SnoRelax – Mental Health Support Application

Final Year B.Tech Project (CSE) DS

Team Members: Shivam Kumar Dubey (2201221540045)
Suryakant Mishra (2201221540054)

Guided By: Er. Kavya Singh
Coordinator: Er. Ratan Ranjan

The Growing Mental Health Crisis

Mental health issues like stress, anxiety, and depression are increasing globally, yet access to professional care remains severely limited.

Societal Stigma

Discourages individuals from seeking help.

High Cost

Therapy and medication are often unaffordable.

Lack of Professionals

Especially pronounced in rural and underserved areas.

Privacy Concerns

Fear of judgment or data misuse deters many.

In India, the treatment gap is nearly 80% (National Mental Health Survey, 2016).

Ques we asked ourselves: How can we make mental health support more accessible, private, and scalable?

Introducing SnoRelax: Your AI-Enabled Mental Health Companion

SnoRelax is a full-stack AI-enabled mobile application designed to provide accessible mental health support through a secure, user-friendly platform.

AI-Powered Chatbot

Empathetic, real-time conversations for immediate support.

Therapist Connectivity

Optional integration for professional prescriptions and recommendations.

Mood Tracking & Analysis

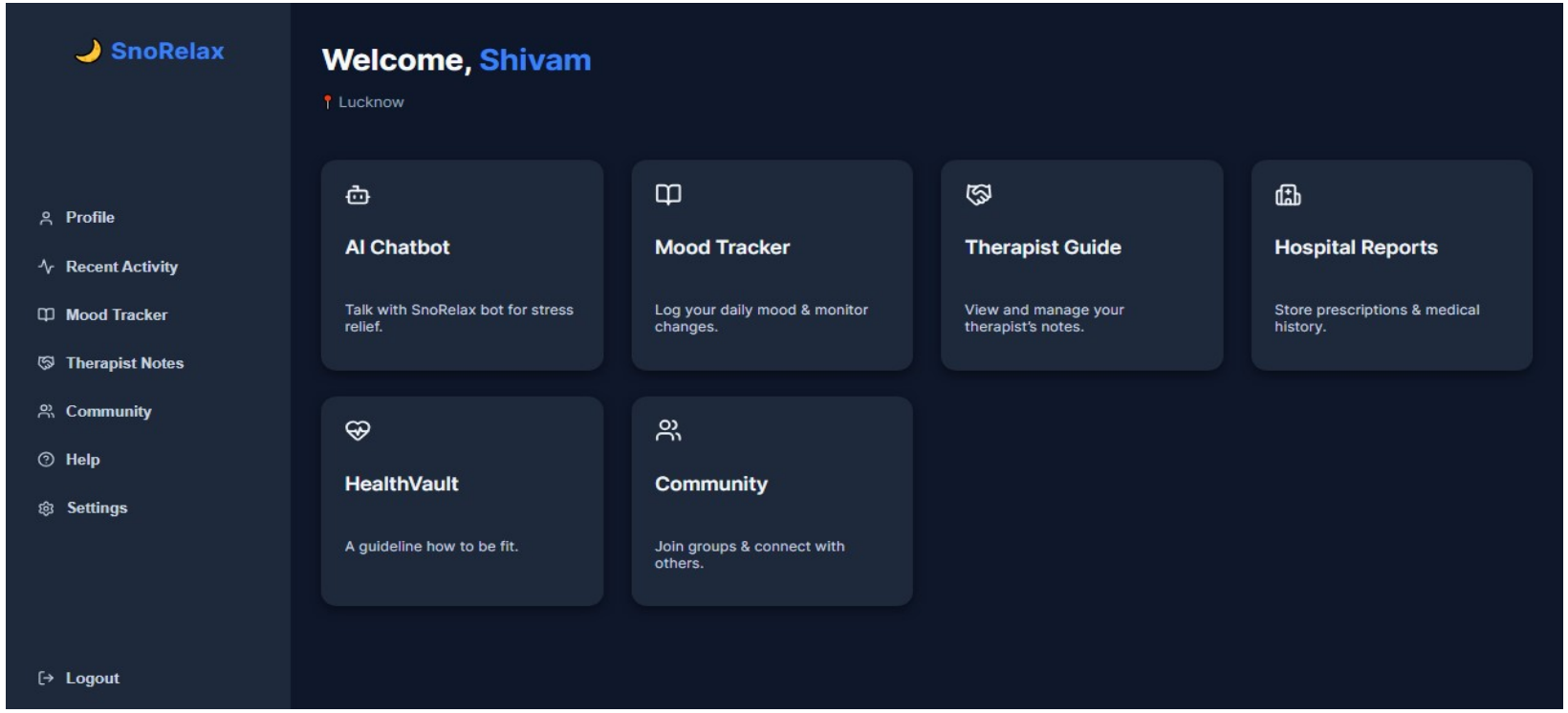
Monitor emotional patterns and gain insights with trend reports.

