

## USER MANUAL

### 1 INTRODUCTION

The User Manual contains all essential information for the user to make full use of the information system. This manual includes a description of the system functions and capabilities, contingencies and alternate modes of operation, and step-by-step procedures for system access and use.

#### 1.1 Purpose and Scope

##### **Purpose of the User Manual for PennyPulse - A Mood Tracker Financial App:**

The purpose of this user manual is to provide comprehensive guidance and assistance to users in effectively navigating and utilizing PennyPulse, a unique mood tracker financial app. It aims to empower users with a clear understanding of the app's features, functionalities, and the seamless integration of financial tracking with emotional well-being monitoring. This manual is designed to ensure users can maximize the benefits offered by PennyPulse, promoting a holistic approach to personal finance and mental health.

##### **Scope of the User Manual:**

##### **A. Introduction to PennyPulse:**

- PennyPulse is a cutting-edge mobile application designed to redefine the way users engage with their personal finances and emotional well-being. This innovative app uniquely combines two essential aspects of life—financial tracking and mood monitoring. By seamlessly integrating these features, PennyPulse offers users a holistic approach to understanding the intricate relationship between their spending habits and emotional states.

At its core, PennyPulse recognizes that financial decisions are deeply intertwined with our emotions. The app goes beyond conventional budgeting tools by introducing a comprehensive mood tracking system. Users can effortlessly record their moods and correlate them with specific financial transactions, gaining valuable insights into the emotional context of their spending behaviors.

The dual focus on financial tracking and mood monitoring sets PennyPulse apart as a versatile tool for self-discovery and personal growth. Users can explore the impact of their emotions on financial choices and, conversely, how financial decisions influence their overall well-being. This unique synergy empowers users to make informed and mindful choices, fostering a healthier relationship with both their money and emotions.

Whether analyzing spending patterns, gaining mental health resources, receiving daily inspirational quotes, or engaging in a global chat community, PennyPulse is a comprehensive solution for those seeking a more balanced and connected lifestyle. The app's concept revolves around the belief that financial health and emotional well-being are

interconnected, and PennyPulse is here to guide users on a transformative journey towards financial mindfulness and emotional resilience.

-Welcome to PennyPulse, your all-in-one companion for transforming the way you engage with your finances and emotional well-being. Explore a rich tapestry of features designed to empower you on your journey to financial mindfulness and emotional resilience.

### **(i) Spending Analysis:**

Uncover the secrets of your financial habits with our intuitive spending analysis tools. Track, categorize, and visualize your expenses through comprehensive graphs, providing you with a clear understanding of your financial landscape.

### **(ii) Mood Tracking:**

PennyPulse recognizes the profound link between emotions and spending. Effortlessly log your moods through 4-choice notification pings every time you make a transaction and witness the dynamic interplay between your emotional states and financial decisions. Our sophisticated graphs offer a visual narrative, allowing you to gain insights and make mindful choices.

### **(iii) Mental Health Resources:**

Nurture your mental well-being with our curated collection of mental health resources. Access articles, tips, and expert insights to support your emotional journey, creating a harmonious balance between financial stability and mental wellness.

### **(iv) Inspirational Quotes:**

Elevate your spirits daily with our handpicked inspirational quotes. Designed to motivate and uplift, these quotes provide a positive mindset as you navigate the complexities of life, finances, and emotions.

### **(v) Global Chat Feature:**

Connect with a diverse community on our global chat platform. Share experiences, seek advice, and engage in conversations that transcend geographical boundaries. Forge meaningful connections as you embark on your journey towards financial and emotional well-being.

### **(vi) Graphs for Mood Monitoring and Spending:**

Visualize your progress with detailed graphs for mood monitoring and spending analysis. These visual aids offer a dynamic perspective, helping you identify patterns, set goals, and celebrate achievements.

PennyPulse is more than an app; it's a transformative experience. Embrace the synergy of financial insights and emotional awareness, and let PennyPulse guide you towards a more mindful and connected life.

## B. Getting Started:

### PennyPulse Installation Guide for iOS

Welcome to PennyPulse, your go-to app for seamless financial tracking and mood monitoring. Follow these steps to download, install, and set up PennyPulse on your iOS device:

#### Step 1: Download from the App Store

- Open the App Store on your iOS device.
- Search for "PennyPulse" in the search bar.
- Tap the "Download" button next to the PennyPulse app.

#### Step 2: Account Setup

- Open PennyPulse after installation.
- Create an account using your regular email or quickly sign up with Google, Facebook, or X API for a hassle-free setup.

#### Step 3: Privacy Policy and Terms

- Review and accept PennyPulse's privacy policy and terms and conditions to proceed.

#### Step 4: Enable Notifications

- To enhance your experience, enable notifications. You'll receive 4-choice mood selection push notifications and transaction notifications for better tracking.

#### Step 5: Link Your Card or Account

- PennyPulse uses the integrated Plaid API for secure and streamlined financial tracking.
- Link your card or connect your account by following the simple on-screen instructions.

Congratulations! You're all set to enjoy the benefits of PennyPulse, tracking your spending, monitoring your mood, and gaining valuable insights into your financial well-being. Stay tuned for future updates, including availability on Android.

Happy tracking! 🚀

## C. User Interface and Navigation:

### PennyPulse App Interface Exploration

Welcome to PennyPulse, where financial tracking meets mood monitoring in a seamlessly integrated experience. Let's explore the app's interface for a holistic understanding:

#### (i) Home Screen

- The soothing mint green background sets the tone for a calming experience.
- Your spending analytics take center stage, providing a quick overview of your financial landscape.

### **(ii) Spending Analytics**

- Navigate to the "Analytics" tab to delve into detailed spending insights.
- Interactive graphs and charts present a visual representation of your expenditures, empowering you to make informed financial decisions.

### **(iii) Mood Tracking**

- Access the "Mood Tracker" feature to log your daily emotions effortlessly.
- The app's intuitive design allows you to select your mood from a range of options including seamless 4-choice push notification everytime you transact so that you don't have to navigate to the app every time.

### **(iv) Mental Health Resources**

- Discover the "Resources" section for a curated collection of mental health support.
- From articles to videos, PennyPulse aims to nurture not just your financial well-being but your mental health too.

### **(v) Inspirational Quotes**

- Find inspiration in the "Quotes" section, where uplifting quotes await.
- A daily quote of positivity from us to brighten your financial journey.

### **(vi) Global Chat**

- Engage with the PennyPulse community in the "Global Chat" feature.
- Share experiences, insights, or seek advice, fostering a sense of connection in the financial wellness journey.

### **Navigation Tips:**

- Swipe left or right for seamless navigation between features.
- Access the menu at the bottom for quick jumps to specific sections.

Embark on a journey of financial mindfulness and emotional well-being with PennyPulse. Happy exploring! 🌟

## **D. Financial Tracking:**

### **Adding and Categorizing Expenses Based on Your Mood**

PennyPulse makes expense tracking an intuitive and personalized experience. Follow these detailed instructions to add and categorize expenses based on your mood:

#### **(i) Expense Addition:**

- Navigate to the "Spending" or "Analytics" section.

- Tap on the "+" icon to add a new expense.
- Automate this process by integrating your bank card or bank account using our in-built Plaid API integration.

### **(ii) Mood Selection:**

- As you add an expense, you'll be prompted to select your current mood.
- Choose from a range of mood options that resonate with your emotional state at the time of the expense.
- If you automated the transaction collection process through the linking of your bank card or account, then the app will send you push notifications asking for your mood every time you make a transaction.

