Therapy Corner :
Android based Mental Health Services Provision Application

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Therapy Corner : Android based Mental Health Services Provision Application

A dissertation submitted for the Degree of Master of Information Technology

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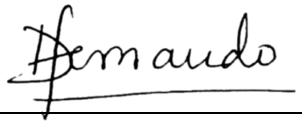
Signature			
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Abstract

The rising demand for mental health services in Sri Lanka underscores the need for accessible platforms that offer comprehensive support. This thesis presents "Therapy Corner," an Android-based mobile application developed to address this gap by combining two core services: (1) professional online mental health therapy and (2) self-improvement tools for personal mental well-being. Unlike existing apps that typically offer either therapy services (e.g., BetterHelp, Talkspace) or self-improvement features (e.g., MoodKit, Worry Watch), Therapy Corner integrates both, providing users the option to seek professional help, work on self-improvement, or use both services simultaneously.

Key features include therapist matching, messaging, video consultations, a self-journal that can be shared with therapists, mood tracking, milestone creation, and medication tracking. This integrated approach not only simplifies access but also promotes a more holistic form of care where users can benefit from self-improvement tools and professional support.

Preliminary research highlighted that no existing platform in Sri Lanka offers both services in a single app. Currently available solutions such as Therapy Route and Kalyana primarily function as therapist directories. By filling this gap, Therapy Corner offers users culturally inclusive, comprehensive mental health support tailored to their specific needs.

This thesis demonstrates that mobile technology, through platforms like Therapy Corner, can bridge service delivery gaps in Sri Lankan mental health care, improving both accessibility and personalization of mental health support.

Acknowledgement

It is with heartfelt thanks that would like to thank my supervisor Dr. Dinuni K. Fernando for her uncountable times of support, guidance, and comments throughout the process. Dr. Fernando's knowledge of IT and her commitment to promoting academic excellence contributed to the steering of the course and the quality of this research. Her positive remarks and constructive criticisms have been of great help to my personal growth and academic development.

I am genuinely grateful for the contribution made by the participants who provided their valuable time and experiences, and without whom this research project could not have been accomplished. Their active participation in the discussions, sharing of ideas and providing helpful comments further enhanced the results and increased the qualitative assessment of the topic. Their contributions are sincerely recognized and valued.

Moreover, I cannot emphasize enough the importance of my family and friends who throughout this academic track were always there for me with endless love, support, and motivation. The undisputed trust they have in my abilities and their continuous support are always my motivation, providing me with the strength and the willpower to cope with hardship and persevere in my research projects.

Lastly, I also want to thank the most the teachers and lecturers who supported me at school as well as the ones who gave me the ideas and motivation throughout the process. Their continual readiness to offer their expertise, engage in animated debates, and provide critical feedback were irreplaceable in the process of forming and reshaping the research results.

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Chapter 1 – Introduction

1.1 Mental Health in Sri Lanka; an Overview

As Digital, C. (ed.) (2015) has observed *"...over 75% of adult mental problems developing before the age of 25 and over 45% of the entire burden of disease for those aged 10 to 24 years, adolescents and young adults are particularly vulnerable"."*

Mental health issues have become a pressing concern worldwide, affecting individuals across various age groups, cultures, and socioeconomic backgrounds. In Sri Lanka, the prevalence of mental health disorders has been steadily increasing, placing a significant burden on the healthcare system. However, accessibility and availability of mental health therapy services remain limited, particularly in rural areas. The emergence of mobile technology presents a unique opportunity to bridge this gap and provide effective mental health support to a wider population.

Ministry of Health, (2015) states, *" the country has experienced a number of traumatic events such as the 26-year long civil war, the 2004 tsunami, and more recently the Easter Sunday bombings in 2019 and the economic crisis and inflation that the country is currently faced with."* This has had a significant impact on the mental health of individuals and communities.

Samarasekara, N., Davies, M. L. M. and Siribaddana, S. (2012, pg. 30) has observed the following in regard to the effort Sri Lanka has made in terms of addressing mental health:

The Sri Lankan government has made some efforts to address mental health issues, the mental health services in Sri Lanka still face significant challenges. Still, stigma and discrimination towards people with mental illness remain prevalent in society. This can make it difficult for individuals to access services and support.

Furthermore, there is also a shortage of mental health professionals in the country, which can limit the availability of services.

That being said, it is clear that Sri Lanka is very well behind in terms of providing proper care or services in the mental health field. Lack of such services are as mentioned, due to number of reasons,

1. Shortage of mental health professionals in the country
2. No proper means of finding the limited number of therapists/ professionals.
3. No proper platform to communicate with therapists/professionals in a convenient manner.
4. Lack of awareness and the stigma surrounding mental health in individuals

This thesis aims to explore the development and implementation of an Android app designed to enhance mental health therapy services in Sri Lanka. The app seeks to leverage the widespread adoption of smartphones to increase accessibility, reduce stigma, and improve the overall mental well-being of individuals in need.

1.2 Motivation

The motivation behind conducting this study on the provision of mental health therapy services in Sri Lanka through an Android application stems from several key factors.

1. Bridging the gap in mental health care

Sri Lanka, like many other countries, faces a serious problem. Gaps in the provision of mental health therapy services are found frequently. Limited resources, geographic barriers, and social stigma contribute to inadequate access to mental health support, especially in rural areas. The motivation behind this research is to explore how mobile technology, especially Android apps, can fill this gap and provide effective and accessible therapy services to a wider population.

2. Smartphone penetration is showing a large increment.

Sri Lanka has seen significant growth in smartphone usage in recent years. The growing popularity of smartphones presents a unique opportunity to leverage technology to improve mental health care. By developing an Android app specifically designed for mental health therapy, the motivation is to take advantage of the widespread use of smartphones to reach people in need and overcome physical barriers. geography and logistics.

3. Potential benefits of m-Apps in Mental Health fields

Research has shown that mobile apps have the potential to improve mental health therapy services. These can provide self-help resources, mood trackers, secure communication channels with therapists, and teletherapy sessions. When exploring the use of Android apps in Sri Lanka, the motivation was to harness the benefits of mobile apps to improve mental health, empower individuals, and facilitate effective therapeutic services. more effective and accessible.

4. To reduce stigma and promote seeking help.

Stigma surrounding mental health remains a significant barrier to seeking professional help in Sri Lanka. Mobile apps have the potential to reduce the stigma associated with mental health issues by providing individuals with a more private and confidential way to access therapy services. By developing an Android app that promotes anonymity and discreet access to mental health support, the aim is to encourage more people to seek help, thereby promoting positive change in attitudes towards mental health in Sri Lankan society.

1.3 Objectives

1. To explore the effectiveness of online counseling and therapy in providing the necessary support to people facing various mental illnesses

Online counseling platforms offering mental health support have become increasingly popular in recent years. These platforms allow individuals to receive mental health support from licensed professionals in a convenient and accessible way. Online therapy is not only beneficial to the client, but also to the therapist. Therapists are no longer having to commute to the office, and in some cases, no longer having to rent office space. A more relaxed therapist, as with any worker, means more productivity and an increase in staying in the present moment.

2. To assess the current landscape of mental health therapy services in Sri Lanka, including an examination of the accessibility, availability, and challenges faced by individuals seeking therapy.

Here the goal is to assess the state of mental health therapy services in Sri Lanka. This involves examining accessibility, availability, and challenges faced by those seeking therapy. Accessibility considers factors like geographical reach and affordability. Availability assesses the number of professionals and the range of services offered. The challenges faced by individuals include stigma, lack of awareness, financial constraints, and cultural barriers. Various research methods can be used to conduct the assessment. The findings will inform strategies to improve mental health support services in Sri Lanka.

3. To identify the specific needs, preferences, and barriers faced by individuals seeking mental health therapy services in Sri Lanka, considering factors such as geographical location, socioeconomic status, and cultural context.

To identify the specific needs, preferences, and barriers faced by individuals seeking mental health therapy services in Sri Lanka, factors such as geographical location, socioeconomic status, and cultural context need to be considered. This involves analyzing the availability of services in different regions, understanding financial constraints and affordability, recognizing the influence of cultural beliefs and attitudes, and addressing language barriers. Conducting surveys, interviews, and qualitative research can provide insights into these factors, helping tailor therapy services to meet the diverse needs of the population effectively. Collaboration with mental health professionals and local communities is crucial for gathering relevant information and developing targeted interventions.

4. Create a platform to provide accessible and convenient mental health support to individuals.

One of the main advantages of online counseling platforms is their accessibility. Individuals should be able to access counseling services from the comfort of their own homes or anywhere with an internet connection. Furthermore, it means traveling anywhere to get the help needed is not required, saving time and money. This is also helpful if one's mental health, mobility, or other issues make it difficult to leave the house, especially if the lactation is a remote area.

5. Make an environment that makes treatment approachable for individuals suffering from mental disorders.

Many people do not feel comfortable sharing their mental health details in the same way as their physical health. Therefore, online means play a crucial role in making the treatment of mental health issues approachable. It is also an effective strategy that encourages young people to receive treatment more comfortably since most time is spent on the internet. When accessing therapy online, the stigma that is traditionally associated with mental health conditions can be easily overcome.

6. To explore the potential of the Android app in reducing stigma associated with seeking mental health support in Sri Lanka.

This objective also includes examining changes in attitudes and behaviors towards mental health and assessing the app's role in promoting help-seeking behaviors. Mental health services in Sri Lanka still faces significant challenges. Stigma and discrimination towards people with mental illness remain prevalent in society, which can make it difficult for individuals to access services and support. One of the objectives of this project is to create awareness in the country in terms of just how scary mental health can be in its negative form. It is a common in Sri Lanka that many were brought up with the saying, "just shake it off, things in your mind aren't real". But just because one can't see it doesn't mean it's not there. In fact, just because it is not visible, makes it even scarier and dangerous.

By achieving these objectives, the study seeks to enhance the provision of mental health therapy services in Sri Lanka, contribute to the field of mobile mental health interventions, and ultimately make a positive impact on the well-being of individuals in need of mental health support.

1.4 Background of the Study

The concept of intellectual wellness as a vital part of holistic well-being is globally acknowledged, and in Sri Lanka it has a greater significance. The United States, with a long history of prolonged conflicts, natural disasters, financial instability, and a highly stigmatized mental health, has produced a very complex picture of psychological well-being. The effects of war-linked trauma and crop failures related disasters have caused pain to the people and communities. Social and economic hardships further aggravate psychological stress and the social stigma as a mental health issue keeps people away from seeking help. Addressing mental health issues of Sri Lanka needs multidimensional approach. This includes that the support services should be accessible, awareness programs should be in place, de-stigmatization efforts should be made, and policy changes should be in place in order to create a culture of knowledge and care for mental well-being.

The World Health Organization (WHO) reports that mental health disorders are prevalent in Sri Lanka, with a 17.3% incidence rate of diagnosed mental health conditions. Nevertheless, the number of mental health therapy services in the country is not enough, and the ones that are available are only concentrated in urban centers where the majority of the country dwells.

The mental health care system in Sri Lanka faces several challenges that impede the rendering of therapy services. Some of these challenges include. Some of these challenges include,

1. **Limited resources and infrastructure**

Mental health service in Sri Lanka is usually inadequate as it lacks resources like sufficient funding, mental health professionals, and treatment facilities. This gap leads to long waiting lists and a huge stress on the existing mental health workforce.

2. **Geographical barriers**

Rural areas in Sri Lanka face a lot of challenges when it comes to mental health services, such as geographical barriers, which include transportation difficulties and lack of mental health facilities in places that are far from the main cities.

3. **Stigma and cultural beliefs**

The stigma on mental health issues still matters in Sri Lankan society. In turn, people facing discrimination and reluctance to seek professional assistance due to stigma. Cultural beliefs and misunderstandings of the mental health issue also increase the underutilization of already existing services.

The emergence and widespread adoption of mobile technology, particularly smartphones, present an opportunity to address challenges and enhance the provision of mental health therapy services in Sri Lanka. Through mobile apps, people can easily and discreetly access therapeutic materials, make connections with mental health specialists, and receive assistance.

In recent years, the potential mobile applications, to enable mental health therapies has received a lot of attention around the world. Study has repeatedly displayed the efficiency of these applications in various aspects of mental health care, starting from psychoeducation and self-help resources to mood tracking and remote therapy sessions. The accessibility, convenience, and personalized nature of mobile apps make them valuable tools for promoting mental well-being and supporting individuals in need.

However, there is a noticeable gap in research specific to Sri Lanka regarding the development and implementation of mental health therapy apps. While studies worldwide have highlighted the benefits of such interventions, there is a lack of research on tailoring these apps to address the unique challenges and cultural nuances of mental health in Sri Lanka. The nation's complex history, socio-cultural dynamics, and linguistic diversity create a distinct backdrop against which the effectiveness and feasibility of mental health apps must be evaluated.

Therefore, this thesis aims to fill this research gap by exploring the potential of using an Android app as a transformative tool to enhance mental health therapy services in Sri Lanka. Leveraging the widespread use of smartphones in the country, this research aims to utilize this technology to overcome existing barriers to accessing and delivering mental health support.

By focusing on developing and implementing an Android app tailored to the Sri Lankan context, this study seeks to make a significant impact on the delivery and receipt of mental health care in the country. The goal is not only technological integration but also to gain a nuanced understanding of the challenges faced by individuals seeking mental health support, ultimately contributing to the enhancement of mental health care in Sri Lanka.

Through an examination of the current landscape of mental health therapy services, identification of key challenges, and the development of an Android app prototype specific to Sri Lanka, this study aims to provide valuable insights for policymakers, mental health professionals, and technology developers to improve the accessibility, availability, and effectiveness of mental health services in Sri Lanka and potentially in similar settings worldwide.

1.5 Scope of the study

The scope of this study focuses on the provision of mental health therapy services in Sri Lanka through an Android app. This app will cater for two main basic purposes.

1. Provision of online mental health therapy services.
2. Provision of a platform for mental self-improvement in individuals.

To elaborate point 1; “Provision of online mental health therapy services”

Through this app patients will be able to find suitable mental health specialists and get professional help through messaging and audio or video consultations. A feature for Therapist Matching will also be provided. This will be done using a preliminary questionnaire completed by the individual. Furthermore, the possibility to book on-site therapy sessions with preferred therapists in affiliated hospitals is also provided.

Moving on to elaborate on point 2; “Provision of a platform for mental self-improvement in individuals.”

This part of the app is aimed at individuals wanting to monitor their mood swings, cultivate positive thinking, and break unhealthy habits. Here we offer a variety of distinctive features for the user.

1. Self-Journal - This function as an e-diary that will help the user relieve stress by jotting down their inner feelings, thoughts, stresses , triggers etc.

2. Mood of the day - This is a mood tracker that will allow the user to select the kind of mood felt in a particular day. Furthermore, the user can also view the moods going back a month's time period.

3. Relaxation Music - This is a feature crafted to induce peace and tranquility, serves as a therapeutic aid designed to promote serenity. This musical genre utilizes harmonious tones and calming rhythms to reduce tension encouraging individuals to immerse themselves in these soothing vibes. This approach is recognized as an effective method employed by specialists to enhance mental health and wellness.

4. Self-Affirmations – This is a set of positive affirmations that will be displayed to the user. Thie purpose of this feature is to enhance the user’s mental wellbeing. This provides a much-needed boost before starting the day

There are 03 main modules that the proposed system will be divided into,

1. Individuals/Patients module

The users are categorized into two types. One of these types is the Individual/Patients. These will be users in the Individuals/Patients module. Once an individual has registered into the system, there will be two main options.

➔ Get professional help.

➔ Use the mental self-improvement options.

The patient users can either use one of them or both these options. If the users decide to get professional help, an option will be received to take part in answering a bunch of questions that will pick the most suitable therapist for them (as per the results of the undertaken questions). Or the patient users will have the option to search for the therapists that are currently registered in the system.

Once the users find a suitable therapist, the option to book an appointment with them is presented(this will be further elaborated in the booking module section), or an option to communicate with them using the chat application is available.

The individuals can also use the mental self-improvement options provided for them. These are the Self-Journal , Mood of the day, Relaxation Music, Self-Affirmations. These have been elaborated above.

2. Therapist / Professional module

The other type of user defined in the system is the Therapists / Professionals. These will be the users that will use the Therapist / Professional module. Once a user is registered into the system, these users will have the option to fill out their profile (The data in these fields will be used when matching suitable therapists).

Furthermore, the option to see the bookings from patient users is available. Then the therapist users can either accept or reject these applications. Once accepted this request will be handled by the booking module. The therapist users also have the option to chat with the users that have sent them messages.

3. Booking Module

This module will be an integration module between the Therapist module and the Individuals module in terms of booking an appointment. In this module it makes sure that the same therapist is not double booked for the same date/time slot.

1.6 Structure of the Dissertation

Chapter 2: Background

Related to consumer needs and available market options, the project's relevance is justified. Here, the technologies utilized in the system are also detailed.

Chapter 3: Design

This chapter explains the methodologies for gathering information and developing new ideas.

Chapter 4: Implementation

This chapter describes the technologies that are employed in the creation and application of systems.

Chapter 5: Testing and Evaluation

This chapter describes the application of the theories and methods used in user evaluation. At the conclusion of this chapter, a conclusion and future projects are also stated.

Chapter 6: Conclusion

Final conclusion of the project and Thesis. This chapter summarizes the key findings and insights of the thesis, providing a final perspective on the topic or research question addressed.

References

The references section follows this conclusion, containing all sources cited throughout the thesis.

1.7 Summary

The introduction chapter offers a thorough overview of the background, problem statement, project motivation, objectives, significance, and scope of the thesis. It serves as a foundation for the following chapters that will explore the development, features, evaluation, and suggestions for future research of the app.

Chapter 2 - Background

2.1 Introduction

In this chapter, the focus is on discussing the functional and nonfunctional requirements of the proposed system. Functional requirements define what the system should do or the specific features and functionalities it should possess. The Nonfunctional requirements are generally described as the qualities and characteristics of the system, for example performance, reliability, usability, and security.

To justify the need for a new system, the chapter also explores previous studies or existing similar systems. It analyzes their strengths and weaknesses, identifying why these systems are not suitable for the expected situation.

Furthermore, the chapter delves into related technologies that are relevant to the proposed system. It also gives a general view on the technological landscape, and it examines various tools, frameworks, or platforms that can be used to develop this system.

By addressing functional and nonfunctional requirements, this chapter assesses existing systems, and explores related technologies. The foundation is set for the upcoming development and design phases offering a thorough structure to help make informed choices about the system's architecture features and technology options. This structure aids in the successful creation of a system customized to meet the specific needs of the scenario.

2.2 Requirement Analysis

2.2.1 Functional Requirements

1. User Registration and Authentication

    - User Registration (Therapist and Patient)
        - The app should provide a user registration process to allow new users to create an account.
        - Users should be required to provide essential information such as name, email address, and password during registration.
        - The registration process should include validation checks to ensure the accuracy and completeness of user-provided information.

- Login
    - Registered users should have the ability to log into their accounts using their registered email address and password.
    - The app should authenticate user credentials to ensure secure access to the user's account.
    - Login functionality should include error handling for incorrect credentials and account lockouts after multiple failed login attempts.

2. User Profiles (Therapist & Patient)

- Patient Profile
    - Users should be able to create and manage their patient profiles within the app.
    - Patient profiles should include basic information such as name, age, gender, and contact details.
    - Users should have the ability to edit and update their profile information.

- Therapist Profile
    - Therapists should have the ability to create and manage their therapist profiles within the app.
    - Therapist profiles should include professional information such as qualifications, specialties, experience, and certifications.
    - Therapists should have the ability to edit and update their profile information.

- Profile Visibility
    - Patients and therapists should have control over the visibility of their profile information.
    - Users should be able to choose which information is visible to others, such as name, profile picture, or specific details.

3. Therapist matching questionnaire

- The system will provide the user with a set of questions to answer.
- The questionnaire should include a set of relevant questions that help in identifying the user's specific therapy requirements and preferences.
- Will match the therapist to the patient based on attributes like patient therapy preferences, gender, age, cultural background, or language proficiency, communication preferences etc.

4. Booking and Scheduling

    - Browse Therapists
        - Patients should be able to browse through a list of available therapists within the app.
        - The app should provide filters and search functionality to help patients find therapists based on criteria such as specialization, location, or availability.

    - View Therapist Profile
        - Patients should be able to view detailed profiles of therapists, including their qualifications, specialties, experience, and user ratings.
        - Therapist profiles should provide relevant information to help patients make informed decisions about their therapy selection.

    - Appointment Booking
        - Patients should have the ability to book therapy appointments with their chosen therapists.
        - The app should display the the date and times to pick, allowing patients to select suitable date and time slots for their appointments.
        - Patient should not be able to book an already booked time slot.
        - Payment Gateway should be present to pay for the session.
        - Patients should receive confirmation of the booked appointment.

5. Payment Gateway
    - PayHere payment gateway is implemented for the payments

6. Communication Channels

    - Real-time Chat
        - The app should provide a real-time chat system that allows patients and therapists to engage in text-based conversations.
        - Chat messages should be delivered instantly, creating a seamless and responsive communication experience.

