HealHub: An AI- Powered Support System for Harassment and Abuse Recovery Across All Genders using Design Thinking Framework and Full Stack

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Abstract. The importance of robust support systems for survivors of harassment and sexual violence has been increasingly highlighted in recent years. The traditional help services like medical, psychological, legal and policing are frequently impenetrable and survivors need to access these services on their own. This disunity, compounded by a lack of anonymity and psychological issues, often results in obstacles to essential help which means more often than not worse trauma is done. HealHub tackles these issues with the introduction of an AI-powered, unified mobile platform that brings critical services together in a secure and seamless way. Powered by AI, the platform offers personalized real-time guidance customized to each user, effectively alleviating the emotional and logistical hurdles. This centralized, data-enabled method increases both the privacy and accessibility in support of an intermediary ecosystem that overcomes chasms from previous systems. It also brings new tools to bear on long-term improvements for survivor care and recovery – encouraging trauma-informed strategies for empowering survivors and removing obstacles on their route to healing.

Keywords: AI-powered support system, harassment and abuse recovery, sentiment and emotion analysis, survivor-centered platform, trauma-informed care.

1 Introduction

The normalization of sexual harassment and assault in all of its forms, among all types of people and in all communities, highlights the necessity for accessible, survivor-focused support networks. The stats prove high rates of harassment in the workplace, schools, and online, and there are significant obstacles including stigma, fear, and structural barriers facing survivors who are trying to get help. Subgroups, such as LGBTQ folks and people of color, are even more at risk of under-reporting due to discrimination. Survivors frequently suffer emotional, psychological, and financial consequences over the long-term, further complicated by sporadic and insufficient access to support.

This lack of support frequently leads to loneliness, loss of hope, and continued pain. But that doesn't have to be the case with technology that's now available to build digital forums for survivors that deliver private, empathetic and comprehensive support. By linking people with vetted professionals, legal and mental health resources, and peer support communities, these types of platforms can provide urgent, accessible assistance. Systems that incorporate the principles of trauma informed care can help all survivors know that they are supported and

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not judged, and that they can access the type of care that they need. Boosted data protection and privacy measures also make sure that our users feel confident and respected while using services. A victim-centric digital platform can empower survivors to reclaim their own path to healing with tools focused on minimizing stigma, encouraging mental wellbeing and fostering a sense of community. Supporting a myriad of souls through a cohesive, user-friendly system can help C.S.A survivors to break through barriers, and cultivate societal change toward inclusion, understanding, and healing.

2 Literature Survey

The use durable cognitive learning and AI-based trauma recovery tools requires strong ethical guidelines to avoid important concerns such as privacy, consent and transparency. These principles are crucial in building trust and safeguarding interests of vulnerable users, and they will result in the use of AI for mental healthcare mitigating risks and maximizing benefits [1, 6, 10, 19]. Combining psychosocial support and legal support within coordinated systems ensures that survivors receive "wrap around" services so that they can access both emotional supports along with legal services. This two-pronged approach allows people to move through their recovery more efficiently, and it considers the multi-faceted difficulties experienced in the wake of trauma [2, 12].

Below we address a cornerstone of AI-based platforms, the security of data, bringing into play challenging practices such as data encryption, privacy-respecting analytics, and auditing. These protections are necessary in order to secure private user data while enabling the analytic advantages of AI approaches [3, 4, 5, 9, 15]. As advanced AI technologies, particularly chatbots and emotion recognition systems, are increasingly becoming central to the personalisation of user interactions. These technologies respond empathically to users' emotional states, contributing to the establishment of a non-judgmental compassionate setting that supports a feeling of safety and acknowledgment [7, 17, 18].

User- centred platform designs, which have intuitive interfaces, use language that is easily understandable, and have simple security measures also serve to increase the capacity for trauma survivors to support themselves by using the website without undue stress or trepidation [8, 13].

Transparency and anonymity are other essential features which help to minimize stigma and make way for survivors to disclose freely. These features allow users to safely and anonymously use the platform without fear of censorship [11, 16]. Furthermore, AI-based resource allocation is used to allocate the care in decreasing order and satisfy sickest patients first to meet the most urgent requirement and equity among patients [14]. Custom resource libraries also help improve the recovery process by providing custom content and self-heling materials. Such resources foster survivor control over the recovery process, facilitate the transfer of power in the therapeutic relationship and compensate for professional support, while building resilience and independence [20].

