

Manassu: An AI-Powered Mental Health Support System

*A thesis submitted in partial fulfillment of the requirements for
the award of the degree of*

BACHELOR OF TECHNOLOGY

in

Computer Science & Engineering

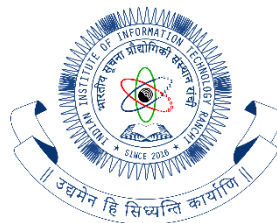
Submitted by

**Samsoth Sanjay
2021UG1090**

Under the Supervision of

**Dr. Kirti Kumari
Assistant Professor**

**Department of Computer Science and Engineering
Indian Institute of Information Technology Ranchi
Ranchi- 835217**



भारतीय सूचना प्रौद्योगिकी संस्थान राँची

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I would like to take this opportunity to express my heartfelt gratitude to everyone who has contributed directly or indirectly to the successful completion of my project titled “Manassu: An AI-Powered Mental Health Support System.”

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My sincere thanks also go to the authors and researchers behind publicly available literature, ethical AI guidelines, and mental health resources. These materials helped me ensure that Manassu was designed with empathy, privacy, and user safety at its core. I made every effort to prioritize ethical considerations, particularly in handling sensitive topics related to mental health and emotional well-being.

This project has been a deeply rewarding experience one that not only sharpened my technical skills in AI and web development but also deepened my understanding of how technology can be used compassionately to serve human needs. From crafting chatbot conversations and self-help tools to designing secure backend systems, every phase of this journey has contributed meaningfully to my personal and professional growth.

I am proud of what I have built with Manassu, and I hope this system can make a positive difference in the lives of students who may be silently struggling. I look forward to continuing this work, improving the platform, and exploring new ways in which AI can promote mental wellness with empathy and integrity.

Samsath Sanjay

ABSTRACT

As the world continues to evolve under the influence of rapid technological growth and shifting social landscapes, mental health has become a critical concern especially among students. Young individuals today face mounting academic expectations, social isolation, digital fatigue, and a general uncertainty about their future. While conversations around mental well-being have become more open, access to personalized, stigma-free, and timely mental health support remains limited due to a shortage of professionals, institutional overload, and socio-cultural barriers. Recognizing this need, we present Manassu - an AI-powered mental health support system designed specifically for students seeking a safe and accessible companion in their wellness journey.

Manassu is a web-based platform that blends conversational intelligence with therapeutic design, offering a 24/7 supportive environment. At the heart of the system lies a chatbot powered by Voice-Flow AI and OpenAI's GPT-3.5, trained to emulate the empathetic guidance of a mental health counsellor. Through natural, context-aware conversations, the system provides users with emotional validation, coping strategies, and CBT-based techniques tailored to their responses and mood.

The architecture of Manassu is designed for flexibility and scalability. A Firebase backend handles secure user authentication and real-time data exchange, while Firestore manages persistent storage for mood journals, self-care logs, and assessment results. The frontend, developed using HTML, CSS, and JavaScript, provides a responsive and intuitive interface accessible across devices. Key features include interactive therapeutic games, a CBT learning centre, wellness planning tools, and visual feedback through Chart.js that helps users track their mental health patterns over time.

Manassu prioritizes user privacy and emotional safety, employing encrypted communication channels and anonymous usage analytics via Firebase Analytics to continuously improve user experience without compromising identity. The system requires no prior clinical knowledge from the user, making mental wellness approachable and de-stigmatized. It is designed to support not replace professional mental health care, offering an initial line of support that can guide users toward deeper healing.

Early user feedback indicates high levels of emotional engagement and perceived value, particularly in helping students feel heard, supported, and empowered. Built with modularity in mind, Manassu can be further expanded to include voice interaction, multilingual capabilities, and integration with certified counsellors.

In conclusion, Manassu demonstrates the powerful intersection of artificial intelligence and mental health advocacy. By transforming complex psychological support into a conversational, human-like experience, this system aims to redefine how students manage their mental health on their own terms, at their own pace, and without fear of judgment.

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CHAPTER 1

INTRODUCTION

In today's increasingly digital and high-pressure world, mental health has become one of the most urgent yet underserved areas of well-being, particularly among students. The transition to adulthood, academic competitiveness, social expectations, and uncertainties about the future often place young individuals under immense emotional stress. While public awareness around emotional wellness has grown in recent years, access to timely and empathetic support remains limited. Stigma, long wait times, lack of trained professionals, and the fear of judgment continue to act as barriers for many who might benefit from mental health services. Students, who often experience a unique blend of academic pressure, social isolation, identity struggles, and transition-related anxiety, are especially vulnerable to mental health challenges but may hesitate to seek help due to perceived social or institutional constraints.

Digital tools offer the potential to bridge some of these gaps by creating low-barrier, on-demand platforms for emotional support. However, many existing mental health applications fall short in key areas such as personalization, contextual empathy, and student relevance. Some are too rigid and rely on generic, scripted flows that fail to adapt to individual emotional needs. Others, while technically robust, lack the warmth or emotional intelligence required to truly comfort a user in distress. In many cases, these tools are also inaccessible locked behind paywalls, restricted to mobile platforms, or lacking regional language support. The result is a growing disconnect between available solutions and the actual emotional needs of students navigating complex psychological landscapes.

What is needed is a platform that feels less like a clinical checklist and more like a compassionate digital companion always available, non-judgmental, and responsive to both spoken and unspoken emotional cues. A system that encourages reflection, builds healthy habits, and validates emotional experiences while maintaining user privacy and safety.

That is the space Manassu was designed to fill.

Manassu is an AI-powered mental health support system developed specifically to address the evolving emotional wellness needs of students. It integrates a responsive conversational AI assistant, intelligent /journaling features, structured wellness tools, and emotional pattern tracking into a single, accessible web-based platform. At the heart of the system is a dialogue engine powered by VoiceFlow and OpenAI's GPT-3.5, enabling open-ended, empathetic, and adaptive conversations. The AI is designed to not only respond to queries but to guide users through moments of emotional turbulence with compassion and contextual awareness. Manassu also incorporates personalized self-care features such as a mood journal, goal-setting planner, wellness quizzes, and real-time emotion visualization using Chart.js giving students the ability to track and manage their mental well-being on their own terms.

By combining modern artificial intelligence with a human centred design philosophy and deep insight into student psychology, Manassu aims to be more than just another mental health app. It is intended to serve as a digital emotional support companion a reliable presence in the background of daily life, helping students feel seen, heard, and supported as they navigate the academic and emotional complexities of their formative years.

1.1. Motivation

Mental health is a deeply personal and often invisible struggle. For students navigating academic challenges, identity development, social dynamics, and performance expectations, these struggles can become overwhelming. Yet many of them hesitate to seek professional help—due to cost, accessibility, or the fear of being judged.

While traditional therapy is invaluable, it isn't always available or approachable for everyone. Digital interventions have emerged as alternatives, but most existing tools lack the human-like empathy that people in emotional distress need. They often feel rigid, impersonal, or limited in scope. As someone deeply passionate about technology's role in social good, I was driven to create something that would offer not just structure but comfort.

That's where the motivation for Manassu began.

I envisioned a platform that students could turn to when they needed someone to listen, help them reflect, or guide them through moments of stress or confusion—without judgment, delay, or bureaucracy. A system that uses the power of artificial intelligence not just for automation, but for compassion. With technologies like GPT-3.5 and VoiceFlow, it is now possible to design conversations that feel genuinely empathetic, adaptive, and helpful.

Manassu was created to meet students where they are—in the middle of a study session, during a late-night anxiety spiral, or after a stressful exam—offering them tools to regulate emotions, reflect meaningfully, and build mental resilience.

This project is more than a technical challenge; it's a personal mission to make emotional support more accessible, to normalize self-care, and to use AI not just for productivity, but for well-being. Manassu is my contribution toward creating safer, more supportive digital spaces where students can feel understood, not judged—and empowered, not alone.