Guided Exercises

Breathing techniques and mindfulness to reduce stress.

Community Interaction

Foster a supportive environment for peer interaction.



LITERATURE REVIEW

- Digital mental health apps show promise but face challenges.
- Automated conversational agents: helpful but limited long-term.
- Affective computing: mood analysis with wearables.
- Privacy-preserving techniques still evolving.
- User engagement requires empathy and personalization.

Aspect	Existing Systems	SnoRelax Solution	Gap Addressed
Accessibility	Geographical, financial, and professional shortage constraints	Mobile, OTP login, anonymous ID	Improves access and ease of use
Privacy	Poor data security	OTP-based login, anonymous IDs, end-to-end encryption	Stronger privacy safeguards
Personalization	Generic advice	AI chatbot (NLP + LSTM), mood analytics	Personalized support
Professional Escalation	Poor therapist integration	Optional therapist connectivity	Easy escalation to professionals
Engagement	High dropout rates	Mood tracking, guided exercises, community interaction	Better user retention
Analytics	Limited insights	Visual mood trend reports, wearable data analysis	Actionable data-driven insights
Scalability	Poor infrastructure design	Cloud-native, modular architecture	Supports growth efficiently
Cost	High treatment costs	Freely accessible platform	Affordable solution
Clinical Validity	Misleading clinical claims	Based on CBT principles, clear disclaimer	Clear support vs. therapy boundary

Objectives: A Secure Path to Well-being

Our core objectives for SnoRelax focused on creating a comprehensive, private, and effective mental health platform.

Secure Authentication

OTP + Anonymous IDs for enhanced privacy.

Empathetic AI Chatbot

Real-time, supportive conversations.

Mood Tracking & Analytics

Actionable insights into emotional patterns.

