Software Requirements Specification (SRS) Document

Project number	Team 49[1]
Project Title	Wave Diaries
Document	Software Requirements Specification (SRS) Document
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Brief problem statement

The problem focuses on aiding people suffering from mental health issues such as depression, stress, and anxiety. The core objective is to build an AI-based model, integrated with a speech-to-speech module which can track the user's mood, and empathetically respond to alleviate the distress that the user might be facing. The model's context-aware therapeutic responses can act as an alternative to treatment by professional psychologists where money, time and opportunity can all be constraints for patients. It can also act complementary to the treatment and help the user tackle issues on-the-go in real-time, while the patient's personal therapist can review these conversations. The problem requires a personalized, sensitive solution committed to the needs of the user with very little margin of error available.

System requirements

The system requirements for our solution is as follows:

1. A Trello Board has been created for task management.
2. V S Code is the primary editor which we shall be using.
3. MERN stack-based web-app
    a. MongoDB
    b. Express.js
    c. React (might use Next.js or Remix: react based Frameworks(undecided))
        i. Figma
        ii. Material UI/ Tailwind
    d. Node.js
    e. Associated Tools:
        i. Typescript
        ii. ESLint
        iii. Postman
        iv. JWT
4. GEN AI technologies (including for Automatic speech-to-text):
    a. LangChain: Whisper
    b. Groq
    c. Gemini
    d. GPT 4o

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    e. Smallest.ai
    f. Hugging Face
5. Python and python libraries required:
    a. PyTorch/ TensorFlow
    b. NumPy
    c. Pandas
    d. NLTK
    e. SpaCy
    f. PyAudio
6. Deployment:
    a. StreamLit
    b. Docker
    c. AWS

Users profile

Primary Target Audience: 13–19-year-old (Teenagers)

Mode of usage: Web-app

Technical Literacy (familiarity with software): High

Teenagers or adolescents preparing for competitive examinations, those dealing with college applications, and even those in school often face significant stress and anxiety due to intense competition. Some teenagers also grow up in a toxic environment, one which they have little control of, and these are more susceptible to such issues. Teenagers suffering from faltering relationships, or socially and morally depressed teenagers can end up using our application. This age group is particularly vulnerable to mental health challenges, both during and after puberty, as they navigate personal life complexities alongside academic pressures. As they mature, their ability to manage these challenges evolves, and we need to keep note of this while designing the application.

