Revitalizing Traditional Health Practices with HealingHands: An AI powered Chatbot

Jasjot Singh
Department of Electrical Engineering
Dayalbagh Educational Institute
Agra, India
jasjot191131@dei.ac.in

Sparsh
Department of Electrical Engineering
Dayalbagh Educational Institute
Agra, India
sparsh191168@dei.ac.in

Ankur Bansal
Department of Electrical Engineering
Dayalbagh Educational Institute
Agra, India
ankur191114@dei.ac.in

Shivansh Mittal
Department of Electrical Engineering
Dayalbagh Educational Institute
Agra, India
shivansh191166@dei.ac.in

A. Charan Kumari
Department of Electrical Engineering
Dayalbagh Educational Institute
Agra, India
charankumari@dei.ac.in

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***Abstract*—This paper presents the design and development of an AI-driven Chatbot, HealingHands, with the goal of giving tailored health advice to those looking for natural alternatives for their health complications. Based on their symptoms and personal health profile, the HealingHands is meant to give users with evidence-based recommendations on home remedies for a wide range of health concerns.**

The paper then discusses the home remedy chatbot's development and deployment, including its functionality, design, and testing. The study also looks into the chatbot's effectiveness in offering individualised health advice and increasing customer happiness.

The findings of the study imply that the Health Bot (HealingHands) is a beneficial tool for those seeking natural solutions for their health conditions. The study concludes with a discussion of the findings' implications for the future of chatbot technology in healthcare, as well as the possible advantages of incorporating natural medicines into standard medical care.

Keywords: HealingHands, Dialogflow, AI chatbot, Healthbot, Intent-based.

I. Introduction

Healthcare is a fundamental component of one's life, andit is critical to one's physiological and emotional well-being. There has been a substantial surge in the usage of digital technology to improve healthcare services in recent years. Chatbots, which are software programs that simulate conver- sations with human users, are one such technology.

Chatbots have become a popular tool in the healthcare profession, allowing patients to conveniently obtain knowledge and direction. They can be especially helpful in recommending home remedies to treat minor health complications.

It is not a novel idea to utilise home medicines to manage minor health issues. For generations, many people have relied on these methods. But, in today's hyper world, individuals frequently find it difficult to take time our of their hectic schedules to see a doctor. Furthermore, not everyone has access to medical facilities or expert supervision. Chatbots can be an effective alternative in certain scenarios.

In recent years, the use of natural remedies to treat various ailments has gained popularity. Natural remedies, including herbal medicines, essential oils, and various alternative therapies, are considered a safer alternative to conventional medicine due to their natural origin and minimal side effects. This approach is particularly appealing for individuals who prefer to avoid pharmaceuticals and their potential side effects.

Several studies have shown the effectiveness of natural remedies for various health conditions. For example, a study by Koulivand *et al.* [1] discovered that lavender oil can effectively reduce anxiety and improve sleep quality. Similarly,A study by Barnes *et al.* [2] figured out that that many individuals turn to natural remedies as a way to take control of their health and to reduce their dependence on conventionalmedicine. Another study by Furnham *et al.* [3] perceived that individuals who use natural remedies often report greater satisfaction with their healthcare compared to those who use conventional medicine. Similarly, a study by Cho *et al.* [4] found that herbal medicine can be effective in treating various digestive disorders, including irritable bowel syndrome. Thesestudies demonstrate the potential of natural remedies as an alternative to conventional medicine.

The goal of this study work is to investigate the possible benefits of employing chatbots to offer home remedies and yoga practises for minor health conditions. We will also investigate the capabilities of chatbots and their potential to tackle these problems.

Section II describes the Existing Study. Section III givesa brief description of Conceptual Framework. Section IV explains Methodology of the proposed Chatbot. Section V gives the detailed description and Section VI concludes.

II. Existing Study

There are variety of studies going on using Google's Dialogflow architecture, but applications of all those studies are different from application proposed in this paper.

An application named Medbot [1] which used Dialogflow construct a medical chatbot. Sixteen symptoms with treatmentshave been encoded into the chatbot. The chatbot can provide the user with appropriate replies and help for dealing withthe symptoms. This approach improves customer

comfort, increases service capabilities, and lowers the operating costsof medical consulting services.

