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AI-POWERED 3D MENTAL HEALTH THERAPY CHATBOT: AN INTELLIGENT AND EMPATHETIC FRAMEWORK FOR PERSONALIZED EMOTIONAL SUPPORT

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Abstract: The increasing need of universal mental health support in the global context, in particular, in the high-density urban environment, presupposes that the range of digital processes is to be developed in such a way that it became user-friendly and cost-effective to a great extent. The paper at hand is on the design and architectural implementation of a proof-of-concept, artificial intelligence (AI) 3D conversational agent (CA) that will be intended to provide initial mental health advice and psychoeducational services. This system is based on the concepts of Natural Language Processing (NLP), especially which give more emphasis on reliability and predictability of dialogue rather than on generative competencies. The invention of the solution must be the creation of such a simple and deterministic dialogue core with a complex 3D graphical interface with an embodied (avatar) avatar which is able to synchronize lip movement and emotive gestures. This Human Computer Interaction (HCI) emphasis is in a bid to develop more user interaction, solve the poor adherence issue in the popular text-only systems, and so as to develop a stronger sense of therapeutic presence. In a critical discussion on the deep-rooted ethical problems of accountability, privacy of data, and the constraints of artificial mimicry, in a therapeutic context, the report describes the three-layered nature of the system, formalizes non-functional requirements (NFRs), and functional requirements. The test of the implementation is how the final form of dialogue can be revived in order to assist the majority of people with mental support in a way that is immersive and readily accessible.

Index Terms - Conversational Agents (CAs), Digital Mental Health, 3D Visualization, Rule-Based Chatbot, Human-Computer Interaction (HCI).

I. INTRODUCTION

Mental health disorders are among the causes of disability on the planet. However, there are millions of people without treatment and the barriers are financial, social and logistic. Such issues as insufficient professionals, overcharging, and stigma in society are likely to haunt the conventional therapy. The solution to these issues can be identified in the rapidly developing area of artificial intelligence (AI) in healthcare, which can offer convenient, non-judgmental, and scalable mental health aid systems. Mental issues like anxiety, stress, depression rates are increasing at a tremendous pace. Despite the raised awareness, this is because there is no proper provision of mental health professionals and services especially in the developing regions. Furthermore, social stigma normally denies individuals access to help.

The traditional forms of digital chatbots can only interact to an extent as they are a text based system and do not in any way give an emotional response. Therefore, there emerges the need to have AI-based mental health therapy software that gives early mental care and welcomes a broad and participatory environment with a 3D avatar. Such a system will be capable of filling the disparity in access, minimizing the incidence of stigma, and motivate people to seek timely professional help

where they are in need of it. The present paper presents a mental health treatment system based on AI assistance, which assists the user in creating a safe online space in which they could have a productive conversation. The system also possesses a three-dimensional (3D) computer-generated character known as the avatar, unlike traditional chatbots, which facilitates more natural communications, which leads to building trust and facilitating the therapeutic process. This mix of natural language understanding, affective computing, and real-time responses will result in the platform becoming another mental health support, although it will not take care of the role.

II. LITERATURE SURVEY

A . The Global Mental Health Accessibility Crisis And Digital Interventions

The increased occurrence of mental diseases and necessity of professional therapeutic schemes is still growing higher and higher all over the world, yet the availability to them is still extremely low. It has been established that nearly half of the individuals that should be provided with therapeutic services are not reachable due to the barriers that encompass cost, stigma, and geographical location. Such issue of accessibility is typically blown out of proportion in the over-populated urban capitals as the primary contributor, and hence, the need to escape this scenario in a scalable and presently attainable way.

The gap has been filled by significant research and development of the health directed conversational agents (CAs). These robotic systems are affordable, 24/7 available, and serve as an initial stage of contact with those people in need of psychological assistance. Design philosophy of such systems is more likely to be oriented either to the delivery of specific therapeutic modalities, including the Cognitive Behavioral Therapy (CBT), or some fundamentals of psychoeducational information to cope with the symptoms of the anxiety and depression [3]. The successful application of the digital agents is based on the potential to be continuously active with users and provide them with stable and reliable interaction, which is the demand that the architectural choices of the specified system precondition.

B. Historical And Foundational Conversational Agents

The theoretical foundation of automated therapeutic dialogue is in the ELIZA program of Joseph Weizenbaum, developed in 19641967 [2]. Weizenbaum authored ELIZA as an experimentation of the potentials of natural language dialogue between human and machine, which was to be applied as non-directive, Rogerian psychotherapist. Eliza worked deterministically and in a rule-based way. It operated by looking in keywords in the input of the user and imposing rules of decomposition based on the keywords and producing responses based on the corresponding reassembly rules. ELIZA was a genius because it pretended to understand, showing that one could be as context sensitive as the least possible, that there is predictable performance, despite the fact that there was no genuine artificial intelligence. This work forms the basis of justification as to why a rule-based methodology, which is structurally simple, should be adopted in resource-constrained systems or prototype systems in which the complexity caused by training NLP models is inhibitory.

