CURING MENTAL HEALTH BY USING CHATBOT

A PROJECT REPORT

Submitted by

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

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

NATIONAL ENGINEERING COLLEGE

(an Autonomous Institution)

ANNA UNIVERSITY: CHENNAI 600 025

APRIL 2022

ANNA UNIVERSITY : CHENNAI 600 025

BONAFIDE CERITICATE

Certified that this project report **"CURING MENTAL HEALTH BY USING CHATBOT**" is the bonafide work of **"JEEVANANTHAN S K(1811036), ARAFATHALI M(1811090), DAISON MANICKAM A(1811401)"** who carried out this work under my supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

ACKNOWLEDGEMENT

We at first like to thank the Lord Almighty for his guidance throughout our entire project and making this project a great success.

We immense pleasure to convey grateful thanks to our honourable Director **Dr.S.Shanmugavel** and our beloved Principal **Dr.K.Kalidasa Murugavel** for providing an opportunity to undergo this project.

We are greatly indebted whole heartedly to our Head of the department **Dr.A.Shenbagavalli, Professor and Head/ECE** for her valuable and consistent encouragement for carrying out the work and support in bringing this project.

We express our regards and sincere thanks to our Project coordinator **Dr.V.R.S.Mani, AP(SG)/ECE** and **Dr.T.Vijayanandh, AP(SG)/ECE** for their constant supports.

We express our sincere gratitude and thanks to our respected project guide **Dr. T. Vijayanandh, AP(SG)/ECE** for his valuable guidance, useful suggestion, constant encouragement and kind advice in bringing out this project a successful one. His inspiration and systematic guidance have sharpened our abilities for a critical forward looking while carrying out work.

We would also like to thank all our teaching, non-teaching staffs for their kind and generous supports throughout our entire project. Finally, we thank our family members and friends instrumental in the completion of the project work.

ABSTRACT:

Mental issues can hit anyone really hard. Mental health issues is an extremely complex disease. No one knows exactly what causes it. A chatbot is a system that is able to converse and interact with human users using spoken, written, and visual languages. Chatbots have potential to increase access to mental health interventions. In particular, chatbots may encourage interaction by those who have traditionally been reluctant to seek mental health advice due to stigmatization.

Some people may experience depression and feel overwhelmed with sadness and loneliness for no known reason. People dealing with depression want to tell their stories to somebody and they are mostly afraid to speak to their close friends and relatives. The best way of treating the mental health problems is to contact the doctors. Our chatbot provides guidance to the user by arranging a video or audio call meeting with the special psychologist available throughout the world by providing therapy.

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LISTOF ABBREVIATIONS

S.NO	ABBREVIATION	EXPLANATION
1.	SDK	Software Development Kit
2.	NLP	Natural Language Processing
3.	GUI	Graphical User Interface
4.	IDE	Intergrated Development Environment
5.	SQL	Structured Query Lanugage
6.	API	Application Programming Interface
7.	CDN	Content Delivery Network

CHAPTER 1

INTRODUCTION

In recent researches, according to the World Health Organization, there are around 264 million people who suffer from depression and in the worst-case scenario, it tends to mental depression. Many cases of stress and anxiety are among the people aged between 15 - 29 years and the source of depression can be diverse among these age groups. The number of people suffering from mental illness is immense but the issue is, many of them consider to be a phase and continue to be stressed without knowing how it affects their brain cells. Stress release is something that should be practiced by every individual. Another issue is about 76-85% of people in the low-middle income countries don't haveproper resources or lack trained health care providers.

A web-based application is created to connect user who are suffering from mentalhealth problems. They can not reach best doctors all over the world. Our website provides service for connecting them through virtual mode. Chatbots are simulations which can understand human language, process it and interact back with humans while performing specific tasks.

A chatbot is a system that interacts with users using natural language through a variety of ways that include written, spoken, facial and/or body expressions. Other terms used for a chatbot include: machine conversation system, virtual agent, dialogue system, conversational user interface (CUI), and chatterbot. The purpose of a chatbot system is to simulate a human conversations.

Chatbots are usually text-driven, with images and unified widgets, which make it easy to start interacting with a bot. There are two types of chatbots: unintelligent (rule-based) chatbots which generate their dialogue based on some predefined rules or decision trees, and intelligent chatbots which use Artificial Intelligence (AI) to understand the context and intent of a user utterance and respond to it. Healthcare has witnessed an increase in chatbot use over thepast few years.

Chatbot is an Entity which imitate human discussion in its particular accepted set-up together with a text or vocal language with techniques such as Natural Language Processing (NLP). The aim of this system is to replicate a person's discussion. The development of chatbot application can be done with making a user interface to sendinput and receive response. It is a system that interact with user by keeping the track of the state of interaction and recollecting the preceding commands to give functionality. The medical chat-bots can be developed by using artificial algorithms that scrutinize user's queries and recognize it and give reply to related query. A big disease can start from small problems such as headache which feels normal but it may beginning of big disease such as brain tumor .Most of the disease can be identified by common symptoms so the disease can be predicted if the patient body is analyzed periodically using Acobot API.

The system give response by use of an efficient Graphical User Interface such that if actual person is chatting with the user. chatterbot that can be used in various fields like education, healthcare, and route assistance.The central part of the chat-bots includes Firebase, Acobot API.

However the previous proposed designs in the past did not focus in intensity of the illness that the user is suffering through. Our proposed design aims toask more questions to the user until it gets confident about the probable illness that the user is suffering through. Also our Chatbot design has the concept of threshold level that helps it to detect the intensity of the problem and connects the user directly to the doctor if it feels that the problem is too serious for the Chatbot to handle.

CHAPTER 2

LITERATURE SURVEY

A. Teles, 2019, et.al [1]: They proposed to identify, analyze and characterize the current state of mobile applications focused on depression. To do so, they conducted a systematic review of applications for depression assistance. The two most popular mobile app stores (Google Play Store and Apple App Store) have been explored to find the most relevant apps. After applying the inclusion and exclusion criteria and performing the quality assessment of the results, 216 applications were selected for the data extraction phase, where they summarized their benefits and limitations and identified gaps and trends. The results of this review evidenced that there is a growth in the diversity of apps' purposes such as chatbot, online therapy, educational tools, mood tracker, testing, and self-help.

D. Miranda and D. Kayande,2021, et.al[2]: The proposed system aims to ease this problem by providing a chatbot to students that would provide the required support similar to a counsellor or therapist. Recent use of technology in aiding with Mental Health recovery has proven to be highly effective in terms of machine learning. The method involves surveys, questionnaires, data analysis and natural language processing. The aim is to build an online platform through which the tool will function.

V. Dhanasekar, Y. Preethi,2021, et.al[3]: They proposed to develop a chatbot for students to promote their mental health through emotion recognition technique. By developing a human friendly chatbot that can help students get the right guidance for their issues at the right time is a much needed one. These kind of chatbots can play a vital role in reducing the number of suicides in the country due to depression and stress. The chatbot named Maxx helps students solve or prevent any mental health issue in their day-to-day life. Maxx converses with the student, understands his/her present emotional state/mental health issue (if any), identifies the cause of that emotion/mental health issue and provides the right guidance based on the reason identified. Maxx uses technologies like DialogFlow for Natural Language Processing (NLP), Flutter for app development and Google Cloud Platform (GCP) for data storage and security.

N. V. Krishna and T. P. Jacob,2022, et.al[4]: they proposed a program to presents the Speech API, which permits clients to incorporate voice data into a web application. With the assistance of the present-day web, users can highly depend on an assortment of UI capacities to speak with clients. With the Web Speech API, the voice orders can be utilized to foster rich sites with local clients and little web clients. There is a wide range of ways for visiting, and this study particularly attempts to utilize chatbots that remain valuable for providing instruction. This permits numerous applications to be utilizedon rich sites. Furthermore, the API can empower online applications to assist individuals with physical or mental handicaps or wounds.

CHAPTER 3

SYSTEM DESIGN

SYSTEM ARCHITECTURE:

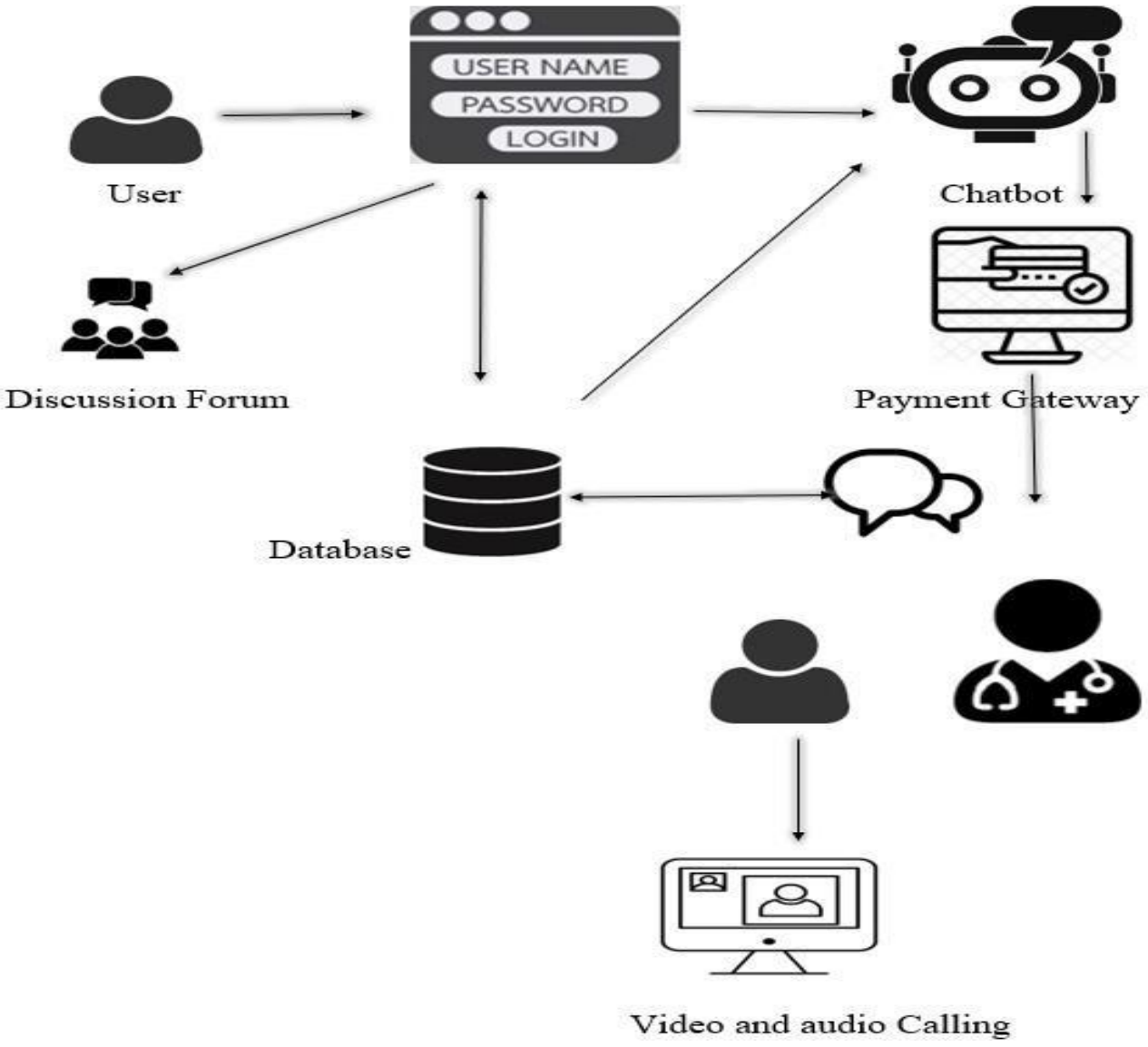


Fig 3.1 MENTAL HEALTH WEB-APPLICATION ARCHITECTURE

The user register by providing details.After creating an account the user shall login to access the account. A discussion forum is available,to discuss about the website details. Chatbot acts as an interface between the user and the application, it helps the user by arranging session with doctors. By using some keyword like session, therapy the user move to session part. A secure payment gateway is set , in which the user has tocertain amount for consulting the doctor.

