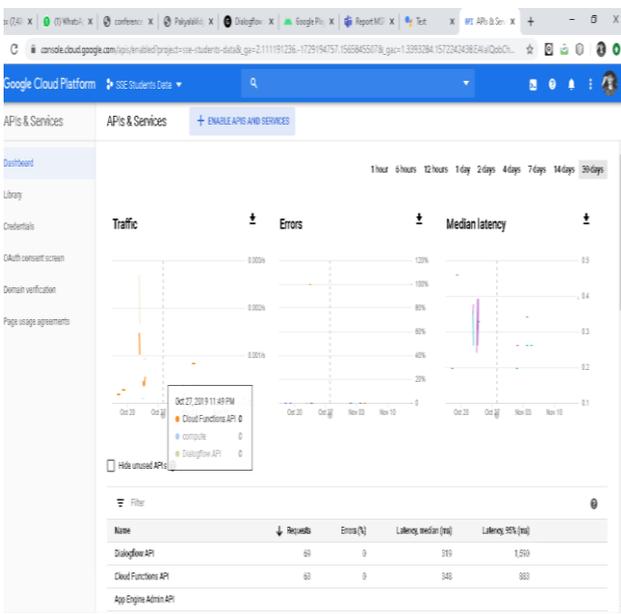


Fig 5.4 Project API & Traffic page

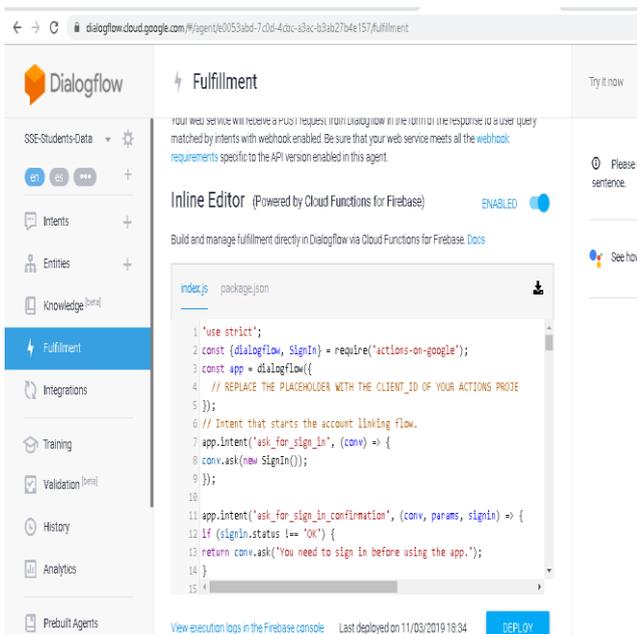


Fig 5.5 Dialog flow Fulfillment & Webhook page

V. CONCLUSION

Therefore, in this way we can create an Artificial Intelligence & Machine Learning based google assistant for any organization. This process is easier when compared to other procedures. That can automate the basic and complex tasks and reduces the employee intervention of organization to solve the customer queries. As the above stated methodology, we can improve the Machine Learning techniques in Dialogflow and Firebase real-time database provides various features and with OAuth authentication our application becomes more secure and responsive and Google cloud or any other cloud services we can use like Microsoft Azure, Google Cloud etc.

I have created a demo of this project in Google actions Simulator you can view it here using the following link <https://googlee.technology/>.

For more details you can contact me on LinkedIn <https://www.linkedin.com/in/chinnapareddy-kanakant-i-053ab812a/>

Thanks for reading my journal paper. I think this paper will help you in creating new technology.

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AUTHORS PROFILE



K Chinnapa Reddy is a tech enthusiast & working as a Microsoft Student Partner [MSP] in the Microsoft Inc. Currently Studying Final year, Department of Computer Science and Engineering, Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Thandalam, Chennai, India. He having knowledge on various domains like Cyber Security, GCP, Microsoft Azure, Edge Computing and Programming and he got Intel AI Scholarship and holding Google IT Professional Certification by Google and lot of various certifications.



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His research interests include Cloud, Networking, Network Security, Google Actions, Virtual Reality and Cyber Security. To view his Resume, go here http://bit.ly/China_Resume and connect with him on social media platforms.



[Click on the above icons you can catch him there]



Dr. R. Sabitha is working as a Professor in the Department of Computer Science and Engineering, Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Thandalam, Chennai, India. She received her B.E. in Computer Science and Engineering from, Bharathidasan University, India, during 1995 and M.E in Computer Science and Engineering from Sathyabama Institute of Science and Technology, Chennai, India, during 2002. She was awarded Ph.D. in Computer Science and Engineering from Sathyabama University, Chennai, India, during 2010. She has totally 23 years of teaching experience. She has published more than 41 papers in various reputed National and International Journals. Her citations in Scopus indexed journals is 36 and h-index is 3. Her research interests include Networking, Network Security, Data Mining, Mobile Computing and Sensor Networks.