This has formed the basis of contemporary changes. A conversational agent, Woebot, is an example of a completely automated conversational agent that offers modules of CBT. Randomized Controlled trials verify the viability, acceptability and effectiveness of such agents as effective in minimizing symptoms of anxiety and depression among young adults [3]. Still, effective text-based digital CBT algorithms have been reported to exhibit the issue of poor long-term compliance, though. This fact suggests that its therapeutic argumentation may be excellent, but the way it is presented, in the form of a plain text interface, may lack the thrill to keep the process of its usage long.

C. Precedents For Immersive Technologies In Psychological Treatment

The immersive technologies, which are Virtual Reality (VR) and eXtended Reality (XR), have already demonstrated applications in the medical sphere, and psychotherapy. Virtual Reality Exposure Therapy (VRET) is used on learners who are affected by Post-traumatic Stress Disorder (PTSD) and majority of phobias [9]. The technologies are valued because of the ability to create a secure and regulated therapeutic environment and maximize interactions with the patient by deep visualization [8]. The coherent approach towards visual space helps to allow personal inspiration and involvement of the subject matter of the therapeutic content to a greater extent [11].

As much as it requires specialized hardware to recreate a full-sized VR environment, the concept of a 3D, embodied virtual human on the conversational interface was directly built on this positive clinical experience. The embodiment concept and the social presence concept can be manipulated according to the well-known psychological principles, according to the presence of a visual representation of an agent instead of a text window only.

D. Comparative Analysis Of Existing Systems

Table 1 provides a comparative analysis of some of the most outstanding AI-based mental health systems, i.e., Woebot, Wysa and Replika, their architecture, their therapeutic strategies, their interaction modalities as well as the extent of their validation. Woebot and Wysa are rule-based and machine learning company designs which are highly and moderately clinically validated, respectively. Replika, conversely, is based on the generative large language model (LLM) architecture to provide emotional support by text and a 3D avatar interface, albeit with low validation and increased risks associated with it. The table brings to the fore the limitations that exist, such as emotional nuance, scalability, and safety concerns, which, in their turn, justify the concept of adopting the advanced multimodal and clinically valid AI-based wellness solutions.

Table No. 1 Comparative Analysis of Existing Systems

SYSTEM	*ARCHITECTURE TYPE*	*PRIMARY THERAPEUTIC APPROACH*	*INTERFACE DIMENSION*	*CLINICAL VALIDATION*	*KEY LIMITATION*
Woebot	Rule-Based/ ML Hybrid	Cognitive Behavioral Therapy (CBT)	Text-Based 2D	High (Strong ROT evidence)	Lack of emotional nuance; inability to handle complexity
Wysa	Rule-Based/ ML Hybrid	CBI, Motivational Interviewing g	Text-Based 2D	Moderate (Pilot studies show efficacy)	Limited multimodal adaptation; scalability VS. personalization trade-off
Replika	LLM-Based (Generative)	Emotional Support, Companionship	Text/Basic 3D Avatar	Low(Early validation/Risks cited)	Potential for unsafe advice; unverified therapeutic

E. Rationale For Combining Conversational AI With 3D Embodiment

The proposed project seeks to address the lack of reliability of the deterministic and rule-based dialogue systems (like ELIZA), to which the interaction of the 3D immersive visualization (like VRET) is added. The system will resolve the low adherence rates that prevail in otherwise text-based interfaces with the assistance of the 3D avatar which uses facial expression, hand gestures, and lip-synchronization [12].

The architectural focus is specifically shifted to the achievement of the greater degree of linguistic knowledge (it also presupposes the use of superior linguistic knowledge (LLMs) and extensive training information to achieve it), to the Human-Computer Interaction (HCI). Studies have also revealed that a user who communicated with a virtual human would have revealed more sensitive information. Thus the project hypothesis is that through visual embodiment to make the perception of empathy and presence as high as possible, the system will be able to achieve greater levels of user acceptance and duration of interaction, even though the system is reliant on the basic logic of matching keywords. This combination is a viable approach of offering convenient mental health delivery at minimal technical hazard, which can be utilized to rapid deployment and initial scholarly research.

