We Matter

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A Final Year Project submitted to the Department of Software Engineering, Faculty of Engineering Sciences, Bahria University, Islamabad in the partial fulfillment for the award of degree in Bachelor of Software Engineering

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It is to certify that the above students' project has been completed to my satisfaction and to my belief, its standard is appropriate for submission for evaluation. I have also conducted plagiarism test of this thesis using HEC prescribed software and found similarity index at 15% that is within the permissible limit set by the HEC. I have also found the thesis in a format recognized by the department.

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We Matter

SUSTAINABLE DEVELOPMENT GOALS

SDG No	Description of SDG	SDG No	Description of SDG
SDG 1	No Poverty	SDG 9	Industry, Innovation, and Infrastructure
SDG 2	Zero Hunger	SDG 10 ✓	Reduced Inequalities
SDG 3 ✓	Good Health and Well Being	SDG 11	Sustainable Cities and Communities
SDG 4	Quality Education	SDG 12	Responsible Consumption and Production
SDG 5	Gender Equality	SDG 13	Climate Change
SDG 6	Clean Water and Sanitation	SDG 14	Life Below Water
SDG 7	Affordable and Clean Energy	SDG 15	Life on Land
SDG 8	Decent Work and Economic Growth	SDG 16	Peace, Justice and Strong Institutions
		SDG 17	Partnerships for the Goals

RANGE OF COMPLEX PROBLEM SOLVING

Range of Complex Problem Solving			
	Attribute	**Complex Problem**	
1	Range of conflicting requirements ✓	Involve wide-ranging or conflicting technical, engineering and other issues.	
2	Depth of analysis required ✓	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models.	
3	Depth of knowledge required ✓	Requires research-based knowledge much of which is at, or informed by, the forefront of the professional discipline and which allows a fundamentals-based, first principles analytical approach.	
4	Familiarity of issues ✓	Involve infrequently encountered issues	
5	Extent of applicable codes ✓	Are outside problems encompassed by standards and codes of practice for professional engineering.	
6	Extent of stakeholder involvement and level of conflicting requirements ✓	Involve diverse groups of stakeholders with widely varying needs.	
7	Consequences ✓	Have significant consequences in a range of contexts.	
8	Interdependence ✓	Are high level problems including many component parts or sub-problems	
Range of Complex Problem Activities			
	Attribute	**Complex Activities**	
1	Range of resources ✓	Involve the use of diverse resources (and for this purpose, resources include people, money, equipment, materials, information and technologies).	
2	Level of interaction ✓	Require resolution of significant problems arising from interactions between wide ranging and conflicting technical, engineering or other issues.	
3	Innovation ✓	Involve creative use of engineering principles and research-based knowledge in novel ways.	
4	Consequences to society and the environment ✓	Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation.	
5	Familiarity ✓	Can extend beyond previous experiences by applying principles-based approaches.	

Abstract

We Matter is an online tool created to assist people with their mental well-being through a secure and easy-to-access solution. The application has a variety of features, such as sessions with specialists, discussion boards among peers, a personal journal, mood monitoring, AI chatbot, and self-assessment modules. The main goal of this initiative is to blend clinical and self-help approaches in one product by providing professional guidance and community support in parallel. The program enables its users to have anonymous conversations in online forums, book meetings with licensed therapists, and monitor their improvement using embedded tools. Regarding technologies, the application utilizes modern innovations in web programming. React is applied to create the front-end of the system, whereas Node.js and Express manage backend operations. MongoDB is used for storing information about users efficiently. Moreover, we incorporated WebSockets to provide immediate messaging between customers and specialists in real time. Finally, We Matter represents innovative ideas in the digital mental health sector because it integrates clinical solutions, AI, and community support into one service.

Keywords*: Mental Health, MERN Stack, Depression, DASS-21, Artificial Intelligence, React JS, Real-Time Chat, Therapy Platform, Web Application*

Dedication

This feeling that we have towards such amazing individuals is due to our amazing families. It was their constant support through their prayers, encouragement, and blessings that gave us the ability to progress from one stage to another. It was only because of their many sacrifices and total belief in us that We Matter came into being.

Acknowledgments

We are deeply grateful to Almighty Allah for granting us the strength, patience, and determination to complete this project successfully.

We appreciate the valuable guidance and encouragement provided by our project supervisor, Engr. Bilal Ashraf Awan, which made this project's successful completion possible. Our special thanks go to Ms. Javeria Asim (Department of Psychology) for her valuable advice and encouragement during the development of this project.

We are also thankful to our teachers, friends, and everyone who helped us directly or indirectly. Lastly, we appreciate each other's teamwork, dedication, and hard work in making We Matter a reality.

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Chapter 1

Introduction

1. Introduction

Mental health is a problem in our world today. People of all ages deal with stress, anxiety and emotional issues. But it is hard for them to get the help they need because it can be expensive and people are embarrassed to talk about it **[1], [2]**. They do not know where to go. The old ways of getting therapy are good. Many people cannot use them.

We want to help with this problem, so we made We Matter. We Matter is a website that helps people with their health. It is easy to use and safe. We Matter has things to help people, such as AI chatbot that can talk to you, a place to write down your thoughts, a way to track how you are feeling, groups where you can talk to other people who are going through the same things and therapy sessions with professionals.

We Matter uses the internet to help people with their health. We want to make a place where people can talk about how they're feeling and see how they are doing over time. We Matter is a place where people can feel safe and get the help they need with their health and that is what We Matter is all about helping people with their mental health.

1.1. Motivation

The increasing number of individuals, particularly depressed students, motivated us to develop an application that would be cost-effective and accessible. Professional counselling works miracles. Unfortunately, professional counselling is too expensive and hard to reach by all. It is not easy to open up to someone about personal problems because of negative perceptions about health matters **[2]**. Some of them face a challenge of no website providing therapy, community support, and self-help resources. It, therefore, becomes necessary to have a secure place where people can share their concerns anonymously. To address the issue, We Matter application has been developed to meet the needs. First, We Matter gives anonymous communication. Secondly, it allows for interactive communication, therapy, and provision of community support and self-help resources needed for them to stay healthy.

1.2. Objectives

Objectives of We Matter are:

- Develop a website for providing mental health services using MERN stack development.
- Incorporate AI-driven chatbots that can provide instant guidance and counselling.
- To implement mood tracking and journaling features for self-awareness.
- Offer online therapy sessions from licensed therapists.
- Promote mental well-being with self-help tools and resources.

1.3. Main contributions

- Comprehensive Mental Health Platform: Designed an integrated web-based platform, which integrates therapy, self-help tools, and community support into one platform.
- AI-Based Emotional Support: Added an AI chatbot, which guides users in real-time.
- Community Support for Registered Users: Enabled communication between registered users using support groups where people can exchange experience and support one another and stay anonymous.
- Self-Help and Tracking Tools: Added capabilities like mood tracking, journaling, and self-assessment to enable users to track and learn their emotional health.
- Professional Therapy Integration: Assisted with a session booking and management system with licensed professionals.

1.4. Report organisation

The structure of the report is shown in Figure 1.1 and described below:

Chapter 2: Literature Review

Discusses about the current research and work in the area of digital mental health, depression assessments, and AI/ML in therapy. This chapter assists in determining the gap that We Matter tries to close.

Chapter 3: System Requirements

Considers both functional as well as non-functional requirements of the system including use case diagrams and other interface/database requirements.

Chapter 4: System Design

Details system architecture, design choices, and technologies/tools applied in the construction of We Matter website.

Chapter 5: Implementation

The chapter describes the implementation process, the interconnectivity of the modules, and the integration of artificial intelligence and assessment algorithms.

Chapter 6: Testing and Evaluation

The chapter describes the testing procedure, website evaluation results, and user or tester feedback.

Chapter 7: Conclusion and Future Directions

The chapter contains conclusions regarding the project and recommendations for improving the project's impact on We Matter.

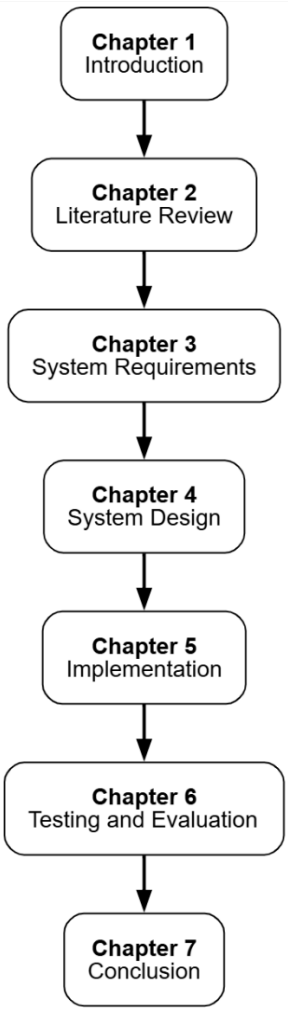


Figure 1.1 Thesis Organization

Chapter 2

Background Study/ Literature Review

2. Background Study/Literature Review

Everything that is required as far as the basics, including information, data, research, and technological aspects of development, has been covered in this chapter. The existing websites, their strengths, and limitations have also been discussed in this chapter. It will be helpful to understand what the gap in the area is and what needs to be done accordingly.

2.1. Key Concepts

Mental health needs to be a concern in the world, particularly among students and professionals, owing to increased stress, anxiety and depression. Although effective, traditional therapy is sometimes constrained by cost, availability and stigma. The current digital tools such as web applications and artificial intelligence (AI) systems can ensure this gap by providing such services as journaling, mood tracking, guided exercises, and chatbot-based support **[4]**. We Matter is a harmonization of these features and community interaction and professional therapy providing mental health care in a flexible and accessible manner.

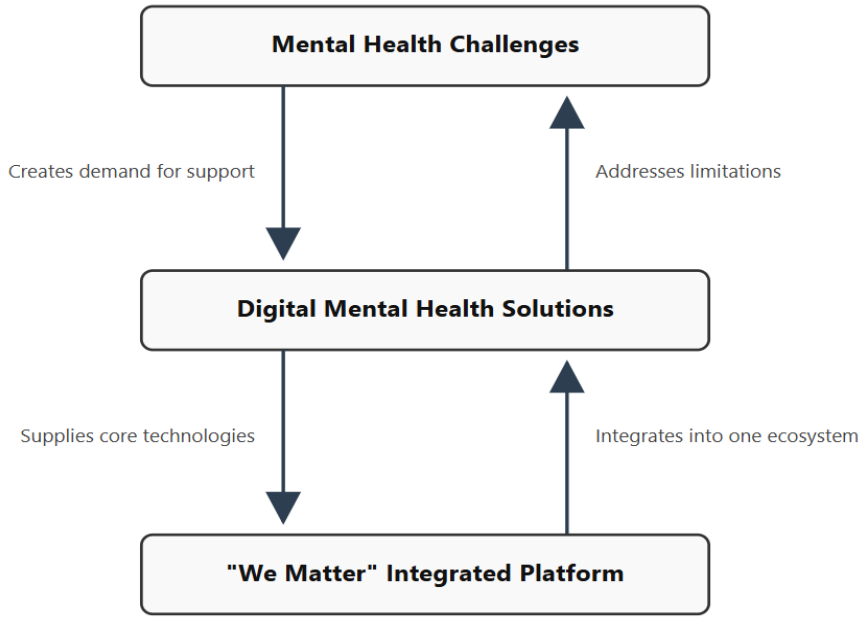


Figure 2.1 Relationship between the enterprise integration concepts

2.1.1. Depression and DASS-21 Scale

Depression is a widespread yet severe mental disorder that has adverse effects on individual well-being. To measure it, We Matter uses the **DASS-21 (Depression, Anxiety, Stress Scales)** which is a psychological test that measures the severity of depression symptoms.

2.1.2. Related Work / Existing Solutions

Many mental health platforms are available today, each with their own way of offering therapy and support. Some of the major ones are:

Table 2.1 Comparison of Existing Mental Health Platforms

Application	Strengths	Weaknesses	Relation to We Matter
BetterHelp	Professional therapy sessions	Expensive, subscription-based	Inspired therapy module
Talkspace	Online counseling, licensed therapists	Limited free features	Inspired appointment system
Wysa	AI chatbot, CBT-based support	Limited personalization	Inspired chatbot feature
Flo (formerly 7 Cups)	Anonymous peer support, active community listeners	Limited professional therapy integration, quality varies	Inspired community support feature

Though these programs are capable of providing useful assistance, they generally cater for either work-related or personal fitness sessions only. Thus, it will be challenging to find a program integrating all these attributes into one.

2.1.3. Gap Analysis

Although there is a host of benefits associated with these platforms, it becomes clear that none of them constitutes an effective comprehensive platform for mental well-being treatment.

Table 2.2: Gap Analysis

Feature	Existing Platforms	We Matter
Integrated Platform	Separate features	All-in-one solution
DASS-based assessment	Rarely included	Included
Depression-only focus	Mostly general mental health	Yes, focused on depression
AI Chatbot Support	Limited	Fully integrated
Community Support	Partial	Available for registered users
Professional Therapy	Paid only	Integrated system
Free Accessibility	Limited	Completely free

It is the lack of these very features that makes We Matter such a great platform since it contains everything needed in a comprehensive platform.

2.1.4. Summary

In the process of the current part, we were able to discuss all the essential aspects associated with mental wellbeing. Besides, we have evaluated the available tools and their pros and cons. Through gap analysis, we identified the need for an integrated solution that provides multiple forms of support in a single platform.

We Matter stands out because:

- It combines AI support, therapy, and community interaction.
- It provides self-help tools like journaling and mood tracking.
- It supports registered users through community groups.
- It offers accessible and user-friendly mental health services.

The background supports the development of the We Matter platform as a beneficial and helpful tool for students and individuals facing depression.

Chapter 3

System Requirements

3. System Requirements

All the system requirements of the We Matter project are described in this chapter. It covers use case diagrams, functional and non-functional requirements, interface design, database requirements, and feasibility analysis. These elements assist in designing and developing the website in a systematic manner.

3.1. System Level Use Case Diagram

The diagram in Figure 3.1 demonstrates the interaction between different entities including the user, licensed professional, and admin within the context of the mental health system. This diagram is helpful in highlighting important features like user self-care actions, managing therapy sessions, and professional approval processes.

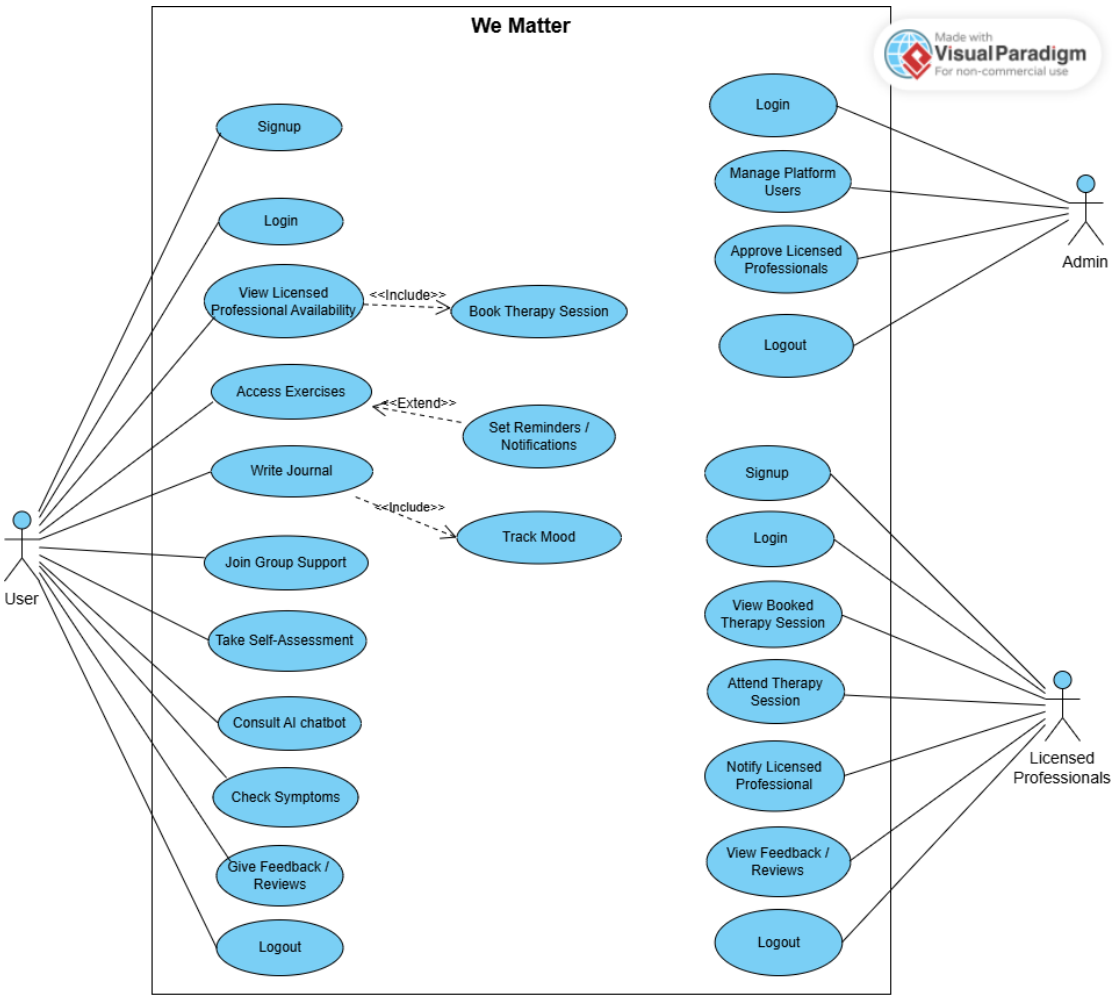


Figure 3.1 Use Case Diagram

Description:

1. User Sign Up:
To create a new account, user enters First Name, Last Name, Username, Phone Number, Email, Password and Confirm Password. The data is checked by the system and a user is registered.

2. User Login:
User enters Email and Password to log into the system. The user can also click "Forgot Password? Click Here" to reset their password.

3. Take DASS-21 Assessment:

Users complete the DASS-21 assessment questionnaire to assess their present depression level.

4. View Depression Score:

Upon completion of the assessment, the system calculates and displays depression score to the user based on his/her answers.

5. Receive Suggested Exercises:

Based on the assessment scores, the system suggests appropriate exercises according to the severity level in exercise section. The exercises follow techniques from the book *The Mindful Way Through Depression* written by Mark Williams, John Teasdale, Zindel Segal, and Jon Kabat-Zinn [3].

6. Write Journal Entry:

The user writes a self-journal entry on the journaling page to describe thoughts, emotions, and daily experiences.

7. Mood Progress Tracker:

The tool applies NLP techniques to your entries and displays the changes in your moods via visualizations in your dashboard.

8. Chat with AI:

The AI chatbot, which operates on the Gemini platform, is available for everyone who needs assistance or guidance in terms of emotion.

9. Check Symptoms:

What you need to do is simply tell the bot about how you feel, for how long you have been feeling like that, on a scale of 1-10, how intense your emotions are, and anything else you want. Then, the AI chatbot analyzes your input using the Gemini model and gives valuable recommendations **[5], [6].**

10. Anonymous Group Chat Support:

It is important to note that those people who have already signed up for an account are able to talk to each other at any time without disclosing their real identities.

11. Retake Depression Assessment:

The user can retake the DASS-21 assessment to monitor their mental health improvement over time.

12. Book Session with Psychologist:

User can view available licensed psychologists and book therapy sessions.

13. Chat with Psychologist:

The user can communicate directly with a psychologist through a chat interface for consultation or follow-up.

14. View Profile Information:

The user can view their stored profile information, such as their name, email, and past assessment information.

15. Psychologist SignUp:

Registering requires you to fill in First Name, Last Name, CNIC, Username, Phone Number, Email, Password and Confirm Password. An account is created and needs to be approved by an administrator before access is granted.

16. Psychologist Login:

Approved psychologist enters Email, CNIC, and Password to log into the system. “Forgot Password? Click Here” option is also available.

17. View Appointments:

Psychologist can see all booked sessions and manage their schedule/availability.

18. Conduct Therapy Session:

Psychologist conducts online therapy sessions with users.

19. Admin Manage Users:

The administration can create, update or remove user accounts to the system and grant licensed professional.

20. Admin Approve Licensed Professionals:

The admin verifies and approves psychologists by reviewing their credentials, certifications, and work experience. Only qualified professionals like MS Clinical Psychologists are granted access.

3.2. Functional Requirements presented as Use Case Descriptions

Table 3.1 Use Case Description: User Sign Up

Use Case ID:	UC01	
Use Case Name:	User Sign Up	
Actor(s):	User	
Pre-Conditions:	The user is not registered.	
Post-Conditions:	User account created successfully.	
Priority:	High	
Basic Flow:	1. The user logs into the website. 2. The user clicks on "Register". 3. The user fills out the necessary information (name, email address, password). 4. The user clicks the register button.	
Actor Actions		**System Response**
1.	The user accesses the registration page.	**2.** The system presents the necessary information..
3.	User inputs information and clicks on the register button.	**4.** The user completes the form and clicks the register button.
Alternative Course of Action (if any)		
3(a)	User enters invalid input.	System shows validation error.

Table 3.2 Use Case Description: User Login

Use Case ID:	UC02	
Use Case Name:	User Login	
Actor(s):	User	
Pre-Conditions:	User has an existing account.	
Post-Conditions:	User logs in successfully and is redirected to the Home Page.	
Priority:	High	
Basic Flow:	1. User visits the website. 2. The user selects login. 3. The user keys in their email and password. 4. User clicks the sign-in button.	
Actor Actions		**System Response**
1.	User visits the login page.	**2.** System shows the login fields.
3.	User keys in their email and password.	**4.** System validates the credentials.

5.	User clicks on the sign in button.	**6.** System signs in the user to the dashboard.
Alternative Course of Action (if any)		
1(a)	User selects "Forgot Password" option.	System redirects the user to the password recovery process.
3(a)	User enters incorrect credentials.	System shows an error message: "Invalid email or password."