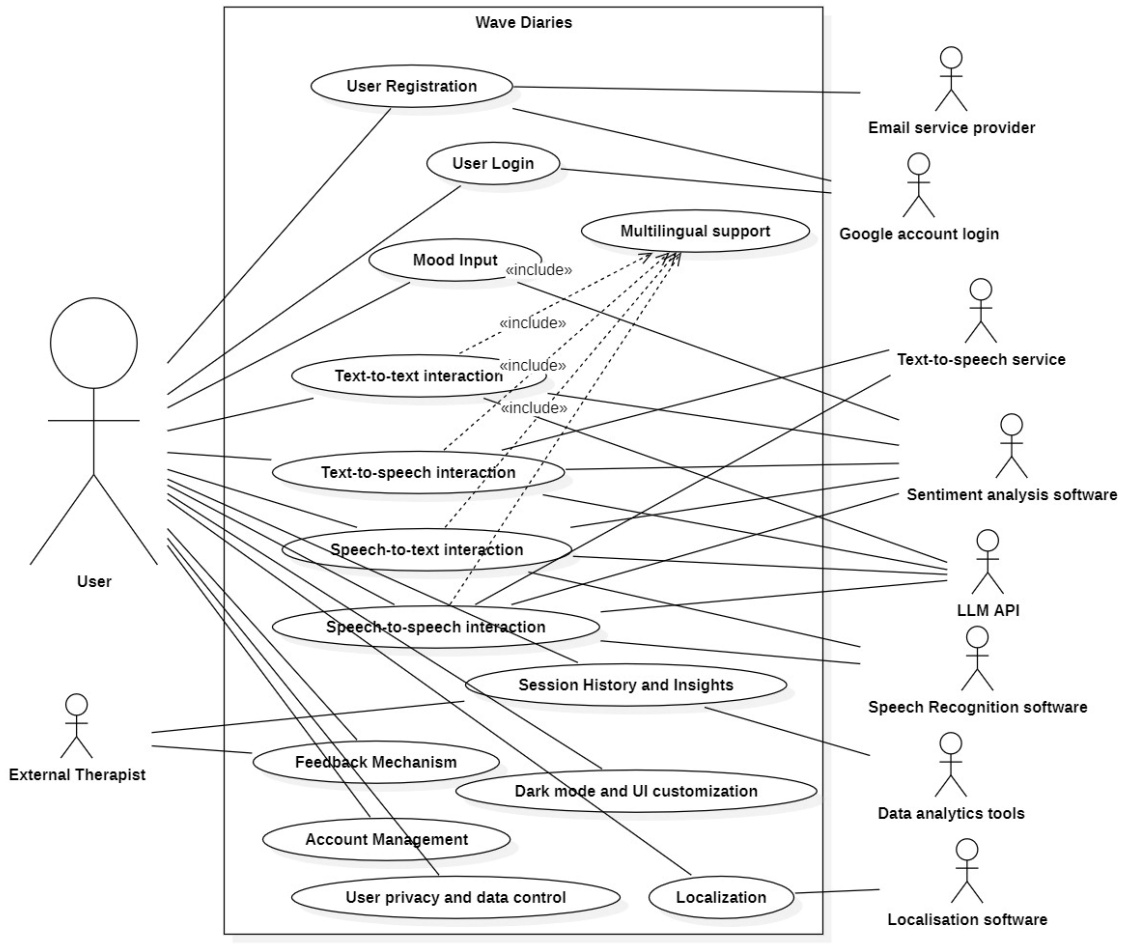
The responses of the model are intended to cater to these users' specific needs, personalized for our primary target audience. We note the general technical literacy and an appeal for aesthetic UIs that teenagers have and intend to design our web app as one that caters to their specific demands.

Feature requirements (described using use cases)

No.	Use Case Name	Description	Release
1	User Registration	Enables a new user to create an account by providing required details (e.g., email, password, and basic profile information). The system validates the information and sends a verification email to complete the registration.	R1
2	User Login	Allows a registered user to log in securely by entering their credentials. The system verifies the provided details and grants	R1

		access to the personalized dashboard upon successful authentication.	
3	Mood Input	Allows the user to input their current mood in terms of presets. This helps personalise the responses better, and aids the system in its sentiment analysis.	R1
4	Speech-to-Speech Interaction	Permits users to interact with the system using voice. The system converts spoken input to text, processes it, and then outputs a voice response, providing a natural conversational experience.	R1
5	Text-to-speech interaction	Permits users to interact with the system using text. The system converts spoken input to text, processes it, and then outputs a voice response, providing a natural conversational experience.	R1
6	Text-to-text interaction	Permits users to interact with the system using text. The system converts spoken input to text, processes it, and then outputs a text response, providing a chat-like experience.	R1
7	Speech-to-text interaction	Permits users to interact with the system using voice. The system converts spoken input to text, processes it, and then outputs a text response, providing a chat-like experience.	R1
8	Session History and Insights	Allows users to view past interactions and mood trends through saved session logs. This feature helps users reflect on their progress and gain insights into their emotional patterns over time. Can be extremely useful to mental health support professionals to track their patient's trends.	R1
9	Feedback Mechanism	Enables users to rate their experience and submit feedback about the system's interactions. The collected feedback supports continuous improvement of the AI and overall user experience.	R2
10	Dark Mode and UI Customization	Allows users to customize the application's appearance by selecting themes (such as dark mode). These preferences are saved in the user profile to ensure a personalized and consistent experience across sessions.	R2
11	Account Management	Provides users with the ability to update profile details, change passwords, or delete their account. The system securely processes these updates while ensuring data integrity and privacy.	R1
12	User Privacy and Data Control	Lets users manage their personal data by reviewing and, if desired, deleting stored conversation logs and other personal information. This ensures that users have full control over their data in compliance with privacy standards.	R2
13	Multilingual Support	Allows users to select their preferred language for the interface and AI responses.	R1
14	Localization	The system dynamically adapts to deliver a seamless and localized experience based on the user's language choice.	R2

Use case diagram



Use case description

Delete all the blue text and fill-in the template before adding this to your repository or turning it in to your instructor.

