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I hereby declare that this report represents my own work at the University of Bolton. All sources used have been appropriately cited and referenced.

Signature:

Date:

Abstract

Keywords:

Artificial Intelligence, AI-Chatbot

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List of Abbreviations

Abbreviation	Definition
AI	Artificial Intelligence
CBT	Cognitive-behavioural Therapy
DL	Deep Learning
DSR	Design Science Research
GPT	Generative Pre-trained Transformer
IDE	Integrated Development Environment
IPFS	InterPlanetary File System
LLMs	Large Language Models
ML	Machine Learning
NLP	Natural Language Processing
NN	Neural Network
SUS	System Usability Scale
WHO	World Health Organization

1. Introduction

Depression, anxiety, and stress-related illnesses are growing more widespread worldwide Halbreich (2021). In 2019, one in every eight people, or 970 million people worldwide, had a mental condition, with anxiety and depressive disorders being the most common Collaborators et al. (2022). Despite the growing need for emotional and psychological support, access to traditional mental health services remains limited. Many individuals, especially those living in rural or underserved areas, face significant barriers when seeking professional help Grant et al. (2018). These include high costs, long waiting times, geographic limitations, and the stigma associated with mental illness. As a result, people often go without the careHassan they need, further deepening the crisis Grant et al. (2018) Trautmann et al. (2016).

In response to these issues, digital mental health platforms have arisen as possible answers. Among these, AI-powered chatbots offer the promise of instant, empathetic conversations for individuals seeking support Koutsouleris et al. (2022). These systems use natural language processing and sentiment analysis to provide responses that mimic human interaction. However, most current platforms operate on centralized architectures, which raises serious concerns about data privacy, user trust, and ethical responsibility. Sensitive mental health data stored on central servers is vulnerable to misuse, surveillance, and unauthorized access Lustgarten et al. (2020).

To address these concerns, researchers are increasingly exploring decentralized technologies such as the InterPlanetary File System (IPFS) Bieri (2021). These systems allow secure, distributed storage and anonymous transactions, thereby empowering users to retain control over their data. However, despite the parallel growth of AI in healthcare and decentralized technology in financial systems, very few studies have combined both approaches within the mental health domain. This research aims to fill that gap by designing a privacy-first, decentralized platform that integrates conversational AI, IPFS-based storage, and blockchain-enabled transactions.

1.1 Problem Statement

Depression, anxiety, and mental problems are becoming increasingly widespread. Traditional therapy is usually expensive, time-consuming, and inaccessible in rural or underprivileged areas. Additionally, many people are deterred from seeking help due to fear. People often try to access online applications that support Artificial Intelligence (AI) based chatbots. Most of these platforms offer paid subscriptions and operate as centralized systems, which raises questions about people's privacy and security. So far, research has primarily used AI chatbots alone or paired with IPFS in healthcare, but few have used both together in mental health platforms. To solve this problem, it is important to propose an application that offers AI-powered conversation, IPFS storage for securing the data, and a free-of-cost usage facility for all users.

1.2 Aim of the Thesis

This study aims to design and prototype a decentralized, privacy-focused mental health support platform that integrates AI-powered conversational agents, encrypted decentralized data storage, and blockchain-enabled secure transactions. The platform will offer immediate and empathetic responses through a Python-based chatbot equipped with sentiment analysis. It will utilize Filecoin for storing sensitive data securely and employ Ethereum smart contracts to allow private and transparent payments or donations. This comprehensive approach intends to create a trusted and accessible environment for mental health support.

1.3 Research Questions

This research will address the following questions:

1. How can a web-based platform be effectively developed to provide accessible and user-friendly mental health support services?
2. To what extent can an AI-powered chatbot deliver empathetic and context-aware conversational support for individuals seeking mental health assistance?
3. What are the most suitable encryption techniques to ensure data privacy and security in

a web-based mental health support system?

1.4 Objectives of the Thesis

- To develop a web-based mental health support platform
- To design and integrate an AI chatbot for providing empathetic conversational support
- To implement encrypted data storage to ensure the privacy and security of the data.

1.5 Significance of the Study

This study is significant because it brings AI-based conversation and a secured mechanism to store data in a single mental health support system. It responds to the urgent need for digital platforms in healthcare that are developed considering privacy, ethics, and user empowerment. This thesis proposes a web-based application which provides empathetic support without compromising the privacy of the user. It also offers a practical framework that developers and researchers can use to create secure and sustainable digital health services. In addition, this research contributes to the broader fields of digital mental health, AI ethics, and decentralized system design.

1.6 Scope of the Thesis

This thesis aims at an AI-powered chatbot that provides a counselling service to humans.

- The proposed system only supports text conversations in the English language. Other languages are not supported.
- The proposed system focuses only on the content of the response, which is related to the mental health support service. The conversation, which involved another unrelated field, is not supported.
- The proposed system can recognize the meaning of the user's text input in English.
- The proposed system is only focused on providing counselling services to humans, and it will not give any diagnosis or medication to the user.

