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Graduation Project

Academic Year 2024-2025

Final Documentation

# Abstract:

Mental health issues such as stress, anxiety, depression, and suicidal tendencies have seen a significant rise globally. Many individuals require continuous psychological support, but barriers such as high costs, limited accessibility to psychotherapists, and social stigma prevent them from seeking professional help. The absence of affordable, easily accessible, and stigma-free mental health support exacerbates these issues, leaving many without the necessary resources to manage their mental well-being effectively.

Our project, **Stoic**, aims to bridge this gap by offering continuous, daily assistance through a mobile application. While not a replacement for professional psychotherapy, Stoic serves as a life coach, providing structured daily plans to support users' mental health. The app leverages advanced emotion detection and Artificial Intelligence (AI)-driven personalized responses to help users cope with anxiety, depression, and stress. Key features include an onboarding phase, emotion analysis from user text in the chatbot, localization for Arabic speakers, personalized mental health resources such as podcasts, breathing exercises, and articles, and community groups where users can share thoughts and engage in talk rooms.

Stoic is powered by advanced technologies, including **DeepSeek-R1**, **React-Native**, **Artificial Intelligence(AI) Algorithms**, **MySQL**, and **Spring Boot**, ensuring a seamless and effective user experience. By combining accessibility, personalization, and community engagement, Stoic aims to make mental health support more inclusive and empowering for all.

# Table of content:-

# Chapter 1 Background

## 1.1 Introduction

Mental health is a crucial aspect of overall well-being, influencing emotions, thoughts, and daily functioning. However, millions of people worldwide struggle with mental health issues, often facing barriers such as high costs, geographic limitations, and social stigma that prevent them from seeking professional help.

According to the World Health Organization (WHO), over 1 billion individuals globally suffer from mental health disorders, yet many lack access to adequate care. This gap in mental health support highlights the need for alternative solutions that are accessible, affordable, and stigma-free.

With advancements in digital health technologies, mobile applications have emerged as a promising tool to bridge this gap. Stoic is designed to provide continuous and personalized mental health support by integrating AI-driven insights with life coaching techniques. Unlike traditional therapy, Stoic offers an affordable and inclusive platform, empowering users to take charge of their emotional well-being.

By offering structured daily plans, AI-powered emotion analysis, and tailored mental health resources, Stoic helps users manage anxiety, stress, and depression while fostering personal growth. Additionally, with full Arabic language support, Stoic ensures accessibility for Arabic-speaking users, making mental health support more inclusive and widespread.

## 1.2 Motivation

The need for mental health apps is more critical than ever, as global mental health issues continue to rise. Statistics show that:

- Over **1 billion people** worldwide suffer from mental health disorders.
- **70%** of individuals in low- and middle-income countries lack access to mental health services.
- **Stigma** and **cost barriers** prevent many from seeking traditional therapy.

Stoic aims to tackle these challenges by providing an affordable, accessible, and inclusive platform for mental health support, empowering users to take control of their emotional well-being.

## 1.3 Beneficiaries

Stoic is designed to serve a wide range of individuals, including:

- Those experiencing **anxiety, depression, stress, or suicidal thoughts**.
- Individuals with stable mental health seeking **personal growth** and **emotional well-being**.
- People unable to access traditional life coaching due to **cost, availability, or social barriers**.
- Users looking for **daily guidance** in mental wellness, productivity, and personal development.
- Arabic-speaking users, thanks to **localized language support**, ensuring inclusivity and accessibility.

## 1.4 Problem Definition

The absence of affordable, accessible, and stigma-free mental health support has left many individuals without the resources they need to manage their mental well-being effectively. Traditional therapy is often out of reach due to high costs, limited availability, and social stigma. Additionally, many existing mental health apps lack **personalization**, **localization**, and **community-driven features**. Stoic addresses these gaps by offering a **life coaching app** that provides **structured daily plans**, **AI-driven emotion analysis**, and **personalized resources** to support users in their mental health journey.

## 1.5 Main Application Features

Stoic serves as a **life coach**, providing structured daily plans to support users' mental health. Key features include:

### 1.5.1 Emotion Analysis

- Uses **AI-driven sentiment analysis** to detect emotions like anxiety, stress, depression, and suicidal tendencies from user text.
- Identifies emotional patterns to provide **personalized support**.

### 1.5.2 Personalized Responses

Based on emotion analysis, Stoic offers tailored recommendations, including:

- **Podcasts**
- **Breathing Exercises**
- **E-Books**
- **Daily Affirmations & Motivational Quotes**

- **Emergency Calling** for crisis situations.

### 1.5.3 Notification System

- Sends reminders for mental health activities (e.g., breathing exercises, journaling prompts).
- Tracks emotional progress over time, encouraging **continuous improvement**.