III. METHODOLOGY

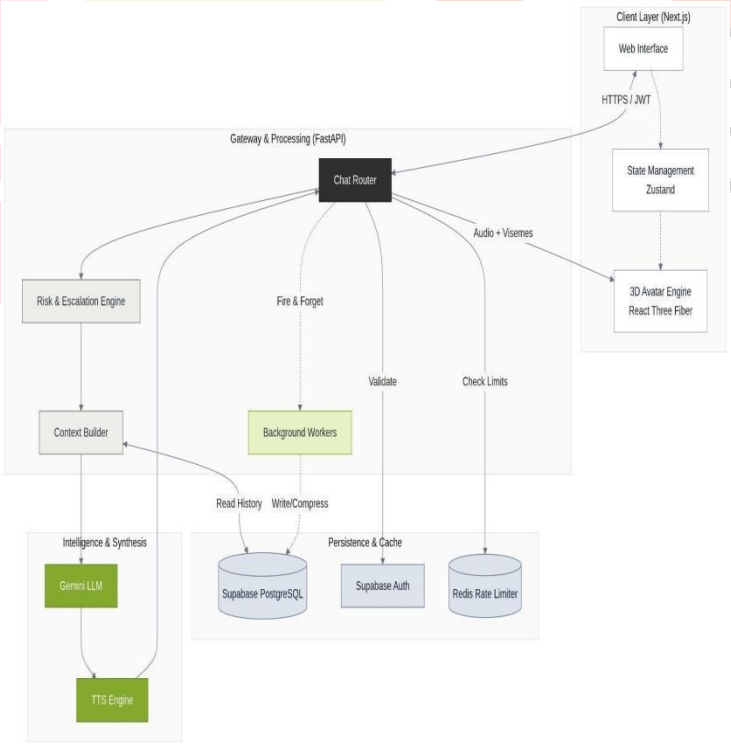

Fig 1. System Architecture of the Proposed Chatbot

The creation of the 3D mental health chatbot is an AI-based project that is developed in a systematic approach, which prioritizes real-time interaction, user safety, and efficient data management. It is created in a layered design that offers a more flexible way of implementing its components with each part having a particular role to play and, hence, greater modularity and simpler maintenance.

It works by first inviting user interaction with the frontend interface whereby the user is allowed to type or speak. The web interface is connected to the backend safely with the help of HTTPS and JWT. Text can be converted back to voice and then through a speech-to-text module it can be further processed. After the input has been received, it is forwarded to the

backend server to be processed. The backend is a gateway, which has a central Chat Router that processes incoming data. Authentication and validation checks are initially done by this router using a connection to Supabase Auth and checking request limits with a Redis Rate Limiter. This is so that the request is made by a legitimate user and the request is within the permit usage parameters.

Once it is validated, the input is sent to the Risk & Escalation Engine. This is a significant measure in a mental health application that can detect sensitive or damaging content. In case of detection of high risk content, the system will automatically give a predefined safe response rather than generate a dynamic response. This makes the system act responsibly in situations of criticalities. The Rule-Based Intent Detection algorithm acts as the first line of defense in the Risk & Escalation Engine. It uses predefined regular expression patterns to immediately identify specific keywords or phrases related to high-risk topics (e.g., self-harm or crisis). By using Regex matching, the system can "short-circuit" the standard generative AI flow and instantly deliver a safe, canned response with helpline information, ensuring zero-latency safety checks.

The Risk Detection Algorithm performs a deeper assessment of user input. It calculates a risk score for each interaction, which is logged in the Session entity of the database. If the score exceeds a safe threshold, it triggers an escalation event, allowing the system to handle severe emotional distress responsibly by guiding users toward professional help.In the case of normal inputs, the system retrieves the relevant past conversation data with the help of Context Builder. The Sliding Window Context Algorithm is utilized by the Context Builder to manage the AI's short-term memory. It ensures that the Large Language Model (LLM) receives a window of the most recent messages from the current session. This allows the chatbot to maintain a coherent and contextually relevant conversation without being overwhelmed by excessive data, ensuring the response remains focused on the user's immediate needs.This covers the recent messages as well as the old messages which are summarized. Both the input and context are then given to the Gemini LLM (Large Language Model) that then produces a context-sensitive and meaningful output.

The Memory Compression Algorithm maintains long-term context efficiently; this algorithm periodically summarizes older interactions into ConversationSummary records using vector embeddings. It compresses large volumes of past chat data into concise summaries, which background workers process without interrupting the main chat flow. This allows the AI to remember a user's history over multiple sessions while staying within the token limits of the LLM.The response that is created is passed to a Text-to-Speech (TTS) engine. The system also generates viseme data along with audio generation and the data is sent back to the client layer so as to animate the lips of the 3D avatar. Lastly, the user is provided with the answer in both audio and text form that is interactive and engaging. Meanwhile, background workers can be used to do fire-and-forget jobs such as data compression and database writes without discontinuous the primary chat.