### **(iii) Categorization:**

- Specify the category of the expense, such as no groceries, entertainment, or bills.
- PennyPulse offers a user-friendly category list for easy classification.
- If the transactions get logged automatically through Plaid, then the app will just add whatever your bank statement says under "Other" categories.
- Future versions will have automatic detection of categories from bank transactions.

### **(iv) Amount and Details:**

- Enter the expense amount and any additional details you wish to include.
- The more details, the better the app adapts to your spending habits.
- This would again be automated if you linked your bank card or bank account through our in-built Plaid API integration.

### **(v) Save and Analyze:**

- Save the entry to include it in your spending history.
- Will be taken care of automatically if your bank account or bank card is linked in the app.
- The app will automatically correlate your mood with the expense, providing valuable insights into the emotional context of your spending.

## **Guidance on Interpreting Spending Patterns and Trends:**

### **(i) Access Analytics:**

- Head to the "Analytics" tab for an in-depth view of your spending patterns.

### **(ii) Mood-Based Insights:**

- Explore how your mood correlates with spending by checking the mood-specific analytics.
- Identify trends and patterns that link emotions to financial decisions.

### **(iii) Set Goals:**

- Utilize the app's goal-setting feature to align spending targets with your emotional well-being.

- Receive notifications and insights to stay on track.

#### **(iv) Historical Trends:**

- Delve into historical data to understand your long-term spending habits.
- PennyPulse offers a visual representation of trends to empower proactive financial choices.

By incorporating mood into your expense tracking, PennyPulse transforms financial management into a personalized, insightful journey. Enjoy a holistic understanding of your spending habits and emotional connections! 📊✨

### **E. Mood Tracking:**

#### **Recording and Analyzing Moods in PennyPulse**

Accurately recording and analyzing moods in PennyPulse is a seamless process, providing valuable insights into the correlation between spending behavior and emotional well-being. Follow these steps for an enriching experience:

##### **(i) Mood Recording:**

- Head to the "Mood Tracker" or similar section in the app.
- Tap on the "+" icon to record your current mood.
- If you automated the transaction collection process through the linking of your bank card or account, then the app will send you 4-choice push notifications asking for your mood every time you make a transaction.

##### **(ii) Mood Selection:**

- Choose from the diverse range of mood options provided.
- Feel free to be specific; PennyPulse encourages honest and nuanced mood entries.

##### **(iii) Time Stamp:**

- The app automatically timestamps each mood entry, capturing the temporal aspect of your emotional state.

##### **(iv) Optional Notes:**

- Include optional notes to contextualize your mood further.
- Share any relevant details, events, or feelings to enhance the app's understanding.

##### **(v) Save and Reflect:**

- Save the mood entry to build a comprehensive history over time.
- Will be taken care of automatically if your bank account or bank card is linked in the app.
- Reflect on your moods within the app to gain self-awareness and insights.

## Understanding the Correlation:

### (i) Explore Analytics:

- Navigate to the "Analytics" or "Insights" section of PennyPulse.
- Look for features that highlight the relationship between spending patterns and recorded moods.

### (ii) Mood-Specific Spending:

- Dive into mood-specific spending analytics to see how each emotion aligns with your financial decisions.
- Identify trends and outliers to better comprehend your habits.

### (iii) Set Spending Goals:

- Leverage the app's goal-setting functionality.
- Align spending targets with your desired emotional well-being to create a balanced financial lifestyle.

### (iv) Receive Personalized Insights:

- PennyPulse employs advanced algorithms to provide personalized insights.
- Receive notifications and recommendations based on the app's analysis of your spending and mood data.

By consistently recording your moods and exploring the app's analytics, you unlock a powerful tool for self-discovery and financial mindfulness. PennyPulse is designed to empower you on your journey to holistic well-being and financial health! 🌟📈

## F. Mental Health Resources:

### PennyPulse Mental Health Resources: A Comprehensive Overview

PennyPulse goes beyond financial tracking, prioritizing your holistic well-being. Here's an insightful look into the mental health resources available within the app:

### (i) Diverse Range of Resources:

- PennyPulse offers a curated selection of articles, tips, and tools designed to support your mental well-being.
- From expert insights to practical self-help strategies, we've compiled a diverse range of resources to cater to various needs.

### (ii) Accessing Articles:

- Navigate to the "Mental Health" section on the app's home screen. Here, you'll find a collection of articles addressing different aspects of mental well-being.
- Explore topics such as stress management, mindfulness, and building resilience for a more comprehensive understanding.

### **(iii) Tips for Well-being:**

- Find quick and actionable tips to integrate into your daily routine for improved mental health.
- Whether it's mindful breathing exercises or productivity hacks, PennyPulse provides practical suggestions tailored to your lifestyle.

### **(iv) Interactive Tools:**

- Engage with interactive tools designed to enhance your mental health journey.
- From mood tracking features to goal-setting exercises, our tools are user-friendly and impactful, promoting an active and positive mindset.

### **(v) Personalized Recommendations:**

- Receive personalized recommendations based on your mood patterns and spending behavior.
- Our algorithm tailors suggestions to your unique preferences, ensuring a more relevant and meaningful user experience.

### **(vi) Seamless Integration:**

- Accessing mental health resources is intuitive within the PennyPulse app, fostering a seamless user experience.
- Whether you're a seasoned advocate for mental well-being or just starting your journey, our resources cater to all levels of engagement.

### **Why PennyPulse?**

- We believe in a holistic approach to well-being, recognizing the interconnectedness of financial health and mental well-being.
- PennyPulse is not just an app; it's your companion in fostering a balanced and fulfilling life.

Embark on your journey to financial and mental well-being with PennyPulse — where your holistic health is our priority.

## **G. Quotes and Inspiration:**

### **PennyPulse Quotes Feature: Elevating Your Daily Experience**

Discover how the Quotes feature in PennyPulse is designed to uplift your mood and positively influence your financial habits:

#### **(i) Inspiring Daily Quotes:**

- Immerse yourself in a daily dose of motivation with PennyPulse's Quotes feature.
- Each day, you'll encounter handpicked inspirational quotes aimed at fostering a positive mindset and encouraging mindful financial practices.

#### **(ii) Mood Elevation Through Wisdom:**



- Quotes have a profound impact on mood, and PennyPulse leverages this by integrating uplifting messages into your daily routine.
- As you engage with these motivational snippets, experience a boost in positivity that extends to your financial decision-making.

### **(iii) Reinforcing Financial Resilience:**

- PennyPulse's Quotes are strategically chosen to align with themes of financial responsibility, resilience, and empowerment.
- By incorporating these messages into your routine, you're not just receiving motivation — you're reinforcing a mindset that supports healthy financial habits.

### **(iv) Seamless Integration:**

- The Quotes feature seamlessly integrates into your daily app usage, appearing prominently on the home screen.
- As you track your spending and monitor your mood, let these quotes be a constant source of encouragement and inspiration.

### **(v) Personalized Selection:**

- PennyPulse understands that motivation is a personal journey, and our Quotes feature reflects that.
- Expect a diverse selection of quotes curated to resonate with your unique journey, ensuring a personalized and meaningful user experience.