Stress Management Exercises

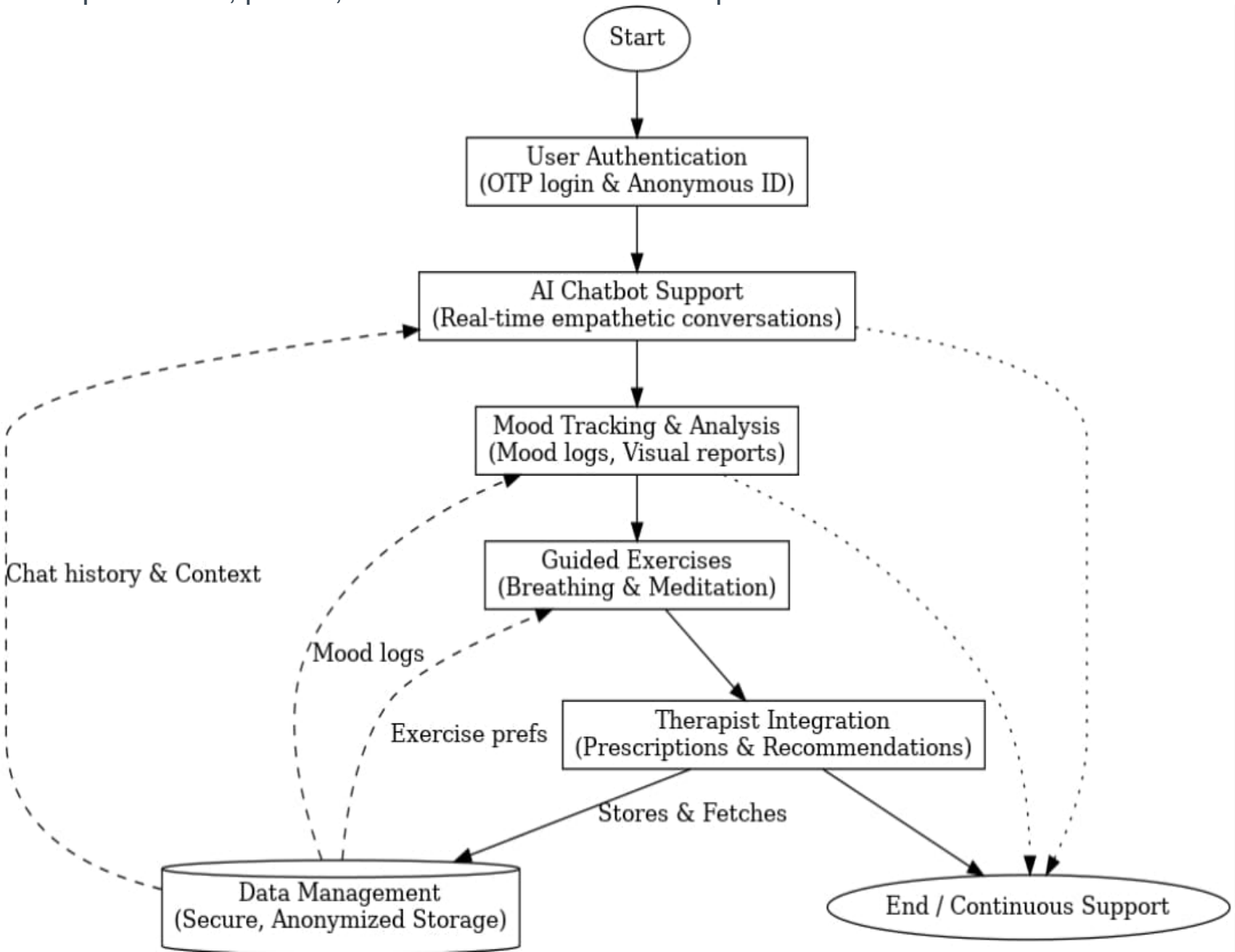
Guided techniques for relaxation.

Optional Therapist Linkage

Seamless integration for professional care.