Table 3.3 Use Case Description: Attempt DASS-21 Assessment

Use Case ID:	UC03	
Use Case Name:	Attempt DASS-21 Assessment	
Actor(s):	User	
Pre-Conditions:	User is signed in.	
Post-Conditions:	User DASS-21 responses are saved to MongoDB Atlas, depression score is calculated and displayed, and recommended exercises are generated.	
Priority:	High	
Basic Flow:	1. User selects the "Take Assessment" option to check their depression level. 2. System displays the DASS-21 questionnaire. 3. User answers all the questions. 4. User submits the assessment. 5. System calculates the depression score. 6. System displays the depression level to the user.	
Actor Actions		**System Response**
1.	User selects "Take Assessment" from the dashboard.	**2.** System displays the DASS-21 questionnaire.
3.	User answers all 21 questions and submits assessment.	**4.** System calculates and displays the depression score.
Alternative Course of Action (if any)		
3(a)	User skips a question.	System shows a prompt: "Please answer all questions to proceed."

Table 3.4 Use Case Description: Receive Suggested Exercises

Use Case ID:	UC04	
Use Case Name:	Receive Suggested Exercises	
Actor(s):	User	
Pre-Conditions:	Depression score has been calculated.	
Post-Conditions:	Exercises are displayed.	
Priority:	Medium	
Basic Flow:	1. User navigates to the Exercise section. 2. System retrieves the user's latest assessment score. 3. System analyzes the severity level. 4. System generates appropriate exercise recommendations. 5. System displays the suggested exercises to the user.	
Actor Actions		**System Response**

1.	User opens exercise section.	**2.** System shows personalized exercises.
3.	User selects an exercise.	**4.** System displays exercise steps for the user to perform.
Alternative Course of Action (if any)		
1(a)	No exercises found for the score.	System shows a message: "No recommendations available at the moment."

Table 3.5 Use Case Description: Add Journal Entry

Use Case ID:	UC05	
Use Case Name:	Add Journal Entry	
Actor(s):	User	
Pre-Conditions:	User is logged in.	
Post-Conditions:	Journal entry is successfully saved to MongoDB Atlas and becomes part of the user's journaling history.	
Priority:	High	
Basic Flow:	1. User navigates to the Journaling section. 2. System displays a blank journal entry form. 3. User writes thoughts, emotions, and experiences. 4. User submits the journal entry. 5. System validates the input. 6. System saves the journal entry to the MongoDB Atlas.	
Actor Actions		**System Response**
1.	User opens journaling section.	**2.** System displays a blank journal entry form.
3.	User writes their thoughts and submits.	**4.** System saves entry in the user's journal history.
Alternative Course of Action (if any)		
3(a)	User leaves entry blank and clicks save.	System displays a message: "Journal entry cannot be empty."

Table 3.6 Use Case Description: Mood Progress Tracker

Use Case ID:	UC06
Use Case Name:	Mood Progress Tracker
Actor(s):	User
Pre-Conditions:	Journal data exists.
Post-Conditions:	Mood trends displayed.
Priority:	Medium
Basic Flow:	1. The user initiates the dashboard. 2. The system retrieves the journal entry created by the user from the database. 3. Analysis of the journal entry is performed using NLP. 4. The system discovers insights about the mood trend. 5. The system presents insights about the mood trend in graphical format on the dashboard.

Actor Actions		System Response
1.	User opens dashboard.	**2.** System analyzes journal entries using NLP.
3.	User views mood insights on dashboard.	**4.** System displays mood graph.
Alternative Course of Action (if any)		
1(a)	No journal entries available.	System displays an empty mood graph.

Table 3.7 Use Case Description: Chat With AI Chtbot

Use Case ID:	UC07	
Use Case Name:	Chat With AI Chatbot	
Actor(s):	User	
Pre-Conditions:	AI chatbot is integrated and backend is active.	
Post-Conditions:	User receives response.	
Priority:	High	
Basic Flow:	1. The user accesses the chatbot module. 2. The system welcomes the user and shows the chat screen. 3. The user inputs his/her query. 4. The system analyzes the query through AI. 5. The system replies with useful recommendations.	
Actor Actions		**System Response**
1.	User opens the chatbot feature.	**2.** System greets user and asks "How can I help today?"
3.	User types their concern.	**4.** Chatbot replies with supportive suggestions.
Alternative Course of Action (if any)		
3(a)	Chatbot fails to understand query.	System replies: "I didn't get that. Can you rephrase?"

Table 3.8 Use Case Description: Check Symptoms

Use Case ID:	UC08	
Use Case Name:	Check Symptoms	
Actor(s):	User	
Pre-Conditions:	User is logged in.	
Post-Conditions:	Suggestions displayed.	
Priority:	Medium	
Basic Flow:	1. User opens the "AI Symptom Checker" section. 2. System displays symptom input interface. 3. User enters symptoms. 4. System analyzes input using AI. 5. System displays insights and suggestions.	
Actor Actions		**System Response**

1.	User opens the "AI Symptom Checker" section.	**2.** System displays symptom input interface.
3.	User enters symptoms.	**4.** System analyzes input using AI and shows insights and suggestions.
Alternative Course of Action (if any)		
3(a)	If the user enters incomplete or unclear symptoms.	System prompts user to provide more details.

Table 3.9 Use Case Description: Anonymous Group Chat Support

Use Case ID:	UC09	
Use Case Name:	Anonymous Group Chat Support	
Actor(s):	User	
Pre-Conditions:	User is logged in.	
Post-Conditions:	User participates in anonymous group chat.	
Priority:	Medium	
Basic Flow:	1. User navigates to group chat section. 2. User composes messages on the group chat section. 3. System composes notifications for anonymous messages that have been posted by the user to other users. 4. User navigates to replies made by other users.	
Actor Actions		**System Response**
1.	User navigates to group chat section..	**2.** The group chat section screen is displayed.
3.	User sends a message.	**4.** System sends the message anonymously to everyone.
Alternative Course of Action (if any)		
3(a)	If chat connection fails.	System displays message: "Unable to connect to chat. Please try again."

Table 3.10 Use Case Description: Book Session with Psychologist

Use Case ID:	UC10
Use Case Name:	Appointment with a Psychologist
Actor(s):	User
Pre-Conditions:	User is logged in and psychologists are available.
Post-Conditions:	Appointment is successfully booked.
Priority:	High
Basic Flow:	1. The individual then gets access to their dashboard. 2. This application shows the list of psychologists as well as the time when sessions are scheduled. 3. The individual chooses one of the psychologists and makes an appointment for the session. 4. After that, the booking is confirmed. 5. The booking details are saved in the application and a notification is sent to the psychologist.

Actor Actions		System Response
1.	The user logs into the dashboard.	**2.** The system presents list of psychologists along with slots.
3.	The user chooses psychologist and the slot.	**4.** The system confirms appointment booking.
Alternative Course of Action (if any)		
3(a)	If selected slot is already booked.	System prompts user to choose another available time.

Table 3.11 Use Case Description: Chat with Psychologist

Use Case ID:	UC11	
Use Case Name:	Chat with Psychologist	
Actor(s):	User, Psychologist	
Pre-Conditions:	User and psychologist are logged in and chat session is active.	
Post-Conditions:	Messages are exchanged successfully between user and psychologist. Chat conversation is saved for record.	
Priority:	High	
Basic Flow:	1. The psychologist will log in to the online platform. 2. Next, they will check their calendar for any future appointments that may be booked. 3. Afterward, they will enter the online appointment to start the session. 4. The client will then join the online session to start the session. 5. Finally, they will then start discussing the therapy session.	
Actor Actions		**System Response**
1.	User enters chat interface.	**2.** User starts chatting session.
3.	User picks psychologist and sends message.	**4.** System forwards message to psychologist.
5.	Psychologist replies.	**6.** System displays response to user.
Alternative Course of Action (if any)		
3(a)	If connection fails.	System shows error: “Unable to connect to psychologist.”

Table 3.12 Use Case Description: Update Profile Information

Use Case ID:	UC12
Use Case Name:	Update Profile Details
Actor(s):	User
Pre-Conditions:	User has logged in.
Post-Conditions:	The updated details in the profile (username, photo, etc.) are saved.
Priority:	Low

Basic Flow:	1. User opens profile settings. 2. User updates name, age, gender, or location. 3. System saves changes.	
Actor Actions		**System Response**
1.	User opens profile page.	**2.** System shows editable fields for name, picture, etc.
3.	User updates field and clicks Save.	**4.** System saves profile data.
Alternative Course of Action (if any)		
3(a)	User uploads unsupported file type.	System shows: "Invalid file type. Please upload an image."

Table 3.13 Use Case Description: Conduct Therapy Session

Use Case ID:	UC13	
Use Case Name:	Conduct Therapy Session	
Actor(s):	Psychologist, User	
Pre-Conditions:	User and psychologist are logged in and appointment is scheduled.	
Post-Conditions:	Therapy session is completed.	
Priority:	High	
Basic Flow:	1. Psychologist logs into the system. 2. Psychologist views scheduled appointments. 3. Psychologist starts session. 4. User joins session. 5. Therapy session is conducted and session ends.	
Actor Actions		**System Response**
1.	Psychologist starts session.	**2.** System establishes session link.
3.	Psychologist conducts therapy.	**4.** System facilitates communication between both parties.
Alternative Course of Action (if any)		
3(a)	If connection drops.	System attempts reconnection or ends session safely.

Table 3.14 Use Case Description: Admin Manage Users

Use Case ID:	UC14
Use Case Name:	Admin Manage Users
Actor(s):	Admin
Pre-Conditions:	Admin has logged in.
Post-Conditions:	User accounts are managed.
Priority:	High
Basic Flow:	1. The administrator accesses the admin console. 2. Below is the list of all users' profiles present. 3. The administrator selects any profile to be managed. 4. Afterward, the administrator can input information, edit information,

	or even delete any information of the user. 5. In the end, the back-end system stores the updated information.	
Actor Actions		**System Response**
1.	Admin navigates to the user management panel.	**2.** System displays user list.
3.	Admin performs add, edit, and delete actions.	**4.** System updates database accordingly.
Alternative Course of Action (if any)		
3(a)	Invalid operation. .	System shows error message.

Table 3.15 Use Case Description: Admin Approve Licensed Professionals

Use Case ID:	UC15	
Use Case Name:	Approve Admin Applications for Professionals with License	
Actor(s):	Admin	
Pre-Conditions:	Psychologist has registered and is pending approval.	
Post-Conditions:	Psychologist account is approved or rejected.	
Priority:	High	
Basic Flow:	1. The admin gains access to the tab where the application for the position of the psychologist is confirmed. 2. All applications and qualifications of professionals are presented on the website. 3. The admin requires a while to study all the information offered. 4. This provokes the admin to make a decision on whether to accept or refuse an applicant. 5. The system updates the status of the applicant according to the outcome.	
Actor Actions		**System Response**
1.	Admin launches form for verification.	**2.** Present psychologist applications in the system.
3.	Admin validates qualifications.	**4.** System shows approval/rejection option.
5.	Admin selects approve/reject.	**6.** System updates account status.
Alternative Course of Action (if any)		
3(a)	If required documents are missing.	System shows “Incomplete application.”

3.3. Interface Requirements

In this section, the interface requirements for We Matter Platform will be explored. It must be noted that the first thing which comes into consideration is making sure there is an interface among the users, the experts, and the system. This platform has been created in such a way that its responsiveness cannot be doubted at any point in time.

3.3.1. User Interface Requirements

User interface of We Matter is extremely clean, quick, and easy to use. It ensures that its flawless functionality can be accessed in any web browser. This is because everything on the platform is centered on the dashboard page. Therefore, it is easy to navigate from one section of the site to another. Some of the core sections of the website include Journaling, Mood Tracker, Community, Therapy, and AI Chatbot. Upon login, the user will be directed to a personalized dashboard with quick access links to all necessary tools and notifications like therapy reminders.

The journaling feature enables the user to freely input, edit or remove his entries in the journal. There are also features where the user may add tags for different moods or categories in relation to his entry. Using the mood tracking feature, users will be able to input their mood using the slider or the emoji. After inputting, they will then see the output of the data in a very presentable chart form. The group chat feature is where users can log in to anonymous peer support groups and communicate. The therapy feature helps them to easily search, schedule and consult with licensed therapists who provide psychological advice. Moreover, there is also an AI chatbot that can give instant help in conversations.

3.3.2. Software Component Interfaces

- **Frontend:** React.js is used on the front-end side to develop highly interactive user interfaces.
- **Backend:** On the back-end side, the combination of Node.js and Express.js would be used to run the business logic code.
- **Database:** MongoDB to store user data, journals, chats and appointments.
- **AI Integration:** Gemini API for chatbot and symptom checker.
- **Authentication:** JWT-based authentication for secure access.
- **Real-Time Communication:** WebSockets for chat and live sessions.

3.3.3. Physical Interface Requirements

The platform will have to integrate seamlessly with:

- Desktop computers and laptops.
- Smartphones and tablets.
- Devices with modern web browsers such as Chrome, Edge, Safari, Firefox.
- Stable internet connectivity for real-time features.

3.4. Database Requirements

The platform requires MongoDB Atlas as its main database management system. The database will have to hold the following information:

- User profiles
- Journal entries
- Mood logs
- Group chat messages
- Therapy session data
- Psychologist profiles
- Appointment schedules

3.5. Non-Functional Requirements

For all this to take place, there are specific non-functional requirements that the We Matter team must take care of. Taking care of these issues will ensure that our platform is reliable, secure, and user-friendly. Some of the non-functional requirements that we will have to take into consideration include**:**

3.5.1. Security

- Anyone utilizing this system will need to prove his or her identity in a safe manner via JWT authentication.
- Information that is highly classified, for example, passwords of the users, their personal journals, and mood diaries will be encrypted within the database.
- The application will make use of role-based access control when dealing with any endpoints that are restricted, whether the person is a regular User, a Licensed Professional, or an Admin.

3.5.2. Performance

- The system must be efficient in terms of speed, even when using an ordinary internet connection.
- The instant messaging system, notifications, and emotion recognition systems will be immediate, thanks to the incorporation of WebSocket technology.
- It should perform optimally even when there are multiple simultaneous users without affecting the performance of the application and making navigation difficult for the user.

3.5.3. Usability

- The interface must be neat regardless of the screen size used by the user.
- Users should be able to perform core actions such as mood logging, journaling, and assessments without navigating through excessive menus or links.
- Font sizes, color schemes, and iconography must follow standard accessibility guidelines to support readability and ease of use for all users.

3.5.4. Modifiability

- At the same time, during development, the emphasis should be placed on the realization of modularity and implementation of the application using the component architecture. It will make it easier to include other functionalities in the system, such as artificial intelligence algorithms or psychotherapy tools.
- Additionally, it is important for the modules to remain loosely coupled and testable.

3.5.5. Reliability & Availability

- The platform must remain functional 99% of the time so that people are guaranteed continuous access to mental health care.
- In case there are any connection problems with the Internet or an application is shut down unexpectedly, the backend will synchronize the stored data which is kept in local storage as well as in the database.
- Synchronization guarantees continuous updating of the user's information without losing data.

3.5.6. Interoperability

- The app must be compatible with all types of browsers.
- The application must be capable of integrating with third-party APIs to cater to features such as push notifications, analytics, and even artificial intelligence capabilities.

3.5.7. Constraints

- **Cost Constraint:** It is necessary to utilize the free version of MongoDB Atlas for the development and testing process only in the case of the application under consideration.
- **Time Constraint:** It is crucial to design and test the essential features of the proposed application before handing over the final project report by the deadline of the last year project.
- **Tech constraint:** Development of the software is expected to be done using MERN stack which incorporates MongoDB, Express.js, React.js, Node.js, and artificial intelligence service provision.

3.6. Project Feasibility

Before initiating the development of We Matter, several feasibility aspects were analyzed to determine whether the project can be practically implemented.

3.6.1. Technical Feasibility

“We Matter" can be considered technologically possible owing to technological innovations in the field. The system is developed in the framework of the MERN stack (MongoDB, Express.js, React.js, and Node.js), which provides a reliable foundation for the development of full-stack software.

- React.js technology is employed to develop a functional user interface that contains such components as journal, mood tracker, and chatbots.
- The back end is developed with the help of Node.js and Express.js technologies, which provide efficient development of the back end and API creation.
- A NoSQL database, specifically MongoDB, is used in order to implement a non-relational structure for storing the unstructured data that will be created, i.e. Chat logs, mood entries, journal entries.

- Deployment is achieved using platforms like Vercel and MongoDB Atlas to ensure the application is scalable, always available, and that the data stored is secure.
- Integrating external services through the use of APIs is achieved due to our use of a RESTful architecture.

3.6.2. Operational Feasibility

The We Matter platform is really easy to use because it is designed to be simple and easy to get around.

- The We Matter platform has an interface that lets users easily get to things like tracking how they feel, writing in a journal, talking to an AI chatbot and booking therapy sessions.
- People do not need to know a lot about technology to use the We Matter platform so a lot of people can use it.
- It acts as an internet-based portal that can be accessed through mobiles, tablets, and even computers since it is equipped with an adaptive design that works perfectly irrespective of the way it is accessed.
- Instant messaging and chatbot technologies provide real-time communication opportunities and allow users to stay engaged and get immediate assistance.
- It works completely without the need for any kind of human intervention. It can thus serve as a sustainable solution for the mental well-being of the users.

3.7. Analysis Models

3.7.1. Activity Diagram (Login Process)

The diagram in Figure 3.2 represents the process of authenticating users. This is shown from the moment when the user submits their credentials until either redirection to the dashboard occurs or an error in the login process is handled.

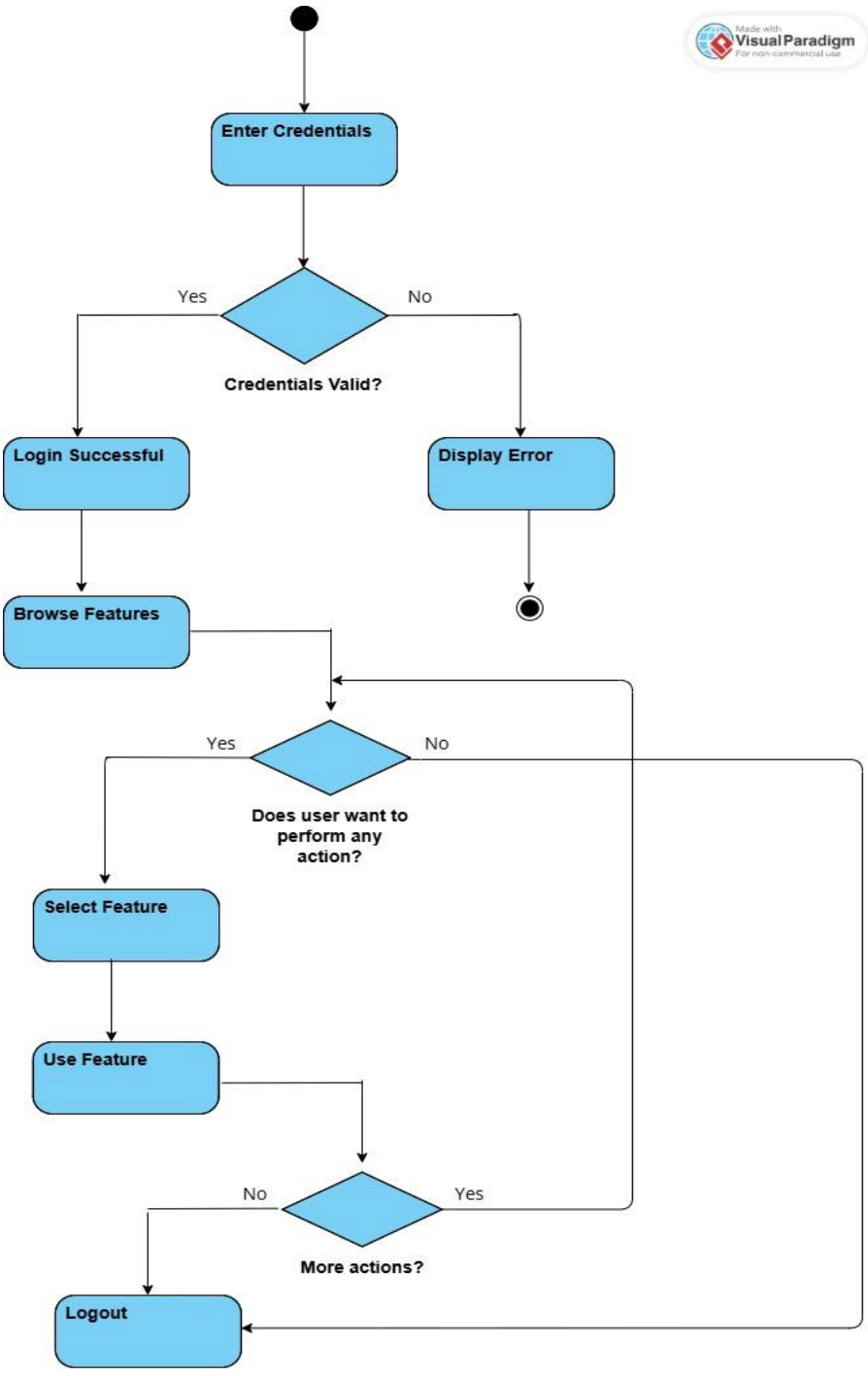


Figure 3.2 Activity Diagram for Login Process

3.7.2. Activity Diagram (Journaling)

The diagram in Figure 3.3 demonstrates how to use the journaling function through the entire process of opening the journal, typing new material, saving the entry, and giving the user a choice to either edit further or end the activity.

