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# Solace: Mental Health Support

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**Abstract**: *Mental health challenges continue to rise globally, creating an urgent need for accessible self-evaluation tools. Our solution, Solace is a secure, web-based platform designed to give users insight into their mental health through a structured, clinically informed assessment. After completing the evaluation, individuals receive clear feedback on their emotional state whether they're in a stable place, could benefit from self-care strategies, or might want to consider professional support. The platform also includes helpful features like mood tracking, a journal for personal reflections, encouraging messages, and useful mental health materials.*

**Keywords**: Mental health, Self-evaluation, Web-based platform, Mood tracking, Professional support

## I. INTRODUCTION

Mental health is a major issue worldwide, with more people than ever struggling with stress, anxiety, and depression. The World Health Organization (WHO) reports that roughly one in eight individuals globally deals with some form of mental health disorder. Yet, many don't have reliable ways to assess their condition or get professional help [2].

In today's fast-paced world, mental health is a critical concern, with rising stress, anxiety, and depression affecting people everywhere. Many struggle to seek professional help due to stigma, cost, or limited access to resources, making the need for accessible and user-friendly mental health apps more important than ever. Digital tools offer a private and convenient way for users to check in on their emotional well-being, track their moods, and access self-help resources. These apps play a key role in early detection, emotional regulation, and building mental resilience.

Popular mental health apps like Headspace, Moodpath, and Woebot provide features such as guided meditation, mood tracking, and cognitive behavioral therapy exercises. However, many lack thorough assessment tools, personalized feedback, and interactive journaling features that could improve user engagement.

Solace, a mental health app, addresses these gaps by offering structured self-assessments, real-time mood tracking, and therapeutic resources. By combining assessments, self-help tools, and proactive mental health management, Solace provides a well-rounded approach to emotional wellness, empowering users to take control of their mental health journey.

Built with standard web technologies (Hyper Text Markup Language (HTML), Cascading Style Sheets (CSS), JavaScript, and Bootstrap), Solace ensures smooth usability while keeping data secure through Firebase. By blending self-assessment, mood tracking, and smart content filtering, Solace aims to make mental health support more practical and accessible for everyone.

## II. LITERATURE REVIEW

The rise of digital mental health interventions reflects a growing need for accessible and scalable solutions. Mental health apps have become powerful tools in our fight against anxiety, depression, and other psychological struggles, but they are not without their limitations. Studies show that apps like Woebot, which use cognitive behavioral therapy (CBT) techniques, can genuinely help—especially when combined with support from a real therapist [1].

However, many people stop using these apps after just a few months, with only 15% sticking around long-term [7]. AI chatbots, such as Wysa and Replika, provide quick, stigma-free support for mild symptoms, but they also come with concerns like privacy risks, hidden biases in their algorithms, and the worry that people might rely too much on

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technology instead of human care [2, 8]. Shockingly, nearly 80% of mental health apps share user data with third parties, making it clear we need better regulations to protect privacy [3].

The best results seem to come from a mix of app-based tools and real therapy, but this "blended care" approach isn't always affordable or accessible [11]. For younger users, especially teens and college students, apps that feel more like games or adapt to personal needs tend to keep people engaged—though we still don't know enough about their long-term effects [5, 17, 21].

Meanwhile, new tech like smartwatches and phone sensors can now detect mood changes or even predict bipolar episodes with surprising accuracy (75-85%) by tracking things like sleep, movement, and speech patterns [6, 12, 16]. But these tools aren't perfect; they sometimes flag false alarms, and there are real worries about whether they might misdiagnose certain groups unfairly [8, 18].

A major hurdle is making sure these apps work for everyone, not just those with the latest smartphones or tech know-how. Apps like SHARP have helped people in low-income countries, but limited internet access and literacy remain big barriers [10]. Culturally adapted apps do better at engaging minority and LGBTQ+ communities, but rural areas still get left behind [13, 27].

Exciting innovations like VR therapy for PTSD or augmented reality (AR) tools for phobias are more affordable than traditional treatments, but they aren't yet widely available [9, 19]. Even blockchain, which could make data more secure, is often too complicated for everyday users [14].

There are also debates about features like social media connections in mental health apps: while they can provide much-needed peer support, they might also lead to unhealthy comparisons [25]. And when apps feel too commercial or pushy, users tend to lose trust in them [28]. Workplace mental health programs and apps for new moms show real benefits, but they need ongoing support from employers or healthcare systems to keep people engaged [20, 24].