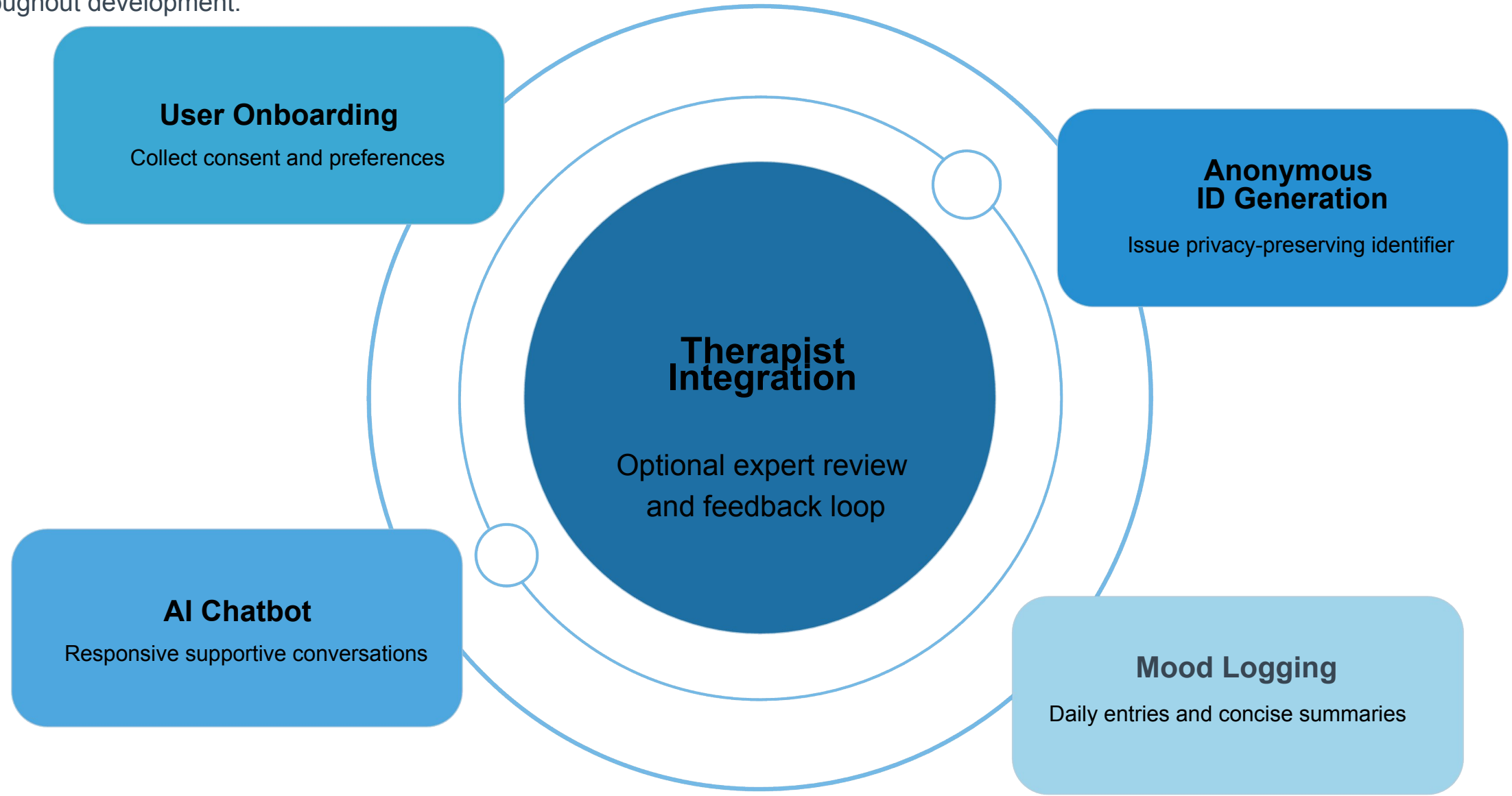
Robust Privacy & Data Protection

End-to-end encryption and secure protocols.



Methodology: Prototype-Driven Development

We adopted a Prototype Model to ensure iterative design and user-centered refinement, prioritizing empathy and feedback throughout development.



Technology Stack: Powering SnoRelax

A robust and modern technology stack ensures SnoRelax is performance, secure, and scalable.

Frontend: React Native / Flutter (Mobile interface, mood graphs, exercises dashboard)

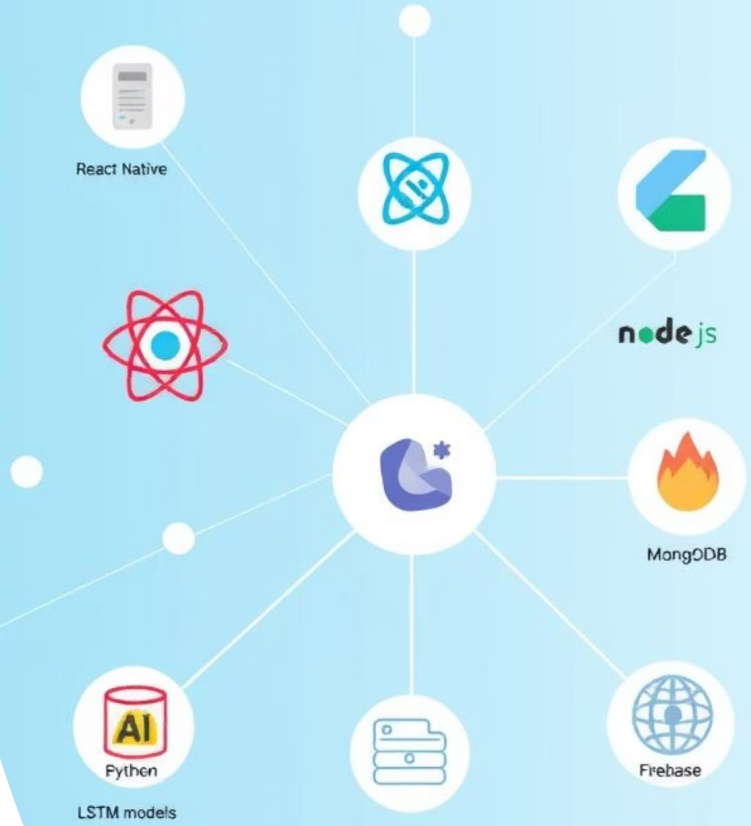
AI/NLP: Transformer-based models (BERT) + LSTM (Mood prediction)