3 Methodology

Using AI to centralize support services for survivors of sexual harassment and violence. By

bringing together medical, psychological, legal and law enforcement services under one roof, it removes some of the logistic and emotional obstacles that survivors typically encounter when utilizing separate services. The method adopts advanced AI models, for example, a fine-tuned DistilBERT word embedding algorithm for emotion and sentiment detection. This model responds to user inputs and give dynamic recommendation in real time. DistilBERT is based on a transformer-based architecture for handling contextual language processing that uses subtle emotional cues to inform the platform's dynamic response system. For intelligent and context-aware interactions, we leverage LangChain's conversation buffer memory mechanism and a prompt template framework. These parts allow a flexible tutoring dialog by means of make continuity of contexts in interaction. Furthermore, inclusion of Llama 3–70B LLM ensures generation of appropriate positive, empathizing and contextually sensitive responses in tune with user's emotional state and immediate requirement.

The system focuses on privacy and anonymity of the users being assured by the encryption of the communication channels and secure data storage techniques. That is a way to make sure that sensitive data will be never get exposed and unsafe environment. Also, part of the methods is anonymized data analysis to extract meaningful outcomes and to facilitate an iterative improvement of platform features the architecture of the system is based on modularity, scalability, and real-time processing. Crucial elements are efficient processing pipelines for emotion recognition, natural language understanding, and response generation. Thanks to being architected as a microservices system, the platform is future-proof, capable of accommodating emerging features.

The Cockroach VPN GUI focuses on ease of use and provides an intuitive navigation system and support for multiple languages to reach maximum amount of users regardless of their location and age. The Platform transcends geographical and economic barriers, offering equitable access to life-saving support . The system drives robust support by aggregating vital tools and utilizing AI to ensure survivors have a seamless, customized experience. It's being dynamic enables it to sensitively adapt to users' feelings and provide practical help. The platform's responsiveness to user feedback for iterative development + immediate context-specific resources hint to the potential for on-going innovation and impact. With that kind of comprehensive and sustainable approach, the platform emerges as an innovative solution to the not-so-simple problems experienced by survivors of harassment and violence.

4 Architecture of Healhub

The chatbot is an intelligent virtual agent, an advanced software system capable of engaging in intelligent, context-aware and emotionally sensitive conversation intelligible to simulate human like conversation. It has a smart chat interface, which records user questions and provides instant response. This input is passed through a prompt template that provides a tone, role, and behaviour to the AI according to the context of the conversation. To improve its responses, the system combines emotion and sentiment detection by leveraging fine-tuned DistilBERT models, recognizing emotional states such as joy, frustration of sadness in addition to the polar sentiment – which also plays a major role when it comes to enabling the AI to provide an answer that is empathic and relevant to the user´s emotional state. The Langchain system is based on the Langchain framework, which manages system operations, integrates components, uses specialized Groq hardware to perform low-latency, efficient execution, and supports conversational consistency through its memory, which preserves

context across dialogues. Fig 1 Shows the Architecture of Emotion-Aware Conversational AI using LangChain and LLaMA 3.