After successful payment, the user is navigated to doctor selection. Depending upon the user wish the doctor can be selected and time slot can be requested. A mail is sent to the doctor about the appointment, depending on doctor's availability the time slot is fixed. Notification is given to the user about the meeting session with the doctor. As the time arrives the user and doctor has a video and audio call. Their mental health problems can be discussed between them and correct solution will be given by the doctor.

There are few Medical Chatbots that already exist, but they do not provide users dynamic solutions to any illness but connect them with a Medical QA Forum and show them similar questions to their symptoms that doctors may have previously answered.

The proposed system is implemented with modules they are,

1. Registration page
2. Login page.

Registration Page

The new user can register to the page by providing their details like name, email address, password, gender in the form. Only after verifying the email address the account is activated.

Login page

After completing email verification, the account is redirected automatically to the home page. User can also login using their email id and password.

Existing System

The existing system is a simple chatbot that interacts with the user regarding health problems. Depending upon the mental state of the user, the Chatbot replies the message. Physical mode is the available to the user to consult to the doctor by getting proper appointment arranged by chatbot.

Proposed system

The proposed system is a web-based application that helps the user with mental health problems, to consult specialized doctors all over the world virtually.

User and physcologist can talk through a web-based meeting application regarding their mental health problems.The chatbot will act as a virtual doctor and makes possible for the patientto interact with virtual doctor.

Based on the survey given it is found that the number of correct answer given by the chatbot is 80% and incorrect/ambiguous answer given is 20%. From this survey of chatbot and analysis of result suggested that this software can be used for teaching and as a virtual doctor for awareness and primary care.

PROCESS FLOW DIAGRAM

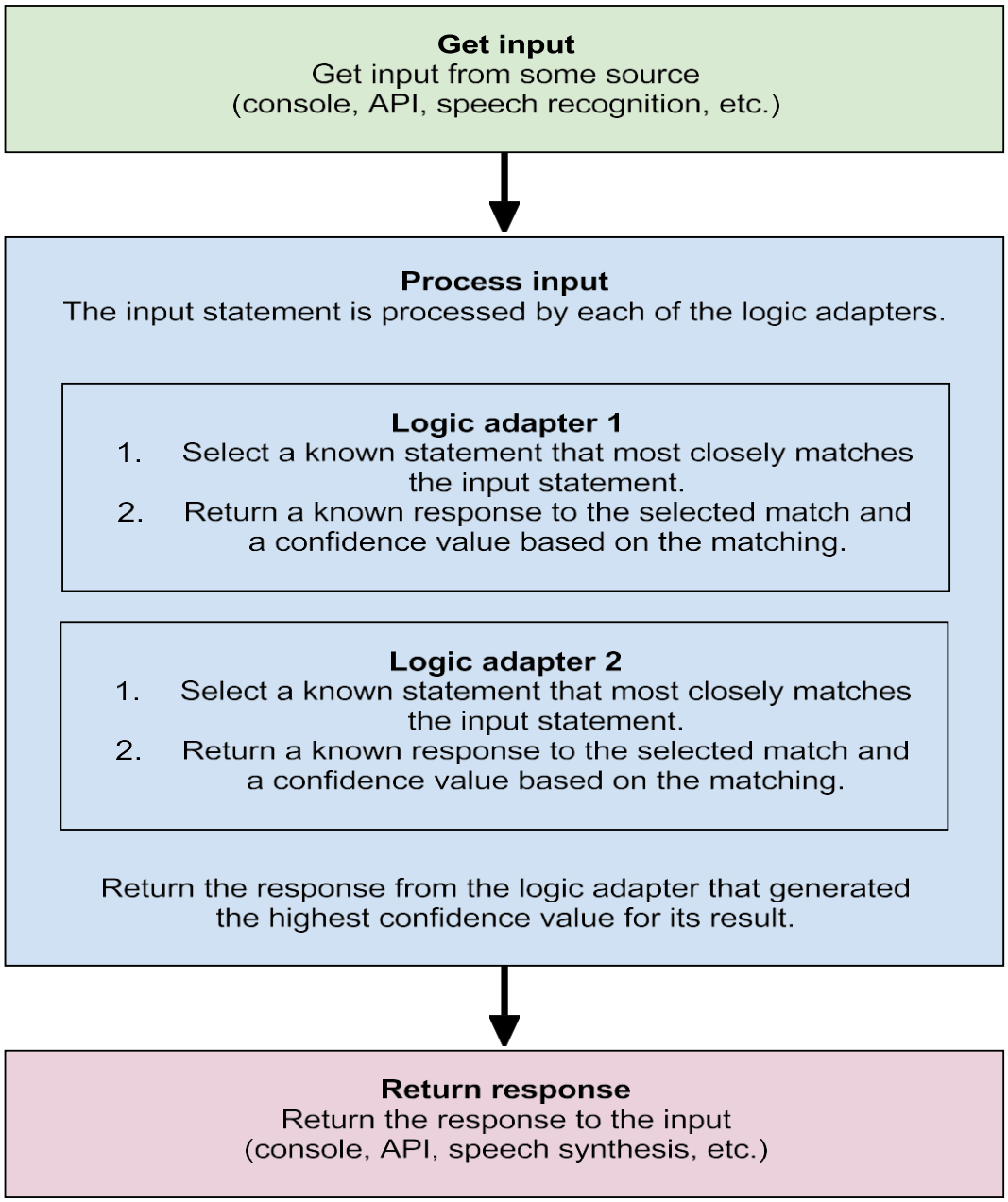


Fig 3.2 Process Of Flow Diagram

Fig 3.2 describes that the Chatbot gets an input from the source and checks a given statement to see if it contains a mathematical expression that can be evaluated. If one exists, returns a response containing result.

CHAPTER 4

SYSTEM REQUIREMENTS AND SPECIFICATION

Software Specifications:

Front end	: HTML,JAVA Script,CSS
Back end	: Netify, EmailJS,Agora
Data base	: Firebase
Operating System	: Any OS
IDE	: VisualStudio

The **Hyper Text Markup language or HTML** is the standard markup language for the documents designed to displayed in the web browser.

It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript. Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

HTML elements are the building blocks of HTML pages. With HTML constructs,images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are delineated by tags, written

using angle brackets. Tags such as <**img**/> and <**input** /> directly introduce content into the page. Other tags such as <**p**> surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags but use them to interpret the content of the page.

HTML can embed programs written in a scripting language such as JavaScript, which affects the behavior and content of web pages. Inclusion of CSS defines the look and layout of content.

Cascading Style Sheets (**CSS**) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts. This separation can improve content accessibility; provide more flexibility and control in the specification of presentation characteristics; enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file, whichreduces complexity and repetition in the structural content; and enable the .css file to be cached to improve the page load speed between the pages that share the file and its formatting.

Netlify is a San Francisco-based cloud computing company that offers hosting and serverless backend services for web applications and static websites .The company provides hosting for websites whose source files are stored in the version control systemGit and then generated into static web content files

served via a Content Delivery Network. Netlify creates its own repository that pushes to Github and its own microservices. It then executes and distributes content across a wide CDN to deliver pre-built static websites to visitors.

The best thing about Netlify is that it selects the best CDN and distributes content. This results in pre-built websites that load faster than on traditional hosting networks. Instead of loading the site for each visit, the visitor gets a pre-loaded version straight from the closest server. This sharply reduces load times.

Agora's Real-Time Engagement Platform provides reliable worldwide coveragewith ultra-low latency, scalability, and flexible interactive features.
Our easy-to-embed APIs, broad range of SDKs, and partner ecosystem help you embed voice, video, real-time messaging and recording solutions quickly and cost-effectively. It provides video call, audio call, Interactive live streaming, recording, real-time messaging.

Agora is **a Live Engagement Platform as a Service Company**. As part of our core engagement services, Agora o ers live interactive audio/video streaming powered by our Software-Defined Real-time Network that is accessible and available anytime, anywhere in the world.

EmailJS helps to send emails using client-side technologies only. No server is required just connect EmailJS to one of the supported email services, create an email template, and use our Javascript library to trigger an email.

Features

- Support for multiple transactional/personal email providers
- Email templates editor
- Email history/resend
- REST API
- Auto-reply, attachments, CAPTCHA and more

Google Firebase is a Google-backed application development software that enables developers to develop iOS, Android and Web apps. Firebase provides tools for tracking analytics, reporting and fixing app crashes, creating marketing and product experiment.The Firebase Realtime Database is a cloud-hosted NoSQL database that letsyou store and sync data between your users in realtime.

NEW: Cloud Firestore enables you to store, sync and query app data at global scale. This is different than traditional app development, which typically involves writing both frontend and backend software. The frontend code just invokes API endpoints exposed by the backend, and the backend code actually does the work. However, with Firebase products, the traditional backend is bypassed, putting the work into the client. Administrative access to each of these products is provided by the Firebaseconsole.

Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft. It is used to develop computer programs, as well as

websites, web apps, web services and mobile apps. Visual Studio uses Microsoft software development platforms such as Windows API, Windows Forms, Windows Presentation Foundation, Windows Store and Microsoft Silverlight. It can produce both native code and managed code.

Visual Studio includes a code editor supporting IntelliSense (the code completion component) as well as code refactoring. The integrated debugger works both as a source-level debugger and a machine-level debugger. Other built-in tools include a code profiler, designer for building GUI applications, web designer, class designer, and database schema designer. It accepts plug-ins that expand the functionality at almost every level— including adding support for source control systems (like Subversion and Git) and adding new toolsets like editors and visual designers for domain-specific languages or toolsets for other aspects of the software development lifecycle (like the Azure DevOps client: Team Explorer).

CHAPTER 5
SYSTEM IMPLEMENTAION

In mental health web-application architecture, the user is an entity. New users can create a profile of their own and the user data are stored in the database. After this the user can use the modules like chatbot, discussion forum, payment gateway, personal chat, and video and audio call**.**

Chatbot:

- It helps the users to interact with chatbot and connect to the session easilyusing keywords.

Discussion Forum:

- The users can chat between them to known about the website. Discussion forum is the interface between the website and user. The user can interactwith other user, to know about the website details.

Payment gateway:

- A payment is required to pay the doctor for consultation. Payment gateway is required to proceed further in the website. The user has to payfor consulting a therapist.

Personal Chat:

- It is used in between the doctor and the user to chat personally. Personal chat is available for user and therapist to contact through message personally.

Video and Audio call:

- It is used to connect the doctor and the user virtually all over the world.

Time slot:

- The Time Slot in which the user receives the time slot allocated by the doctor.