### 1.5.4 Community-Driven Support

- **Safe Peer Interaction**: Moderated forums for anonymous discussions.
- **Topic-Based Support Groups**: Focused on areas like anxiety management and stress relief.
- **AI-Powered Moderation**: Blocks harmful content to ensure a safe environment.
- **Privacy Controls**: Optional anonymity and user-controlled participation visibility.

### 1.5.5 Weekly Mental Health Check-In

- **Quick Assessment**: Mood rating, sleep hours, anxiety symptoms, and chatbot feedback.
- **Reports Generated**: Mood/sleep trends, stress patterns, activity-mood analysis, and personalized recommendations.

### 1.5.6 Arabic Language Support

- Stoic is fully available in **Arabic**, ensuring accessibility for Arabic-speaking users.
- Users can interact with the AI, receive recommendations, and participate in community discussions in Arabic.

### 1.5.7 Main Technologies

Stoic leverages advanced technologies to enhance its functionality:

- **DeepSeek-R1**: Enables emotion detection and sentiment analysis.
- **React Native**: Ensures smooth cross-platform app development.
- **AI Algorithms**: Generate personalized mental health recommendations based on user input and behavior.
- **MySQL**: Manages data storage and notifications.
- **Spring Boot**: Handles backend logic, API endpoints, and app functionality.

### 1.5.8 Limitations

While Stoic provides valuable mental health support, it has certain limitations:

- It **does not replace professional psychotherapy** or medical treatment.
- Emotion detection depends on user-input text, which may not fully capture emotional depth.
- AI-generated responses follow patterns and may not address **complex mental health issues**.

# Chapter 2 :Related Work

Several mental health apps share similarities with **Stoic**, but key differences set it apart:

| Feature | BetterMe | Soul AI Therapy | MoodTalker | Stoic |
|---|---|---|---|---|
| **Cost** | Paid subscription | Premium features required | Free with limitations | Free mental health plans |
| **AI Capabilities** | Basic recommendations | Chatbot-based support | General AI responses | Advanced AI-driven coaching |
| **Personalization** | Limited | Emotional support | Mood journaling | Real-time sentiment analysis |
| **Community Features** | No | No | No | Forums & support groups |
| **Language Support** | English only | English only | English only | Arabic & English support |
| **Platform Availability** | iOS & Android | iOS only | iOS & Android | iOS & Android (React Native) |

**Key Takeaways:**

1. Accessibility: Stoic is free, while competitors require paid subscriptions.
2. Advanced AI: Real-time emotion analysis for personalized recommendations.
3. Community Support: Forums and groups for peer interaction.
4. Arabic Support: Breaks language barriers for Arabic-speaking users.

# Chapter 3 Project specifications:

## 3.1 Stakeholders:

- End Users: Individuals with mental health concerns, personal growth seekers, Arabic-speaking users.
- System Administrators/Managers: Manage accounts, content, and support.
- Developers: Build and maintain the system (app, backend, AI).
- Content Creators: Provide mental health resources (podcasts, articles).
- Legal and Regulatory Authorities: Ensure compliance with data protection and mental health regulations.

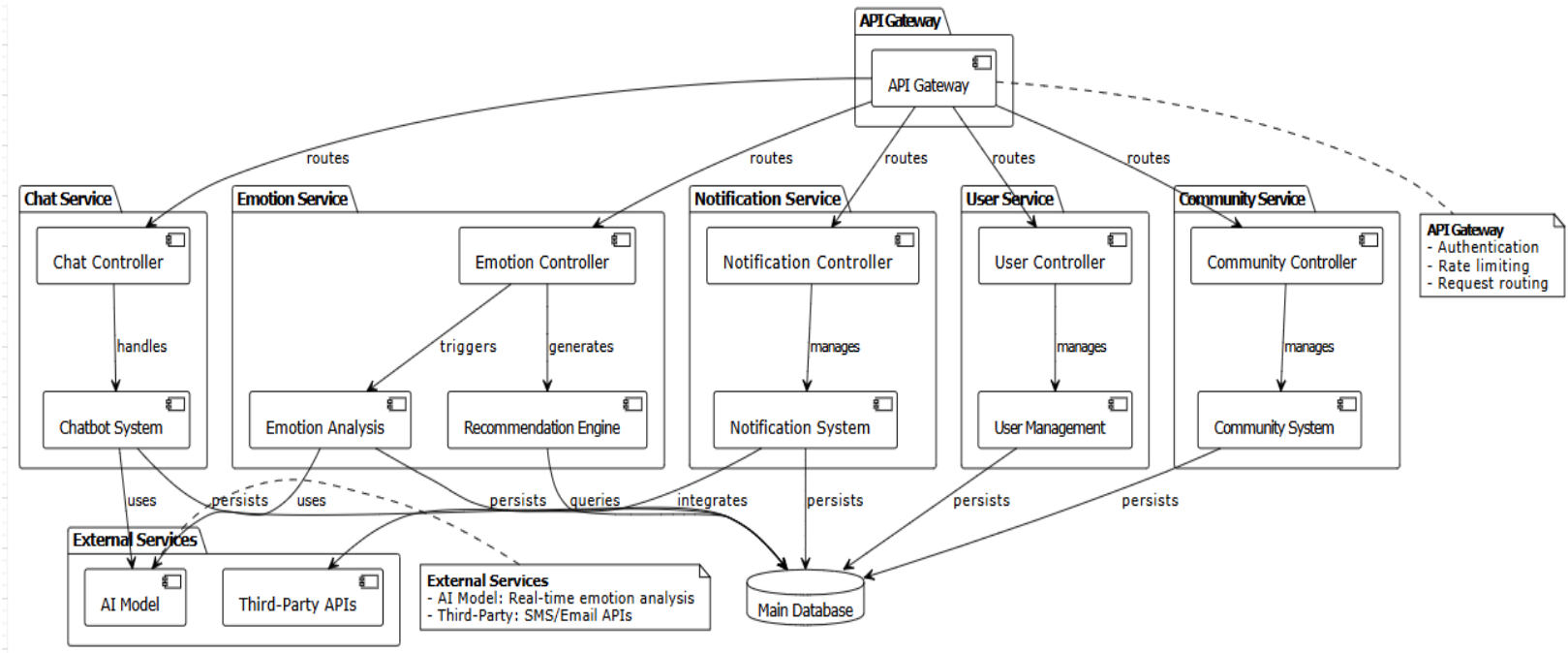
## 3.2 Functional Requirements (FRs):