1.7 Structure of the Thesis

The thesis is structured into six chapters as shown in Figure 1. Firstly, Chapter One presents the introduction to the topic and lays the groundwork for the research. Chapter Two presents a literature review. It provides an overview of past research on AI chatbots, decentralized data storage, and ethical issues in digital mental health. Chapter Three explains the methodology. It describes the research design, tools, and technologies used to build and evaluate the platform. Then, Chapter Four focuses on implementation and results. It presents the development process, key features of the prototype, and results based on testing and user feedback. After that, Chapter Five offers a discussion. It analyses the findings in relation to the research questions, discusses limitations, and explores the potential impact of the system. Lastly, Chapter Six concludes the report. It summarizes the key findings, highlights the importance of the research, and suggests future directions for improvement.

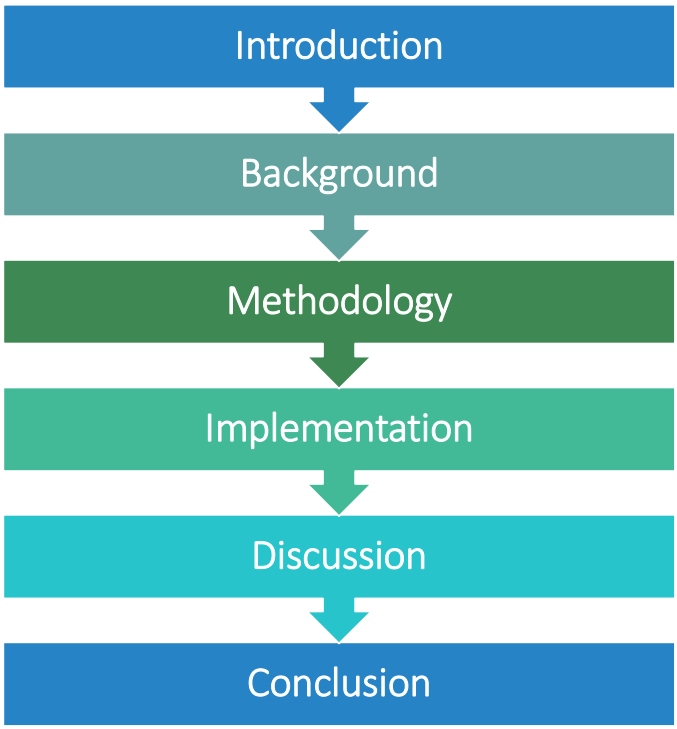

Figure 1: Structure of the thesis

2. Background

This chapter critically reviews the existing literature relevant to the design and development of a decentralized, AI-powered mental health support platform. It aims to provide a comprehensive understanding of the theoretical and technical foundations upon which this thesis is based. This chapter identifies existing trends, gaps, and limitations that justify the need for current research.

2.1 Theoretical and Contextual Background

This section presents the foundational concepts and developments necessary to understand the scope and motivation of the current research. The study draws from a multidisciplinary context, combining AI, decentralized technologies, and mental health care systems. Understanding these domains is essential for appreciating the rationale behind integrating AI-driven conversational support with decentralized infrastructure for mental health applications.

2.1.1 Mental Health in the Digital Age

Mental health disorders include depression, anxiety, and stress-related conditions. These are among the leading causes of disability worldwide. The World Health Organization (WHO) estimates that over 300 million people are affected by depression globally. An estimated 280 million people, or 5% of all adults, suffered from depression in 2019. Women are more likely than men to experience depression. More than 10% of pregnant and postpartum women worldwide suffer from depression *Depression --- who.int* (2025).

Access to timely and effective mental health care remains a significant challenge, especially in low-resource settings. Common barriers include financial costs, stigma, long waiting times, and geographical isolation Liu et al. (2020) Ogbuagu et al. (2024).

In response to these challenges, digital health interventions have gained prominence. These include mobile applications, telepsychiatry, and web-based platforms offering mental health education and self-help tools. However, while digital technologies improve accessibility, they often raise concerns about data privacy, user autonomy, and the quality of care provided.

2.1.2 Artificial Intelligence and Conversational Agents

AI-powered chatbots have emerged as a promising solution in digital mental health. These chatbots simulate human conversation using Natural Language Processing (NLP), sentiment analysis, and ML techniques Vaidyam et al. (2019). AI chatbots like Woebot, Wysa, and Replika have been deployed to assist users in managing anxiety, depression, and stress through cognitive behavioral strategies Fitzpatrick et al. (2017) Inkster et al. (2018) Pentina et al. (2023). Existing research indicates that these tools may help users develop emotional awareness and coping mechanisms. Nonetheless, many AI systems lack the emotional depth and contextual understanding, and they needed to fully replicate human therapeutic interactions. Concerns also remain about the safety, accuracy, and transparency of these apps when handling sensitive information Fiske et al. (2019).

2.1.3 Privacy and Ethical Challenges in Mental Health Technologies

Mental health data is among the most sensitive types of personal information. Centralized digital platforms often collect and store this data in proprietary databases, sometimes without adequate encryption or informed consent mechanisms. Reports have shown that many mental health applications share data with third parties, including advertisers and analytics firms, often without clear user knowledge Parker et al. (2019). This has raised concerns over surveillance, data commodification, and user autonomy. Ethical frameworks stress the need for informed consent, data minimization, and transparency when deploying AI in healthcare. However, many platforms fail to meet these standards due to commercial pressures, limited regulatory oversight, or technical constraints Mennella et al. (2024).