7. Self-Care Options

    - Journaling
        - The app should include a journaling feature that allows users to record their thoughts, emotions, and experiences.
        - Users should be able to write journal entries and date stamp their entries.

- Mood Tracking
    - The app can include a mood tracking functionality that enables users to track and analyze their emotional states over time.
    - Users should be able to record their mood, select emotions from a predefined list, and add contextual notes.

- Relaxation Music
    - The app should provide a premade list of relaxation music.
    - Users will be able to play music as wished for therapeutic purposes in order to induce peace and tranquility.

2.2.2 Non-functional Requirements

1. Performance
    - The app shall provide a smooth and responsive user experience with minimal latency.
    - The system shall handle multiple concurrent users without significant performance degradation.

2. Security
    - The app shall comply with relevant data protection regulations in Sri Lanka.
    - User data and communication shall be encrypted and stored securely.

3. Reliability
    - The system shall be available and accessible to users consistently, minimizing downtime.
    - The app should have backup and recovery mechanisms in case of system failures or disruptions.

4. Usability
    - The app shall have a user-friendly interface with intuitive navigation and clear instructions.

5. Compatibility
    - The app shall be compatible with Android devices running on different versions of the operating system.

6. Compliance
    - The app should comply with ethical guidelines and professional standards for therapy services in Sri Lanka.
    - The system should follow local regulations related to mental health service provision and data privacy.

2.3 Review of Similar Systems

A comprehensive review of existing mental health therapy systems reveals a diverse landscape of mobile apps, online platforms, and digital interventions aimed at addressing mental health challenges. These systems employ various therapeutic tactics, technologies, and features to provide support and treatment for people searching for mental health services.

There are a number of mental health therapy platforms available. All of these platforms present a selection of services that can help individuals improve their mental health and wellbeing. Here is a list of some notable systems.

Braun, A. and Cronkleton, E. (2021) states that existing apps like Better Help, Talkspace, Ginger etc. are online counseling platforms that provide users with access to licensed therapists. Users can choose to communicate with their therapist through text, phone, or video chat.

BetterHelp

Acosta, K. (2021) mentions that BetterHelp is a prominent online counseling platform that matches users with licensed therapists for remote therapy sessions that operates through a mobile app. The app facilitates connections with licensed therapists. The platform includes various therapy options and progress tracking features. The image in article from (top10, 2024:online) shows the main features. This is illustrated in Figure 2.1.

Strengths: Provides multiple communication methods, including messaging, live chat, phone calls, and video sessions. Offers a broad selection of licensed therapists. User-friendly interface and easy switching of therapists.

Weaknesses: Similar to Talkspace, the lack of in-person sessions may limit therapeutic depth. The pricing structure may not be affordable for everyone.

Figure 2.1 : Key Features of Better Help (Source : top10, 2024:online)

Ieso Digital Health

Ieso Digital Health is an online therapy platform that offers live one-on-one cognitive-behavioral therapy (CBT) sessions. It provides synchronous therapy sessions through secure messaging in real-time. The image on their official website (Anon, n.d., 2023:online) shows some features. This is illustrated in Figure 2.2.

Strengths: Offers live one-on-one cognitive-behavioral therapy (CBT) sessions through secure messaging in real-time. Matches users with licensed therapists specialized in CBT. Provides scheduled appointments and progress tracking.

Weaknesses: Limited to CBT approach. Lack of in-person sessions.

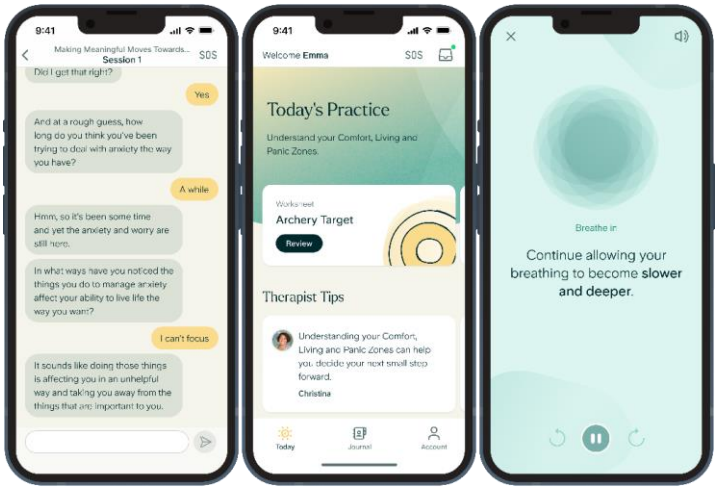


Figure 2.2 : Ieso Digital Health (Source: iesohealth, n.d., 2023:online)

There are also apps that are focused on mental health self-improvement which provide a range of features and approaches to support individuals in their well-being journey. A range of tools are offered for relaxation, mindfulness, mood tracking, self-reflection, and coping strategies. Users can access personalized content, track their progress, and engage with supportive communities.

Headspace

L.V.U. 2022 (n.d.). mentions in their article that Headspace is a meditation and mindfulness app that offers guided meditation sessions, breathing exercises, sleep sounds, and mindfulness exercises. The image in article from (CNN, n.d., 2023:online) shows the main features. This is illustrated in Figure 2.3.

Strengths: Provides a wide range of guided meditation and mindfulness exercises. Offers structured programs and personalized recommendations. Features content for various contexts and situations.

Weaknesses: Some advanced features require a subscription. Limited focus on specific mental health conditions or therapeutic approaches.

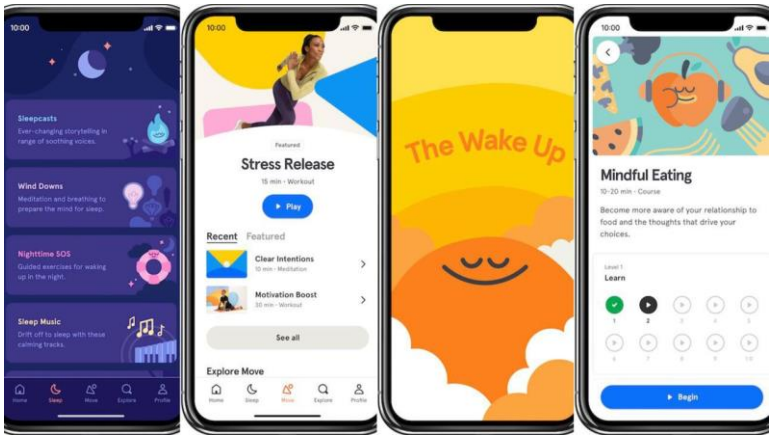


Figure 2.3 : Headspace (Source: CNN, n.d., 2023:online)

Moodpath

Moodpath is an app that helps individuals track and understand their moods, emotions, and mental well-being. The app also includes educational content, coping strategies, and recommendations for seeking professional help if needed. The image on their official website (Intellectsoft, n.d., 2023:online) shows some features. This is illustrated in Figure 2.4.

Strengths: Helps individuals track and understand their moods and emotions. Provides insights into potential patterns and triggers. Offers coping strategies and recommendations for seeking professional help.

Weaknesses: Limited therapeutic interventions beyond mood tracking and insights. App-based tools may not replace the depth of professional therapy.

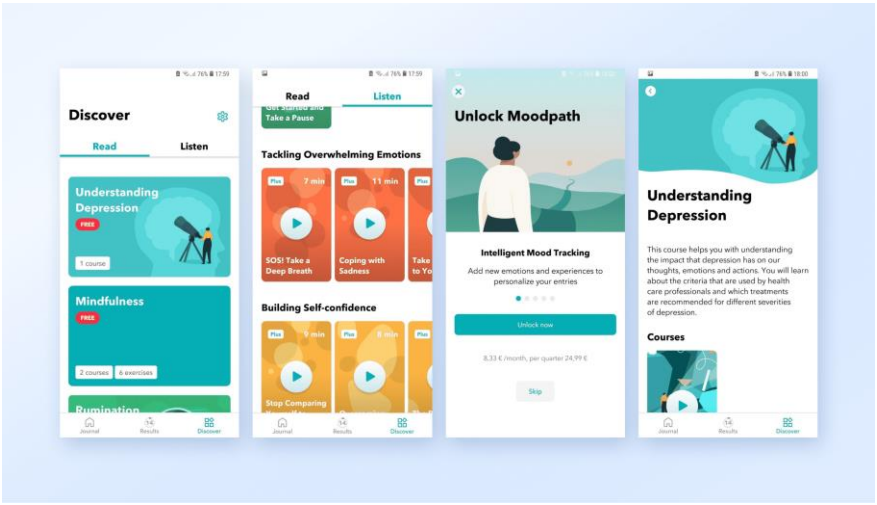


Figure 2.4 : Moodpath (Source: Intellectsoft, n.d, 2023:online)

Furthermore, self-improvement apps of similar kind that are currently available, include Breathe, Think, Do with Sesame aimed at kids, MoodKit to helps to identify negative thought patterns, improve the mood, and build positive life skills and Worry Watch that helps one track the anxiety over time.

Taking into consideration the target audience of the project is aimed at individuals in Sri Lanka who are dealing with mental health issues, it is worth noting that after conducting thorough research the existing systems in the country primarily consist of websites that aid in searching for therapists. These platforms are specifically designed to assist users in locating suitable mental health professionals and streamline the process of finding the support as needed.

Therapy Route

One of the prominent existing systems in Sri Lanka for accessing mental health support is Therapy Route. Therapy Route is a website dedicated to connecting individuals with therapists and mental health professionals in Sri Lanka. The platform serves as a comprehensive directory where users can search for therapists based on their specific needs and preferences.

Therapy Route offers a user-friendly interface that allows individuals to filter their search based on various criteria such as location, specialization, therapy approach, and language preference. Users can also read detailed profiles of therapists, including their qualifications, experience, and areas of expertise.

MindApp

MindApp offers a range of features, including access to information on various mental health conditions, relaxation techniques, and guided meditation sessions. The app also provides a platform for users to connect with mental health professionals through virtual consultations or teletherapy services, allowing individuals to seek professional help conveniently from their own homes.

Therefore, based on the information available, it appears that there is currently no existing system in Sri Lanka that combines both online mental health therapy services and a platform for individual mental self-improvement. While there are separate resources available for online therapy and mental self-help, there is no integrated platform that offers both services simultaneously. Therefore, the system proposed would fill the gap in the existing mental health support landscape in Sri Lanka by providing a comprehensive solution that encompasses online therapy services and tools for individual mental self-improvement.

The table below provides a concise overview of the key features that are considered strengths in a mental health therapy and self-improvement app. These features will be compared to the newly proposed system to gain an understanding of the benefits and advantages it offers.

Feature	BetterHelp	Ieso Digital Health	HeadSpace	MoodKit	Therapy Route	MindApp	Newly proposed system
Therapist matching via a questionnaire	✓	--	--	--	--	--	✓
Online therapy via chat system	✓	✓	--	--	--	--	✓
Professional support	✓	--	--	--	✓	✓	✓
Self – help tools	--	--	✓	✓	--	✓	✓
Journal Keeping	--	--	✓		--	--	✓
Mood tracking	--	--		✓	--	--	✓
Provide self-boosting encouragement	--	--	✓	✓	--	--	✓
Booking therapist for online sessions	✓	--	--	--	--	--	✓
Booking therapist for onsite sessions	--	--	--	--	--	--	✓
User – friendly interface	✓	✓	✓	✓	--	--	✓
Information	--	--	✓	--	✓	✓	✓

Table 2.1 : Functional comparison

As depicted, the data demonstrated in Table 2.1 - Functional Comparison , shows that almost all the currently existing will provide only one of the main services, which is either Professional help or Self-help. Mental health therapy apps will provide services like finding therapists, giving individuals a means of online communication with them. Whereas mental health self-improvement apps will only supply individuals with means of activities or features that can be used to track their own mental wellbeing and give them means to improve themselves.

In the proposed solution , individuals have been provided with a means of receiving both these services through one application. The option to either seek professional help or seek to self-improve themselves are presented or are free to use both these services at their preference.

As one can seek professional help one can also take steps to ensure their mental wellbeing. For example, the Self-Journal that is proposed as a self-improvement feature can also be used as a journal that is used by an individual to jot down their gratitude, grievances etc. The relaxation music feature can be utilized by patients to listen to soothing sounds and Self-Affirmations feature can encourage themselves during their healing journey.

2.4 Related Technologies

Android Studio

The Frontend of the proposed system will be developed as an android application. A native mobile app is a smartphone application that is coded in a specific programming language, such as Java for Android operating systems. Native mobile apps usually provide fast performance and high reliability, and access to various devices on a phone, such as the camera and address book, is also available..

Java

The programming language that will be used in coding will be Java. The reason the Java language was chosen was because it is platform independent , object-oriented (which allows one to create modular programs and reusable code). Java is considered one of the easiest languages for developing mobile apps in Android Studio. Given the candidate's status as a beginner developer, Java was deemed the most suitable language for software development. Furthermore, using Java will also provide the necessary security needed for the system, especially considering there are monetary transactions and personal details stored in the application proposed. Therefore, with that in mind, Java was decided to be used as the programming language.

SQL(Lite)

One of the databases that will be used in the app is SQL(Lite). SQL(Lite) can perform so many operations on this data such as adding new data, updating, reading, and deleting this data. Because SQLite is embedded into the application itself, it does not require a separate client/server architecture or the need for JDBC or ODBC drivers to establish connections. This is important since the project will also be dealing with features that will only store data within phone storage instead of cloud storage. For example, Mood tracking, Journal keeping etc. SQL Lite is the best way to store data in Android applications.

Firebase

Firebase is an all-encompassing platform catering to mobile and web app development needs, offering a suite of services including real-time database, authentication, hosting, and more. In this project, Firebase Realtime Database was leveraged for the chat functionality, allowing real-time synchronization of messages between users. This ensures a seamless and interactive chat experience within the application. Additionally, Firestore has been employed to handle booking details, providing a scalable and efficient solution for storing and managing booking details. By utilizing both Firebase Realtime Database and Firestore, implementing robust features for chat communication and booking management has been possible, enhancing the overall user experience of the application.

PayHere

PayHere is an authorized Payment Gateway that accepts all major credit cards, mobile wallets, and internet banking systems in Sri Lanka. In this project, PayHere was used as the Payment Gateway to provide a convenient and secure way for users to pay for booking therapy sessions. Integrating PayHere into the project enhances the user experience by offering multiple payment options and ensuring transaction security.

2.5 Summary

This chapter of the thesis gives a comprehensive background for the development of a Mental Health Therapy Services Android App in Sri Lanka. Overall, it provides a strong foundation for the development of the app by analyzing the requirements and examining existing systems and technologies. It sets the stage for the following chapters that delve into the app's design, implementation, and evaluation, ensuring a well-informed and effective development process.

Chapter 3 - Design Architecture

3.1 Introduction

In this chapter, the primary focus is on developing a transformative mental health therapy app that empowers individuals on their journey to well-being. The vision is to create a safe and encouraging digital environment with a user-centric approach centered around human-centered design. The core activities in the software design process include generating innovative ideas, setting objectives, coding, configuring hardware, and reviewing designs to address complex system issues.

At the heart of the design process is the systematic identification of requirements through thorough analysis, resulting in a comprehensive specification aligned with specific objectives. The software design process involves essential activities such as conceptualization, framing, implementation, commissioning, and modifications to complex systems. This foundational stage occurs both before programming and after meticulously specifying project requirements.

To ensure a well-structured development process, an appropriate process model that utilizes UML diagrams to visually represent the app's architecture and interactions was selected. Therefore, the dynamic prototyping model was chosen for system development. This model allows one to create, test, and revise multiple models iteratively, particularly beneficial when project requirements are not fully understood initially.

This chapter embodies the passion for innovation, blending compassionate design with cutting-edge technology to redefine mental health support. The mission is clear: to leverage technology to bring hope, healing, and empowerment to those in need.

3.2 Related Design Strategies

Using a mobile-based system for a mental health therapy services provision app refers to a software application designed to deliver mental health therapy and support directly on mobile devices. This app will act as the medium through which the user can reach therapy resources, be in contact with therapists, track progress, and do therapeutic activities through their smartphones, tablets, or personal devices.

Some advantages of using a mobile-based system for the project includes,

- Accessibility - Users can access therapy services anytime and anywhere using their Android devices, fostering continuous support and immediate assistance.
- Convenience - The app's mobile nature eliminates the need for physical appointments, providing users with flexible scheduling options and reducing barriers to therapy.

- Real-time Communication - Secure messaging and video call features enable real-time communication between users and therapists, ensuring timely support and guidance.
- Personalization - The app can offer personalized therapy experiences by tailoring content, therapeutic approaches, and resources to individual user needs.
- Self-Help Resources - This app can provide a library of self-help resources, such as relaxation exercises, mindfulness techniques, and coping strategies, empowering users to manage their mental health independently.

3.2.1 Object-Oriented Analysis and Designing

The Mental Health Therapy services provision android app is more suited to be an Object-Oriented Design (OOD).

Object-Oriented Design (OOD) is well-suited for complex systems that involve multiple interacting entities and require modularity and extensibility. In the context of a mental health therapy app, OOD allows for the organization of the app's functionalities into classes and objects, representing real-world entities like users, therapists, appointments, resources, and more.

The decision to implement the Mental Health Therapy services provision android app using an Object-Oriented Design (OOD) approach is grounded in the specific needs and characteristics of the app.

Here are some reasons why OOD is a suitable choice for the app proposed,

- Modularity: OOD encourages modular development, where each component is self-contained and interacts with others through well-defined interfaces. In the context of a therapy app, this means that features like user profiles, appointment scheduling, therapy resources, and communication tools can be developed as separate modules. This modularity not only simplifies development but also allows for incremental improvements and updates.

- Encapsulation: Data security and privacy are paramount in a mental health therapy app, as it deals with sensitive user information. OOD's encapsulation principle ensures that data and behavior are contained within objects, limiting external access, and safeguarding sensitive data. User profiles, therapy history, and communication logs can be encapsulated within appropriate classes, reducing the risk of unauthorized access.

- Inheritance: Many elements of a mental health therapy app, such as user authentication or notification systems, might have common attributes and behaviors. OOD's inheritance mechanism allows developers to create a parent class with shared properties and methods. Subclasses can then inherit these attributes, promoting code reuse and maintaining consistency across the app.

- Polymorphism: Mental health therapy needs can evolve over time, and the app must adapt to changing requirements. OOD's polymorphism feature enables different classes to implement the

same interface in unique ways. This flexibility allows for seamless integration of new features or changes without impacting existing code. For instance, different therapeutic techniques or communication methods can be integrated while adhering to a unified interface.

- Complex Relationships: In a therapy app, entities like users, therapists, appointments, and therapy resources are interconnected in complex ways. OOD's ability to model relationships through classes and associations provides a clear and organized representation of these interactions. This modeling enhances the app's overall coherence and navigability.

- Ease of Maintenance: As the app gains users and evolves with feature updates, maintenance becomes a critical aspect. OOD's modular structure simplifies maintenance tasks by isolating changes to specific modules.

In conclusion, the Mental Health Therapy services provision android app stands to benefit significantly from an Object-Oriented Design approach due to its capacity to manage complexity, support modular development, ensure data privacy, encourage code reuse, provide flexibility for changes, handle intricate relationships, and streamline maintenance efforts. This approach aligns with the app's multifaceted functionalities and the need for a secure, scalable, and maintainable solution in the realm of mental health therapy provision.

3.2.2 MVC Architecture

Implementing the Model-View-Controller (MVC) architecture in a Mental Health Therapy services providing android app offers several significant advantages. The clear separation of concerns ensures an organized and maintainable codebase, simplifying development and updates as each component can be worked on independently. The Model handles data and business logic, the View manages the user interface, and the Controller oversees user interactions, promoting a streamlined and efficient app development process.

The MVC architecture is also well-suited for the intricate nature of a Mental Health Therapy app. It aligns with the need to manage complex interactions, data handling, and user interface components. The clear separation of the Model, View, and Controller elements allows developers to dedicate specific attention to each aspect, resulting in a well-structured and organized application.

Additionally, the MVC architecture promotes modularity and reusability, crucial for the complexity of a mental health therapy app. By breaking down the app into distinct components with specific tasks, developers can create reusable code, facilitating the implementation of new features and modifications. This adaptability proves valuable for accommodating future expansions or adjustments to meet evolving therapy needs effectively.

For a mental health app, the UI plays an important role in creating a positive and supportive user experience. The MVC architecture emphasizes the View component, responsible for user interface

presentation. This gives room to designers and user experience specialists to finetune the interface, which provides the interface expectable to users seeking therapy and support.

The MVC architecture also promotes iterative development, allowing for continuous improvement based on user feedback and changing therapy requirements. The modular structure allows a developer to update or to change only specific parts of an application, without disturbing the entire app. Such an iterative approach fits in with the client-centered approach of mental health care, which allows for adjustments according to use in the actual world.

In essence, the Model-View-Controller (MVC) architecture is an advantageous choice for developing a Mental Health Therapy services providing android app due to its ability to handle complexity, ensure efficient division of responsibilities, offer user-centric interface design, safeguard data privacy, accommodate evolving therapy practices, facilitate collaborative development, and support user-centered iterative improvements. This architectural style not just compliments mental health care it ensures user-friendly design that makes the app more robust and thus suitable for sensitive users of therapy support.