- User Management: Secure registration, preferences, anonymous mode.
- Onboarding: The system provides guided questions, mental health assessment.
- Emotion Analysis: AI-driven sentiment analysis, detect stress, anxiety, depression.
- Personalized Recommendations: Resources, affirmations, emergency calling.
- Notification System: Activity reminders, emotional progress tracking.
- Community Support: Moderated forums, topic-based groups, AI moderation.
- Room Management: Create/join talk rooms, private/public access.
- Weekly Check-In: Mood trends, activity-mood analysis.
- Arabic Support: AI chatbot, recommendations, Register transfer level (RTL) layout. نحطه ف key differences

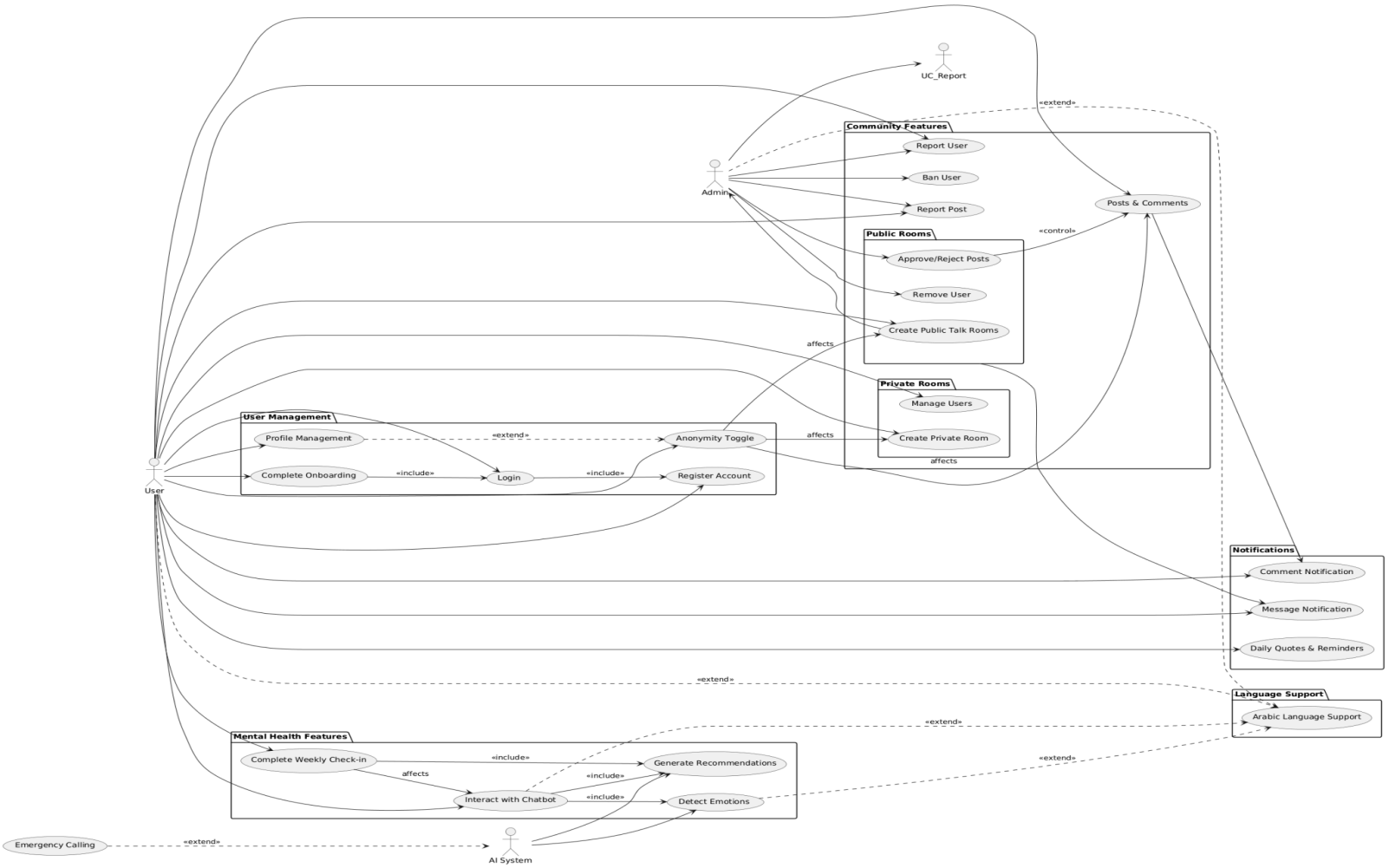
## 3.3 Non-Functional Requirements (NFRs):