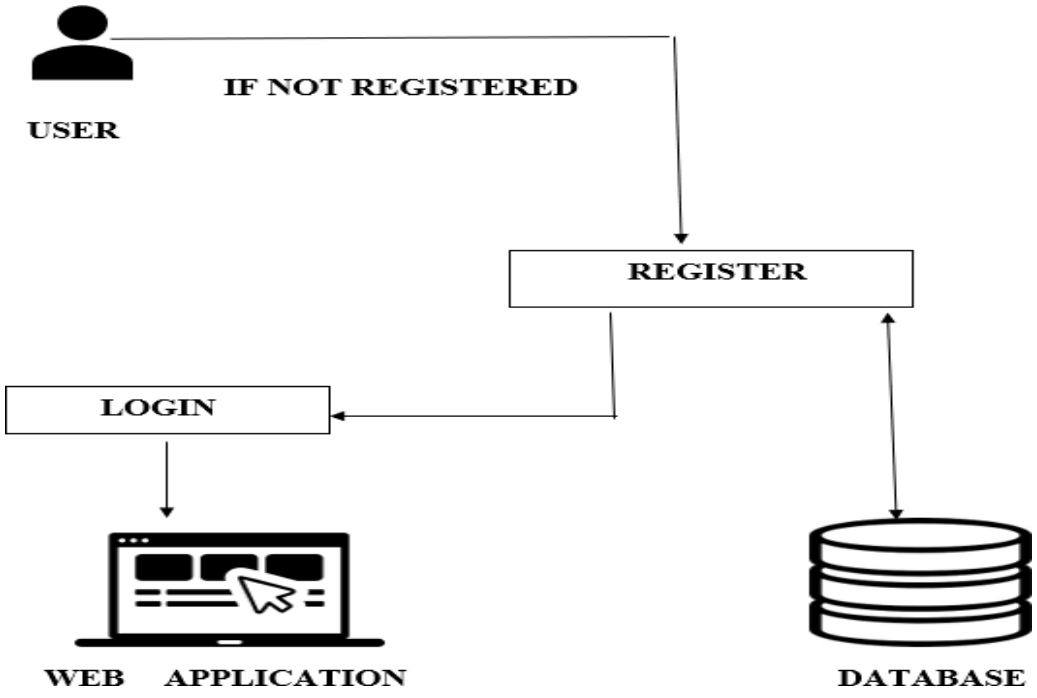
Let us have a quick glance at Python's **Chatter Bot** to create our bot. ChatterBot is a Python library built based on machine learning with an inbuilt conversational dialog flow and training engine. The bot created using this library will get trained automatically with the response it gets from the user. Chatter Bot is a Python library designed to make it easy to create software that can engage in conversation.

1. User authentication for application
2. Chatbot module
3. Discussion forum module
4. Payment gateway module
5. Video and call module

User authentication for application:

User authentication is a means of identifying the user and verifying that the user is allowed to access some restricted service. The main aim of this modules is to authenticate the user to access the application that includes username and password. The user has to register by providing full name, gender, email address, phone number, password, confirm password. After registering, an email verification is sent to the registered email address of the user. After verifying the email the user can login into the account.

Fig 5.1 USER AUTHENTICATION FOR APPLICATION



Chatbot module:

In Chatbot module, the user can chat with the chatbot available in the website.By using keywords like therapist, session the chatbot directly takes to the session arrangement with the doctor. Chatbot acts as an intermediate between the user and the application. It works by using an API, where all the dataset is stored in it.

The Users section shows a list of people that have chatted with your bot. Each person as a separate user with valuable data gathered such as name, email address, collected attributes, and more. Moreover, each profile shows how often the person talksto the bot and when the last chat occurred. Users can be added to custom lists, called segments, that can be further sent to your mailing lists or databases and utilized for yoursales or marketing purposes.

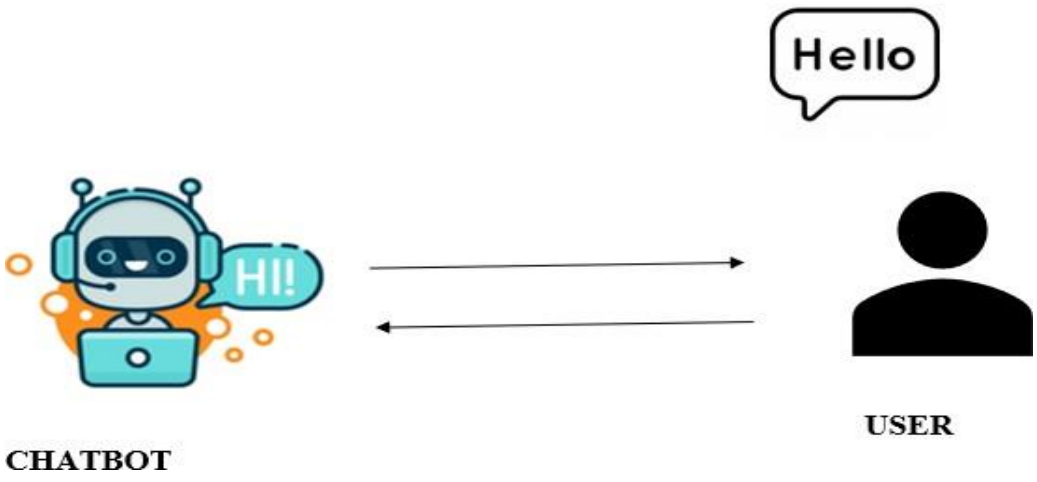


Fig 5.2 CHATBOT MODULE

Discussion forum module:

Discussion forum module is used to help the user to discuss about the website. The user is not required to pay for using discussion forum. Every user who has registered the website has the permission to use this module without payment .Discussion forum is an online discussion site where people can hold conversations in the form of post messages. They differ from chat rooms in that messages are often longer than one line of text, and are at least temporarily archived.

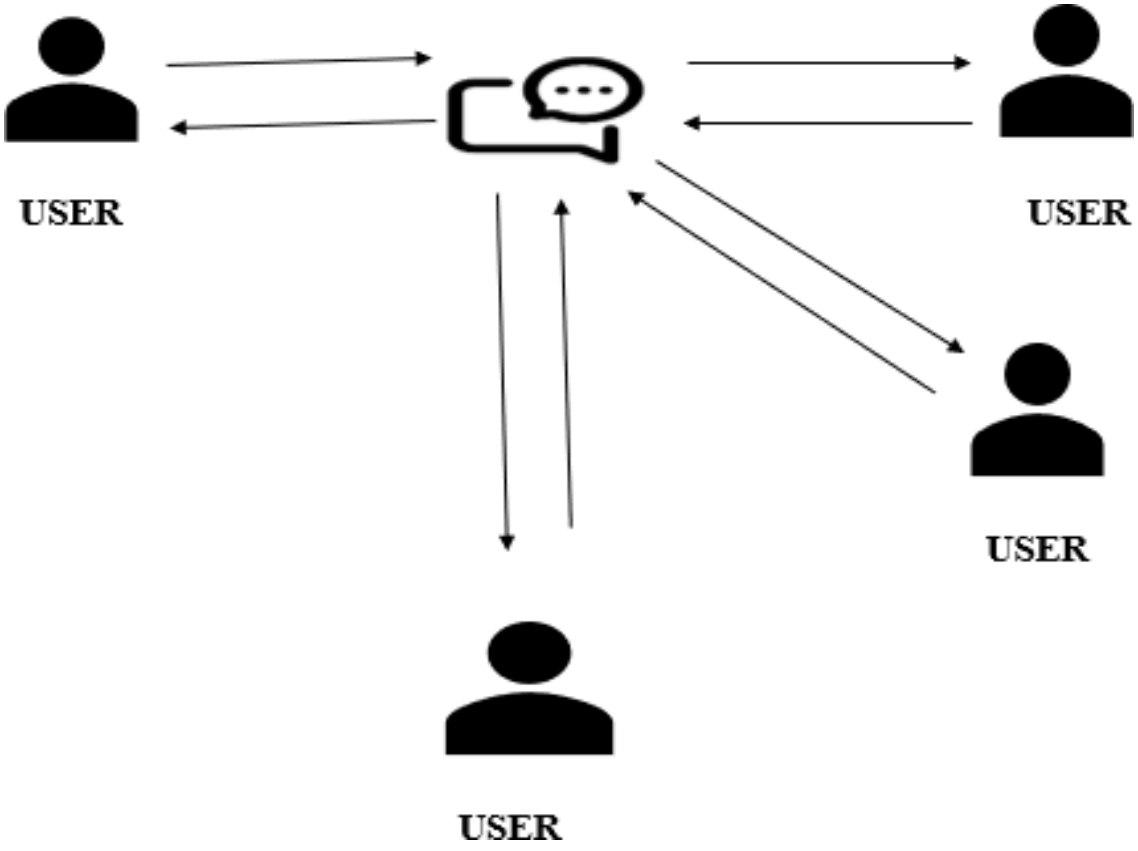


Fig 5.3 DISCUSSION FORUM MODULE

Payment gateway module:

Payment gateway module is used to make secure payment in the website. Payment gateway are the "checkout" portals used to enter credit card information or credentials for services such as Razor pay, PayPal.

Payment gateways are distinct from payment processors, which use user information to collect payments on behalf of the merchant.

Razor pay helps you accept online payments from customers across Desktop, Mobile web, Android & iOS. Additionally by using Razor pay Payment Links, you can collect payments across multiple channels like SMS, Email, WhatsApp, Chatbots & Messenger.

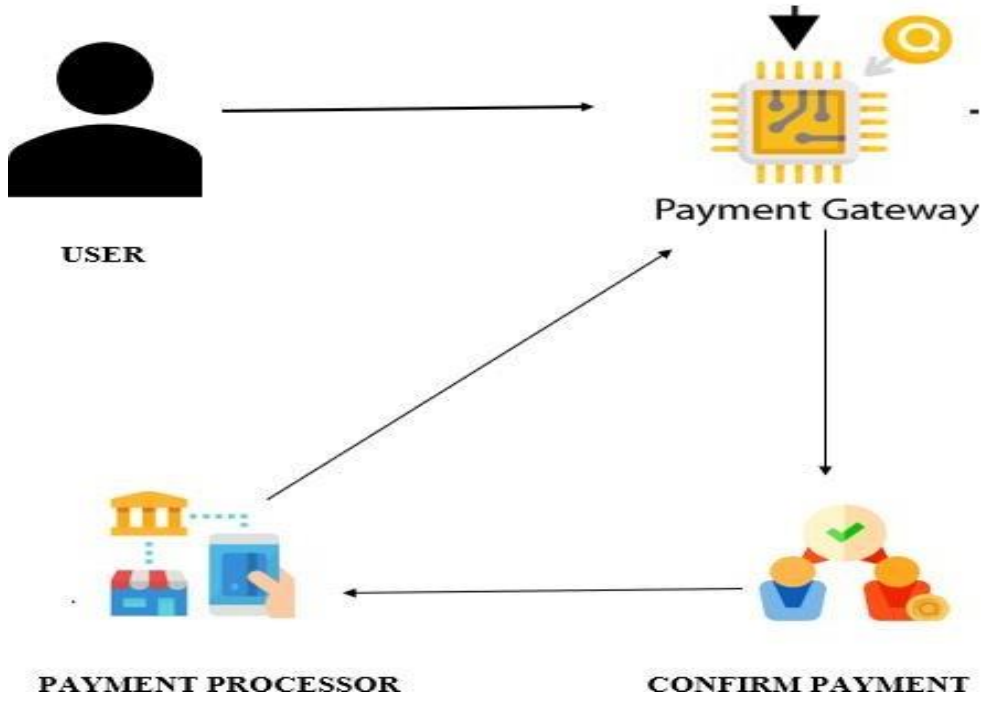


Fig 5.4 PAYMENT GATEWAY MODULE

Video and Audio call module

Video and audio call module is designed to arrange video and audio call between the user and the therapist. In this module Agora platform is used.

Agora is the leading video, voice and live interactive streaming platform, helping developers deliver rich in-app experiences—including embedded voice and video chat, real-time recording, interactive live streaming, and real-time messaging.