3.3 System Architecture

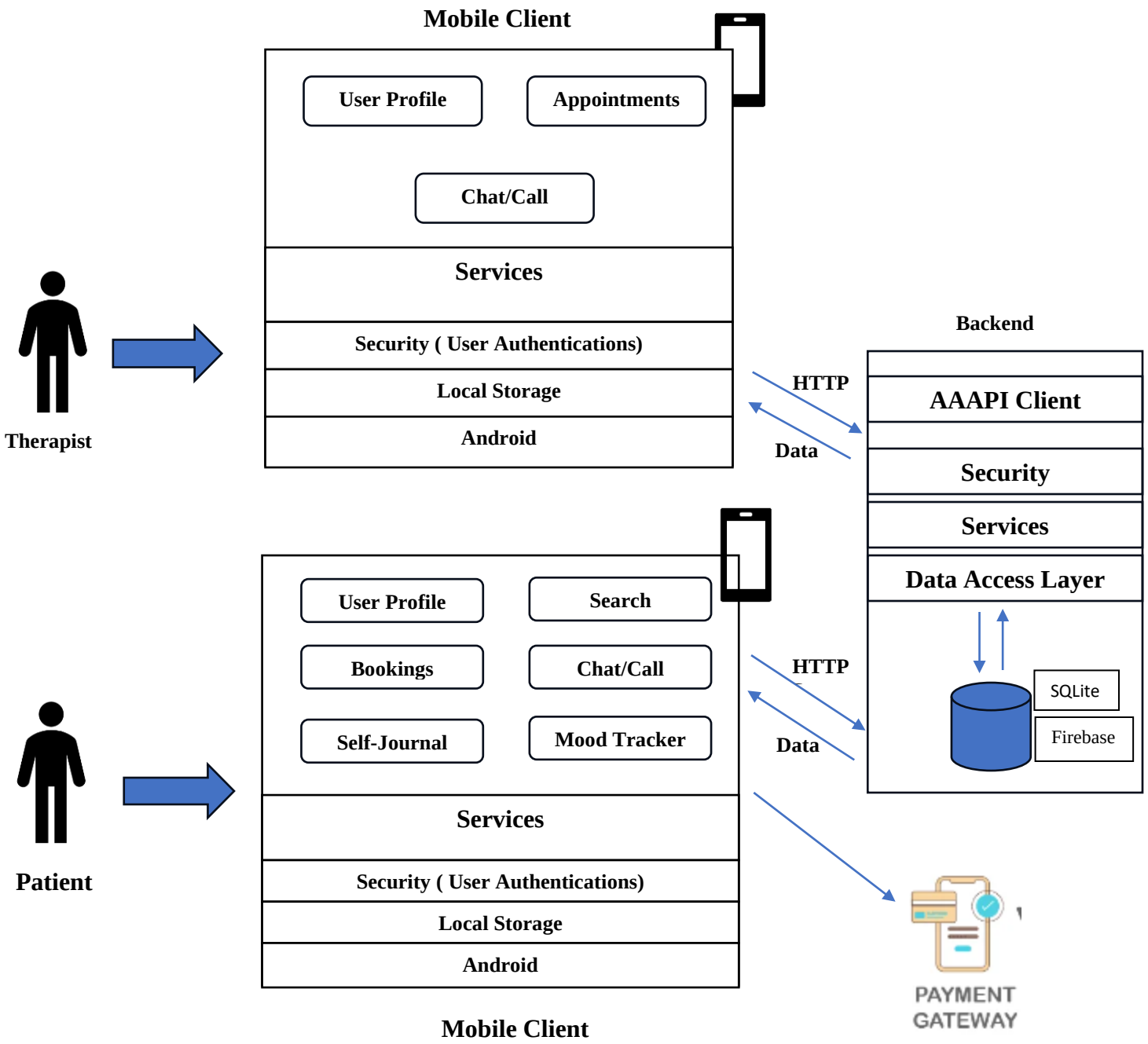


Figure 3.1 - System Architecture Diagram

The high-level System Architecture is illustrated in Figure 3.1 - System Architecture Diagram. Software architecture encompasses a set of guidelines that outline software development and assembly. It outlines the structure and organization of the software system, encompassing factors such as component relationships and complexity levels. Architecture serves to articulate project objectives and guide the planning and creation of novel systems.

3.4 UML Diagrams

The Unified Modeling Language (UML) is a standardized visual representation language intended for use in,

- Illustrating business and similar processes,
- Analyzing, designing, and implementing software-based systems.

UML serves as a universal language for business analysts, software developers, and engineers. It enables them to depict, specify, design, and document both existing and new business processes, as well as the structure and behavior of software system components.

It's important to note that UML itself is a standard modeling language, not a software development process. The UML 1.4.2 Specification clarified this distinction, highlighting its role as a language for describing various aspects of software systems.

3.4.1 Use Case Diagram

The use case diagram as illustrated in Figure 3.2 - Use Case Diagram, identifies the system requirements by analyzing user needs. It depicts system actors and their interactions with the system, highlighting core roles. Also, it represents how the external systems get involved with the proposed system and which way it is going to interact with the proposed system. These external systems can be either a person, system components or the whole system.

A use case is a solitary unit of important work. It gives an abnormal state perspective of conduct discernible to somebody or something outside the system.

Figure 3.2 – Use Case Diagram

Use Case Scenarios

Use case scenarios are descriptions of how a system will be used in real-world situations, outlining specific interactions between users and the software to achieve particular goals. The data presented in Table 3.1 – Use Case Scenarios, demonstrates the use cases that covers the proposed system.

Class of Use Case	Use Case	Description
Registration	1. Register as Therapist 2. Register as Patient	1. A therapist will register into the system user type = patient 2. A Patient will register into the system by picking user type = patient
Authenticate	1. Login as Therapist 2. Login as Patient	1. Therapist logs into the system giving correct credentials 2. Therapist logs into the system giving correct credentials
Update Profile	1. Update user data 2. Update the additional user data	1. Update the basic profile details. 2. Update additional profile details aft ether registration
Search Therapist	1. Patient searches for therapist	1. Patient searches for therapist by answering a questionnaire, where the results will be filtered by the answers given
Book Therapist	1. Patient books a therapist 2. Patient pays for the book session through payment gateway	1. Patient will book a therapist in a date and time that is available to therapist
View Appointments	1. Therapist can view his appointments	1. Therapist can view all the appointments that are booked to him by the date, time, and patient
Cancel Booking	1. Therapist cancels booking	1. Therapist can cancel the booking 2. The booking session money should be refunded.
Create Chatroom	1. Patient creates a chatroom	1. Patients can create a chat room with relevant therapists to initiate a chat conversation with them
Send Message	1. Patient sends a message 2. Therapist sends a message	1. Patient can send (a) / reply (to the) message to therapist from created chatroom 2. Therapist can send (a) / reply (to the) message to patient from created chatroom
Maintain Self Journal	1. Patient creates a self-	1. Patient can create a self-journal

	journal 2. Patient enters details in self-journal 3. Patient views the saved entries in self-journal	2. Patient can enter data into the in self-journal, by the date 3. Patient can view the past saved entries in self-journal
Track Mood	1. Patient enters the mood of the day. 2. Patient views the mood in the past days	1. Patient enters the mood of the day 2. Patient can view the mood in the past days
Relaxation Music	1. Patients click on the various music numbers given	1. Patient can listen to the relaxation music

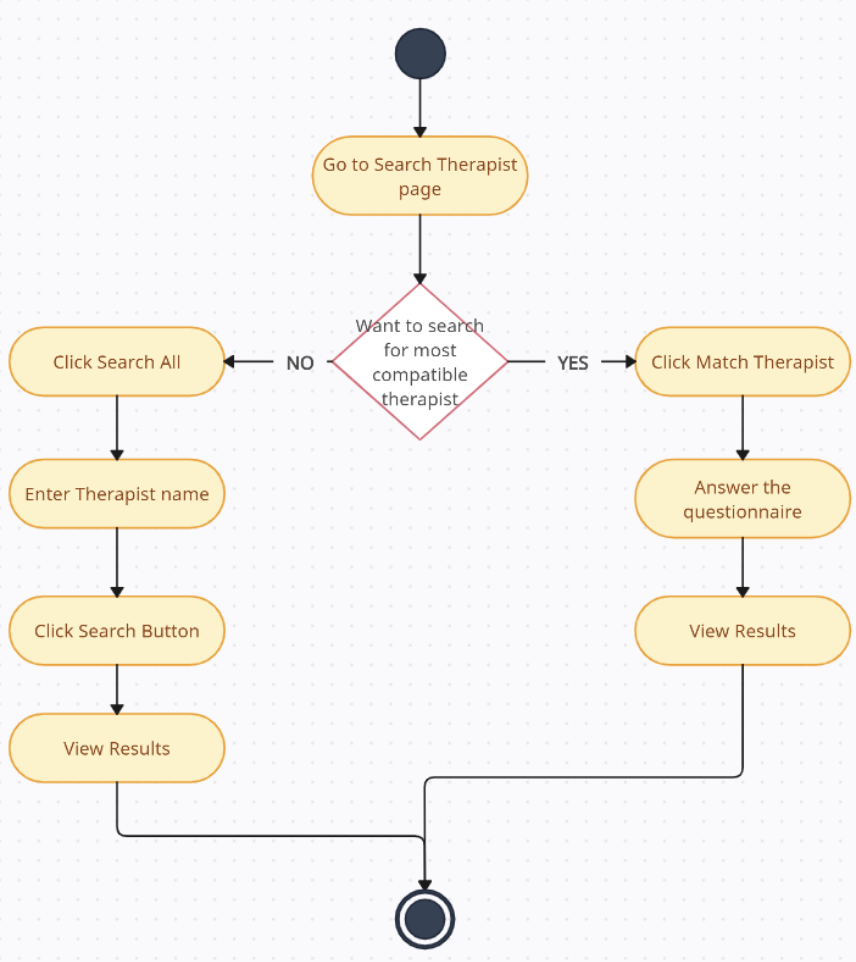
Table 3.1 – Use Case Scenarios

3.4.2 Activity Diagram

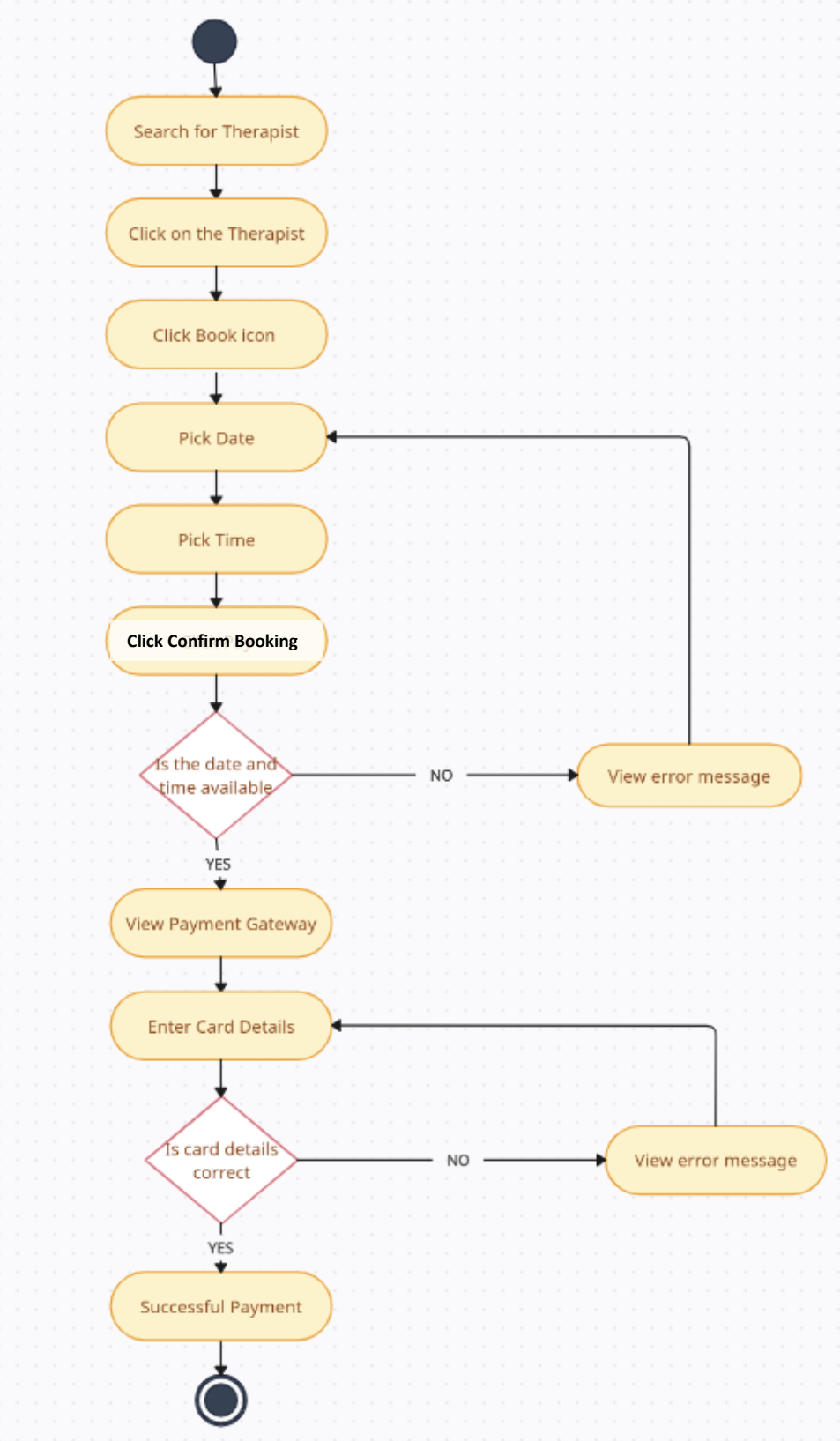
In UML, an activity diagram is utilized to show the arrangement of activities in the system. Activity outlines demonstrate the work process from the beginning point to the completion point specifying the numerous choice ways that exist in the movement of occasions contained in the action. It may be utilized to detail circumstances where parallel preparing may happen in the execution of a few activities.

Activity outlines are beneficial for businesses, showcasing the specific procedures involved in business activity.

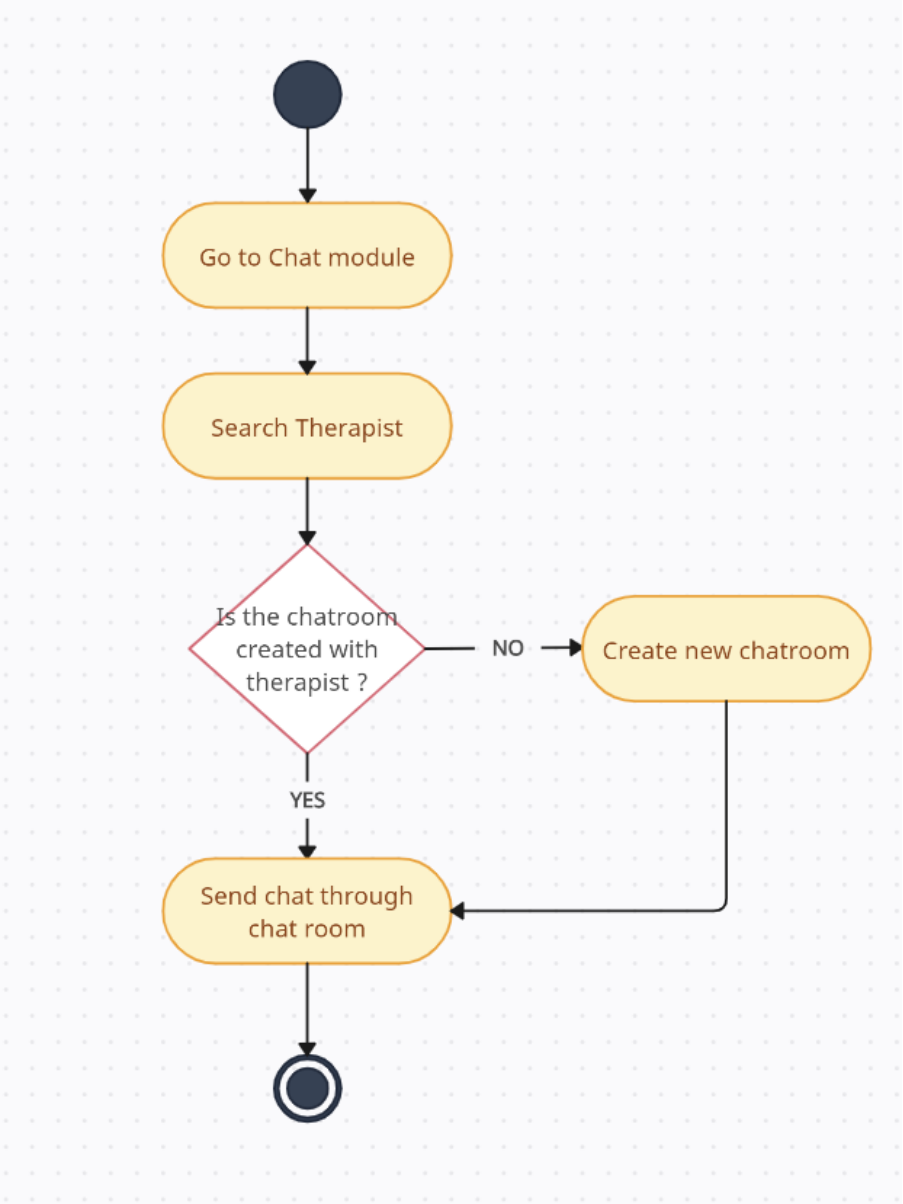
1. Patient search and match with therapists