IV. IMPLEMENTATION DETAILS

[A] Overview Of The 3D Emotional Interface

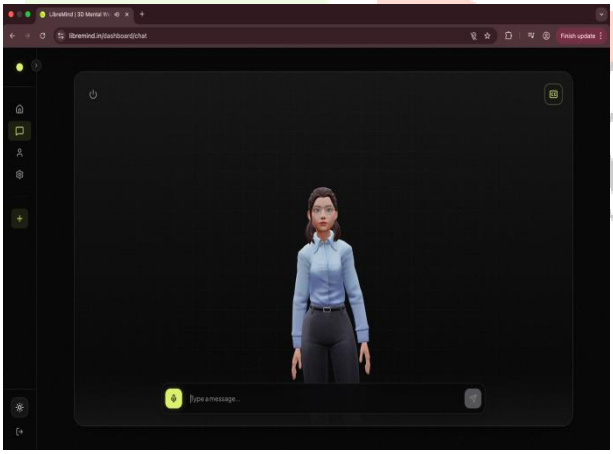

Fig. 2. 3D Avatar Interface

Figure 2 shows the graphical user interface (GUI) of the proposed 3D Mental Health Chatbot. The chatbot also has a realistic avatar, which can show different states of emotion, such as happy, sad, angry or surprised. These signs of display are also a reflection of emotional stimulus to the emotional response of the user. It will also focus the avatars on encouraging human-computer interaction with the simulated empathetic nonverbal behavior that will give a significant component of building trust and engagement in a conversation involving mental health.

The graphic layout is quite basic, user-friendly, and friendly. The low-key facial expression and the background soft gradient are well selected so that emotional overstimulation is not caused to a distress victim. The aspect of non-obtrusive animation, e.g. nodding, blinking, smiling, etc., can make the virtual communication look more natural and comfortable. These features enable the chatbot to create the atmosphere, where the emotional bonding can be fostered, which is particularly significant in the context of psychological assistance.

B. Emotion Recognition And Response Mechanism

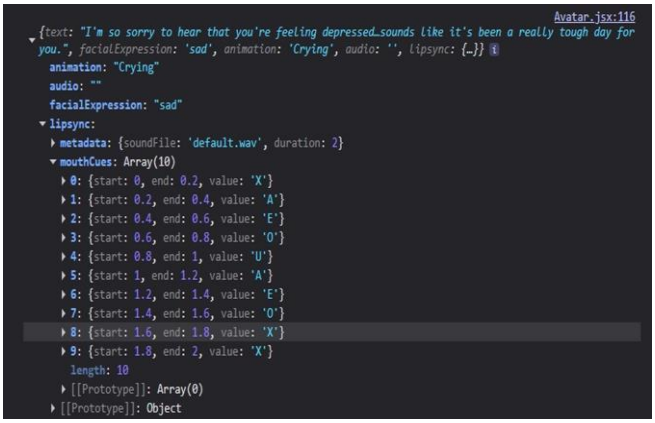

Fig. 3. Chatbot Response Generation Code Structure

The code sample depicts the dynamic mapping of the textual mood to the animated mood accomplished by the chatbot. Here, variable facial Expression: "sad" produces a visual impact on the face of the avatar and changes it in accordance with the emotional coloration that a user uses. Meanwhile, the state of animation, Crying, may be requested to suggest the pitying nature of the response.

A row of phoneme cues (e.g., A, O, E, U, X) is known as the lip-sync unit and is the unit which aligns the scheme of the conversation between the audio output speech and the avatar to the speech or recordings that are actually generated. This provides another realistic perception that the system is able to support a conversation with the required level of emotional congruency. This design will provide the users with an impression that the chatbot is not just listening but also cares about them, which is fundamental to mentally effective systems of support.

C. Core Technologies and Framework

The system is deployed with the help of a mixture of new web technologies and AI tools. The frontend is created with Next.js that offers a user interface that is fast and responsive. React three fiber uses the 3D avatar, which provides real-time rendering and animation in the browser. Zustand is utilized in state of application management, in order to promote the flow of data between the web interface and the 3D avatar engine.

The back-end processing and gateway is built with FastAPI on Python, a high-performing framework with support of asynchronous operations. The FastAPI central Chat Router receives and uses API calls, user-entered information, and communicates with AI services. Asynchronous programming has to make sure that other tasks like database operations and AI processing do not hinder the system.

In the case of persistence and caching, Supabase is employed, which is a PostgreSQL database with its own authentication services. It retains user data, chat logs and session data. A Redis Rate Limiter is embedded to ensure the control of the amount of requests and prevent the system to be overloaded.

The Gemini LLM drives the intelligence and synthesis component of the project and it produces answers depending on the input of the user and context. Text responses are converted to audio output using a TTS engine. The system further has a speech-to-text that deals with voice input. Background workers are used to perform the activities like writing messages to the database, generation of summaries and effective management of long term memory.