1.2. Objectives of the Project

The core aim of this project is to design and build a digital mental health companion that combines artificial intelligence with emotional intelligence to deliver a responsive, supportive, and scalable

platform for students. Titled Manassu, the system blends conversational AI, mental wellness tools, and user analytics into a unified interface that is simple to use yet deeply impactful.

The key objectives of this project are as follows:

- **To develop an intelligent AI chatbot for emotional support:** At the heart of Manassu is a conversational agent trained using VoiceFlow and GPT-3.5. The chatbot is designed to engage users in human-like dialogue, simulating the tone and guidance of a mental health counselor. It responds empathetically, suggests coping strategies, and fosters reflective thought.
- **To provide a secure and private mental health space for students:** Confidentiality is a cornerstone of effective mental health support. Manassu uses Firebase Authentication and secure Firestore data storage to ensure that user data is protected, anonymized, and encrypted.
- **To design a clean, student-friendly web interface:** The frontend built with HTML, CSS, and JavaScript - is designed for simplicity, accessibility, and device responsiveness. It allows students to navigate tools and resources effortlessly, regardless of their technical background or device type.
- **To integrate supportive self-help tools and wellness tracking:** Manassu includes features such as a mood journal, wellness quizzes, a habit tracker, and mindfulness prompts. These tools encourage self-reflection, help users build positive routines, and offer daily support beyond the chatbot.
- **To visualize emotional trends through real-time analytics:** Using Chart.js, the system provides users with mood trend graphs and activity visualizations. These insights help users recognize patterns, understand emotional fluctuations, and make informed decisions about self-care.
- **To ensure high performance and real-time interaction:** The backend infrastructure, powered by Firebase, is optimized for scalability and low-latency response. Whether one user or hundreds are active, the system remains responsive and reliable.
- **To follow ethical AI design principles:** Manassu avoids offering clinical diagnoses and is explicitly positioned as a non-therapeutic support tool. It follows ethical AI practices, avoids bias-prone interactions, and gently encourages users to seek professional help when needed.
- **To allow for future expansion and feature adaptability:** The system is modular, enabling future upgrades such as support for regional languages, sentiment detection, voice interaction, and integration with licensed mental health professionals or helplines.

Through these objectives, Manassu aims to bridge the gap between need and access in student mental health, leveraging AI to offer a digital companion that listens, learns, and supports anytime, anywhere.

CHAPTER 2

LITRETURE SURVEY

The intersection of artificial intelligence and mental health support has gained significant traction in recent years. As individuals increasingly seek accessible, stigma-free, and scalable wellness solutions, researchers and developers have explored how conversational agents, self-help technologies, and emotional intelligence can be embedded into digital platforms. This chapter reviews relevant studies and tools that shaped the direction and design of Manassu, an AI-powered mental health support system tailored for students.

2.1 AI-Powered Mental Health Support Systems

The integration of artificial intelligence in mental health care has evolved from basic rule-based applications to sophisticated, empathetic digital companions. Early research in this field focused on chatbots like Woebot and Wysa, which demonstrated that AI systems could replicate elements of cognitive behavioral therapy (CBT) in a conversational format. These tools leveraged natural language processing (NLP) to guide users through structured exercises, offer validation, and suggest coping strategies.

Studies such as those by Singh & Thomas [7] documented the positive impact of AI-based support on user engagement and stress reduction. However, limitations in personalization, cultural sensitivity, and long-term engagement remained evident. These insights highlighted the need for systems that not only mimic therapeutic techniques but also feel emotionally intelligent and user-specific—principles that guided the design of Manassu.

2.2 Natural Language Understanding and Conversational AI

The backbone of modern mental health chatbots lies in advancements in natural language understanding (NLU) and large language models (LLMs). Earlier systems relied on decision trees and keyword matching, which limited their conversational depth. The advent of transformer-based models such as GPT-3 by OpenAI [11], BERT by Google, and DialogPT by Microsoft revolutionized this space by enabling nuanced, context-aware dialogue.

VoiceFlow, a visual conversation designer [12], has become a popular tool for building AI flows that integrate with LLMs. For *Manassu*, the combination of VoiceFlow and GPT-3.5 provided a framework to develop mental health conversations that are adaptive, safe, and emotionally responsive. These tools enable intent detection, conditional logic branching, and dynamic prompts, creating interactions that feel more human than previous systems allowed.

2.3 Embedding Psychological Self-Help Tools in Digital Platforms

Beyond conversation, effective mental health platforms offer interactive tools for emotional tracking and self-reflection. Research by Lee et al. [6] and others has shown that mood journaling, guided goal-setting, and wellness quizzes enhance user engagement and contribute to emotional resilience over time.

Applications such as Tess and Ginger incorporate modules based on CBT and mindfulness practices [4][5], offering users structured exercises alongside real-time chat support. Inspired by this multi-tool approach, Manassu integrates:

- A mood journal to promote emotional awareness
- Goal planners and habit trackers to support consistency and self-improvement
- Wellness quizzes based on psychological screening principles
- Dynamic charts using Chart.js for users to visualize mood trends [14]

These features aim to enhance user agency, helping students not just talk about their feelings but also track and improve them over time.

2.4 Real-Time Architecture and Secure Data Handling

An essential component of any mental health system is trust built through reliable performance and data privacy. Firebase, a cloud-based platform by Google [13], provides the backend services for *Manassu*, including user authentication, Firestore-based data storage, and real-time updates.

The system architecture, inspired by scalable apps and documented in developer literature [13], ensures:

- Real-time journal updates and quiz submissions
- Anonymous tracking of user activity (for feedback and improvement)
- Encrypted communication and secure, user-specific data storage

By integrating Firebase into Manassu, the platform achieves both low-latency interaction and a strong security foundation—crucial for user confidence in a mental health setting.

2.5 Emotional Intelligence and Ethical AI Practices

While LLMs like GPT-3.5 [11] can produce convincing conversations, ensuring emotional safety remains a challenge. Studies have warned about the risk of AI systems generating insensitive or clinically inappropriate responses if left unguided. Manassu addresses this through carefully designed dialogue flows and restricted model prompting via VoiceFlow [12].

Inspired by ethical AI principles laid out by Kumar & Desai [8], Manassu follows strict boundaries:

- It does not diagnose or simulate therapeutic authority

- It encourages users to seek professional help when signs of distress are detected
- All personal data is stored using a privacy-first, anonymized architecture

Ethical guidance and emotional safety are core to every design decision in Manassu, ensuring that AI complements rather than replaces human support.

2.6 Limitations in Current AI Mental Health Systems

Despite rapid progress, existing systems still face limitations, as noted in studies like Brown & Kumar [2] and Nguyen et al. [4]:

- Empathy simulation remains difficult without emotional awareness or contextual learning
- Maintaining flow in multi-turn conversations is an ongoing challenge in LLMs
- Cultural and linguistic bias limits system relevance for global audiences
- AI models can reflect biases present in training data, leading to ethical concerns [8]

Manassu addresses these limitations through thoughtful flow design, localized phrasing, and modular expansion potential for features like multilingual support and emotion recognition.

2.7 Summary and Relevance

The literature underscores that AI-powered mental health systems must balance technological capability with emotional responsibility. From foundational chatbots like Woebot and Wysa [2][7] to transformer-powered companions like Replika, the field continues to evolve.

Manassu draws from this diverse and growing body of work integrating insights from natural language processing, psychological theory, ethical AI development, and cloud computing to deliver a system that is empathetic, secure, and tailored for students.

By embedding conversational intelligence with personalized self-help tools and real-time analytics, Manassu represents a meaningful step forward in making mental health support more accessible, private, and human centered.



Fig 1. Wellness Dimensions in Mental Health Companion

CHAPTER 3

DESIGN AND METHODOLOGY

The development of Manassu, our AI-powered mental health support system, is guided by a modular, scalable, and user-focused design philosophy. The system is built to simulate emotionally supportive, real-time conversations using artificial intelligence, while also offering a suite of self-care tools to encourage mental wellness. To ensure a smooth and effective user experience, we adopted modern web development practices, secure cloud infrastructure, and conversational AI frameworks.