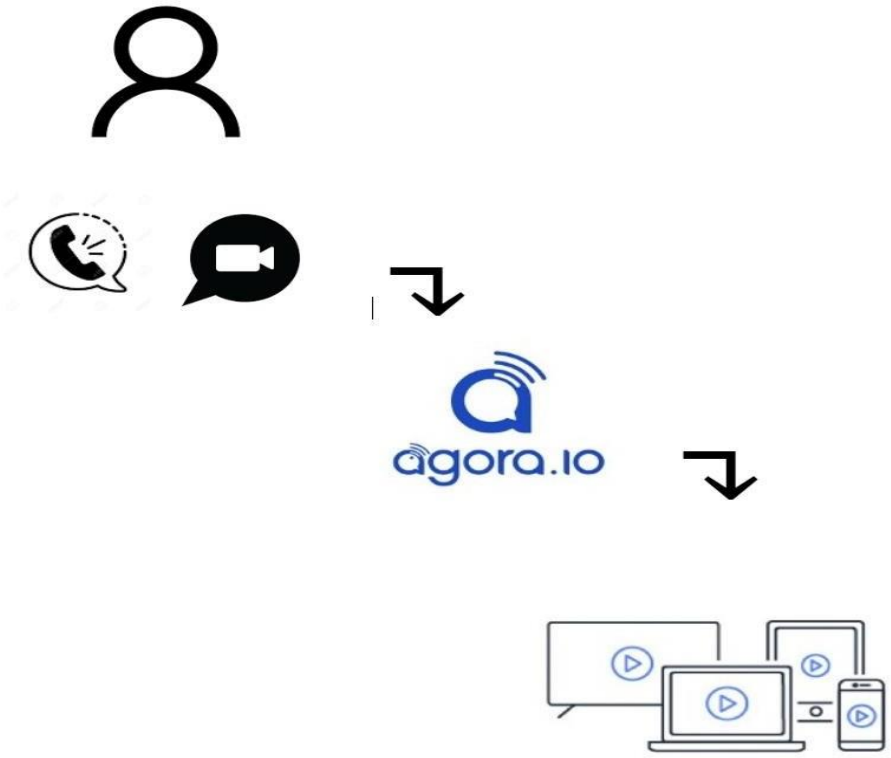


Fig 5.1.3 Video And Audio Call Module

CHAPTER 6

RESULT ANALYSIS

Result:

Main Activity

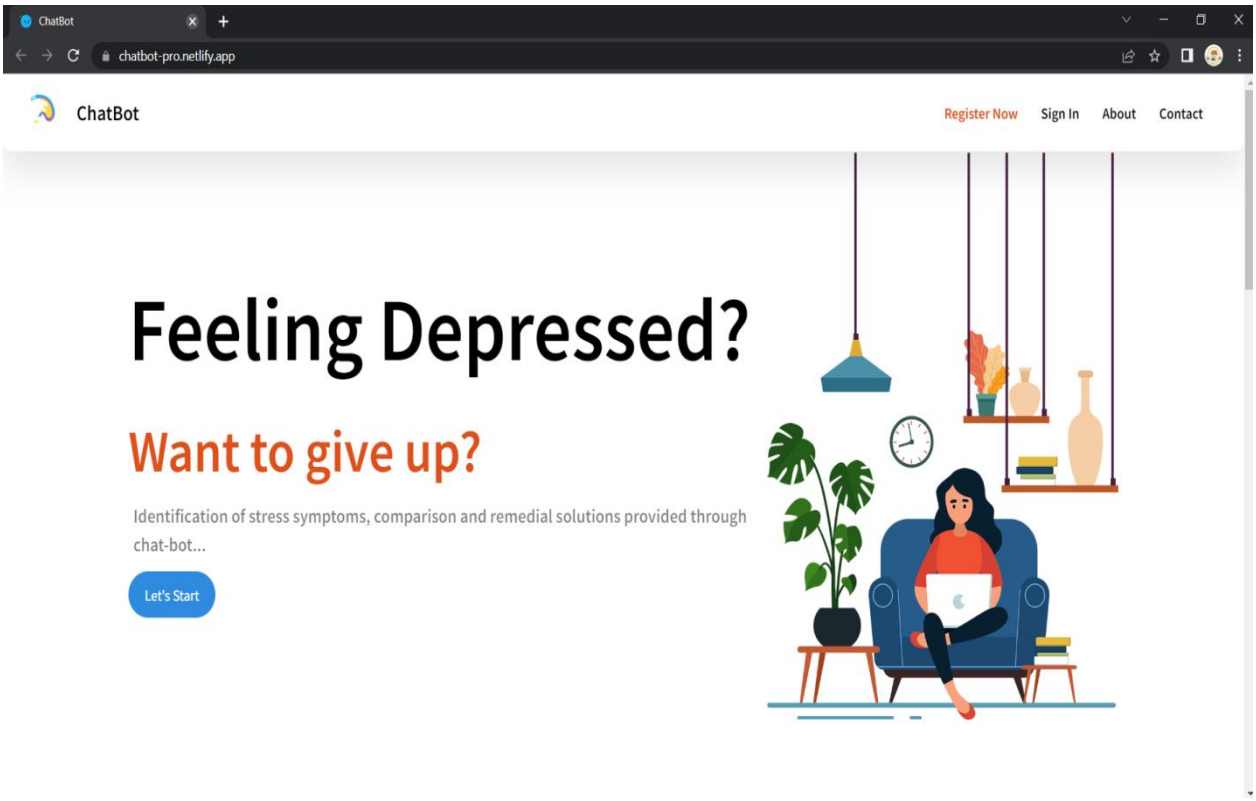
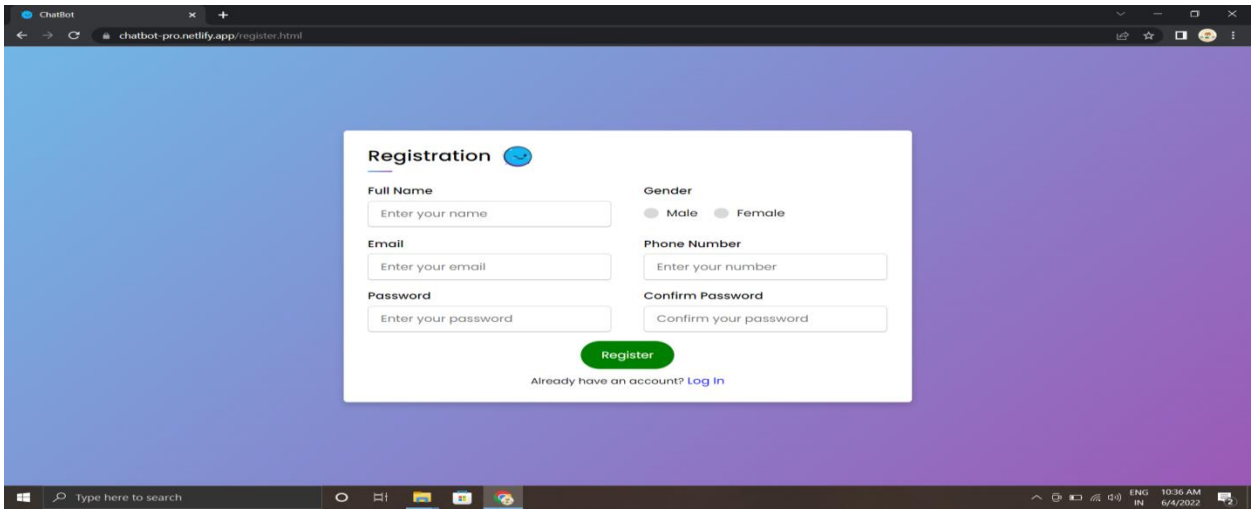


Fig 6.1 Main Activity

The fig 6.1 describes the main page in which the user can choose either sign in or signup options

Register Activity:



. **Fig 6.2 Register Activity**

The fig 6.2 describes, the register activity, where the users will give their details toregister.

Login Activity:

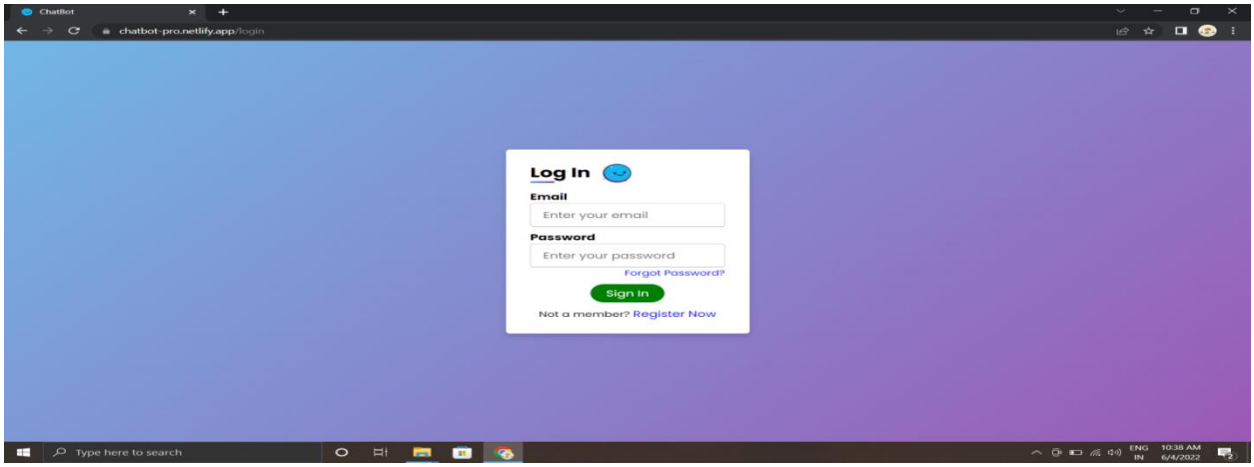


Fig 6.3 Login Activity

The fig 6.3 describes the Login page in which the user shall login using their email andpassword.

Email verification Activity:

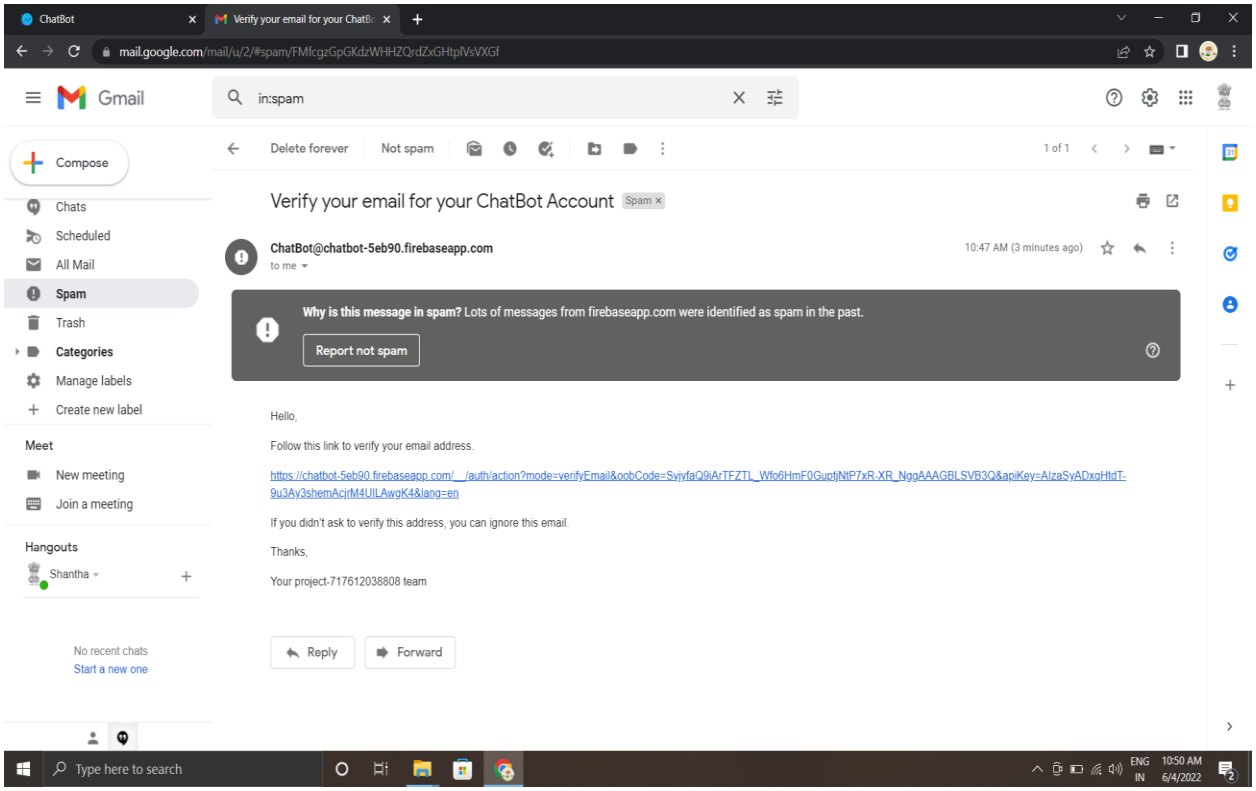


Fig 6.4 Email Verification Activity

The fig 6.4 describes the Email verification in which the user has to verify before login page.