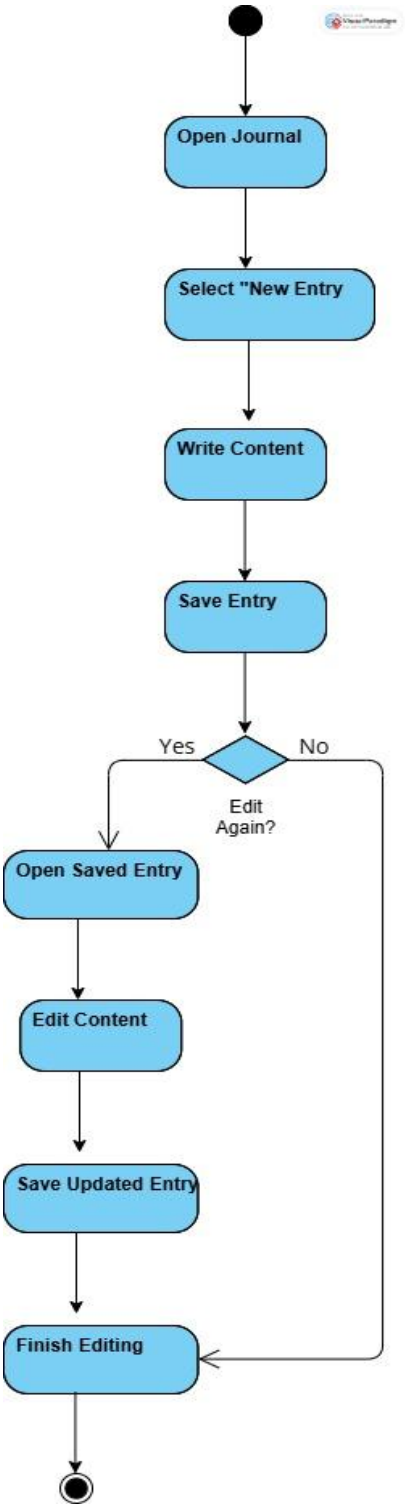


Figure 3.3 Activity Diagram for Journaling

3.7.3. Activity Diagram (AI Chatbot)

The diagram in Figure 3.4 demonstrates how the user interacts with the system by providing it with a query which is then processed to produce an informative reply.

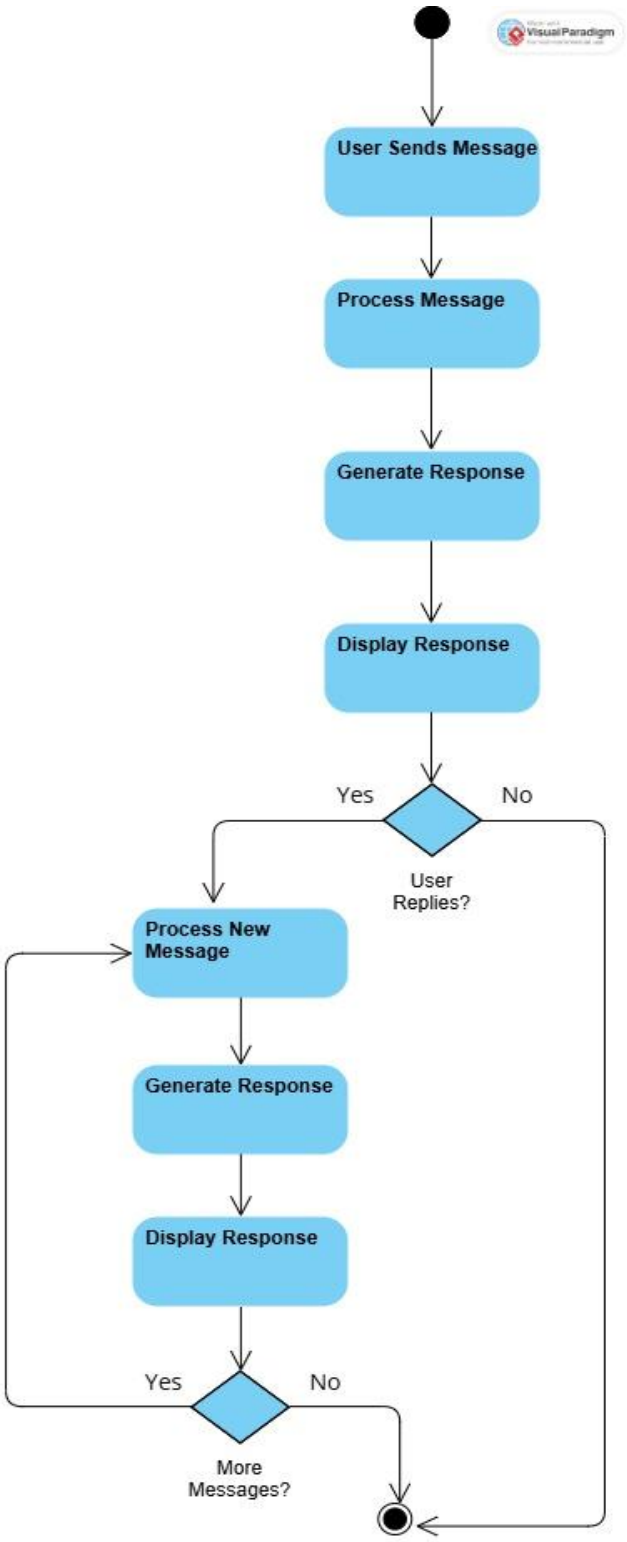


Figure 3.4 Activity Diagram for AI Chatbot

3.7.4. Activity Diagram (Appointment Scheduling)

The diagram in Figure 3.5 demonstrates the appointment making procedure from opening the scheduler, selecting a professional and placing a request until receiving the respective confirmation or refusal from the system.

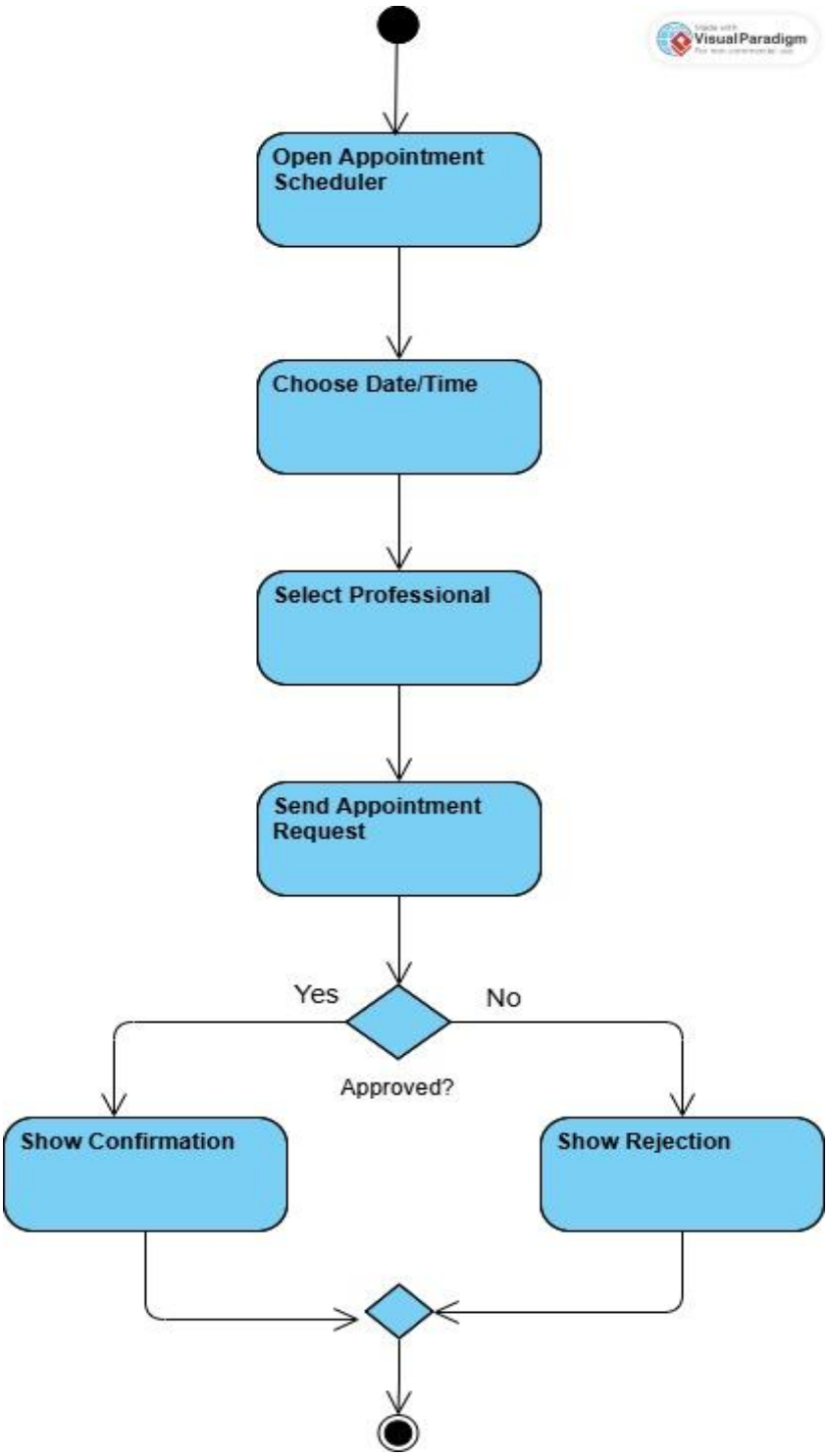


Figure 3.5 Activity Diagram for Appointment Scheduling

3.7.5. Activity Diagram (Mood Tracking)

The diagram in Figure 3.6 describes the entire procedure of monitoring mood for a particular day from making appropriate comments about your moods, storing this information in the database, to reviewing previously recorded data.

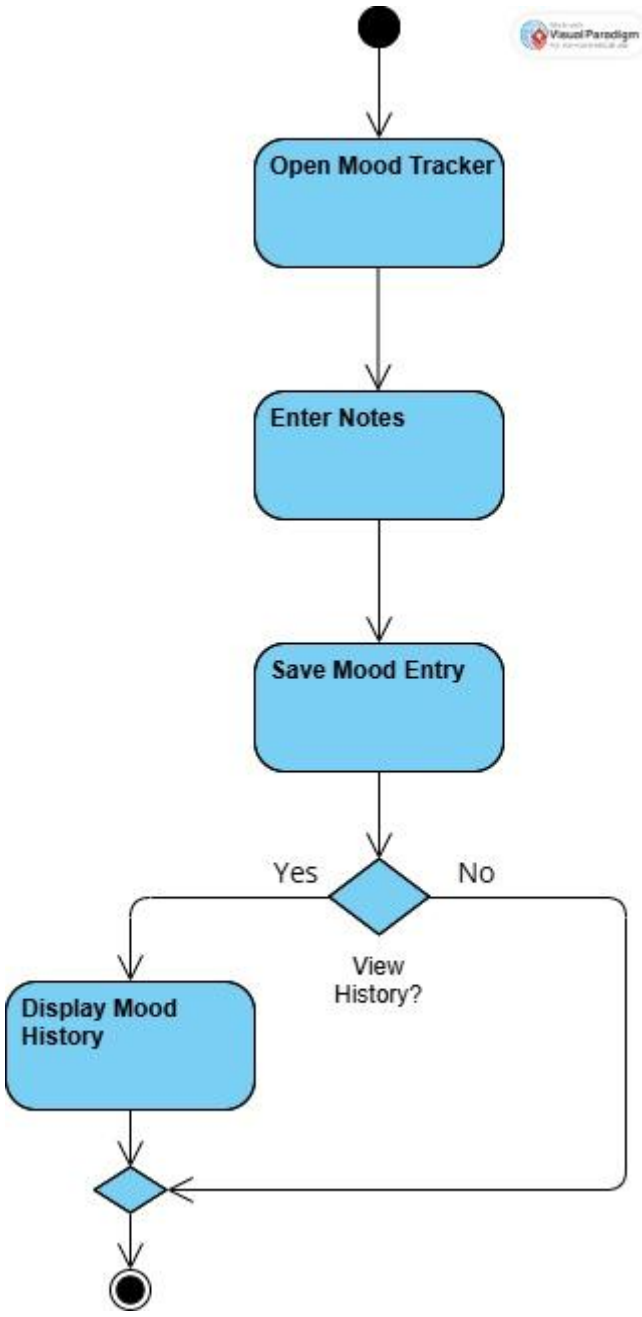


Figure 3.6 Activity Diagram for Mood Tracking

3.8. Conclusion

This chapter looked closely at the We Matter system. It talked about the problem it tries to solve who is involved what the system needs to do and what it needs to be like. The analysis part helped figure out how the system should work and how people will use it without worrying about the technical stuff. This chapter findings give us a base to design the system. The We Matter systems analysis will help create design pictures and blueprints in the next chapter. The analysis phase was important, for the We Matter system. It helped understand what the system should do. Now we have an idea of the We Matter system. The next chapter will show the design of the We Matter system. The We Matter system will be designed based on this analysis.

Chapter 4

System Design

4. System Design

This section gives a brief description about the architectural design of We Matter. The section gives a clear idea about how the architecture works and the relationship between the modules. As a matter of fact, we have developed a fairly simple way to design the entire system architecture.

4.1. Design Approach

The application named "We Matter" is built using a modular and hierarchical approach. In other words, first, we design the user interface, secondly, the back-end, thirdly, the database, and, last but not least, we combine them. Such an approach will help us simplify the entire process of developing our application, accelerate the pace of our work, and ensure that future updates will be much easier to implement. Besides, the software has been designed according to the principles of Object-Oriented Design (OOD).

4.2. Design Constraints

The way We Matter works is affected by an important things that we have to think about when we are making it.

- We Matter has to be simple for students to use even if they do not know much about computers.
- We Matter needs the internet to work properly so students can send in reports. Get help from counselors.
- We have to make sure that the information students give us is safe and private all the time.
- We Matter should be able to handle users as it gets bigger.
- The way We Matter looks and works has to match the technology we use for the backend and database of We Matter.

4.3. System Architecture

We Matter follows a **3-tier architecture**:

1. Presentation Layer (Frontend):

The presentation layer will consist of the front-end aspect of We Matter that will allow students, counsellors, and administrators to log in/log out, post issues, ask for counselling, and view responses received.

2. Application Logic Layer (Backend):

We will be taking care of all application logic like authenticating the user and handling issues posted, appointment requests and granted and authorization (based on role).

3. Data Layer:

All information like personal user data, issues raised, counselling one has received, and feedback given will be stored in this layer.

4.4. Logical Design

The diagram in Figure 4.1 is a general view of the architecture of the whole system, showing how the interaction between UI modules, back-end components, and databases takes place in relation to third-party APIs and deployment environment.

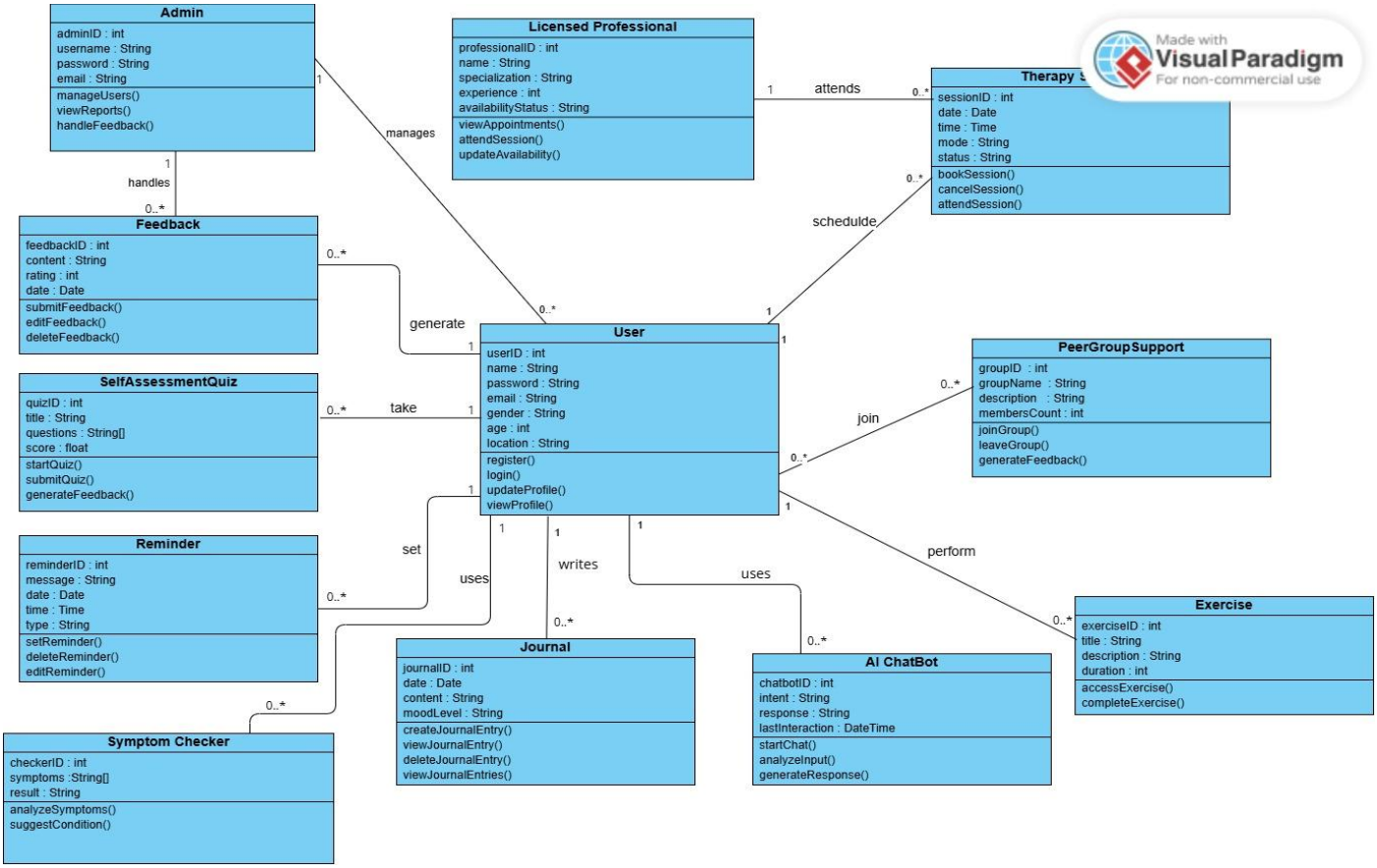
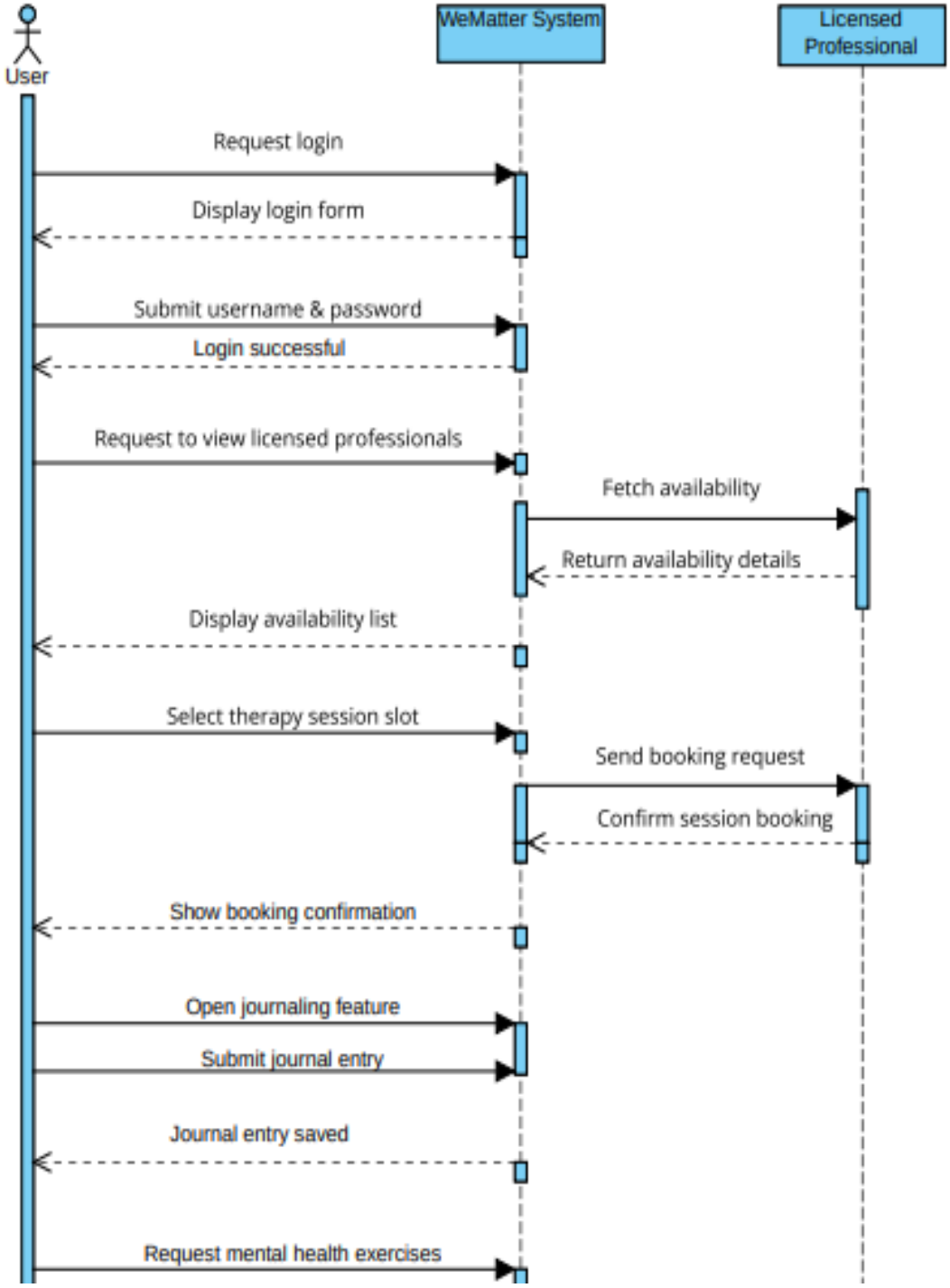


Figure 4.1 Class Diagram

4.5. Dynamic View

4.5.1. Sequence Diagram (From User Perspective)

The diagram in Figure 4.2 illustrates the sequence of events from the point of view of a user interacting with different system modules, including mental health exercises, self-assessment exercises, and reminders.