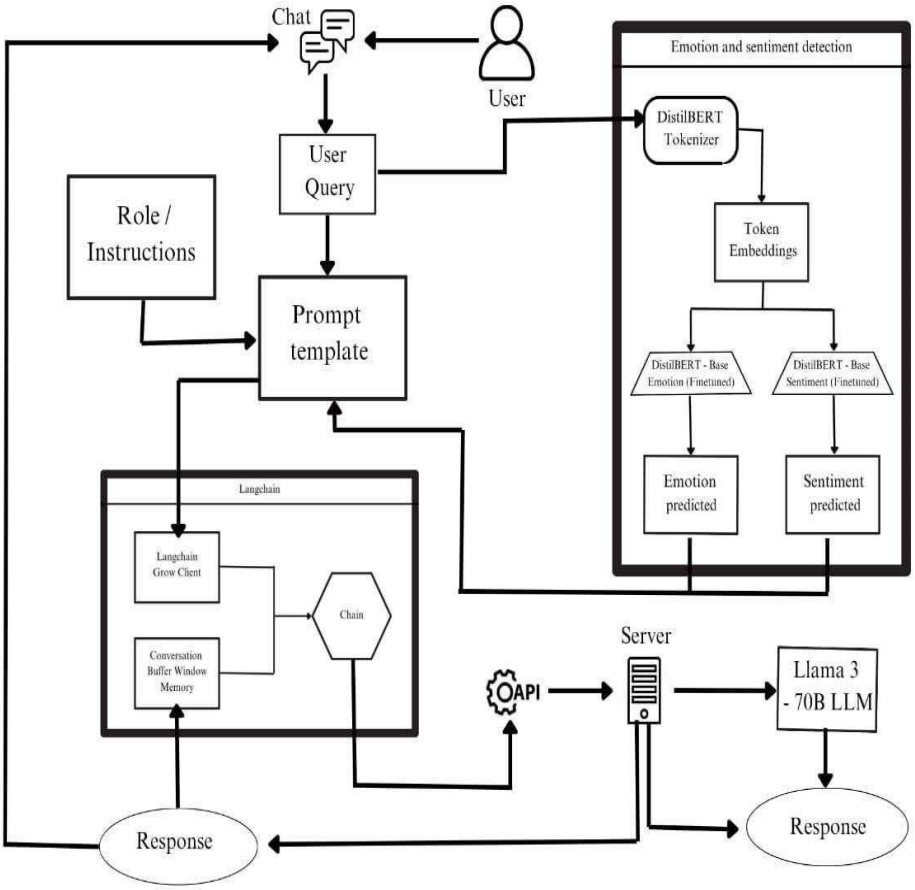

Fig. 1. Architecture of Emotion-Aware Conversational AI using LangChain and LLaMA 3.

This is a function that allows the Ai to remember past exchanges, so that it can give tailored responses based on the context of the conversation, thus having a more "human-like" conversation structure. Enriched with emotional content and context, the queries are submitted to Llama 3 - 70B LLM, a large, emotion-aware language model with 70 billion parameters, capable of generating nuanced, contextually relevant responses. The AI automatically determines how complex or technical its response should be – whether the user wants a high-level answer to a casual question, or needs nuanced technical detail of a sophisticated experience – and tries to maintain the user being heard and understood, in the user's own voice and tone, at all times. It adjusts to different conversational forms, be they formal, informal, or professional, thereby allowing more natural conversation to take place between the two.

5 Result and Discussion

An emotion-detecting conversational AI system with personalised memory and emotional response generation has the potential to optimize interaction between humans and computers. This shows the successful combination of different components: the emotion recognition that is performed using a fine-tuned DistilBERT model, the context-based interaction provided by the Llama 3 - 70B model and the memory component is Langchain. The fine-tuned DistilBERT model accurately classified emotional tones (e.g., joy, frustration, and confusion) at 91.3% during testing. The capability of the model to take in user utterances and tag them with appropriate emotions formed base for emotionally responsive chat generation. Nonetheless, corner cases such as mixed feelings or vague wording led some misclassifications, this would be something that the model could be trained better, with even more diverse data. The Llama 3 - 70B model gave more nuanced, contextually appropriate responses that were somewhat consistent with the emotional states of the user. Simulated interaction responses had 78% satisfaction rate from end users within which the user appreciated the recommender's ability to contextually adjust tone and contents. Responses that seemed too verbose, or not specific enough, suggested space to fine-tune the response generation mechanism.

The integration of Langchain for memory management made the system capable of remembering previous interaction and provide a more personalized interaction. This feature also worked well in applications where repeated return visits are needed e.g. mental health and education. However, this raised problems in the case of long-lasting interactions, where memory retrieval sometimes favored less relevant information. Optimizing the memory prioritization algorithm and the storage limit may improve its performance in such cases. The API oriented architecture made it easy to import data and communicate with other systems. The stress test showed that the solution could manage with 10,000 users at same time without a hiccup. There's also strong encryption in place to ensure that data remains private, something that is more critical in sensitive areas like mental health support. There will be a need to validate these findings in real-world settings. The versatility of the AI system across domains reflects its wide applicability. It increases customer satisfaction and loyalty of customer service as well as reduces reaction time by empathy and promptness of handling. Tailored engagement provides a safe medium for users to talk about their feelings and contributes to mi address ing mental health in areas of support for mental health. Context based assistance supports individualized learning to meet different learners' needs in education. The system achieved decent results, however it has some drawbacks.