Navigation Activity:

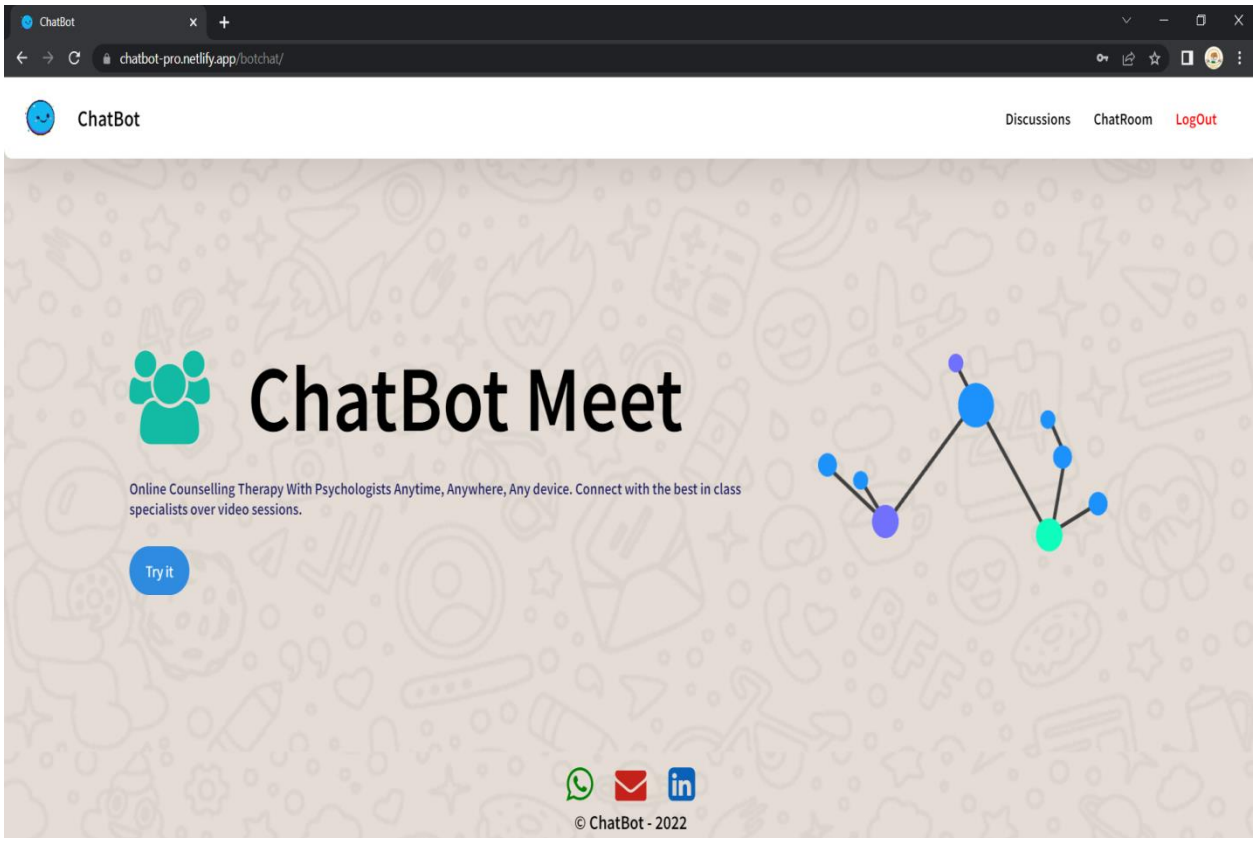


Fig 6.5 Navigation Activity

The fig 6.5 describes the navigation in which the user is navigated to the page afterlogging in.

Chartbot Activity:

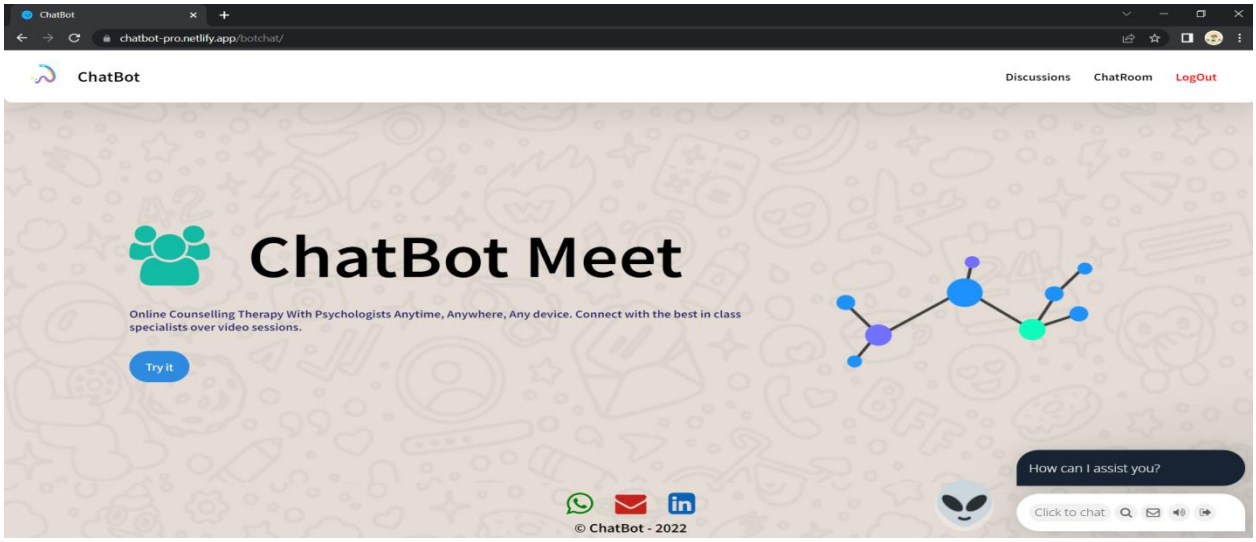


Fig 6.6 Chatbot Activity

The fig 6.6 describes the Chatbot in which the user can interact with the chatbot.

Discussion Form Activity:

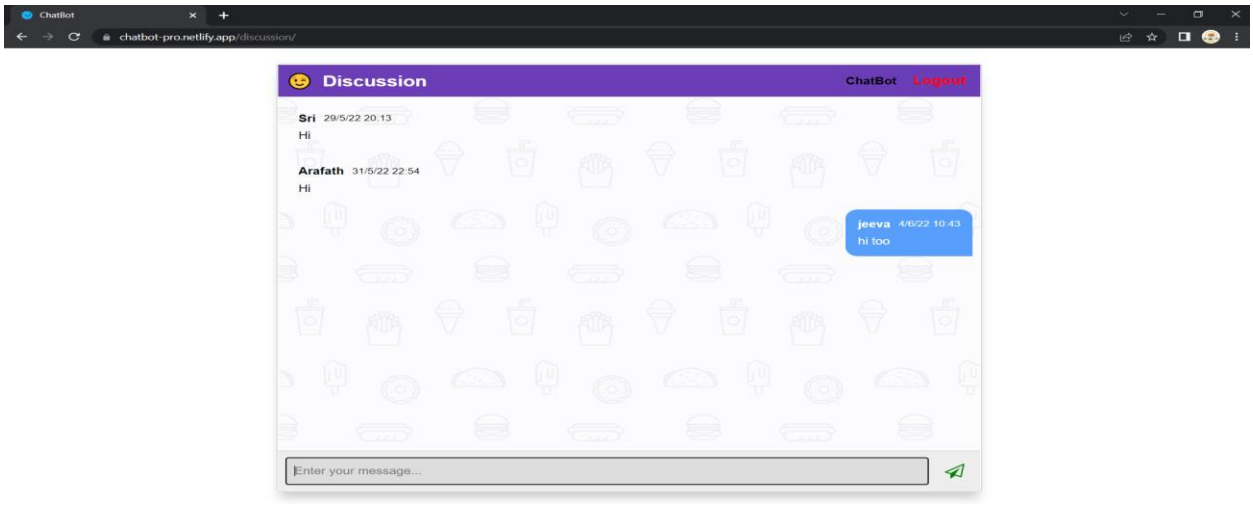


Fig 6.7 Discussion Forum Activity

The fig 6.7 describes the Discussion Forum in which the user can discuss about thewebsite with other user.

Payment Gateway Activity:

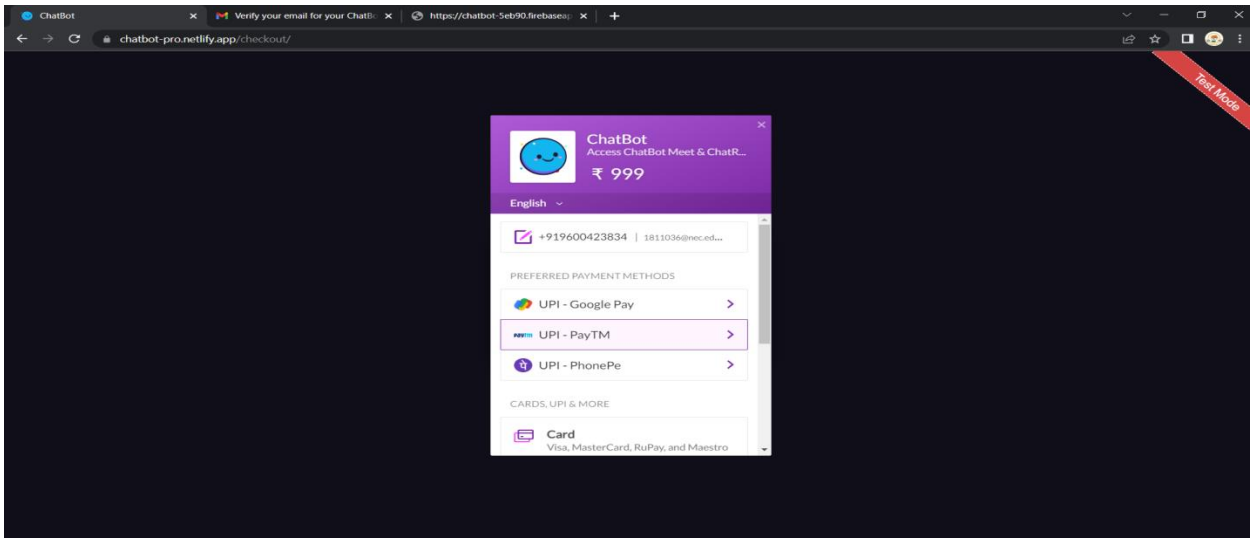


Fig 6.8 Payment Gateway Activity

The fig 6.8 describes the Payment Gateway in which the UPI details have to be filed.

