Innovation e-Proceeding e-ISSN: 2716-6732
International Innovation, Technology & Research Exhibition and Conference
October 1, 2025, Selangor, MALAYSIA

Mental Health Companion Application

Khairul Syahmir Bin Azman, Ts. Izwan Suhadak Ishak, Ts. Dr. Irny Suzila Ishak, Ts. Roziyani binti Setik, Ts Zuraidy bin Adnan

Universiti Selangor

3232014082@student.unisel.edu.my, izwan@unisel.edu.my, irny@unisel.edu.my, roziyani@unisel.edu.my, zuraidy@unisel.edu.my

1. Product Description

QALBI is an AI-powered mental health companion application developed to address the rising prevalence of mental health issues among youth. The application integrates Cognitive Behavioral Therapy (CBT) principles with artificial intelligence to provide real-time emotional support, personalized guidance, and systematic mood tracking. QALBI features an empathetic AI chatbot, a mood check-in system with visual insights, bilingual support (Malay and English), and an emergency support page for immediate assistance. The app is designed using Flutter, Firebase, and GPT API, ensuring secure cloud-based data management and a mobile-optimized interface for accessibility and usability.

2. Innovation Objectives

QALBI aims to develop an AI-powered mobile application that directly addresses the growing mental health challenges faced by today's youth. The project's primary objective is to provide accessible, affordable, and personalized support for individuals aged 15 to 30, particularly students and young professionals who often struggle with stress, anxiety, and emotional regulation. By integrating Cognitive Behavioral Therapy (CBT) techniques into an AI-driven chatbot, QALBI seeks to deliver empathetic, evidence-based guidance that helps users reframe negative thought patterns and adopt healthier coping strategies. In addition, the application includes mood and health tracking tools that allow users to record their emotional states, identify behavioral patterns, and gain meaningful insights into their mental well-being over time. A distinctive feature of QALBI is its bilingual support (Malay and English), which ensures inclusivity for diverse users, especially those in rural or underserved areas where access to professional therapy is limited. Beyond technical innovation, QALBI is designed to reduce the stigma surrounding mental health by offering a safe, judgment-free, and user friendly digital companion that is available anytime, anywhere. The overarching objective is to bridge the gap

between traditional therapy and contemporary self-help tools by combining CBT principles, AI technology, and mobile accessibility into a comprehensive solution that empowers young people to take proactive steps in managing their mental health.

3. Problem Statement

Mental health challenges among youth have become increasingly prevalent worldwide, driven by factors such as academic pressures, heightened societal expectations, and the influence of digital lifestyles including social media and constant connectivity. Although awareness of mental health has grown, many young people still face barriers to accessing professional therapy due to stigma, high costs, and limited availability of trained professionals in certain regions. Existing mobile applications often rely on static self-help content or generic modules that fail to adapt to individual needs, resulting in limited engagement and effectiveness. Furthermore, many solutions lack comprehensive features such as real-time emotional guidance, personalized mood tracking with actionable insights, bilingual accessibility, and emergency support options. These gaps highlight the urgent need for an innovative, user-centered approach. QALBI addresses these issues by integrating Cognitive Behavioral Therapy (CBT) principles with AI-powered interactions, secure cloud-based mood tracking, and bilingual support, offering an accessible, affordable, and personalized digital companion designed specifically for students and young professionals.

4. Authenticity / Novelty

QALBI is unique in its integration of CBT techniques with AI-driven real-time interaction, bilingual support, and emergency accessibility. Unlike generic self-help apps, QALBI emphasizes personalization by adapting chatbot responses and mood insights based on user input. The app also prioritizes inclusivity by offering manual language selection (English and Malay) and providing an emergency support feature instead of generic relaxation tools. This makes QALBI both innovative and practical, addressing real-world mental health needs in a culturally and contextually relevant manner.

5. Implementation Level

a) Preliminary Phase :

In this phase, a comprehensive literature review and background research were conducted. The team studied Cognitive Behavioral Therapy (CBT), AI-powered chatbots, Flutter framework, Firebase database, and existing mental health applications. Case studies of applications such as Wysa, Youper, Calm, Replika, and BetterHelp were reviewed to identify strengths, weaknesses, and best practices. This research provided a strong foundation for the development of QALBI by highlighting issues such as stigma, accessibility, personalization, and secure data management.

b) Data Collection Phase :