Skinvision app [6] has been studied for its effectiveness in detecting skin cancer in various research studies. One study published in the Journal of the European Academy of Dermatology and Venereology came to know that the app had a high sensitivity of 95.1% and specificity of 75% for detecting skin cancer compared to dermatologists.

The ADA health app [7] is a digital platform that assists users in managing their health by collecting and analysing symptoms, giving individualised health insights, and connecting them with healthcare specialists. It uses AI technology to provide individualised ideas and guidance, and it allows users to securely save and share their health information.

This ADA app recommends Medicines and tablets which may have some side effects depending upon one's health condition.

Sarris *et al.* [8] conducted a comprehensive review of the clinical evidence and psychopharmacology of herbal medicinefor depression, anxiety, and insomnia. They found that certain herbal remedies showed promise as effective treatments for these conditions.

Panahi *et al.* [9] organised a randomized clinical trial to assess the effectiveness of ginger for chemotherapy-induced nausea and vomiting. They found that ginger significantly reduced the severity and frequency of these symptoms compared to placebo.

Didari *et al.* [10] did a systematic review and meta-analysis of the effectiveness of probiotics as a natural remedy for irrita- ble bowel syndrome. They found that probiotics significantly improved symptoms of IBS, such as bloating and abdominal pain.

Molassiotis *et al.* [11] ran a pragmatic randomized controlled trial to assess the effectiveness of acupuncture as a natural remedy for cancer-related fatigue in patients with breast cancer. They found that acupuncture significantly reduced fatigue levels compared to usual care.

Hofmann *et al.* [12] conducted a meta-analysis to review the effect of mindfulness-based therapy on anxiety and depression. They found that mindfulness-based therapy showed promise asan effective treatment for both anxiety and depression.

The main objective of this research paper is to find a solution to the common health problems using traditional health practices.

III. Conceptual Framework

A chatbot is a software application intended to converse with people via text or voice. A chatbot often includes machine intelligence and human language interpretation, making it a smart computer program that can respond to inquiries that are particular to humans.

A. Types of Chatbots

1) Rule-based chatbots: Such rule-based chatbots are de- signed to have a pre-defined outlook that can interpret and respond in a very specific and a rigid way. These are very primitive in understanding complex structures of problems andbehave in the very way they are commanded.

2) AI-powered chatbots: These chatbots are enabled by machine learning and algorithms of Natural Language Processing (NLP) which they use to evolve over the course of time depending on the frequency of interaction with the user.

3) Hybrid chatbots: As the name goes by, it is somewhere in between the rule-based and the AI-powered ones because they integrate heuristics and rules for conventional or simpler problems and AI [13] for much more complicated ones.

B. Basic Concepts

The AI-based or intent-based method is based on the humanability to learn on their own and gather useful knowledge.To do this, the chat bot is trained using natural languageprocessing (NLP) with conversion dialogue data sets to extractthe combination of conversational elements such as intent, context, and entity. Recent technologies like Dialogflow [14], IBM Watson [5], Wit.ai and Api.ai are widely used these daysfor the development of chatbots. This paper is based on the Google's Dialogflow architecture. The remaining part of the section briefly describes the terminologies in Dialogflow.

C. Dialogflow

Dialogflow is an NLP platform that lets programmers develop conversational interfaces such as chatbots and voice assistants. Formerly known as API. Dialogflow [16], which is now a component of the Google Cloud, offers a variety of resources and functionalities for building intelligent chatbots that can interpret and respond to human linguistic input.

It analyses user input and determines the purpose behindit using machine learning methods. It is able to recognisea broad range of phrases and sentence patterns, as well as extracting crucial information from input such as names, dates,and places. Dialogflow also includes tools for controlling conversation flow, interacting with users, and connecting withother services and platforms.

D. Components of Dialogflow

1) Agent: A Dialogflow agent is a virtual agent that man- ages several discussions with the end-users. It has a natural language processing module that can interpret the subtleties of the natural spoken words.

2) A Dialogflow agent is comparable to a live call centre repre- sentative. The training doesn't have to be extremely detailed; just enough to prepare students for common conversational situations.

