Project: Personal Finance and Budgeting Application

Members:
Abdelrahman Emad
Malak Mowaffak
Omar Ahmed
Tariq Mohamed
Ziad Osama

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Introduction:

Purpose:

This project focuses on developing a Personal Finance and Budgeting Application, a web platform designed to empower users to effectively manage their money by simplifying the process of tracking income, categorizing expenses and setting detailed budgets.

The application allows users to securely create an account; add and categorize all transactions; create monthly or weekly budgets for various needs and visualize their spending habits and budget adherence using dashboards and charts with an added capability to set and track progress toward savings goals. Simultaneously, the system includes an Admin component responsible for managing user accounts, monitoring application usage and generating essential anonymized reports on user trends to ensure the platform runs smoothly.

Scope:

The scope is to document the design, functionality and implementation of the development of a complete Personal Finance Assistant web application. It covers all user-facing features like secure authentication, real-time transaction syncing, and customizable budgeting driven by an AI Bot for automation and proactive insights. It also includes the full Admin system for user management and security, strictly constrained by the requirement to protect all user card details.

Overview:

Funder specializes in real-time financial control. It features secure access, AI-driven automation (categorization, smart budgeting, and fraud alerts), and visual tools for tracking goals and spending. The system is backed by an Admin console for security and analytics, maintaining user trust by strictly protecting all card details. The SRS outlines the purpose, scope and intended audience. Focusing on the design and architecture of ‘Funder’. The document serves as a comprehensive guide for developers, testers and stakeholders ensuring consistent implementations and maintenance through sections that cover functional design, interface specifications and architectural components.

Similar Systems:

MINT

Mint is a widely-used, free personal finance application designed to help users track and manage their money effortlessly. It automatically connects to bank accounts, credit cards and bills to categorize transactions in real time, giving users a clear overview of their income and expenses. The app provides budgeting tools, alerts for bills and overspending and insights into financial habits, including credit score monitoring. Its visual dashboards, charts, and graphs make it easy for users to understand their spending patterns and make informed financial decisions.

YNAB

YNAB is a budgeting-focused application that emphasizes zero-based budgeting, helping users assign every dollar a purpose and take control of their financial goals. Unlike traditional budgeting tools, YNAB encourages proactive financial planning by tracking income, expenses and future goals. It provides real-time transaction syncing with bank accounts, customizable categories and detailed reports to show spending patterns over time. By promoting a hands-on approach to money management, YNAB helps users reduce debt, save effectively and maintain a disciplined budgeting routine.

PocketGuard

PocketGuard is a personal finance app that simplifies budgeting by clearly showing users how much money is available to spend after accounting for bills, goals and recurring expenses. It automatically tracks income and expenses by connecting to bank accounts, credit cards and bills by categorizing transactions to give a straightforward view of disposable income. The app provides insights into spending habits through visual summaries, alerts to prevent overspending and goal-setting features that help users stay on track with saving and budgeting. Its focus on simplicity makes it ideal for users who want fast and actionable insights into their finances.

MoneyWiz

MoneyWiz is a comprehensive finance management application that supports budgeting, expense tracking, and investment monitoring. Users can link multiple accounts to track income and expenses automatically. It provides reports and charts to visualize financial habits and offers features for planning future expenses. MoneyWiz is designed for people who want detailed control over their money in one app.

System overview:

Funder is a personal finance platform providing users with secure account syncing, automated budgeting and goal tracking, backed by an Admin panel for security and analytics:

Key features:

1. **Smart Financial Management:**
   Users can track income, expenses and budgets automatically through real-time syncing, AI categorization and visual dashboards.