Finally, while long-term app users often see lasting improvements, many relapse after stopping suggesting we still need better ways to help people stay well [30].

## III. METHODOLOGY

The development of the Solace Mental Health Application follows a structured, user-centered approach to ensure both technical robustness and therapeutic effectiveness. The project employs an iterative design and development process, incorporating evidence-based psychological principles while leveraging modern web technologies to create a scalable and secure platform.

The frontend interface is built using HTML5, CSS3, and JavaScript, with Bootstrap 5 ensuring responsive design across devices. This combination allows for an accessible user experience while maintaining a clean, maintainable code structure. The backend infrastructure utilizes Firebase's comprehensive suite of services, including Authentication for secure user login, Firestore for structured data storage, and Cloud Storage for housing therapeutic resources. Security is prioritized through proper configuration of Firebase rules and data encryption to comply with privacy regulations like the General Data Protection Regulation (GDPR) and the Health Insurance Portability and Accountability Act (HIPAA).

The core mental health assessment module is carefully designed using clinically validated methodologies. A 30-item questionnaire is developed with input from mental health professionals, employing Likert-scale responses to quantify subjective states. The scoring algorithm aligns with the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) symptom clusters and validates against established screening tools (PHQ-9 and GAD-7) to ensure accurate risk categorization.

*PHQ-9 (Patient Health Questionnaire-9):* A 9-item tool screening depression severity based on DSM-5 criteria, scored 0-27.

*GAD-7 (Generalized Anxiety Disorder-7):* A 7-item scale assessing anxiety severity, aligned with DSM-5, scored 0-21.

Dynamic progress indicators are implemented to enhance user engagement and reduce survey fatigue. For the therapeutic tools, evidence-based interventions are translated into digital features. The mood tracker uses emoji-based inputs linked to a database of context-aware motivational quotes. The journaling system applies principles of expressive writing therapy, with secure cloud storage and rich-text formatting. Affirmations are curated using cognitive behavioral therapy (CBT) principles, delivered through randomized algorithms weighted by user mood data.

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The evaluation process incorporates both technical testing and user feedback. Functional testing verifies system reliability, while usability studies with representative groups assess interface intuitiveness. Validation against clinical benchmarks ensures assessment accuracy, and performance metrics track engagement patterns.

## IV. SYSTEM DESIGN AND FEATURES

The Solace mental health app is designed with a simple, user-friendly workflow, as shown in the provided flowchart (Fig.1). The process starts with user authentication, where the app checks if someone is a new or returning user. New users go through a quick sign-up process while existing users can log in directly both using secure Firebase authentication to protect their data.

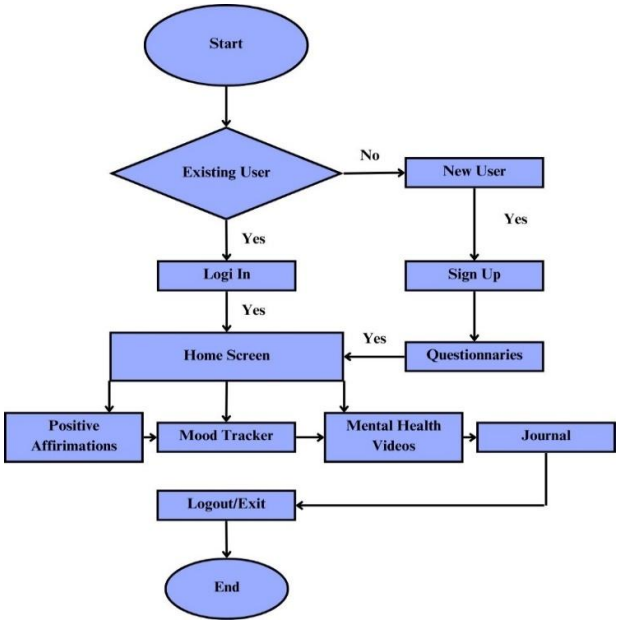


Fig. 1. Flowchart for Solace: Mental Health Application

Once logged in, users land on the home screen, which serves as the main hub for all features. From here, they can choose to take a mental health questionnaire, which gives them real-time feedback on their emotional well-being, categorizing it as low, moderate, or high risk.

