PROJECT SYNOPSIS/PROJECT CONCEPT DOCUMENT V2

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Description

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.

Profile of Users

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

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

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UIs that teenagers have and intend to design our web app as one that caters to their specific demands.

Usage Model Diagram for AI-Based Therapy Web App

1. Users

- **New Users**: Sign up, set preferences (language, therapy style), and complete an initial mood assessment for personalized recommendations.
- **Returning Users**: Log in, interact with AI, track past moods, and receive tailored insights.

2. Inputs

- **Speech Input**: Users can speak, while the AI-based speech to speech module processes it.
- **Text Input:** User can text chat with the AI, which becomes further relevant if the user is more comfortable in text, and if they have something written (like a poem) that they want to show to the chatbot.
- **Mood Selection**: Users must be allowed to manually select emotions or moods from a predefined list.
- **Feedback**: Users can rate AI responses to refine future interactions.

3. Processing (AI Backend)

- **Natural Language Processing (NLP)**: Identifies user intent and emotional context.
- **Sentiment Analysis**: Extracts emotional tone from text/speech inputs.
- **Mood Tracking**: Logs and analyzes mood patterns over time.
- **Personalization**: Adapts responses based on user history and preferences.
- **Gamification**: Encourages engagement through rewards, streaks, or challenges.
- **Multilingual Vector-Based RAG (Retrieval-Augmented Generation)**: Enhances AI responses by retrieving relevant multilingual therapeutic resources.

4. Outputs

- **Text Response**: AI-generated affirmations, reflections, or therapy suggestions.
- **Speech Response (TTS - Text-to-Speech)**: AI provides spoken responses for accessibility. Tailor made sensitive responses that cater largely to the requirements of the user.

5. User Feedback Loop

- **User Ratings**: Users provide feedback via thumbs up/down or a like/dislike on the

generated response calling for its critical assessment.

- **AI Adjustments**: AI refines responses based on cumulative feedback.
- **Secure Data Storage**: Mood trends and user interactions are securely stored for better personalization.

6. System Components & Interactions

- **Frontend (User Interface)**: Intuitive chat-based interface, dashboard, and visual mood history.
- **Backend (AI & Data Processing)**: AI engine, NLP models, APIs, and databases for seamless processing.

7. Security & Privacy

- **Data Encryption**: Ensures secure storage and transmission of user data.
- **User Anonymity Options and long-term memory**: Users can remain anonymous while interacting with AI. The long-term memory of the model does not require an already registered user to promptly enter the credentials thus ensuring seamless communication.
- **Regulatory Compliance**: Adheres to GDPR, HIPAA (if applicable), and other relevant data privacy laws.

AI-Based Therapy Web App Flowchart

New User → **Sign Up** → **Set Preferences** → **Initial Mood Assessment** → **Personalized Recommendations**

Returning User → **Log In** → **Interact with AI** → **Track Past Moods** → **Tailored Insights**

Speech Input → **Speech to Text Processing** → **NLP**

NLP → **Sentiment Analysis** → **Mood Tracking** → **Personalization** → **Gamification** → **Multilingual RAG**

NLP → **Text Response** → **Speech Response**

Mood Selection → **Select Mood**

Feedback → **Rate AI Response** → **User Ratings** → **AI Adjustments** → **Secure Data Storage** → **Data Encryption** → **User Anonymity** → **Regulatory Compliance**

Frontend → **User Interface** → **Dashboard** → **Visual Mood History**

Backend → **AI Engine** → **NLP Models** → **APIs** → **Databases**