### **(vi) Impact on Financial Habits:**

- Research indicates a strong link between positive affirmations and behavior change. PennyPulse capitalizes on this connection to positively influence your financial habits.
- Watch as daily exposure to motivational quotes contributes to a more mindful and intentional approach to your financial decisions.

### **Why Quotes Matter:**

- PennyPulse is not just about numbers; it's about nurturing a positive mindset that extends to your financial well-being.
- The Quotes feature is our way of infusing your financial journey with daily inspiration, making each interaction with the app a moment of growth and empowerment.

Elevate your mood and financial habits with PennyPulse — where wisdom meets wealth on your journey to financial well-being.

## **H. Global Chat Feature:**

### **Global Chat in PennyPulse: Building a Supportive Community**

Explore the Global Chat feature in PennyPulse, designed to foster community interaction and create a respectful, supportive environment:

**(i) Connecting with the PennyPulse Community:**

- Global Chat is your gateway to connecting with a diverse community of PennyPulse users worldwide.
- Engage in meaningful conversations, share insights, and build connections with individuals who share a common interest in financial well-being and mood tracking.

**(ii) Accessing the Global Chat:**

- Easily access the Global Chat feature from the app's main menu.
- Join ongoing discussions, ask questions, and participate in a community-driven space focused on the intersection of mood, spending habits, and personal finance.

**(iii) Guidelines for Participation:**

- To ensure a positive experience for all users, PennyPulse has established clear guidelines for participating in the Global Chat.
- Familiarize yourself with these guidelines to contribute to a constructive and inclusive community atmosphere.

**(iv) Creating a Supportive Environment:**

- PennyPulse values every user's journey, and the Global Chat is a space to uplift and support one another.
- Contribute to a positive atmosphere by offering encouragement, sharing experiences, and providing valuable insights that enhance the collective financial well-being of the community.

**(v) Respectful Interaction:**

- Respect is at the core of the PennyPulse community. Engage in discussions with empathy, acknowledging diverse perspectives and experiences.
- The Global Chat is a space where users can learn from one another, share challenges, and celebrate victories on the path to financial empowerment.

**(vi) Moderation for Quality:**

- PennyPulse employs a moderation system to ensure the quality of interactions within the Global Chat.
- Moderators are committed to maintaining a respectful environment, addressing concerns, and fostering a space where users feel heard and supported.

**(vii) Community-Driven Features:**

- PennyPulse continually evolves based on user feedback. The Global Chat is a space to share your thoughts on app features, suggest improvements, and actively contribute to shaping the PennyPulse experience.

**Join the Conversation:**

- Immerse yourself in the Global Chat within PennyPulse — a space where your voice matters, your experiences are valued, and together, we build a community that thrives on financial well-being and positive vibes.

Connect, share, and grow with PennyPulse's Global Chat today!

## I. Troubleshooting and FAQs:

### **Troubleshooting Tips and FAQs: Navigating PennyPulse with Ease**

Encountering an issue or have a question? Explore this guide for common solutions and frequently asked questions to ensure a seamless experience on PennyPulse:

#### **Common Issues and Solutions:**

##### **(i) Transaction Not Recorded:**

- Ensure you've granted necessary permissions for PennyPulse to access transaction data.
- Check your account connectivity; reauthorize if necessary.

##### **(ii) Notification Issues:**

- Verify that notifications are enabled for PennyPulse in your device settings.
- In-app notification settings can be adjusted in the PennyPulse app for a personalized experience.

##### **(iii) Difficulty Adding Bank Cards:**

- Confirm that the card you're trying to add is supported.
- Check your internet connection; a stable connection is required for card integration.

##### **(iv) Graphs Not Updating:**

- Graphs may take a moment to refresh; pull down to manually update.
- If issues persist, log out and log back in to refresh data.

#### **Frequently Asked Questions (FAQs):**

##### **(i) How Do I Change My Mood?**

- Navigate to the Mood Tracker section.
- Tap on your current mood to explore and select a new one.

##### **(ii) Is PennyPulse Available on Android?**

- Currently, PennyPulse is available exclusively on iOS. Android development is underway; stay tuned for updates.

##### **(iii) Where Can I Find Mental Health Resources?**

- Access mental health resources via the main menu under "Wellness."
- Explore articles, tips, and tools for supporting your mental well-being.

##### **(iv) How Often Should I Record My Mood?**

- Record your mood whenever you make a transaction or at a frequency that feels right for you.

- Consistent tracking provides valuable insights into the connection between mood and spending habits.

### **(v) What Security Measures Are in Place?**

- PennyPulse prioritizes user security; transactions are encrypted, and sensitive data is protected.
- Review our Privacy Policy for detailed information on security measures.

### **(vi) How Can I Contribute to the Global Chat?**

- Access the Global Chat feature from the main menu.
- Join ongoing conversations, share your experiences, and connect with the PennyPulse community.

### **(vii) What Should I Do If I Encounter a Bug?**

- Report any bugs through the in-app support feature or via our official support email.
- Include details on the issue for a prompt resolution.

Navigating PennyPulse is a breeze with these helpful tips. For additional support, explore our FAQs or reach out to our dedicated support team. Happy tracking!

## **J. Conclusion:**

### **Unlocking Balance with PennyPulse: Your Quick Guide**

Embark on a journey of financial mindfulness and mental well-being with PennyPulse! Here are key takeaways to enhance your experience:

#### **(i) Seamless Integration:**

- Enable notifications for real-time mood tracking prompts with each transaction.
- Connect your accounts effortlessly using the integrated Plaid API.

#### **(ii) Dive into Mood Insights:**

- Regularly record your mood to uncover patterns and correlations with spending habits.
- Leverage intuitive graphs to visualize the impact of your mood on financial decisions.

#### **(iii) Wellness Resources:**

- Explore a wealth of mental health resources under the "Wellness" section.
- Access articles, tips, and tools to support your journey to holistic well-being.

#### **(iv) Daily Motivation:**

- Experience daily motivational quotes contributing to a positive user experience.
- Witness the uplifting impact of motivational quotes on both mood and financial choices.

#### **(v) Global Community:**

- Engage in the Global Chat feature for community interaction.
- Foster a respectful and supportive environment while connecting with other PennyPulse users.

## **Troubleshooting and FAQs:**

- Refer to our Troubleshooting guide for quick issue resolution.
- Explore FAQs to find answers to common questions and make the most of PennyPulse.

## **Your Journey Awaits:**

- Embrace the unique intersection of financial tracking and mood monitoring.
- Make PennyPulse a daily companion on your path to balanced living.

Discover the power of mindful spending and emotional well-being. Start your PennyPulse journey today!

By addressing the above aspects, this user manual aims to facilitate a positive and informed user experience, encouraging users to seamlessly integrate PennyPulse into their daily lives.

## **1.2 Organization**

### **User Manual Organization: Navigating Your PennyPulse Guide**

Welcome to the organized and user-friendly PennyPulse User Manual! Here's a breakdown of how it's structured to help you effortlessly navigate the features and maximize your PennyPulse experience:

#### **(i) Introduction:**

- Brief overview of PennyPulse, its dual focus on financial tracking and mood monitoring, and the unique offerings.
- A warm welcome to the world of mindful spending and well-being.

#### **(ii) Installation Guide:**

- Step-by-step instructions for downloading and installing PennyPulse on iOS, with future considerations for Android.
- Account setup details, including options like email, Google, Facebook, or X API.
- Notification settings guidance for mood prompts and transaction alerts.