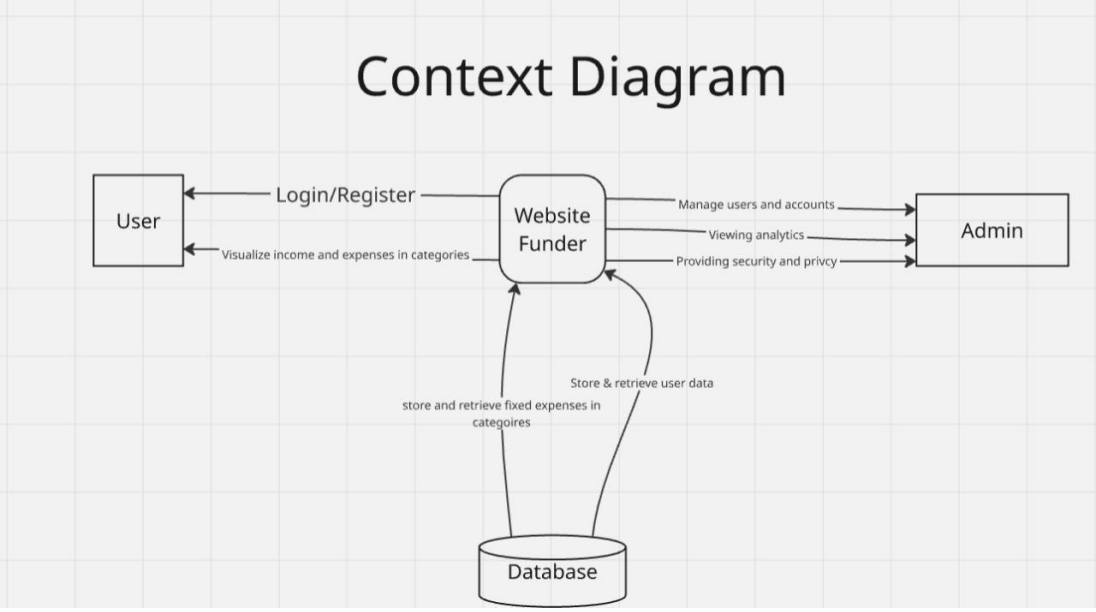
2. **AI-Powered Assistance:**
   An intelligent chatbot provides spending insights,The system analyzes monthly spending. If spending in a category (e.g., 'Dining') exceeds the budget by more than 75%, the assistant triggers an alert: You are close to exceeding your Dining budget.The system allows a user to set a custom transaction amount limit. If a transaction exceeds this limit, the system flags it for the user's review and helps users manage goals and budgets conversationally.

3. **Strong Security & Admin Control:**
   Secure access with PIN, biometrics, and two-factor authentication; admins manage users, monitor system activity, and ensure privacy without accessing sensitive financial details.

Target Users:

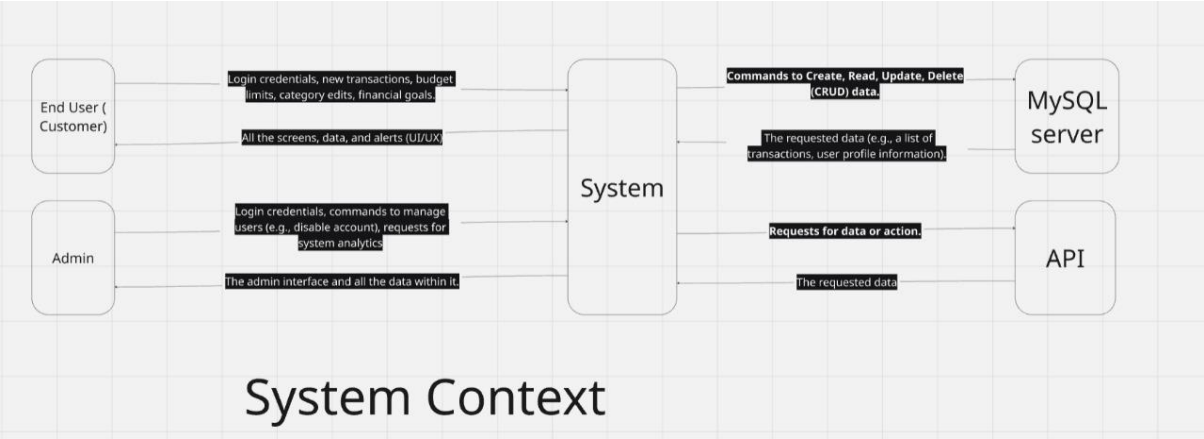
1. Clients: Individuals who want to track income, expenses and savings
2. Admins: Manages user accounts, database and system maintenance

System Environment:



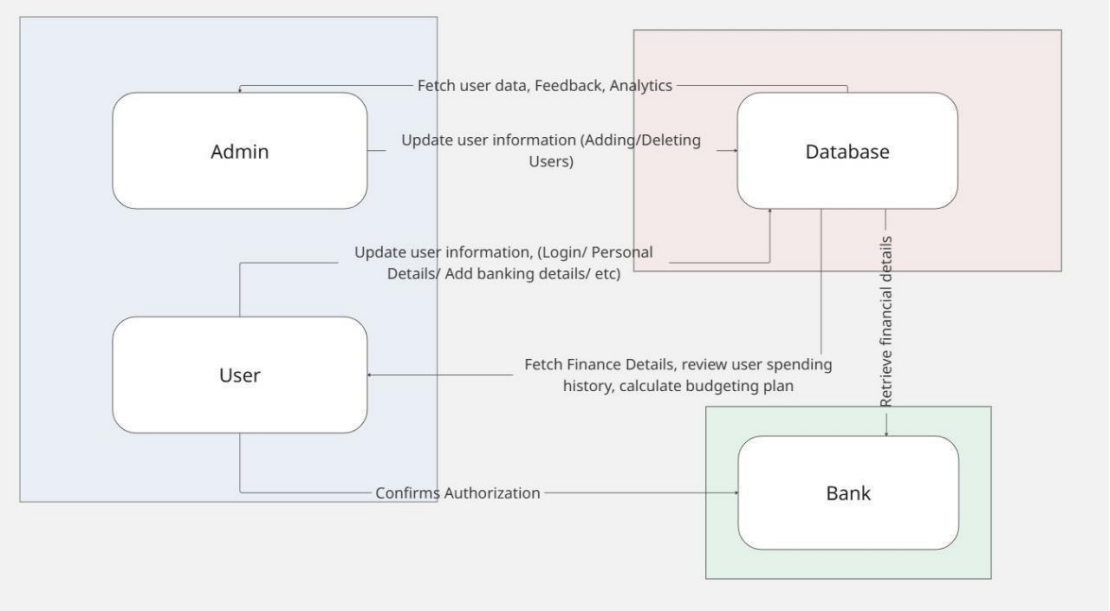
1 context diagram

System Context:



1 system context diagram

Interface viewpoint:



2 interface viewpoint

What is expected from each criterion?

ADMIN:

The admin oversees system security, user management and communication while ensuring privacy. They can delete inactive accounts, view analytics and monitor unauthorized access without seeing card details. Additionally, they manage stakeholders such as end users, service providers, and banks.

USER:

The user can sign up and log in securely using their personal details. They can create custom income and expense categories to organize their finances and link debit or credit cards for automatic transaction syncing.

AI BOT:

The AI bot tracks and categorizes expenses, offering smart budgets, insights and personalized financial tips. It alerts users when spending exceeds income and provides real-time data, charts, and fraud detection for better financial management.

SYSTEM & SECURITY:

Users can securely access their accounts with email, SMS, PIN or biometric verification. They can sync transactions in real time, create budgets, track financial goals and monitor progress visually. The app also offers customization, subscription tracking, and an ‘My Funds’ feature showing remaining funds.

System Boundaries:

The application is limited to personal financial management, focusing on tracking income, expenses, budgets, and savings goals. It does not handle real money transfers or direct banking operations. While it analyzes linked account data for insights, it cannot access or store full card details or sensitive banking information. The application will facilitate the linking of user bank accounts through a secure, certified third-party API provider (e.g., Plaid). The application itself will never store or handle user bank login credentials. All credential authentication and data aggregation is delegated to the third-party API. Our system will only store and use the tokenized financial data (e.g., transaction amounts, dates, and merchant names) returned by this API for the purposes of categorization, budgeting, and insight generation.

Functional and Non-functional requirements:

Functional requirements define the services the system should provide, including how it should react to inputs and behave in specific situations, and they may specify what the system should not do. Non-functional requirements are constraints on the services or functions, such as timing constraints and standards which often apply to the system as a whole.

Functional requirements:

User requirements:

- Secure user sign-up and login with email verification and two-factor authentication
- The user shall be able to add, edit, or delete income and expense records
- Linking debit and credit cards for real-time transaction syncing
- Creating personal income and expense categories
- Creating and customizing budget plans based on spending patterns
- Setting and tracking financial goals with progress visualizations (charts or graphs)
- The user shall be able to export reports in formats like PDF
- Receiving AI-powered recommendations, alerts, and fraud detection notifications
- The user shall be able to securely link their bank accounts via a third-party API, granting the application read-only access to transaction data
- The system shall allow the user to unlink a bank account at any time, revoking API access

Admin Requirements:

- Admin can view and manage user accounts.
- Admin can monitor transaction logs.
- Admin can handle reported fraud cases.
- The admin shall be able to view a list of all registered users, showing their email, registration date, and status (Active/Inactive)
- The admin shall be able to deactivate a user account, preventing that user from logging in
- The admin shall be able to view the total number of active users and the total number of transactions recorded in the system

System Requirements:

- Tracking income, expenses and balances automatically
- Viewing insights, reports and dashboards for financial analysis (The system shall display a summary of the user's monthly income and expenses)
- The system shall generate visual reports (charts or graphs) showing spending habits.
- The system shall ensure data security so that personal financial data is protected.
- The system shall automatically categorize a transaction as 'Uncategorized' if the user does not select a category
- The system shall calculate and display the user's current balance as: Total Income vs Total Expenses
- The system shall prevent a user from setting a budget with a negative amount

Non-functional requirements:

Security:

- Secure user sign-up and login with email verification and two-factor authentication
- Ensure personal financial data is protected (encryption, secure storage, access control)
- Fraud detection notifications and alerts to maintain system integrity

- All user passwords shall be hashed in the database
- User sessions shall expire after 30 minutes of inactivity
- Admin and User data and interfaces shall be strictly separated
- All tokenized financial data stored in the application's database shall be encrypted.

Performance:

- The system shall load the user's dashboard within 3 seconds of login
- Generating a PDF report shall take no longer than 10 seconds

Scalability:

- Designed to handle a growing number of users and transactions efficiently.

Reliability:

- Ensures continuous availability and accurate financial data syncing.
- Accurate tracking and reporting of income, expenses, budgets, and goals
- The application shall have an uptime of 99% during core development testing periods

Usability:

- Easy-to-use interface for adding/editing income and expenses
- Intuitive dashboards and charts for tracking budgets and financial goals
- The interface shall be intuitive enough for a non-technical user to add a new transaction within 3 clicks from the dashboard
- The system shall be used on modern web browsers (Chrome, Firefox, Edge) from a desktop or laptop

Maintainability:

- Easy to update system features, fix bugs, and integrate new AI-powered recommendations
- The code shall be well-documented with comments to allow for easy feature addition by other developers

Compatibility:

- Works across different devices and operating systems seamlessly.

Privacy:

- Protects sensitive financial information and complies with data protection regulations.

Financial Management System Scenario

INITIAL ASSUMPTION:

The user has successfully created an account, verified their email and set up two-factor authentication. They are currently logged in to the system to manage their finances.

NORMAL:

The user navigates to the transactions section to add a new income or expense record. They enter the amount and specify its category then add their payment method and the date for transaction is automatically set up. The user then navigates to the budgeting tool to create or customize a budget plan. He also can review a visual report (chart or graph) to track progress toward their financial goals. The AI Bot provides a recommendation for saving money based on their recent activity and spending patterns. Finally, the user can generate a report in PDF format for their personal records.

WHAT CAN GO WRONG:

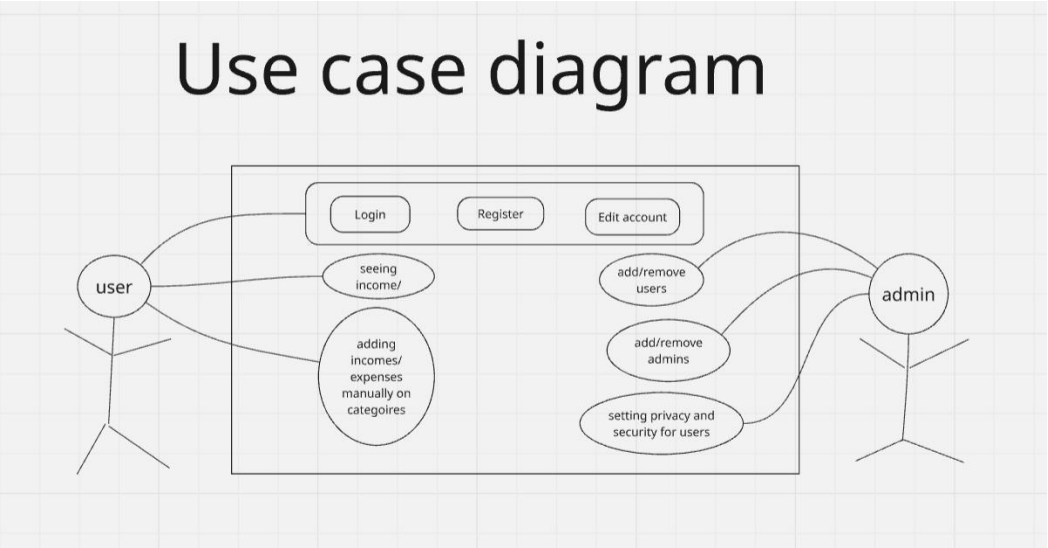
- Failed Login: The login attempt fails due to incorrect credentials or a network issue. The system would display a clear error message and provide options to retry or recover credentials.
- Transaction Sync Failure: Transactions fail to sync with a linked card. The system notifies the user of the failure and allows for manual entry of the transactions.
- Invalid Input: The user attempts to save a duplicate or invalid category name or a budget plan with impossible constraints. The system triggers a prompt to edit the input or select a different option.
- AI Service Unavailability: AI recommendations are temporarily unavailable due to a system issue. The user is informed and told they can access the feature once the service is restored.
- The third-party banking API is unreachable, the user's bank is undergoing maintenance, or the access token has expired.