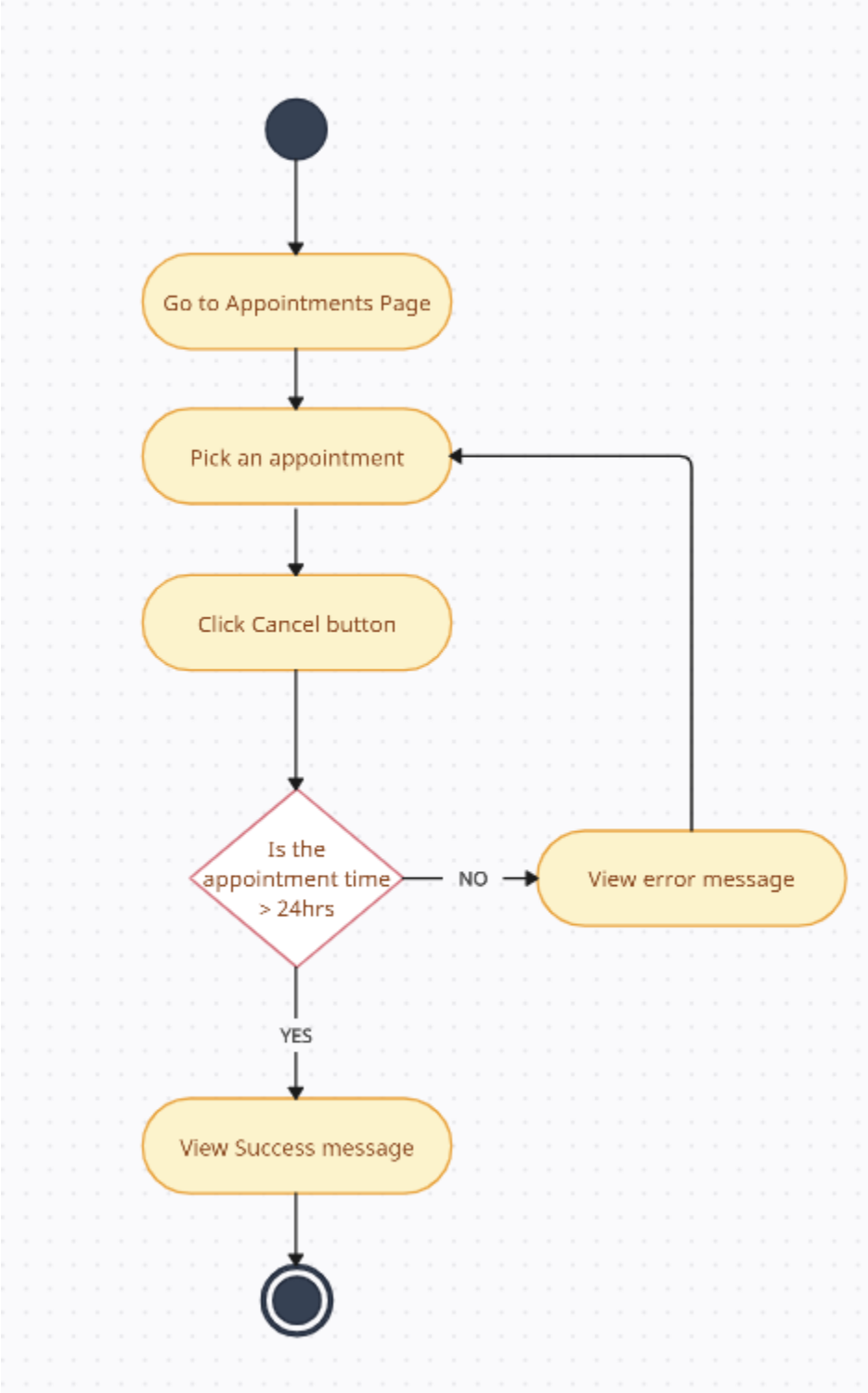
2. Patient books a therapist



3. Chat with Therapist



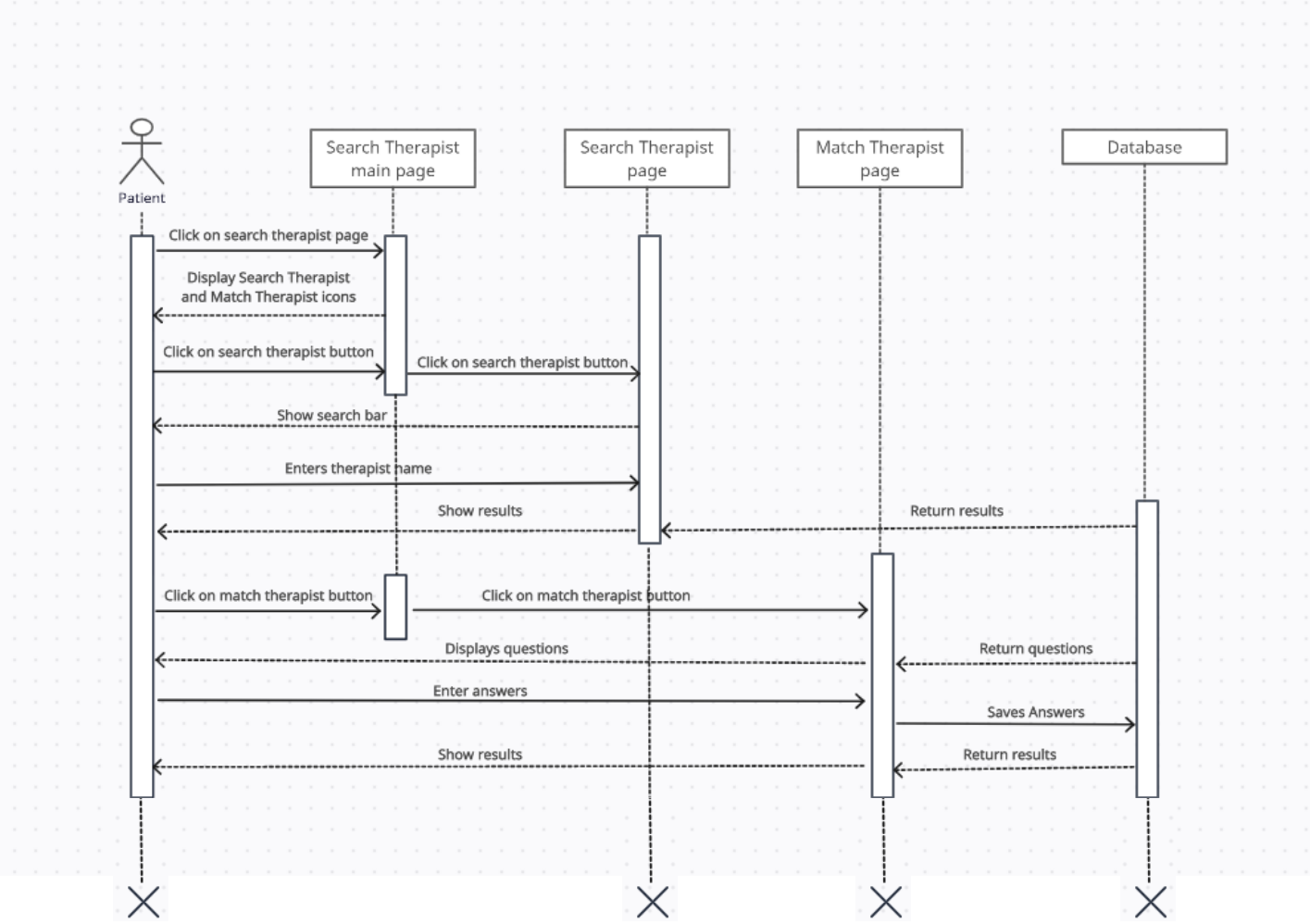
4. Therapist cancels appointment



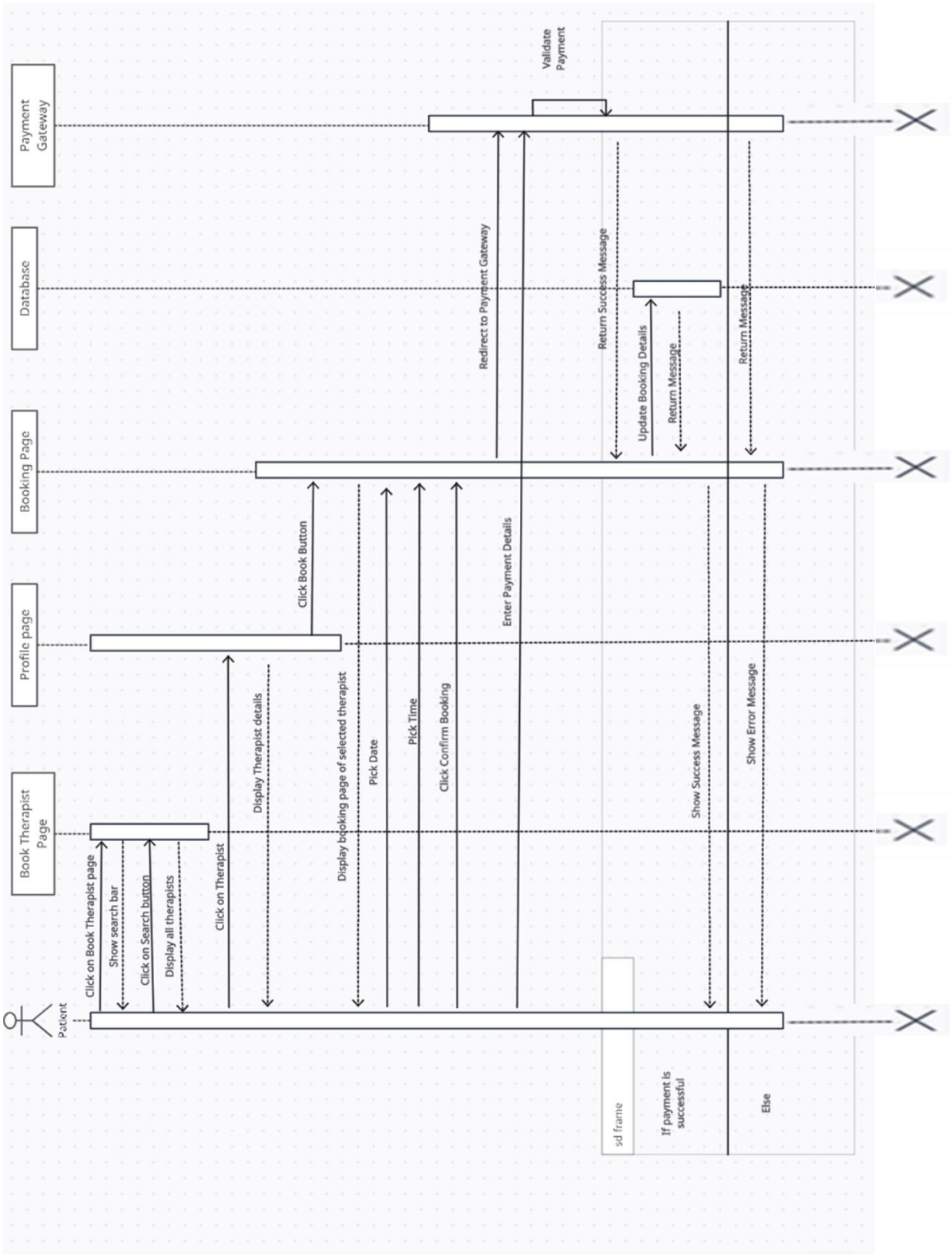
3.4.3 Sequence Diagram

This is also called an interaction diagram. Sequence diagrams show how processes interact with each other and in what order. It represents the interaction between objects in a time sequence and message exchanges between those objects to finish functionalities of scenarios.

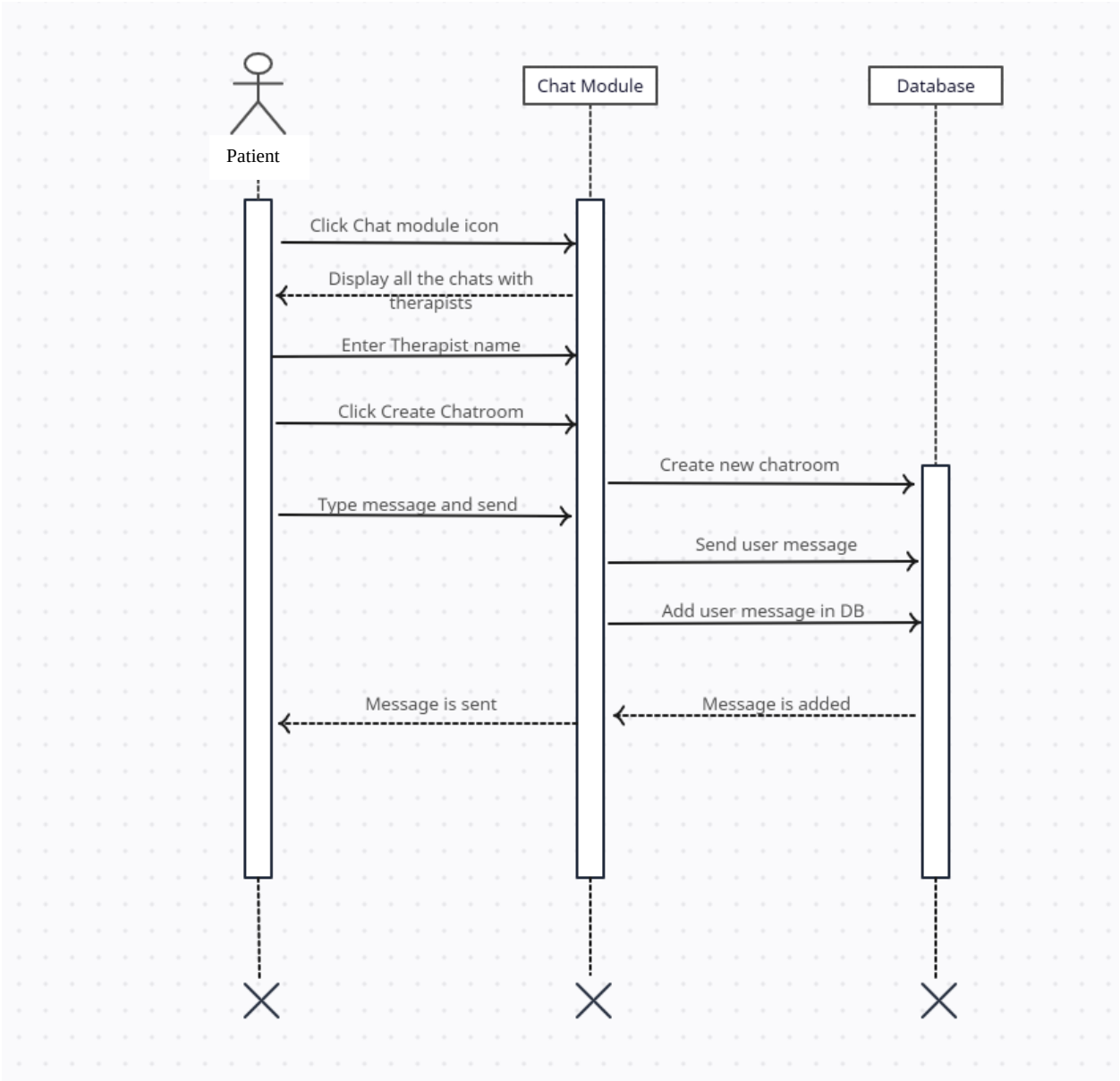
1. Patient search and match with therapists



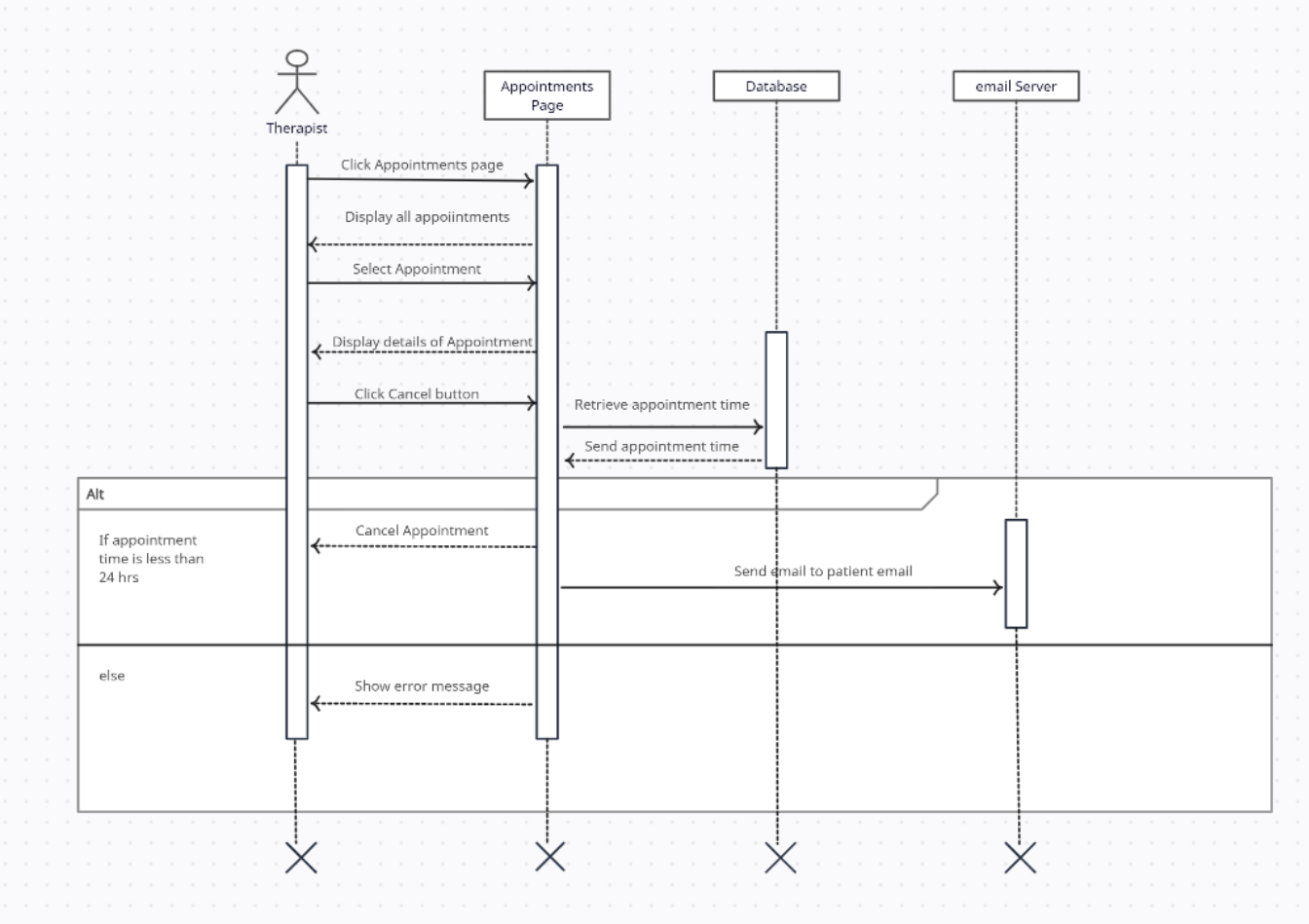
2. Patient books a therapist



3. Chatting with therapist



4. Therapist cancels appointment



3.5 Summary

In conclusion, this design chapter has meticulously laid the groundwork for a transformative mental health therapy app. The user-centric approach, guiding the development of core features, ensures that the diverse needs of users are addressed. With a strong emphasis on systematic requirements analysis, the app's architecture is well-structured and poised for successful implementation. The dynamic prototyping model, integral to the development process, enables continuous refinement, ensuring the app remains in alignment with evolving user expectations. The fusion of compassionate design and innovative technology showcased in this chapter holds the promise of reshaping the landscape of mental health support in the digital age, bringing empowerment and healing to individuals in need.

Chapter 4 - Implementation

4.1 Introduction

In this chapter, an in-depth exploration is initiated, delving into the complexities of methodology and implementation, as the navigation continues through the meticulous process of constructing a dedicated mental health service provision app using the Android Studio platform. Subsequent sections will unveil an in-depth perspective, offering comprehensive insight into the technical strategies, design considerations, and practical implementation steps that collectively converge towards the realization of a fully functional and impactful application.

The focus remains not solely on the technical intricacies but also extends to the broader context within which this endeavor unfolds. While navigating through the landscape of this chapter, readers can anticipate gaining a nuanced understanding of the pivotal role that mobile applications play in advancing mental health care. The upcoming discussions will unveil the chosen architectural framework, elucidate the decisions made regarding user interface design, delve into the backend development process, and shed light on the methods employed for testing, debugging, and ensuring the app's ethical alignment.

Addressing the prevailing challenges, sensitivities, and socio-cultural dynamics, this chapter endeavors to present not merely a technical narrative but also an inclusive and holistic perspective on the fusion of technology and mental health care. As the journey into methodology and implementation commences, readers are invited to unravel the intricate tapestry of crafting a digital solution that stands at the intersection of technology, well-being, and compassionate support.

4.2 Implementation Environment

The data demonstrated in Table 4.1 - System Requirements outlines the essential hardware and software prerequisites necessary to establish the implementation environment.

Hardware Requirement	**Software Requirement**
Smartphone with android operating system (version 4.4 or upper)	Android Studio 4.4.2
RAM-4GB or above	SQLite
Internet Connection	Java

Table 4.1 : System Requirements

4.3 System Development tools and techniques

During the development of the system, the following tools and techniques were employed. These tools and techniques were crucial for the system's development, providing essential support across different stages of the lifecycle. Their combined use ensured the system's successful implementation, meeting objectives effectively.

Draw.io (Diagrams.net) - This is an open-source graph drawing tool. It was used to create the system architecture diagrams, such as flowcharts, entity-relationship diagrams, and user interface mockups. This tool aided in the conceptualization and visualization of system components, enabling better planning and communication of the system's design.

Photopea – An open-source online photo editor which served as the primary tool for creating and editing custom images and visual elements, such as icons and banners, for the app. Photopea was particularly useful for enhancing the UI aesthetics and ensuring a visually appealing user experience.

Android Studio - Integrated Development Environment (IDE) for Android app development, supporting Java. Android Studio was the core development environment for coding the system's functionalities, styling, and debugging. It provided a comprehensive toolset for creating the app, including an emulator for testing, Android SDK integration, and built-in libraries essential for mobile app development.

Firebase - Backend-as-a-Service (BaaS) platform by Google. Firebase was used for handling user authentication, real-time database management, and cloud storage. It enabled secure user login and streamlined the process of managing therapist bookings, chat features, and user data storage.

SQL Database (SQLite) - Relational database management system. Employed for local data storage on users' devices, allowing the app to save user activity like mood tracking and journal entries offline. SQLite ensured efficient management of the self-improvement features without requiring constant internet connectivity.

Java – Programming language chosen for this application's development. Java was used to implement key functionalities such as therapist matching, chat features, video consultations, mood tracking, and milestone creation. Its compatibility with Android Studio allowed for seamless integration with various Android libraries and APIs, ensuring efficient performance and smooth operation of the app's features.

4.4 Methodology

4.4.1 Data Gathering

In order to develop a comprehensive and effective mental health service provision app, a robust methodology for data gathering was essential to ensure that the app addresses the nuanced needs of its users.

1. **User Surveys and Questionnaires**

To grasp the specific mental health concerns of potential app users, a structured survey was designed. This survey incorporated questions that delved into user demographics, previous experiences with therapy, preferred communication methods, and desired features in the app. This data gathering method provided quantitative insights, allowing for the identification of prevalent mental health issues and the tailoring of the app's functionalities to address them.

A User Survey was conducted as part of the data collection process to gather valuable insights for the development of a dedicated mental health service app. This was to ensure that the app effectively addresses the needs and preferences of the general public.

The survey received over 100 responses, which were then utilized in the development and refinement of the app to enhance its functionality and user experience.

For the specific Google Form used for collecting user opinions, refer Figure A.1 – User Survey for Mental Health App Development in Appendix A.

2. **Individual Research**

In this phase, an extensive exploration of various sources, including scholarly articles, existing mental health systems, and relevant documents, was undertaken. The goal was to gather valuable insights, best practices, and a contextual understanding to contribute to the development of the mental health service provision app. Through the study of existing literature, examination of successful systems, and review of pertinent documents, a deeper understanding of user needs, technological trends, and ethical considerations in the realm of mental health technology was sought. This research-driven approach informed the design and implementation of the app, ensuring alignment with industry standards, user expectations, and ethical guidelines.

By strategically combining quantitative and qualitative approaches, involving potential users and professionals, and continuously gathering interaction data, the data gathering methodology aimed to ensure that the mental health service provision app resonated authentically with the needs, preferences, and sensitivities of its diverse user base.