Personal chat Activity:

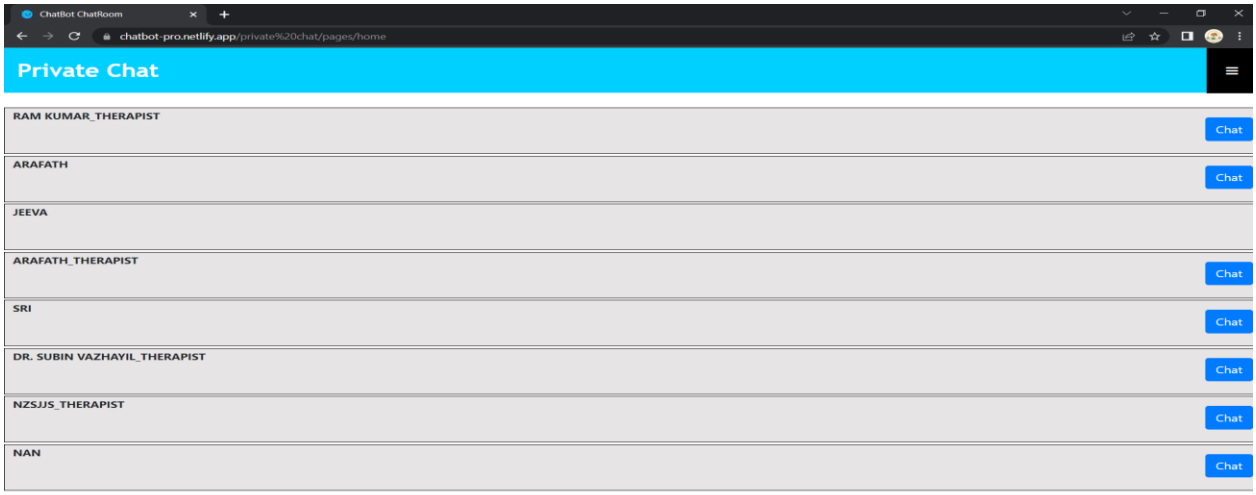


Fig 6.9 Personal Chat Activity

The fig 6.9 describes the personal chat in which the user can chat personally with the Doctor.

Doctor Selection Activity:

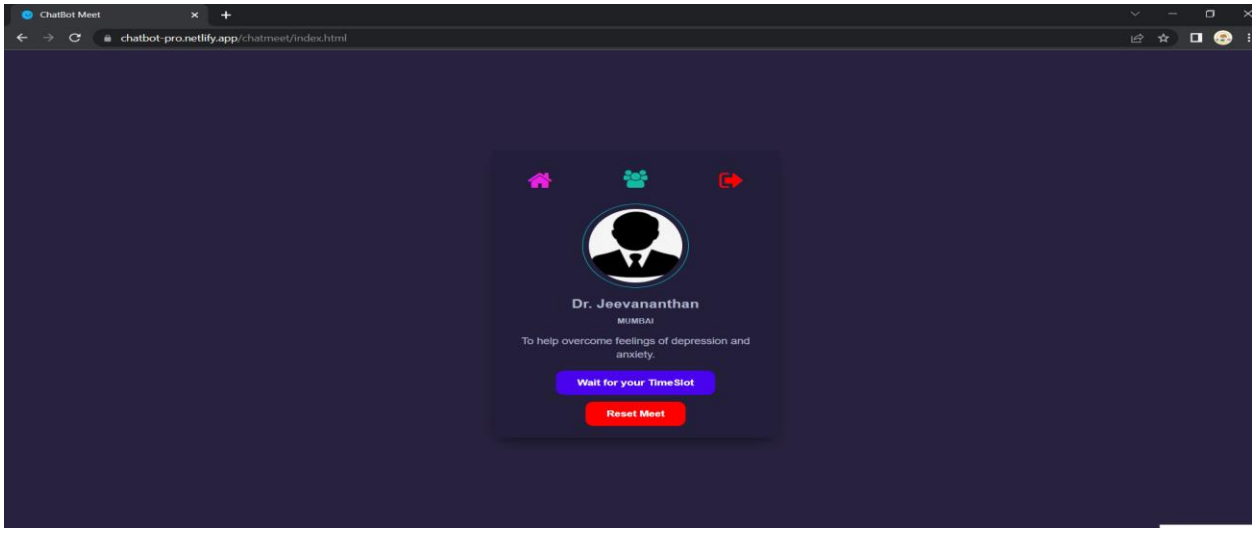


Fig 6.10 Doctor selection Activity

The fig 6.10 describes after doctor selection the user has to wait for some time until theappointment is fixed.

Time Slot Activity:

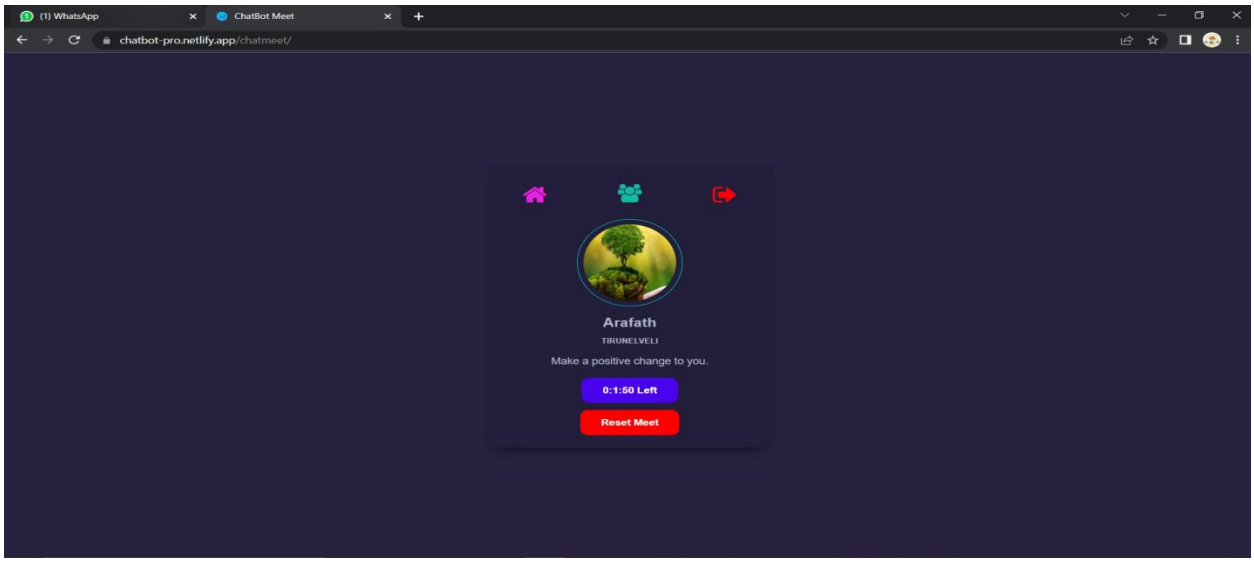


Fig 6.11 Time Slot Activity

The fig 6.11 describes the Time Slot in which the user receives the time slot allocated by the Doctor.

Time slot Cancelling Activity:

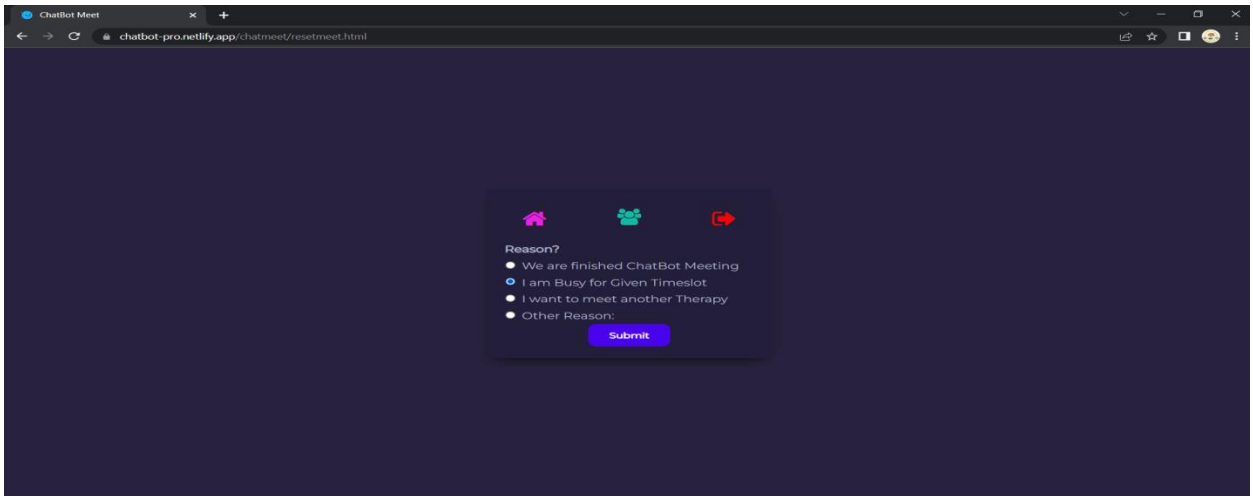


Fig 6.12 Time slot canceling Activity

The fig 6.12 describes the Time slot canceling in which the user cancel the time slotwhen they are not ok with the timings.

Doctor Meeting Login Activtiy:

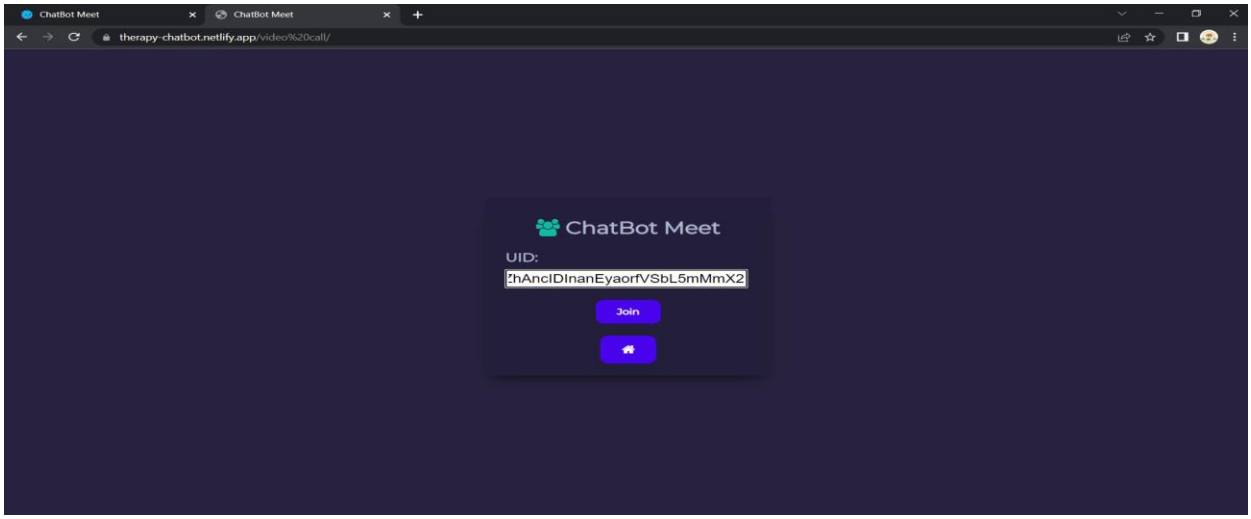


Fig 6.13 Doctor meeting Login Activity

The fig 6.13 describes the Doctor meeting Login in which the doctor login's to start the session.

Video and Audio Call Activity:

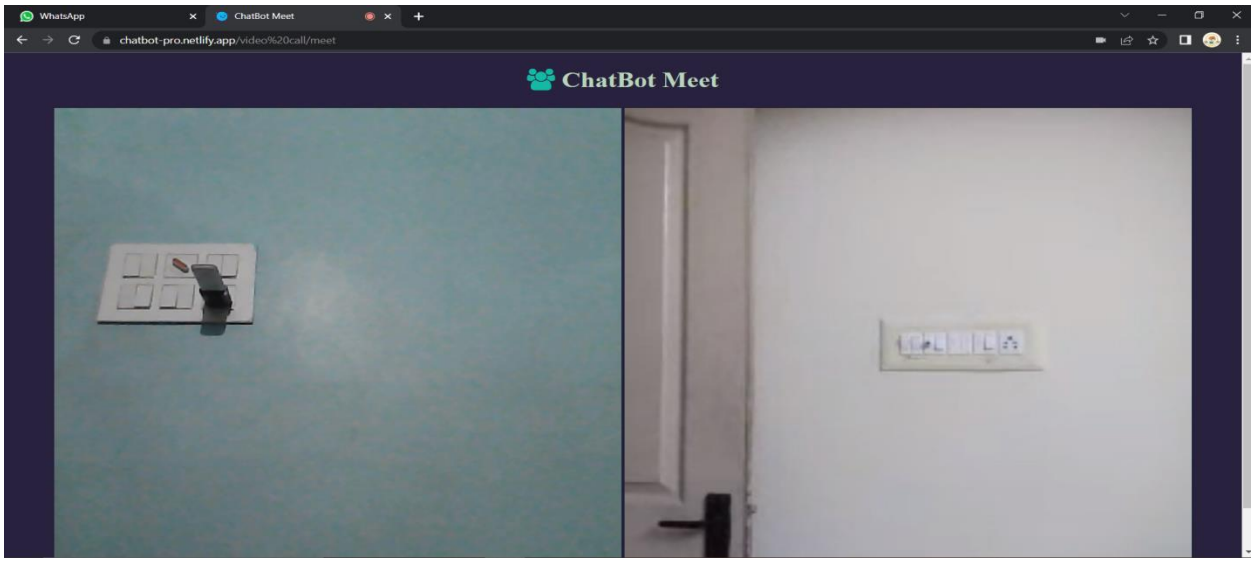


Fig 6.14 Video and Audio Call Activity

The fig 6.14 describes the Video and audio call in which the doctor and usercan have sessions.