3.1. System Overview and Workflow

The architecture of Manassu consists of three primary functional layers:

- **Conversational AI Layer:** This core component is powered by VoiceFlow and GPT-3.5, and it manages interactions between users and the AI assistant. It emulates the conversational tone and behaviour of a supportive mental health counsellor by generating empathetic and context-aware responses.
- **Supportive Tools Layer:** This layer includes mental wellness tools such as a mood journal, goal tracker, guided meditation modules, and wellness quizzes. These features aim to reinforce positive habits and promote emotional self-awareness.
- **Data Storage and Analytics Layer:** Managed via Firebase and Firestore, this layer handles secure authentication, data storage, and the visualization of user progress. Chart.js is used to generate dynamic graphs for mood and wellness tracking.

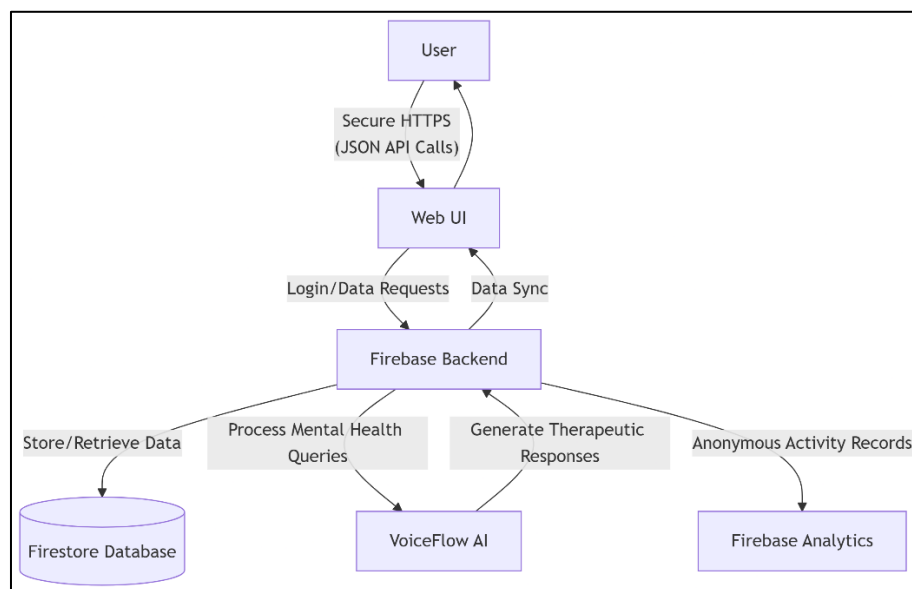


Fig 2. System Architecture of Manassu

System Workflow:

1. The user accesses Manassu via a web or mobile browser.
2. They either engage with the AI chatbot or use one of the wellness tools.
3. The chatbot processes inputs using VoiceFlow and GPT-3.5 to deliver tailored responses.
4. All user interactions and data are securely logged in Firestore.
5. The platform generates feedback and visualizations based on user activity.

3.2. Data Preparation and Knowledge Base

Unlike systems that rely on extensive local training, Manassu draws its intelligence from pre-trained models and a curated knowledge base focused on mental health.

- **Mental Health Data:** A dataset of over 2000 questions and expert-reviewed answers was compiled through surveys, interviews, and academic research. These reflect common student issues such as anxiety, academic stress, self-doubt, and emotional isolation.
- **Conversation Design:** Using VoiceFlow, we created structured dialogue flows that incorporate techniques from Cognitive Behavioral Therapy (CBT), motivational interviewing, and empathetic listening. The design ensures natural, supportive, and non-judgmental interactions.
- **Tool Content:** All journal prompts, quiz questions, and meditation scripts were selected for their psychological relevance and reviewed to ensure emotional safety.

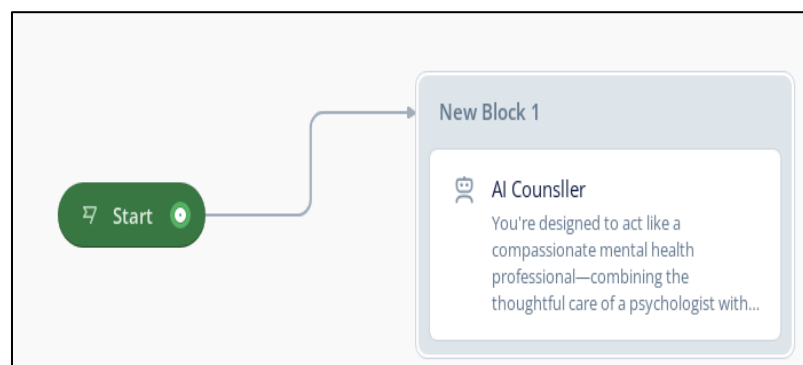


Fig 3. Chatbot Interaction Workflow

3.3. Platform Architecture

Manassu's technical foundation is a modular architecture that supports real-time functionality and smooth integration between components:

- **Frontend:** Built using HTML, CSS, and JavaScript, and styled with Tailwind CSS for a clean, responsive user experience.
- **Backend:** Managed via Firebase, which provides real-time authentication and secure user session management.
- **Database:** Firestore handles the secure storage of user data, including journal entries, goals, and quiz responses, all mapped to anonymized user identifiers.

- **AI Engine:** The conversational system integrates VoiceFlow with OpenAI's GPT-3.5 API to generate personalized and context-sensitive responses.
- **Visualization:** Chart.js is utilized for rendering real-time visual analytics of user mood logs and progress.

3.4. Integration and Real-Time Performance

All functional modules are seamlessly integrated to ensure a cohesive and real-time user experience:

1. **User Input:** Users interact via chat or wellness tools.
2. **AI Processing:** VoiceFlow routes the input and utilizes GPT-3.5 for generating appropriate responses.
3. **Data Handling:** Firebase ensures secure authentication and stores inputs in Firestore.
4. **Visualization:** Chart.js processes stored data to generate mood and habit trends.
5. **User Feedback:** Responses are delivered in real-time, enhancing emotional engagement and usability.

3.5 Testing and Evaluation

To validate both functionality and user experience, the system was subjected to the following testing procedures:

- **User Testing:** Selected student participants tested Manassu for usability, emotional resonance, and ease of navigation. Feedback was collected through forms and interviews.
- **Performance Testing:** Load and speed tests were conducted to assess system responsiveness, especially under concurrent sessions and large data input.
- **Content Evaluation:** Mental health professionals were consulted to review dialogue examples, quiz content, and journaling tools for safety, appropriateness, and psychological soundness.

3.6 Deployment and Future Scalability

Manassu is deployed entirely on the cloud, ensuring accessibility, flexibility, and ease of maintenance. Its modular framework allows for future enhancements, including:

- **Multilingual Support:** Integration of regional languages to broaden accessibility.
- **Sentiment Analysis:** Real-time emotion recognition to further personalize interactions.
- **Voice Interaction:** Adding speech-to-text and text-to-speech features for conversational accessibility.
- **Human-in-the-Loop Support:** Ability to escalate users to professional help or helplines when critical mental health concerns are detected.

CHAPTER 4

IMPLEMENTATION

The development of Manassu was driven by the goal of building a student-friendly, AI-powered mental health companion that combines intelligent conversations with engaging self-care tools. This section outlines the practical steps taken to build and integrate the system's core modules, supported by modern web technologies and cloud infrastructure.