2.1.4 Decentralized Technologies: Filecoin

Decentralized storage technologies such as the InterPlanetary File System (IPFS) and Filecoin have been introduced to address privacy and data sovereignty concerns. IPFS is a peer-to-peer network that uses content-addressed storage, allowing users to store and retrieve data using unique cryptographic hashes Doan et al. (2022). Filecoin builds upon IPFS by providing a blockchain-based incentive layer. These technologies remove the need for a central server.

They also empower users to control access to their own data, making them suitable for applications involving sensitive information such as mental health records.

2.2 Technologies for the Development of Healthcare Apps

2.2.1 Interplanetary file system

A distributed data storage mechanism for a completely decentralised system is called IPFS. Off-storage data management is supported by the blockchain's hard drive. Files are kept within IPFS objects in IPFS. There are two components to IPFS objects: the connection component and the data component. A single IPFS object will hold tiny data, such as a text file up to 256 KB in size. Files that are larger than picture or video files are divided into smaller pieces and stored in several IPFS objects.The basic architecture of IPFS is shown in 2. The architecture of IPFS is very simple and powerful, with the following features:

- A directory structure having some files
- Content-addressable
- Immutable
- Fully distributed

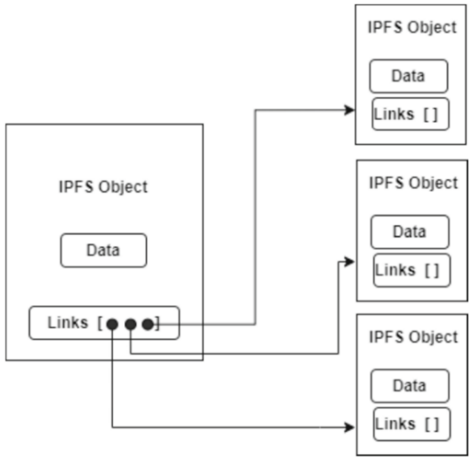

Figure 2: Basic IPFS Architecture

2.3 Review of Related Literature

2.3.1 AI-Powered Chatbots for Mental Health

Woebot was a cognitive-behavioural therapy (CBT)-based chatbot developed using NLP and decision-tree logic. It was free for individual users and easy to use. It do not supports deep personalization and emotioanl depth. Woebot app was retired June 30, 2025, and is no longer available for usage *FAQ --- woebothealth.com* (2025).

Tess is used to treat depression and anxiety as well as to identify emotional disorders. It uses NLP and sentiment analysis algorithms combined with AI decision trees to deliver context-aware responses. It is paid service and it is available for organizations *For individuals --- x2ai.com* (2025).

Wysa is an AI-powered mental health app that uses rule-based NLP and some proprietary DL algorithms to simulate empathy and guide self-help conversations. Wysa is available in both free and paid versions. Although Wysa provides effective mood management tools, its AI still struggles with nuanced emotional understanding and complex mental health scenarios *Wysa for Individuals | Your AI Companion for Everyday Wellbeing| AI Based Mental Health Platform --- wysa.com* (2025).

Replika is a chatbot designed to create emotionally intelligent conversations and simulate friendship. It is based on GPT-style neural networks. It is available as a free app. It is not specifically designed for therapeutic outcomes and may lack scientific grounding in psychological methods. Its data privacy practices have been questioned, especially concerning how user data is stored and used for NLP to assess user input and provide contextually suitable replies *Replika --- replika.ai* (2025).

Youper is an emotional health assistant that combines psychology with LLMs to guide users through mood tracking and therapeutic journaling. It uses NLP and reinforcement learning to personalize mental health interventions over time. The app is available in freemium mode with in-app purchases and subscriptions *Youper: Artificial Intelligence for Mental Health --- youper.ai* (2025).

Elomia uses CBT, and AI to provide personalised care. AI optimises therapies, and the app pro-

vides visualisation and meditation aids. It works with OpenAI by using GPT-3 to deliver effective and accessible therapeutic help Elomia (2025).

Faino is an anonymous chatbot for stress management that can be found on Telegram. It offers healing routines and gauges stress levels. It provides a range of voice chats and mental health exercises without asking users for any personal information. These technologies effectively meet urgent demands and support conventional therapy approaches, despite their limitations in thorough diagnosis and human emotional connection *Faino --- faino.help* (2025).

2.3.2 Decentralized Storage in Healthcare

Mohanta et al. (2025) proposed a scheme that uses the IPFS model. A technique based on the 128-bit Advanced Encryption Standard was proposed to encrypt patient information and store it in an IPFS-based decentralized network. Edge-computing techniques were used to perform computations at the edge level within a decentralized architecture, thereby addressing the computational challenges associated with cloud computing. Lastly, the encryption keys were stored using blockchain technology to address the issue of restricted computational power on low-end devices through off-chain and on-chain business processes.