To ensure that the application addressed real user needs, two main data collection methods were applied. First, interviews were conducted with Mr. Muhammad Hanif Jani, an officer from the National Anti-Drug Agency Malaysia (AADK), who has extensive experience in counseling and rehabilitation using CBT and other psychological approaches. His insights provided critical guidance on designing the application in an ethical, effective, and user-centered manner. Second, questionnaires were distributed to 53 respondents aged 15–30, gathering data on user preferences, comfort levels with AI, desired features such as mood tracking, personalized insights, and emergency support, as well as concerns related to privacy and over-reliance on AI. By combining expert input with user survey results, the project ensured that both professional perspectives and end-user needs were fully integrated into the design and development process.

c) Analysis Phase :

This phase focused on analyzing the information obtained during data collection to clearly define the requirements of the application. The user requirements highlighted the need for features such as an AI-powered CBT chatbot, mood tracking, personalized insights, emergency support, and a bilingual interface. From these, the functional requirements were established, which included core functions like user authentication, chatbot interaction, mood logging, emergency contacts, and user profile management. In addition, non-functional requirements were specified to ensure the system's overall quality, covering aspects such as performance efficiency, secure data storage, cross-platform compatibility on both iOS and Android, scalability to support a large number of users, and a user-friendly interface. The outcome of this phase was a detailed requirements specification document that served as a clear guideline for the subsequent design and development of the application.

d) Design Phase:

Based on the requirements, the design phase produced multiple system models and diagrams to visualize the overall structure and flow of the application. The system architecture was defined by selecting Flutter as the cross-platform development framework, Firebase for secure cloud storage and authentication, and the GPT-4 API as the AI engine. Use case diagrams were developed to outline user interactions such as signing in, chatting with the AI, tracking moods, accessing emergency support, and managing profiles. Sequence diagrams illustrated the step-by-step interactions between system components for processes like login, chatbot conversations, and mood check-ins. An Entity Relationship Diagram (ERD) was created to model the database structure, covering entities such as users, moods, chats, and emergency contacts. Additionally, class and flowchart diagrams represented system logic and functional workflows, while user interface (UI) design mockups and prototypes were developed for key pages including onboarding, home dashboard, chatbot, mood check-in, insights, and emergency support. This structured design approach ensured that the system was both technically feasible and user-friendly.

e) Development Phase :

The development of QALBI followed the Agile methodology, emphasizing iterative testing and continuous refinement throughout the process. The technology stack comprised Dart with Flutter as the programming language and framework, Firebase Firestore as the backend for real-time secure storage, and GPT-4 Turbo integrated as the AI engine for chatbot responses. Development tools included Visual Studio Code, Figma for UI design, and supporting APIs. Several key modules were implemented, starting with the splash screen and onboarding process to guide new users into the app, followed by authentication for account registration, login, and secure credential management. The homepage dashboard served as the central hub for accessing app features, while the chatbot module provided AI-powered CBT conversations with saved chat history. The mood check-in module allowed users to log moods daily or weekly and view visual insights, and the emergency support module offered quick access to crisis hotlines and emergency contacts. Additional features included profile management for user information and customization, as well as a smooth navigation flow across modules. Through this phase, a functional prototype of QALBI was successfully developed and made ready for testing and evaluation.

6. Uses and Applications

QALBI is primarily targeted at youth aged 15–30 years, particularly students and young professionals who may face emotional challenges but hesitate to seek conventional therapy. It can also benefit NGOs, educational institutions, and mental health organizations as an outreach and support tool. Educators and researchers can use anonymized data from the app to analyze mental health trends, design targeted interventions, and further develop AI-driven psychological tools. The bilingual feature makes QALBI especially useful for rural and diverse communities.

7. Innovation Product/Project Impact

The QALBI application enhances inclusive mental health support by providing youth aged 15–30, particularly students and young professionals, with accessible and affordable assistance available anytime and anywhere. Through the integration of CBT-based chatbot guidance and mood tracking features, the app empowers users to reframe negative thoughts, develop healthier coping strategies, and build emotional resilience. Its bilingual interface, offered in both Malay and English, ensures inclusivity and relevance for diverse communities, including those in rural areas with limited access to professional therapy. By offering a safe and judgment-free digital platform, QALBI helps reduce the stigma surrounding mental health and encourages proactive management of emotional well-being. Furthermore, the application contributes to national and global efforts in promoting mental health awareness, creating opportunities for educators, NGOs, and researchers to extend outreach programs. As a scalable and adaptable tool, QALBI holds the potential to expand into community-based support networks, thereby improving overall well-being outcomes and inspiring further innovation in AI-assisted healthcare.

8. Achievements

Awarded the Best IT Product at Universiti Selangor's Final Year Project Exhibition year 2025 for the development of the QALBI application, an AI-powered mental health companion app designed to support youth through bilingual CBT-based chatbot guidance, mood tracking, and real-time emotional insights. This recognition reflects the product's technical excellence, social relevance, and potential to contribute meaningfully to national mental health advocacy.