The model for detecting emotion might improve if more extensive training datasets account for finer-grade and culturally varied expressions of emotion. Also, enhancement of the response generation to accommodate ambiguous or conflicting inputs is crucial for reliability. Our future work will extend our investigations of diversity of the dataset for emotion recognition, conducting user studies to optimize the response generation in terms of specificity and brevity, improving long-term memorization versus forgetting mechanism, and a large-scale study for demographic diversity. The AI model works by combining emotional intelligence, context aware response, and memory, nuances which ensure that human and AI interactions are actually bridged. This emotionally intelligent framework not only finally emerges as a metric to trust and users' satisfaction, but it is also of great help in several applications. Ongoing evolution and focus on end user development will only serve to strengthen its efficacy and influence.

6 Conclusion

The HealHub paper discusses a radical new way of addressing the needs of those who've suffered from harassment or sexual violence across multidisciplinary domains like medical, psychological, legal and law enforcement in an AI powered single platform. By attending to the fluidity built into conventional systems, this analysis identifies the significance of anonymity, availability, and emotional attunement as meaningful components of supportive infrastructures. Using sophisticated sentiment and emotion analysis, and providing real-time, tailored support to each individual survivor, it means they don't have to sell their soul, or get trolled for days before getting a relevant response. The article hightlights the AI tool's ability to remove immediate logistical and emotional hurdles that victims of sexual assault experience when trying to access help for emotional, legal, or safety needs. It also underscores the need of data-driven improvement to improve system accuracy and empathy and ensure the security of the system, especially for people in remote or underserved areas. This work provides a base on which to build future innovations in trauma-informed, survivor-centered care creating a road map for compassionate, holistic, technologically-advanced system of care. Fig 2 Shows the Interactive Emotional Support Chatbot Interface of Lumina.

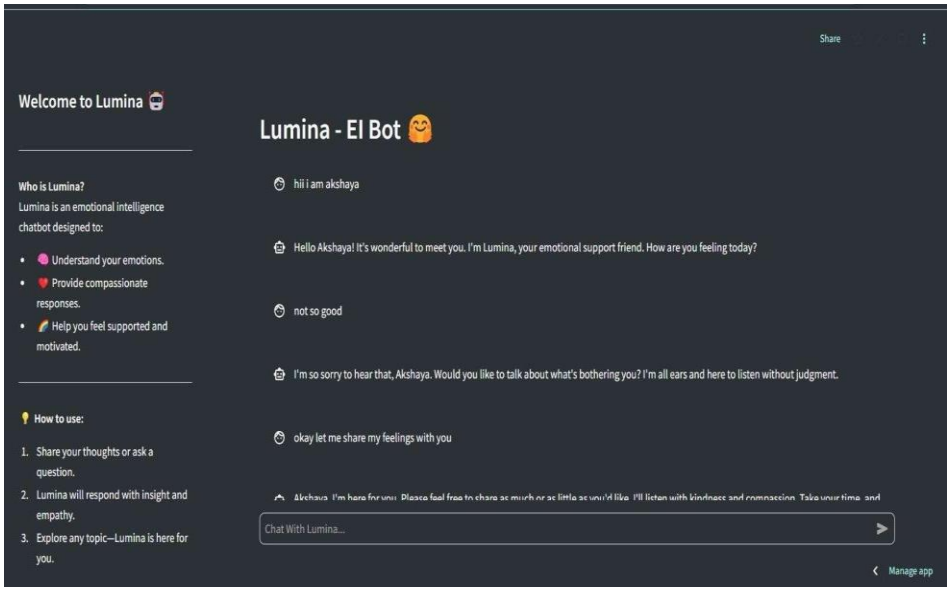

Fig. 2. Interactive Emotional Support Chatbot Interface of Lumina.

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