Use Case Number:	UC-XX (Replace XX with a number)
Use Case Name:	Enter the name of Use Case
Overview:	Describe the purpose of the Use Case and give a 1-2 line description. This could be the same as the description provided in feature requirements section.
Actors:	List all actors that participate in this Use Case.
Pre condition:	Enter the condition that must be true before the main flow is executed.
Flow:	Main (success) Flow: Steps should be numbered.

	Alternate Flows: Include the post condition for each alternate flow if different from the main flow.
Post Condition:	Enter the condition that must be true when the main flow is completed.

UC-1

Use Case Number:	UC-01
Use Case Name:	User registration
Overview:	This use case describes how a new user creates an account in our AI-based mental health application. The system collects basic personal information, verifies the user's email and password along with other requested credentials, and ensures that the user consents to data processing and privacy terms. Successful registration grants the user access to the system's mental health features and services.
Actors:	User
Pre condition:	The new user does not have an existing account in the system. The system is online and capable of processing new account requests. Necessary data protection and privacy policies are in place to handle user information securely.
Flow:	1. Main (success) Flow: **Access Registration Page** a. The new user navigates to the registration page within the application or website. 2. **Enter Registration Details** a. The user inputs required information (e.g., name, email, password, date of birth, etc.). b. The user reviews and accepts the privacy policy and consent forms for data usage and mental health support. 3. **Submit Registration** a. The user taps "Register" or "Sign Up," sending the data to the system. 4. **System Validation** a. The system checks if the email or username already exists. b. The system validates that mandatory fields are filled and comply with format requirements (e.g., valid email format, strong password). 5. **Account Creation** a. If all validations pass, the system creates a new account in the database. b. The system sends a verification email or code to the user (if applicable). 6. **Registration Complete** a. The system displays a success message and redirects the user to the login page.
	Alternate Flow: 1. **AF1: Duplicate Username** b. **Condition**: The user's chosen username is already registered. c. **Flow**: i. The system displays an error message indicating that the username is already in use. ii. The user is prompted to enter different credentials.

	d. **Post Condition**: Registration is not completed until a unique username is provided. **2. AF2: Invalid Input Data** e. **Condition**: Mandatory fields are missing, or the provided data fails format checks (e.g., invalid email). f. **Flow**: i. The system highlights the invalid fields and provides instructions for correction (if any). ii. The user updates the information and resubmits. g. **Post Condition**: Registration remains incomplete until valid data is provided. **3. AF3: User Declines Consent** h. **Condition**: The user does not agree to the privacy policy or data usage terms. i. **Flow**: i. The system notifies the user that consent is required to create an account. ii. The user can either accept the terms or exit the process. j. **Post Condition**: Registration is terminated if the user does not provide consent.
Post Condition:	A new user account is successfully created and verified. The user can now log in to the AI-based mental health application and access personalized support, mood tracking, and other therapeutic features under secure and privacy-compliant conditions.

UC-2

Use Case Number:	UC-02
Use Case Name:	User Login
Overview:	This use case describes the process by which a user logs into the system. By providing valid credentials, the user gains access to the system's features and his/her personal data.
Actors:	User
Pre condition:	The user has an existing account in the system. The system is online and capable of processing authentication requests.
Flow:	Main (success) Flow: 1. **Navigate to Login Page** a. The user opens the application, and the login page is displayed. 2. **Enter Credentials** a. The user enters a valid username and password. 3. **Submit Login Request** a. The user clicks the "Login" button. 4. **System Validates Credentials** a. The system checks the provided credentials against the stored user database. 5. **Successful Authentication** a. If the credentials match, the system creates a session for the user. 6. **Grant Access** a. The system redirects the user to the home page, indicating a successful login.