4.4.2 Setup

Install Android Studio: Download and install Android Studio, which includes the Android SDK and necessary tools for app development.

Create a New Project named Final Project : Start a new Android project and choose an appropriate template (An Empty Activity was chosen).Refer Figure 4.1 - Front-end application folder structure, to view the front-end application that was used in the proposed project.

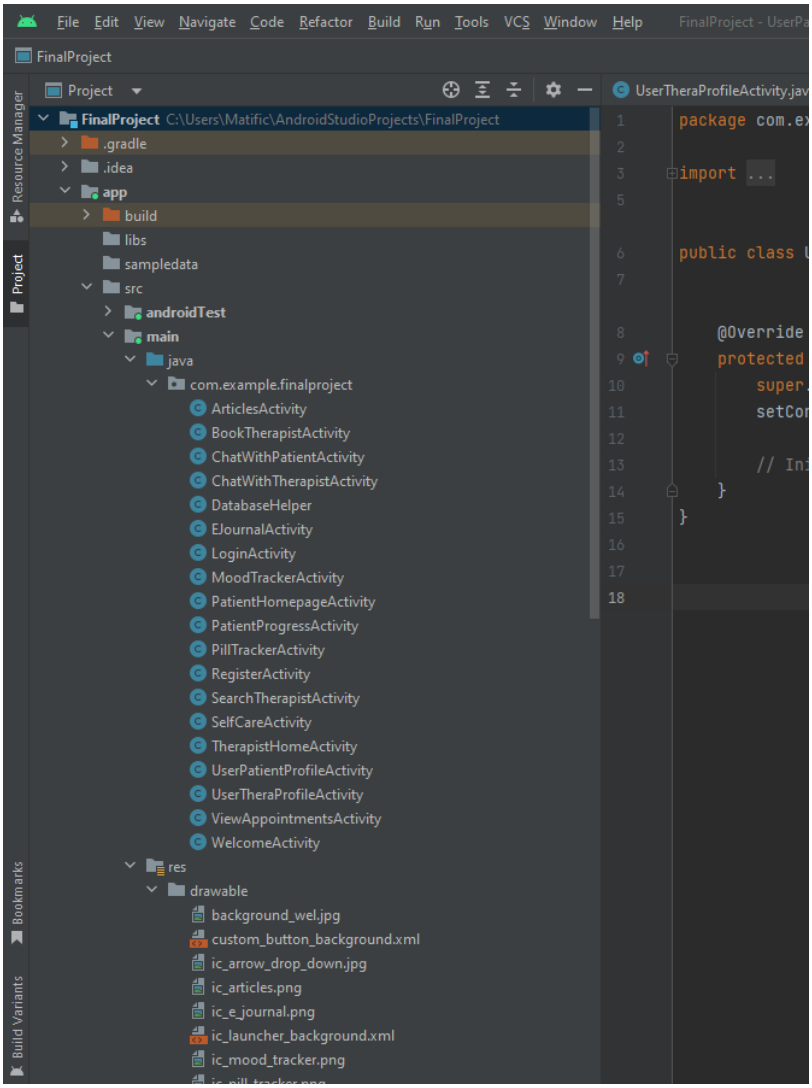


Figure 4.1 - Front-end application folder structure

4.4.3 User Interface Design

Designing the UI - XML layout files were utilized to craft the app's user interface. These files served as the foundation for structuring the visual elements and interactive components of the app. Android Studio's Layout Editor facilitated the visual design of the app's screens..

Implementing Layouts - Various layouts such as ConstraintLayout and LinearLayout were employed to structure the UI components effectively, ensuring a cohesive and intuitive user experience. By strategically utilizing these layout options, a visually appealing and user-friendly interface that enhances the overall user experience was achieved.

Design for Accessibility - Considerable attention was given to designing the app's UI with accessibility in mind. Appropriate elements and content descriptions were incorporated to ensure that the UI remains accessible to users with disabilities, aligning with inclusive design principles.

The User Interfaces will be depicted and described in Appendix D – User Manual.

4.5 Summary

In this chapter, the meticulous process of constructing a dedicated mental health service provision app using Android Studio is thoroughly explored. Technical strategies, design considerations, and practical implementation steps are scrutinized, emphasizing the fusion of technology and compassionate support. The chapter also addresses the unique context of mental health therapy services in Sri Lanka, navigating challenges and socio-cultural dynamics. Through this holistic perspective, readers gain insight into crafting a digital solution at the intersection of technology and well-being, aiming to enhance mental health care accessibility and effectiveness.

Chapter 5 - Testing & Evaluation

5.1 Introduction

In this chapter, we delve into the indispensable domain of Testing & Evaluation, a critical facet in the landscape of contemporary research and technological advancements. As we navigate through the complexities of this phase, the overarching objective is to ensure the reliability, effectiveness, and overall quality of the solutions under consideration. Testing & Evaluation serves as a crucial checkpoint in the journey from theoretical conception to practical implementation, where the robustness of concepts is rigorously scrutinized, laying the foundation for the subsequent success of the research endeavors.

In dissecting the purpose of the Testing & Evaluation phase, the core objective is to assess the solutions systematically and objectively at hand. This section unveils the specific goals propelling the integration of rigorous testing methodologies, shedding light on their role as crucibles for theoretical concepts. Through subjecting these concepts to practical applications, Testing & Evaluation becomes instrumental in the transformation of abstract ideas into tangible, resilient applications.

5.2 Related Testing Types

There are many testing types available today. To test, the therapy app system was created, a combination of few test types was used.

Manual Testing

Manual Testing is a type of software testing in which test cases are executed manually by a tester without using any automated tools (Hamilton, 2023). Although manual testing is considered the most primitive testing type we have to conduct it because 100% automated testing cannot be done in a practical scenario. There are many manual testing methods with specific objectives and strategies available today. When developing the Therapy app system, the testing types are used in the following order.

1. **Unit testing**

Units are the smallest testable component in any application. In unit testing, individual modules are built and tested by the developer. When developing the Therapy app system unit tests are conducted from the beginning of the coding stage to minimize errors.

When developing the system, the entire system was divided into modules. For each module, sub-modules are created according to their functionality.

2. Regression testing

Once the code base is changed after modification we have to ensure that previously run tests are still passed after modification. For that, we are conducting regression testing. When developing the Therapy app system after each modification regression testing is performed to verify that recent code changes aren't affecting the existing features.

3. System Testing

Once the system was developed and integrated completely the entire system was tested. This is called system testing.

4. Acceptance Testing

Acceptance testing was conducted to determine whether the Therapy Corner app that was developed satisfied the initial requirements and objectives.

5.3 Test Cases

This section outlines the manual testing procedures employed for each module and its functionalities within the system. Included are descriptions of various test cases and their corresponding results, specifically conducted for the key system modules. Please note that these are very high level testcases.

5.3.1 Test Cases for User Authentication

The testcases for the Login and authentication of the Patients and Therapist users are given below in the Table 5.1

Test Case Id	Description	Testing Steps	Expected Outcome	Actual Results	Pass/Fail
TU001	Check user login with valid data	1) Open the app 2) Click Login 3) Give Username 4) Give Password 5) Click Login button	• Users should be able to log into the system. • If the user is a therapist, they should be taken to the Therapist	As Expected	Pass

			homepage. • If the user is a patient they should be taken to the Patient homepage		
TU002	Check user login with invalid username	1) Open the app 2) Click Login 3) Give incorrect Username 4) Give Password 5) Click Login button	• Users should be given an error message. • The user should not be able to log into the system.	As Expected	Pass
TU003	Check user login with invalid password	1) Open the app 2) Click Login 3) Give Username 4) Give **incorrect** Password 5) Click Login button	• Users should be given an error message. • The user should not be able to log into the system.	As Expected	Pass
TU004	Check user login with null data	1) Open the app 2) Click Login 3) Do not enter data to username and password fields 5) Click Login button	• Users should be given an error message. • The user should not be able to log into the system.	As Expected	Pass

Table 5.1 : Test cases for User Authentication

5.3.2 Test Cases for User Registration

The testcases for the Registration of the Patients and Therapist users are recorded as below in the Table 5.2

Test Case Id	**Description**	**Testing Steps**	**Expected Outcome**	**Actual Results**	**Pass/Fail**
TU005	Check the registration of a therapist user	1) Open the app 2) Click Register 3) Enter details to all fields 4) Pick Therapist as option 5) Click Submit	• Users should be able to register as a therapist into the system. • Users should be given a success message.	As Expected	Pass

TU006	Check the registration of a patient user	1) Open the app 2) Click Register 3) Enter details to all fields 4) Pick patient as option 5) Click Submit	• Users should be able to register as a patient into the system. • Users should be given a success message.	As Expected	Pass
TU007	Check if all fields are mandatory in the register form	1) Open the app 2) Click Register 3) Leave a field empty and add details to other fields 4) Click Submit	• Users should be given an error message.	As Expected	Pass

Table 5.2 : Test cases for User Registration

5.3.3 Test Cases for Match Therapist

The testcases for the feature where the Patient can match up with a therapist is given below in the Table 5.3

Test Case Id	**Description**	**Testing Steps**	**Expected Outcome**	**Actual Results**	**Pass/Fail**
TU008	Check the availability of questions and answer dropdowns	1) Open the app 2) Login as a patient user 3) Navigate to Match Therapist page	• Users should be able to see the questions and answer dropdowns for each	As Expected	Pass
TU009	Check the user can answer questions and submit	1) Open the app 2) Login as a patient user 3) Navigate to Match Therapist page 4) Pick answer from dropdowns as to your needs 5) Click Submit	• Users should be able to answer questions and submit	As Expected	Pass

TU010	Check the best match therapist is displayed	1) Open the app 2) Login as a patient user 3) Navigate to Match Therapist page 4) Pick answer from dropdowns as to your needs 5) Click Submit	• Users should be able to see the best match therapist for them	As Expected	Pass

Table 5.3 : Test cases for Match Therapist

5.3.4 Test Cases for User Profile

The testcases for the creation and editing of the user Profiles for both the Therapist and the Patients is given below in the Table 5.4

Test Case Id	**Description**	**Testing Steps**	**Expected Outcome**	**Actual Results**	**Pass/Fail**
TU011	Check the addition of data to the patient user profile	1) Open the app 2) Login as a patient user 3) Navigate to User Profile page 4) Add image 5) Enter details to other fields 6) Click Save	• Users should be able to login to the patient homepage • The enter data should be saved	As Expected	Pass
TU012	Check the editing of data to the patient user profile	1) Open the app 2) Login as a patient user 3) Navigate to User Profile page 4) Add different image 5) Enter different details to other fields 6) Click Save	• Users should be able to login to the patient homepage • The newly entered data should be saved	As Expected	Pass

TU013	Check the addition of data to the therapist user profile	1) Open the app 2) Login as a therapist user 3) Navigate to User Profile page 4) Add image 5) Enter details to other fields 6) Click Save	• Users should be able to login to the therapist homepage • The enter data should be saved	As Expected	Pass
TU014	Check the editing of data to the therapist user profile	1) Open the app 2) Login as a therapist user 3) Navigate to User Profile page 4) Add different image 5) Enter different details to other fields 6) Click Save	• Users should be able to login to the therapist homepage • The newly entered data should be saved	As Expected	Pass

Table 5.4 : Test cases for User Profile

5.3.5 Test Cases for Booking Therapists

The testcases for the process workflow of booking a therapist by the Patients is given below in the Table 5.5

Test Case Id	**Description**	**Testing Steps**	**Expected Outcome**	**Actual Results**	**Pass/Fail**
TU015	Verify if user can search for all therapists in the system	1) Open the app 2) Login as a patient user 3) Navigate to Book Therapist 4) Click Search button	• Users should be able to view all the therapists in the system	As Expected	Pass
TU016	Verify if user can search for all therapists in the system	1) Open the app 2) Login as a patient user 3) Navigate to Book	• Needed therapist should be searched	As Expected	Pass

		Therapist 4) Enter value 5) Click Search button			
TU017	Verify user can click on a therapist to view their profile	1) Open the app 2) Login as a patient user 3) Navigate to Book Therapist 4) Enter value 5) Click Search button 6) Click on the needed therapist	• Users should be taken to the therapist's accurate profile. • The profile page should be read-only	As Expected	Pass
TU018	Verify user can book desired therapist	1) Complete Testcase steps TU017 2) Click Book Button 3) Pick Date and Time 4) Click Confirm Booking	• Users should be able to book the therapist	As Expected	Pass
TU019	Verify if user cannot book already booked date and time	1) Complete Testcase steps TU017 2) Click Book Button 3) Pick already booked Date and Time 4) Click Confirm Booking	• Users should NOT be able to book the therapist	As Expected	Pass
TU020	Verify if therapist receives email when user books them	1) Complete Testcase steps TU018	• Therapist should receive an email with Patient Name Booked Date Booked Time	As Expected	Pass

Table 5.5 : Test cases for Booking Therapist

5.3.6 Test Cases for Chatting with Therapist

The testcases for the chat communication between the Therapists and the Patients is given below in the Table 5.6

Test Case Id	Description	Testing Steps	Expected Outcome	Actual Results	Pass/Fail
TU021	Verify if user can search for all therapists in the system	1) Open the app 2) Login as a patient user 3) Navigate to Chat Hub 4) Click Search icon	• Users should be able to view all the therapists in the system	As Expected	Pass
TU022	Verify if user can start a chat with picked therapist	1) Open the app 2) Login as a patient user 3) Navigate to Chat Hub 5) Click Search icon 6) Click on therapist 7) Start chat with therapist 8) Write and send message	• User should be able to start a chat with picked therapist	As Expected	Pass
TU023	Verify if therapist can view the chat message	1) Open the app 2) Login as a therapist user 3) Navigate to Chat Hub	• Therapist should see the latest chat from user	As Expected	Pass
TU024	Verify if therapist can send message back to user	1) Open the app 2) Login as a patient user 3) Navigate to Chat Hub 5) Click patient user 6) Write and send message	• Therapist should be able to send message back to user	As Expected	Pass
TU025	Verify if user can view the chat message from therapist	1) Open the app 2) Login as a therapist user 3) Navigate to Chat Hub	• User should see the latest chat from therapist	As Expected	Pass

Table 5.6 : Test cases for Chatting with Therapist

5.3.7 Test Cases for Patient Self Care pages.

The testcases for the self-care pages and their functionalities used by patients is given below in the Table 5.7

Test Case Id	Description	Testing Steps	Expected Outcome	Actual Results	Pass/Fail
TU026	Verify if user can navigate to Self-care pages	1) Open the app 2) Login as a patient user 3) Click on Self Care	• Users should be able to navigate to Self-care pages	As Expected	Pass
TU027	Verify if user can add a note in Gratitude Journal	1) Do steps of TU026 2) Click Add icon 3) Navigate to Self-Care 4) Click Gratitude Journal 5) Click Add icon 6) enter details 7) Click Add Note	• Users should be able to add a note in Gratitude Journal	As Expected	Pass
TU028	Verify if user can view the notes in Gratitude Journal	1) Do steps of TU027 2) Navigate back to Gratitude Journal	• User should be able to view only their notes in Gratitude Journal	As Expected	Pass
TU029	Verify if user can add a mood for needed day	1) Do steps of TU026 2) Click Mood Tracker 3) Select Date 4) Select Mood 5) Enter Reason 6) Click Set Mood	• User should be able to add a mood to a date	As Expected	Pass
TU030	Verify if user can view mood added to their days	1) Do steps of TU029 2) Pick Date	• User should be able to view the mood and reason for the date	As Expected	Pass

TU031	Verify if user can play music in Relaxation Music	1) Do steps of TU026 2) Navigate to Relaxation Music 3) Click on a music icon	• User should be able to play the relevant music of the clicked icon	As Expected	Pass
TU032	Verify if user can see all the Self-Affirmations	1) Do steps of TU026 2) Click Self-Affirmations 3) Click Next / Previous	• User should be able to see all the Self-Affirmations	As Expected	Pass

Table 5.7 : Test cases for Patient Self Care pages

5.4 User Evaluation

Assessing usability is crucial in ensuring an optimal user experience, especially in mental health therapy apps where user feedback is pivotal for long-term sustainability. Throughout the development process, user input and suggestions play a central role. Thus, analyzing user feedback becomes imperative.

To gather end-user comments and feedback for the usability testing of the proposed mental health therapy service provision app, a predefined questionnaire was designed. Google Forms was utilized for easy data collection, and its feature of automatic graph and table generation greatly facilitated data analysis.

A group of 20 participants were gathered to use the app and these app users were encouraged to interact with the app and then provide feedback through the Google Form. The evaluation focused primarily on four key categories,

1. Usability
2. Functionality
3. Productivity
4. Appearance

Responses to the questionnaire were evaluated using a Likert scale, with the following values:

1. Strongly Disagree
2. Disagree

3. Neutral
4. Agree
5. Strongly Agree

The initial beta testing was done with 20 participants due to limited budget and geographical conditions. Therefore, a selected group of known individuals, that are familiar to the candidate was chosen, who are diagnosed with low to high mental health conditions to use the app and provide feedback. The identities of individuals shall be kept anonymous, as per their preference.

For the specific Google Form used for collecting user feedback, refer Figure B.1 – User Evaluation Questionnaire in Appendix B.

5.5 Results of user's feedback evaluation

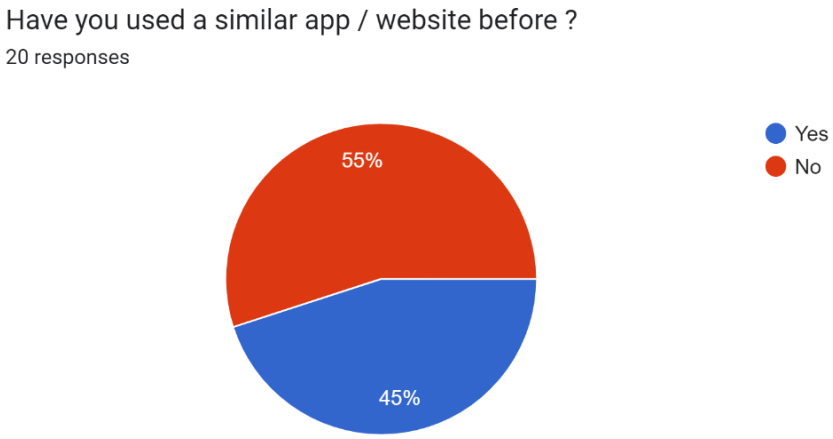
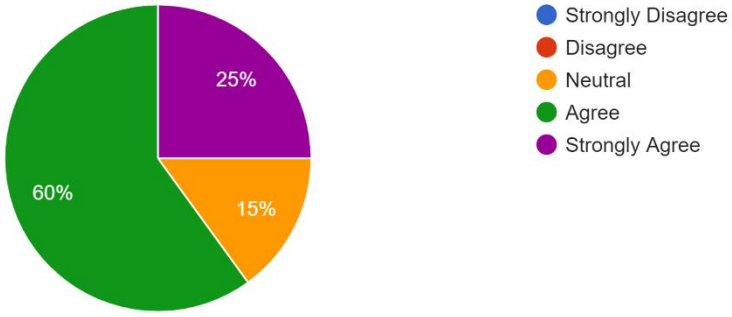


Figure 5.1 – Question 1 Feedback Chart

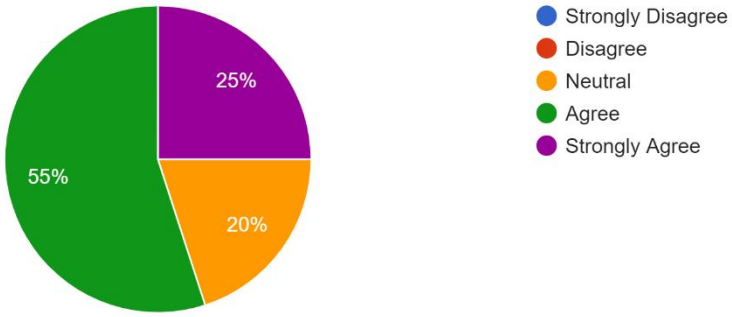
It was easy to use the overall app ?

20 responses



It was easy to book your preferred therapist through the app ?

20 responses



You were satisfied with the therapist - matching feature provided.