3. Methodology

This chapter describes the methodological framework used for the design, development, and evaluation of a MindMesh. It outlines the development approach, model selection, dataset sources, data preparation, training process, integration methods, and evaluation techniques. Since this research is development-oriented, the methodology primarily focuses on system design and testing using secondary data and pre-trained language models. replication and reproducibility.

3.1 Research Design

This study employs a design science research (DSR) approach, which is appropriate for projects involving the creation of innovative artefacts, such as software tools or platforms. The research comprises three main phases:

1. Requirement Analysis and System Design: Understanding system objectives based on existing literature and user needs.
2. Model Training and Implementation: Fine-tuning a pre-trained LLM (LLaMA 2 and GPT-2) using a publicly available Mental Health Reddit Dataset (CMU) Rani et al. (2024) and DAIC-WOZ dataset DeVault et al. (2014).
3. Evaluation and Testing: Assessing usability, performance, and ethical compliance.

3.2 Dataset and Sampling

This thesis uses a publicly available dataset for training of proposed chatbot. There are two datasets, the first is the Mental Health Reddit Dataset (CMU) Rani et al. (2024), it is curated for NLP research involving depression and anxiety discussions, and the second is DAIC-WOZ dataset DeVault et al. (2014), which is a multimodal corpus for detecting psychological distress. These datasets contain anonymised text data, which is suitable for fine-tuning conversational AI models in the mental health domain.

The study employs purposive sampling to extract subsets from the datasets. Conversations that

meet specific quality and relevance criteria (e.g., expression of emotional states, structured replies, mental health tags) are selected for training and validation. This sampling ensures the dataset reflects the real-world diversity of mental health discussions.

3.3 Limitations

The study faced limitations in terms of sample size, potential self-selection bias, and the constrained testing period. Real-world deployment challenges such as scalability and system accessibility in low-resource settings are beyond the scope of this research.

3.4 Validity and Reliability

To ensure validity, the dataset from authentic sources is used. Reliability was ensured by pilot-testing the chatbot with multiple users and conducting repeated trials of system performance under varied network conditions. Expert feedback further strengthened the credibility of the results.

3.5 Justification of Approach

The mixed-methods approach is justified given the interdisciplinary nature of the study. The usability testing allowed for a holistic understanding of the technical and human factors involved. The selected methods align with the research objectives of assessing empathy, privacy, and trust in AI-driven mental health support systems.

3.6 Procedure

The study followed these sequential steps:

1. Literature review and requirement specification
2. Design of system architecture
3. Development of chatbot (using Hugging Face), IPFS, and Filecoin.
4. Pilot testing and participant recruitment

5. Data collection through interactions and feedback
6. Data analysis using statistical and thematic techniques
7. Expert validation and system refinement

3.7 Materials

The following materials and tools are used:

- Frontend: React.js
- Backend: Node.js
- Database/Storage: IPFS + Filecoin
- AI Libraries: Python, Hugging Face Transformers, PyTorch, TensorFlow, LangChain
- System Usability Scale (SUS) Questionnaire
- NVivo (for qualitative data analysis)
- API Testing: Postman
- IDE: Visual Studio Code

4. Implementation

5. Discussion

6. Conclusion

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7. Appendix

Variation 6:

What methods ensure a web-based platform offers intuitive and accessible mental health services? To what extent can an AI chatbot provide caring and context-specific support for mental health assistance? What encryption approaches best ensure data security and privacy in a mental health support platform?

Variation 7:

How can a web platform be built to deliver accessible and user-focused mental health support services? How well can an AI-driven chatbot offer empathetic and situation-aware responses for mental health support? Which encryption solutions provide optimal data privacy and security for a web-based mental health system?

Variation 8:

What techniques create a web platform that offers user-friendly and accessible mental health support? How effectively can an AI chatbot deliver compassionate and context-appropriate mental health assistance? What are the most secure encryption methods for protecting data in a mental health web platform?

Variation 9:

How do you construct a web-based platform to provide accessible and straightforward mental health services? To what degree can an AI-powered chatbot offer sensitive and context-relevant mental health support? Which encryption strategies best protect data privacy and security in a mental health support website?

Variation 10:

What approach builds a web platform that ensures intuitive and accessible mental health support? How capable is an AI chatbot of providing empathetic and context-sensitive mental health assistance? What encryption methods offer the strongest data security for a web-based mental health system? Build an online platform focused on mental health assistance. Create and embed an AI-driven chatbot to deliver compassionate dialogue support. Use secure encryption for data storage to protect user privacy and safety.

Construct a digital platform to support mental well-being. Develop an artificial intelligence chatbot to offer caring conversational aid. Apply data encryption methods to safeguard user information and confidentiality.

Design a web platform dedicated to mental health resources. Integrate an AI-powered conversational agent for empathetic user interaction. Employ encrypted storage solutions to maintain data security and privacy.

Create an internet-based mental health care system. Implement a chatbot with AI capabilities to provide supportive conversations. Ensure data protection through encrypted storage mechanisms.