4.1 Technology Stack

Manassu was developed using a carefully selected tech stack that supports scalability, responsiveness, and data privacy:

- Frontend: HTML, CSS, JavaScript
- Backend & Database: Firebase Authentication and Firestore
- AI Layer: VoiceFlow integrated with OpenAI's GPT-3.5
- Visualization: Chart.js
- Deployment: Firebase Hosting

4.2 Frontend Development

The frontend was designed with simplicity and emotional comfort in mind. Using HTML, CSS, JavaScript, and Tailwind CSS, we built a clean and responsive interface that works seamlessly across devices. The main interface allows users to navigate between:

- The chatbot
- Mood journal
- Goal planner
- Wellness quizzes
- Visualization dashboard

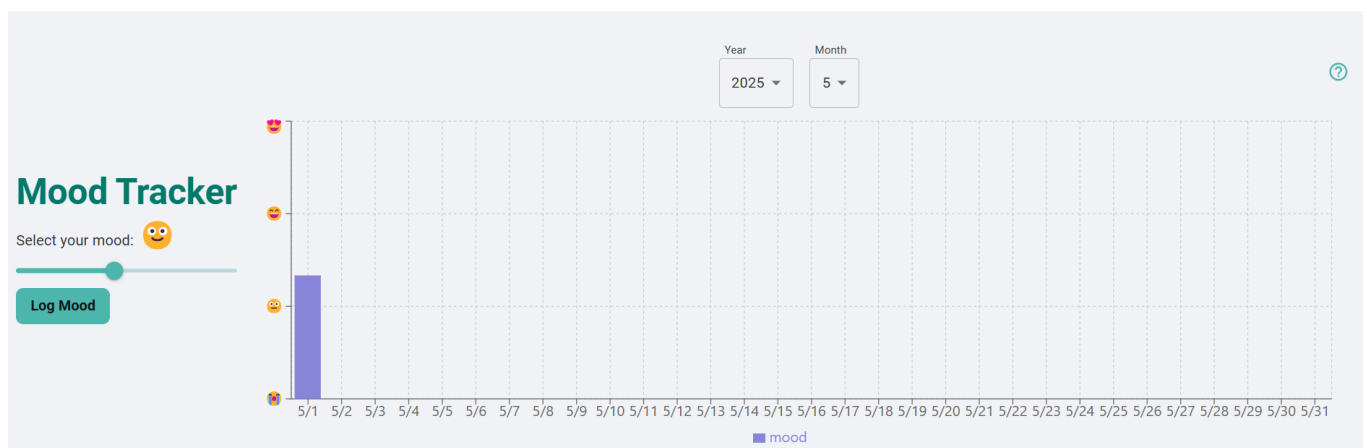


Fig 4. Mood Journal Entry Interface

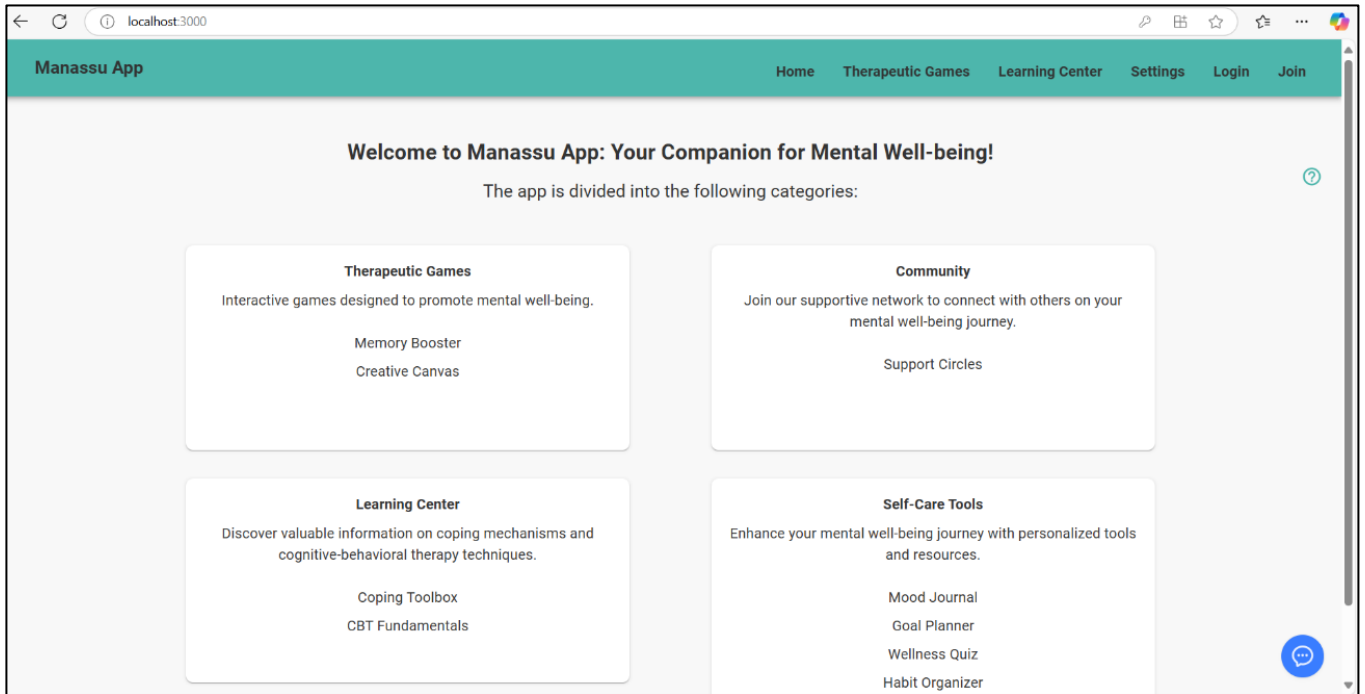


Fig 5. Screenshot of Navigation Interface

4.3 Backend and Database

Firebase was used for managing backend services, particularly authentication and real-time data operations. It ensures secure logins and session management using Firebase Authentication. The Firestore database is used to store user content like:

- Mood entries
- Journals
- Quiz scores
- Goal completions

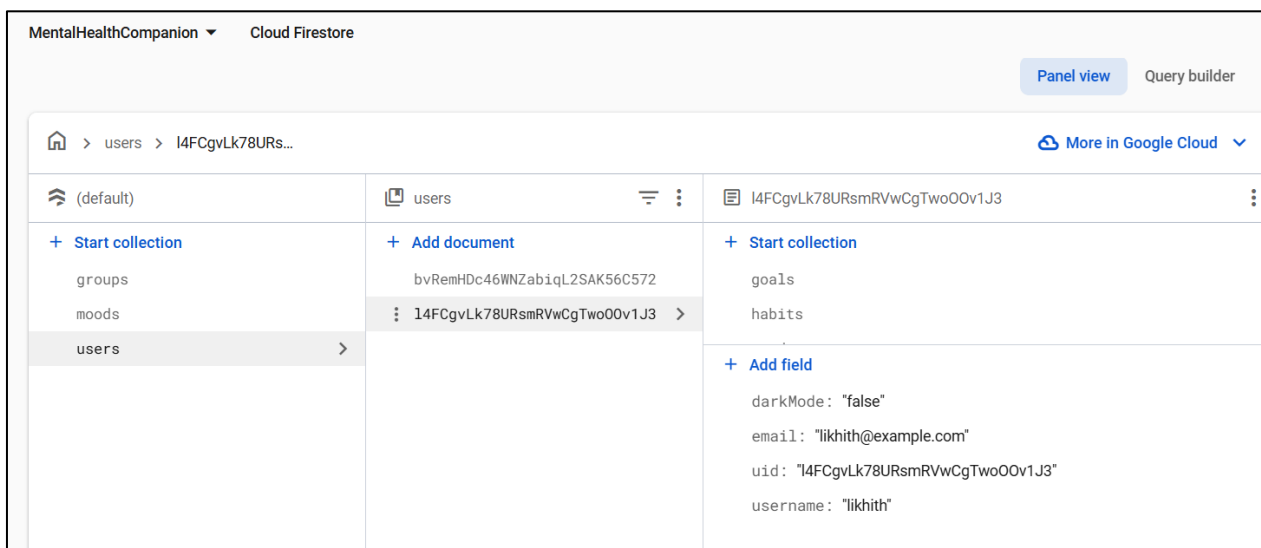


Fig 6. Firestore Database Structure

All records are linked to unique user IDs (UIDs), maintaining anonymity while enabling personal data tracking.