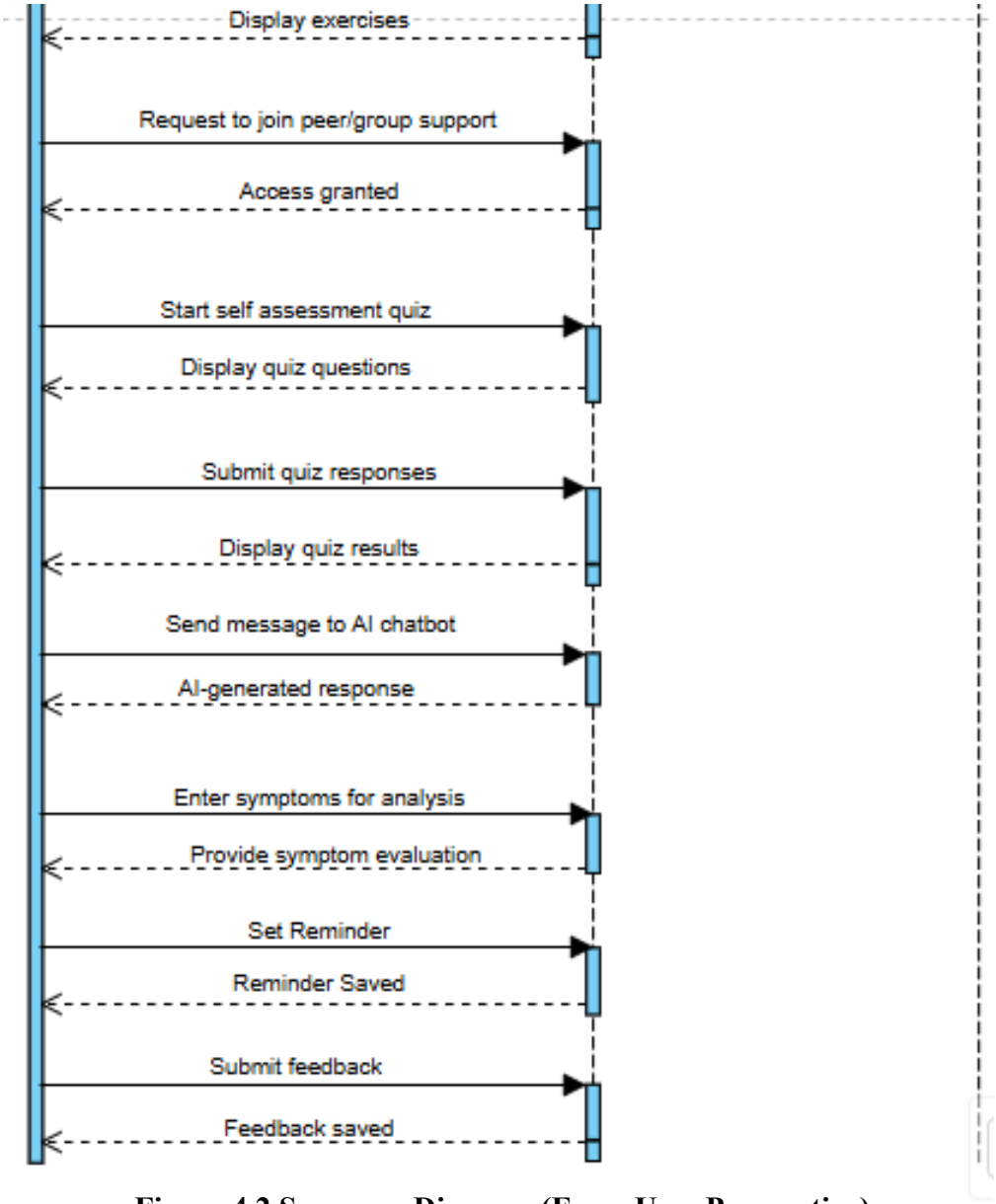


Figure 4.2 Sequence Diagram (From User Perspective)

4.5.2. Sequence Diagram (From Licensed Professional Perspective)

The diagram in Figure 4.3 shows the sequence of actions from the perspective of licensed professionals as they communicate with the system and manage their appointments and live therapy sessions.

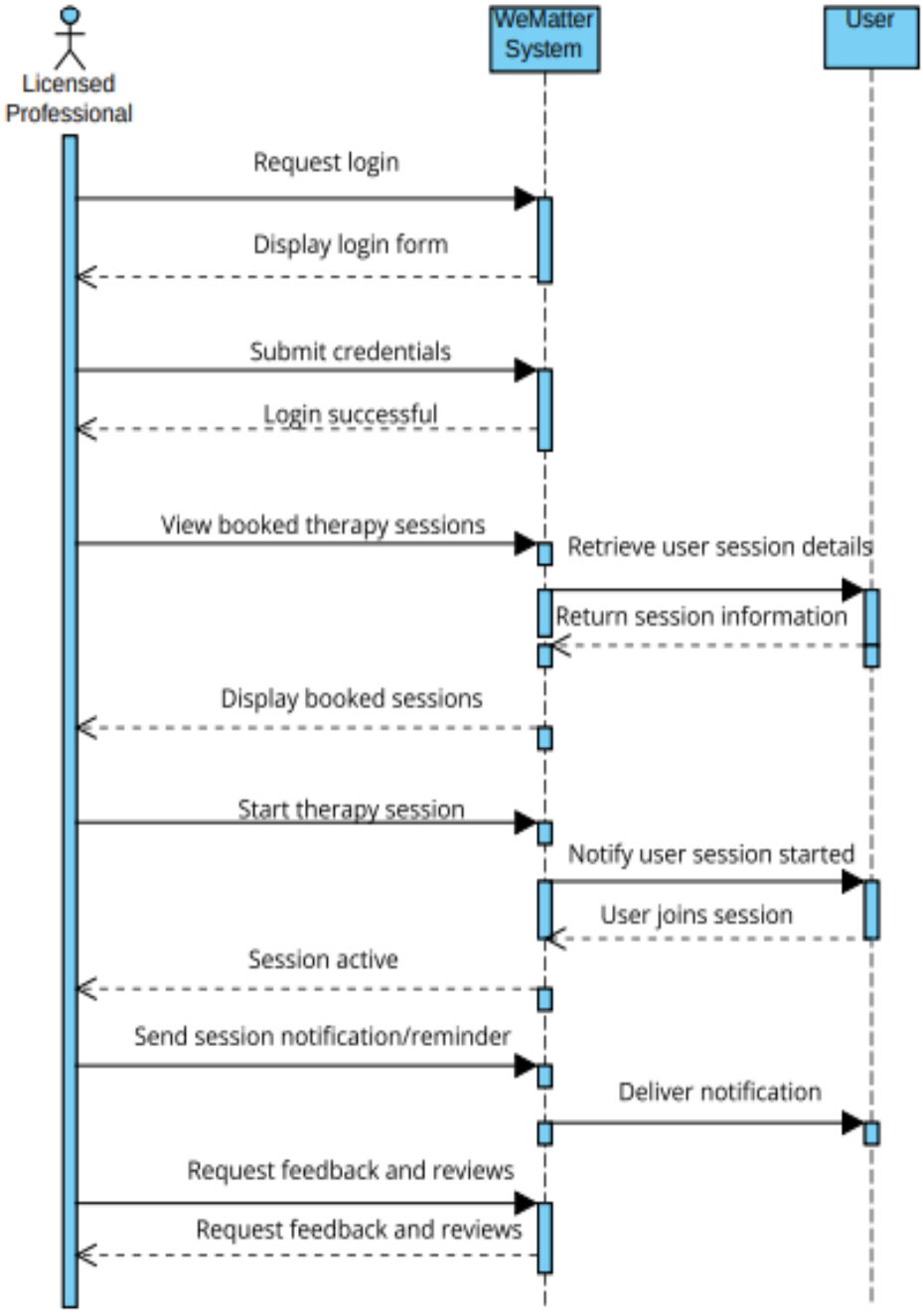


Figure 4.3 Sequence Diagram (From Licensed Professional Perspective)

4.5.3. Sequence Diagram (From Admin's View)

The diagram in Figure 4.4 illustrates the interaction from the point of view of system admins, showing the flow of interaction related to managing user accounts, licensing professionals' qualifications, and handling users' feedbacks.

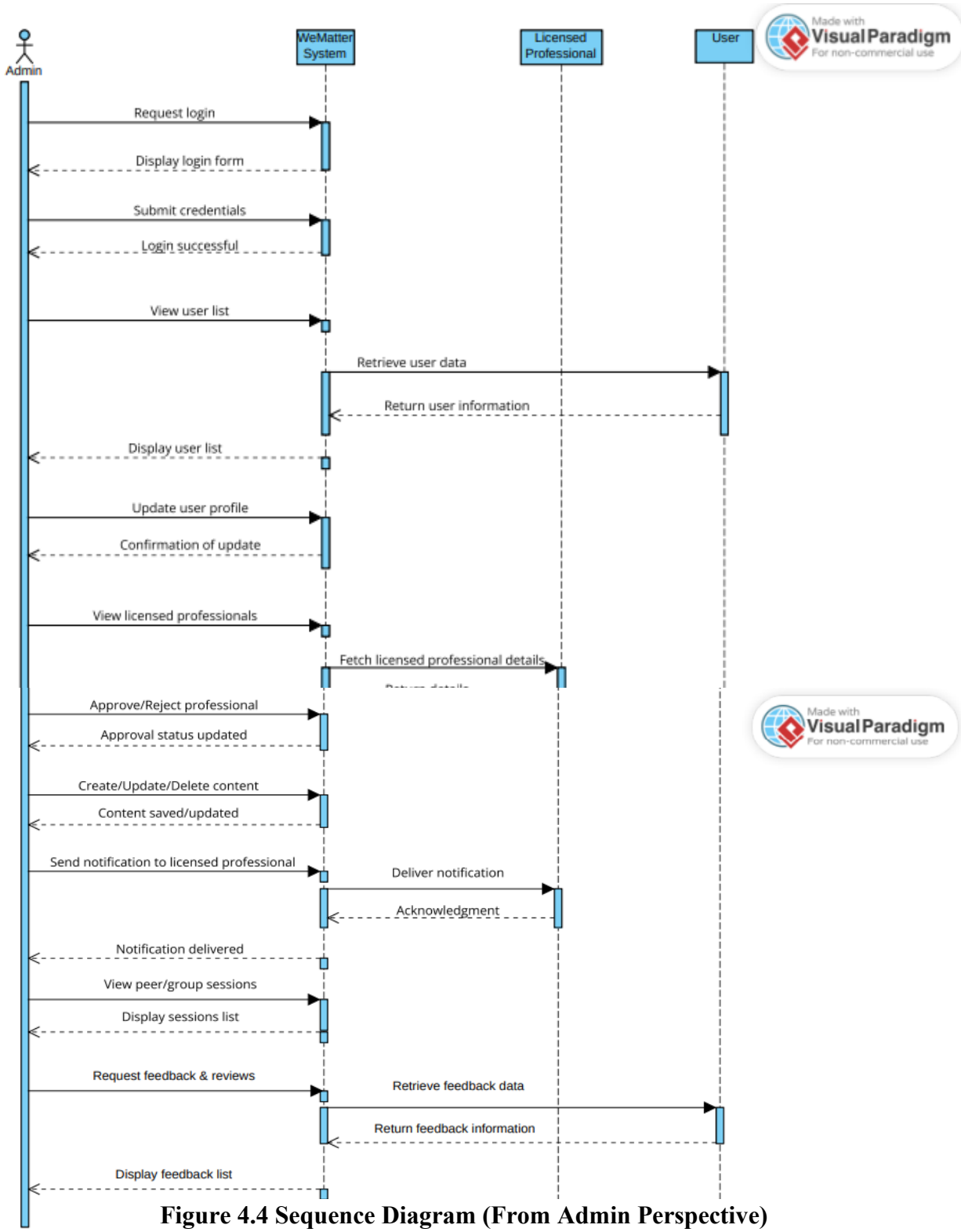


Figure 4.4 Sequence Diagram (From Admin Perspective)

4.5.4. Sequence Diagram (Journaling Feature)

The diagram in Figure 4.5 is responsible for documenting the interactions between the Login module, the Journal module, and the Database when authenticating the data and saving it into the Database.

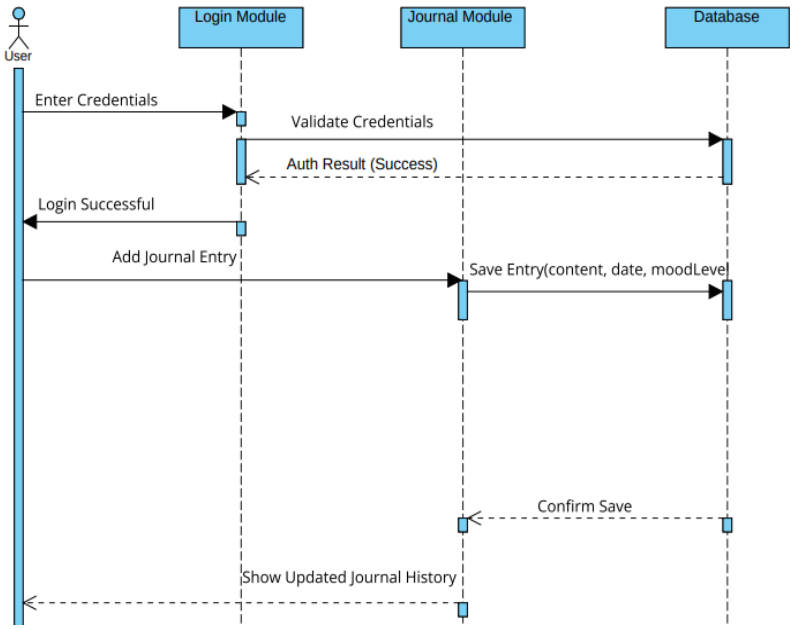


Figure 4.5 Sequence Diagram for Journaling

4.5.5. Sequence Diagram (AI ChatBot)

The diagram in Figure 4.6 captures all the data flows needed to facilitate the functioning of the chatbot. It demonstrates how the input by the user is processed by the intent classifier to find the appropriate reply and record it in the database.

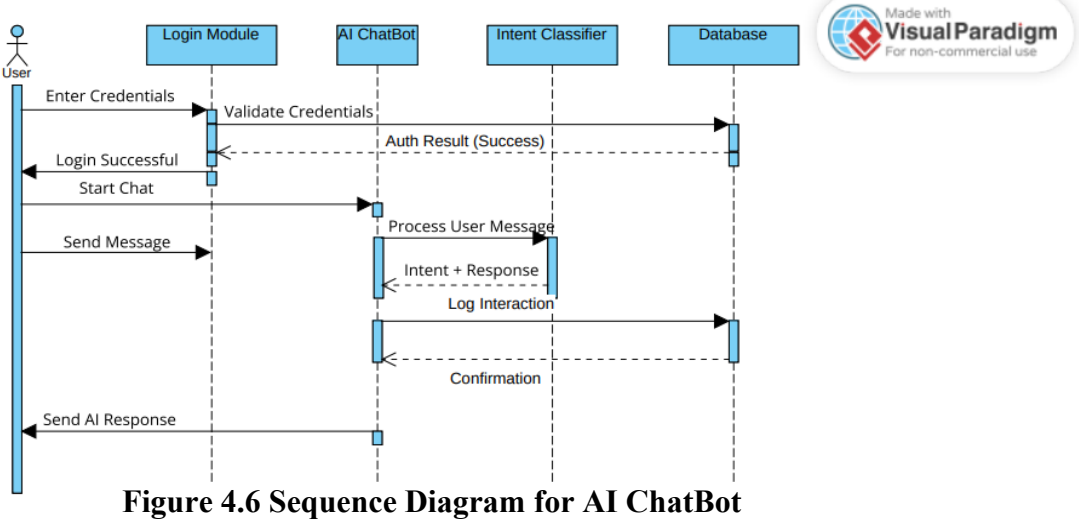


Figure 4.6 Sequence Diagram for AI ChatBot

4.5.6. Sequence Diagram (Appointment Scheduling with Licensed Professional)

The diagram in Figure 4.7 captures all request/response interactions needed for appointment booking between the user, the Appointment module, the Psychologist, and the Database.

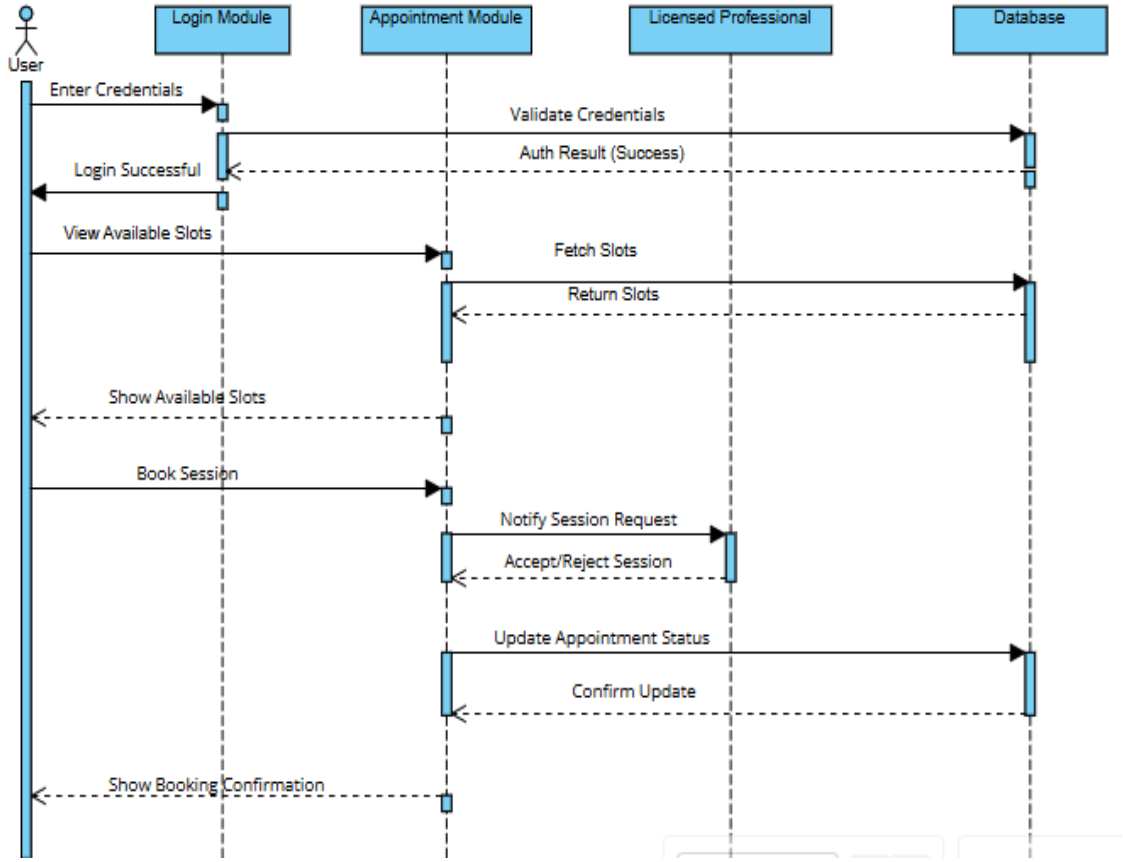


Figure 4.7 Sequence Diagram for Appointment Scheduling with Licensed Professional

4.5.7. Sequence Diagram (AI-Powered Symptom Checker)

The diagram in Figure 4.8 that shows the whole process involved in the development of the AI-powered symptom checker from user authentication to presenting results to the user together with health recommendations. User input of symptoms is followed by passing the symptoms through the AI model, logging the detected conditions, and then presenting them to the user.

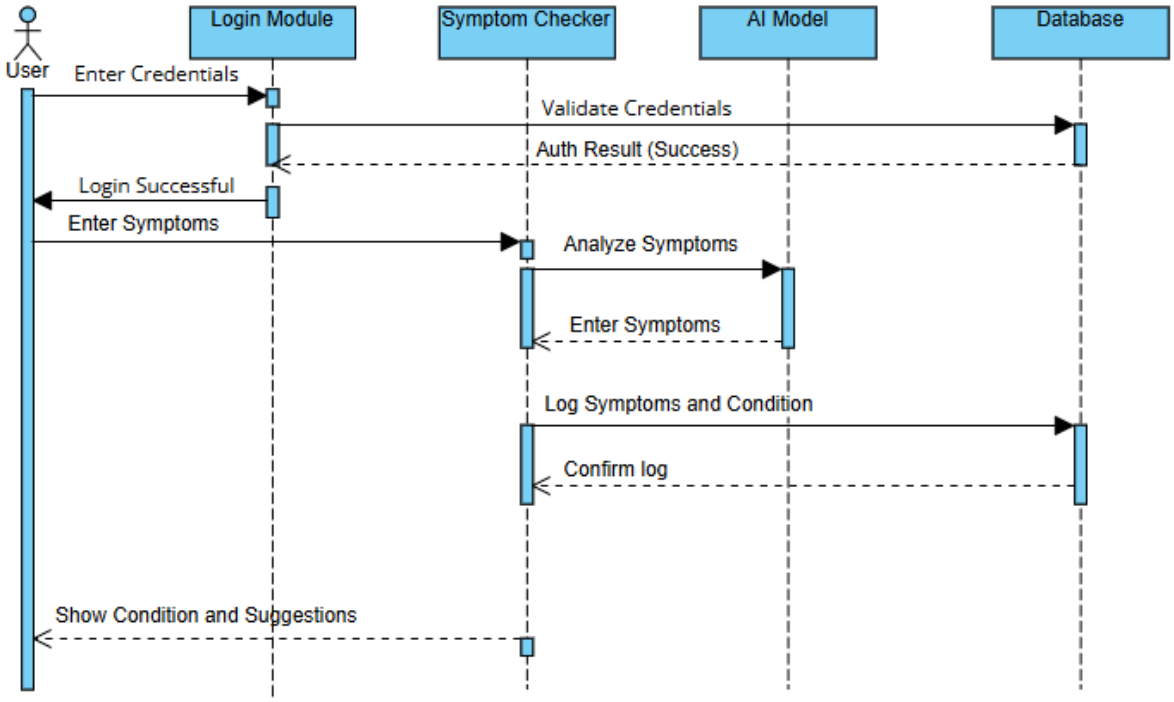


Figure 4.8 Sequence Diagram for AI-Powered Symptom Checker

4.6. State Diagram

4.6.1. State Diagram (Journaling)

The diagram in Figure 4.9 illustrates that the journey starts from an empty entry, transitions into an active entry, continues with data saving, and ends after the entry becomes viewable to the user.