Backend: Node.js + Express, Python Flask (API handling, AI integration)

Deployment:
Vercel (Frontend)
Render.com (Backend)

Database: MongoDB Atlas, Firebase (Secure data storage)

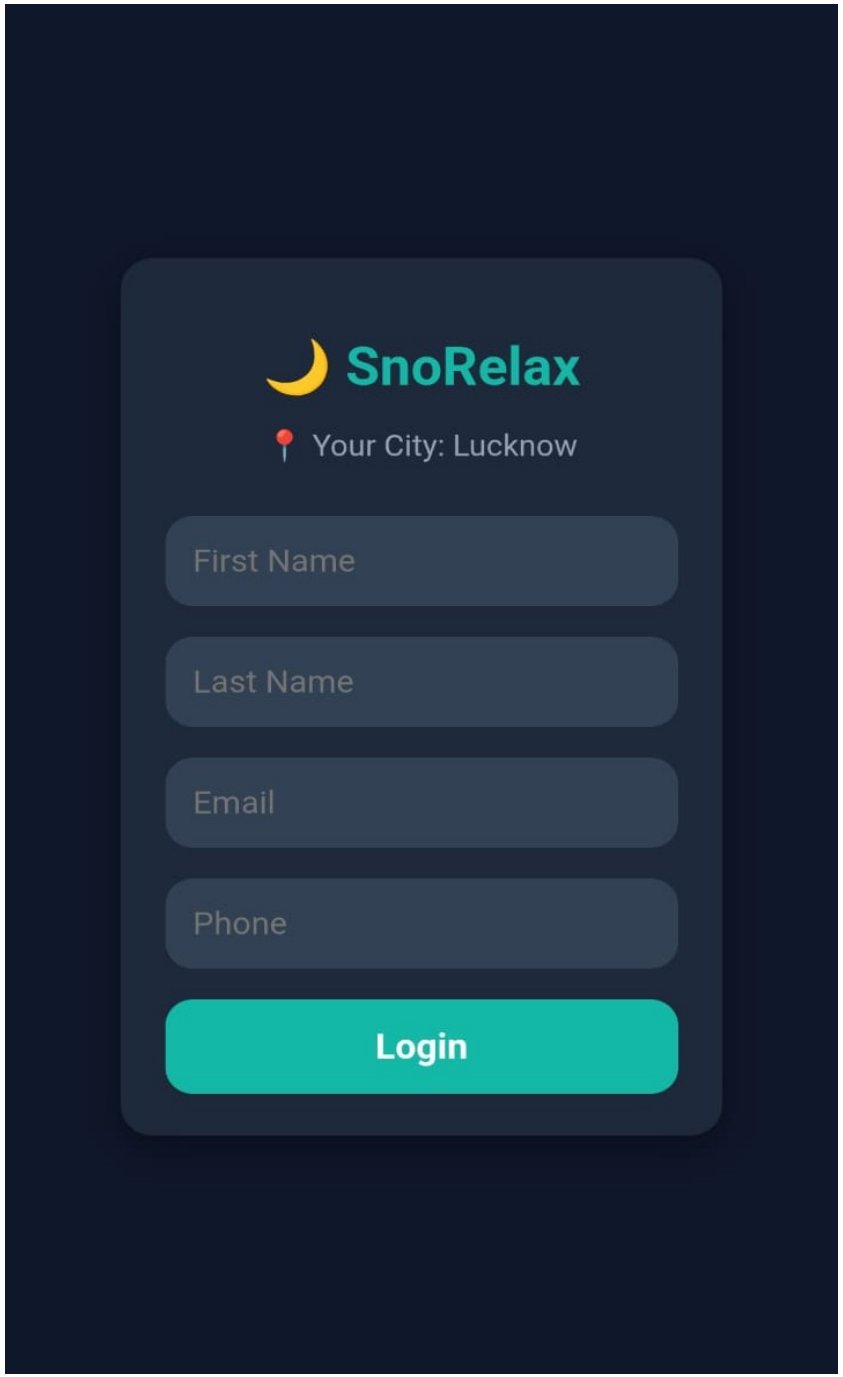
Security: JWT authentication, End-to-end encryption