Develop a website to facilitate mental health support services. Incorporate an AI chatbot designed for sensitive, supportive dialogue. Secure user data with robust encryption protocols for privacy.

Build a web application to promote mental health support. Add an AI conversational tool to engage users with empathy. Protect sensitive data with advanced encryption techniques.

Establish an online mental health assistance platform. Design an AI-based chatbot to foster caring user interactions. Implement strong encryption for data to ensure confidentiality.

Create a digital hub for mental health care and support. Embed an artificial intelligence chatbot for compassionate communication. Use encryption to secure data storage and protect user privacy.

Develop a web portal for mental wellness support. Integrate a chatbot powered by AI to provide empathetic responses. Apply secure data encryption to maintain user trust and safety.

Build an online system to aid mental health care. Incorporate an AI-driven conversational agent for supportive engagement. Ensure privacy with encrypted data storage solutions. This research matters because it integrates AI-driven dialogue with secure data storage in a mental health platform. It addresses the critical demand for healthcare digital tools built with privacy, ethics, and user control in mind. The thesis presents a web application delivering empathetic support while safeguarding user data. It provides a usable framework for developers and researchers to build secure, sustainable digit[illegible] systems. The research impacts digital mental health, AI ethics, and decentralized design fields. Variation 3 This work stands out because it merges AI-based interaction with protected data storage in a mental health system. It responds to the urgent call for digital healthcare solutions designed with privacy, ethics, and user empowerment at the core. The thesis proposes a web app providing supportive dialogue while ensuring data security. It offers a clear framework for developers to create reliable digital health tools. The study contributes to digital mental health, AI ethics, and decentralized syste[illegible] 5 This study holds value because it blends AI conversation tools with secure data storage for mental health support. It answers the critical need for digital platforms in healthcare that prioritize privacy, ethics, and user empowerment. The thesis presents a web-based tool offering compassionate support without compromising data security. It gives developers a framework for creating dependable digital health services. The research supports progress in digital mental health, AI ethics, and decentralized design. Variation 6 This work is notable because it combines AI-based dialogue with a secure d[illegible] meets the urgent need for digital healthcare solutions focused on privacy, ethics, and user control. The thesis introduces a web application delivering supportive communication while ensuring data protection. It provides a clear model for developers to build sustainable health tools. The work impacts digital mental health, AI ethics, and decentralized system design. Variation 8 This study is impactful because it merges AI conversation with secure data mechanisms in a mental health support system. It responds to the need for digital healthcare platforms that prioritize privacy, ethics, and user emp[illegible] providing compassionate support while safeguarding user data. It offers a practical guide for developers to create reliable digital health systems. The study supports digital mental health, AI ethics, and decentralized design fields. Variation 10 This research is significant because it integrates AI-based dialogue with a secure data framework in a mental health system. It tackles the pressing need for digital healthcare tools designed with privacy, ethics, and user control in focus. The thesis presents a web app that delivers empathetic support while protecting user confidentiality. It provides a usable [illegible]

The system exclusively handles text-based interactions in English. Support for other languages is not included. The system prioritizes responses related to mental health counseling. Topics outside this scope, such as unrelated domains, are not addressed. The system accurately interprets the meaning of English text inputs from users. The system is designed solely to offer counseling services to individuals. It does not provide medical diagnoses or prescribe medications.

Variation 2

This platform supports only English-language text conversations. Non-English inputs are not processed. Responses are limited to mental health support content. Discussions involving unrelated fields are not permitted. The platform understands the intent behind user-provided English text. The platform focuses on delivering human-centered counseling services. It avoids offering diagnoses or medication recommendations.

Variation 3

The system processes text interactions solely in the English language. Other languages are not accommodated. The system restricts its responses to mental health support topics. Content from unrelated areas is not supported. The system comprehends the meaning of English text entered by users. The system provides counseling services to people. It does not issue medical diagnoses or suggest medications.

Variation 4

The system is limited to English text-based dialogues. Other languages are not supported. The system concentrates on mental health counseling responses. Conversations involving other subjects are not allowed. The system can interpret the meaning of user inputs in English text. The system is dedicated to offering counseling to individuals. It does not provide diagnostic or medicinal advice.

Variation 5

The platform supports only English text conversations. Non-English languages are not included. The platform focuses on mental health support responses. Unrelated topics are not addressed. The platform recognizes the meaning of English text inputs from users. The platform provides counseling services to humans. It does not offer diagnoses or medication prescriptions.

Variation 6

The system handles text interactions only in English. Other languages are not processed. The system responds only to mental health counseling queries. Topics from other fields are not supported. The system understands the intent of English text inputs by users. The system focuses on providing counseling to individuals. It avoids giving medical diagnoses or medication advice.

Variation 7

The system supports text-based communication in English only. Other languages are not permitted. The system delivers responses focused on mental health support. Unrelated subjects are not covered. The system interprets the meaning of user-entered English text. The system offers counseling services to people. It does not provide diagnoses or prescribe medications.

Variation 8

The platform is restricted to English text conversations. Support for other languages is not available. The platform prioritizes mental health counseling content. Responses to unrelated topics are not supported. The platform can understand the meaning of English text inputs from users. The platform is designed to provide counseling to individuals. It does not offer medical diagnoses or medication suggestions.