20 responses

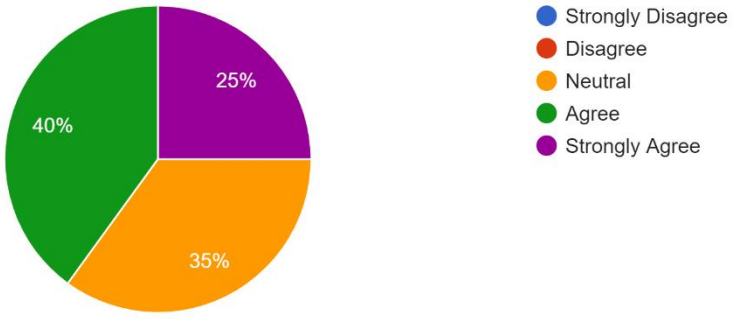
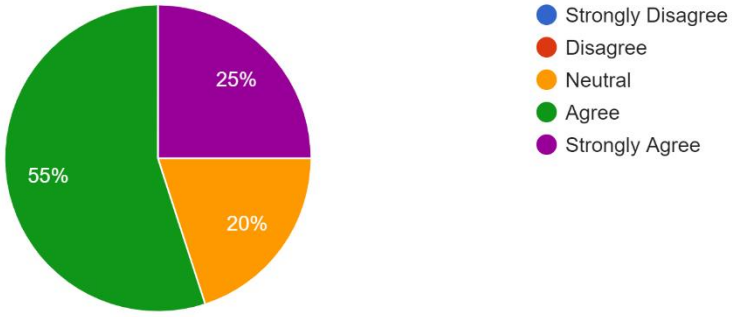


Figure 5.2 – Questions 2,3,4 Feedback Chart

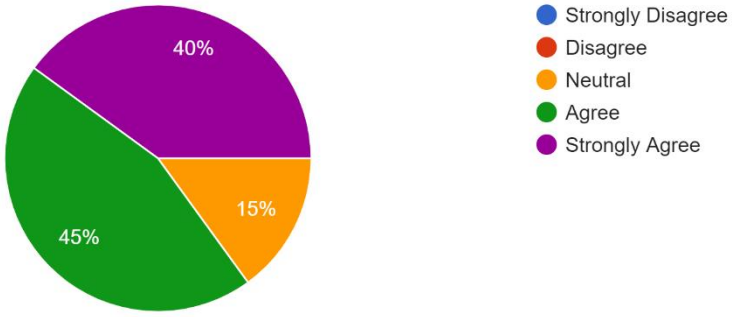
It was easy to communicate with your preferred therapist through the app

20 responses



You were satisfied with the self-care options provided by the app

20 responses



You were satisfied with the overall performance of the system

20 responses

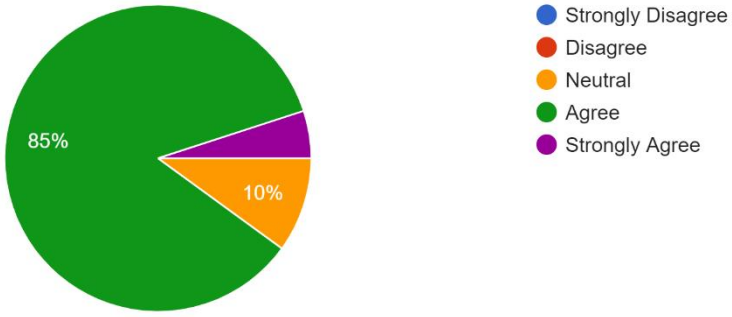


Figure 5.3 – Questions 5,6,7 Feedback Chart

It is analyzed that 45% of users has used similar systems before and 55% has not, refer Figure 5.1.

85% of the users are very satisfied with the overall system functionality and performance of the system. Only 10% of the users responded as neutral, refer Figure 5.2.

On the whole more than 55% of users say that it is easy to use the features and functionalities of the system and are satisfied with the job it gets done. 30% of users find it extremely easy. Only 15% of the users remain neutral. This is depicted in Figure 5.1, Figure 5.2 and Figure 5.3.

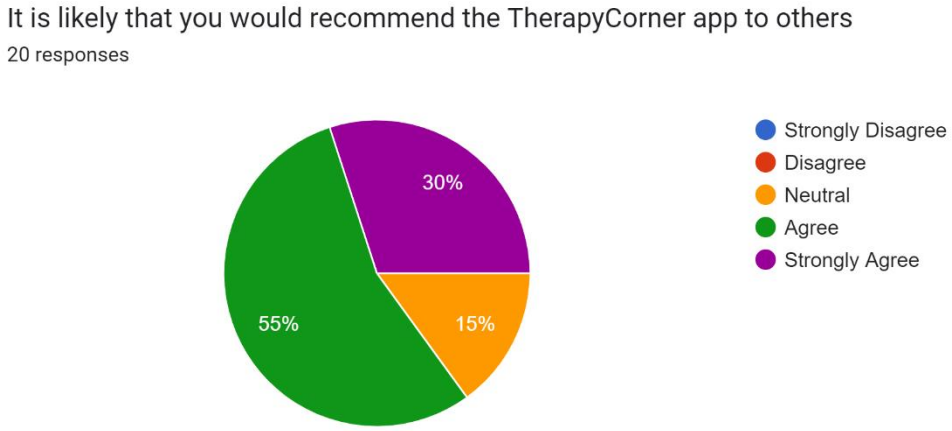


Figure 5.4 – Question 8 Feedback Chart

As displayed in Figure 5.4, most of them are likely to recommend the “TherapyCorner” app to others. And some provided Feedback on how to make the app perform even better, refer Figure 5.5.

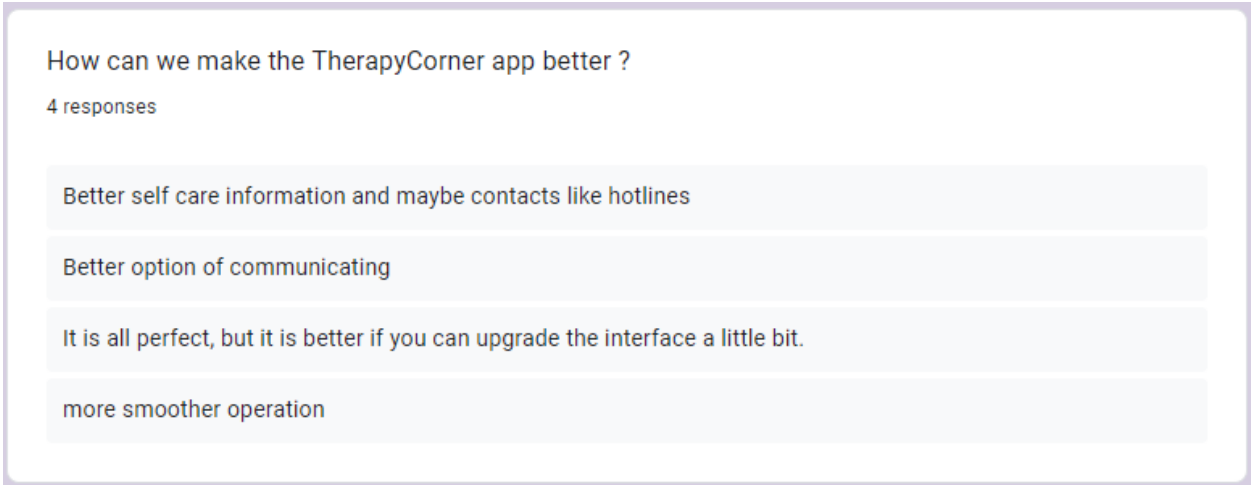


Figure 5.5 – Feedback Chart Optional Question for Suggestions

5.6 Summary

In conclusion, the Testing & Evaluation chapter underscores the indispensable role of this phase in research and technology. It serves as a pivotal checkpoint, ensuring the reliability and effectiveness of solutions by rigorously scrutinizing concepts and validating them through systematic assessment. By transforming theoretical concepts into tangible, resilient applications, Testing & Evaluation bridges the gap between abstract ideas and real-world implementation, laying a robust foundation for subsequent endeavors in the field.

Chapter 6 - Conclusion

6.1 Introduction

In this chapter, the research objectives will be revisited, and key findings will be summarized, providing a concise overview of the entire thesis. Additionally, it will address any limitations encountered during the study and suggest potential avenues for future research. Through this brief yet comprehensive analysis, the aim is to leave the reader with a clear understanding of the study's impact and potential for future exploration.

6.2 Conclusion

The “TherapyCorner” application is an android-based application that was built to cater mental health provision services designed for Sri Lanka. Leveraging the power of technology, seeking and delivery of mental health services should be easy , accessible, and convenient. The main purpose of this application is to bridge service delivery gaps in mental health care and improve the accessibility of support services and provide a safe platform. By integrating mobile technology, the goal is to effectively address the mental health needs of individuals in Sri Lanka.

From the requirement analysis phase, all the functional and non-functional requirements are focused to achieve the objectives of the system as well as the satisfaction of the users. Then the system was designed with three major modules: Individuals/Patients module, Therapist / Professional module, Booking Module. Afterward the application was implemented using Android Studio and developed using Java. Throughout the implementation phase testing was carried out and after implementation also separate user evaluation was carried out for quality assurance purposes. The satisfaction level of the users can be understood with the user’s feedback.

Furthermore, the utilization of Management Information Systems (MIS) reports is used to gain meaningful insights into user demographics and user engagement throughout the application's usage. By providing valuable data regarding the demographic profiles of users accessing the application, including age, gender, and user engagement like the frequency of booking etc.

Some of the main MIS reports can be found in Appendix C of the thesis.

6.3 Challenges / Problems

There were some problems that were encountered through different phases of the project. The most prevalent problems were limitations to accessing resources and technologies. Mental Health is a vast area of study, therefore when conducting the research, the decision was made to have limited it to the most prevalent and frequent mental health types.

Another challenge that was faced was due to the limited knowledge of software development, as an elementary level developer, learning the basics in the language and platform that would be used was necessary. Furthermore, basics of design concepts had be learnt and a simple yet functional method in bringing out the features that will be provided from the application had to be found. While it might not be the best, it is believed by the candidate that a satisfactory job in bringing forward the vision for the application.

As all the phases of the SDLC were done solely by one person, therefore the candidate believes a lot of knowledge and experience building applications through an IDE like Android Studio and NoSQL databases (Google Firebase and Firestore) was gained.

6.4 Future Work

In a remarkably short period of time, the project was conceived, and every effort was made to ensure that it would be completed as effectively as possible. There are still certain places where the project may be strengthened. The project's implementation could be done more artistically. Therefore, one of the main goals of the future in regard to this project, is to employ a small team of developers and designers and rework on enhancing current functionalities and features.
The system's versatility can also be increased by incorporating a few extra components. Future considerations are illustrated in the list below.

- In-app payment gateway that will allow the registered therapists to receive payments from the app and enable the patients to have a subscription-based therapist package.

- Provide the options for patients to download and add relaxation music.

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Appendix A - User Survey for Mental Health App Development Questionnaire

User Survey for Mental Health App Development

Dear Participants,

As part of my Masters' final project, I am conducting a user survey to gather valuable insights for the development of a dedicated mental health service app. Your participation in this survey is essential in ensuring that the app effectively addresses your needs and preferences. This survey aims to explore your opinions on various aspects of mental health support and app features.

Your responses will remain confidential and will only be used for research purposes. Your input will greatly contribute to the success of this project and the creation of an app that resonates with your expectations.

Thank you for taking the time to participate in this survey. Your input is highly valued.

jsavindi@gmail.com Switch account

Not shared

* Indicates required question

What age group do you belong to? *

Choose

Gender *

- Male
- Female
- Prefer not to say
- Other:

What is your highest level of education completed? *

Choose

Please specify your current region or location

Your answer

Previous Experiences with Therapy

This section aims to gather insights into participants' history with mental health therapy or counseling, including whether they have undergone any previous professional therapy sessions.

Have you ever received any form of mental health therapy or counseling? *

- Yes
- No

If yes, please specify the type of therapy

Your answer

If no, what factors have prevented you from seeking therapy in the past?

Your answer

How satisfied were you with your previous therapy experiences? *

- ◯ Very Satisfied
- ◯ Satisfied
- ◯ Neutral
- ◯ Unsatisfied
- ◯ Very Unsatisfied

Preferred Communication Methods

This section will explore participants' comfort level with digital platforms for mental health support and identify their preferred methods of communication for seeking mental health assistance.

How comfortable are you with using digital platforms for mental health support? *

- ◯ Very Comfortable
- ◯ Comfortable
- ◯ Neutral
- ◯ Uncomfortable
- ◯ Very Uncomfortable

Which communication methods do you prefer for seeking mental health assistance? *

Choose

Desired App Features

This section aims to understand participants' preferences by inquiring about specific features they would find valuable in a mental health app, ranging from mood tracking to self-assessment quizzes and more.

What specific features would you find valuable in a mental health app? (Select all that apply) *

- [ ] Mood Tracking
- [ ] Self-assessment Journals
- [ ] Online counselling through various means
- [ ] Guided Meditation
- [ ] Self-care enhancement

How important is it for the app to match you with a therapist who specializes in treating your specific symptoms or concerns? *

- ○ Very Important
- ○ Important
- ○ Neutral
- ○ Not Important

How important is access to educational resources on mental health topics? *

	1	2	3	4	5	
Not Important	○	○	○	○	○	Very Important

Feedback on App Design

This section aims to understand their preferences, expectations, and thoughts on the app's design elements, ensuring that the app's aesthetics align with their comfort and needs.

What colors or visual themes do you associate with a calm and supportive environment? *

Your answer

What aspects of existing mental health apps do you appreciate, and which aspects do you find lacking?

Your answer

How user-friendly do you expect the app's interface to be *

	1	2	3	4	5	
Not user-friendly at all	○	○	○	○	○	Very user-friendly

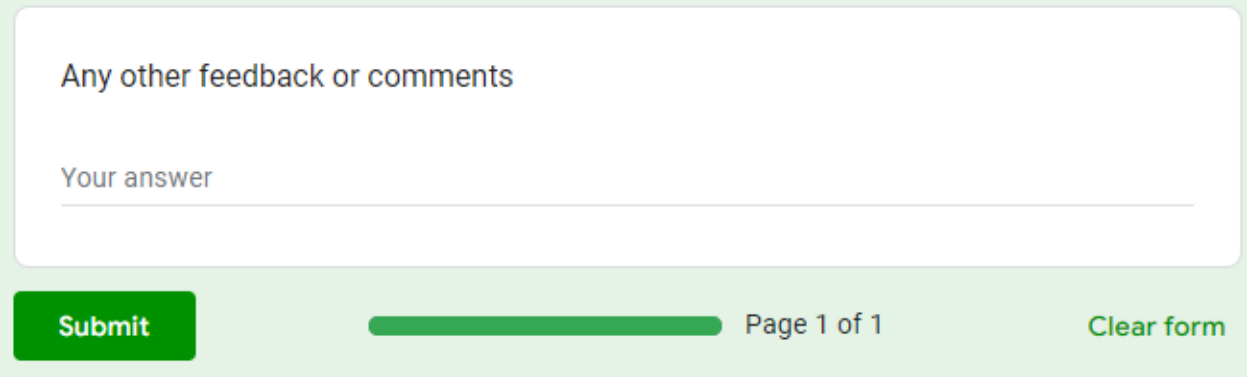
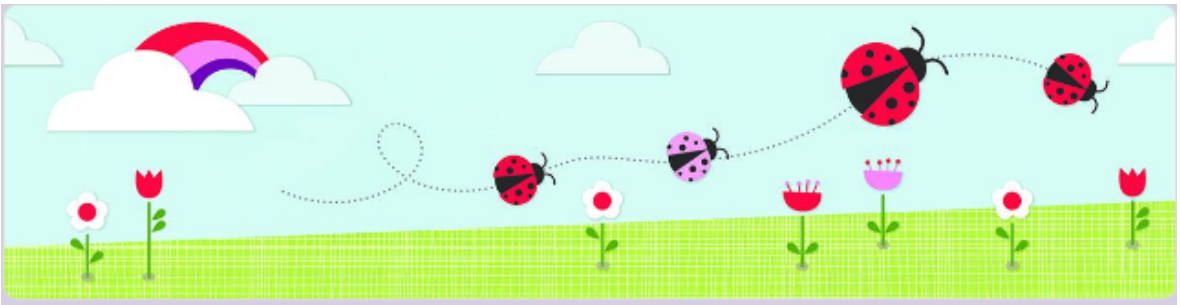


Figure A.1 – User Survey for Mental Health App Development

Appendix B - User Feedback Questionnaire



Feedback on TherapyCorner App

We would love to hear your thoughts on how we can improve this system

jsavindi@gmail.com Switch account

Not shared

* Indicates required question

Have you used a similar app / website before ? *

- ◯ Yes
- ◯ No

It was easy to use the overall app ? *

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

It was easy to book your preferred therapist through the app ? *

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

You were satisfied with the therapist - matching feature provided. *

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

It was easy to communicate with your preferred therapist through the app *

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

You were satisfied with the self-care options provided by the app *

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

You were satisfied with the overall performance of the system *

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

It is likely that you would recommend the TherapyCorner app to others *

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

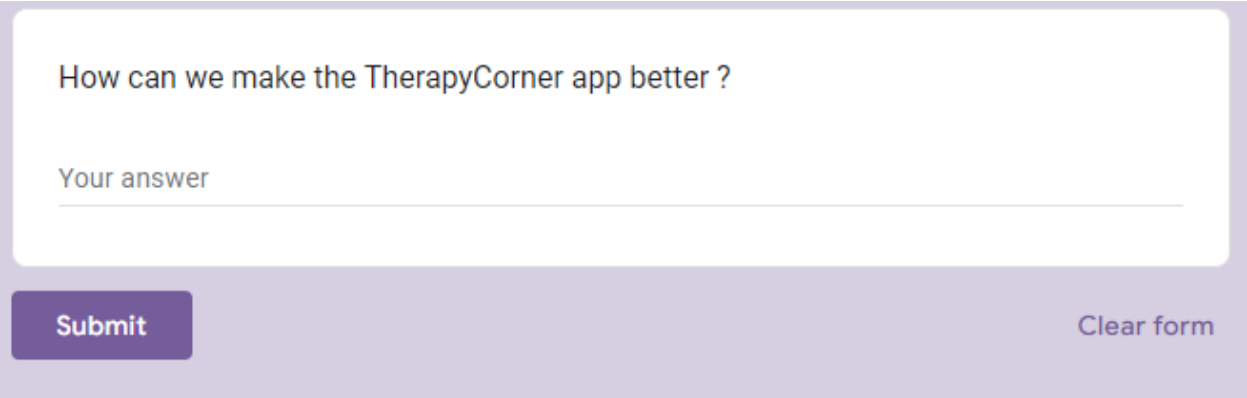


Figure B.1 – User Evaluation Questionnaire

Appendix C - MIS Reports

Introduction

Management Information System (MIS) Reports serve as the backbone of informed decision-making within organizations, providing a comprehensive and organized view of critical data. In the dynamic landscape of modern business, where data is abundant and diverse, MIS Reports play a pivotal role in distilling complex information into meaningful insights. These reports are designed to empower management with a clear understanding of key performance indicators, trends, and financial metrics, allowing them to navigate the challenges and opportunities that shape the course of the organization.

User Demographics and Behavior Reports

User Demographics and Behavior Reports for a therapy app provide valuable insights into the characteristics and behaviors of the app's user base. These reports are instrumental in tailoring services to meet the diverse needs of users and optimizing the overall user experience. By examining demographic information, user profiles, usage patterns, and preferences, the app can deliver personalized and targeted interventions. Insights into referral sources, drop-off points, and accessibility metrics further refine strategies for user acquisition, retention, and inclusivity. The dynamic nature of these reports empowers developers and healthcare professionals to continually enhance the app's efficacy in supporting mental health and well-being.

User Engagement Reports

User Engagement Reports for a therapy app are essential tools that provide insights into how users interact with the platform, fostering a deeper understanding of their engagement levels and preferences. These reports focus on the dynamics of user interaction within the app's therapeutic features. By delving into session frequency, duration, and user activity patterns, the app gains a nuanced view of user commitment and the effectiveness of therapeutic content. Progress tracking and feedback mechanisms enable continuous improvement, allowing the app to tailor its offerings to better meet individual user needs. Understanding the impact of push notifications and analyzing usage trends over time ensures that the app remains a relevant and supportive tool for users on their mental health journey. These reports serve as a compass for refining content, optimizing user experiences, and maintaining the app's role as a valuable resource in promoting mental well-being.

Booking Therapists

The Management Information System (MIS) report for booking therapists is a comprehensive document capturing vital details essential for efficient therapy session management. It encompasses key elements such as the patient's name, therapist's name, booking date and time, location, and the specific service provided. Additionally, the report includes information on the mode of communication, delineating whether the session is conducted via phone call, chat, or video call. This holistic representation not only aids in organizing and coordinating therapy sessions but also provides valuable insights into the preferred communication methods, allowing healthcare professionals to tailor their services to meet individual patient needs effectively. The MIS report acts as a central hub, fostering streamlined scheduling, enhancing therapist-patient interactions, and contributing to the overall optimization of therapeutic processes. This is illustrated in the Figure B.1 – Booking Therapists

Patient Username	Therapist Username	Service	Date	Time	Location
Lev	Mek	Individual Counseling	10/10/23	10:00:00	Colombo
Yuop	Lola	Family Therapy	10/10/23	11:00:00	Gampaha
Ludarcris	Mek	Individual Counseling	10/10/23	13:00:00	Colombo
Maxi	Menol	Art Therapy	10/10/23	15:00:00	Colombo
Yuu	Serene	Grief Counselling	11/10/23	10:00:00	Ampara
Lev	Lola	Family Therapy	12/10/23	15:00:00	Gampaha
Ludarcris	Mek	Individual Counseling	12/10/23	10:00:00	Colombo
Jolie	Nikesh	Family Therapy	12/10/23	15:00:00	Gampaha
Ludarcris	Menol	Art Therapy	13/10/23	15:00:00	Colombo
Yuop	Lola	Family Therapy	13/10/23	11:00:00	Gampaha
Maxi	Riftan	Individual Counseling	13/10/23	10:00:00	Colombo

Figure B.1 - Booking Therapists

Mood Tracking

The Management Information System (MIS) report on patient mood tracking encapsulates essential information: patient name, date, recorded mood of the day, and associated reasons. This report empowers therapists to monitor emotional trends, identify triggers, and customize interventions. Serving as a concise tool for personalized mental health care, it facilitates informed discussions and tracks the effectiveness of therapeutic strategies. This is illustrated in Figure B.2 – Mood Tracking.