D. Theoretical Implications

It is a significant step towards the affective dialogue systems of the human-computer interaction (HCI) viewpoint which can replicate empathy through the multimodal expression. Emotion recognition, adaptive visual feedback, and realistic animation are incorporated in the creation of a psychologically conscious conversational interface.

They may be utilized in mental health counseling, yet may be extended into therapeutic training, digital companions and emotive cognizant customer care. Moreover, this framework demonstrates the way the application of the AI-driven emotional modeling can be used ethically to support afflicted users without jeopardizing the computational transparency and manipulation of automated affective mechanisms.

E. Interactive mental health support features

The given system is not only confined to the simplistic chatbot interaction but also features a number of interactive mental health assistance features which allow the users to handle their emotions in a more efficient manner. The features are intended to assist instantly in various emotional conditions and enhance user experience in general.

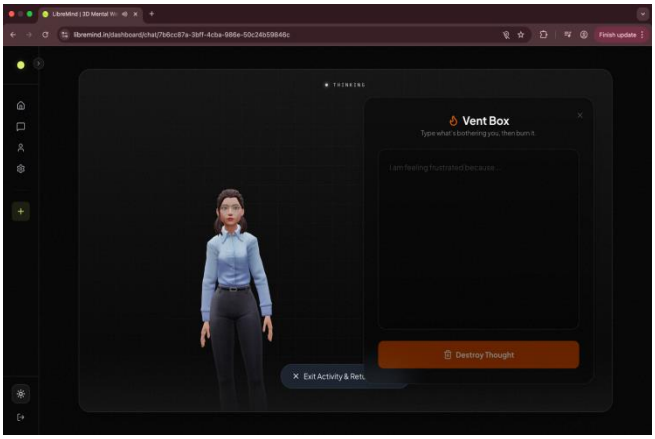

Fig. 4. The Vent Box Module for Emotional Release and Stabilization

Emotional release mechanism also known as the Vent Mode is one of the major aspects of the system. This mode will be triggered when the system recognizes that the user is angry, frustrated, or feeling overwhelmed, or is venting their emotions. The interface enables one to post freely and express his thoughts in this state. The system is responsive and non judgmental and it can assist the user to relax.

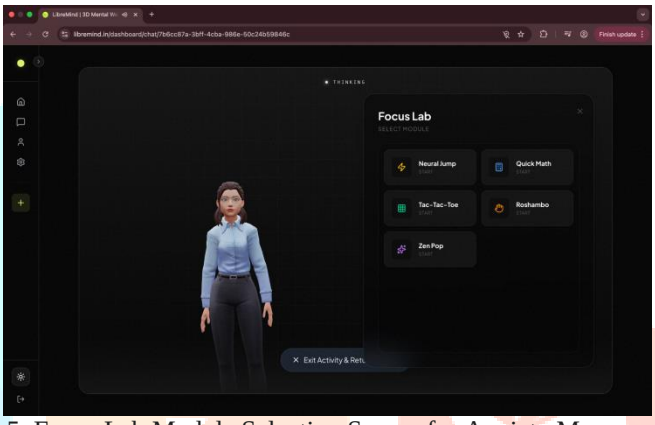

Fig. 5. Focus Lab Module Selection Screen for Anxiety Management

The next significant characteristic is the presence of guided exercises and distractions. Once the system detects indications of panic or agitation, it can recommend activities provided in an in-built Focus Lab. This lab has easy mini-games that bring the user back to earth like Neural Jump, Quick Math, Roshambo, Zen Pop and a tactical X/O (tic-tac-toe) game, which can be played with either the AI or a friend.

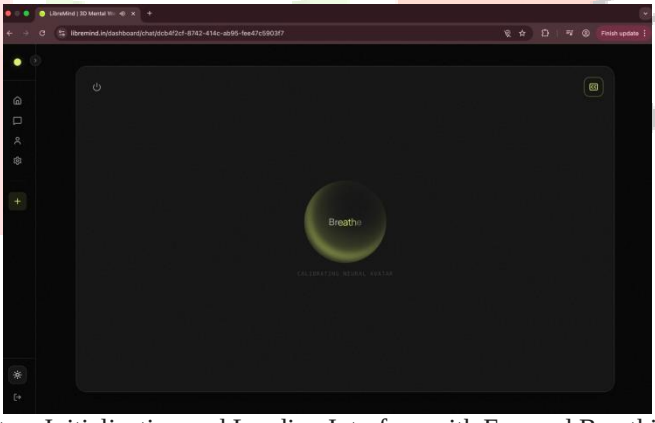

Fig. 6. System Initialization and Loading Interface with Focused Breathing Prompt

To go further into it, the system offers a visual breathing exercise. The interface turns dark and a user is required to press a microphone button and a visual ring is filled which then instructs the user to breathe in slowly. It also has a visual grid and a streak counter to ensure that the user has a visual representation of their position at the given time.