3) Intent: The aim of an end-user for one dialogue is classified as an intent. Variety of intentions are provided for each agent, and the entire combined intents are capable of handling a complete dialogue. Dialogflow matches the expression of the end-user – also known as end-user statement – that the end-user makes to the optimal intent in the agent.

For example: If user says "Hi", "Hello" etc. then the agentwill fall into Default Welcome Intent and will give response i.e. "Hey user, This is HealingHands. How may I assist you?".Components of intent are as follows:

- *Training Phrases*: These are the statements or phrases that the user may utter.
- *Action*: When input given by the user is matched, Dialogflow gives an option to do some action based on the intent.
- *Parameters*: When an intent is given to the agent, it extracts some parameters that are required to proceed the conversation. Each parameter has some datatype which we call as entity type.
- *Responses*: These are the phrases which are given in response to the query of the user by the agent.

All the above terms which are defined are shown in Fig.1

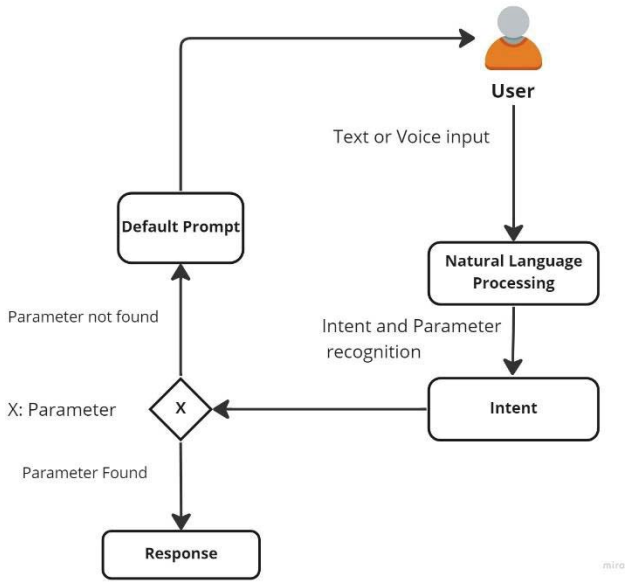

Fig. 1. Communication Flow

4) Entities: As in programming data-types are used, in the similar fashion for each parameter there is an entity type called as Entities. For e.g. @sys.number, @sys.date-time

5) Contexts: It provides the background or framework that helps to shape and give meaning to an event, situation, or communication. For e.g. "They were having dinner". Here the context must be given to the agent to understand what does "They" imply.

6) Follow-up Intent: A follow-up intent in Dialogflow is an intent that is stimulated involuntarily when a prior intent is matched. Follow-up intentions are used to extend a dialogue and obtain further information, as well as to explain a user's request.

Follow-up intents enable your to construct a natural conver-sation flow and obtain extra information from users without starting a new discussion each time. They can also be used to give clarification or more information to the user's request.

IV. Methodology

The idea of HealingHands has been inspired by "ADA" – a health application [7] that predicts the most probable diseases that one might be suffering from on the basis of the symptomsthe system suggests the corresponding medicine.

A. Basic Idea

The idea of chatbot in health has dynamic uses. At times, we don't want to visit a doctor for common health issues asit can be a lengthy process so as a replacement, the idea of HealingHands comes into play.

1. The bot will ask common questions from the user about his/her symptoms being experienced for e.g. about headache, fever, cough and cold, etc.
2. The user's answer will be taken in both click based format and text reply making it more user friendly.
3. Based on the input received, the bot will diagnose the possible issue.
4. Based on the probable issue diagnosed, the bot will provide some common corresponding home remedies.

Based on the study/research, the home remedies suggested by the proposed model do not have any health side-effect unless otherwise specified.

B. Knowledge Base

Knowledge base is the heart of any AI-driven system. In this paper "Dadi, Nani, Maa Ke Gharelu Nuskhe [17]" is used in building the knowledge base. This book contains many home remedies and natural therapies for common diseasesand health problems. These treatments may be based on traditional knowledge passed down through generations and may address skincare, hair care, digestion, colds, coughing, and other common health issues. The book may also provide advice on how to maintain general health and wellness using natural and easy substances present in most homes.

