

## **Problem Statement (100–120 words)**

In today's fast-paced and emotionally complex world, many people struggle with mental health challenges but lack access to timely and understanding support. Barriers such as cost, stigma, language, and cultural disconnect make it difficult for individuals—especially in diverse communities—to find help they feel comfortable with. Existing digital tools often feel impersonal, unrelatable, or emotionally disconnected, making users feel unheard. This project aims to create a safe, supportive space through two virtual companions: one like a trusted friend, and another like a caring, mature guide. By offering warm, ongoing conversations in multiple languages and tones, the platform hopes to make mental health support more relatable, inclusive, and available to those who need it most.

## **Target Audience & Context (80–100 words)**

The platform is aimed at persons aged 15–40 in India and similar culturally diverse regions, who are underserved by traditional mental health service. This includes students, young professionals, and rural users that are digitally connected but are reluctant or unable to access professional mental health care. Using relatable voice-based agents in regional languages and dialects helps to address both accessibility and cultural stigma. It is also very relevant in institution contexts, like universities, where youth mental health is a growing concern but still have underdeveloped mental health infrastructure.

## **3. Use of Gen-AI (120–150 words)**

Generative AI forms the backbone of this conversational mental health system. Large Language Models (LLMs) like LLaMA or Mistral enable natural, emotionally intelligent dialogue with two distinct agents: a peer-like companion and a therapist-like guide. Multilingual voice inputs are transcribed using Whisper (STT), translated via IndicTrans2 or M2M-100, and processed through LangGraph and CrewAI to route responses. RAG, powered by LangChain and ChromaDB, retrieves relevant mental health resources to ensure grounded, safe responses. Emotion-aware prompt engineering adapts outputs using acoustic signals from HuBERT or OpenSMILE. Coqui or ElevenLabs handle text-to-speech (TTS), generating realistic voice responses in the user's language. Redis or ChromaDB supports shared memory across agents, simulating therapeutic continuity and personalization. These integrated Gen-AI tools enable an accessible, emotionally adaptive, and multilingual support system.

## **4. Solution Framework**

At the core of the platform is a modular multi-agent architecture featuring two distinct AI personas:

- **PeerPal** – a friendly, conversational companion that provides casual, emotionally resonant support.
- **TherapistAI** – a calm, mature guide offering deeper, therapeutic conversations.

Each agent is powered by an open-source LLM (e.g., LLaMA, Mistral) with personality controlled through structured prompts and emotion-aware memory injection. Agents access a **shared context memory** using **Redis or ChromaDB**, ensuring continuity and personalization across sessions.

The conversational pipeline includes five core stages:

1. **Voice Input** – Users speak in any supported regional language.
2. **Emotion Detection** – Speech is analyzed using **HuBERT or OpenSMILE** to classify emotional tone.
3. **STT & Translation** – Whisper handles speech-to-text, followed by **IndicTrans2/M2M-100** for multilingual translation if needed.
4. **LLM + RAG Response** – LangGraph routes the text and emotion to either PeerPal or TherapistAI via **CrewAI**. RAG (using LangChain + ChromaDB) enriches replies with verified, supportive content.
5. **Voice Output** – Responses are synthesized using **Coqui or ElevenLabs**, matching the user's language and emotional tone.

This system runs on a **FastAPI backend** with a **React or Streamlit frontend**, fully containerized for deployment on Render or Railway. Modular microservices handle translation, emotion, memory, and agents—enabling scalability, multilinguality, and emotionally intelligent dialogue for real-world mental health support

## Feasibility & Execution (80–100 words)

The MVP uses Whisper for multilingual STT, Wav2Vec2/OpenSMILE for emotion detection, and LangGraph with CrewAI for agent routing. Inputs are translated via IndicTrans2/M2M-100 before LLM processing. LangChain with ChromaDB enables RAG, and outputs are synthesized using Coqui/ElevenLabs TTS. Redis ensures shared memory across agents. Dockerized services are deployed on Render or Railway. The modular backend enables region-specific tuning. A

compact team skilled in voice AI, LLMs, and API integration can deploy the pilot version supporting English, Hindi, and Tamil.

## **Scalability & Impact (80–100 words)**

The MCP architecture is designed for horizontal scalability, supporting multi-user environments and multilingual adaptation. It can be monetized via:

- **Freemium model** with premium features (e.g., memory retention, wellness reports),
- **B2B licensing** for schools, colleges, and wellness apps,
- **API-as-a-Service** for integration into health platforms.

Scaling quickly into new languages and cultures could be possible using regional language specific AI models such as Bhashini. The platform can democratize emotional support, have a big impact on user wellness, and carve out a niche in the rapidly expanding \$25 billion+ digital mental health market.

## **Conclusion / Summary & Bonus Minimum Lovable Product (50–70 words)**

This project uses voice-enabled, emotionally intelligent AI agents to reimagine mental health support. Gen-AI, emotion recognition, and multilingual voice technology are combined to create a platform that is relatable and inclusive. In addition to providing immediate assistance to actual users, the MVP—a two-agent, voice-driven assistant with shared memory and sentiment sensitivity—lays the groundwork for a scalable, socially significant, and commercially successful mental health solution.