	Alternate Flow: • **AF1: Invalid Credentials** o **Condition:** The user enters an incorrect username or password. o **Flow:** ♣ The system displays an error message indicating invalid credentials. ♣ The user is prompted to re-enter valid credentials or reset the password. o **Post Condition (for this alternate flow):** The user remains on the login page until valid credentials are provided or they choose to exit. • **AF2: System Unavailable** o **Condition:** The system or authentication service is temporarily offline. o **Flow:** ♣ The system displays a notification that the service is currently unavailable. ♣ The user may attempt to log in again later. o **Post Condition (for this alternate flow):** No session is created. The user remains logged out.
Post Condition:	Upon successful login, the user is authenticated and gains access to the system's exclusive features and benefits.

UC-3

Use Case Number:	UC-03
Use Case Name:	
Overview:	
Actors:	
Pre condition:	
Flow:	Main (success) Flow:
	Alternate Flow:
Post Condition:	

UC-4

Use Case Number:	UC-04
Use Case Name:	
Overview:	
Actors:	
Pre condition:	
Flow:	Main (success) Flow:
	Alternate Flow:
Post	

Condition:	

UC-5

Use Case Number:	UC-05
Use Case Name:	
Overview:	
Actors:	
Pre condition:	
Flow:	Main (success) Flow:
	Alternate Flow:
Post Condition:	

UC-6

Use Case Number:	UC-06
Use Case Name:	
Overview:	
Actors:	
Pre condition:	
Flow:	Main (success) Flow:
	Alternate Flow:
Post Condition:	

UC-7

Use Case Number:	UC-07
Use Case Name:	
Overview:	
Actors:	
Pre condition:	
Flow:	Main (success) Flow:
	Alternate Flow:
Post Condition:	

UC-8

Use Case Number:	UC-08
Use Case Name:	Session History and Insights
Overview:	Allows users to view past interactions and mood trends through saved session logs. This feature helps users reflect on their progress and gain insights into their emotional patterns over time. Can be extremely useful to mental health support professionals to track their patient's trends.

Actors:	
Pre condition:	
Flow:	Main (success) Flow:
	Alternate Flow:
Post Condition:	

UC-9

Use Case Number:	UC-09
Use Case Name:	
Overview:	
Actors:	
Pre condition:	
Flow:	Main (success) Flow:
	Alternate Flow:
Post Condition:	

UC-10

Use Case Number:	UC-10
Use Case Name:	Toggle Dark Mode
Overview:	This use case describes how a user toggles the dark mode setting on the home page of the application. Dark mode provides an alternative UI theme to reduce eye strain and create a more comfortable viewing experience, which is necessarily important in a sensitive mental health environment.
Actors:	User
Pre condition:	The user is logged into the application and is on the home page. The dark mode toggle button is visible and accessible at the top of the home page (on a navbar).
Flow:	Main (success) Flow: 1. **Display of Home Page** a. The home page loads with the dark mode toggle button prominently displayed. 2. **User Clicks Dark Mode Toggle** a. The user clicks the dark mode button to switch the UI theme. 3. **System Processes Request** a. The system registers the toggle action and initiates the theme switch. 4. **Theme Change Execution** a. The system applies the dark mode theme across the application interface. 5. **Visual Confirmation** a. The user sees the UI updated to dark mode, confirming that the toggle was successful.
	Alternate Flow:

	• **AF1: Toggle from Dark Mode to Light Mode** o **Condition:** The user clicks the dark mode button while the application is already in dark mode. o **Flow:** ♣ The system registers the toggle action as a request to switch back to light mode. ♣ The system reverts the UI to the default light theme. ♣ The user's preference is updated and persisted as "light mode." o **Post Condition:** The application now displays the light theme, and the toggle reflects the change. • **AF2: Theme Application Failure** o **Condition:** The system encounters an error when attempting to apply the dark mode theme. o **Flow:** ♣ The system displays an error notification indicating that the theme change could not be applied. ♣ The UI remains in the current mode (either dark or light). ♣ The system logs the error for further investigation. o **Post Condition:** The user is informed of the issue, and no preference is updated until the error is resolved.
Post Condition:	• Upon successful completion, the user's interface is updated to the selected theme (dark or light), and the chosen preference is saved for future sessions. • The user experience is enhanced by offering a customizable, eye-friendly display that aligns with personal preferences and supports mental well-being.