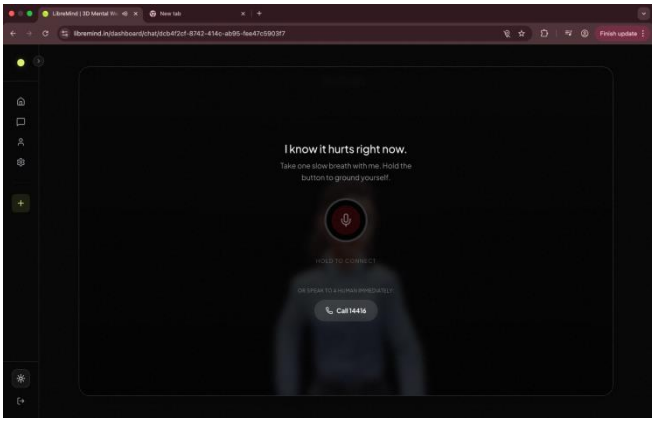

Fig. 7. Emergency Mode Activation with Direct Helpline Integration

The mechanism also encompasses a highly strict emergency handling system regarding the high-risk situations. In case a user comes up with a serious text such as I feel like leaping out of the building, the Risk Engine grabs the role. The normal chat will be discontinued, and the avatar will reply with a stern warning note, asking them to contact a professional. The screen is then shifted to a dark distraction-free crisis mode showing the text I know it hurts right now. The user is provided with a huge button to call a crisis helpline (14416) in this state directly. In case the user opens the breathing tool and leaves the page without closing it, the system rewards his/her effort by displaying the message, I am still here. You stayed. Thank you. Then it leaves them with the choice of either calling the helpline or continuing the conversation with the AI. This will ensure that the system is responsive and that its priority is the human safety before all other factors.

V. DISCUSSION

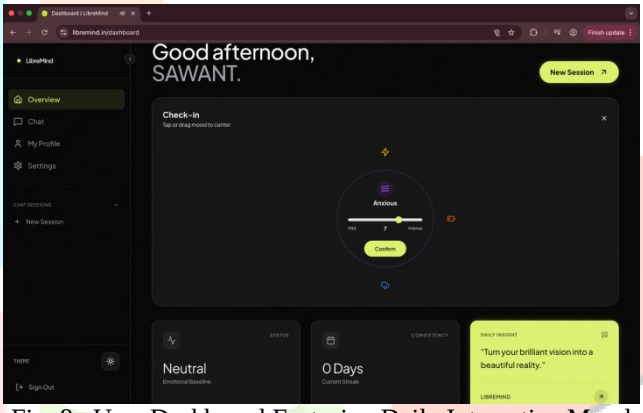

Fig. 8. User Dashboard Featuring Daily Interactive Mood

The system created suggests the significance of integrating conversational AI with interactive support systems in the sphere of mental health apps. The system does not act as a simple question-answer chatbot, but tries to respond dynamically, depending on the emotional state of the user. This is done by several supporting features which are activated on certain conditions making the interaction more meaningful and context-aware.

The fact that the system allows dealing with emotional overflow via a special approach, which is venting, is also one of the significant features of the system. The system does not interrupt the user when he or she is frustrated or angry, but he/she is free to go on with whatever he/she has to say. This makes someone feel that he/she has been heard and this matter of being heard is critical in mental health situations.

The daily mood tracker is the other feature on the dashboard. After choosing one of four general moods, the users then rate its intensity on a slider between 1 and 10. In our code, we separated this 1-10 scale into three particular ranges Each of the ranges is assigned to a particular motivational quote depending on the mood chosen. As a user moves the slider, the system examines the range in which the user has entered and gets the assigned quote. This quote is then given in the yellow box titled Daily Insight.

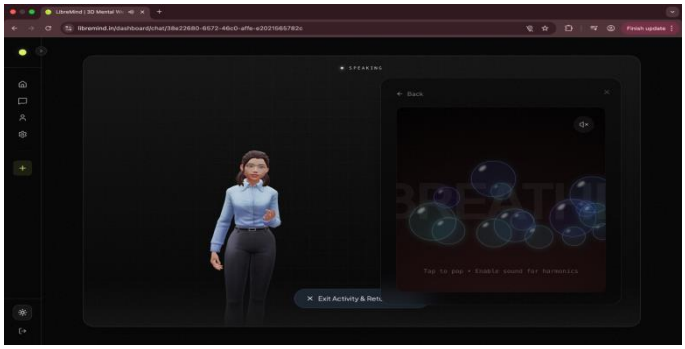

Fig. 9. Interactive Bubble-Popping Exercise for Sensory Grounding and Anxiety Relief

When the user exhibits anxiety, the chatbot does not stick with simple talking, but offers simple, practical tools such as Focus Lab mini-games or the interactive holding-to-breath button. They are not complicated to use and do not need some

professional supervision, which proves that the system can be helpful in assisting users to stabilize their state with the help of real UI elements.