New Doctor Adding Activity:

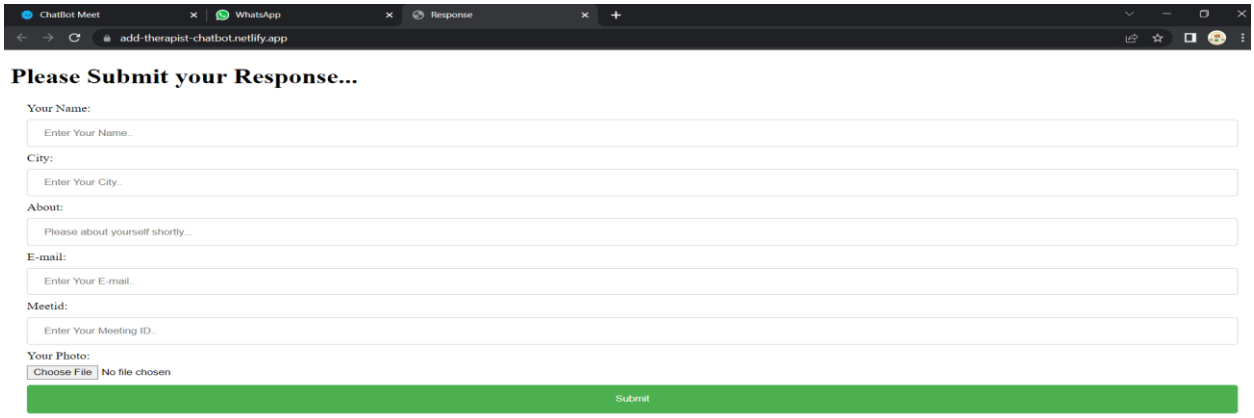


Fig 6.15 New Doctor Activity

The fig 6.15 describes the Doctor meeting Login

Database Connectivity:

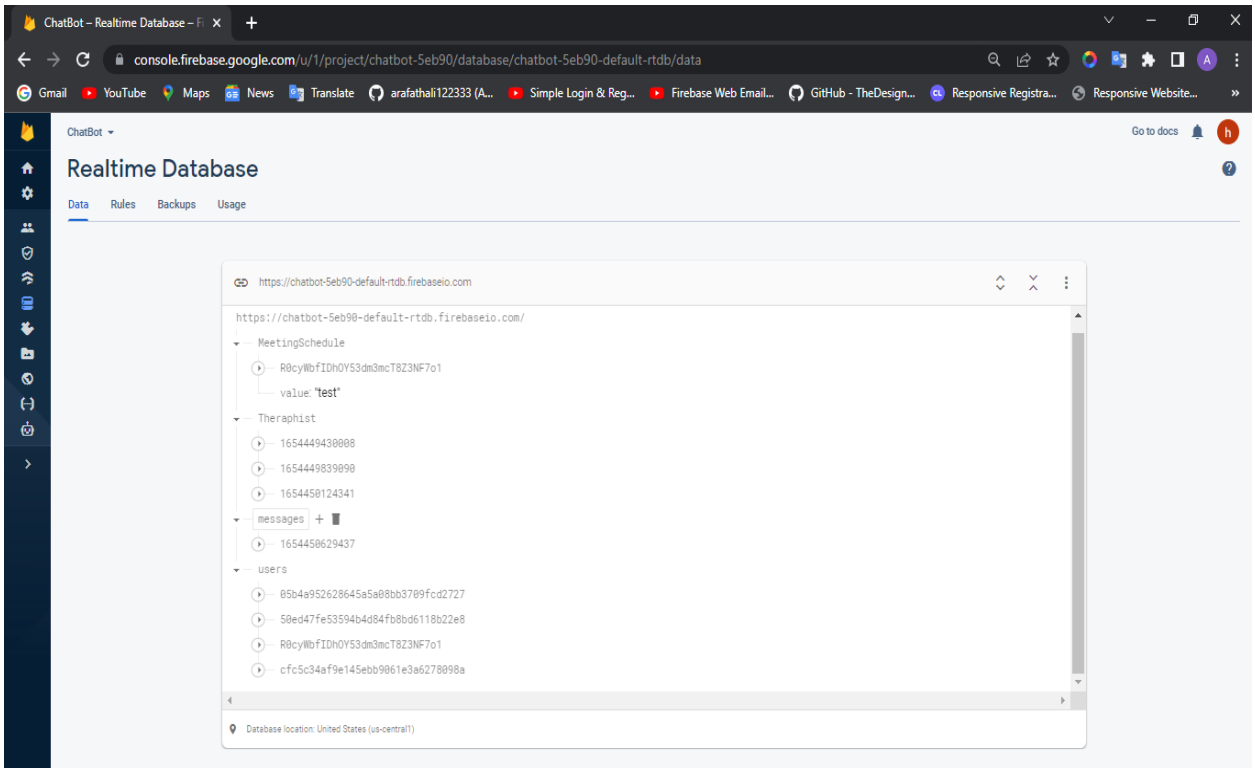


Fig 6.16 Database Connection

The fig 6.16 describes the Database Connection in the application.

EmailJS:

EmailJS helps to send emails using Client side Technologies, there is no server is required.

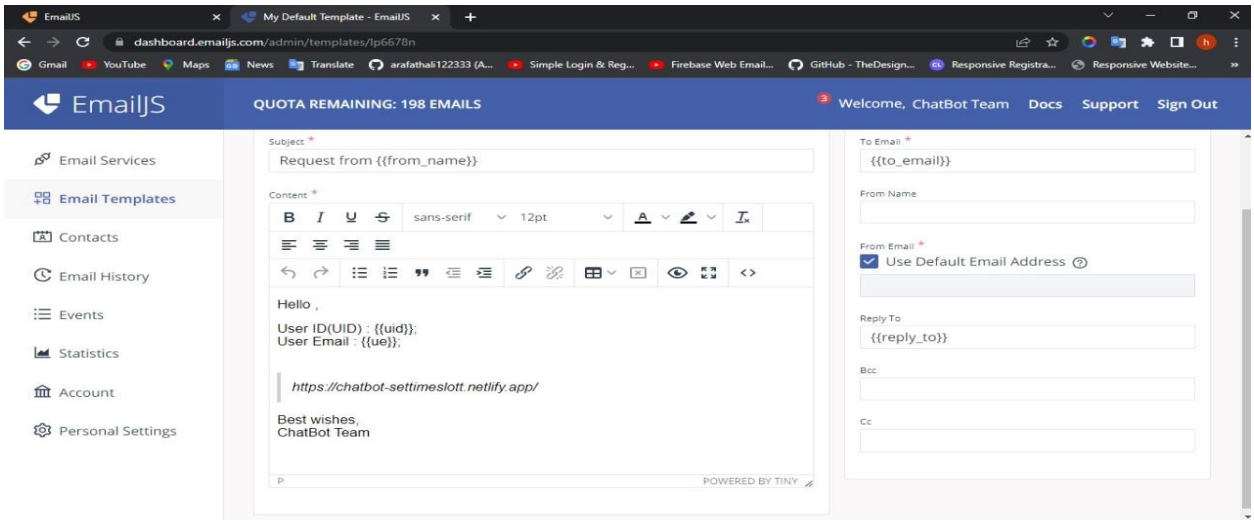


Fig 6.17 EmailJS

Netlify for Web Hosting:

Netlify is a platform for building and deploying/hosting websites.

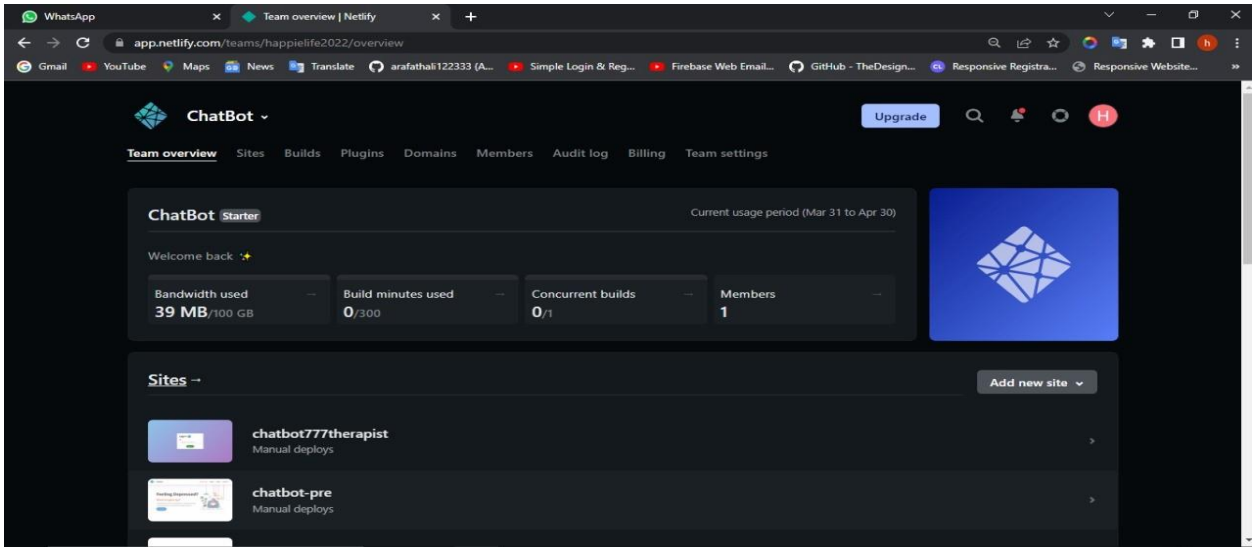


Fig 6.18 Netlify for Web Hosting

Agora for Audio/Video Streaming:

Agora is the leading video,voice and live interactive streaming platform which helps the developers to rich in app experiences includes embedded voice and video chart, real time recording,live streaming and real-time messaging.