The mental health questionnaire in Solace evaluates users' emotional well-being and categorizes their risk level based on symptoms of common mental health concerns, including stress, anxiety, and depression. Here's what each risk level means:

- *Low Risk:* means the user shows few or mild symptoms, suggesting they're coping well but could still benefit from self-care practices and regular emotional check-ins.
- *Moderate Risk:* indicates the user is experiencing noticeable symptoms that might be impacting their daily life, meaning they could benefit from structured self-help tools or might want to consider professional support.
- *High Risk:* suggests the user is dealing with significant distress or frequent symptoms, meaning they may need more immediate support options like therapy or crisis resources.

This system helps users recognize their mental state more clearly and decide on appropriate next steps, whether that means using Solace's built-in support features or looking into additional help. Unlike simpler mood-tracking apps that give basic scores, Solace offers specific, practical guidance based on mental health needs.

The app also offers other helpful tools, all accessible at any time:

Mood tracker where users can log their feelings using emojis, with uplifting quotes appearing based on their input.

Private journal for personal reflections, with all entries securely saved.

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A library of mental health videos and affirmations for additional support.

The design focuses on ease of use, allowing users to move freely between features without a strict sequence. When they're done, they can log out or exit, knowing their data is safely stored. By combining a clean, intuitive interface with Firebase's reliable backend, Solace ensures a smooth and secure experience for users at every step.

## V. IMPLEMENTATION

The Solace application is developed using a carefully selected technology stack to ensure robust functionality and seamless user experience. The frontend is built with HTML5, CSS3, and vanilla JavaScript, with Bootstrap 5.3 providing responsive design capabilities. For the backend, Firebase version 9.0+ is implemented for its real-time database and authentication services.

The UML diagram (Fig.2.) outlines the key interactions between users and the system, demonstrating the application's logical flow and feature integration.

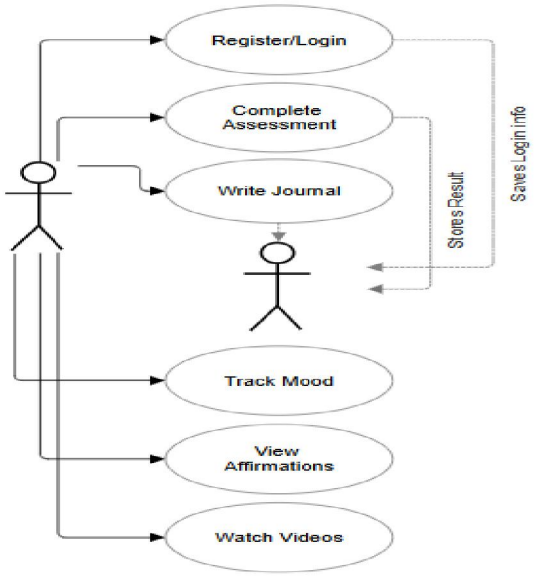


Fig. 2. UML diagram (Use Case diagram) for Solace: Mental Health Application

Below is a detailed breakdown of the implementation process and how Solace differentiates itself from existing mental health applications:

### 1. User Authentication System:

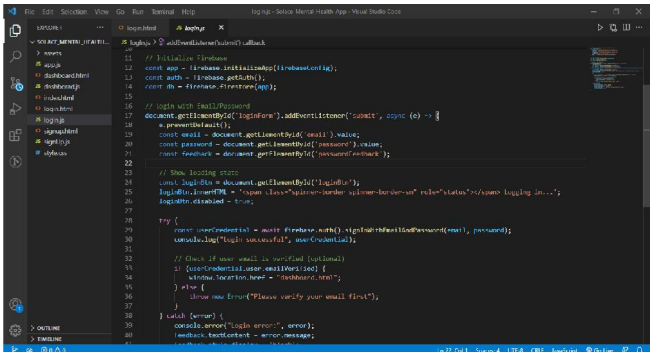

Fig. 3. User authentication module for Solace: Mental Health Application

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Email/password authentication is set up using Firebase Auth, with password strength validation and email verification. The system handles registration, login, and password recovery refer (Fig.3). Successful login redirects users to the assessment page with secure session token storage.

**2. Assessment Module Implementation:**

The assessment is developed as a dynamic multi-page component. Each question offers four response options (Never, Rarely, Sometimes, Often) with custom radio buttons for better UX. The scoring algorithm weights questions by clinical relevance, calculating the final score client-side before storing it in Firebase. Refer (Fig.4) for modules used for implementing the assessments.