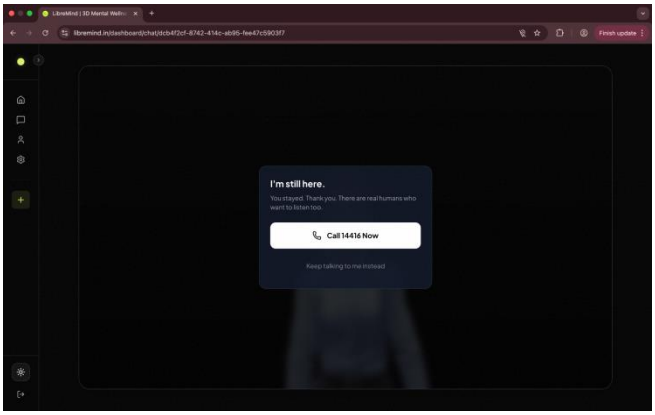

Fig. 10. Post-Crisis Resolution Interface Providing Direct Helpline Access

In the case when the user displays the symptoms of anxiety, the chatbot does not concentrate on mere conversation and provides the user with simple and useful tools, like the Focus Lab mini-games, or the interactive holding-to-breath button. Such methods are rather easy to adhere to, and professional assistance is not required, which proves that the system may be flexible enough to help the users to stabilize their state with the assistance of real UI elements.

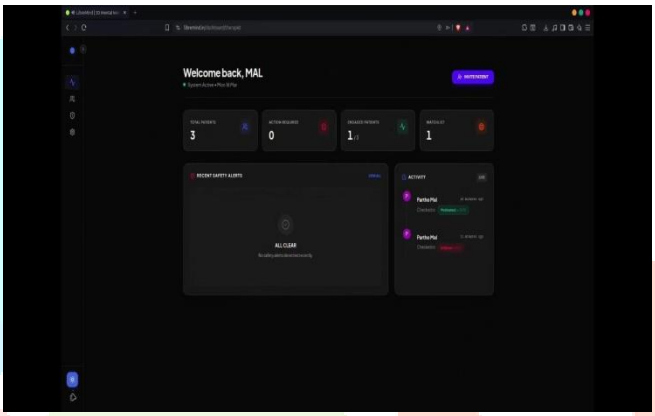

Fig. 11. Therapist Dashboard Displaying a Resolved, All-Clear State

These appear immediately on the Therapist Dashboard side under Action Required as High-Severity safety alerts (e.g., in the case of a particular patient session). The dashboard can be brought back to an ALL CLEAR state when the crisis has been resolved. This is an indicative of a responsible design philosophy where the AI knows its limits, it is keen on ensuring that the user is safe at that moment but it refers to real human professionals to provide real care.

VI. Advantages and Implications

A. Benefits and Drawbacks

The system suggested has a number of benefits. Among the key advantages, there is real-time communication with a 3D character, as a result of which the chatbot is more attractive than the usual system based on text messaging. Accessibility is enhanced by the inclusion of voice input and output, and voice input and output is more natural in communication. Context-aware response generation has been useful to sustain meaningful conversations with time.

The other notable benefit is that it comes with a risk detection mechanism that ensures the safety of the users by detecting harmful/sensitive inputs. Other effective memory management techniques that are used in the system include summarization of older conversations that reduces storage use and enhances performance. System speed and responsiveness is further improved with the use of asynchronous processing.

There are however limitations to the system. The precision of answers is determined by the quality of the language model that can at times produce wrong or irrelevant answers. The speech-to-text module can experience problems with noisy environments, which influences the accuracy of inputs. A stable internet connection is also required in the system because most of the processing is done on the server side. Also, 3D real-time rendering can be intensive in performance, which can be a constraint of low-end systems.

B. Social Implications: Scaling Mental Health Support And Accessibility

Scalability of mental health support: This is the greatest positive social impact of this architecture. A CA at low cost and that can easily be deployed, where the population is extremely high and resources are limited such as in Mumbai, India is a bridge to accessibility that is critical.

This type of a system is installed as a scaleable one to be utilized in preliminary examination, psychotherapeutic provision, and crisis triage. It relieves the human health providers of responsibility by automating the delivery of basic coping skills or referring urgent assistance during acute and non-life threatening distress. This structure will result in full day-to-day access, which goes beyond geographical and time limits that limit care access. This solution is economically feasible to reach large masses of people due to the fact that it is concerned with the use of simple and low overhead technology.