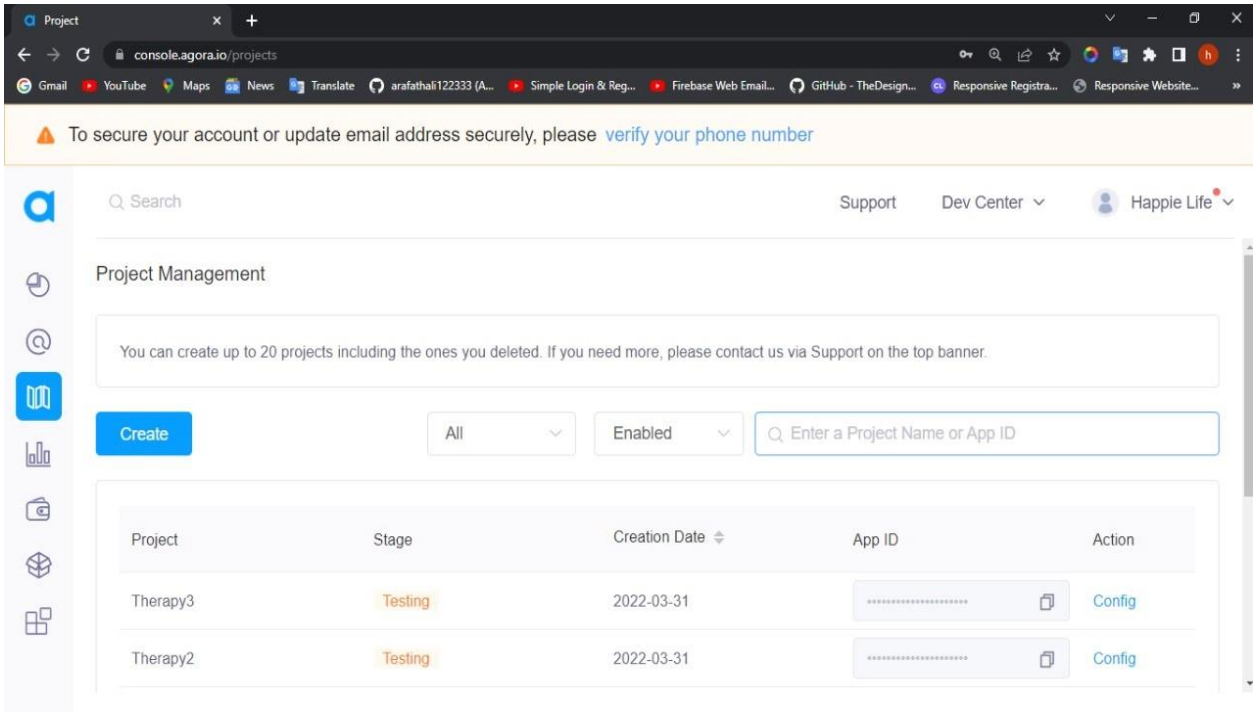


Fig 6.19 Agora for Audio/Video Streaming

Notification:

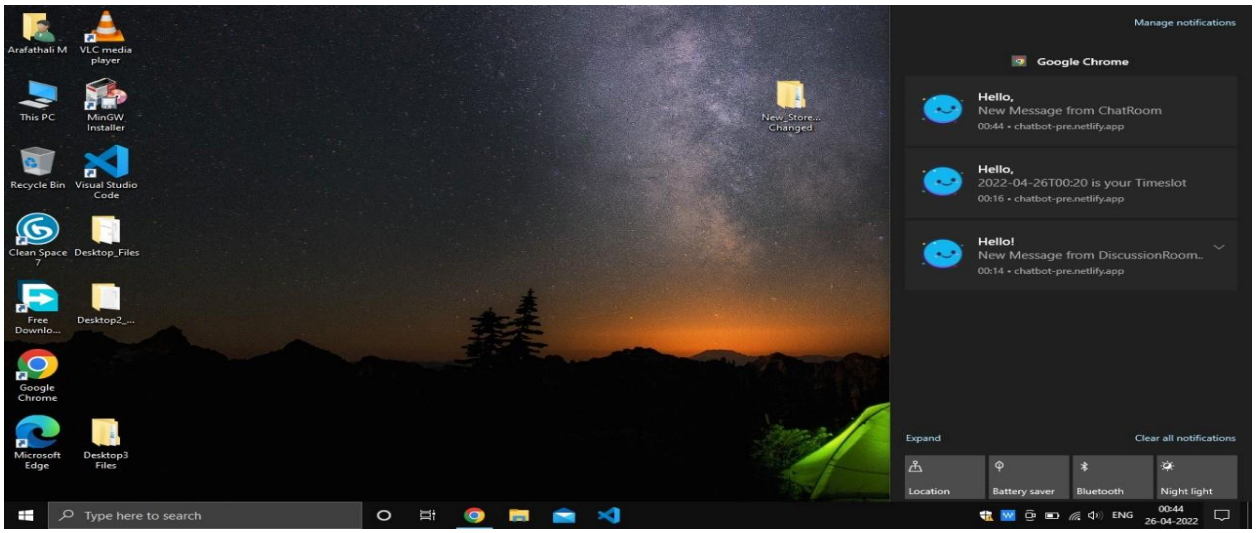


Fig 6.20 Notification on devices

Acobot:

Acobot is a self learing AI. It crawls the website and creates custom Chartbot. No coding or scripting is needed.

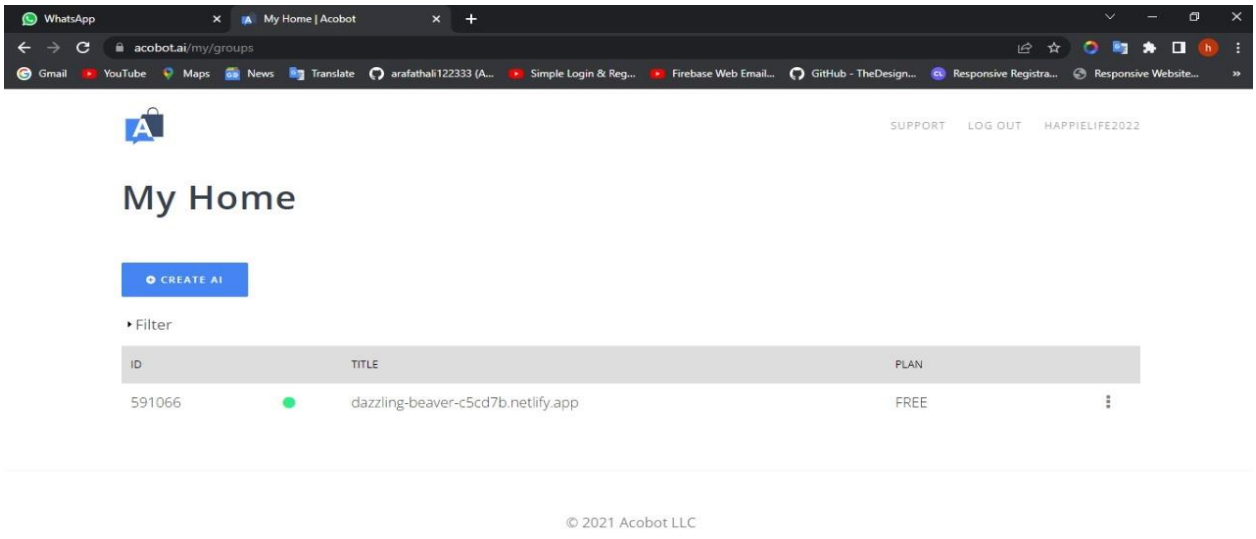


Fig 6.21 Acobot

Android Application:

GoNative provides an end-to-end solution to deploy websites and web-based applications as native iOS and Android apps on mobile devices.Native Plugins enable you to easily add push notifications (e.g. OneSignal), biometric authentication (e.g. Face ID / Touch ID), in-app video calls (e.g. Twilio), and much more. Native Plugins require minimal web development using JavaScript to integrate to your site it maintains core iOS and Android app codebases to ensure compatibility with future device and OS updates. Apps can be rebuilt in minutes with the latest updates, either using GoNative's online app builder platform or by using local tools. This enables you to maintain your apps without maintaining any native code.

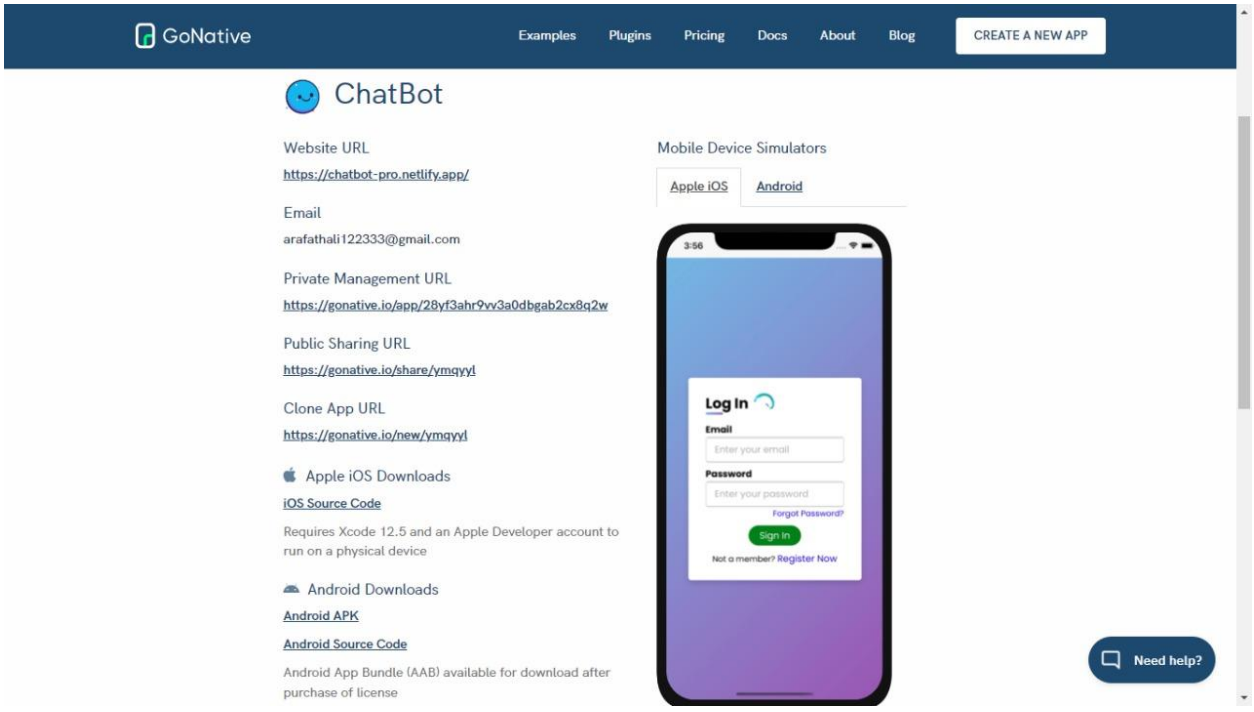


Fig 6.8 Android App

Android App IOS Source Code:

https://drive.google.com/file/d/1OuQdLm_olej0OuwPXmRioGWmX3q5zyAX/view?usp=sharing

Android App Source Code:

https://drive.google.com/file/d/1IxVtpmeoTLVL8ECyuSipmxEhnwb2OIa/view?usp=sharing

Android App:

https://drive.google.com/file/d/1C1qPAGdMWPERIzGnxGBKRIA2EcgGIjj5/view?usp=sharing

Webpage:

https://chatbot-pro.netlify.app/

Doctor's Login Webpage:

https://therapy-chatbot.netlify.app/

Doctor's Adding Webpage:

https://add-therapist-chatbot.netlify.app/

CHAPTER 7
CONCLUSION

The **CURING MENTAL HEALTH BY USING CHATBOT** is an effective Web and mobile user application, to connect doctors and user all over the world. It pave the way to build an interaction between user and the doctors. The main benefit of this application is to make the user to be in connect with the doctor for dealing with their mental health problems and it is also used to connect user's with their desired doctor virtually. Their mental health problems can be easily consulted with the best doctors around, within some moments.

The role of chatbots in clinical care is to address people in need of treatment who are not receiving any treatment at all because of various barriers. Chatbots could bridge the waiting time before approval of psychotherapy and provide low-threshold access to care. Psychiatric problems or illnesses could be addressed by chatbot interventions in the future, whereby at least an improvement in symptoms could be achieved compared to no treatment at all. Chatbots can also offer new opportunities for accessibility and responsiveness: People with a physical illness and depressive symptoms, for example, could interact in the future with the chatbot when they are being discharged from the hospital to receive psycho education and additional assistance relating to the psychological aspects of their illness.

Research regarding chatbots in mental health is emerging, and this was apparent from publication year of studies (most studies were published in the last 9 years), lack ofrandomized controlled trials, and the inconsistency of the studies in terms of outcome measures and reporting of characteristics of chatbots and study design. Future studies should be consistent in measuring the outcomes and follow published guidelines to standardise their reporting.

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