- Performance & Scalability**:** Real-time sentiment analysis (<500ms response) and support for 100,000+ users.
- Security and Privacy: Data encryption, user control over data.
- Availability and Reliability: 99.9% uptime, 24/7 emergency calling.
- Usability and Accessibility: Intuitive UI/UX, Arabic RTL support.
- Maintainability and Extensibility: Modular architecture, future AI integration.

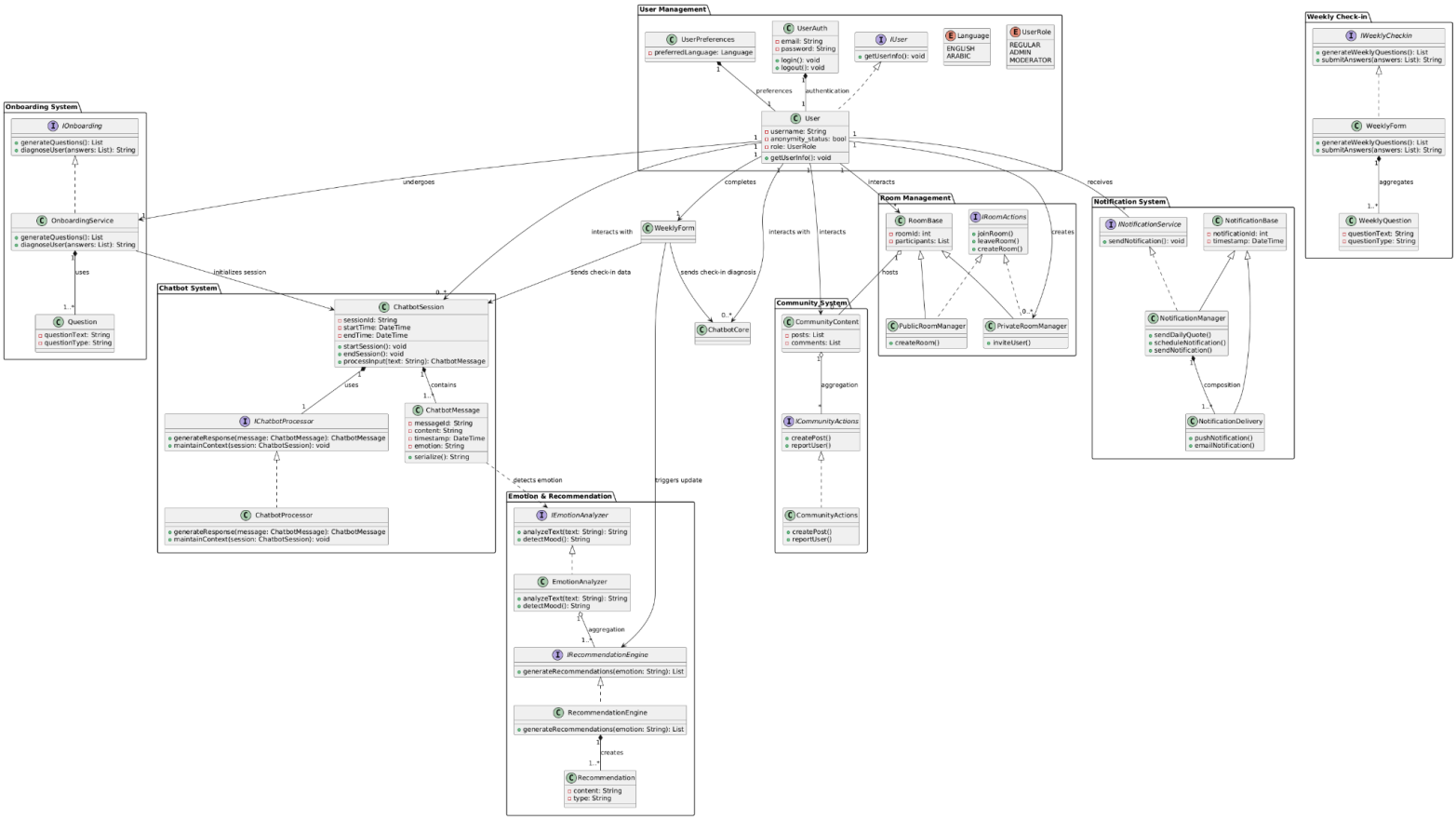
## 3.4 System architecture:



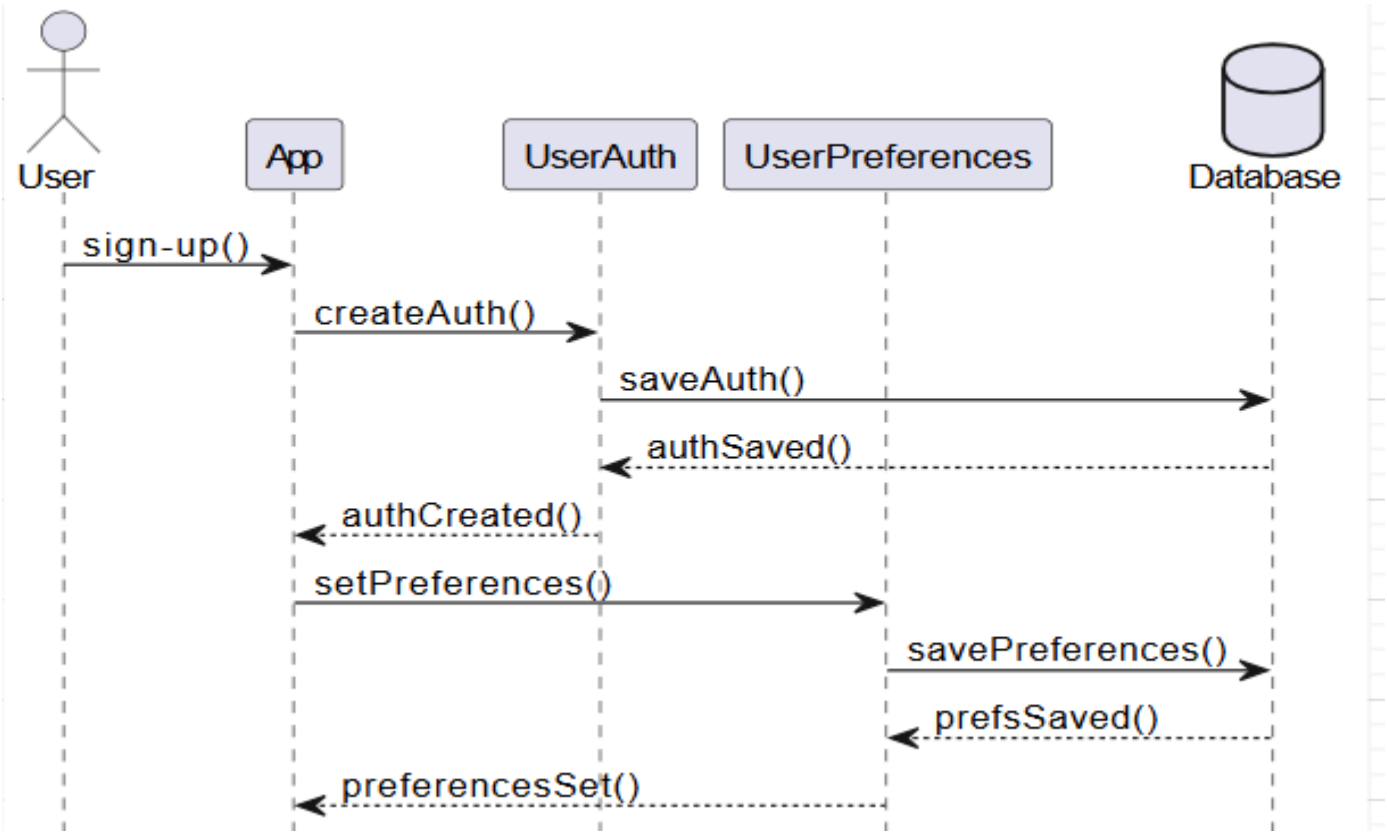
## 3.5 Use-Case Diagram:



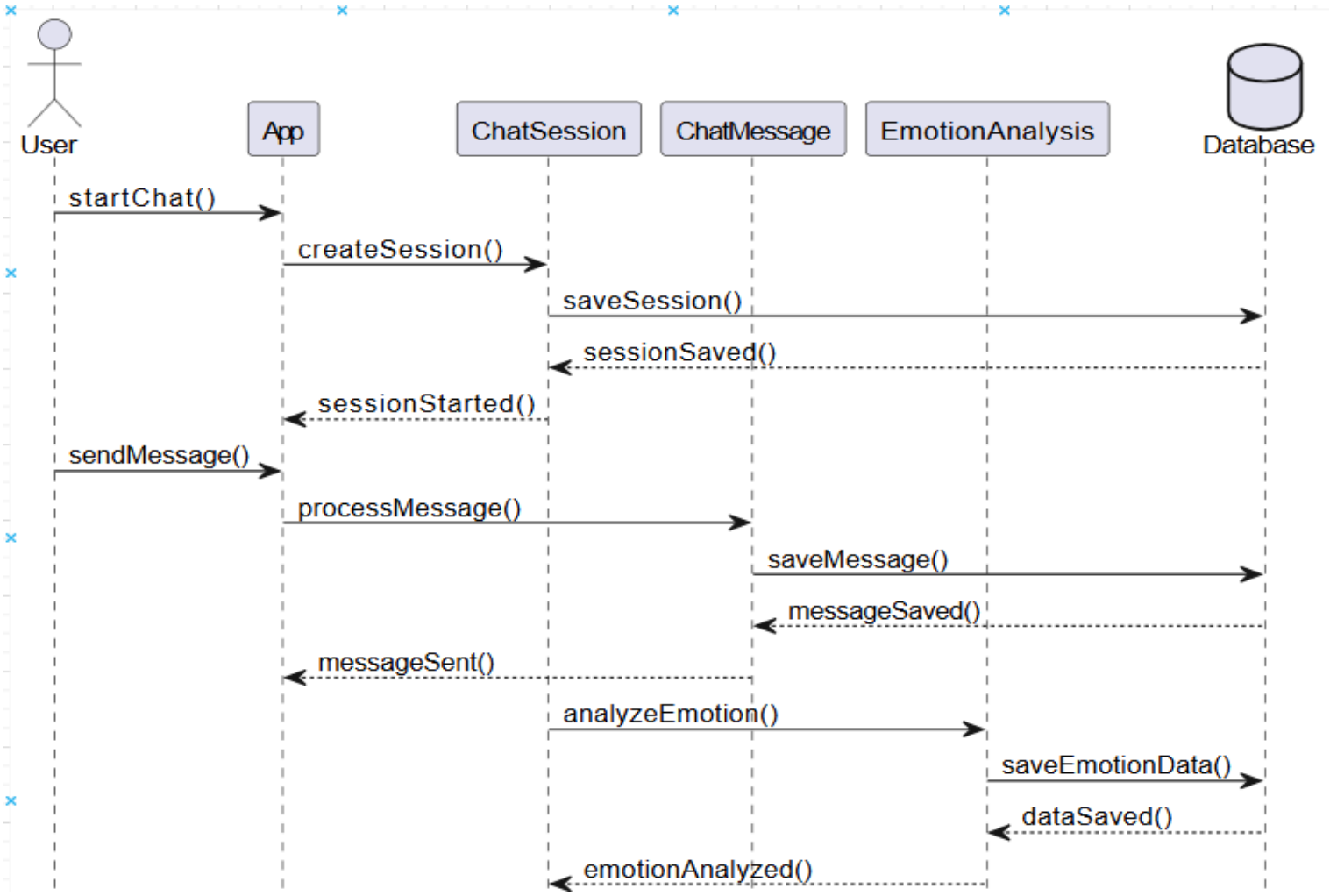
## 3.6 Class Diagram:



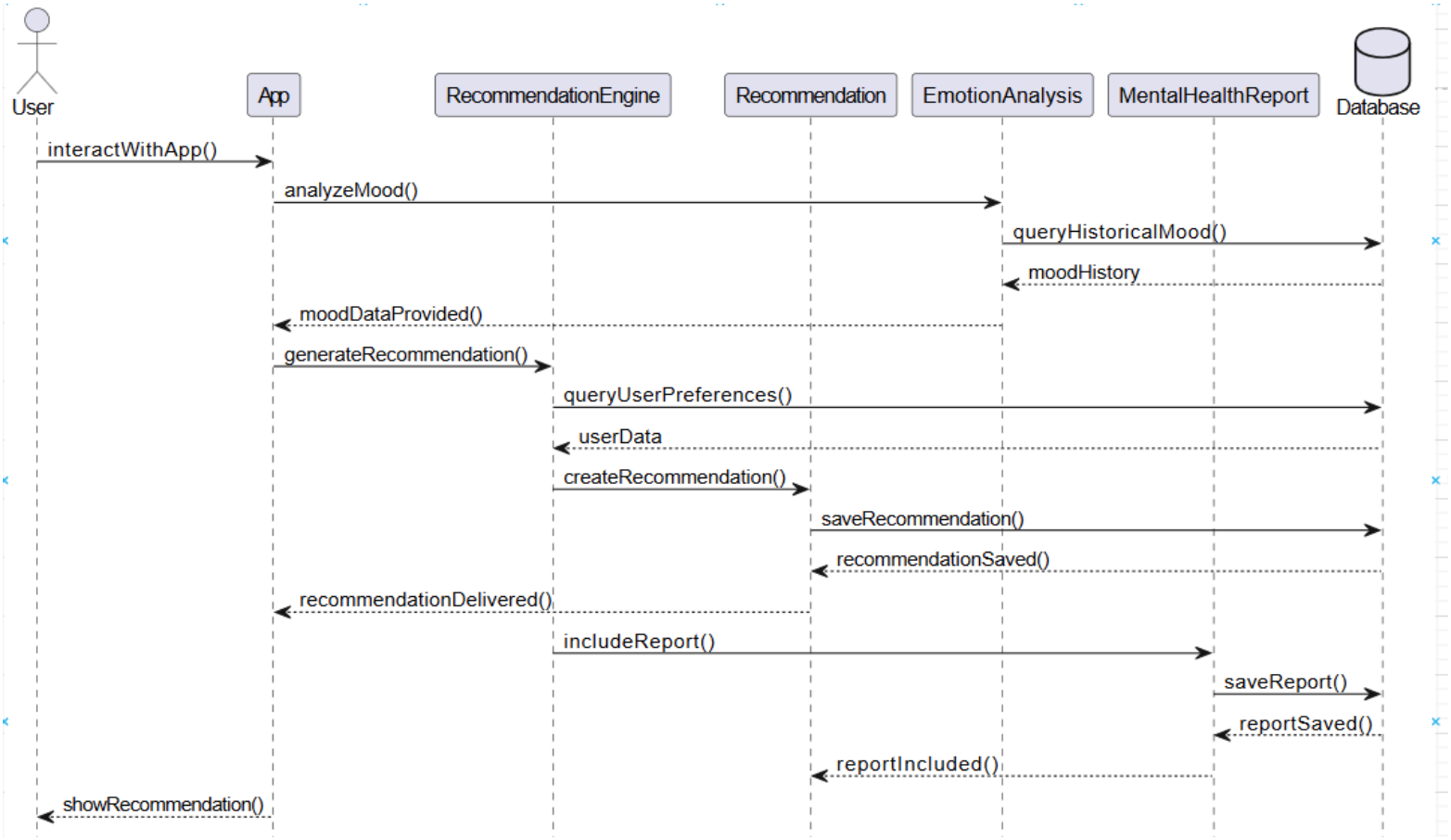
## 3.7 Sequence Diagram:




3.7.1 signup application

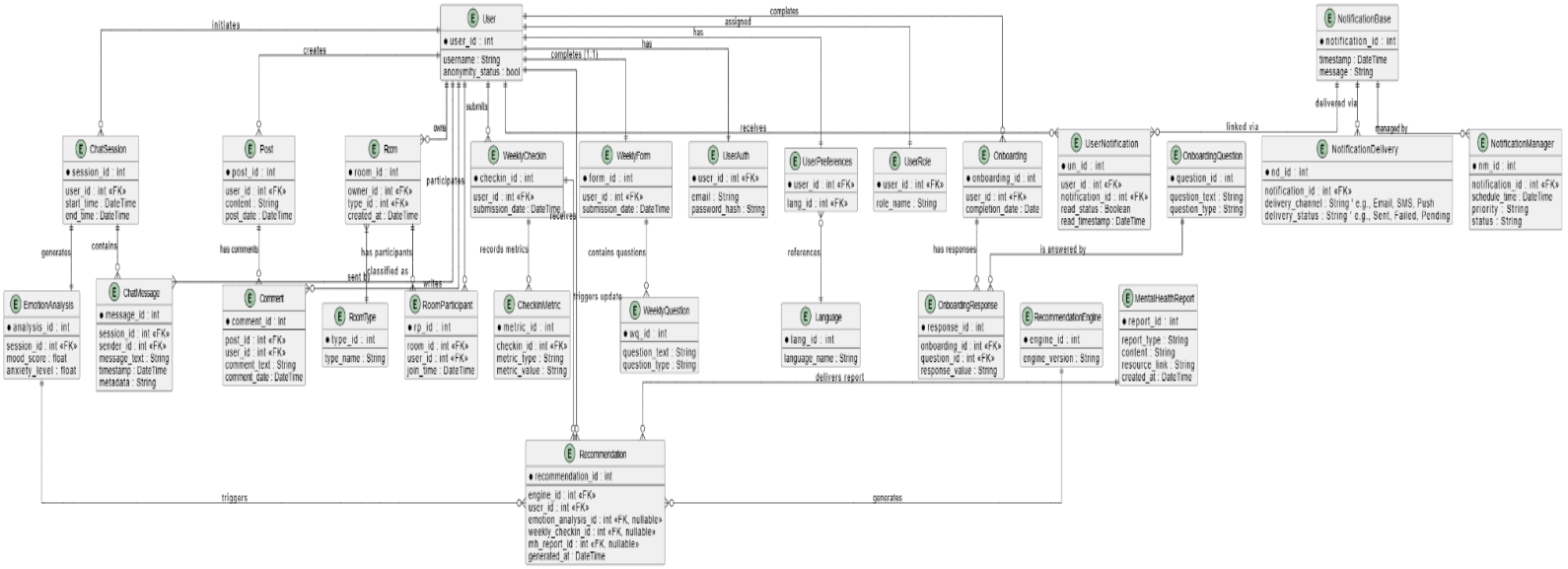



3.7.2 chatting with application



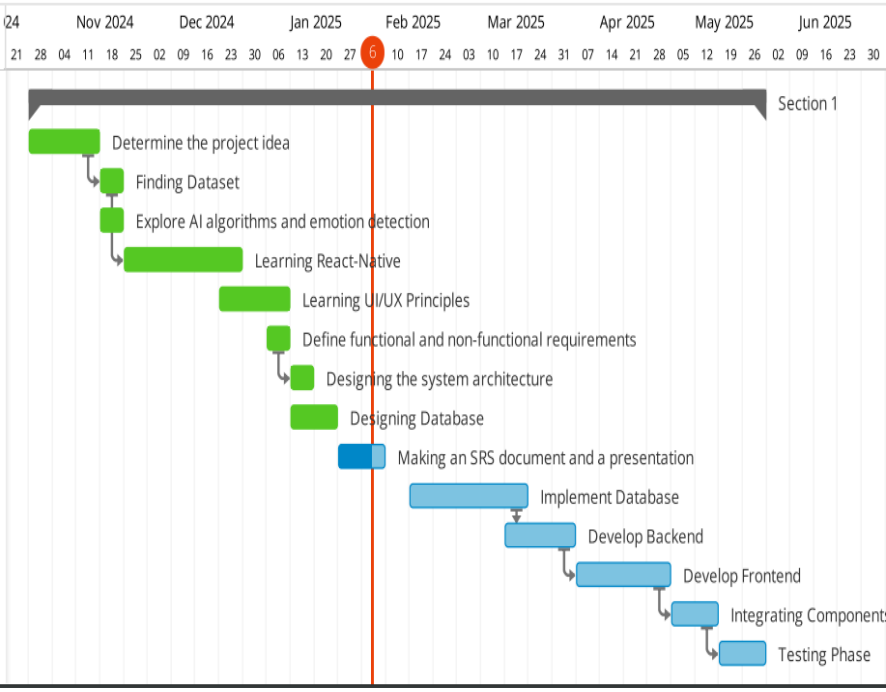

3.7.3 Generate recommendations

## 3.8 Entity Relationship Diagram (ERD):



# Chapter 4 Work Plan:

| | ACTIVITIES | ASSIGNEE | EH | START | DUE | STATUS | % |
|---|---|---|---|---|---|---|---|
| | Section 1 | | - | 01/Nov | 30/May | | 45% |
| 1 | Determine the project idea | Unassigned | - | 01/Nov | 14/Nov | Finished | 100% |
| 2 | Finding Dataset | Unassigned | - | 20/Nov | 24/Nov | Finished | 100% |
| 3 | Explore AI algorithms and e... | Unassigned | - | 22/Nov | 22/Nov | Finished | 100% |
| 4 | Learning React-Native | Unassigned | - | 25/Nov | 25/Dec | Finished | 100% |
| 5 | Learning UI/UX Principles | Unassigned | - | 26/Dec | 07/Jan | Finished | 100% |
| 6 | Define functional and non-f... | Unassigned | - | 08/Jan | 12/Jan | Finished | 100% |
| 7 | Designing the system archit... | Unassigned | - | 15/Jan | 18/Jan | Finished | 100% |
| 8 | Designing Database | Unassigned | - | 18/Jan | 20/Jan | Finished | 100% |
| 9 | Making an SRS document a... | Unassigned | - | 28/Jan | 06/Feb | Started | 70% |
| 10 | Implement Database | Unassigned | - | 17/Feb | 17/Mar | Not started | 0% |
| 11 | Develop Backend | Unassigned | - | 17/Mar | 03/Apr | Not started | 0% |
| 12 | Develop Frontend | Unassigned | - | 07/Apr | 01/May | Not started | 0% |
| 13 | Integrating Components | Unassigned | - | 06/May | 15/May | Not started | 0% |
| 14 | Testing Phase | Unassigned | - | 23/May | 30/May | Not started | 0% |



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2- ICD-11: International Classification of Diseases (11th Revision) *World Health Organization (WHO)* "January 2022" https://icd.who.int/en

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6-DeepSeek-R1 for Emotion Detection: *AI model for text-based emotion analysis* "Accessed February 2025" https://www.deepseek.com