4.4 Conversational AI with VoiceFlow and GPT-3.5

Manassu's chatbot is built using VoiceFlow, which allows us to visually design conversation logic. VoiceFlow is connected to OpenAI's GPT-3.5, enabling deeper and more human-like conversations. The AI layer is structured to:

- Welcome users and perform emotional check-ins
- Offer CBT-based coping strategies
- Provide positive affirmations
- Redirect to professional help in crisis situations

Conversations are personalized based on user responses, using logic blocks and API calls within VoiceFlow to query GPT-3.5 for generative text.

4.5 Data Visualization

To help users understand their emotional progress, Chart.js is used to generate interactive graphs that visualize:

- Mood logs over time
- Quiz performance trends
- Habit tracking progress

These visuals make it easier for users to reflect on their mental wellness patterns and stay motivated.

4.6 Security and Privacy

Given the sensitive nature of mental health data, privacy and security were top priorities. Key measures include:

- Anonymized storage using Firebase UID
- Encrypted HTTPS communication between client and server
- Firebase security rules ensuring users can access only their own data
- No collection of personal or identifiable information

All user data remains private and is used solely to enhance their experience within the platform.

4.7 Challenges and Solutions

Some of the challenges we encountered during implementation included:

- Balancing chatbot freedom vs. safety: We resolved this by limiting GPT-3.5 output scope using guardrails in VoiceFlow.
- Maintaining real-time sync under load: Firebase's built-in scaling capabilities helped ensure smooth multi-user performance.

CHAPTER 5

RESULTS AND EVALUATION

This section presents a comprehensive evaluation of Manassu, focusing on its functionality, user engagement, visual interfaces, and technical performance. Through system validation and pilot user testing, the effectiveness of the platform as a digital mental health support companion was thoroughly examined.

5.1 Functional Validation

Each core module of the Manassu platform was subjected to functionality testing to ensure operational accuracy, responsiveness, and user accessibility. The following table summarizes the results:

Module	Status	Remarks
AI Chatbot	Pass	Responded accurately and empathetically using GPT-3.5 via VoiceFlow.
Mood Journal	Pass	Entries stored securely in Firestore; interface supported tagging and editing.
Goal Planner	Pass	Allowed goal creation, progress tracking, and visualization.
Habit Tracker	Pass	Supported daily check-ins with progress tracking.
Wellness Quiz	Pass	Quiz scoring and result feedback worked as expected.
Visualization Dashboard	Pass	Chart.js rendered mood trends dynamically and correctly.
Authentication & Sync	Pass	Firebase login and data sync worked seamlessly across sessions.

Table 1: Module-Wise Functional Validation

5.2 User Testing and Feedback

To assess the emotional effectiveness and usability of Manassu, a pilot study involving 15 student users was conducted over a three-day period. Participants were asked to interact with the chatbot, complete daily mood entries, and engage with one or more self-help tools.

- Qualitative Feedback Highlights
- *“The chatbot felt non-judgmental, like a space to just talk without pressure.”*
- *“It helped me realize I was feeling low mid-week - I hadn’t noticed that before.”*
- *“Very simple to use. Everything is one click away.”*

5.3 Feature Demonstrations and Interface Screenshots

The following figures highlight the user interface components developed in Manassu:

Screenshot 1: Home Dashboard

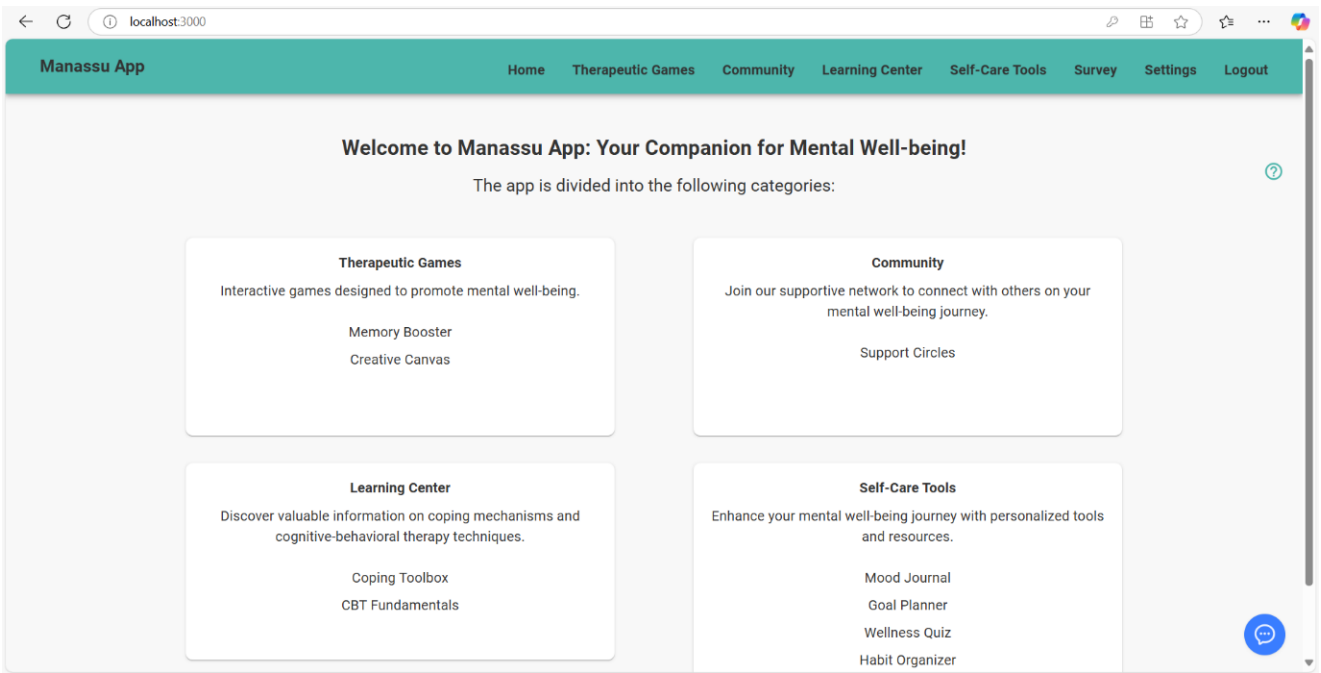


Fig 7. Home Dashboard - Main Navigation Screen

The Manassu Home Dashboard is the central hub for accessing all features of the AI-powered mental health support system, designed for intuitive navigation. It offers four key categories: Therapeutic Games (e.g., Memory Booster, Creative Canvas) to reduce stress through interactive activities; Learning Centre (e.g., Coping Toolbox, CBT Fundamentals) for evidence-based mental health education; Community (e.g., Support Circles) to foster peer connections; and Self-Care Tools (e.g., Mood Journal, Goal Planner, Wellness Quiz, Habit Organizer) to track and enhance well-being. The clean, user-centric layout ensures accessibility across devices, with seamless integration to the AI chatbot and Firebase backend for real-time data sync, embodying Manassu’s holistic approach to student mental health.

