**MindConnect: RealTalk for Real Challenges for the MinSU-CC with Sentiment Analysis**

An

Application Development Project

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**CHAPTER I**

**I. INTRODUCTION**

**PROJECT CONTEXT**

The need for mental health support (MHS) has never been more critical. With increasing awareness surrounding mental health issues, more individuals are seeking help but often face difficulties in accessing traditional services. Mental health support applications have emerged as a promising tool to address the growing mental health crisis. These applications aim to provide accessible, immediate, and user-friendly support to individuals experiencing mental health issues. MHS remains challenging for many to access, with barriers such as stigma or logistical constraints frequently limiting access. MindConnect provides a solution by allowing users to connect with others who understand their experiences without the fear of judgment or exposure. The platform empowers individuals to manage stress, anxiety, and other mental health challenges in a supportive and confidential environment.

According to the World Health Organization (WHO) over 2,000 cases of suicide had been reported in the Philippines in 2000 to 2012. Suicide victims ranged from 15 to 29 years old. The number of cases is likely to be much higher because many people suffering from mental health illnesses are hesitant to seek help or due to some financial constraints. Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community.

Mental health is fundamental to our collective and individual ability as humans to think, emote, interact with each other, earn a living and enjoy life. On this basis, the promotion, protection and restoration of mental health can be regarded as a vital concern of individuals, communities and societies throughout the world (WHO, n.d.). Mental health deserves greater attention and awareness, as many people are unaware that it encompasses emotional, psychological, and social well-being. These factors are reflected in how individuals think, feel, and act. Taking care of one's mental health is crucial at any stage of life. Additionally, society needs to be more open about discussing stress, anxiety, and depression, and not perceive them as weaknesses or taboo subjects. The increasing prevalence of mental health issues is a consequence of modern existence, particularly the unstoppable growth of technology. While technology has its benefits and can save lives, connect people, and improve lives in various ways, it also contributes to the rising mental health challenges (Wathoni, R., & Santoso, A., 2023).

Mental health support applications (MHSA) often include a variety of features designed to assist users. The "Mind Note" app, for example, combines techniques to detect different mental health disorder symptoms and provides interactions through affirmations, emotions, and unloading techniques such as writing and drawing (Crișan-Vida, et. al., 2023). Another application developed for college students includes features like motivational quotes, videos, an online community, nature soundtracks, mindfulness exercises, daily reminders, and a mood tracker. These features aim to provide comprehensive support and encourage users to engage with their mental health proactively (Abaya, S., 2023).

User acceptance is crucial for the success of mental health applications. Research indicates that while these applications are generally considered easy to use, their effectiveness is often questioned, and concerns about privacy and data security can inhibit acceptance (Becker, D., 2016). Additionally, many app descriptions lack information to substantiate their effectiveness and do not mention privacy or security measures, which can further deter users (Radovic, A., 2016).

The integration of peer support services (PSS) into mental health applications has been highlighted as a beneficial feature. Peer support involves individuals with lived experience of mental illness providing support to others, which can instill hope, improve engagement, and enhance the quality of life. However, the effectiveness of PSS can vary, and some studies suggest that integrating these services into healthcare systems may have neutral effects (Shalaby, R., & Agyapong, V., 2020).

Peer support is recognized globally as an essential recovery service for people with mental health conditions. With the influx of digital mental health services changing the way mental health care is delivered, peer supporters are increasingly using technology to deliver peer support (Fortuna, et.al., 2019). MHSA offer a valuable tool for addressing mental health issues, providing accessible and immediate support.

The platform was designed for accessibility on both web and mobile applications. The front-end, developed in Vue.js, works seamlessly with a Node.js back-end, providing users with uninterrupted access across various platforms. This accessibility ensures that users can connect with support whenever and wherever they need it.

In conclusion, MindConnect represents a significant advancement in mental health support by utilizing technology to address common barriers faced by individuals seeking help. Through its innovative features, the platform aims to create a safe space for emotional support while promoting mental wellness. As society continues to recognize the importance of mental health care, initiatives like MindConnect play a crucial role in making support more accessible and effective for everyone in need.

**OBJECTIVES**

General Objectives

The objective of the project is to develop and implement MindConnect, a platform for mental health care that offers peer-to-peer community participation, mood tracking, accessibility to guidance counselors, mindfulness exercises, and real-time emotional support. Through accessibility, the system is designed to reduce stigma, encourage emotional well-being, and enable people to manage mental health issues. intends to improve the platform's efficacy by achieving the following goals. Specifically, the project aims to increase the platform's effectiveness by accomplishing the following objectives.