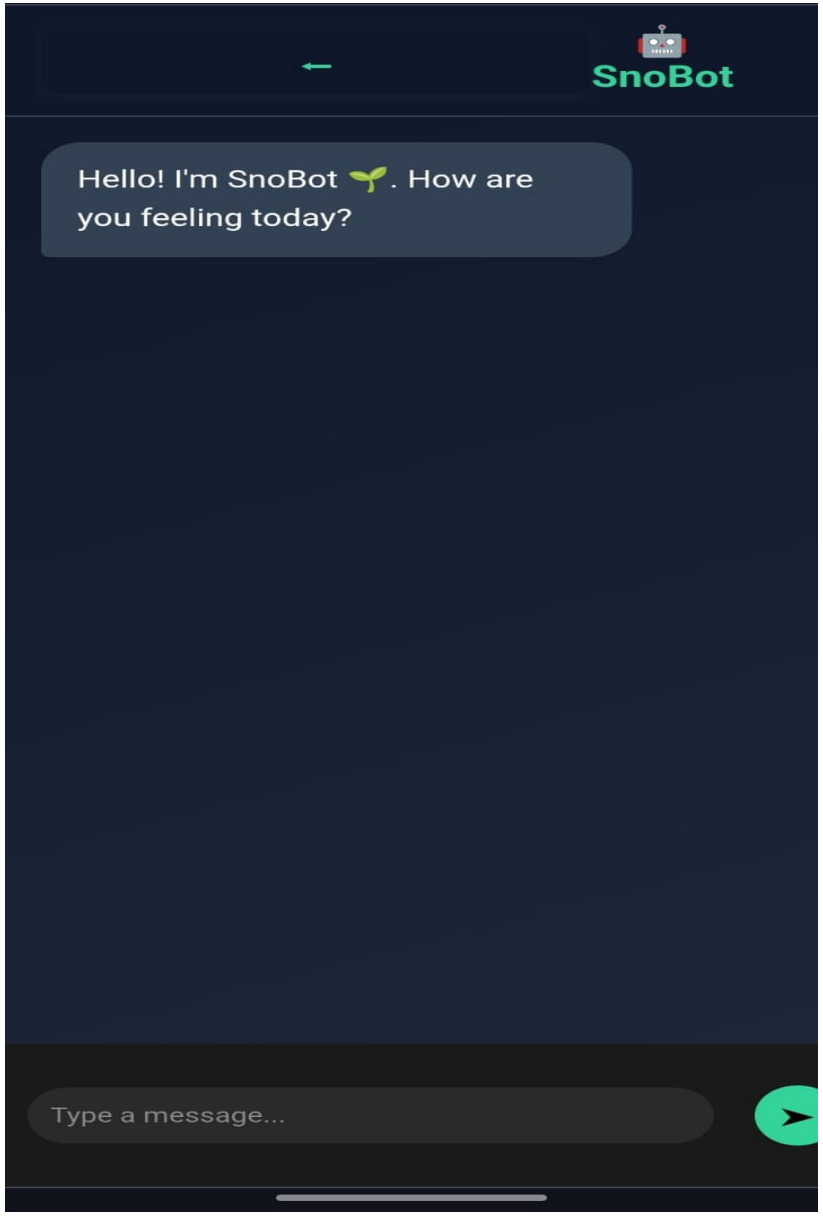
System Architecture: How SnoRelax Works

SnoRelax leverages a multi-layered architecture to deliver a seamless and intelligent user experience.