Some other sources were also used to verify the remedies. Those sources are mentioned in References [20-24].

V. Implementation

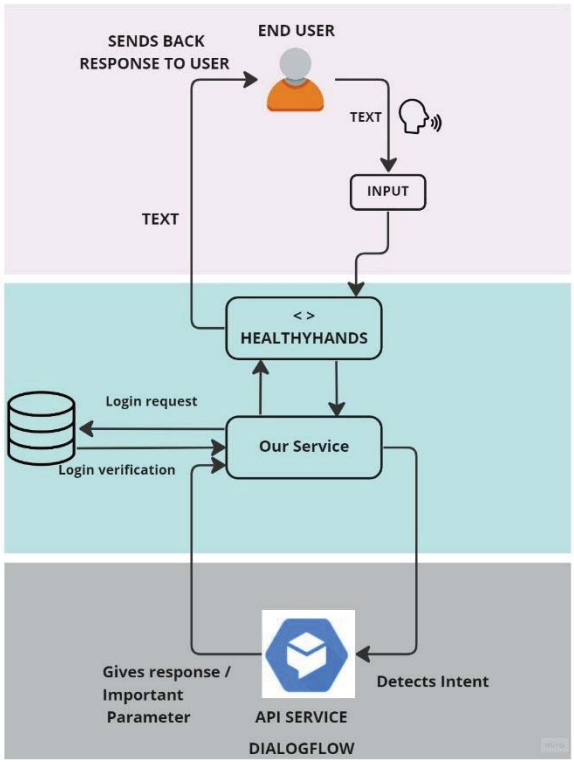

Fig. 2. Dataflow of Query

This section provides detailed implementation of the proposed system. Firstly, Architecture of the system is explained, followed by the Design, Development and Training, User Interface, Integration and Testing and Enhancement.

A. Architecture

The Chatbot that is developed, is based on Intents. This application is an Instant Message type (IM), which takes input as an intent expression and checks for the parameters (if given) and then sends the response from default prompt or from the responses that are given by the user.

When a user submits a query to the app, the message issent to Dialogflow, the chatbot's engine. The training phrase specifies the reaction to the message intent. In addition, responses are generated and given back to the user by the engine which is dialogflow. This process is shown in Fig. 2

A health query includes multiple information like name of the Health issue, severity, time etc. For e.g. "I am experiencing intense abdominal pain from last 10 hours."

In this example exclusion of parameters from intent is shown e.g. $health-issue $severity-type $time-period.

In the HealingHands, there are some parameters which are mandatory to be mentioned else, the bot will inquire. This extraction of parameters from the intent is shown in Fig. 3.

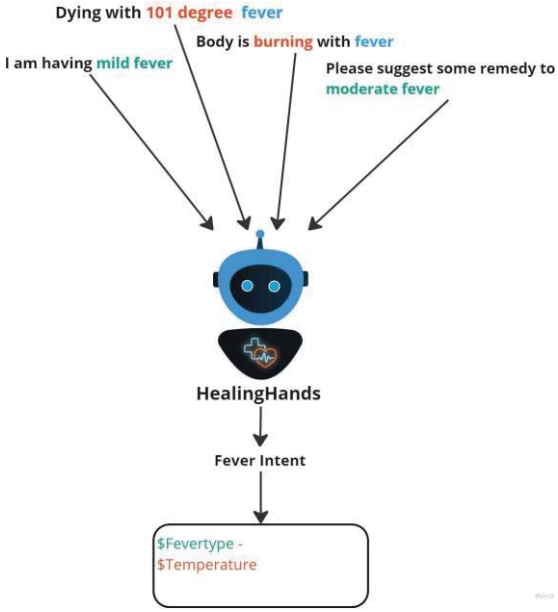

Fig. 3. Extraction of parameters from Intent

B. Designing of HealingHands

The concept of HealingHands is not based on replacing doctors or specialists but it has been trained with many experiences so that it can easily act as a replacement, if not entirely then partially of a doctor in the context of daily or common health issues such as fever, cold, headache, cough etc.