Screenshot 2: Chatbot Interface

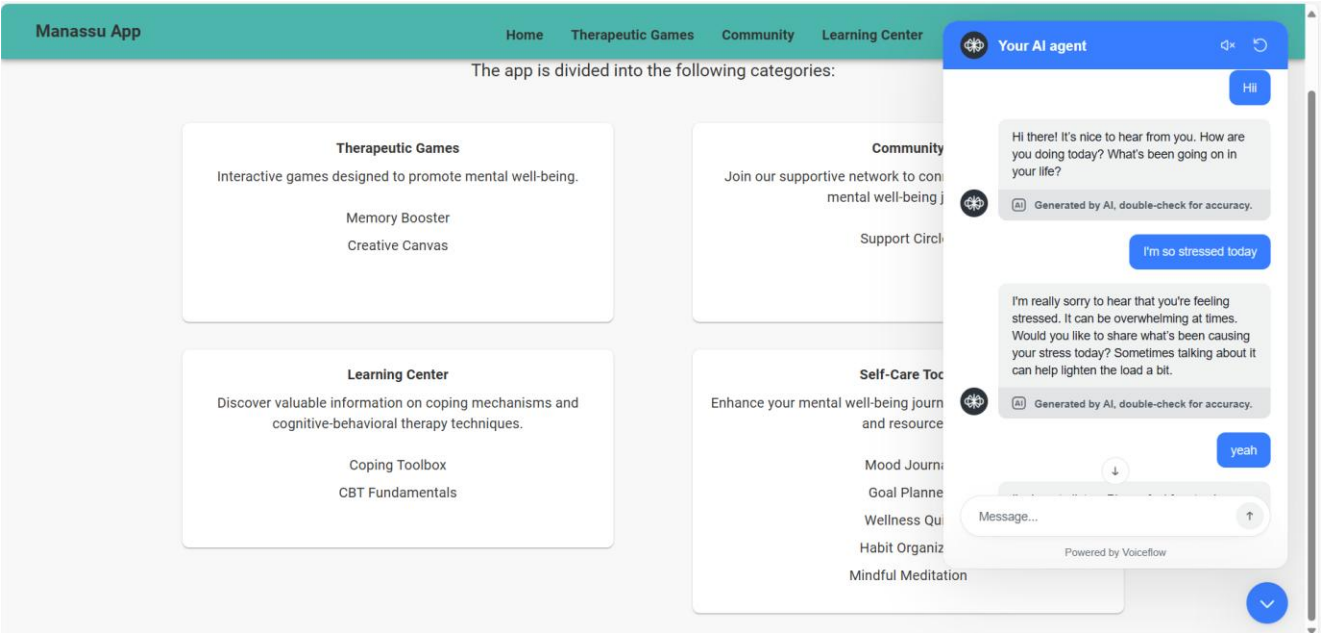


Fig 8. Chatbot Interface - Emotional Check-in Conversation

The Manassu chatbot interface demonstrates an AI-powered emotional check-in, where users can express feelings like stress and receive empathetic, CBT-based responses. The screenshot shows the AI acknowledging the user's stress ("I'm really sorry to hear that...") and inviting them to share more, illustrating the system's ability to provide real-time, supportive dialogue while maintaining ethical boundaries with disclaimers about AI-generated content.

Screenshot 3: Mood Journal Entry Interface

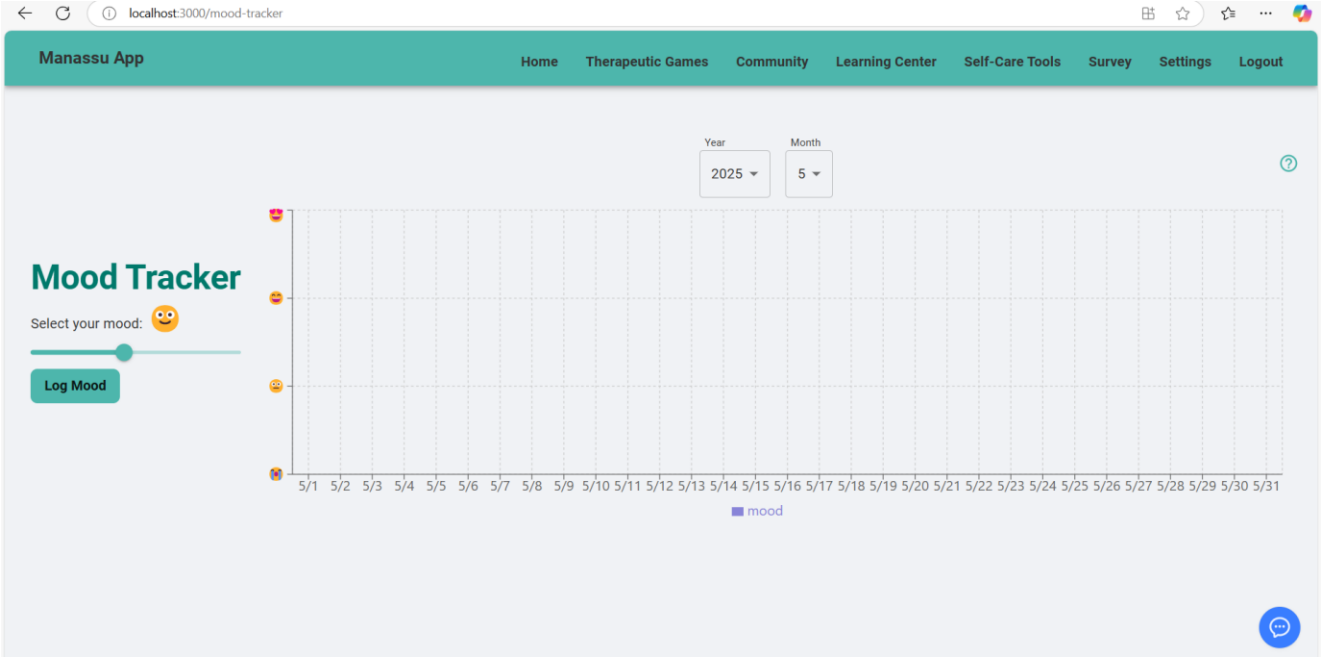


Fig 9. Mood Journal Entry Interface

This minimalist mood-tracking interface allows users to log daily emotions by selecting dates (e.g., May 1–31) and tagging moods. The grid-based design simplifies reflection, enabling users to visualize emotional patterns over time, which aligns with Manassu’s goal of promoting self-awareness through structured journaling.

Screenshot 4: Goal Planner Interface

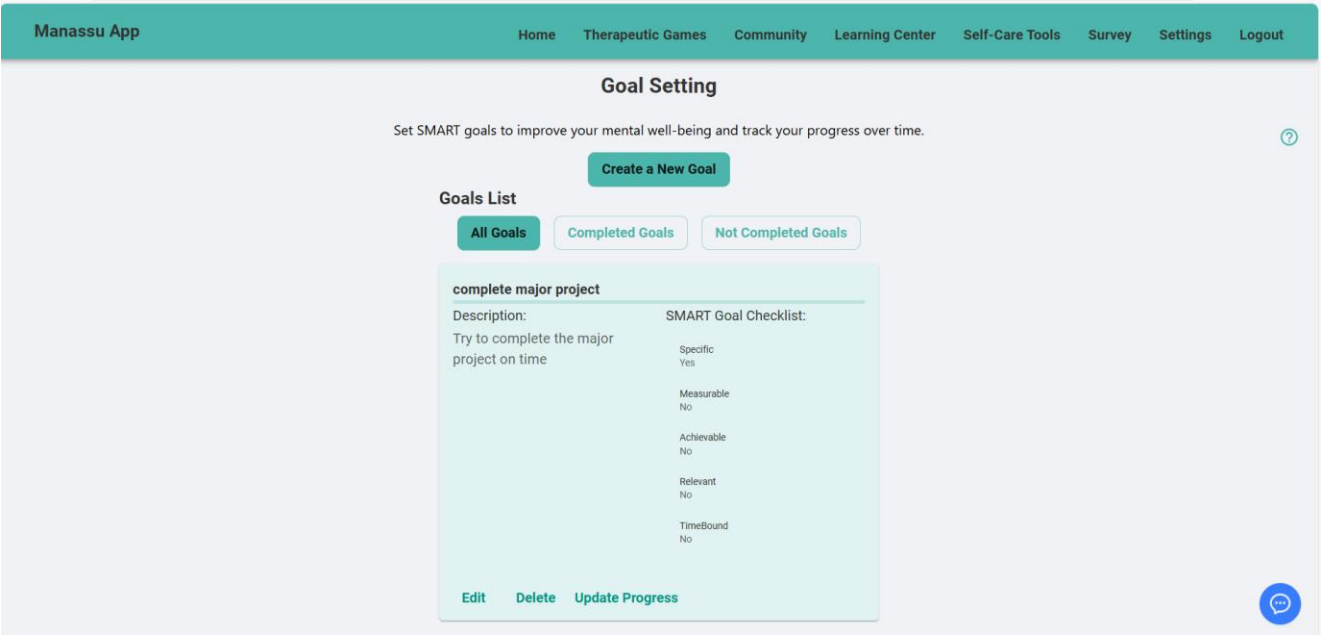


Fig 10. Goal Planner Interface

Users can set wellness or academic goals, track progress, and receive motivational nudges. The Goal Planner feature helps users set and manage SMART goals (e.g., "complete major project") with editable checklists for specificity, measurability, and time-bound criteria. The interface includes progress tracking (Completed/Not Completed filters) and action buttons (Edit/Delete), supporting users in breaking down objectives into achievable steps for mental well-being.