- **User Interface:** Mobile app developed with React Native or Flutter for broad accessibility.
- **Backend Processing:** Node.js with Express for API handling and Flask for AI model integration.
- **AI Core:** BERT for empathetic responses and LSTM for mood trend prediction.
- **Data Management:** MongoDB Atlas and Firebase for secure, anonymized data storage.
- **Deployment:** Frontend on Vercel, backend on Render for reliable service.



Sno-Bot AI-Powered Solution



SnoBot is the **AI-powered conversational agent** of SnoRelax, designed to deliver **empathetic, private, and context-aware support** for mental health.

- **NLP Model:** BERT (fine-tuned) for empathetic responses
- **Mood Analytics:** LSTM predicts user emotional trends
- **Crisis Detection:** Rule-based filters for self-harm or high-risk cases, with therapist/helpline escalation
- **Bridging the Gap:** Aims to provide immediate, personalized support, addressing common barriers to mental health care.
- **Privacy:** Uses anonymous IDs and encrypted storage, ensuring confidentiality

❖ Sno-Bot acts as the **first line of support**, bridging self-help and professional care.

The Intelligence Behind SnoRelax

AI and NLP Implementation

1. NLP for Chatbot (Empathy & Support)

- **Model:** Transformer-based (BERT fine-tuned on mental health datasets)
- **Purpose:** Generates empathetic, context-aware responses (85% empathy recognition).
- **Crisis Handling:** Rule-based filters detect critical text, escalating to professional support.

3. Ensemble Integration

Combines NLP and LSTM outputs using weighted rules for holistic recommendations.

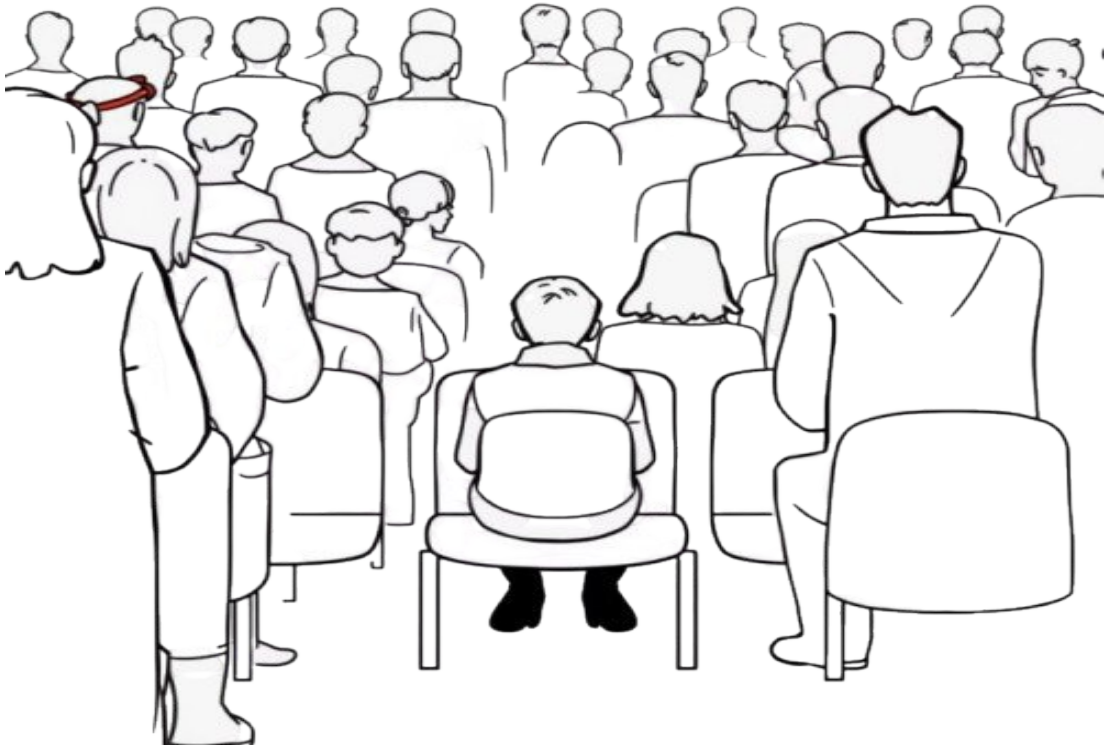
Example: Chatbot detects "high stress" → LSTM confirms negative trend → System recommends breathing exercises. If severe risk, directs to therapist/helpline.