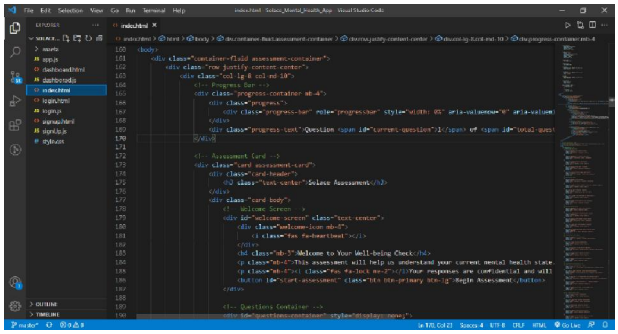

Fig. 4. Assessment module implementation for Solace: Mental Health Application

**3. Dashboard Components:**

The Solace dashboard is designed to provide users with continuous support and engagement after completing their mental health assessment snippet is shown in (Fig.5). Each component serves a unique purpose in promoting emotional wellbeing and personal reflection:

*Mood Tracker:* Custom emoji picker (5 emotional states) triggering API calls to a Firebase-hosted quotes database. Following is the pseudocode algorithm for mood tracker.

**Algorithm: Module 1 (Mood Tracker)**

**Input: selectedEmoji (string) [e.g., "😊", "😢", "😫"]**

**Output: - successStatus (boolean)**
**- motivationalQuote (string)**

```
FUNCTION MoodTracker(userId, selectedEmoji, optionalNote):
  // Validate input
  IF selectedEmoji NOT IN predefinedEmojiList:
    RETURN (false, "Invalid mood selection", null)
    // Generate contextual quote
  quote = QUOTE_DATABASE.matchQuote(selectedEmoji)
    // Prepare data object
  moodEntry = {
    userId: userId,
    emoji: selectedEmoji,
    note: optionalNote,
    quote: quote,
    timestamp: CURRENT_TIMESTAMP()
  }
    // Store in database
  TRY:
    FirebaseDB.collection('moodLogs').add(moodEntry)
        // Update user's streak if consecutive logging
    IF wasLoggedYesterday(userId):
```

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```
        incrementStreakCounter(userId)
          RETURN (true, quote, moodEntry)
      EXCEPT FirebaseError:
       RETURN (false, "Failed to save mood", null)
END FUNCTION
```

*Journal Feature:* Firestore real-time updates with CRUD operations and a rich text editor. Below is the pseudocode algorithm for journal:

```
Algorithm: Module 2 (Journal)
Input:   - userId (string)
  - entryContent (string)
  - category (string) [optional]
  - formattingOptions (object)
Output:      - successStatus (boolean)
  - encryptedJournalEntry (object)
  - storageConfirmation (string)

FUNCTION DigitalJournal(userId, entryContent, category, formattingOptions):
   // Validate minimum requirements
   IF entryContent is empty OR userId is invalid:
      RETURN (false, null, "Invalid input parameters")
     // Apply formatting if specified
   IF formattingOptions exists:
      formattedContent = applyTextFormatting(entryContent, formattingOptions)
   ELSE:
      formattedContent = entryContent
      // Create encrypted payload
   encryptionKey = getUserEncryptionKey(userId)
   encryptedContent = AES256.encrypt(formattedContent, encryptionKey)
      // Prepare journal entry object
   journalEntry = {
      userId: userId,
      encryptedData: encryptedContent,
      category: category || "uncategorized",
      timestamp: CURRENT_TIMESTAMP(),
      formatVersion: "1.0"
   }
      // Store in secure database
   TRY:
      FirebaseDB.collection('journalEntries').add(journalEntry)
      RETURN (true, journalEntry, "Entry stored successfully")