Variation 9

The system processes only English-language text interactions. Non-English inputs are not handled. The system focuses on responses related to mental health support. Other topics are not addressed. The system accurately interprets the meaning of user inputs in English. The system provides counseling services to humans. It does not issue diagnoses or recommend medications.

Variation 10

The system supports English text-based dialogues exclusively. Other languages are not supported. The system responds only to mental health counseling topics. Unrelated fields are not included. The system comprehends the meaning of English text provided by users. The system is dedicated to offering counseling services. It does not provide medical diagnoses or medication advice. Variation 1 The thesis is organized into six chapters, as illustrated in Figure 1. Chapter One introduces the research topic and establishes its foundation. Chapter Two reviews existing literature, covering prior studi[illegible] potential impact. Chapter Six wraps up the thesis, summarizing key results, emphasizing the research's significance, and proposing areas for future work. Variation 2 The thesis comprises six chapters, as depicted in Figure 1. Chapter One sets the stage by introducing the research topic. Chapter Two conducts a literature review, summarizing previous work on AI chatbots, decentralized storage, and ethical challenges in digital mental health. Chapter Three covers the methodology, explaining the research design, tools, and technologies used to create and evaluate the platform. Chapter Four pres[illegible] literature review, exploring past studies on AI chatbots, decentralized data solutions, and ethical issues in digital mental health. Chapter Three describes the methodology, including the research design, tools, and technologies used to build and test the platform. Chapter Four details the implementation, prototype features, and results from testing and user responses. Chapter Five discusses the findings, compares them to research questions, notes limitations, and assesses the system's potential. Chapter Six summarizes the research, highlights its importance, and proposes directions for future [illegible] feedback. Chapter Five analyzes the results, discusses limitations, and evaluates the system's impact relative to research questions. Chapter Six concludes the thesis, summarizing findings, emphasizing the research's significance, and suggesting future enhancements. Variation 5 The thesis is arranged into six chapters, as shown in Figure 1. Chapter One introduces the research topic and its background. Chapter Two reviews the literature, summarizing studies on AI chatbots, decentralized data systems, and ethical aspects of digital mental health. Chapter Three explains the methodology, cov[illegible] One presents the research topic and its context. Chapter Two conducts a literature review, analyzing prior work on AI chatbots, decentralized storage, and ethical issues in digital mental health. Chapter Three outlines the methodology, describing the research design, tools, and technologies used to develop and assess the platform. Chapter Four focuses on implementation, prototype features, and results from testing and user feedback. Chapter Five discusses the findings, compares them to research questions, identifies limitations, and evaluates the system's potential. Chapter Six summariz[illegible] implementation, prototype features, and outcomes from testing and user responses. Chapter Five analyzes the results, discusses limitations, and assesses the system's impact in relation to research questions. Chapter Six concludes the thesis, summarizing findings, emphasizing their value, and proposing future improvements. Variation 8 The thesis is structured into six chapters, as shown in Figure 1. Chapter One lays out the research topic and its foundation. Chapter Two reviews existing literature, focusing on AI chatbots, decentralized data storage, and ethical considerations in digital mental h[illegible] into six chapters, as outlined in Figure 1. Chapter One introduces the research topic and its context. Chapter Two examines prior studies, covering AI chatbots, decentralized data systems, and ethical issues in digital mental health. Chapter Three explains the methodology, detailing the research design, tools, and technologies used to create and evaluate the platform. Chapter Four discusses the implementation, key prototype features, and results from testing and user input. Chapter Five analyzes the findings, compares them to research questions, discusses limitations, and evaluates the system's [illegible]