#### **(iii) Interface Exploration:**

- In-depth exploration of the app's soothing mint green interface.
- Feature placement and functionality overview, guiding you through spending analytics, mood tracking, mental health resources, quotes, and the global chat.

#### **(iv) Expense Management:**

- Detailed instructions on adding and categorizing expenses based on your mood.

- Insightful guidance on interpreting spending patterns and trends for informed financial decisions.

**(v) Mood Tracking:**

- Accurate recording and analysis of moods within the app.
- Understanding the correlation between spending behavior and emotional well-being.

**(vi) Additional Features:**

- Accessing mental health resources, articles, tips, and tools for comprehensive well-being.
- Exploring daily motivational quotes and their impact on mood and financial habits.
- Engaging in the global chat for community interaction with a focus on maintaining a respectful and supportive environment.

**(vii) Troubleshooting and FAQs:**

- Common issues and solutions section for quick problem resolution.
- Frequently asked questions for easy reference and assistance.

**(viii) Key Takeaways and Encouragement:**

- Summary of essential insights gathered from each section.
- Encouragement to make the most of PennyPulse for a balanced financial and mental well-being journey.

Your PennyPulse User Manual is designed to be your go-to companion. Happy exploring!

## 1.3 Points of Contact

**User Support and Assistance:**

At PennyPulse, we are committed to ensuring your seamless experience. Should you need assistance or have inquiries, our dedicated support system is here for you. Here's a breakdown of the support structure:

**(i) Organization Codes:**

- Unique organization codes are assigned for streamlined communication and issue resolution.
- Include these codes when reaching out for prompt and personalized assistance.

**(ii) Support Staff:**

- Our knowledgeable support staff is readily available to address your queries and provide assistance.
- Primary contact information for key support personnel is listed below.

**Primary Support Contacts:**

- Hrishikesh Vikram
- Role: Chief Developer/CEO

- Contact: hvikram@uab.edu
- Shreyas Srinivasa
  - Role: Project Management/Product Owner
  - Contact: ssriniva@uab.edu

### **(iii) Alternates:**

- In the absence of primary support staff, alternates are designated to ensure continuity in assistance.
- Alternates' contact information is provided below.

### **Alternate Support Contacts:**

- Warren Spencer
  - Role: Chief Architect/UX Developer
  - Contact: [warrens2@uab.edu](mailto:warrens2@uab.edu)
- Matthew Garron
  - Role: Customer Service Representative
  - Contact: [meg707@uab.edu](mailto:meg707@uab.edu)
- Sean-Morgan Neville
  - Role: Designer/Web App Developer
  - Contact: [seannev@uab.edu](mailto:seannev@uab.edu)
- Shrijan Pant
  - Role:
  - Contact:

### **(iv) Help Desk Facility:**

- Our centralized help desk facility is equipped to handle a range of queries and technical issues.
- Accessible via +1 (619)764-3321, our help desk ensures swift issue resolution.

### **(v) Telephone Assistance Organization:**

- For urgent matters or immediate assistance, our telephone assistance organization is just a call away.
- Dial +1 (619)764-3321 to connect with our responsive team.

Feel free to reach out whenever needed. We are dedicated to making your PennyPulse experience smooth and enjoyable.

## 1.4 Project References

### Bibliography of Key Project References:

Throughout the development process of PennyPulse, we have relied on a variety of key references and deliverables to shape and enhance our system. The following bibliography provides a comprehensive list of crucial documents and resources:

#### A. Firebase Documentation:

- Firebase has been an integral part of PennyPulse, facilitating real-time database management, authentication, and cloud functions. Refer to [Firebase documentation](#) for in-depth insights into its features and implementation.

#### B. Swift Documentation:

- Swift, the programming language for iOS app development, has played a pivotal role in crafting a seamless user experience on PennyPulse. Consult [Swift documentation](#) for a thorough understanding of language features and best practices.

#### C. Plaid API Documentation:

- PennyPulse leverages the Plaid API for secure and efficient financial data integration. Explore the [Plaid API documentation](#) for details on financial transactions, account linking, and data security.

#### D. PennyPulse User Manual:

- The PennyPulse User Manual serves as a comprehensive guide for users, offering insights into app features, setup instructions, and usage guidelines. Refer to this manual for a detailed overview of PennyPulse functionalities.

#### E. Design and UX Guidelines:

##### (a) Design Principles:

**(i) Simplicity:** Keep the interface clean and simple, ensuring users can easily navigate and understand the app's features.

**(ii) Consistency:** Maintain a consistent design language and user interface elements throughout the app for a seamless experience.

**(iii) Accessibility:** Ensure the app is accessible to users of all abilities, including those with disabilities, by adhering to accessibility standards.

**(iv) Visual Hierarchy:** Prioritize and emphasize key features based on user needs, with clear visual cues to guide them through the app.

**(v) Feedback and Confirmation:** Provide instant feedback for user actions, and confirm critical actions to avoid errors and misunderstandings.



## **(b) User Experience Guidelines:**

- (i) Mood-Driven Insights:** Tailor financial insights based on the user's mood, providing a unique and personalized experience.
- (ii) Real-time Notifications:** Enable users to receive notifications for mood selections and transactions, fostering a connection between emotional states and spending habits.
- (iii) Data Privacy:** Prioritize and communicate the security of user data, ensuring compliance with industry standards and regulations.
- (iv) Graphical Representation:** Utilize graphs and visualizations to represent spending patterns and mood trends over time, aiding users in understanding their financial and emotional journey.
- (v) Educational Resources:** Offer easily accessible mental health resources, articles, and tools within the app to support users' emotional well-being.

## **(c) Industry Standards:**

- (i) [Material Design \(by Google\)](#):** A design system that offers guidelines for creating intuitive and consistent user interfaces.
- (ii) [Human Interface Guidelines \(by Apple\)](#):** Apple's design guidelines for creating apps with a seamless and native feel on iOS devices.
- (iii) [WCAG \(Web Content Accessibility Guidelines\)](#):** A set of guidelines ensuring web content is accessible to a wide range of people with disabilities.
- (iv) [Financial Industry Regulatory Authority \(FINRA\) Guidelines](#):** Compliance standards for financial apps, ensuring transparency and protecting user interests.

## **F. System Architecture and Flow Diagrams:**

- Detailed system architecture and flow diagrams have been instrumental in mapping out the technical structure of PennyPulse. These documents guide the development team in ensuring a scalable and efficient system.

## **G. Industry Best Practices and Standards:**

- Adhering to industry best practices and standards is crucial for developing a robust and secure application. References to these standards have guided the development team in maintaining code quality and security.

**(i) Coding Standards:**

- **JavaScript/TypeScript:** Followed [Airbnb JavaScript Style Guide](#) and [Google TypeScript Style](#).
- **Python:** Adhered to [PEP 8](#) for Python coding standards.

**(ii) Security Standards:**

- **OWASP:** Followed the [Open Web Application Security Project](#) guidelines, especially the [OWASP Top Ten](#).
- **NIST Cybersecurity Framework:** Referenced the [National Institute of Standards and Technology \(NIST\) Cybersecurity Framework](#).

**(iii) Web Development Best Practices:**

- Followed [W3C Web Content Accessibility Guidelines \(WCAG\)](#).
- Adhered to [Responsive Web Design Best Practices](#).

**(iv) Version Control:**

- Used [Git](#) for version control and followed [Gitflow](#) or [GitHub Flow](#) workflows.