   EXCEPT DatabaseError AS e:
      RETURN (false, null, "Storage failed: " + e.message)
END FUNCTION
```

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*Video Library:* Content streamed from Firebase Storage with adaptive bitrate for different connection speeds

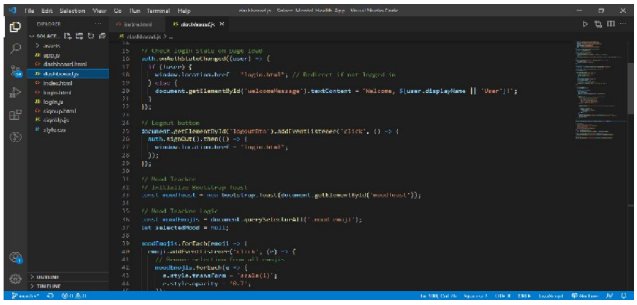

Fig. 5. Dashboard implementation

## IV. RESULT AND ANALYSIS

The standardized questionnaire survey table serves as the foundational data-collection mechanism for Solace's mental health assessment. Each clinically validated question targets specific psychological dimensions such as emotional regulation, stress levels, and social functioning using a weighted 4-point scale ranging from "Never" to "Often."

TABLE I. Questionnaire survey table

| Category | Related Questions | Max Possible Score |
|---|---|---|
| Emotional Well-Being | Q1-Q5 | 20(5Q x 4) |
| Stress and Anxiety | Q6-Q10 | 20 |
| Depression and Sadness | Q11-Q15 | 20 |
| Self-Esteem | Q16-Q20 | 20 |
| Coping Mechanisms | Q21-Q25 | 20 |
| Sleep and Physical Health | Q26-Q30 | 20 |
| Work/School Impact | Q31-Q35 | 20 |

This structured approach allows for meaningful comparisons among users while still capturing individual experiences. The questions follow psychometric best practices, with their order randomized to prevent any potential bias. When responses are combined, they create composite scores that align with recognized mental health screening methods. The table format helps users see their response patterns clearly, which can increase their understanding of their own mental health.

The data collected does more than just provide an initial assessment it also helps the app adapt over time. As users continue with the app, it personalizes recommendations based on their changing needs.

TABLE II. Classification Rules of Mental Well-being Questionnaires

| Mental state Category | Low Score (Healthy) | Moderate Score (Mild Risk) | High Score (Severe Risk) |
|---|---|---|---|
| Stress and Anxiety | 5-10 points | 11-15 points | 16-20 points |
| Depression | 5-10 points | 11-15 points | 16-20 points |
| Self-Esteem | 15-20 points (High) | 10-14 points(Medium) | 5-9 (Low) |
| Sleep Quality | Reverse score (Good = Low) | Moderate score | Poor = High |

Table II defines the scoring thresholds that categorize users' mental well-being into Low (Healthy), Moderate (Mild Risk), and High (Severe Risk) tiers across four key domains. For Stress/Anxiety and Depression, higher raw scores (16–20) indicate greater severity, aligning with clinical screening tools like the GAD-7 and PHQ-9. Self-Esteem uses inverted scoring, where lower values (5–9) reflect poorer outcomes, a convention adopted from the Rosenberg Self-Esteem Scale. Sleep Quality employs reverse coding (lower scores = better sleep) to maintain intuitive interpretation with other domains. These standardized cut-offs enable consistent risk stratification, ensuring users receive appropriately tiered recommendations. The multi-domain approach captures interrelated mental health factors, allowing for nuanced profiling beyond single-score assessments.

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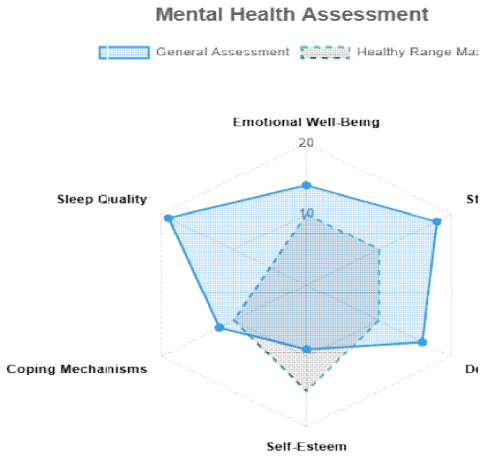


Fig. 6. Spider Chart about mental health assessment

Derived directly from the scoring thresholds outlined in Table II, (Fig.6) spider chart serves as a visual representation of the user's mental health profile. It maps raw scores onto six key psychological dimensions: Emotional Well-Being, Stress/Anxiety, Depression, Self-Esteem, Coping Mechanisms, and Sleep Quality each axis reflecting the 0–20 scoring scale. The spider chart visually interprets the user's data based on the same clinical thresholds, with reference lines (e.g., score of 10 for Stress/Depression, 15 for Self-Esteem) acting as visual indicators of risk categories. A balanced profile appears as a symmetrical hexagon, while distortions highlight areas needing attention. This visualization enhances user understanding and supports professionals in quickly identifying specific concerns using the standardized data from Table II.

The Solace Mental Health Application delivers a comprehensive digital solution designed to assess, track, and support users' psychological wellbeing through an integrated suite of evidence-based tools. The system generates these following outputs:

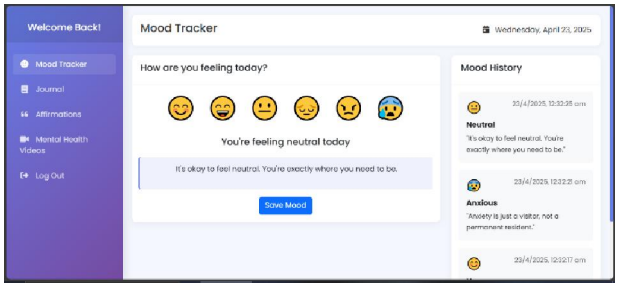


Fig. 7. Dashboard: Mood Tracker