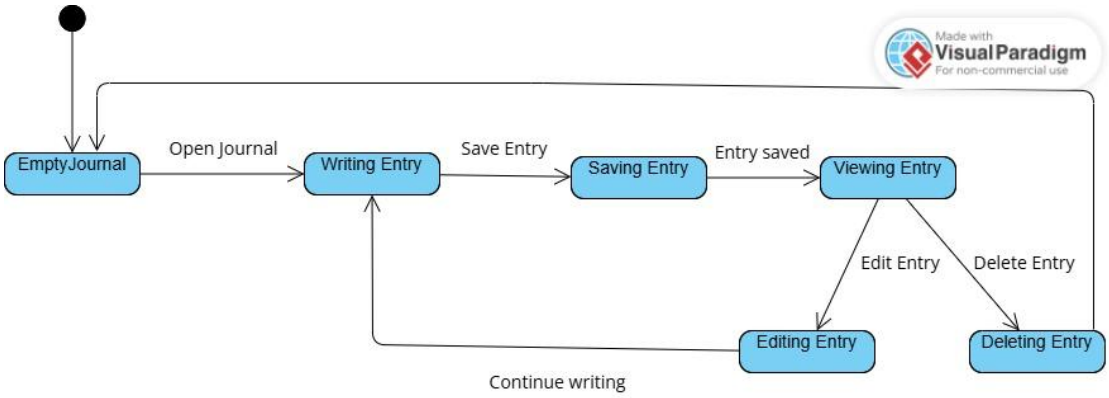


Figure 4.9 State Diagram for Journaling

4.6.2. State Diagram (User Interaction)

The diagram in Figure 4.10 shows the different phases that the user goes through when interacting with the site. It starts from the phase of not having access to the system, continues with login or authentication, browsing available options, and finally getting involved in using one of those available options.

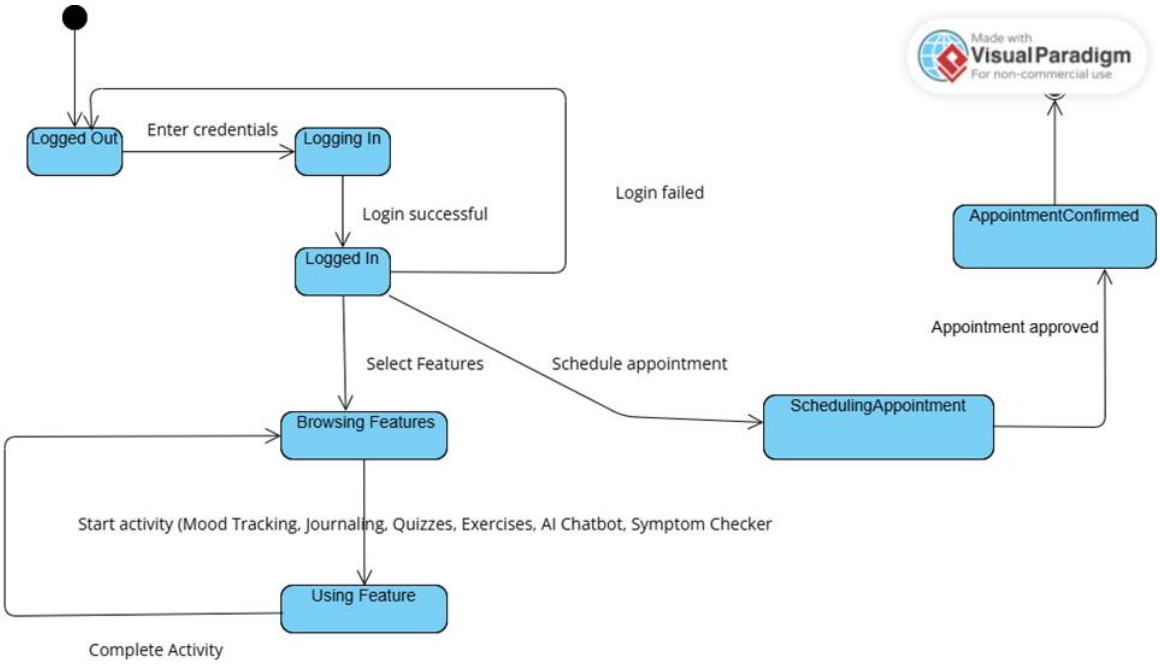


Figure 4.10 State Diagram for User Interaction

4.6.3. State Diagram (AI Chatbot)

The diagram in Figure 4.11 describes how the bot operates throughout the chat. As the bot waits for instructions, when a request arrives, it actively engages with the conversation by providing responses to the users' queries.

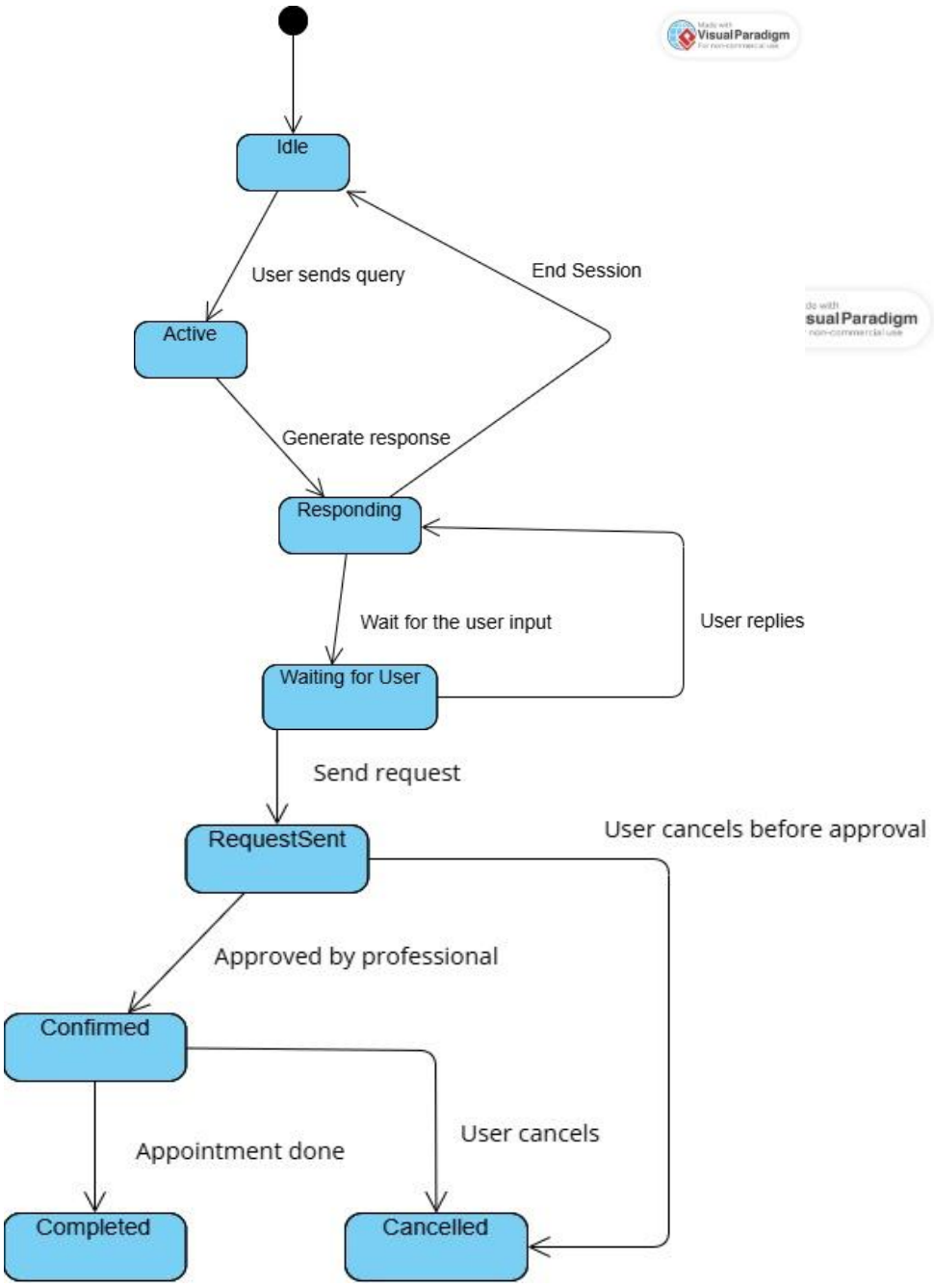


Figure 4.11 State Diagram for AI Chatbot

4.6.4. State Diagram (Appointment Scheduling)

The diagram in Figure 4.12 covers the complete cycle of booking of a therapy session. It begins from its creation process, followed by selection of the specific time slot, passing on the information to the therapist, and concluding with the appointment being either confirmed, completed, or cancelled.

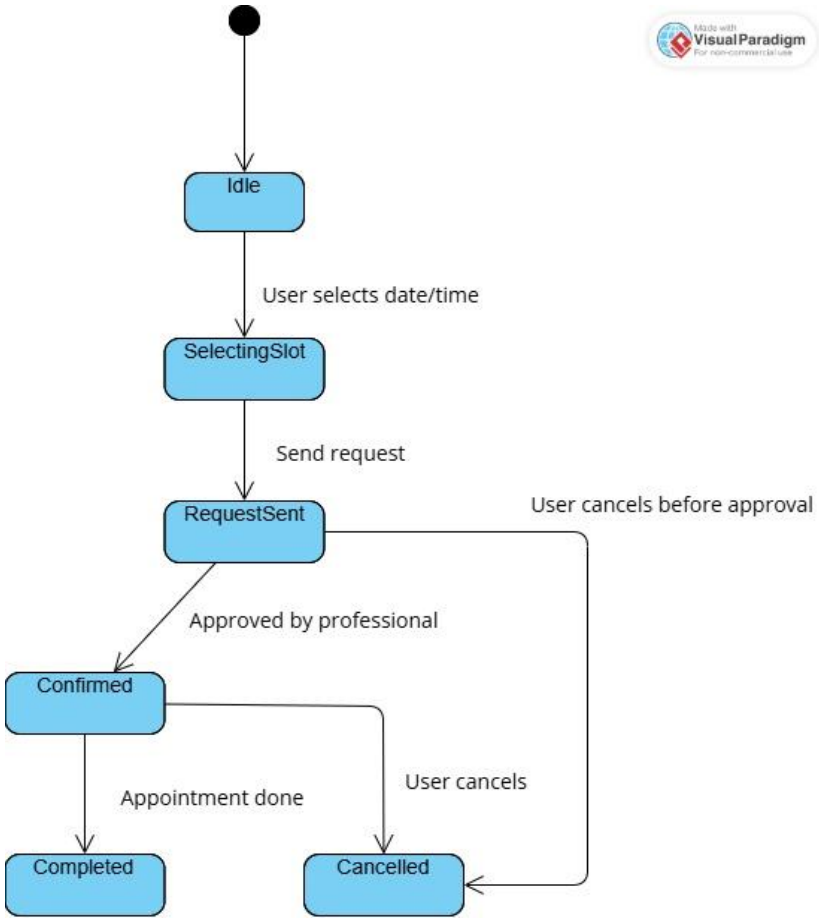


Figure 4.12 State Diagram for Appointment Scheduling

4.7. Component Design

The diagram in Figure 4.13 represents the architecture of the entire system, along with interaction between its major components. The following diagram indicates how the user interface is related to the backend services, database, notifications module, third party APIs, and the deployment environment.

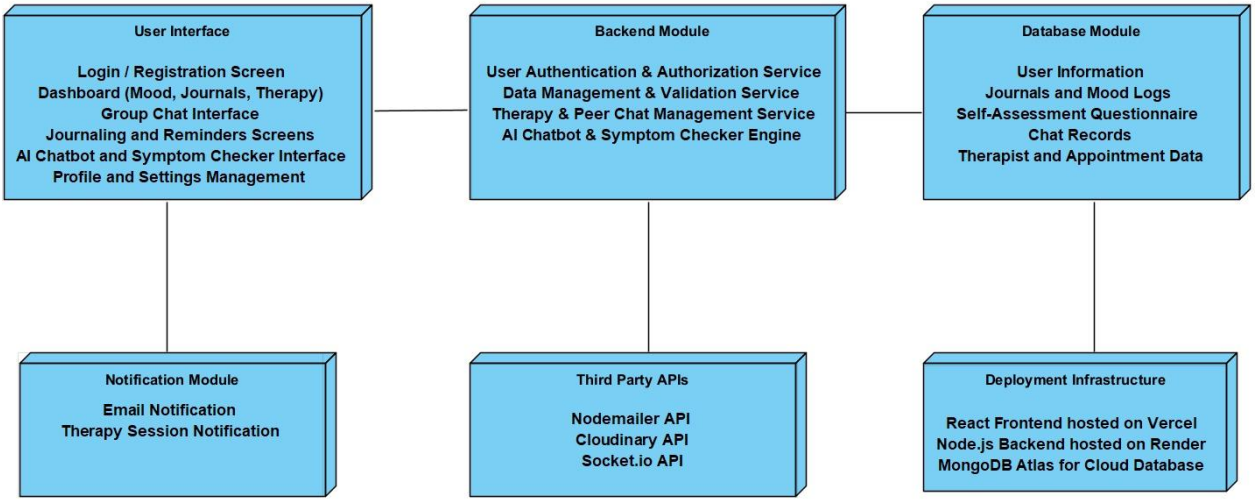


Figure 4.13 Component Design

4.8. Data Models

The diagram in Figure 4.14 shows where the users can be able to control their emotional well-being using various options provided by the application. The users can book counselling sessions, make assessments on themselves using DASS-21, engage in chat forums, conduct physical exercises, and write journals containing mood logs.

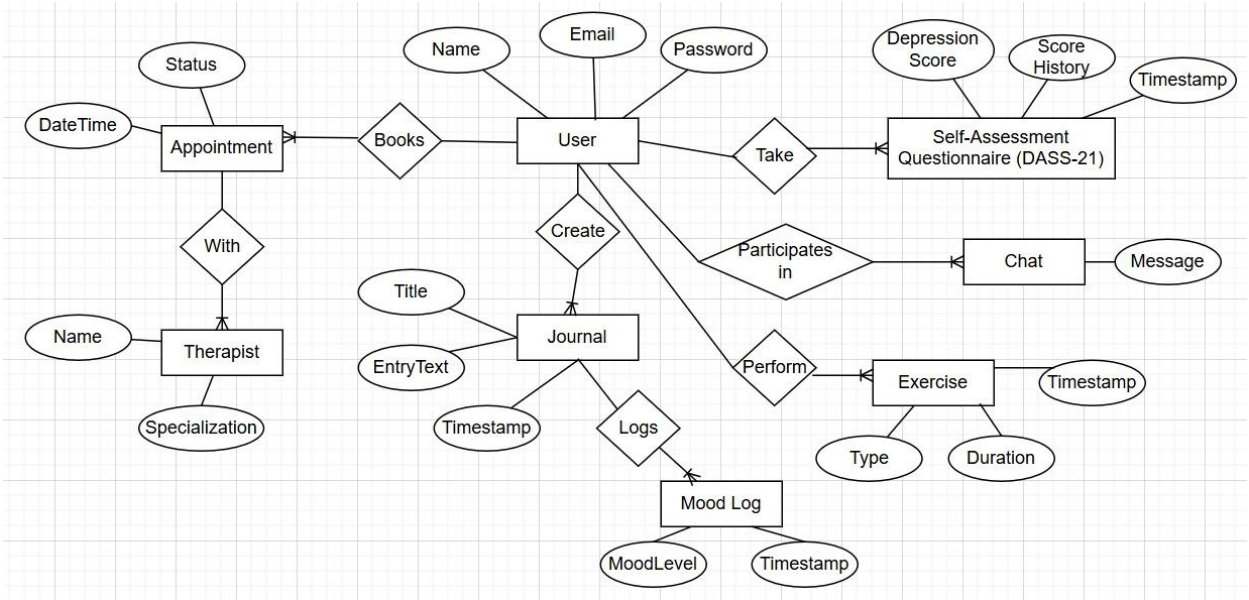
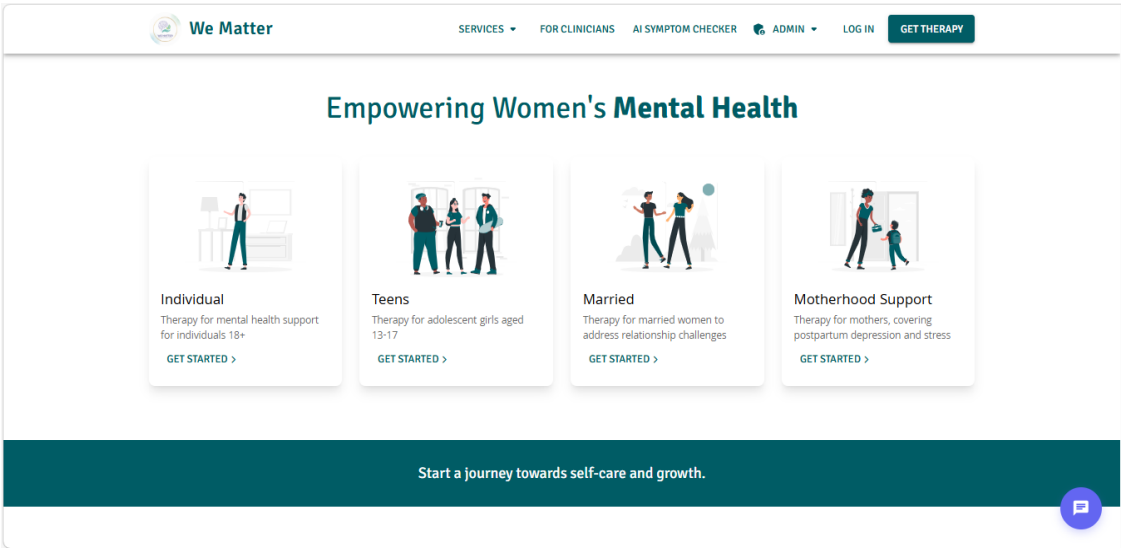
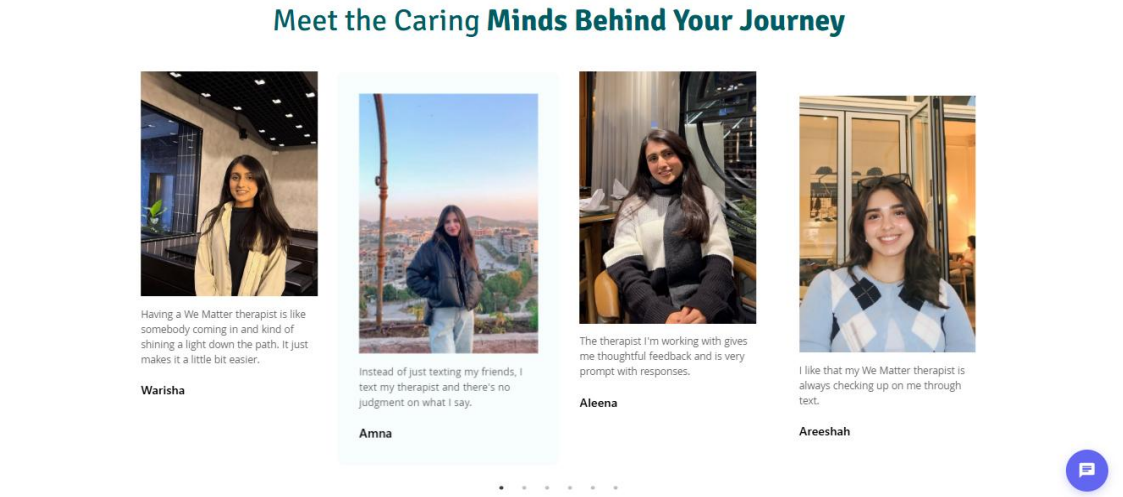