Patient Id	Patient Name	Mood	Date	Reason
P00001	Bill Nymes	Happy	10/10/23	Good Day
P00001	Bill Nymes	Angry	11/10/23	Not so good
P00001	Bill Nymes	Happy	12/10/23	test
P00005	Cristopher Nolan	Sad	12/10/23	test
P00005	Cristopher Nolan	Angry	13/10/23	
P00002	Ceira Thomas	Happy	13/10/23	Test111
P00009	Timan Husian	Happy	13/10/23	

Figure B.2 - Mood Tracking

Therapist Details

The Therapist Details MIS report offers a concise snapshot of therapist demographics, services, and accessibility. It highlights gender distribution, linguistic diversity, and the range of therapeutic services offered. Additionally, it provides insight into therapists' geographical locations and session mediums, aiding in understanding accessibility and telehealth trends. This report is instrumental in optimizing service provision to cater to diverse client needs. This is illustrated in Figure B.3 –Therapist Details.

Therapist Name	Gender	Service	Offered_Languages	Location	Medium_Code
Bill Nymes	Male	Grief Counselling	English	Colombo	Online
Ceira Thomas	Female	Individual Counselling	English	Gampaha	Online
Dilliana Croos	Female	Group Therapy	English/Sinhala	Galle	Online
Meki Jirat	Male	Group Therapy	English	Colombo	Online/Offline
Cristopher Nolan	Male	Psychotherapy	English/Sinhala	Ampara	Online
Timan Husian	Male	Art Therapy	English	Colombo	Online/Offline

Figure B.3 – Therapist Details

Appendix D – User Manual

Introduction

This User document was created to educate users about how to interact with the system easily. The audience of the document includes both Patient users and Therapist users. An assumption that the users are not technically mature was made.

Getting Started

User Access and Roles

There are two types of users in the system, Patients and Therapists. As depicted in Table D.1 – User roles of the system, each has separate user roles and features that are enabled to them.

User	Functionalities
Patient	Create User Create User Profile Search and Book Therapist Match with Therapist Create Chatroom Chat with Therapist Add Journal Entry View/Edit Journal Entry Add a Daily Mood View Daily Mood Listen to Relaxation Music View Self-Affirmations
Therapist	Create User Create User Profile View Booked Appointments Approve Appointments Cancel Appointments Chat with Patient

Table D.1 – User roles of the system

Login Interface

When the user clicks on the app icon, the first page that is loaded is the login screen. If the user account is already registered in the system, The user enters the correct username (case sensitive) and password. The username and password will be validated once the user clicks Login button. If given correct credentials the user will be able to login to the system.

If the user does not have an account created, the user clicks Sign up link. This will direct them to the Sign-Up page. The Login Page is illustrated in Figure D.1 - Login UI

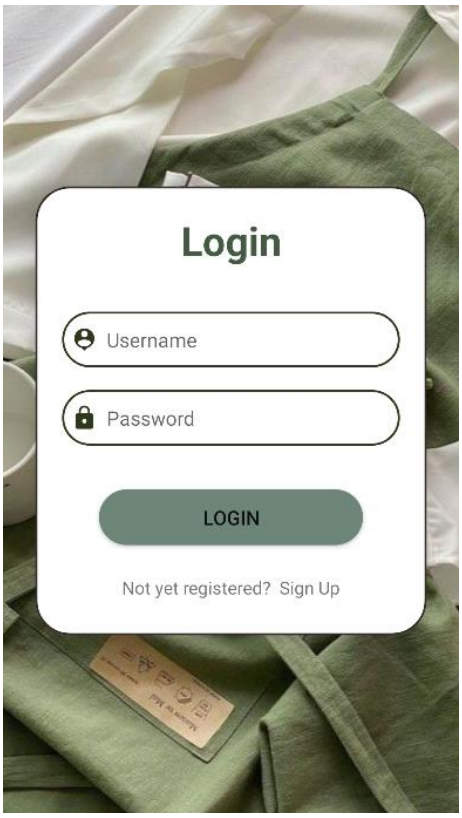


Figure D.1 – Login UI

Sign-up Interface

If the user does not have an account already registered in the system, the user should do so on the Sign-up page.

In the sign-up page the user will provide Name, Email, Username and Password fields. The user has the choice to register as a therapist account or patient account.

The Sign-up Page is illustrated in Figure D.2 – Sign-up UI

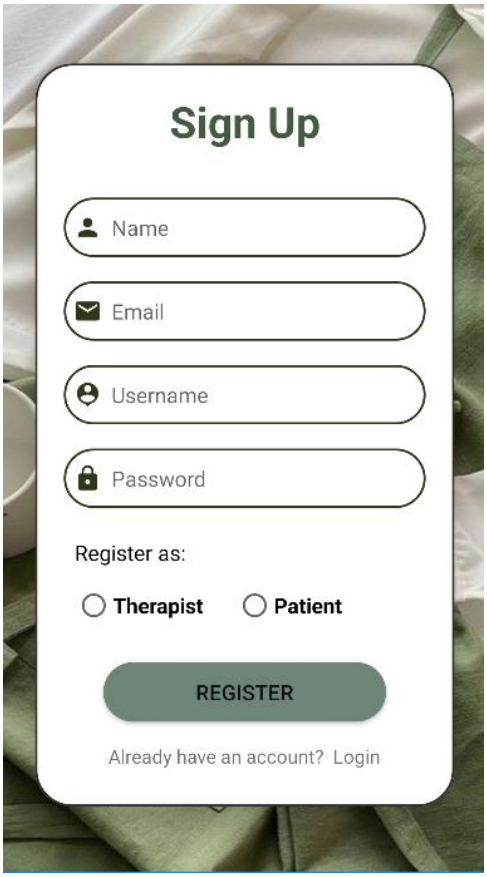


Figure D.2 – Sign-up UI

Patient and Therapist Dashboards

If a patient account was registered and the user enters the correct credentials in Login page, they will be directed to Patient Dashboard. The Patient Dashboard is illustrated in Figure D.3 – Patient Dashboard.

If a therapist account was registered and the user enters the correct credentials in Login page, they will be directed to Therapist Dashboard. The Therapist Dashboard is illustrated in Figure D.4 – Therapist Dashboard.

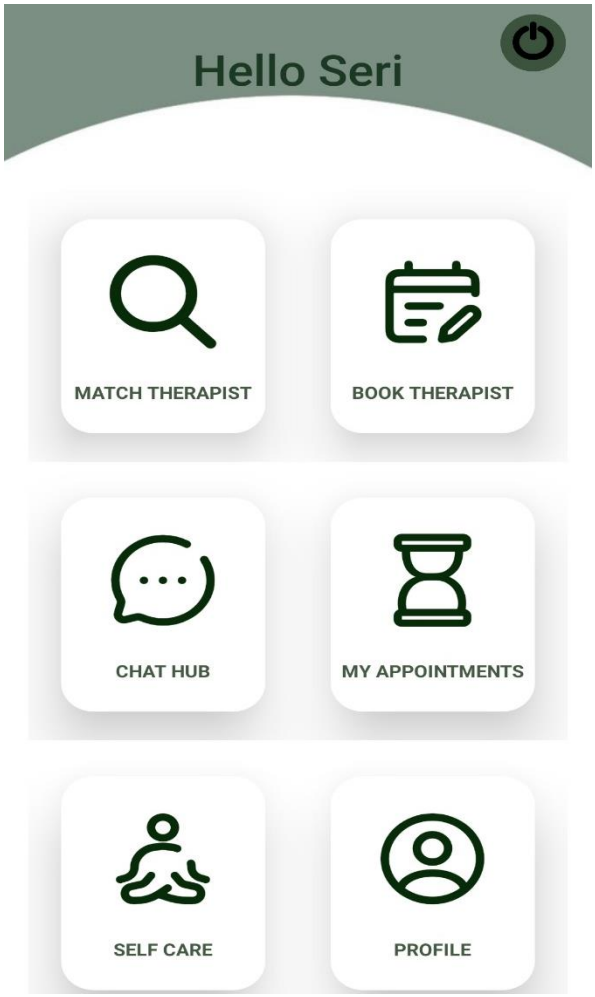


Figure D.3 – Patient Dashboard

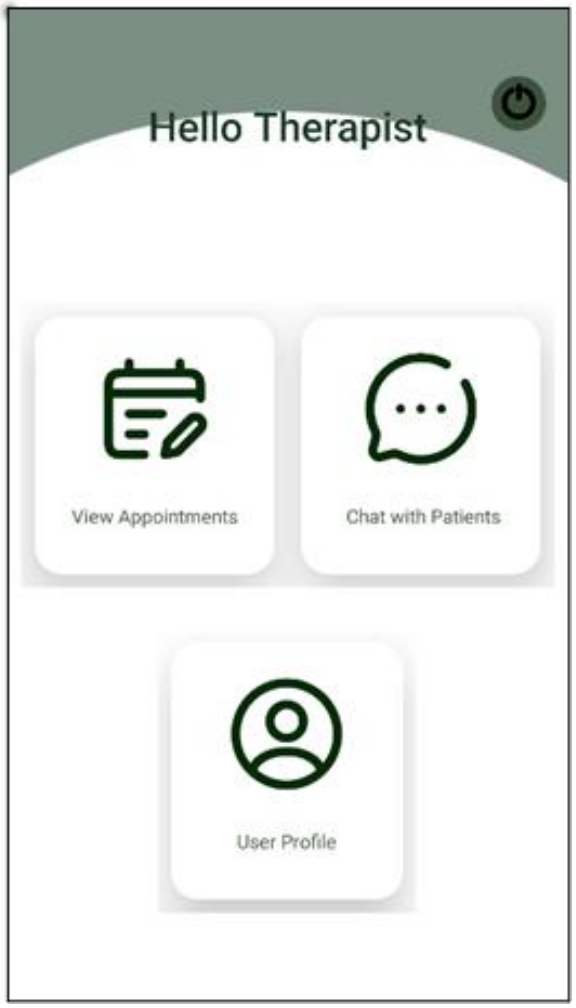


Figure D.4 – Therapist Dashboard

Patient and Therapist Profile Creation

Profile creation is very important. Until either user creates a profile in the system they will not be picked for any interactions between the two user roles.

Patient – The user clicks the User Profile icon in dashboard. The user can provide necessary information to the form that is depicted in Figure D.5 – Patient Profile Interface and Click Save to create the profile . Every field is mandatory.

Therapist – The user clicks the User Profile icon in dashboard. The user can provide necessary information to the form that is depicted in Figure D.6 – Therapist Profile Interface and Click Save to create the profile . Every field is mandatory.

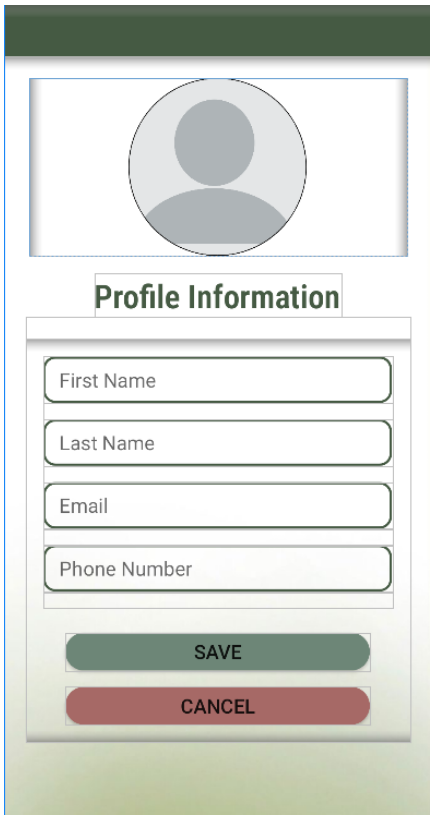


Figure D.5 – Patient Profile Interface

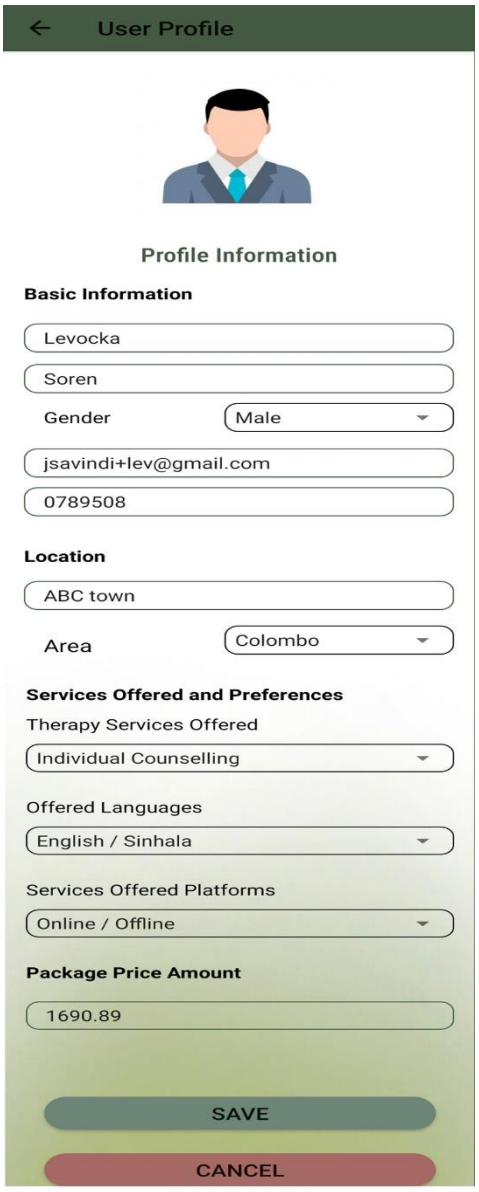


Figure D.6 – Therapist Profile Interface

Therapist Booking Process

The patient user clicks Book Therapist icon in dashboard. In the search bar Patient user enters name of Therapist and click Search icon. Users can click the search button without entering text to view all Therapists. This is depicted in Figure D.7 – Therapist searching page.

The user clicks on the needed therapist. The user will be directed to the Read-only profile page of the selected therapist. The user clicks the Book Button to go to the Booking page. This is depicted in Figure D.8 – Therapist read-only page.

The user selects date and time from the dropdown and click Confirm Booking. This is depicted in Figure D.9 – Therapist Booking page.

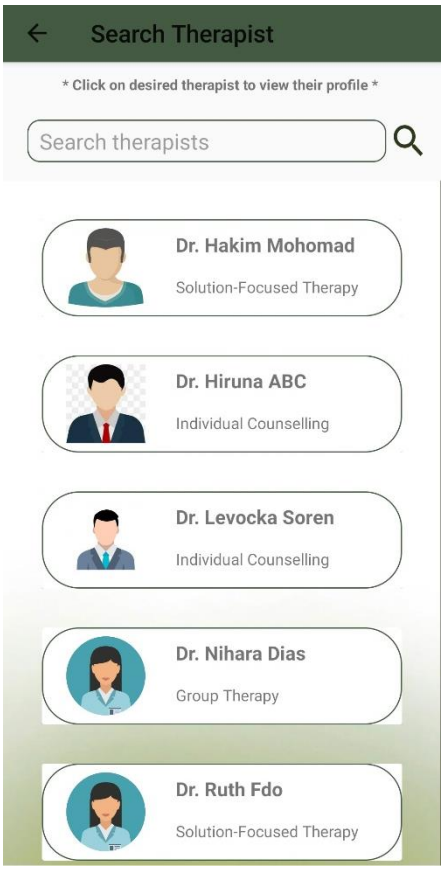


Figure D.7 – Therapist searching page

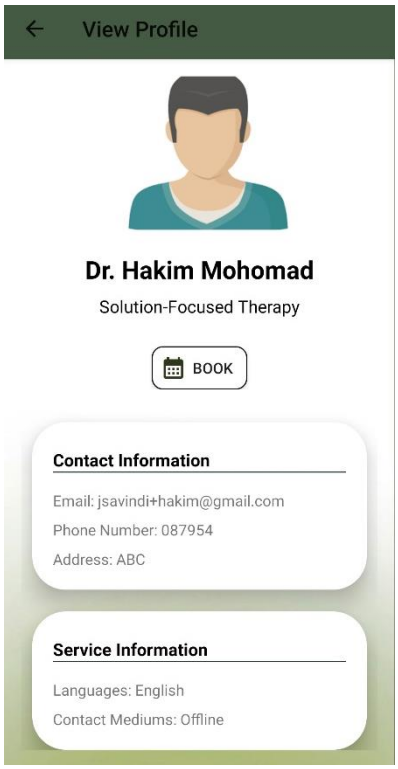


Figure D.8 – Therapist read-only page

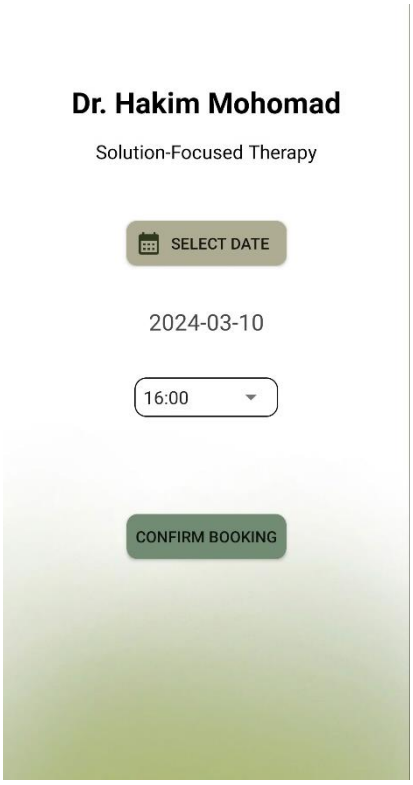


Figure D.9 – Therapist Booking page

Therapist Match

The patient user clicks Match Therapist icon. The user answers the questions. The user gets the best match therapist by the answers. This is depicted in Figure D.10 – Therapist Match page.

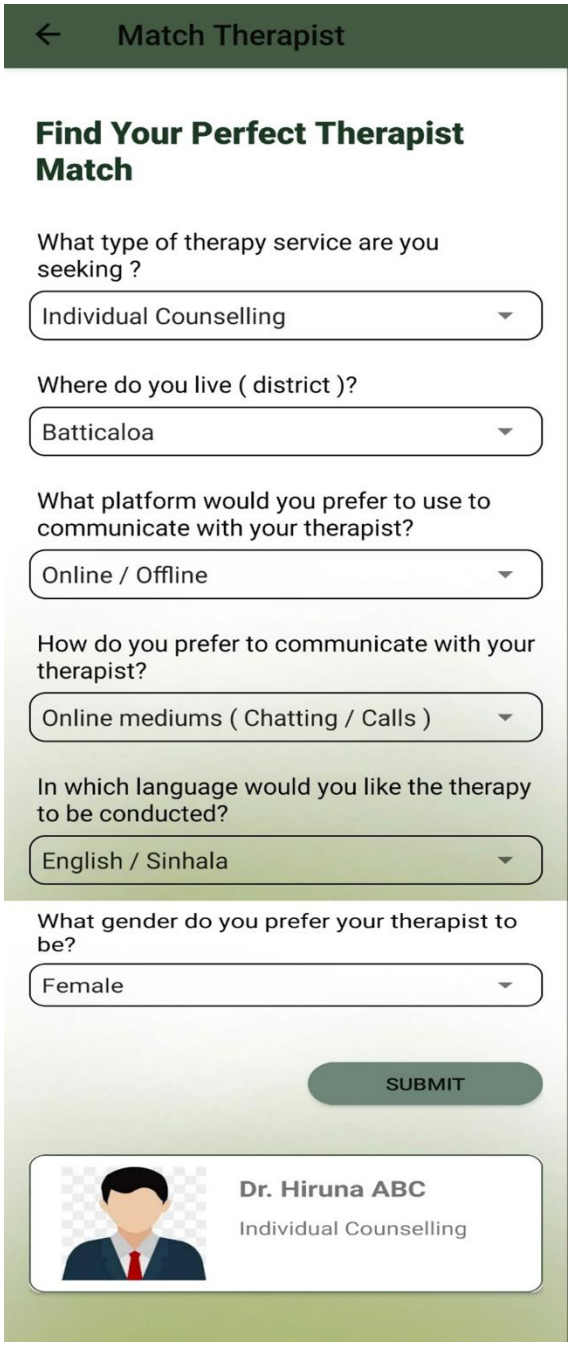


Figure D.10 – Therapist Match page.

In-app Chat

Patient - Only patient users can create a chatroom. The patient user clicks Chat Hub icon in the patient dashboard. The recent chat therapist users will be displayed when clicked the chat hub page. The patient user can click on a therapist and continue the chat.
If a patient user wants to start a chat with a new therapist, the patient user clicks on the + icon at the bottom. The patient user then should search for therapist and click on therapist to start a new chatroom. The patient user can then send a message to the new therapist.