The emoji-based affect logging system (Fig. 7) captures discrete emotional states with timestamped entries, enabling longitudinal pattern analysis. Context-aware quote recommendations leverage this data to deliver situationally appropriate cognitive reframing techniques.


Fig. 8. Journal


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Secure journaling functionality (Fig. 8) implements rich-text formatting with Firebase timestamped backups, creating an auditable emotional diary.

## VII. CHALLENGES AND LIMITATIONS

Key limitation of the Solace application is the variability in user responses to assessment questions, which are often influenced by their current emotional state. Since mood can fluctuate daily due to external factors, the answers provided may not consistently reflect the user's overall mental health condition. This can lead to inaccurate or inconsistent assessment results, potentially affecting the reliability of the risk categorization.

Additionally, gender-based physiological and emotional differences can further influence responses. For instance, females may experience mood swings due to hormonal changes during menstruation, which could affect how they respond to certain questions. Males, on the other hand, may express mental health symptoms differently due to social or psychological conditioning. These variations must be considered when interpreting results.

Moreover, users may not always answer honestly due to social desirability or self-denial, further impacting the accuracy of the evaluation. These challenges highlight the importance of continuous assessment and follow-up mechanisms for more precise insights.

## VIII. FUTURE WORK

The Solace application has significant potential for growth through advanced technological integration and expanded mental health support features. A key focus is developing an AI-powered Natural Language Processing (NLP) system to analyze and filter harmful content from users' social media feeds, helping reduce exposure to negative triggers. This involves training machine learning models to detect depressive or anxiety-inducing language patterns and offering users the option to mute or replace such content with uplifting alternatives.

Additionally, future iterations incorporate predictive analytics to identify early warning signs of mental health decline by analyzing mood journal entries and behavioral patterns over time. Integration with telehealth services enables seamless connections to licensed therapists directly through the app, bridging the gap between self-help and professional care.

Another promising direction is gamification, where users earn rewards for consistent mood tracking and self-care activities, enhancing engagement. Lastly, expanding language support and cultural adaptations makes the app more inclusive globally. By leveraging real-time data analysis, and user feedback, Solace evolves into a comprehensive, proactive mental wellness platform.

## IX. CONCLUSION

The Solace Mental Health web-based app is all about giving people real, meaningful support mixing solid psychology with a design that actually feels good to use. At its core, there's a clinically backed questionnaire that helps users get a clear, honest snapshot of their mental state. But what really makes Solace stand out is how it sticks with user through mood tracking, journaling, and daily affirmations that gently nudge you toward better self-awareness. Built with tools like Firebase and Bootstrap, the app runs smoothly, whether user is on their phone or laptop. Of course, there are challenges, like users might provide responses influenced by the desire to appear a certain way or due to a lack of self-awareness, which can affect the accuracy of the mental health assessment. These limitations underscore the need for regular reassessments and adaptive feedback to better track and understand the user's emotional state over time.

Looking ahead, Solace has big plans like filtering toxic social media content and even connecting users with therapists when needed. These aren't just pie-in-the-sky ideas; they're already in the works. The app isn't trying to replace therapy it's about giving people the tools to understand themselves better and know when it's time to reach out for help. As it grows, Solace is proving that tech can make mental health care more accessible without losing the human touch.

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