**(v) API Design:**

- Followed [RESTful API Design Guidelines](#) for designing APIs.
- Adhered to [GraphQL Best Practices](#).

**(vi) Cloud Computing:**

- Followed [Google Cloud Well-Architected Framework](#).

**(vii) Database Design:**

- Followed [Database Normalization](#) principles.
- Adhered to [ACID](#) properties for database transactions.

**(viii) Testing Standards:**

- Implemented [Test-Driven Development \(TDD\)](#).
- Adhered to [Behavior-Driven Development \(BDD\)](#) principles.

**(ix) Agile Development:**

- Followed the [Agile Manifesto](#).
- Implemented [Scrum](#) or [Kanban](#) methodologies.

**(x) Continuous Integration/Continuous Deployment (CI/CD):**

- Implemented [Jenkins](#) or [GitLab CI/CD](#).
- Adhered to [Continuous Delivery Best Practices](#).

This bibliography reflects the diverse array of resources that have contributed to the development of PennyPulse. Each item listed has played a unique role in shaping the app's functionality, design, and overall success.

## 1.5 Primary Business Functions

In this crucial section, we unveil the core business functions that define the PennyPulse experience. Picture this: users seamlessly navigating through expense tracking, mood monitoring, and engaging with an array of features designed for their financial and mental well-being. The upcoming sections will be your guide, unveiling the intricate design and functionality curated to elevate these pivotal aspects. Let's embark on a journey to uncover how PennyPulse is not just an app but a comprehensive companion for a balanced and enriched life.

Imagine PennyPulse as your personal companion on the journey to holistic well-being. The core business functions revolve around three pillars: financial tracking, mood monitoring, and overall well-being. Each aspect is meticulously designed to offer a seamless and enriching user experience.

### **Financial Tracking:**

PennyPulse provides a sophisticated platform for users to track their spending, offering detailed insights into financial habits. Through interactive graphs and analytics, users can visualize their expenditures, set budgets, and receive real-time notifications. The hypothetical user, let's call them Alex, can effortlessly categorize expenses based on mood, providing a unique blend of financial awareness and emotional intelligence.

### **Mood Monitoring:**

Alex's emotional well-being is seamlessly integrated into PennyPulse. The app sends regular mood selection notifications, prompting Alex to record their feelings. The platform utilizes intuitive graphs to showcase mood patterns over time. If Alex experiences a positive mood shift after a particular spending habit, PennyPulse recognizes and highlights this correlation, fostering a deeper understanding of the connection between emotions and financial behaviors.

### **Overall Well-being:**

PennyPulse goes beyond traditional finance apps. It offers a curated selection of mental health resources, inspirational quotes, and a global chat for community support. Suppose Alex encounters a stressful financial situation. In that case, they can access articles, tips, and tools within the app, creating a comprehensive ecosystem that nurtures both financial and mental well-being.

The platform draws inspiration from industry best practices, ensuring a user-friendly interface and robust security. Our journey will reveal how PennyPulse leverages cutting-edge technology, making it a standout solution in the realm of personal management apps.

## 1.6 Glossary

- See Appendix A.

## 2 SYSTEM CAPABILITIES

### Key Capabilities:

#### (i) Financial Tracking:

- Intuitive Spending Analytics: Visualize your spending habits with interactive graphs and analytics.
- Real-time Notifications: Receive instant alerts to stay on top of your budget and financial goals.
- Categorized Expenses: Effortlessly categorize expenses based on your mood, adding a unique emotional touch to financial management.

#### (ii) Mood Monitoring:

- Regular Mood Check-ins: Receive notifications to record your current mood, fostering emotional awareness.
- Graphical Mood Analysis: Explore mood patterns over time through user-friendly graphs.
- Correlation Insights: Discover correlations between spending behavior and emotional well-being.

#### (iii) Overall Well-being:

- Mental Health Resources: Access curated articles, tips, and tools for enhanced mental well-being.
- Inspirational Quotes: Daily motivational quotes to uplift your mood and inspire positive financial habits.
- Global Chat: Engage with a supportive community to share experiences and insights.

### Innovative Design Principles:

PennyPulse's visual identity is crafted based on design principles and user experience guidelines referenced above in section 1.4 E. The mint green background creates a soothing atmosphere, ensuring a comfortable and pleasant user interface. The placement and functionality of each feature are carefully designed, providing an effortless navigation experience.

As we delve deeper, we'll explore how PennyPulse goes beyond industry standards, incorporating cutting-edge technology, security measures, and a user-centric approach. Get ready to embark on a journey that redefines personal management apps.

## 2.1 Purpose

PennyPulse serves as a revolutionary application system with a dual focus on financial tracking and mood monitoring. The primary purpose is to empower users with a holistic approach to personal well-being by seamlessly integrating financial management, emotional awareness, and community engagement. Through its innovative design and capabilities, PennyPulse aims to redefine the way individuals perceive and manage their finances, fostering a positive and mindful approach to both monetary and emotional aspects of life.

## 2.2 General Description

PennyPulse is an all-encompassing application system designed to revolutionize the user experience through its multifaceted capabilities. The system operates on three key pillars: financial tracking, mood monitoring, and community engagement. Here's an overview of its high-level functions:

### (i) Financial Tracking:

- **Expense Logging:** Users can effortlessly log and categorize their expenses, gaining insights into spending patterns.
- **Graphical Spending Analysis:** Intuitive graphs provide a visual representation of expenditure trends, aiding in informed financial decisions.

### (ii) Mood Monitoring:

- **Real-time Mood Updates:** Users receive periodic notifications prompting them to log their current mood, fostering emotional awareness.
- **Graphical Mood Analysis:** Visual representation of mood fluctuations over time, allowing users to identify patterns and correlations.

### (iii) Community Engagement:

- **Global Chat Feature:** A collaborative space for users worldwide to share experiences, tips, and support.
- **Inspirational Quotes:** Daily motivational quotes contribute to a positive user experience, enhancing both mood and financial habits.

The system's seamless operation and user-friendly interface, complemented by engaging graphics and tables, make it a powerful tool for individuals seeking a balanced approach to financial and emotional well-being.

### (iv) Resource Hub for Mental Health:

- **Comprehensive Mental Health Resources:** A dedicated section providing articles, tips, and tools to support users' mental well-being.
- **Integration with Community:** Users can discuss mental health topics in the global chat, fostering a supportive environment.
- **Notification Pings:** Regular notifications alert users to check out new mental health resources, ensuring continual support.

This additional function enriches PennyPulse by offering a holistic approach to users' financial and mental well-being.

### 3 DESCRIPTION OF SYSTEM FUNCTIONS

#### **System Function Overview:**

This section serves as a comprehensive guide to understanding the distinct functions within PennyPulse. Each subsequent subsection outlines a specific function, replacing "Function X" with the actual function name. The conventions within each subsection include:

#### **(i) Function X Title:**

- Clearly identifies the name of the specific system function.

#### **(ii) Detailed Description of Function:**

- Provides an in-depth understanding of the purpose, uses, initialization, execution options, inputs, expected outputs, and relationships to other functions.

#### **(iii) Preparation of Function Inputs:**

- Defines the necessary inputs, including titles, descriptions, purposes, mediums, limitations, formats, sequencing, special instructions, and examples.

#### **(iv) Results:**

- Describes the anticipated results, including descriptions, forms, output details, report generation, usage instructions, restrictions, relationships to inputs, function-specific error messages, and help messages.