**Specific Objectives**

The specific objectives of the project are to design and implement a mood tracking feature that enables users to log daily entries and analyze trends over time, develop a suite of daily mindfulness exercises, including guided meditations and breathing techniques, to promote mental well-being, and integrate an empathy challenge system that encourages community support through structured tasks. The project also aims to create a private "Heart-to-Heart Room" feature that allows users to schedule sessions with professionals, as well as establish a peer-to-peer community platform where users can share inquiries, experiences, and insights to foster engagement, enhanced by sentiment analysis to better understand and support user interactions. Another objective is to implement a user feedback system that facilitates the submission of suggestions, issue reporting, and experience ratings. The development of the chat system that supports real-time communication, incorporating sentiment analysis to assess the emotional tone of conversations and provide appropriate interventions, is also a priority. Additionally, the project aims to ensure compatibility across devices through the deployment of functional web and mobile platforms and establish a monitoring system that enables administrators to effectively oversee user interactions and manage schedules.

**SCOPE AND LIMITATIONS**

**Scope of the Study**

MindConnect aims to address the challenges of accessing mental health support by offering the following:

MindConnect works to overcome the barriers to mental health support by providing a comprehensive platform that supports all areas of emotional well-being. The website provides real-time emotional assistance through chat, allowing users to communicate with guidance counselors and staff. Sentiment analysis is also used in the chat system to measure the emotional tone of chats, assisting in identifying people in distres. Mindfulness exercises are also included on the platform to help users properly manage stress and anxiety. A peer-to-peer community is included, allowing users to share their experiences and provide each other support. Sentiment analysis is used in the community to help people comprehend and react to the emotional context of interactions, resulting in a more empathic and supportive environment. The system includes a mood tracker, which lets users track their emotional state over time. MindConnect introduces gamified "Empathy Challenges," which encourage thoughtful responses. At last, the site includes a specialized "Heart-to-Heart Room," where users can have private talks with experienced specialists at times, ensuring suited help in a secure setting. MindConnect aims that these additions will make mental health support more accessible and effective for users.

**Limitations of the Study**

MindConnect signifies an enormous effort ahead in Mindoro State University's mental health support services. However, some limitations were discovered during the development and implementation stages. The system's target audience is limited to students at Mindoro State University, limiting possibilities for others who might benefit from its capabilities. Access to specialized support, particularly via the "Heart-to-Heart Room" function, is limited due to a lack of skilled specialists, especially during peak demand periods. The platform's dependency on technology demands a consistent internet connection, which may be unavailable to users in places with poor connectivity.Despite effective encryption mechanisms, security and confidentiality of data risks remain, raising the chance of breaches or exploitation of sensitive user information. The efficacy of real-time emotional support provided via peer-to-peer is dependent on active community engagement, which may lead to inconsistent user experiences. Furthermore, while the sentiment analysis tool is meant to assess the emotional tone of interactions, its AI-driven nature raises the possibility of misinterpreting user input, leading to inappropriate or ineffective answers.The gamified "Empathy Challenges" may mistakenly lead some users to prefer prizes above genuine emotional assistance. Furthermore, the platform is not intended to serve those with severe mental illnesses and should not be considered a substitute for professional therapeutic care. Cultural stigmas and different conceptions of mental health across user demographics may also have an impact on the system's effectiveness and adoption. Moreover, the system may not entirely embrace older devices or operating systems, restricting its use for some users. These limitations highlight areas that need to be addressed in order to improve the platform's diversity, reliability, and general influence.

**DEFINITION OF TERMS**

1. **Admin** – The designated personnel, typically guidance counselors, responsible for moderating user interactions, ensuring compliance with platform policies, and providing professional support.
2. **Chat** **System**- A real-time communication feature allowing users to chat with volunteers or peer supporters. All messages are securely stored.
3. **Empathy Challenges** - Tasks where users offer thoughtful responses to support others.
4. **Heart-to-Heart Room** - A private space in the app for users to engage in meaningful conversations with a trained professional during specified hours.
5. **MindConnect** - Application that provides mental health support by providing a platform to share on feed and post queries, mood tracking, mindfulness exercises, facilitating video conferencing with counselors
6. **Mindfulness Exercise** - Pre-designed activities such as meditation, breathing exercises, and stress-relief techniques aimed at improving mental focus and reducing anxiety.
7. **Mood Tracker** - A tool that allows users to log their moods daily and view visual trends to monitor emotional patterns over time
8. **Peer-to-Peer Community** - A virtual community within the platform where users can interact, share experiences, post queries, and respond to others in a supportive environment. This feature fosters engagement through empathy challenges.
9. **Users** – Students at Mindoro State University, who are the only users of this software, are the other end users besides guidance personnel.