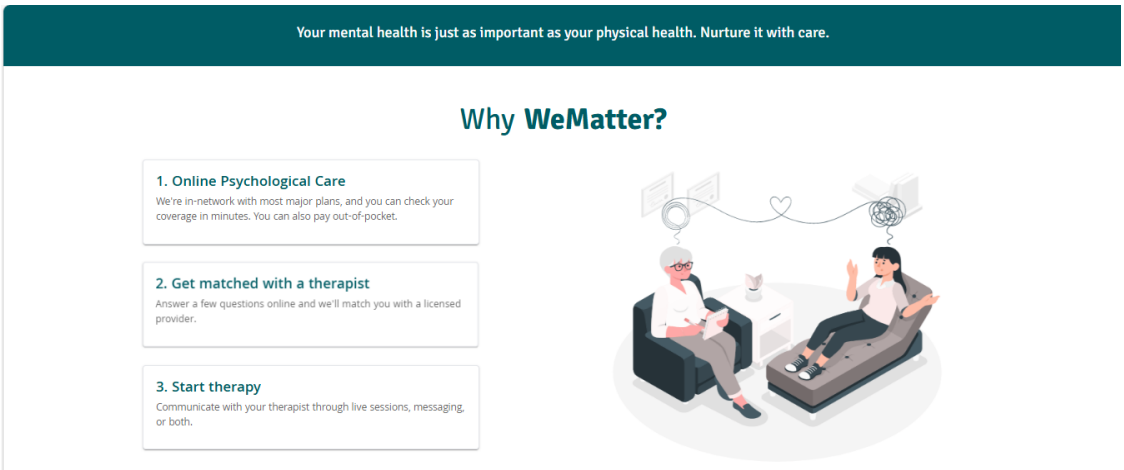
Figure 4.14 Data Models

4.9. User Interface Design

4.9.1. Landing Page







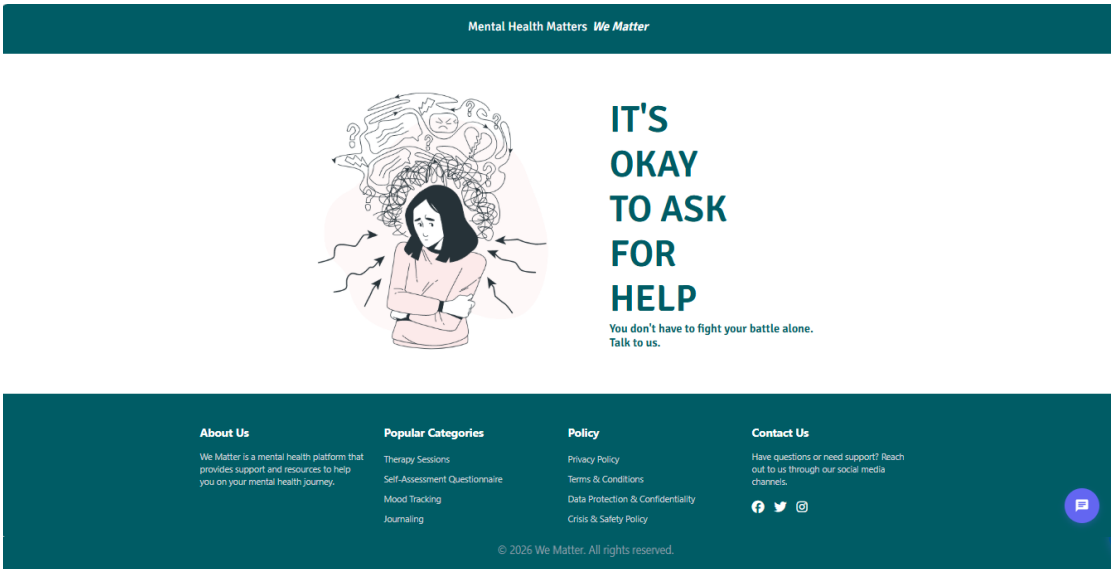


Figure 4.15 Landing Page

4.9.2. User Registration Page

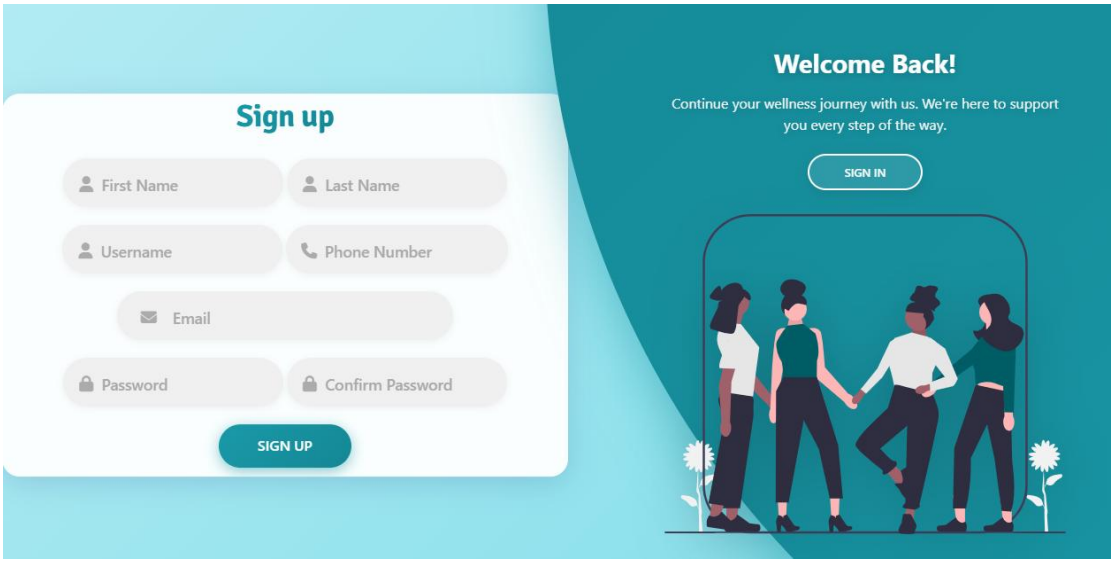


Figure 4.16 User Registration Page

4.9.3. User Login Page

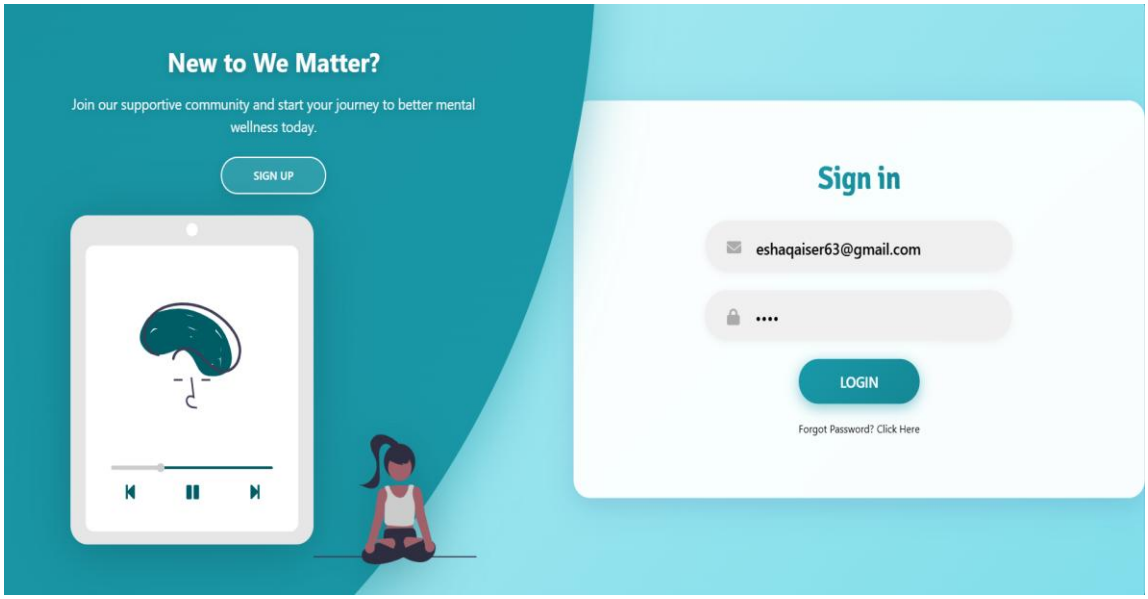


Figure 4.17 User Login Page

4.9.4. Reset Password Page

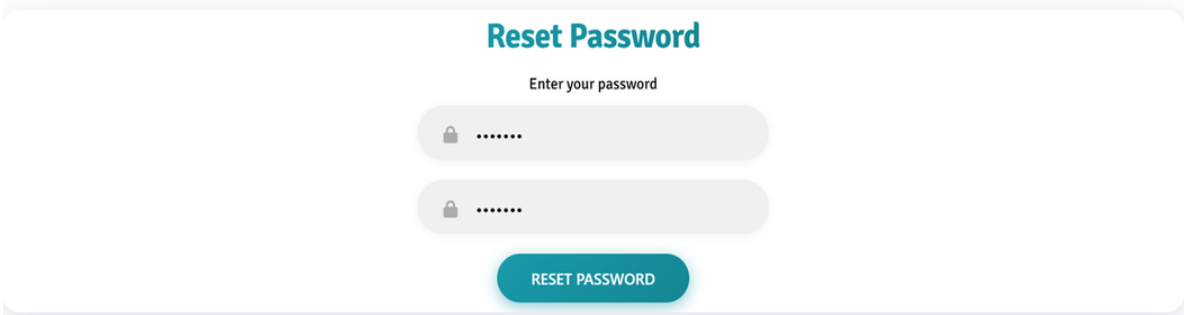


Figure 4.18 Reset Password Page

4.9.5. User Dashboard Page

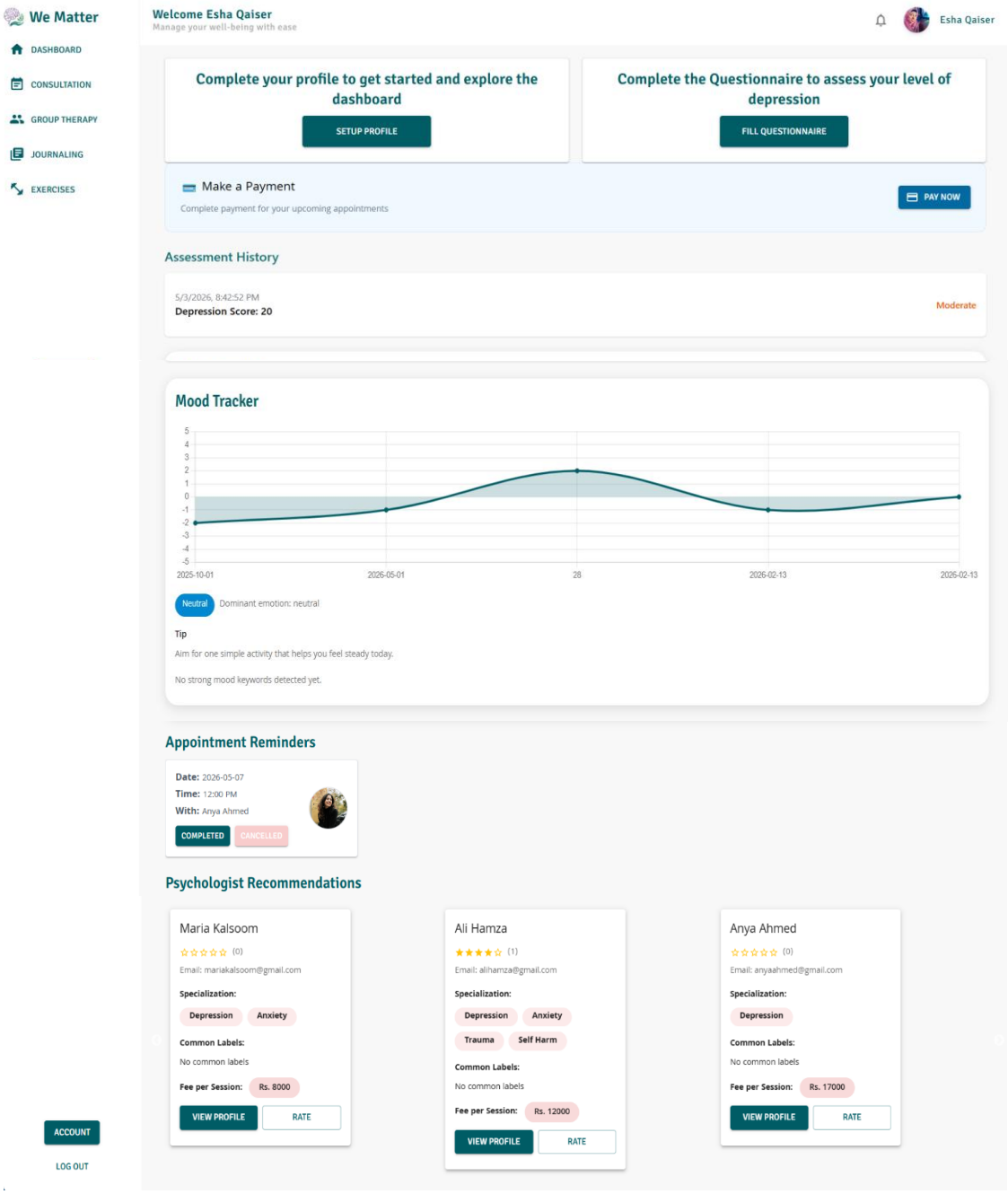


Figure 4.19 User Dashboard Page

4.9.6. Book Therapy Session

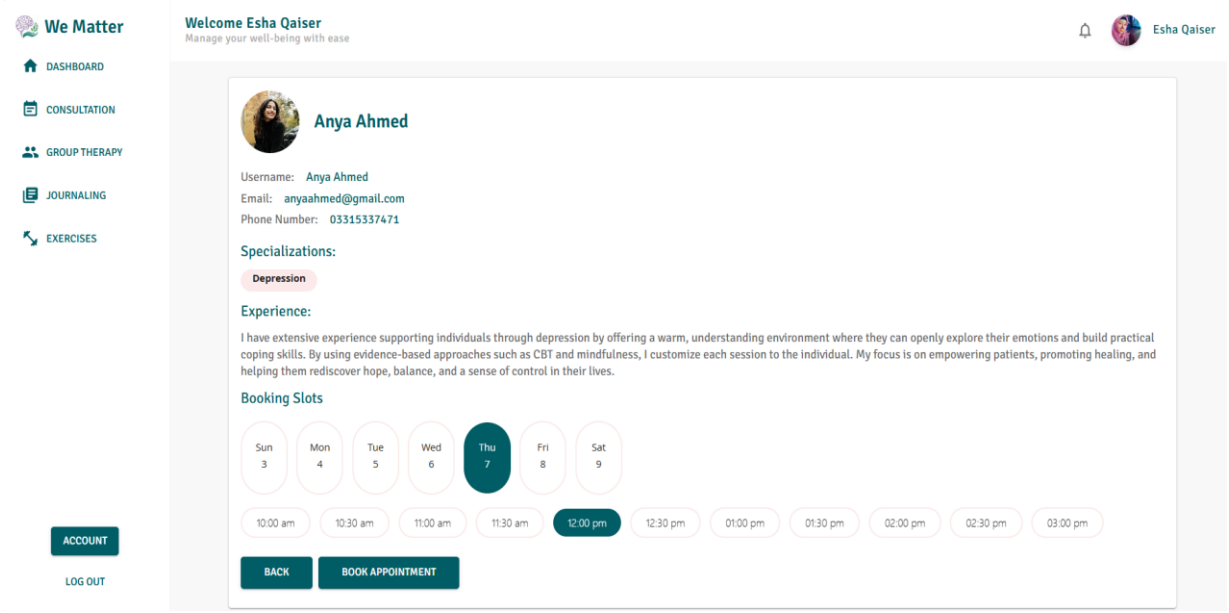


Figure 4.20 Book Therapy Session

4.9.7. Consulation Page

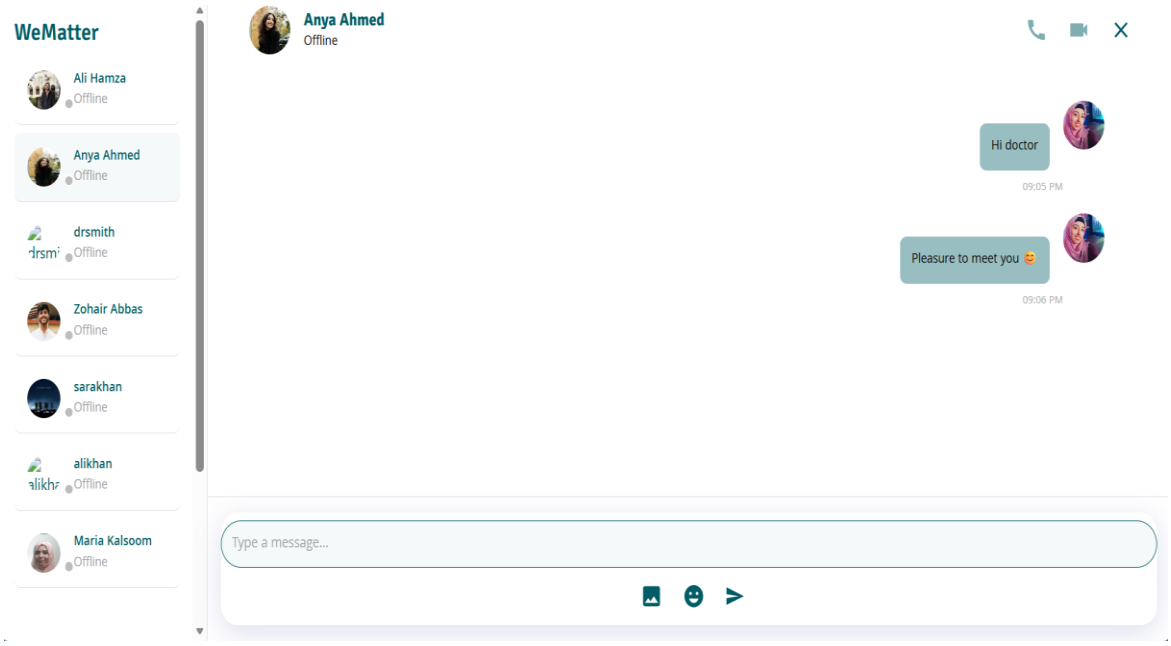


Figure 4.21 Consultation Page

4.9.8. Journaling Page

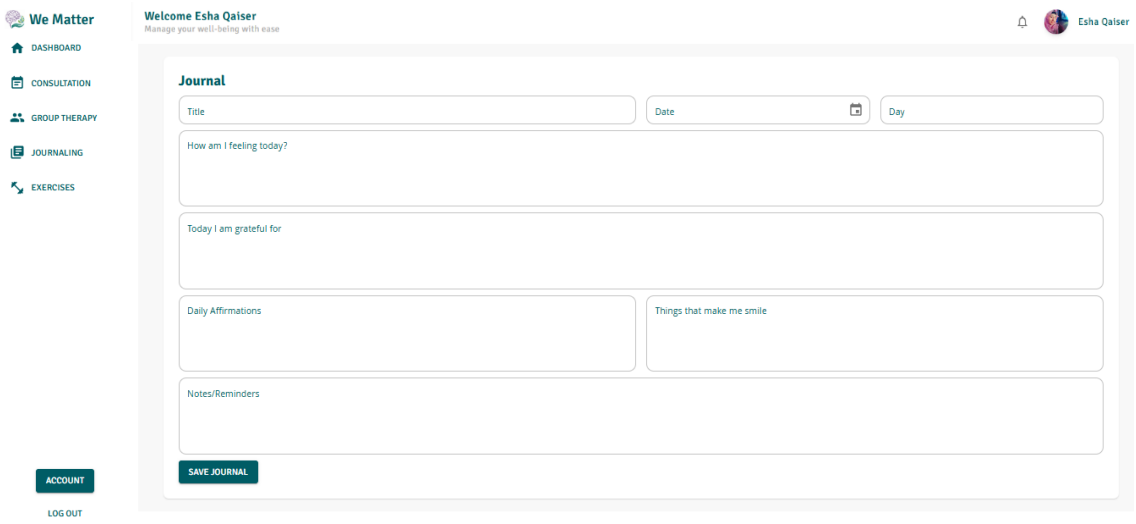


Figure 4.22 Journaling Page

4.9.9. Group Therapy Page

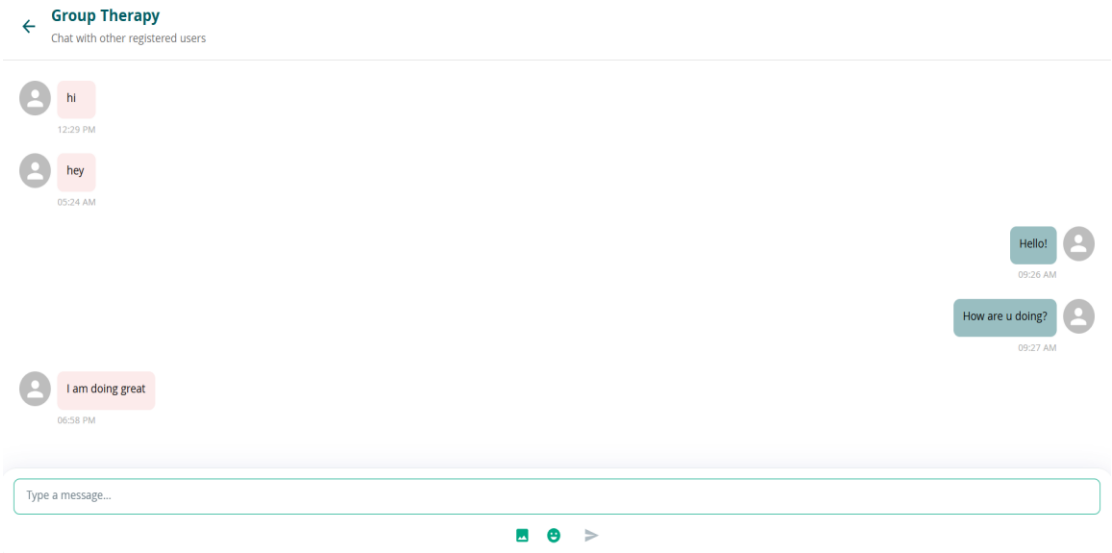


Figure 4.23 Group Therapy Page

4.9.10. Exercises Page

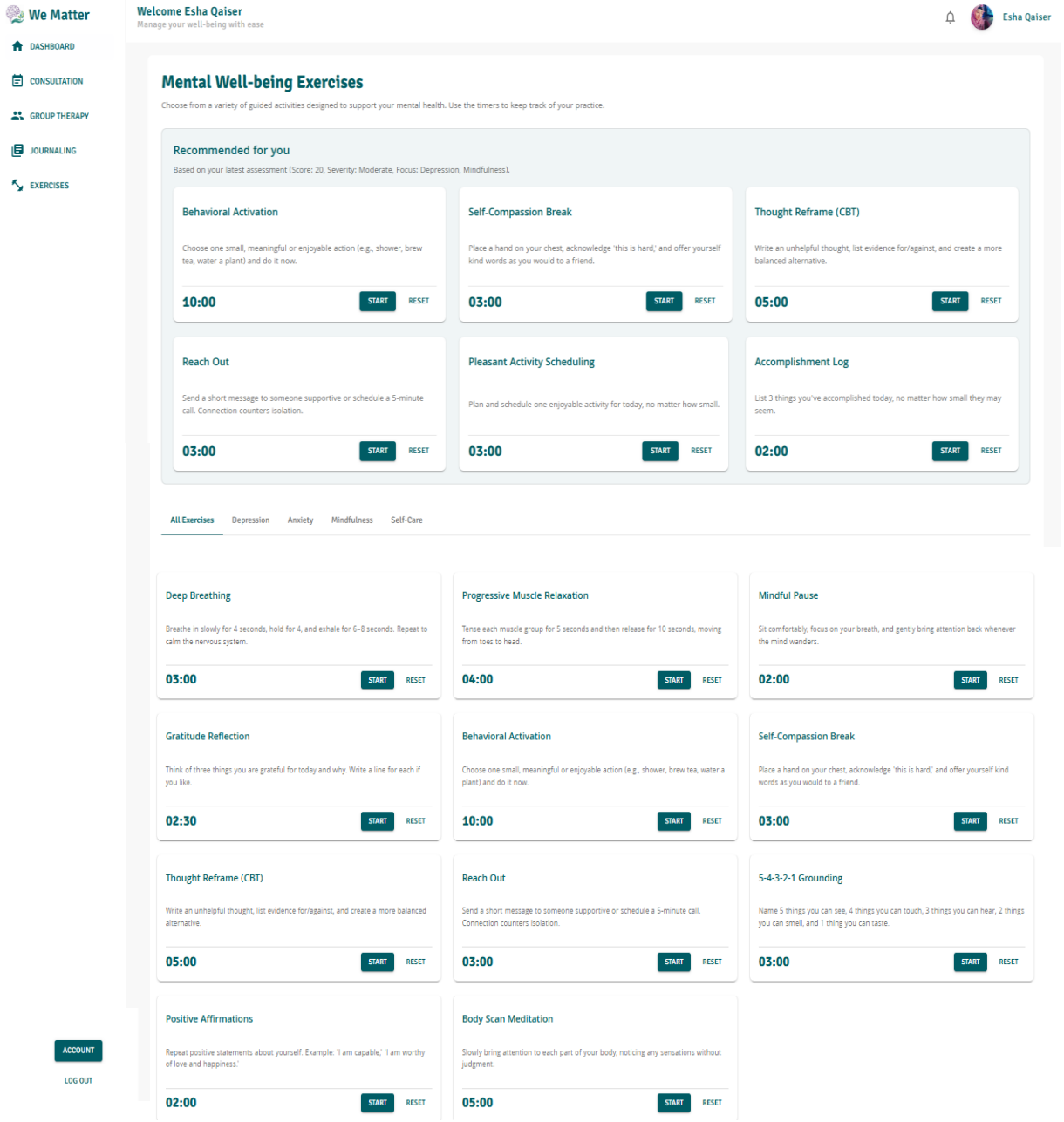


Figure 4.24 Exercises Page

4.9.11. AI Chatbot

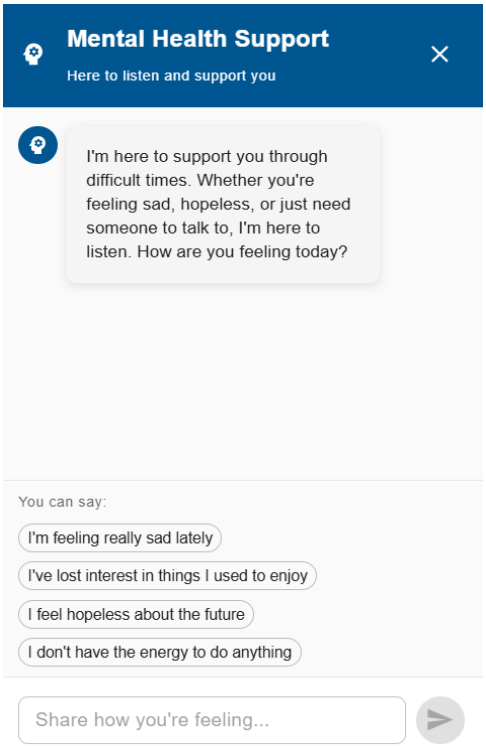


Figure 4.25 AI Chatbot

4.9.12. AI Symptom Checker

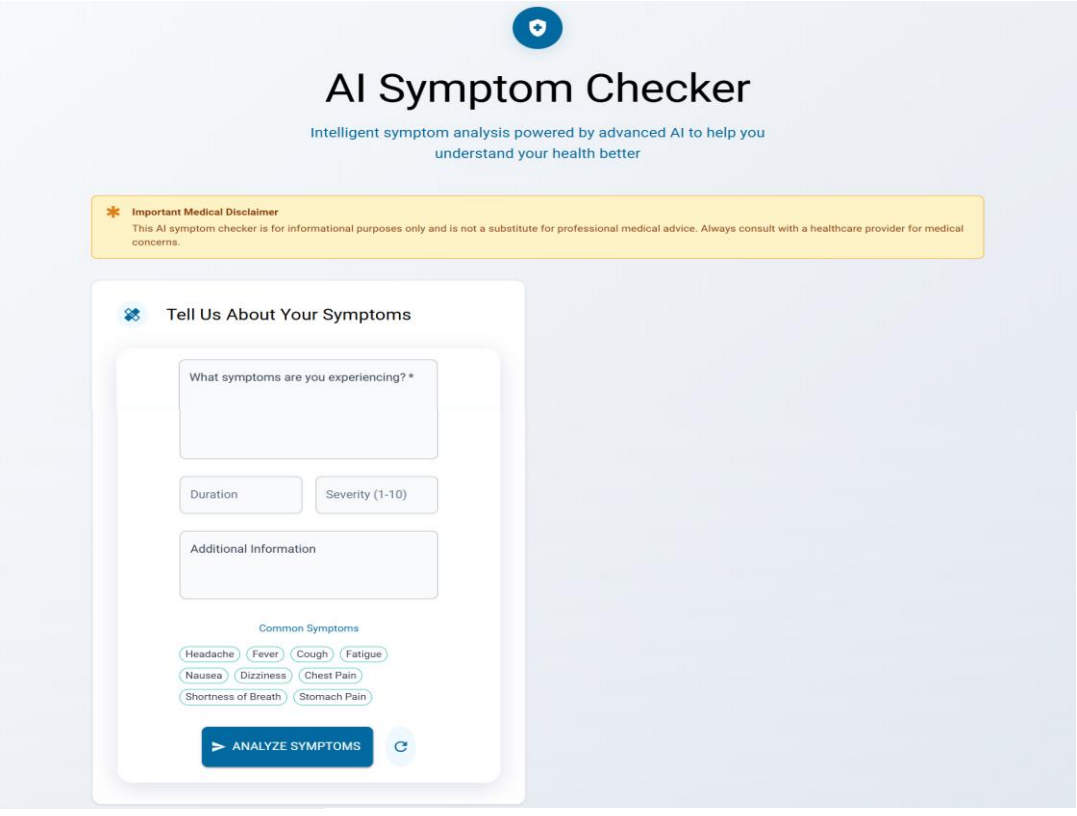


Figure 4.26 AI Symptom Checker

4.9.13. Psychologist SignUp

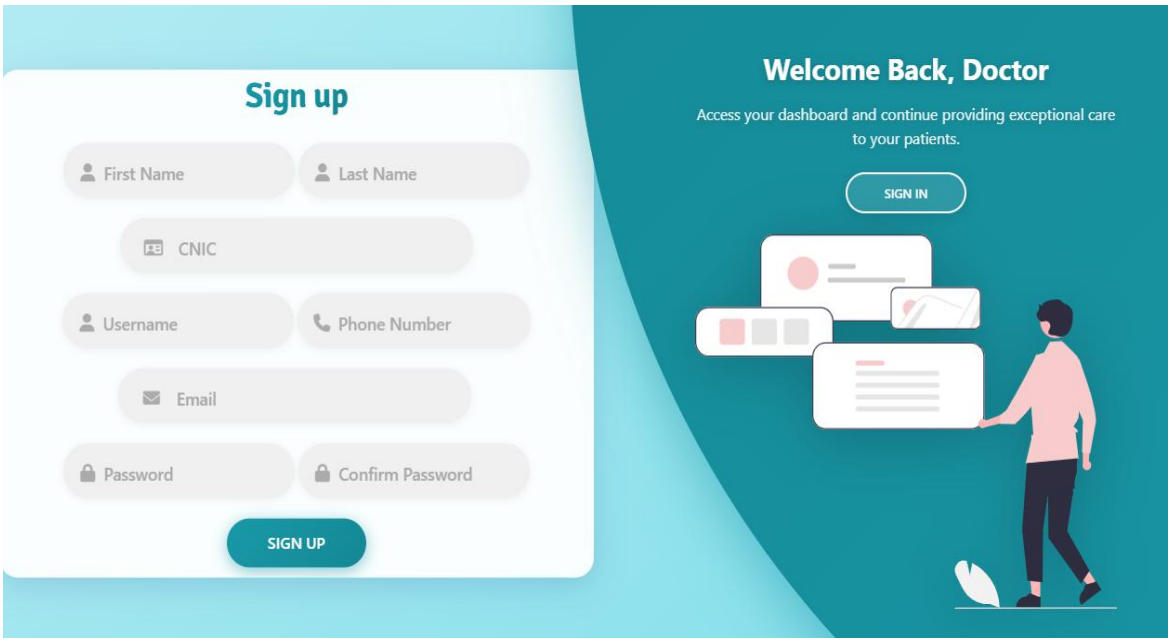


Figure 4.27 Psychologist SignUp

4.9.14. Psychologist Login

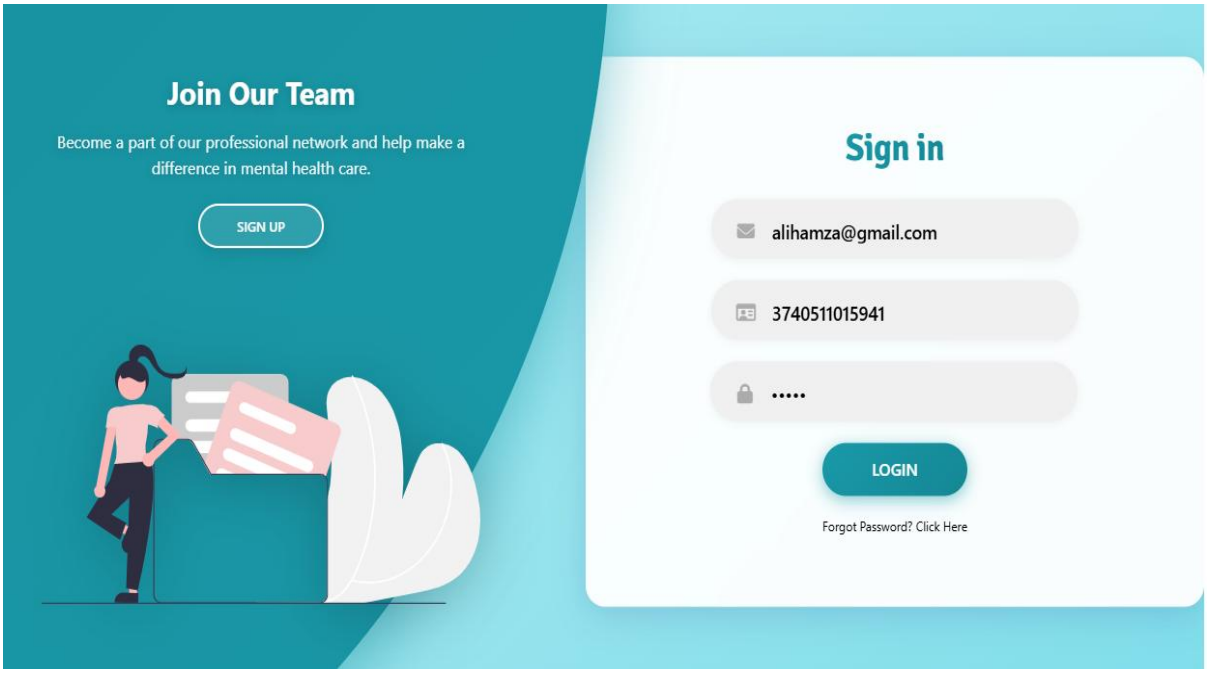


Figure 4.28 Psychologist Login

4.9.15. Psychologists Dashboard

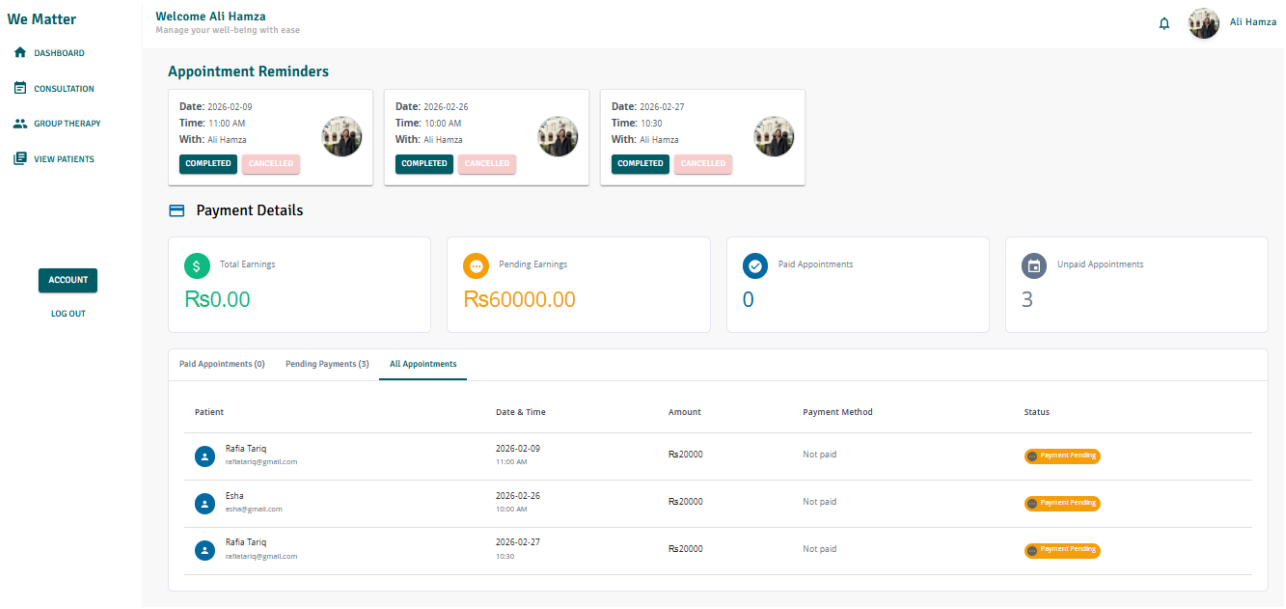


Figure 4.29 Psychologists Dashboard

4.9.16. Counselling Session

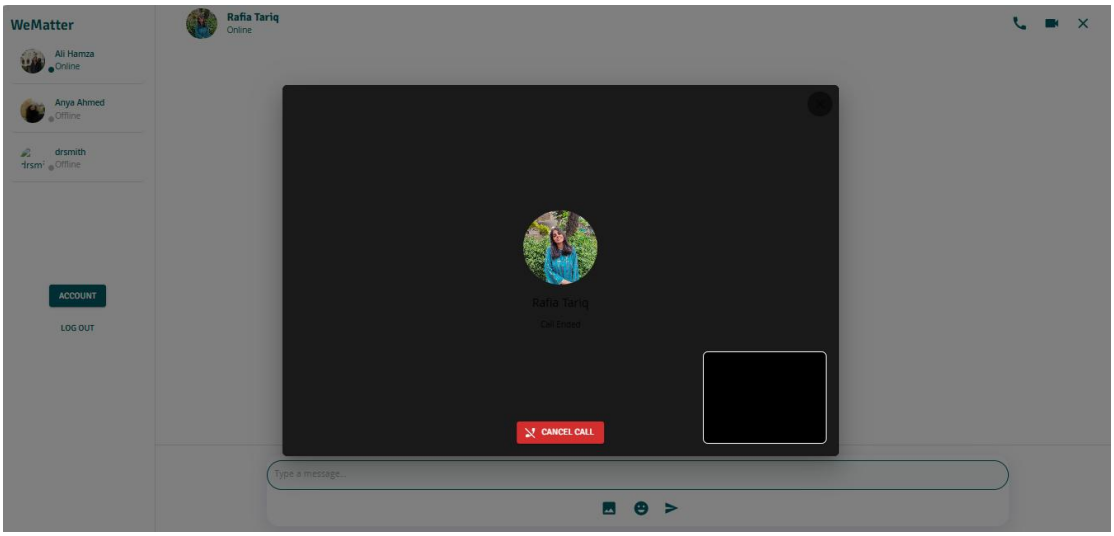


Figure 4.30 Counselling Session

4.9.17. Admin Dashboard (Users Management)