In the situations of extreme severity of sickness, this health-bot recommends consulting a doctor along with some remediesto lower the symptoms. HealingHands has total number of

42 intents, where 13 intents is to identify the health issue. These 13 intents includes fever, cough, cold, indigestion, headache, hairfall, acidity, body pain, dandruff, diarrhoea, itching, hiccups, mild cuts, rashes and prickly heats, heatburns, etc.

Some are follow-up intents which takes the flow to other intent.

Other intents include out of the box answers to the questions given by the user which are generally called as "Default-Fallback Intent.

C. Development and Training

As already explained above in this research paper Google'sDialogflow has been used to develop the Chatbot's back-end.

Steps that should be followed for the development area:

- First of all, a new agent should be created with the name "HealingHands" in Google Dialogflow.
- Post the first step, the flow of similar questions should be created based on each health issue (based on those 13 intents as explained in subsection B of section V.). Results of which are home remedies.
- Now Training phrases and responses are given to each intent. Around 15-20 examples of training phrases should be given to get more accuracy and same goes with the responses.
  Example of the conversation flow is shown in the Fig. 4.

D. User Interface

In this subsection, technologies that have been used for developing the front-end of HealingHands have been explained.

To create the front-end of this Android application, Android Studio [24] has been used i.e. an Integrated DevelopmentEnvironment (IDE). In addition, the designers were consulted to create user interfaces and design elements using Figma[25], a cloud-based design platform. High quality graphics and assests have been developed using Figma, which was then incorporated into the Android Studio project to build a visuallybeautiful and functioning front-end for this application.

One iframe link is given to the front end code. An iframe link is a link that be used to display external content within a response message. An iFrame is an HTML tag that allows you to embed an external web page or web application within your Dialogflow chatbot response.

Input of the query can also be given in the form of audioor by clicking on the mic icon as shown in the Fig. 5

The user interface is equipped with Health Assessment and Small talks.

The main objective of this chatbot is Health Assessment where the user can interact with the bot to get the traditional health solutions to their issues. The main user Interface of the bot is shown in Fig. 5

Additionally, the user can interact with the bot by having general conversations through small talks, like "Who built you?", "How old are you?" etc. A snapshot of the small talks is shown in Fig. 6.

User Interface of Onboarding Introduction and a live exam-ple of how the UI looks like is shown in Fig. 5.