**CHAPTER II**

**REQUIREMENTS SPECIFICATION**

**HARDWARE AND SOFTWARE REQUIREMENTS**

| **Requirement** | **Minimum** | **Recommended** |
| --- | --- | --- |
| User Devices | Desktop or laptop with 4GB RAM, 1.6 GHz dual-core processor, and a stable internet connection. | Desktop or laptop with 8GB RAM, 2.5 GHz quad-core processor, SSD storage, and a reliable internet connection. |
|  | Smartphones or tablets (Android) with 2GB RAM and support for standard web browsers. | Smartphones or tablets (Android) with 4GB RAM, HTTPS protocol support, and modern web browsers. |
| Network Requirements | Internet speed of 5 Mbps for reliable communication (upload and download). | Internet speed of 10 Mbps or higher for seamless video conferencing and real-time interactions. |
|  | Stable and uninterrupted internet connection. | Stable connection to support video conferencing tools like Google Meet or WebRTC. |
| Operating System | Windows 10 (32-bit), Android 8.0 or later. | Windows 11 (64-bit) with updated drivers and patches, and Android 11 or later. |
| Web Browser | Google Chrome version 90, Mozilla Firefox version 80, or Microsoft Edge version 88. | Google Chrome version 110 or higher with enhanced performance settings. |
| Backend Software | Node.js version 14.x, Express.js for API routing, MySQL version 8.0. | Node.js version 20.x (LTS), optimized Express.js middleware, and a robust MySQL database configuration. |
| Frontend Software | Vue.js version 2.6, HTML5, CSS3, and JavaScript for basic web functionality. | Vue.js version 5.x with responsive design frameworks, optimized HTML5, CSS3, and JavaScript. |
|  | Axios for HTTP requests and communication with the backend. | Advanced Axios configurations for seamless session handling and backend interactions. |
| Video Conferencing | Google Meet integration. | Fully integrated WebRTC APIs for real-time communication and enhanced video quality. |
| Security and Authentication Tools | Secure storage of OTPs using server-side storage mechanisms. | Encrypted OTP storage using hashing algorithms (e.g., SHA-256) to enhance security. |
|  | OTP expiration system with 5-minute validity implemented server-side. | Configurable OTP expiration system with options for shorter time frames and additional security policies. |
|  | Passwords encrypted using MD5 or similar basic hashing algorithms. | Passwords encrypted using advanced algorithms like bcrypt with salt for increased security. |

**Table 1. Hardware and Software Requirements**

**FUNCTIONAL REQUIREMENTS**

1. User Account Management System

User Registration and Login with Authentication

* Allow users to register with username, email, password and OTP for secure login and convenience.

Profile Creation

* Allow users to create and customize profiles including their username and preferences

1. Chat System
   * Users can initiate chats with volunteers or peer supporters.
   * Chat logs are stored securely in MySQL for moderation purposes.
   * Sentiment analysis is used in the chat system to assess emotional tone and provide timely support when needed.
2. Peer-to-Peer Community

Community Interaction

* Allow users to post queries and respond to others’ experience
* Sentiment analysis evaluates the emotional tone to improve responses and ensure appropriate support.
* Empathy challenges encourage users to engage with others in the community.

1. Mood Tracking

* Users can log daily moods.
* Mood data is stored securely and accessible for user review.

1. Mindfulness Exercises

* The system will offer daily mindfulness exercises, including breathing techniques and guided meditations.

1. Heart-to-Heart Room

Private Room Access

* Users can access a specific room during designated times to talk privately with a trained professional.

Availability of the room is scheduled and managed through the system.

1. Feedback

Feedback Mechanism

* Implement a feedback system for users to suggest features or report issues

1. **ADMIN SIDE**

User Management

* + - Admins have access to add, edit, suspend, or remove user accounts.

Content Moderation

* + - Admins can review and moderate community posts to ensure safe use of the platform.

Heart-to-Heart Room Scheduling

* + - Admins coordinate with volunteers to manage the availability of Heart-to-Heart Room sessions.

Mood Tracking

* + - Admins can see the mood summary of users.

**NON-FUNCTIONAL REQUIRMENTS**

OPERATIONAL REQUIREMENTS

* + - The platform must be accessible on web and mobile devices, ensuring smooth operation across various browsers and operating systems.
    - It should support real-time chat, mood tracking, and scheduling features with minimal downtime.