This systematic approach ensures a structured and coherent exploration of each function, facilitating a detailed comprehension of PennyPulse's capabilities. Each subsequent section following this format delves into specific functions, elucidating their unique contributions to the application.

## 3.1 Spending Analysis Function

### A. Detailed Description of Function:

This function analyzes users' spending patterns and provides insights to enhance financial decision-making. It includes:

- **Purpose and Uses:** To offer a comprehensive view of spending habits, enabling informed financial planning.
- **Initialization:** Triggered when a user accesses the Spending Analysis feature.
- **Execution Options:** Users can customize the time range for analysis (weekly, monthly, yearly).
- **Function Inputs:** Transaction data, selected time range.
- **Expected Outputs and Results:** Graphical representation of spending trends, categorized expenses, and personalized insights.
- **Relationship to Other Functions:** Influences budget recommendations and mood tracking.
- **Summary of Function Operation:** Aggregates and processes transactional data to generate visual reports on spending habits.

### B. Preparation of Function Inputs:

- **Title of Input:** Transaction Data
- **Description:** Records of user transactions.
- **Purpose and Use:** To analyze spending patterns.
- **Input Medium:** Automatically retrieved from linked accounts.
- **Limitations and Restrictions:** Limited to available transaction data.
- **Format and Content:** Date, amount, merchant, category.
- **Sequencing of Inputs:** Chronological order of transactions.
- **Special Instructions:** Ensure all accounts are linked for accurate analysis.
- **Relationship to Outputs:** Influences the accuracy of spending trend reports.
- **Examples:** Sample transaction data with various categories.

## C. Results:

- **Description of Results:** Graphical representation of spending trends, expense breakdowns.
- **Form in Which Results Appear:** Visual charts and graphs.
- **Output Form and Content:** Categorized spending reports.
- **Report Generation:** Generated upon user request.
- **Instructions on Use of Outputs:** Interpret graphs to identify areas for potential savings.
- **Restrictions on Use of Outputs:** Limited to the accuracy of input data.
- **Relationship of Outputs to Inputs:** Outputs directly reflect the analyzed transaction data.
- **Function-Specific Error Messages:** "Insufficient data for analysis. Please ensure all accounts are linked."
- **Function-Specific Help Messages:** "Explore spending trends to make informed financial decisions."

## 3.2 User Insight Integration Function

### A. Detailed Description of Function:

- Provides an in-depth understanding of the purpose, uses, initialization, execution options, inputs, expected outputs, and relationships to other functions.
- **Purpose and Uses:** Integrates user insights to enhance personalization and recommendations.
- **Initialization:** Automatic upon user interaction.
- **Execution Options:** Continuous background analysis.



## B. Preparation of Function Inputs:

- Defines the necessary inputs, including titles, descriptions, purposes, mediums, limitations, formats, sequencing, special instructions, and examples.

- **Title of Inputs:** User behavior data.
- **Description:** Captures user interactions for analysis.
- **Medium:** Secure data transmission.
- **Limitations:** Adheres to privacy regulations.
- **Format:** Encrypted JSON format.
- **Examples:** Sample user interaction scenarios.

## C. Results:

- Describes the anticipated results, including descriptions, forms, output details, report generation, usage instructions, restrictions, relationships to inputs, function-specific error messages, and help messages.

- **Description of Results:** Enhanced spending recommendations.
- **Form:** Real-time notifications.
- **Output Details:** Personalized insights dashboard.
- **Report Generation:** Daily, weekly, and monthly summaries.
- **Usage Instructions:** Explore personalized recommendations.
- **Restrictions:** Data anonymization for privacy.
- **Relationships to Inputs:** Tailors recommendations based on user behavior.
- **Function-Specific Error Messages:** "Insufficient data for analysis."
- **Help Messages:** "Explore personalized insights for informed financial decisions."

## 3.3 Global Community Chat Function

### A. Detailed Description of Function:

- Provides an in-depth understanding of the purpose, uses, initialization, execution options, inputs, expected outputs, and relationships to other functions.
- **Purpose and Uses:** Facilitates interaction and support within the global PennyPulse community.
- **Initialization:** User opt-in upon account setup.
- **Execution Options:** Real-time, asynchronous chat.

### B. Preparation of Function Inputs:

- Defines the necessary inputs, including titles, descriptions, purposes, mediums, limitations, formats, sequencing, special instructions, and examples.
- **Title of Inputs:** User-generated messages.
- **Description:** Textual content for community engagement.
- **Medium:** Encrypted text transmission.
- **Limitations:** Adherence to community guidelines.
- **Format:** Plain text with optional media attachments.
- **Examples:** Welcome messages, financial queries, success stories.

### C. Results:

- Describes the anticipated results, including descriptions, forms, output details, report generation, usage instructions, restrictions, relationships to inputs, function-specific error messages, and help messages.
- **Description of Results:** Global chat feed with user interactions.
- **Form:** Real-time chat interface.
- **Output Details:** User-generated content.

- **Report Generation:** None; content is real-time.
- **Usage Instructions:** Engage, share, and support in the community.
- **Restrictions:** Compliance with community guidelines.
- **Relationships to Inputs:** Builds a collaborative community.
- **Function-Specific Error Messages:** "Failed to send message; try again."
- **Help Messages:** "Connect with the global community for shared insights."

## 3.4 Inspiration Hub Function

### A. Detailed Description of Function:

- Provides an in-depth understanding of the purpose, uses, initialization, execution options, inputs, expected outputs, and relationships to other functions.
- **Purpose and Uses:** Offers users a space for curated inspirational content related to financial success and well-being.
- **Initialization:** Direct access from the app's main menu.
- **Execution Options:** Browse categories, search, and receive personalized recommendations.

### B. Preparation of Function Inputs:

- Defines the necessary inputs, including titles, descriptions, purposes, mediums, limitations, formats, sequencing, special instructions, and examples.
- **Title of Inputs:** User preferences, search queries.
- **Description:** Criteria for personalized recommendations.
- **Medium:** Text and media content.
- **Limitations:** None; user-driven exploration.
- **Format:** Multimedia content, searchable tags.
- **Examples:** Financial goals, mood-related searches.

## C. Results:

- Describes the anticipated results, including descriptions, forms, output details, report generation, usage instructions, restrictions, relationships to inputs, function-specific error messages, and help messages.

- **Description of Results:** Inspirational content feed.
- **Form:** Visual cards with quotes, success stories, and financial tips.
- **Output Details:** User-curated inspiration boards.
- **Report Generation:** None; content is user-driven.
- **Usage Instructions:** Explore, save favorites, and share.
- **Restrictions:** None; user-driven exploration.
- **Relationships to Inputs:** Personalized inspiration based on preferences.
- **Function-Specific Error Messages:** "Failed to load inspiration; try again."
- **Help Messages:** "Discover financial inspiration tailored to your preferences."

## 3.5 Financial Goal Planner Function

### A. Detailed Description of Function:

- Provides an in-depth understanding of the purpose, uses, initialization, execution options, inputs, expected outputs, and relationships to other functions.

- **Purpose and Uses:** Facilitates the creation, tracking, and achievement of financial goals.
- **Initialization:** Accessed from the app's main menu.
- **Execution Options:** Set new goals, track progress, receive insights.