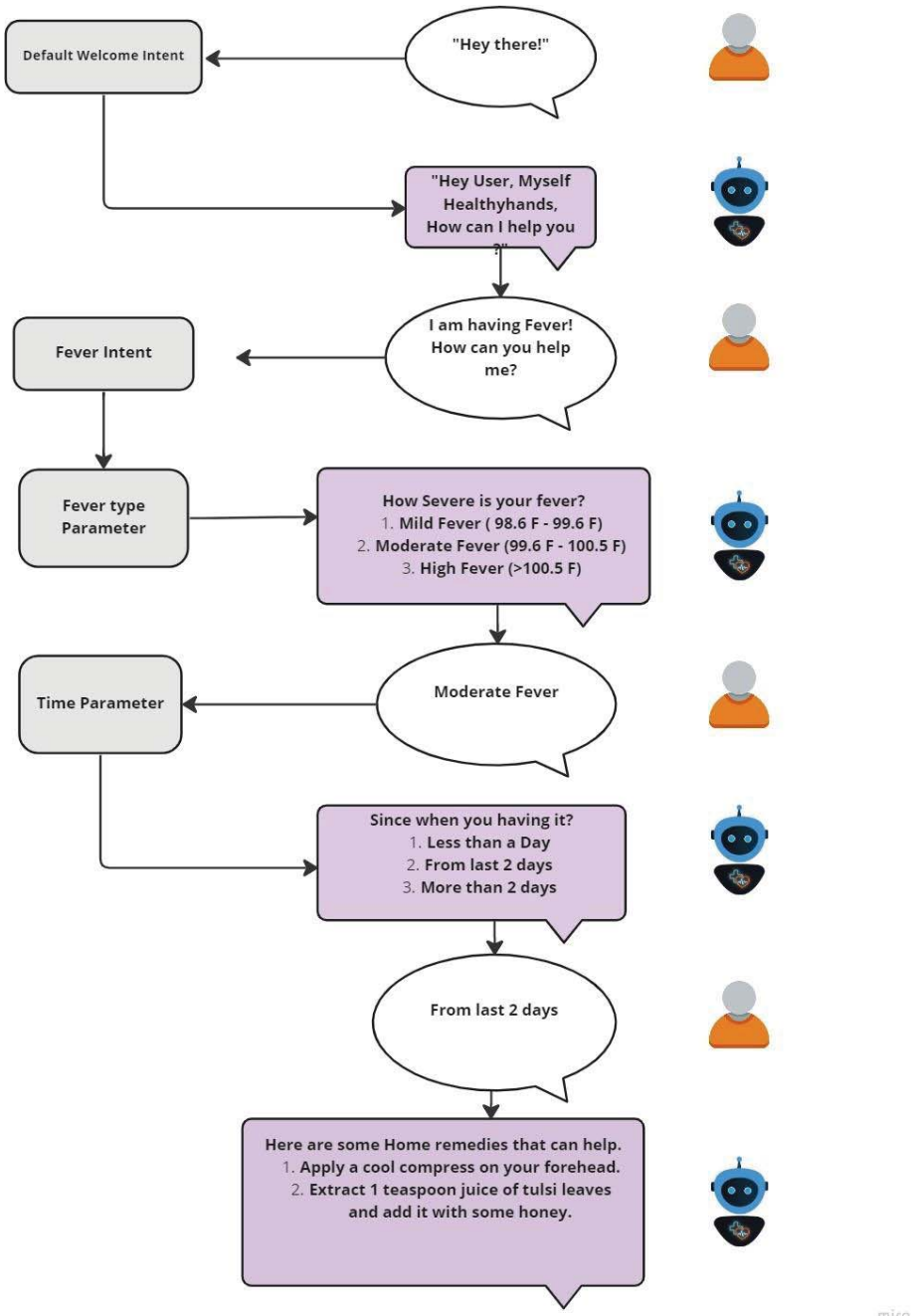

Fig. 4. Conversation flow depending on symptoms

E. Integration

Dialogflow offers several ways to integrate the chatbot. Some of them are explained below:

- **Facebook Messenger Integration**: Integrates Dialogflowwith Facebook Messenger to allow users to interact with your chatbot or virtual assistant through Facebook Messenger.
- **Twitter Integration**: Integrates Dialogflow with Twitter to allow users to interact with your chatbot or virtual assistant through Twitter Direct Messages.
- **Slack Integration**: Integrates Dialogflow with Slack to allow users to interact with your chatbot or virtual assis- tant through Slack channels or direct messages.
- **Skype Integration**: Integrates Dialogflow with Skypeto allow users to interact with your chatbot or virtual assistant through Skype chat or voice calls.
- **Personal Integration**: Allows you to embed your chatbotor virtual assistant on your website or mobile app, or integrate it with other platforms using the Dialogflow API. This paper uses Personal Integration technique.

F. Testing and Enhancement

This is the last step of implementation. Testing can be done in two ways:

- **While making Intents**: For each health issue, corresponding flow of intents have been made which includes context, training phrases, responses and then can be testedin the section provided by Dialogflow.

This section is shown in the Fig. 7.

System Testing or Beta Testing: This type of testing comes under black box testing or Beta testing which is done from the user's end and here user does not know anything happening behind the application. Where there is no role of the developer, user can insert any input of his/her choice.