PERFORMANCE REQUIREMENTS

* Core functionalities like chat and mood tracking should respond within 2-5 seconds.

SECURITY REQUIREMENTS

* User data must be encrypted both at rest and in transit to protect privacy.
* Authentication mechanisms, including OTPs, must be implemented to prevent unauthorized access.

CULTURAL REQUIREMENTS

* The UI must be intuitive and easy to use, with minimal training required for users.
* Language and content must be adaptable to encourage user adoption and engagement.

**Chapter III**

**Design and Development Methodologies**

**System Design**

Database Design

Architectural Diagram / Block Diagram

DFD Level 0

UML Use-case Diagram

Sample Mock-up

**(Name of your chosen methodology)**

**(Phases of your chosen method)**

**Testing**- Indicate all the testing activities you performed and why it is being performed

**ISO 25010 Evaluation**

Respondents Profile

Likert Scale

Evaluation Instrument

**CHAPTER IV**

**DEVELOPMENT, TESTING AND EVALUATION RESULT**

**Presentation of the System Output**

**Testing Results**

**ISO 25010 Evaluation Result**

**CHAPTER V**

**CONCLUSION AND RECOMMENDATION**

**Conclusion**

The study focused on the development of *MindConnect*, a mental health support platform designed to improve access to mental health services, particularly for students at Mindoro State University. By integrating real-time emotional support, mindfulness exercises, peer-to-peer community engagement, and professional consultations through the "Heart-to-Heart Room," the platform provides a safe and accessible space for emotional expression and support. Its emphasis on accessibility that aligns with the goal of reducing stigma and promoting mental well-being.

Despite the challenges posed by cultural stigmas, privacy concerns, technological limitations, and the inability to address severe mental health conditions comprehensively, the platform demonstrates significant potential. It empowers users to manage their mental health proactively, fosters community interaction, and promotes emotional wellness.

The study highlights the importance of leveraging technology to bridge gaps in mental health care access, especially in academic environments. The modular design and user-centered features of the system ensure its adaptability for future enhancements and scalability.

**Recommendations**

1. Enhancements in Functionality

1.1 Improve Sentiment Analysis

Gap: Sentiment analysis may misinterpret user input.

Objective: Enhance sentiment analysis to automatically and accurately interpret the emotional tone of conversations, enabling the system to provide real-time, contextually relevant support.

1.2 Develop "Empathy Challenges" Module

Gap: The current system does not have a reward mechanism to encourage meaningful emotional support.

Objective: Implement a reward system through "Empathy Challenges" that encourages users to provide genuine emotional support, promoting authentic interactions within the community.

1.3 Add Offline Support

Gap: Users without internet access cannot use all features.

Objective: Include downloadable tools like mindfulness exercises and mood trackers for offline use.

2. Improved Accessibility and Compatibility

2.1 Support Older Devices and Systems

Gap: Older devices may not support the platform.

Objective: Optimize the platform for older devices and operating systems to increase accessibility.

2.2 Improve Performance in Low-Bandwidth Areas

Gap: Slow internet connections make the platform difficult to use.

Objective: Enhance the platform’s performance in low-bandwidth areas for smoother use.

3. Data Privacy and Security

3.1 Regular Security Audits

Gap: There is still a risk of data breaches.

Objective: Conduct regular security audits to identify and address potential data risks.

3.2 Clear Privacy Communication

Gap: Users may be unsure about data handling practices.

Objective: Provide transparent communication about the platform's privacy policies and security measures.

4. Cultural Adaptation

4.1 Collaborate with Experts

Gap: Cultural stigmas may affect user adoption.

Objective: Work with mental health and cultural experts to make the platform culturally relevant and inclusive.

5. Integration with External Support Services

5.1 Partner with Professional Organizations

Gap: Limited access to trained professionals for the "Heart-to-Heart Room".

Objective: Partner with professional organizations to ensure adequate staffing for the "Heart-to-Heart Room."

5.2 Referral Mechanism for Critical Care

Gap: Users with serious mental health issues may not be referred to the right care.

Objective: Create a referral system to direct users to appropriate mental health care providers.

6. Expansion of Target Audience

6.1 Broaden Reach

Gap: The platform is limited to Mindoro State University students.

Objective: Expand the platform to other schools and communities to increase its impact.

7. Continuous Monitoring

7.1 Use Analytics for Engagement

Gap: The platform may not monitor user engagement effectively.

Objective: Use analytics to track engagement and identify areas for improvement.

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**APPENDICES**

**Sample Accomplished ISO 25010 Evaluation Form**

**Picture During Development, Testing & Evaluation**