This process is depicted in Figure D.13 – Patient Chat process.

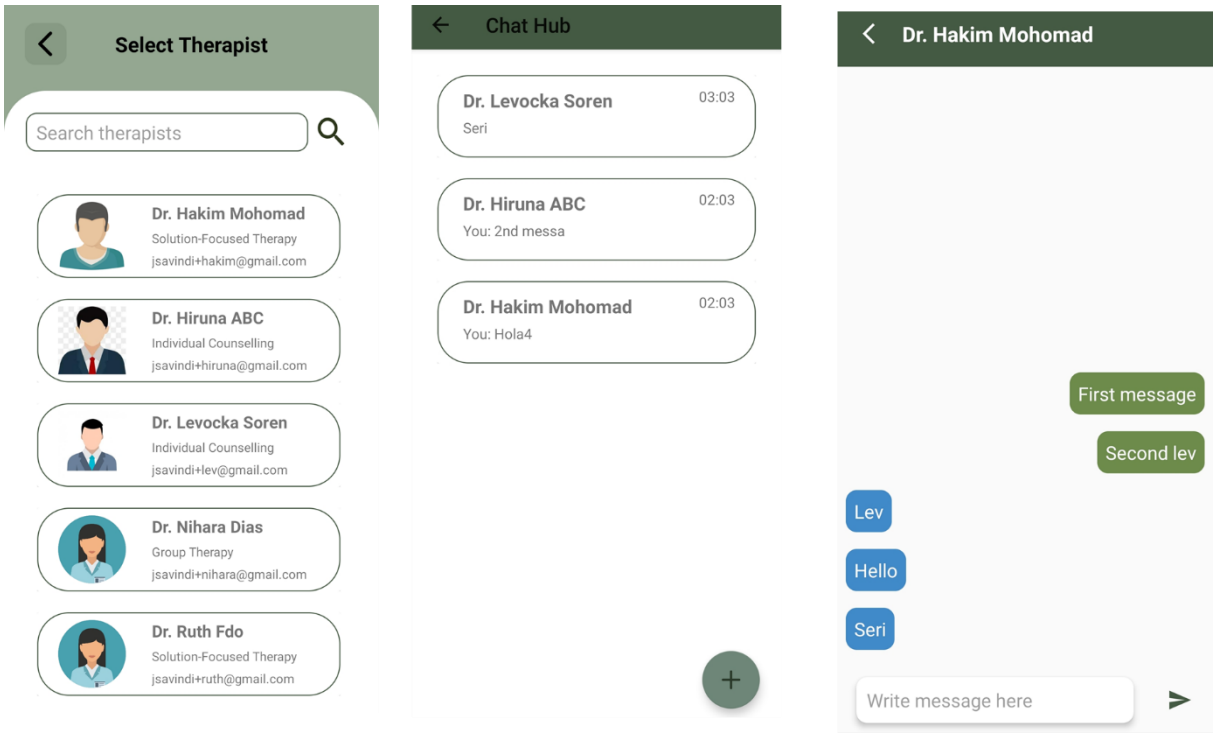


Figure D.13 – Patient Chat process

Therapist - If the user is a therapist user. The therapist user clicks Chat Hub icon in the therapist dashboard. The recent chat patient users will be displayed when clicked the chat hub page. The therapist user can click on a patient and continue the chat.

This is depicted in Figure D.14 – Therapist Chat page.

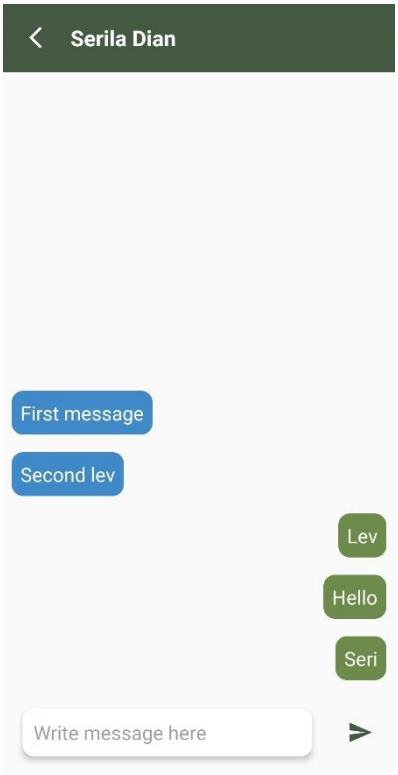


Figure D.14 – Therapist Chat page

Therapist Appointments

After a therapist is booked. The therapist user clicks Appointments icon in the therapist dashboard. The pending booked appointments can be viewed of the therapist user will be displayed when clicked the Appointments page. The therapist user can approve or reject on an appointment. This is depicted in Figure D.15 – Therapist View Appointments.

Therapist cannot reject the appointment if the current date is only 1 day before the booking date. This is depicted in Figure D.16 – Reject alert.

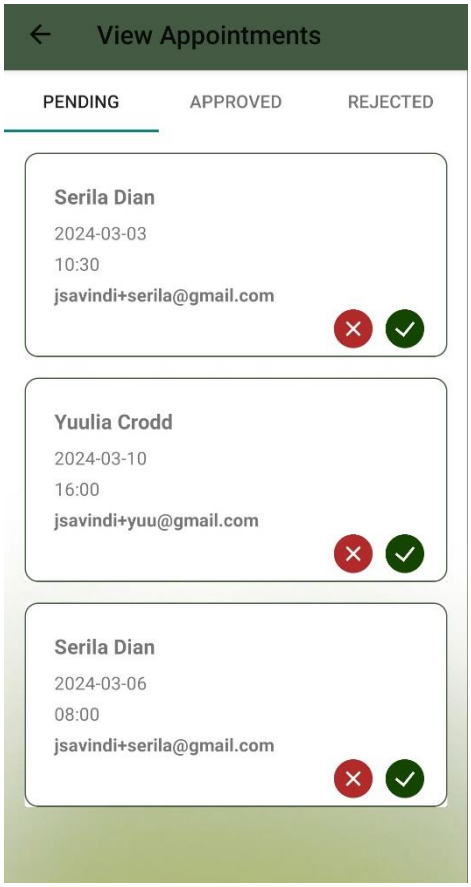


Figure D.15 – Therapist View Appointments

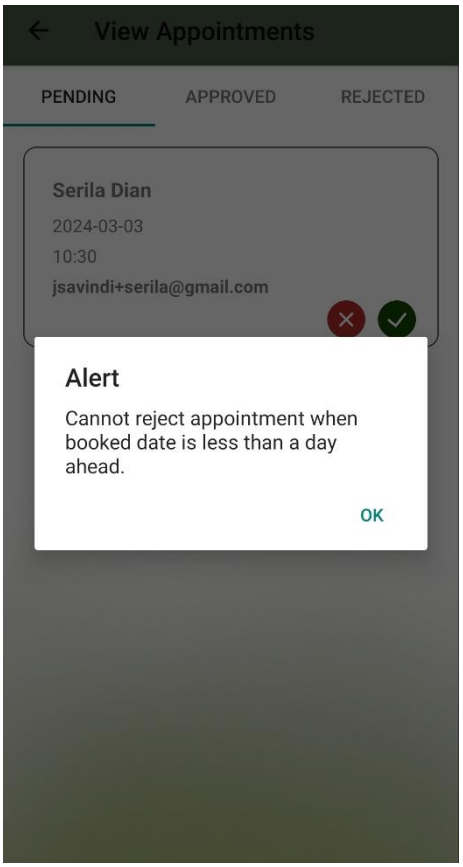


Figure D.16 – Reject alert

Self-Care pages

These pages can only be accessed by patient users. Click on the Self-care icon form the patient user dashboard to navigate to self-care pages. This can be seen in Figure D.17 – Self-care pages.

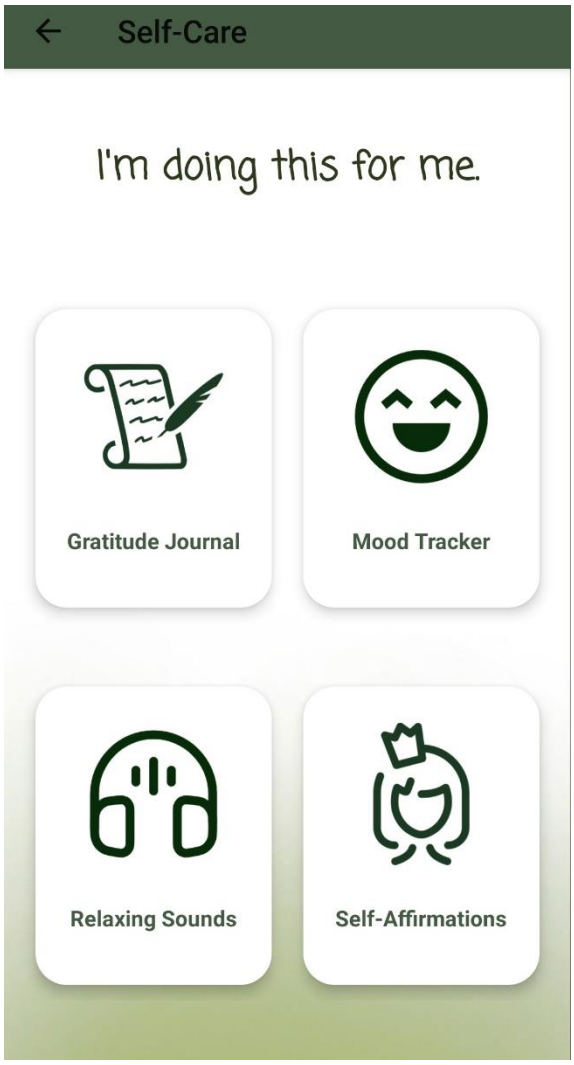


Figure D.17 – Self-care pages.

Gratitude Journal

The user clicks on the Gratitude Journal icon self-care pages dashboard. The already written entries of the users will be displayed. To add a new note, the user clicks the + icon to be directed to add note page. Add title and body text. Click Add note. This can be seen in Figure D.18 – Gratitude Journal.

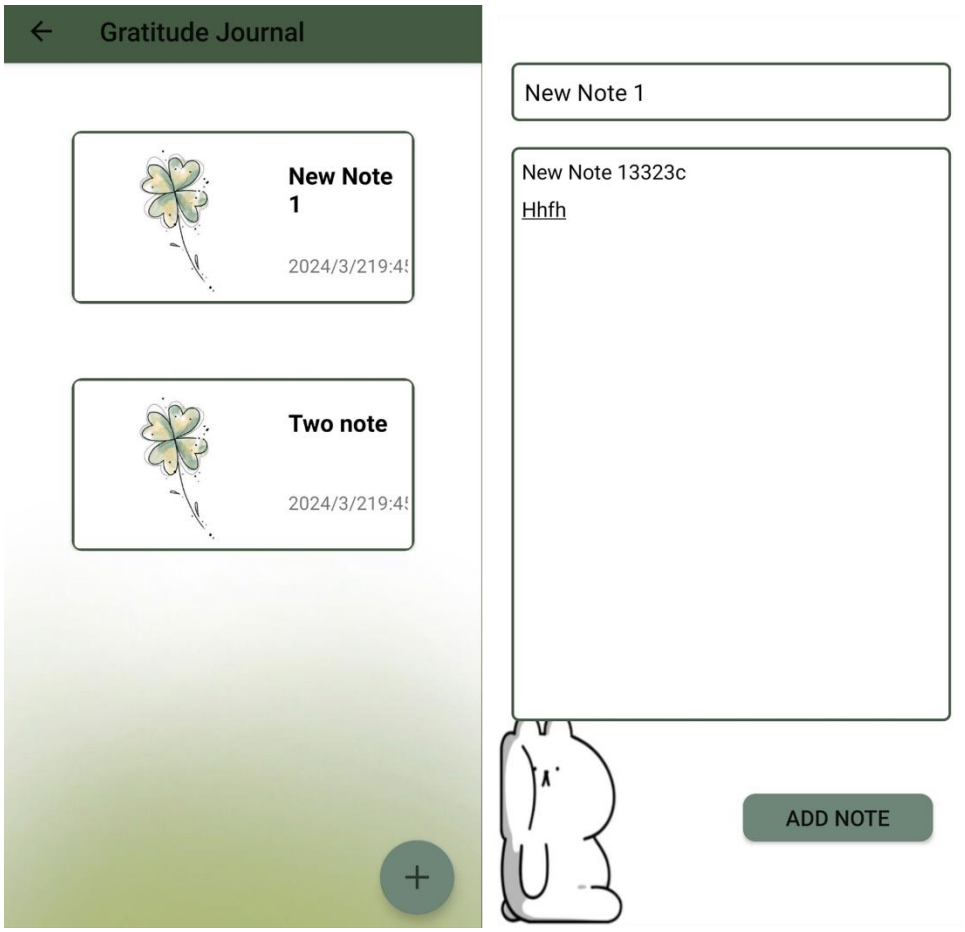


Figure D.18 – Gratitude Journal

Mood Tracker

The user clicks on the Mood Tracker icon self-care pages dashboard. The user selects a date, picks mood, and gives a reason. The user can view moods of dates he has entered the mood for. This can be seen in Figure D.19 – Mood Tracker.

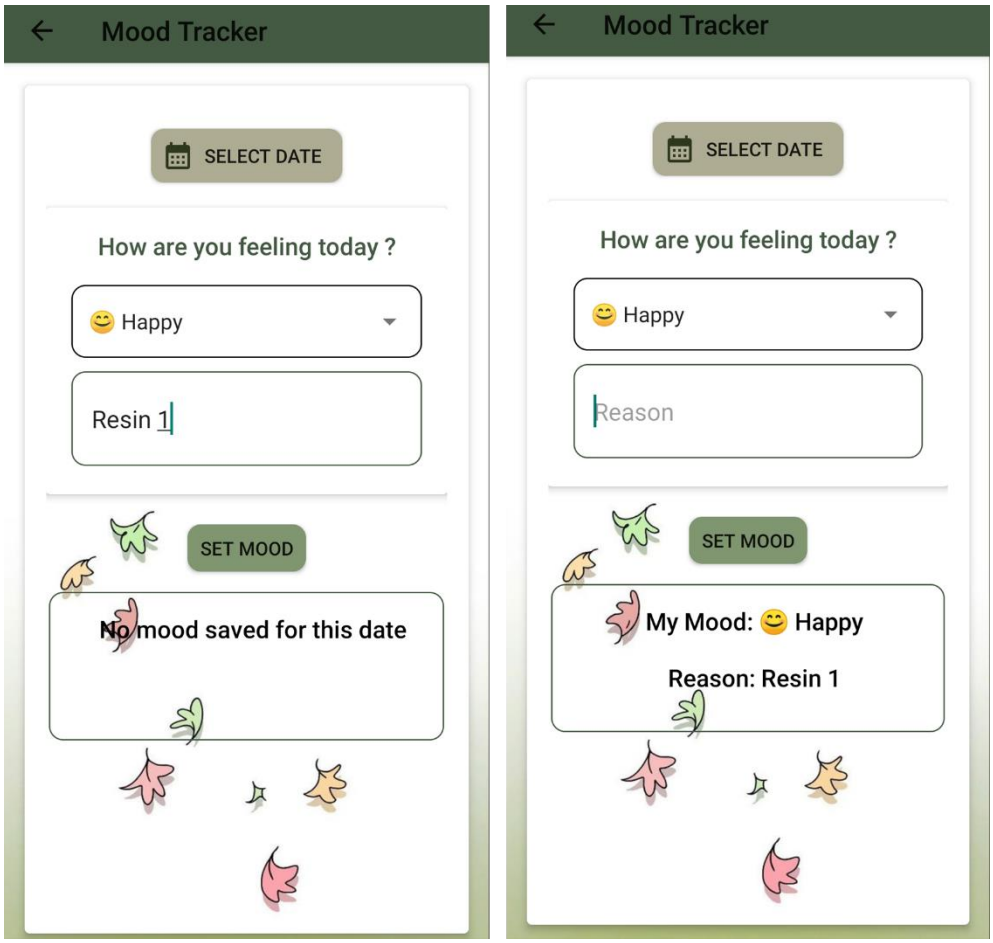


Figure D.19 – Mood Tracker

Relaxation Music and Self-Affirmations

Relaxation Music - The user clicks on the Relaxation Music icon self-care pages dashboard. The user clicks on the preferred music. The user can listen to the music. This can be seen in Figure D.20 – Relaxation Music.

Self- Affirmations - The user clicks on the Self-Affirmations icon self-care pages dashboard. The user can view affirmations on cards. Can navigate to previous cards and next cards. This can be seen in Figure D.21 – Self-Affirmations.

Figure D.20 – Relaxation Music

Figure D.21 – Self-Affirmations

Appendix E – Design Documentations

Use Case Scenarios

Some of the main use case scenarios are given below.

Use Case Name		User Login
Preconditions		User should have already created an account in the system
Normal Flow	**Description**	1. User opens the application 2. User enters the correct username in username field 3. User enters the correct password in password field 4. User clicks the login button
	Postconditions	User gets logged into system If the user gives correct therapist credentials they are redirected to Therapist dashboard If the user gives correct patient credentials they are redirected to the Patient dashboard
Alternative flows and exceptions		If user enters incorrect username or password, error message should be displayed, and user should not be able to log into any system
Nonfunctional requirements		Security – User authentication mechanisms should be present

Use Case Name		Patient Match Therapist
Preconditions		The therapists should need to fill in their profile page
Normal Flow	**Description**	1) User opens the application 2) User will login as a patient user and be directed to patient dashboard 3) User navigates to Match Therapist page by clicking Match Therapist button 4) User picks answers from dropdowns as to they need. 5) User clicks Submit button
	Postconditions	The best match of therapist according to content-based filtering should be displayed for the user
Alternative flows and exceptions		
Nonfunctional requirements		Reliability - The most correct/matching therapist should be displayed Performance – The best match should be displayed in under 3- 5 secs

Use Case Name		Therapist creates user profile
Preconditions		Therapist user should be logged into the system
Normal Flow	**Description**	1) User opens the app 2) User login as a therapist user and be directed to therapist dashboard 3) Therapist users navigate to User Profile page 4) Therapist user will Add image 5) Therapist user will enter details to other fields 6) Therapist user will click Save button
	Postconditions	Success message should be displayed to user The data should be saved in the firebase table The data should be saved from the UI side
Alternative flows and exceptions		If user does not enter data to at least one field, warning message should be displayed (since all fields are mandatory)
Nonfunctional requirements		Performance – The data should be saved, and success message should be loaded within 5 secs

Use Case Name		Patient Chats with New Therapist
Preconditions		The therapists should need to have created their profile page
Normal Flow	**Description**	1) User opens the application 2) User will login as a patient user and be directed to patient dashboard 3) User navigates to Chat Hub page by clicking Chat Hub button 4) User clicks on the add icon at the bottom, then user will be directed to a search therapist page 5) User will enter search term / or just click on the Search icon, the therapists should be loaded 6) From the loaded list of therapists, the user will click on the needed therapist 7) After the user get the chatroom open with the therapist, user will start chat with therapist 8) User will write and send message
	Postconditions	A chatroom will be created between the patient and therapist The user will be able to send a text to the therapist This therapist will be in the recent chat list
Alternative flows and exceptions		
Nonfunctional requirements		Performance – The messages should be viewed by therapist in less than3 secs after sending them. Security – The messages between therapists and the patient should be secure

Use Case Name		Patient Books a therapist
Preconditions		The therapists should need to have created their profile page
Normal Flow	**Description**	1) User opens the application 2) User will login as a patient user and be directed to patient dashboard 3) User clicks the Book Therapist icon 4) User will enter search term / or just click on the Search icon, the therapists should be loaded 5) From the loaded list of therapists, the user will click on the needed therapist 6) User views the profile of the therapist in read only format 7) User clicks the Book button and gets navigated to the booking page 8) User selects the date from date picker 9) User selects the tie from the time dropdown 10) User will click the Book Confirm Button 11) User will give payment details to the payment gateway opened 12) User will click Pay button
	Postconditions	The booking will be reserved, and success message displayed The booking details will be interested to table An email will be sent to Therapist with booking details The booked appointment will be displayed in Therapist dashboard → View Appointments → Pending tab of the booked therapist Payment receipt should be sent to patient's email
Alternative flows and exceptions		If user selects an already booked spot, error message should be displayed. If user enters incorrect payment, the payment and the booking should not be made
Nonfunctional requirements		Security – The payment gateway should be securely implemented

Use Case Name		Therapist cancels an appointment
Preconditions		A pending appointment for the therapist should already have been created
Normal Flow	**Description**	1) User opens the app 2) User login as a therapist user and be directed to therapist dashboard 3) Therapist users navigate to View Appointments page 4) The therapist should click the 'x' button oof the pending appointment
	Postconditions	The appointment should be cancelled The paid amount should be refunded The patient of the appointment should be receiving an email
Alternative flows and exceptions		If the appointment date is 1 day + the current date then error message is displayed, and therapist cannot cancel the appointment.
Nonfunctional requirements		Security – The payment gateway should be securely implemented