UC-11

Use Case Number:	UC-11
Use Case Name:	User Account Management
Overview:	This use case describes how a logged-in user manages their account information within the AI-based mental health application. In addition to updating basic personal details, the user can modify their preferences—such as mood tracking settings (e.g., frequency of mood updates, notification preferences, and data sharing settings)—to tailor the application to their mental health needs. The process emphasizes data integrity, privacy, and user control over sensitive information.
Actors:	User
Pre condition:	The user is authenticated (logged in) and has an existing account in the system. The account management interface is accessible from the home page. All necessary security protocols and data protection measures are in place.
Flow:	Main (success) Flow: 1. **Access Account Management** a. The user navigates to the "Account Management" section from the application's home/dashboard. 2. **Display Current Account Details and Preferences**

	a. The system retrieves and displays the user's current account information (e.g., username ,email) along with configurable preferences, including mood tracking settings (e.g., mood tracking frequency, notification options, and data sharing preferences). 3. **Initiate Update Process** a. The user selects an "Edit" option to update specific details such as contact information or mood tracking preferences. 4. **Present Editable Form** a. The system displays an editable form pre-populated with the current account data and mood tracking settings. 5. **User Makes Changes** a. The user updates one or more fields—such as changing email, updating password, or modifying mood tracking preferences (for instance, opting for daily or weekly mood reminders, enabling/disabling detailed mood analytics, or setting thresholds for notifications). 6. **Validate Input Data** a. The system validates the entered data (e.g., checks for valid email format, password strength, and acceptable values for mood tracking frequency and notifications). 7. **Save Updated Account Details** a. If validation succeeds, the system updates the account information in the secure database and logs the changes for auditing purposes. 8. **Confirm Update** a. The system provides a confirmation message to the user indicating that the account information and preferences have been successfully updated.
	Alternate Flow: • **AF1: Invalid Data Entry** o **Condition:** The user provides invalid or improperly formatted data (e.g., invalid email, or unacceptable mood tracking frequency). o **Flow:** ♣ The system highlights the erroneous fields and displays context-specific error messages. ♣ The user corrects the data and resubmits the update. o **Post Condition:** The update is not saved until all data meets validation requirements. • **AF2: Update Cancellation** o **Condition:** The user decides to cancel the update process. o **Flow:** ♣ The user clicks a "Cancel" button or navigates away from the account management page. ♣ The system discards any unsaved changes and returns to the account overview. o **Post Condition:** No changes are applied; the account remains as previously configured. • **AF3: System Error or Database Failure**

	○ **Condition:** The system encounters an error (e.g., database connectivity issues) while saving the update. ○ **Flow:** ♣ The system displays an error message advising the user to try again later. ♣ The system logs the error for further investigation. ○ **Post Condition:** The account information remains unchanged until the error is resolved. • **AF4: Unauthorized Sensitive Change** ○ **Condition:** The user attempts to update sensitive fields (e.g., changing the password) without proper re-authentication. ○ **Flow:** ♣ The system prompts the user to re-enter their current password or complete a secondary verification step. ♣ Upon successful re-authentication, the system proceeds with the update. ○ **Post Condition:** Sensitive changes are applied only after confirming the user's identity.
Post Condition:	• The user's account information and mood tracking preferences are updated securely and are reflected in subsequent sessions. • All modifications are logged for audit and security purposes, ensuring transparency and compliance with data protection and privacy guidelines.

UC-12

Use Case Number:	UC-12
Use Case Name:	
Overview:	
Actors:	
Pre condition:	
Flow:	Main (success) Flow:
	Alternate Flow:
Post Condition:	

UC-13

Use Case Number:	UC-13
Use Case Name:	
Overview:	
Actors:	
Pre condition:	
Flow:	Main (success) Flow:
	Alternate Flow:
Post Condition:	

UC-14

Use Case Number:	UC-14
Use Case Name:	
Overview:	
Actors:	
Pre condition:	
Flow:	Main (success) Flow:
	Alternate Flow:
Post Condition:	