[illegible] indicate that many mental health apps share user data with third parties, such as advertisers, often without transparent user notification. This raises concerns about surveillance, data monetization, and user control. Ethical guidelines emphasize informed consent, data minimization, and transparency in AI healthcare applications, but commercial pressures [illegible] personal, is often stored in centralized databases without sufficient encryption or clear user consent. Evidence suggests that numerous mental health apps share data with third parties, including analytics firms, often without users' full awareness. This sparks worries about surveillance, data exploitation, and autonomy. Ethical standards demand transparency, [illegible] safety, reliability, and transparency of these apps when handling sensitive information. Mental health data, highly confidential, is often stored in proprietary systems with inadequate encryption or consent mechanisms. Reports reveal that many apps share user data with third parties, such as advertisers, often without clear disclosure. This raises issues of su[illegible] understanding required to fully emulate human therapists. Concerns persist about the security, accuracy, and clarity of these apps in handling sensitive data. Mental health information, among the most private, is often stored in centralized databases without strong encryption or clear user consent. Reports show that many apps share data with third parties, [illegible] However, many AI systems struggle to match the emotional depth and contextual nuance of human therapy. Issues remain regarding the safety, precision, and transparency of these apps when managing sensitive data. Mental health information, highly sensitive, is often stored in proprietary systems without adequate encryption or clear consent processes. [illegible] these tools help users build emotional awareness and coping mechanisms. Still, many AI platforms lack the emotional depth and contextual understanding needed to fully replace human therapists. Concerns persist about the security, accuracy, and transparency of these apps in handling sensitive information. Mental health data, highly confidential, is often st[illegible] behavioral approaches Fitzpatrick et al. (2017) Inkster et al. (2018) Pentina et al. (2023). Studies suggest these tools promote emotional understanding and resilience. However, many AI systems fail to replicate the emotional nuance and contextual insight of human therapy. Questions linger about the safety, reliability, and openness of these apps when handlin[illegible] cope with depression, anxiety, and stress using cognitive behavioral techniques Fitzpatrick et al. (2017) Inkster et al. (2018) Pentina et al. (2023). Research highlights their ability to foster emotional awareness and coping skills. Yet, many AI systems lack the emotional depth and contextual sensitivity needed to fully replace human therapists. Issues persist regard[illegible] Vaidyam et al. (2019). Tools like Woebot, Replika, and Wysa support users in addressing stress, depression, and anxiety through cognitive behavioral methods Fitzpatrick et al. (2017) Inkster et al. (2018) Pentina et al. (2023). Evidence suggests these tools enhance emotional resilience and awareness. However, many AI platforms struggle to match the emotio[illegible] sentiment analysis, and machine learning to mimic human conversation Vaidyam et al. (2019). Apps like Wysa, Replika, and Woebot aid users in managing anxiety, depression, and stress with cognitive behavioral strategies Fitzpatrick et al. (2017) Inkster et al. (2018) Pentina et al. (2023). Studies show these tools promote emotional awareness and coping me[illegible] Decentralized storage systems like IPFS and Filecoin tackle privacy and data ownership issues. IPFS operates as a peer-to-peer network, using content-addressed storage to let users manage data through unique cryptographic hashes Doan et al. (2022). Filecoin enhances IPFS with a blockchain-based reward system. These solutions eliminate reliance on centra[illegible] storage, enabling data retrieval via unique cryptographic hashes Doan et al. (2022). Filecoin complements IPFS by adding a blockchain layer for incentives. These systems remove the need for centralized servers and allow users to control their data access, making them suitable for sensitive data like mental health records. IPFS provides a decentralized mechan[illegible] sensitive applications like mental health records. IPFS is a distributed storage system designed for decentralization. It uses blockchain for off-chain data management. Files are organized in IPFS objects, comprising data and connection components. Small files, up to 256 KB, are stored in a single object, while larger files, like multimedia, are split across multiple [illegible] larger files, like videos, are split into multiple objects. The IPFS architecture, shown in 2, is simple yet powerful, with key features. Variation 5 IPFS and Filecoin offer decentralized storage to address privacy and data sovereignty. IPFS uses a peer-to-peer network with content-addressed storage, retrieving data via unique hashes Doan et al. (2022). Filecoin enhan[illegible] et al. (2022). Filecoin builds on IPFS with a blockchain incentive layer. These technologies remove central servers and enable users to manage data access, ideal for sensitive data like mental health records. IPFS is a distributed storage mechanism for decentralized systems. It leverages blockchain for off-chain data storage. Files are held in IPFS objects, with data [illegible] include data and connection parts. Small files, up to 256 KB, are stored in one object, while larger files, like multimedia, are divided across multiple objects. The IPFS architecture, depicted in 2, is simple and powerful, with notable features. Variation 8 Decentralized storage solutions like IPFS and Filecoin address privacy and data control issues. IPFS employs a p[illegible] a peer-to-peer system with content-addressed storage, retrieving data via cryptographic hashes Doan et al. (2022). Filecoin integrates a blockchain-based incentive layer with IPFS. These solutions eliminate centralized servers and enable users to control data access, suitable for sensitive applications like mental health records. IPFS provides a decentralized dat[illegible] health records. IPFS is a distributed storage framework for decentralized systems. It supports off-chain data management through blockchain technology. Files are stored in IPFS objects, which include data and connection components. Small files, up to 256 KB, fit in one object, while larger files, like multimedia, are divided across multiple objects. The IPFS arch[illegible] scenarios and nuanced mental health issues *Wysa for Individuals | Your AI Companion for Everyday Wellbeing| AI Based Mental Health Platform — wysa.com* (2025). Replika, a chatbot for emotionally intelligent conversations, simulates friendship using GPT-style neural networks. It is free but not tailored for therapy, lacking scientific psychological grounding. [illegible] has free and paid options. Its AI has difficulty handling complex mental health cases and subtle emotions *Wysa for Individuals | Your AI Companion for Everyday Wellbeing| AI Based Mental Health Platform — wysa.com* (2025). Replika creates emotionally engaging conversations and mimics friendship using GPT-style neural networks. It is free but not designed [illegible] algorithms to simulate empathy and guide self-help discussions. It offers free and paid plans. Its AI struggles with complex emotional issues and intricate mental health scenarios *Wysa for Individuals | Your AI Companion for Everyday Wellbeing| AI Based Mental Health Platform — wysa.com* (2025). Replika, a chatbot for emotional conversations, simulates frie[illegible] mental health tool, relies on rule-based NLP and custom DL algorithms to mimic empathy and support self-help conversations. It provides free and paid versions. Its AI faces challenges with nuanced emotions and complex mental health cases *Wysa for Individuals | Your AI Companion for Everyday Wellbeing| AI Based Mental Health Platform — wysa.com* (2025[illegible] — *x2ai.com* (2025). Wysa, an AI mental health app, uses rule-based NLP and proprietary DL algorithms to emulate empathy and guide self-help dialogues. It offers free and paid plans. Its AI struggles with complex emotional scenarios and nuanced mental health issues *Wysa for Individuals | Your AI Companion for Everyday Wellbeing| AI Based Mental Healt[illegible] organizations *For Individuals — x2ai.com* (2025). Wysa, an AI-driven mental health tool, uses rule-based NLP and unique DL algorithms to mimic empathy and facilitate self-help talks. It has free and paid options. Its AI has trouble with complex mental health cases and subtle emotions *Wysa for Individuals | Your AI Companion for Everyday Wellbeing| AI Based[illegible]