VII. RESULT

The test stage of the LibreMind chatbot demonstrated that the system is able to follow the interaction with the user and derive meaningful insights out of the discussions. In order to test the system, we generated user accounts and performed several test sessions with the 3D avatar.

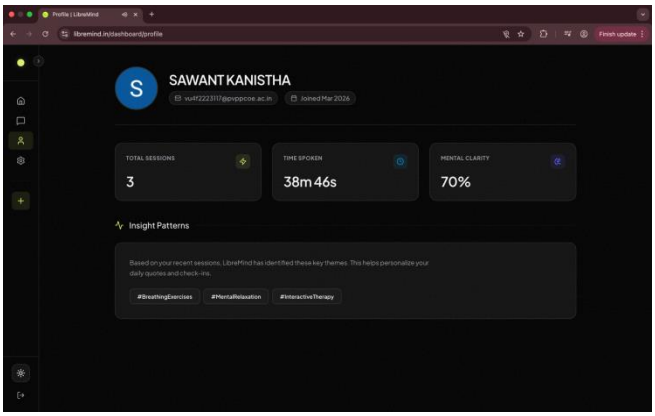

Fig. 12. User Profile Dashboard Displaying Usage Statistics and AI-Generated Insight Patterns

The user profile dashboard can be used to clearly see the results. The system can properly track the simple usage statistics, including the number of overall sessions and the time spent in general. Indicatively, in one of our test running, the dashboard was able to capture 3 active sessions and correctly monitor a total interaction time of 38 minutes and 46 seconds by the user. It is a good outcome to track these metrics since it indicates that the database and the backend are processing user session data properly.

The other significant outcome of this project is the effective execution of the features of the personalized tracking. The system then computes a score in Mental Clarity that in our test was 70% to provide the user with an easy to comprehend visual of the current state of their emotional progress.

Moreover, the AI manages to review the history of the user chatting to come up with the Insight Patterns. The system during testing was able to extract key themes based on conversation of the user and gave relevant tags such as #BreathingExercises, #MentalRelaxation and #InteractiveTherapy. The outcomes affirm that the language model does not respond to messages as an automatic reply, but instead, it comprehends the situation of the sessions. The system then manages to use these insight tags to personalize the daily check-ins and inspirational quotes of the user.

In general, the end product of the project is a completed and smart dashboard that provides users with a comprehensive picture of the mental health process.

VIII. CONCLUSION

To sum up, the present project was able to create an AI-based 3D mental health chatbot that transcends beyond the traditional text-based systems. Creating an emotional reaction to the user by combining the latest web frameworks, such as Next.js and Fast API, and the Gemini LLM, we have created the platform that responsively reacts to the user in their emotional state. The inclusion of a 3D avatar and voice processing makes the experience a lot more natural and enjoyable to the user.

The largest lesson that this project taught me is that a mental health AI should not provide only a chat. The interactive features that we incorporated, such as the Focus Lab mini-games and the visual breathing exercises, provide the users with the real, practical methods of relaxing themselves when they are in an anxiety state. Vent Mode was also a very easy yet effective method of allowing users to relieve their anger without necessarily being judged.

Above all, the project demonstrated that the safety of users must be the priority. The Risk and Escalation Engine will make sure that the AI is aware of its boundaries. The system is a responsible intermediary to actual human assistance instead of attempting to supersede it, by interrupting standard communication in the case of a serious crisis, mentioning the 14416 helpline, and recording high-severity alerts in the Therapist Dashboard.

All in all, the system is functional, despite certain weaknesses such as the requirement to have a stable internet connection and a decent device hardware that can do the 3D rendering. It provides an extremely good basis to develop in the future, demonstrating that interactive, AI-based mental health assistance can be secure, interesting, and actually useful.

IX. FUTURE SCOPE

There are other aspects that can be improved in the system so as to make it more efficient and easier to use. One of the potential solutions is the incorporation of more advanced models of AI to produce more precise and individualized answers. This system can as well be expanded to be multilingual, and this means that it is made available to a greater number of people.

The other aspect that could be worked on is the 3D avatar. Facial expressions and body language can be made more natural with the inclusion of more realistic ones. The emotion detection based on facial recognition or voice-tone analysis can also be introduced into the system in order to get more insight into the mental state of the user.

Regarding the functionality, the chatbot can be connected to wearable devices or mobile applications to ensure the mental health support is present 24/7. A Therapist Dashboard has also been prototyped as part of this project. This might be extended in the future and human therapists would be able to follow the patients assigned to them, check the new safety

warnings, and daily mood check-ins (such as Motivated or Anxious). The project has great opportunities of future development as the chatbot can be connected to a professional dashboard and expanded into an all-encompassing mental health support platform.

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