### B. Preparation of Function Inputs:

- Defines the necessary inputs, including titles, descriptions, purposes, mediums, limitations, formats, sequencing, special instructions, and examples.

- **Title of Inputs:** Goal details, target amount, deadline.

- **Description:** Comprehensive goal information.
- **Medium:** Text and numerical input.
- **Limitations:** Deadline must be realistic.
- **Format:** Structured goal-setting form.
- **Examples:** "Save \$5,000 for emergency fund by December 2024."

### C. Results:

- Describes the anticipated results, including descriptions, forms, output details, report generation, usage instructions, restrictions, relationships to inputs, function-specific error messages, and help messages.

- **Description of Results:** Visual representation of goal progress.
- **Form:** Goal progress bar, insights.
- **Output Details:** Notifications on milestones, insights on spending habits.
- **Report Generation:** Progress reports, savings trends.
- **Usage Instructions:** Set new goals, update progress, receive insights.
- **Restrictions:** None; user-driven goal setting.
- **Relationships to Inputs:** Progress tied to goal details.
- **Function-Specific Error Messages:** "Invalid deadline; please set a realistic date."
- **Help Messages:** "Track and achieve your financial goals with personalized insights."

## 3.6 Expense Analyzer and Categorizer Function

### A. Detailed Description of Function:

- Provides an in-depth understanding of the purpose, uses, initialization, execution options, inputs, expected outputs, and relationships to other functions.
- **Purpose and Uses:** Analyze and categorize expenses for informed financial decision-making.
- **Initialization:** Accessed from the app's main menu.
- **Execution Options:** Upload receipts, categorize expenses, view spending patterns.

### B. Preparation of Function Inputs:

- Defines the necessary inputs, including titles, descriptions, purposes, mediums, limitations, formats, sequencing, special instructions, and examples.
- **Title of Inputs:** Expense details, receipts.
- **Description:** Comprehensive expense information.
- **Medium:** Image upload and text input.
- **Limitations:** Accurate receipt images for better categorization.
- **Format:** Expense categorization form.
- **Examples:** "Dinner at XYZ Restaurant - \$50."

### C. Results:

- Describes the anticipated results, including descriptions, forms, output details, report generation, usage instructions, restrictions, relationships to inputs, function-specific error messages, and help messages.
- **Description of Results:** Visual representation of spending patterns, categorized expenses.
- **Form:** Graphical representation of spending categories.
- **Output Details:** Categorized expense list, insights on spending habits.
- **Report Generation:** Monthly spending reports, category-wise breakdown.
- **Usage Instructions:** Upload receipts, categorize expenses, track spending trends.
- **Restrictions:** Accuracy dependent on user-input data.
- **Relationships to Inputs:** Categorization tied to expense details.
- **Function-Specific Error Messages:** "Invalid receipt; please upload a clear image."
- **Help Messages:** "Gain insights into your spending habits by categorizing expenses accurately."

## 3.7 Mood Tracker Function

### A. Detailed Description of Function:

- Provides an in-depth understanding of the purpose, uses, initialization, execution options, inputs, expected outputs, and relationships to other functions.
- **Purpose and Uses:** Track and monitor daily mood for mental health awareness.
- **Initialization:** Accessible from the app's main dashboard.
- **Execution Options:** Log mood daily, set mood-related goals, view historical mood data.

### B. Preparation of Function Inputs:

- Defines the necessary inputs, including titles, descriptions, purposes, mediums, limitations, formats, sequencing, special instructions, and examples.
- **Title of Inputs:** Daily mood selection, goal setting.
- **Description:** User's mood on a scale and personalized goals.
- **Medium:** In-app interface with mood selection sliders.
- **Limitations:** Daily mood entries for accurate tracking.
- **Format:** Mood selection interface with goal-setting prompts.
- **Examples:** "Feeling happy today; goal - maintain positivity."

### C. Results:

- Describes the anticipated results, including descriptions, forms, output details, report generation, usage instructions, restrictions, relationships to inputs, function-specific error messages, and help messages.
- **Description of Results:** Historical mood data, graphical mood trends.
- **Form:** Line chart depicting mood variations over time.
- **Output Details:** Mood logs, insights into mood patterns.
- **Report Generation:** Weekly or monthly mood summaries.

- **Usage Instructions:** Log daily moods, set achievable mood goals.
- **Restrictions:** Dependent on consistent daily mood tracking.
- **Relationships to Inputs:** Historical mood data linked to daily entries.
- **Function-Specific Error Messages:** "Please log your mood for today."
- **Help Messages:** "Track your mood for a clearer understanding of your emotional well-being."

## 4 OPERATING INSTRUCTIONS

### System Operating Instructions

Welcome to PennyPulse, your all-in-one financial and mental well-being companion. Follow these step-by-step instructions to make the most of our innovative platform.

#### (i) Account Setup:

- Download the PennyPulse app from the App Store (currently available on iOS).
- Create your account using your email, Google, Facebook, or X API.
- Enable notifications for mood prompts, transaction updates, and insights.

#### (ii) Personalization:

- Customize your profile with a photo and personal details.
- Set your mood preferences and receive personalized insights.

#### (iii) Adding Financial Information:

- Connect your bank account or add cards securely using the integrated Plaid API.
- Review and accept the privacy policy and terms and conditions.

#### (iv) Explore Spending Analytics:

- Navigate to the Spending Analytics section to track and categorize your expenses or edit the categories that are predetermined by our intuitive AI.
- Gain insights into your spending patterns and trends.

#### (v) Mood Tracking:

- Participate in mood tracking by responding to timely notifications.
- Explore the correlation between your spending behavior and emotional well-being.

#### (vi) Access Mental Health Resources:

- Visit the Resource Hub to explore articles, tips, and tools for mental well-being.
- Discover quotes and daily motivations for a positive experience.

#### (vii) Global Chat Interaction:



- Join the global chat for community interaction.
- Ensure a respectful and supportive environment for all users.

**(viii) Troubleshooting and FAQs:**

- Visit the Help Center for common issues and solutions.
- Refer to FAQs for quick problem resolution.

**(ix) Key Takeaways:**

- Summarize your PennyPulse experience and encourage balanced financial and mental well-being.
- Explore regularly to discover new features and updates.

Enjoy your journey with PennyPulse, where financial empowerment meets mental well-being. If you encounter any challenges, our Help Center is here to assist you.

## 4.1 Initiate Operation

The PennyPulse application is designed to guide users through the system login and setup, ensuring a smooth start to accessing its functionalities. Below are the steps to initiate and navigate the application's initial operations:

**User Action:** Launches the application for the first time.

**System Response:** Presents the user with a sign-up/login screen.

**User Action:** Inputs email and password for registration.

**System Response:** Validates and registers the user using Firebase Auth, leading to an onboarding process.

**User Action:** Inputs login credentials on subsequent visits.

**System Response:** Authenticates the user using Firebase Auth and redirects to the dashboard.

## 4.2 Maintain Operation

### Software Maintenance Procedures

To ensure seamless operation and address potential issues, follow these user-friendly maintenance procedures for PennyPulse:

**(i) Regular Updates:**

- Check for app updates regularly on the App Store.
- Enable automatic updates for the latest features and improvements.

**(ii) Data Refresh:**

- Periodically refresh your spending data by syncing your accounts.
- Navigate to the Settings menu and select "Refresh Data."

**(iii) Notification Settings:**

- Review and update your notification preferences in the app settings.
- Ensure mood prompts and transaction notifications are enabled for the best experience.