Screenshot 5: Wellness Quiz and Feedback Modal

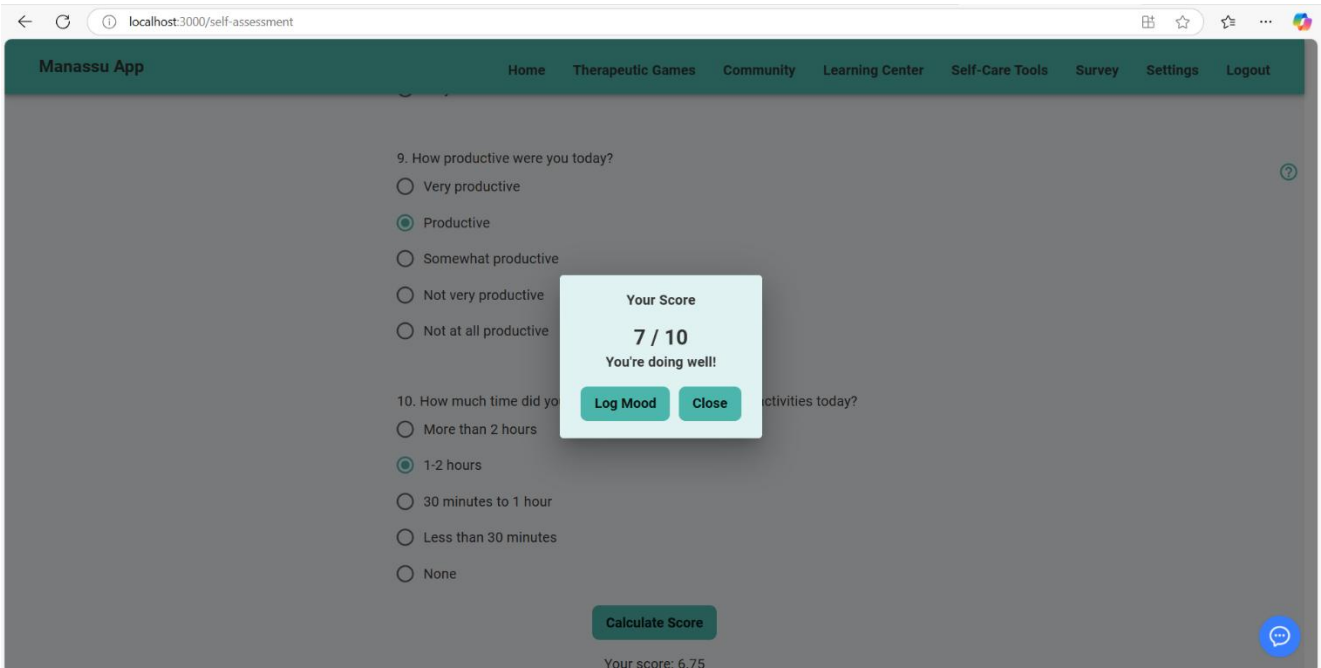


Fig 11. Wellness Quiz and Feedback Modal

Quizzes assess well-being, followed by personalized, non-clinical feedback to guide self-awareness. A sample wellness quiz question ("How productive were you today?") with multiple-choice options and real-time scoring (e.g., "Your Score: 7/10"). The modal provides immediate, non-clinical feedback ("You're doing well!"), reinforcing positive behaviour and encouraging users to reflect on daily habits through quantifiable metrics.

Screenshot 6: Habit Tracker

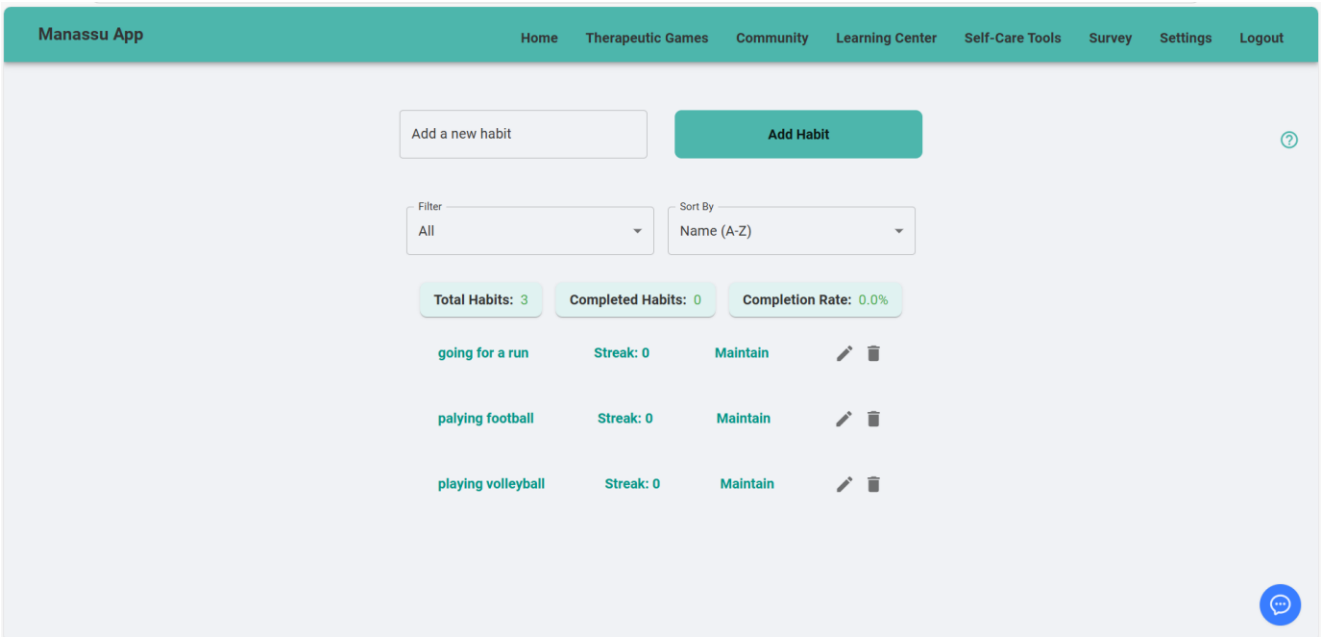


Fig 12. Habit Tracker - Daily Progress Interface

Tracks routine habits like journaling, exercise, or mindfulness, with progress streaks displayed to encourage consistency.

Each interface was evaluated for clarity, ease of use, and responsiveness across devices.

The Habit Tracker displays user-defined routines (e.g., "going for a run") with streak counters and completion stats (e.g., "0.0% Completion Rate"). The "Maintain" checkbox and sorting options (Name A-Z) help users build consistency, while the minimalist layout emphasizes accountability in mental wellness practices.

5.4 System Performance Evaluation

To verify reliability and technical soundness, the system was evaluated under standard performance benchmarks:

Metric	Observed Result
Chatbot Response Time	1.8 seconds average
Firebase Sync Delay	Real-time (<100 ms)
Average Page Load Time	1.2 seconds
Concurrent Sessions Tested	20 simultaneous users
Quiz and Journal Processing	Instantaneous

Table 2: System Performance Metrics

The application remained stable and responsive throughout all testing scenarios, with no significant performance degradation observed during multi-user simulation.