Smart AI Platform for Aging Care: Online Assistance, Personalized Insights, and Community Support

Intelligent Care Portal for Seniors: AI Tools for Caregivers, Recommendations, and Social Engagement

Web-Based AI Assistant for Elderly Care: Support System with Personalization and Community Features

AI Solutions for Senior Care: A Digital Platform for Guidance, Caregiver Support, and Collaboration

Personalized AI Care Portal: Online Assistance for Older Adults and Caregiver Communities

AI-Powered Senior Assistance System: Web Support, Caregiver Tools, and Social Connectivity

Next-Generation Elderly Care Portal: AI-Enabled Recommendations and Community-Oriented Support

Smart AI Portal for Caregiving: Personalized Elder Support and Interactive Community Engagement

Digital AI Platform for Aging Assistance: Caregiver Support, Tailored Advice, and Networking

Elderly Care Support Portal with AI: Personalized Guidance and Community-Centered Features

AI-Enhanced Web Portal for Senior Care: Assistance, Recommendations, and Caregiver Collaboration

Technology-Driven Elder Care Portal: AI Support for Families, Care Professionals, and Communities

AI Care Assistance Platform: Web Solutions for Elder Support, Guidance, and Community Integration

Web-Enabled AI System for Senior Support: Personalized Resources and Caregiver Engagement

AI Health Support Portal for Elderly: Caregiver Tools, Personalized Tips, and Community Sharing

AI Caregiving Companion: A Web Portal for Elderly Support, Recommendations, and Social Inclusion

AI and Web-Based Elderly Support Hub: Personalized Care Insights and Community Assistance

Smart Digital Elder Care Assistant: AI Recommendations, Caregiver Tools, and Shared Engagement

Online Elder Care Platform with AI: Personalized Support and Collaborative Caregiving Features

AI Caregiver Support System: Web Tools for Elder Assistance, Tailored Guidance, and Social Links

AI-Powered Aging Care Portal: Smart Recommendations, Caregiver Services, and Community Forums

Intelligent Online Care Assistant: AI Support for Older Adults and Connected Caregiver Networks

Digital Care Portal for Seniors: AI Assistance, Personalized Guidance, and Caregiver Community

AI-Enabled Health Portal for Aging Populations: Personalized Caregiving and Community Integration

Elderly Support Portal with AI: Online Recommendations, Caregiver Assistance, and Social Connection

AI-Driven Caregiving Hub: Smart Web Portal for Elder Support and Community Participation

AI Web Assistant for Elderly: Personalized Health Tips, Caregiver Support, and Community Features

AI Supportive Care Portal: A Digital Platform for Elder Assistance and Caregiver Collaboration

Future-Oriented Elder Care Platform: AI-Powered Assistance, Personalized Resources, and Social Engagement

Woebot, built on CBT, used NLP and decision-tree logic. It was free and easy to use but offered limited emotional depth and personalization. The Woebot app ceased on June 30, 2025, and is no longer accessible *FAQ — woebothealth.com* (2025). Tess helps manage depression, anxiety, and emotional disorders. It employs NLP, sentiment analysis, and AI decisi[illegible] *Replika — replika.ai* (2025). Variation 8 Woebot, a CBT-based chatbot, operated with NLP and decision-tree logic. It was free and straightforward but lacked emotional depth and personalization. The Woebot app shut down on June 30, 2025, and is no longer in use *FAQ — woebothealth.com* (2025). Tess targets depression, anxiety, and emotional disorders. It c[illegible] user data is used for NLP and response tailoring *Replika — replika.ai* (2025). Variation 9 Woebot relied on CBT, NLP, and decision-tree logic. It was free and user-friendly but limited in emotional engagement and personalization. The Woebot app ended on June 30, 2025, and is no longer available *FAQ — woebothealth.com* (2025). Tess treats depression, anxiety[illegible] user data storage and NLP for responses, raise concerns *Replika — replika.ai* (2025). Variation 10 MindMesh: Emotional Care Assistance Through Filecoin and Tailored AI Conversations