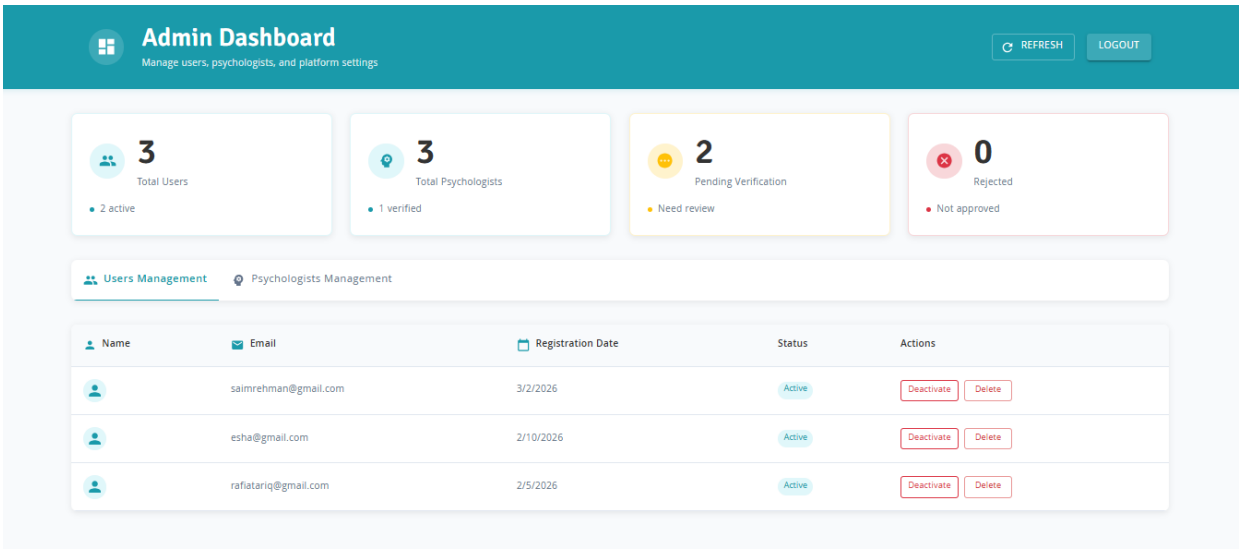


Figure 4.31 Admin Dashboard (Users Management)

4.9.18. Admin Dashboard (Psychologist Management)

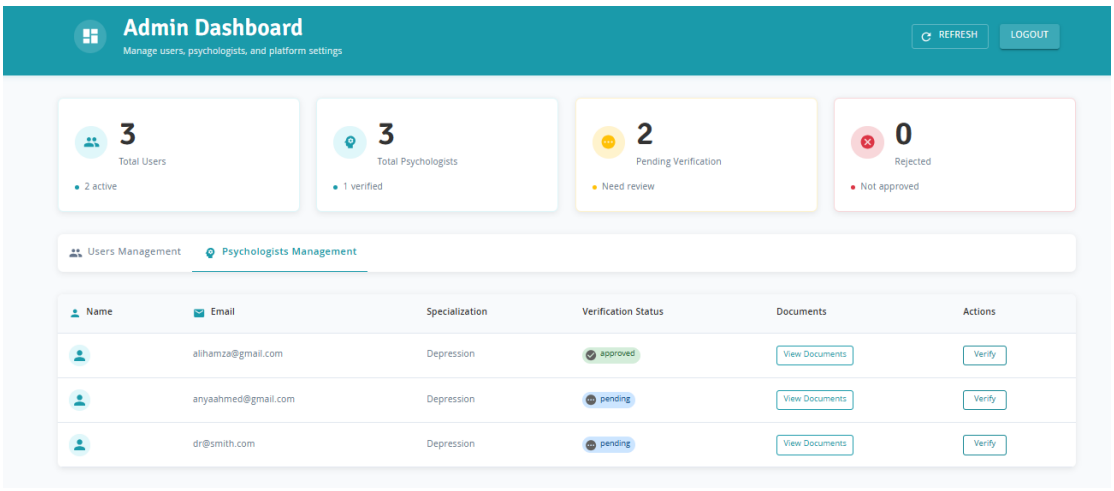


Figure 4.32 Admin Dashboard (Psychologist Management)

4.10. Conclusion

Chapter 4 talks about the We Matter system. It tells us how the We Matter system was designed and built. The We Matter system has parts. These parts include how users log in and what they see when they log in. It also includes parts for reporting and giving feedback. All these parts work together to help students feel better and be more involved.

The platform was highly developed and tested in order to be user friendly as well as scalable in such a way that we could have several users using it. This ensures that We Matter is a fully operational software application. In the coming times, it would become quite easy for us to improve this platform by adding advanced analysis capabilities and other features that would prove to be extremely beneficial for the students **[5], [6]**. It is quite evident from this chapter that We Matter is a practical platform that can make changes in the learning environment.

Chapter 5

System Implementation

5. System Implementation

5.1. Strategy

The implementation of the We Matter platform entailed a process-driven effort to effectively implement the architecture designed in the structured manner into a fully functional website that is both scalable and secure. The adoption of an incremental development method allowed the building of functionalities in a progressive and effective way, in order to integrate them efficiently. Privacy of users, responsive design, and real-time processing were some of the main aspects addressed in this process.