4. Privacy by Design

Differential Privacy anonymizes sensitive input; only trend-level analytics are stored, not raw chat data.

2. LSTM for Mood Prediction (Analytics Layer)

- **Model:** Long Short-Term Memory (LSTM) neural network
- **Input:** User mood logs + optional wearable data
- **Output:** Predicts user state trends (90% accuracy), triggering exercises or alerts.



Applications: Who Benefits from SnoRelax?

Students

Addressing academic stress, exam anxiety, and transitions.

Working Professionals

Coping with workplace stress, burnout, and performance pressure.

Rural Populations

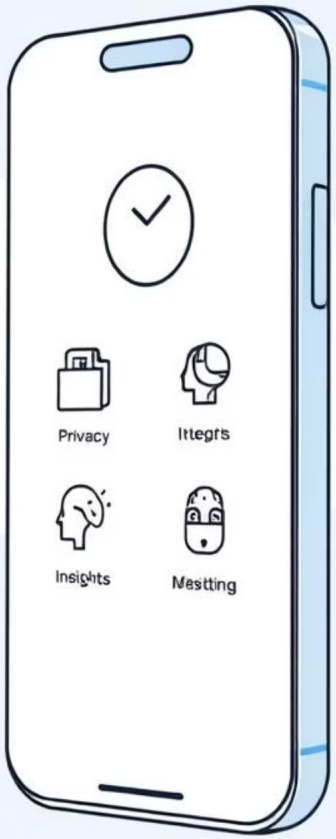
Bridging the gap for accessible mental health care where professionals are scarce.

Universities

Enhancing campus wellness programs and providing preventive support.

Corporates

Integrating with Employee Assistance Programs (EAPs) for staff well-being.



Key Advantages of SnoRelax

- **Privacy-First Design:** OTP login and anonymous IDs ensure user confidentiality.
- **Integrated Platform:** Combines chatbot, mood tracking, mindfulness exercises, and optional therapist linkage in one app.
- **Actionable Insights:** Mood trend analysis provides meaningful data for self-awareness and progress tracking.
- **Low-Friction Access:** Simple, credential-free login removes barriers to entry.
- **Cloud-Native Scalability:** Designed for large-scale adoption, supporting a broad user base.

Recognizing Limitations

While powerful, SnoRelax acknowledges its limitations, ensuring responsible usage and development.

- **Connectivity Dependent:** Requires stable internet for full functionality.
- **Chatbot Nuance:** Performance tied to training data; may not handle highly complex or acute cases.
- **Not a Substitute:** Designed to complement, not replace, licensed clinical care.
- **Engagement Challenge:** Sustaining user engagement requires continuous updates and motivational strategies.

Conclusion: A New Era of Mental Wellness

SnoRelax aims to bridge the mental health care gap through innovative AI, a privacy-first approach, and professional integration.

It is designed to be accessible, affordable, and scalable, making mental health support available to a broader audience.

From students to professionals, rural communities, universities, and corporates, SnoRelax offers a versatile solution for enhanced well-being.

THANK YOU