**(iv) Profile Review:**

- Regularly review and update your profile information.
- Adjust mood preferences or personal details as needed.

**(v) Troubleshooting:**

- If you encounter any issues, visit the Help Center in the app.
- Explore common problems and solutions for quick resolution.

**(vi) Security Check:**

- Keep your account secure by updating your password periodically.
- Enable two-factor authentication for an added layer of protection.

**(vii) Feedback and Suggestions:**

- Share your feedback and suggestions through the app.
- Help us enhance your PennyPulse experience by providing valuable insights.

**(viii) Community Engagement:**

- Participate in the global chat for community interaction.
- Stay informed about any updates, maintenance, or new features.

**(ix) Help and Support:**

- For in-depth assistance, reach out to our support team via the app.
- Submit a support ticket with details about the issue you're facing.

By following these maintenance procedures, you contribute to the optimal performance of PennyPulse. Our commitment is to provide a reliable and empowering platform, and your proactive engagement ensures a positive user experience. Thank you for being a part of the PennyPulse community!

## 4.3 Terminate and Restart Operations

**Normal Termination**

- To exit the PennyPulse application:
  - On IOS:
    - Swipe up from the bottom of the screen to view the app switcher.

- Find the PennyPulse application in the app switcher.
- Swipe the PennyPulse app window upward.

By following these instructions, you can successfully terminate the PennyPulse application on your device, ensuring proper closure of the application when not in use.

## Unscheduled Termination

- In unexpected circumstances where the PennyPulse application experiences a system crash or unexpected termination, follow these steps:
  - Restart your mobile device following the instructions provided by the device's manufacturer.
  - For IOS Devices:
    - press and hold the power button and any volume button simultaneously until the power slider appears on the screen.
    - Drag the slider to power off the device
    - Once powered down hold the power button again until the Apple logo appears

## 5 ERROR HANDLING

The PennyPulse application includes various error messages to assist users in troubleshooting issues they may encounter during operation. Below is a list of potential error messages and their numeric error codes.

### Error code 101- Network Connection Unavailable

- **Meaning:** This error occurs when the application detects an unstable or unavailable network connection.
- **Resolution:**
  - Check your device's internet connectivity.
  - If using Wi-Fi, ensure you are within the range of a stable network.
  - If using mobile data, ensure it's enabled and has sufficient signal strength.
  - Try closing and reopening the PennyPulse application
  - Restart your device if the issue persists.

### Error code 204 - Account Authentication Failure

- **Meaning:** This error occurs when there is a problem with the user authentication during login.
- **Resolution:**
  - Ensure the correct email and password are entered
  - Check for typos or errors in the login credentials.
  - Restart your password through the Forgot Password option
  - Contact support if the issue persists

### Error code 500 - Internal Server Error

- **Meaning:** This error occurs due to a server side problem.
- **Resolution:**
  - Close the application and reopen it to see if the error persists
  - Check for any announced maintenance or server-related issues
  - If the problem persists, contact support for further assistance

## Error code 700 - Data Sync Failure

- **Meaning:** This error indicates a failure in synchronizing data with the server.
- **Resolution:**
  - Ensure a stable internet connection and try again.
  - Check for any restrictions or firewalls that might block data transmissions.
  - Log out and back in to initiate a new attempt.

## 5.1 HELP FACILITIES

The PennyPulse application is equipped with various resources and support channels to assist users in resolving issues or seeking guidance. Below are the available help facilities.

- **In App Support:**
  - Access the application's built-in help and support resources.
  - Find FAQs, tutorials, and guides within the app for assistance with features and functionalities.
- **Contact Customer Support:**
  - For further assistance or inquiries, users can reach out to our dedicated customer support team.
  - Help desk email: [hvikram@uab.edu](mailto:hvikram@uab.edu)
  - Customer support hotline: +1 (619)764-3321
- **Online Resources:**
  - Visit the PennyPulse website for additional information, updates, and FAQs.

## Appendix A: Glossary

1. **PennyPulse:** The name of the unique mood tracker financial app that combines financial tracking and mood monitoring for a holistic approach to personal finance and emotional well-being.
2. **Spending Analysis:** The feature within PennyPulse that allows users to track, categorize, and visualize their expenses through comprehensive graphs for a better understanding of their financial landscape.
3. **Mood Tracking:** A function in PennyPulse where users can effortlessly log their moods, correlated with specific financial transactions, to understand the emotional context of their spending behaviors.
4. **Mental Health Resources:** A curated collection of articles, tips, and expert insights available within the app to support users' emotional well-being and mental health journey.

5. **Inspirational Quotes:** Daily motivational quotes provided within PennyPulse to uplift users' spirits and encourage a positive mindset as they navigate life, finances, and emotions.
6. **Analytics:** The section of the app where users can delve into detailed spending insights, explore interactive graphs, and charts that visually represent their expenditures.
7. **Plaid API:** An integrated tool within PennyPulse used for secure and streamlined financial tracking by linking users' bank cards or accounts to the app.
8. **Home Screen:** The initial screen upon opening PennyPulse, displaying spending analytics, mood tracking, mental health resources, inspirational quotes, and global chat access.
9. **Expense Addition:** The process of adding new expenses within the app, where users can categorize, specify details, and save their spending history.
10. **Categorization:** Assigning specific categories (e.g., groceries, entertainment, bills) to expenses for better classification and analysis within PennyPulse.
11. **Amount and Details:** Inputting the expense amount and any additional information to provide a comprehensive overview of spending habits.
12. **Goal-setting:** Functionality allowing users to set spending targets aligned with their emotional well-being within the app.
13. **Interpreting Spending Patterns:** Analyzing spending trends, identifying correlations between mood and expenses, and utilizing insights to make informed financial decisions.
14. **Receive Notifications and Insights:** Feature allowing users to receive notifications and insights based on their spending and mood data to stay on track and make informed financial decisions.
15. **Historical Trends:** Analysis of long-term spending habits presented visually within PennyPulse, empowering users to make proactive financial choices based on past trends.
16. **Mood Tracking:** The process of recording and analyzing emotions within PennyPulse to understand the correlation between spending behavior and emotional well-being.
17. **Mood Recording:** The act of logging current moods within the app's Mood Tracker or similar sections to create a history of emotional states.
18. **Time Stamp:** Automatic timestamping of mood entries, capturing the temporal aspect of the user's emotional state for reference and analysis.
19. **Optional Notes:** Additional contextual information or details provided by users alongside mood entries to enrich the app's understanding of their emotional context.
20. **Personalized Insights:** Tailored recommendations and notifications provided by PennyPulse based on the analysis of a user's spending habits and recorded moods.
21. **Global Chat:** A platform within PennyPulse allowing users to engage with a diverse community, share experiences, seek advice, and build connections related to financial and emotional well-being.
22. **Analytics or Insights:** Sections within PennyPulse that present visual representations and detailed insights into spending patterns, mood correlations, and personalized recommendations.
23. **Goal-Setting:** A feature in PennyPulse enabling users to set spending targets aligned with desired emotional well-being, encouraging a balanced financial lifestyle.
24. **Daily Quotes:** A section in PennyPulse presenting daily inspirational quotes to uplift users' moods and encourage mindful financial practices.

25. **Wisdom and Wealth Integration:** The concept in PennyPulse where motivational quotes intersect with financial habits to inspire positive changes in users' financial decision-making.