5.2. Tools and Technologies Used

- **Frontend:** React.js
- **Backend:** Node.js with Express
- **Database:** MongoDB (hosted on MongoDB Atlas)
- **Authentication:** Authentication based on JWT
- **Prototyping & UI Design:** Figma
- **Version Control:** GitHub

5.3. Development Process

That was the way in which we created this system, using the incremental approach to the process of its creation. Instead of doing all the things at once, we used the development process on an ongoing basis, whereby we would test and improve our modules continuously by iterating them again and again. The modules that we developed separately included Assessment, Journal, Auth, and appointments.

5.4. Key Feature Implementation:

However, the servers in the background are responsible for ensuring that the data is safe in the We Matter application. They act as a very strict guard for users who have authorization to access a particular piece of data to ensure flawless communication among all the parts of each application.

When you log in to any system, you are authenticated and assigned a particular type of profile, such as a student, an administrator, or a counselor. Depending upon your

selected level, you can open up application components. For privacy reasons, session tokens are used in the system.

Along with this, there is an exclusive area that facilitates reporting. The students will be able to submit their feedback concerning any issues related to their health condition, classes, or any other college activities. The submitted information will be kept in the database, which can be accessed only by the authorized personnel. The person who submits the report will be able to monitor its progress very easily. It becomes possible to give feedback through internal communication lines.

For students to book the sessions, the scheduling function will be helpful for them as far as their ease in booking goes. As a result, the professional team will be able to consider their booking and plan for their schedules effectively. All bookings will be saved securely at all times.

Overall, the back-end design of the platform ensures that users navigate through it effortlessly. The personal details on the platform are considered confidential and cannot be viewed by anyone else except authorized people.

5.5. Algorithms & Data Structures:

- Conditional statements will help in making sure that people are provided with the right resources according to their role.
- The MongoDB collections are organized into categories like users reports, feedback and appointments.
- We use arrays and objects to handle data on the dashboard. This also helps us keep track of the status.
- We rely on logic for role-based access control.
- The data in MongoDB collections is grouped into users reports, feedback and appointments.
- Arrays and objects play a role in managing data on the dashboard and tracking status updates.
- Conditional logic is key for controlling access based on roles.

- MongoDB collections are set up with categories for users reports, feedback and appointments.
- Arrays and objects are tools, for handling dashboard data.
- They also help us monitor the status.

5.6. Security Features:

We have made sure that people can only do things they are allowed to do on our website.

- This is done by making rules for each persons role at the backend level.
- We use codes called tokens to make sure people are who they say they are.
- When you type something into our website we check to make sure it is safe on both the frontend and the backend.
- We also make sure that sensitive data is protected by letting certain people access the database where this data is stored.
- The database has controls, in place to keep this sensitive data safe.

5.7. Workflow and Process Implementation

For an optimal development cycle, we applied a modified agile workflow involving the use of continuous integration and source code versioning via GitHub. The project started with the design and implementation of the interface prototypes using Figma, after which we developed each component separately. Each functionality was tested independently before integrating them into the application and deploying the application for users to access without any hassle.

In order to ensure the quality of our codes, we implemented feature branching in GitHub to ensure that new additions such as our AI chatbot and the DASS-21 module did not affect our main codebase. We held regular peer code reviews to address potential bugs in the development stage itself. To adhere to the strict timeline, we divided our project into smaller sprints, which involved developing simpler aspects such as user registration and journal first, followed by complex aspects such as implementing WebSockets in our therapy chat. Finally, during the deployment phase, we relied upon cloud-based servers for deploying our frontend and backend.

5.8. Conclusion

This chapter talks about how the We Matter system was put into action. It goes over the tools that were used and how each part of the We Matter system works on the inside. The people who made the We Matter system thought about how easy it's to use how secure it is and how well it works. The We Matter system lets students do a lot of things like tell people about problems they are having ask for help give their thoughts, on things and talk to counsellors in one place, the We Matter system.

Chapter 6

System Testing & Evaluation

6. System Testing & Evaluation

This chapter explains how We Matter was tested to make sure it works correctly and reliably. A proper testing process was followed to check each part of the system. The goal was to find and fix bugs early and ensure that users get a smooth and safe experience.

6.1. Test Strategy

Testing is considered as one of the most important aspects in the SDLC process. Testing guarantees that the developed software works properly and any bug is fixed. Proper testing is an essential step that should be done in order to guarantee the reliability of the product.

In our project “We Matter”, we have done proper testing in accordance with the four steps in testing. First, the unit testing of all features was done individually. Then, component testing was performed separately for the complete module. After the integration of the modules, integration testing was done. Finally, system testing was done.

6.2. Component Testing

The objective of component testing is testing modules individually for any faults or issues that exist within it. The following modules were tested individually in We Matter:

- User Authentication
- Issue Report
- Counselling Requests/Management
- Feedback Submission
- Admin Management

Issues with each module that arose from testing were sorted out before proceeding to the next step in development.

6.3. Unit Testing

Unit testing tests individual functions and methods of the system. For We Matter, unit testing was conducted for:

- User inputs (login, registration, issue reporting)
- Save and retrieval from the database
- Authorization based on roles

This made it possible to identify small mistakes and to make sure that each function did its job right.

6.4. Integrated Testing

Once all unit testing and component testing were completed, the integration testing phase was executed to see if the various modules operate together effectively. Some cases involved:

- Login success leading to access to the dashboard.
- An issue being filed and seeing the status report.
- The counselor's response being seen by the student correctly.
- The admin monitoring system activity.

Integration testing helped us ensure that data flows smoothly between modules and the app behaves correctly.

6.5. System Testing

The process of system testing took place when all modules have been completed. Testing involved the whole We Matter application from start to finish by a real user. These functionalities were checked out:

- User registration/login
- Issue submission/tracking
- Counseling request/response
- Admin system monitoring

System testing made sure that all of the functional requirements have been met.

6.6. Test Cases

Test cases were created to check how the system works in situations. Here are a few examples of test cases: They help to validate system behaviour under scenarios. Some of these test cases are given below.

6.6.1. Test Case#1

Table 6.1 Submitting Assessment Form

Test Scenario ID		**TS-001**	**Test Case ID**	**TC-001**	
Test Case Description		Submitting self-assessment questionnaire (DASS-21)	**Test Priority**	High	
Prerequisite		The user logs in	**Post-Requisite**	Assessment stored and score calculated.	
Test Execution Steps:					
S. No	**Action**	**Inputs**	**Expected Outcome**	**Actual Outcome**	**Test Result**
1	Access Assessment module	—	DASS-21 form displayed	Form opened	Pass
2	Answer questions	Ratings (0–3)	Responses accepted	Responses saved	Pass
3	Submit assessment	—	Score calculated	Score generated	Pass
4	View result	—	Severity level shown	Displayed correctly	Pass

6.6.2. Test Case#2

Table 6.2 Adding new journal

Test Scenario ID	TS-002	**Test Case ID**	TC-002
Test Case Description	Adding a new journal entry	**Test Priority**	Medium
Prerequisite	The user logs in	**Post-Requisite**	Journal entry saved and displayed in journal log.
Test Execution Steps:			

S. No	Action	Inputs	Expected Outcome	Actual Outcome	Test Result
1	Access journal screen	—	The journal entry screen should be opened	Screen displayed	Pass
2	Enter mood and notes	Mood: 4, Notes: “Had a good day”	Input accepted	Input saved successfully	Pass
3	Click save	—	Entry saved to MongoDB Atlas	Entry saved and confirmed	Pass

6.6.3. Test Case#3

Table 6.3 Conversing with AI chatbot

Test Scenario ID	TS-003	**Test Case ID**	TC-003
Test Case Description	Conversing with AI chatbot	**Test Priority**	High
Prerequisite	The user logs in	**Post-Requisite**	Response is received from the chatbot.
Test Execution Steps:			

S. No	Action	Inputs	Expected Outcome	Actual Outcome	Test Result
1	Access chatbot screen	Click Chatbot icon.	Chat screen loads	Chat opened	Pass

2	User types a message	"I'm feeling down".	Message processed	Reply received	Pass
3	Continue conversation	—	Bot gives suggestions/tips	Response helpful and relevant	Pass

6.6.4. Test Case#4

Table 6.4 Book Therapy Session with Licensed Professional

Test Scenario ID		TS-004	**Test Case ID**	TC-004	
Test Case Description		Book therapy session with licensed professional	**Test Priority**	High	
Prerequisite		The user logs in	**Post-Requisite**	Session booking done successfully	
Test Execution Steps:					
S. No	**Action**	**Inputs**	**Expected Outcome**	**Actual Outcome**	**Test Result**
1	Open therapy session module	—	List of licensed professionals displayed	Professionals listed	Pass
2	Select licensed professional	Psychologist A	Available slots displayed	Slots shown	Pass
3	Choose time slot	5:00 PM	Slot selected successfully	Slot selected	Pass
4	Confirm booking	—	Booking confirmation shown	Booking confirmed	Pass

5	Save booking	—	Appointment stored in database	Appointment saved	Pass

6.6.5. Test Case#5

Table 6.5 Mood Tracking

Test Scenario ID	TS-012	**Test Case ID**	TC-012
Test Case Description	Record daily mood and view progress graph	**Test Priority**	Medium
Prerequisite	The user is signed in	**Post-Requisite**	Mood entry saved and reflected in graph

Test Execution Steps:

S. No	Action	Inputs	Expected Outcome	Actual Outcome	Test Result
1	Open mood tracking module	—	Mood input screen displayed	Screen opened	Pass
2	Select mood rating	4 (Happy)	Mood selected successfully	Mood recorded	Pass
3	Add optional note	“Productive day”	Note saved with entry	Saved successfully	Pass
4	Save mood entry	—	Data stored in database	Stored in backend	Pass
5	View progress graph	—	Mood trend chart displayed	Graph shown correctly	Pass

6.7. Results & Evaluation

All the tests mentioned above were performed successfully. The system passed functional and integration tests without any major issues. Few UI bugs and edge cases were identified and resolved. Based on testing, We Matter performs its intended tasks such as assessment, journaling, online session with licensed psychologist and mood tracking, accurately and reliable **[4]**.

6.8. Conclusion

This chapter describes the testing and evaluation process of the We Matter website. Various types of testing ensured that the software satisfied the needs of its users.

Chapter 7

Conclusion

7. Conclusion

This chapter concludes the work done throughout the development of We Matter. It summarizes the contributions of the project, the key learnings and reflections during the process, and possible directions for future improvement and expansion.

7.1. Contributions

We Matter is a digitally designed and developed solution that caters specifically towards enhancing mental wellness, issue reporting, and providing necessary assistance to students in a school or college setup. The major contributions made through this project are:

- Designing and development of a system where students could submit issues and concerns.
- Inclusion of DASS-21 questionnaires to analyze the level of mental wellness of the students.
- Automatic calculation of the scores of the DASS-21 questionnaire responses to detect the level of mental wellness.
- Providing structured analysis on the state of mental wellness to detect potential signs of depression, anxiety, and stress.
- Ensuring secure authentication and authorization of users based on their roles (students, counselors, and administration).
- Allowing the students to make requests for counseling sessions and getting responses.
- Providing facilities for the administration to track down the reports and perform other administrative tasks.

We also carried out a critical analysis of the students to confirm the level of depression using DASS-21 test results. In this case, the test has been employed to conduct an analysis of the mental health of the selected population, which will help identify the extent of depression faced by different individuals. The analysis was conducted by categorizing the participants according to their level of depression that ranged from Normal to Extremely Severe. Further comparisons were made in terms of gender to find out whether there are any differences in the experience of depression between males and females.

Table 7.1 Depression Level Assessment by DASS-21

Subject ID	Gender	Test 1	Test 2	Test 3	Average Score	Level of Depression
Subject 1	Female	12	14	13	13.0	Mild
Subject 2	Male	8	7	9	8.0	Normal
Subject 3	Female	16	18	17	17.0	Moderate
Subject 4	Male	22	25	23	23.3	Severe
Subject 5	Female	29	28	31	29.3	Extremely Severe
Subject 6	Male	10	11	9	10.0	Mild
Subject 7	Female	6	8	7	7.0	Normal
Subject 8	Male	14	13	15	14.0	Moderate
Subject 9	Female	19	18	20	19.0	Moderate
Subject 10	Male	27	26	28	27.0	Severe
Subject 11	Female	13	15	14	14.0	Mild
Subject 12	Male	17	19	16	17.3	Moderate
Subject 13	Female	9	10	8	9.0	Normal
Subject 14	Male	24	23	25	24.0	Severe
Subject 15	Female	12	11	14	12.3	Mild
Subject 16	Male	13	12	14	13.0	Mild
Subject 17	Female	18	16	19	17.7	Moderate
Subject 18	Male	30	31	29	30.0	Extremely Severe
Subject 19	Female	11	12	10	11.0	Mild
Subject 20	Male	21	20	22	21.0	Severe

As shown in Table 7.1, the outcome of the DASS-21 test, there is evidence of the existence of a marked difference in the depression levels among both male and female subjects.

The outcome of DASS-21 screening test shows a marked difference in the depression levels among the male and female subjects, which show wide variations in the severity of depression levels.

Among the 10 females screened for depression, there are wide variations in the depression levels. Some few females fall within the "mild" classification and have

average scores ranging from 6 to 14. From the above information, it can be concluded that those females have relatively low depression levels. Many of the female participants have been classified within the "moderate" category, which implies a certain degree of depression that needs intervention. Among the female subjects, subject number 5 has the highest level of depression and falls within the "extremely severe" classification.

In the case of respondents the distribution also shows different levels of depression. Some males are labeled as "Normal" with scores between 7 and 9. This means these men do not have any signs of depression. There are males who are classified as "Mild" and have low depression scores. However, it is clear that several males are also categorized as "Severe" with scores ranging from 21 to 27. This indicates that their depression signs are more serious and need treatment. Among males the serious case is Subject 18. He is categorized as " Severe" with a score of 30. The depression signs in males are a concern. Depression in males is an issue that needs attention. Male depression scores vary widely. The distribution of depression scores among males shows a range of severity. Some males have depression and need help. Males, with depression scores need to be treated. The case of Subject 18 is particularly concerning. Subject 18s depression score is extremely high.

Based on the comparison between male and female samples, the pattern indicates that females in this study are generally prone to moderate to severe cases of depression. Although some of the male subjects are categorized as having moderate and severe cases of depression, most are classified either under “Normal” or “Mild.” On the other hand, a higher percentage of the female subjects is classified under “Moderate,” “Severe,” and “Extremely Severe” categories.

The difference among the female and male respondents may be attributed to many factors, including gender differences in perceiving or expressing depression, social and psychological pressure that may affect women more than men in the community **[1], [2]**. But regardless of their gender, both groups agree on the need for specific mental health interventions for respondents identified as “Moderate,” “Severe,” and “Extremely Severe.”

7.2. Reflections

Being part of the We Matter project was an interesting learning experience as it offered useful insight into actual system design and applications that are centered on mental health.

Strengths:

- The system addresses real-world challenges that students face, such as communication problems and mental health.
- DASS-21 integration gives the entire system scientific validity.
- The website is user-friendly, making students willing to use it.
- Role-based access ensures increased privacy and accountability.

Limitations:

- The system applies predetermined score calculation in relation to the DASS-21 questionnaire.
- Communication with a counselor is not real-time.
- The website can be used solely at academic institutions.

Conclusion:

- We Matter system detects potential mental health problems among students.
- Students' health status is regularly monitored.
- Confidentiality is assured.

7.3. Future work

As time goes by, the We Matter platform will gain even more improvement using algorithms that utilize machine learning in analyzing the results of the DASS-21 test taken by the person. This will help in recognizing any kind of pattern that will emerge as far as their well-being is concerned. There is another way that the application can be improved, as well, through providing services like instant messaging along with emotional assistance using AI technology for their daily needs **[4], [5], [6].**

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APPENDICES

In this part of the report, extra documentation has been added to provide an improved understanding of the process involved in designing, developing, and evaluating We Matter. The documentation provides extra information on the construction of assessments and the data architecture of the tool.

APPENDIX A – DASS-21 QUESTIONNAIRE

The DASS-21 survey shown in Figure 7.1 below, is employed by We Matter to assess the user's mental wellbeing. Depending on their answers, the total score for the user is calculated by We Matter.

DASS21 Name: Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree or a good part of time
3 Applied to me very much or most of the time

1 (s)	I found it hard to wind down	0	1	2	3
2 (a)	I was aware of dryness of my mouth	0	1	2	3
3 (d)	I couldn't seem to experience any positive feeling at all	0	1	2	3
4 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5 (d)	I found it difficult to work up the initiative to do things	0	1	2	3
6 (s)	I tended to over-react to situations	0	1	2	3
7 (a)	I experienced trembling (e.g. in the hands)	0	1	2	3
8 (s)	I felt that I was using a lot of nervous energy	0	1	2	3
9 (a)	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10 (d)	I felt that I had nothing to look forward to	0	1	2	3
11 (s)	I found myself getting agitated	0	1	2	3
12 (s)	I found it difficult to relax	0	1	2	3
13 (d)	I felt down-hearted and blue	0	1	2	3
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15 (a)	I felt I was close to panic	0	1	2	3
16 (d)	I was unable to become enthusiastic about anything	0	1	2	3
17 (d)	I felt I wasn't worth much as a person	0	1	2	3
18 (s)	I felt that I was rather touchy	0	1	2	3
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20 (a)	I felt scared without any good reason	0	1	2	3
21 (d)	I felt that life was meaningless	0	1	2	3

Figure 7.1 Appendix A – DASS-21 Questionnaire

APPENDIX B- DATABASE DATA STRUCTURE

The following Figure 7.2 represents the structure that describes the way We Matter organizes and keeps data from all the users in MongoDB Atlas. It becomes apparent from the diagram above that several collections and subcollections exist. Each collection/subcollection has its own purpose, whether it is management of mental tests, journaling, well-being, or interaction with a bot.

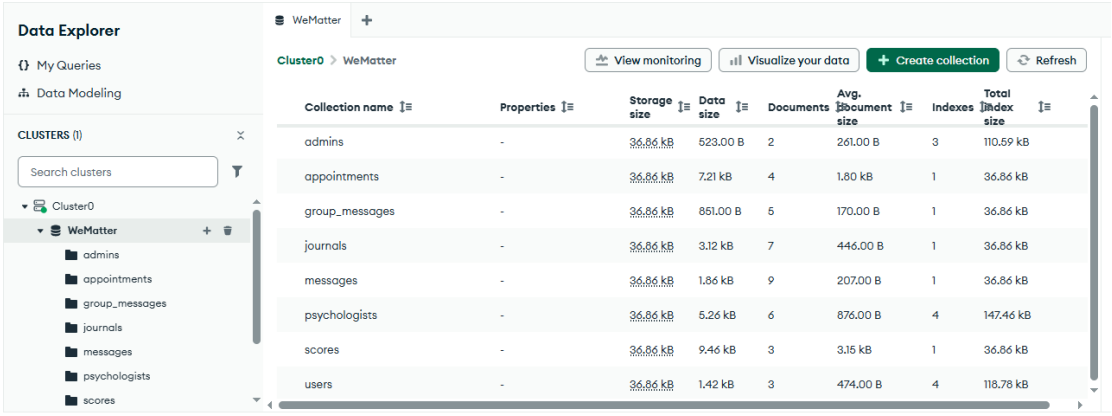
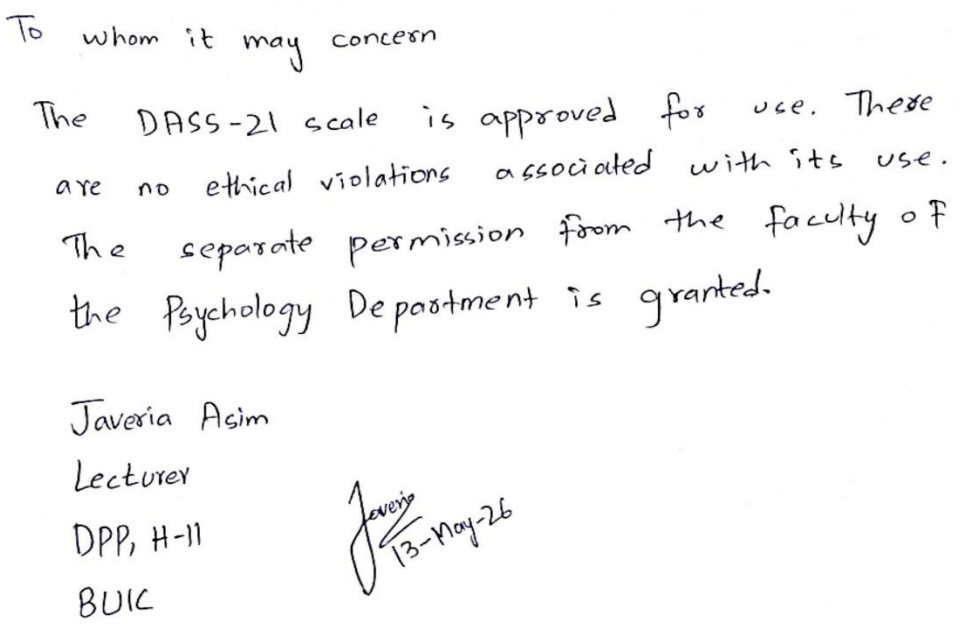


Figure 7.2 MongoDB Data Structure

APPENDIX C- PSYCHOLOGY DEPARTMENT APPROVAL

As shown in Figure 7.3, this appendix contains the letter of formal approval written by Ms. Javeria Asim, Lecturer in the Department of Psychology at Bahria University (H-11 Campus). This letter states that the use of the DASS-21 instrument in this study is allowed, as it satisfies all necessary ethical considerations.


To whom it may concern

The DASS-21 scale is approved for use. There are no ethical violations associated with its use. The separate permission from the faculty of the Psychology Department is granted.

Javeria Asim
Lecturer
DPP, H-11
BUIC

Javeria
13-May-26

Figure 7.3 Psychology Department Approval