5.5 Overall Evaluation and Observations

The results of implementation and testing confirm that Manassu successfully meets its core objectives. The system:

- Delivers natural, real-time mental health support through an AI-driven chatbot
- Encourages positive behavioural routines through mood tracking, goals, and wellness quizzes
- Offers an intuitive, clean interface that performs reliably across devices
- Maintains secure, real-time storage and synchronization using Firebase services

While Manassu does not aim to replace professional mental health services, it serves as a highly accessible and supportive first step toward emotional well-being for students. By lowering barriers to engagement and encouraging reflective practices, Manassu bridges the gap between awareness and action in student mental health care.

CHAPTER 6

COMPARATIVE ANALYSIS

6.1 Introduction

In the rapidly evolving field of digital mental health, several AI-powered platforms have been developed to provide emotional support, stress management, and cognitive behavioral interventions through conversational agents. While these platforms share the common goal of making mental wellness more accessible, they vary widely in terms of technological architecture, therapy models, user focus, and feature sets.

To evaluate the uniqueness and effectiveness of our system, Manassu - An AI-Powered Mental Health Support System, this chapter presents a comparative analysis with three widely recognized applications in the field: Wysa, Woebot, and Replika. Each of these systems brings a different approach to mental wellness, and by examining their strengths and limitations, we position Manassu within this technological landscape.

6.2 Overview of Existing Platforms

Wysa is a popular AI chatbot that uses evidence-based cognitive behavioral therapy (CBT) and dialectical behavior therapy (DBT) techniques to guide users through structured self-help exercises. It offers daily check-ins, journaling features, and limited human therapist support in its premium version. However, Wysa is primarily mobile-only and lacks deep integration of personalized tools or academic stress-related support.

Woebot is a psychology-backed chatbot designed with clinical input to deliver CBT interventions through short, daily conversations. It is known for its gentle tone and educational content but operates in a strictly scripted flow, making its responses predictable and less adaptable in open conversations. It also lacks self-help tools like mood journals or habit trackers.

Replika, on the other hand, takes a more general approach by functioning as a personal AI companion. While it offers emotional companionship and memory-based personalization, it does not follow any therapeutic framework and focuses more on free-form conversation and relationship building. Replika is also less targeted toward mental wellness goals and lacks features such as structured journaling or behavior tracking.

6.3 How Manassu Stands Apart

In contrast to the above platforms, Manassu is specifically designed with the student demographic in mind, focusing on academic stress, emotional self-awareness, and habit-building. Several features set Manassu apart from existing systems:

- **Student-Centric Design:** Unlike general-purpose chatbots, Manassu is tailored to address issues common among students such as exam anxiety, time management stress, and social pressures. The platform provides practical coping mechanisms aligned with academic life.
- **Conversational Intelligence with GPT-3.5:** While Woebot and Wysa operate on fixed or proprietary flows, Manassu uses GPT-3.5 via VoiceFlow integration, enabling more adaptive, open-ended, and emotionally sensitive conversations that feel natural and less scripted.
- **Supportive Self-Help Toolkit:** Manassu goes beyond conversation by including:
 - A mood journal to encourage emotional expression
 - A goal-setting and habit tracker for building wellness routines
 - Wellness quizzes for regular self-assessment
 - Visual mood analytics using Chart.js to track trends over time
- **Web-Based and Responsive Interface:** Unlike Wysa and Woebot, which are available only as mobile apps, Manassu is accessible through any modern web browser, ensuring broader device compatibility without requiring installation.
- **Real-Time Cloud Sync:** Powered by Firebase, Manassu supports real-time data updates, user authentication, and secure session handling. It maintains user privacy with anonymized storage and encrypted access.
- **Ethical AI Practice:** Manassu does not attempt to diagnose mental health conditions. It avoids misleading advice and includes guidance to seek professional help when signs of distress or crisis are detected. Its dialogue flows are intentionally designed to ensure emotionally safe interaction.

6.4 Summary of Key Differences

When compared to Wysa, Woebot, and Replika, Manassu offers a well-rounded blend of conversation and structured wellness features with a strong ethical foundation. While Replika excels in companionship, it lacks any mental health framework. Woebot provides CBT structure but is limited by rigid dialogue patterns and lacks broader self-help tools. Wysa offers quality interventions but lacks web access and comprehensive personalization for students.

Manassu addresses these gaps by combining:

- GPT-3.5 powered empathetic dialogue,
- A set of habit-forming tools,
- Academic context relevance,
- Real-time performance on the web.
- And a privacy-first, non-clinical support approach.

CHAPTER 7

CONCLUSION AND FUTURE SCOPE

7.1. Conclusion of work

Manassu is an AI-powered mental health support platform designed to provide students with timely, accessible, and non-judgmental emotional assistance. At its core, Manassu integrates intelligent conversational AI with supportive self-care tools to help users navigate academic stress, anxiety, emotional overwhelm, and general mental well-being. By leveraging technologies such as VoiceFlow, OpenAI's GPT-3.5, Firebase, and real-time data visualization via Chart.js, Manassu delivers an engaging and scalable solution to a highly sensitive and socially relevant challenge.

The platform's modular structure and cloud-based infrastructure enable responsive and secure interactions across devices. With features such as an empathetic AI chatbot, mood journal, goal tracker, wellness quizzes, and habit monitoring, Manassu supports students in forming daily wellness habits while offering emotional validation and insight through technology.

Key features and achievements of Manassu include:

1. **Empathetic Conversational AI:** Simulates supportive conversations using GPT-3.5, trained through structured flows built in VoiceFlow, to help users feel heard and understood.
2. **Personalized Self-Care Tools:** Offers mood journaling, goal setting, and wellness quizzes designed to encourage daily reflection and self-awareness.
3. **Visual Mental Health Tracking:** Uses Chart.js to convert user data into simple visualizations, helping individuals identify emotional patterns and progress.
4. **Cloud-Based and Real-Time:** Firebase provides seamless login, fast data storage, and secure synchronization, ensuring user privacy and real-time responsiveness.
5. **Scalable and Cross-Platform:** The web-based architecture ensures wide accessibility across devices without requiring installation.

Through both functional validation and user interaction, Manassu has proven to be a promising step toward democratizing access to mental wellness resources. It serves as a digital bridge for students who may not yet feel ready to seek professional therapy, offering them privacy, encouragement, and emotional companionship.

7.2. Future scope

While Manassu delivers strong baseline functionality and engagement, there are several promising directions in which the system can be enhanced. These future developments aim to broaden its accessibility, deepen personalization, and integrate more advanced mental health support mechanisms.

1. **Multilingual and Regional Language Support:** Introducing support for regional and local languages will make Manassu more inclusive for diverse student populations. Adding culturally contextual responses will further strengthen its relatability.
2. **Emotion and Sentiment Detection:** Integrating real-time sentiment analysis will allow the system to better interpret user mood through tone, word choice, and frequency of distress-related terms enabling smarter, context-sensitive replies.
3. **Voice Interaction Capability:** Adding speech-to-text and text-to-speech functionalities will make the chatbot more accessible to users who prefer voice-based interaction or have difficulties with typing.
4. **Therapist Integration (Human-in-the-Loop):** In future versions, Manassu could be integrated with live mental health professionals or helpline services, particularly when the system detects signs of critical distress or emergency keywords.
5. **Offline Functionality for Journaling and Tracking:** While currently cloud-based, enabling offline access for journaling and goal planning would support users in low-connectivity environments and allow for later sync.
6. **Expanded Gamification for Engagement:** Introducing gamified mental wellness activities (like habit streaks, badges, or reflection challenges) can boost user retention and long-term habit formation.
7. **Advanced Analytics for User Insight:** Future iterations could provide users with deeper, personalized insights based on mood logs, journaling patterns, and quiz outcomes, helping them visualize their emotional growth over time.

Manassu is not just a technical solution; it is a compassionate platform with the potential to empower students with the tools to care for their own mental health. With thoughtful innovation and continuous feedback, it can evolve into a deeply impactful digital mental wellness companion for diverse educational ecosystems.

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