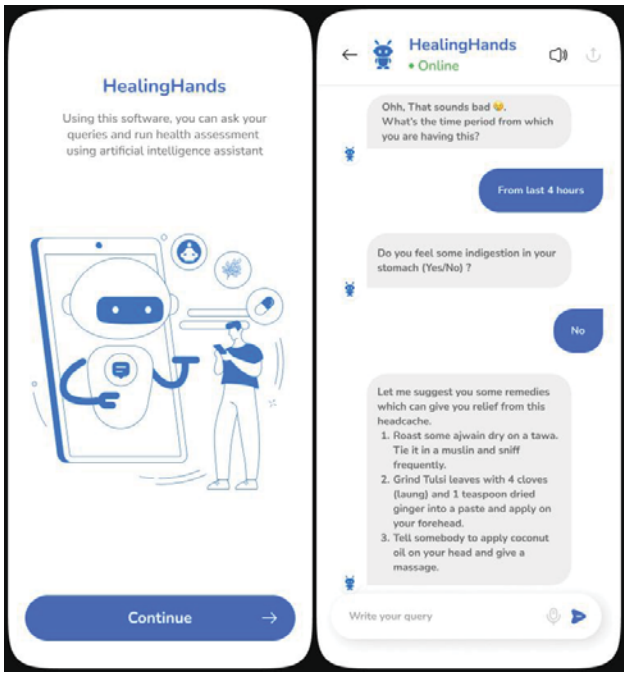

Fig. 5. Onboarding and Chat Interface

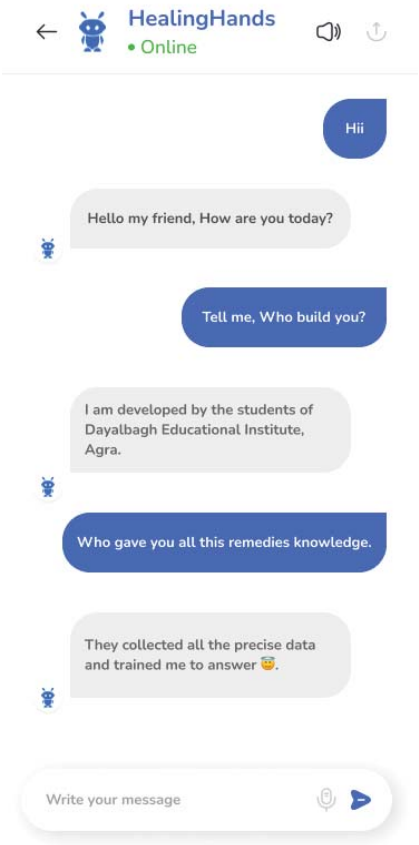

Fig. 6. Small Talk

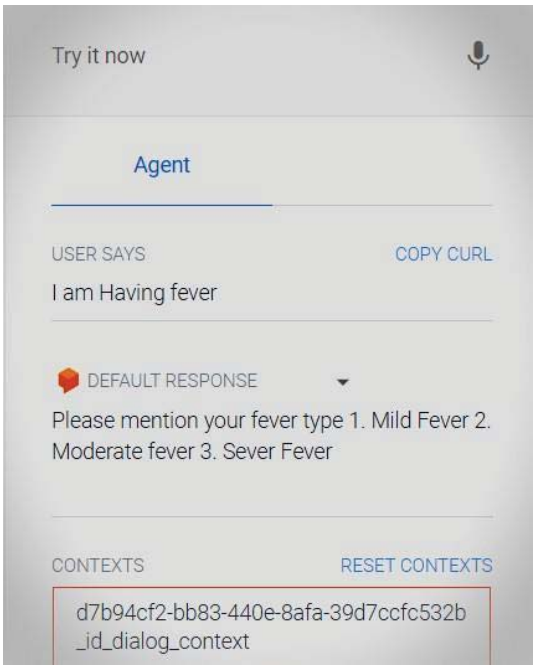

Fig. 7. Testing

Enhancement can be done by correcting the inputs by making them fall into the specific intent in which they should fall. This can be done by using the Conversation History option [13] which falls in the context of dialogflow to correct the queries by making them fall into exact intents.

VI. Conclusion

"HealingHands" is an effective and consistent Healthbot thatutilizes cutting-edge technology to give users with tailored health insights and symptom evaluations. Users may obtain personalised medical advice based on their specific requirements and symptoms. The bot is enriched with 42 intents, including 13 symptom-based intents. The usage of Dialogflow as the backend ensures that the bot can properly read user input and respond in a timely manner. The front-end, created with Android Studio and wireframes from Figma, is user-friendly and delivers a smooth experience.

"Health Assessment", being the primary objective that makes it convenient for the users to communicate with the bot and get the help they require, along with getting the liberty of having a general conversation referred as "Small talks".

This work uses the latest technologies using Artificial Intelligence, Speech recognition and NLP using Dialogflow.

This bot is trained to answer question related to daily health issues. Language This application is a good option for those who are newbies in the traditional health approach. Nevertheless, there is still room for this application to grow.

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