OTHER ACTIVITIES:

While the user is adding or editing records, the system ensures smooth operation even if another user in the household is simultaneously updating a different part of the financial records. All system activities are constantly maintaining strict data privacy to prevent unauthorized external access.

SYSTEM STATE ON COMPLETION:

The user is logged on. All newly added or edited income and expense records, budget plans, and financial goals are permanently saved in the database. Linked card transactions are fully synchronized. A comprehensive system log records all user actions, AI alerts, and report export events, along with the date and time, ensuring a secure and reliable record of the session.



3 use case diagram

Scenarios:

Scenario One: User login

Use Case ID: 001

Use Case Name: User Login

Actor: User

Description: Allows a registered user to log in using their email and password.

Precondition: The user must have a registered account.

Main Flow:

1. The user enters their email and password.
2. The system verifies the credentials.
3. The system logs the user in and displays the dashboard.

Alternative Flow:

- If credentials are invalid, the system shows an error message: *'Incorrect email or password.'*

Postcondition:
The user gains access to their personal finance dashboard.

Scenario Two: Adding expense record

Use Case ID: 002

Use Case Name: Adding Expense Record

Actor: User

Description: Allows the user to add a new expense to track daily spending.

Precondition: The user must be logged in.

Main Flow:

1. The user selects ‘Add Expense’ from the dashboard.
2. The system displays a form with fields such as amount, date and category.
3. The user fills in the expense details.
4. The user clicks “Save.”
5. The system validates the data and saves the record in the database.
6. The system updates the total expenses and balance.
7. The system displays a confirmation message: ‘Expense added successfully’.

Alternative Flow:

- If any required field is missing, the system displays an error: ‘Please fill all required fields.’
- If invalid data is entered the system prompts the user to correct it.

Postcondition: The new expense appears in the user’s transaction history, and the total balance is updated.

Scenario Three: User uses AI tool

Use Case ID: 003

Use Case Name: Use AI Financial Assistant

Actor: User

Description: Allows the user to get AI-powered recommendations, alerts, and insights to manage their income, expenses, budge, and financial goals effectively.

Precondition: The user must be logged in and have at least one income or expense record.

Main Flow:

1. The user navigates to the AI Assistant section.
2. The system prompts the user to select a task, such as budget recommendations, expense optimization or goal tracking advice.
3. The user selects a task.
4. The system analyzes the user’s financial data using AI algorithms.
5. The AI provides recommendations, charts or alerts based on spending patterns and goals.
6. The user reviews the suggestions and chooses to accept, modify or ignore them.

7. The system updates budgets, goals or alerts according to the user's choice.

Alternative Flow:

- If the AI cannot generate a recommendation due to insufficient data, the system prompts the user to add more transactions.
- If the user disagrees with a suggestion, they can provide feedback to improve AI accuracy.

Postcondition: The user receives actionable AI-driven advice, helping them optimize spending, save money, or stay on track with financial goals.

Scenario Four: Admin manages user accounts

Use Case ID: 004

Use Case Name: Manage User Accounts

Actor: Admin

Description: Allows the admin to view, edit, deactivate or delete user accounts for system management and security.

Precondition: The admin must be logged in with administrative privileges.

Main Flow:

1. The admin navigates to the User Management section.
2. The system displays a list of all registered users.
3. The admin selects a user to manage.
4. The system displays the user's account details.
5. The admin can edit user information, deactivate or delete the account.
6. The system confirms the changes and updates the database.

Alternative Flow:

- If the admin attempts to delete an active account linked to financial data, the system prompts a warning and requires confirmation.

Postcondition:
The user account is updated, deactivated, or removed according to the admin's actions.

Scenario Five: Admin monitors system transactions

Use Case ID: 005

Use Case Name: Monitor System Transactions

Actor: Admin

Description: Allows the admin to monitor transactions across all user accounts to detect fraud, errors, or unusual activity.

Precondition: The admin must be logged in with administrative privileges.

Main Flow:

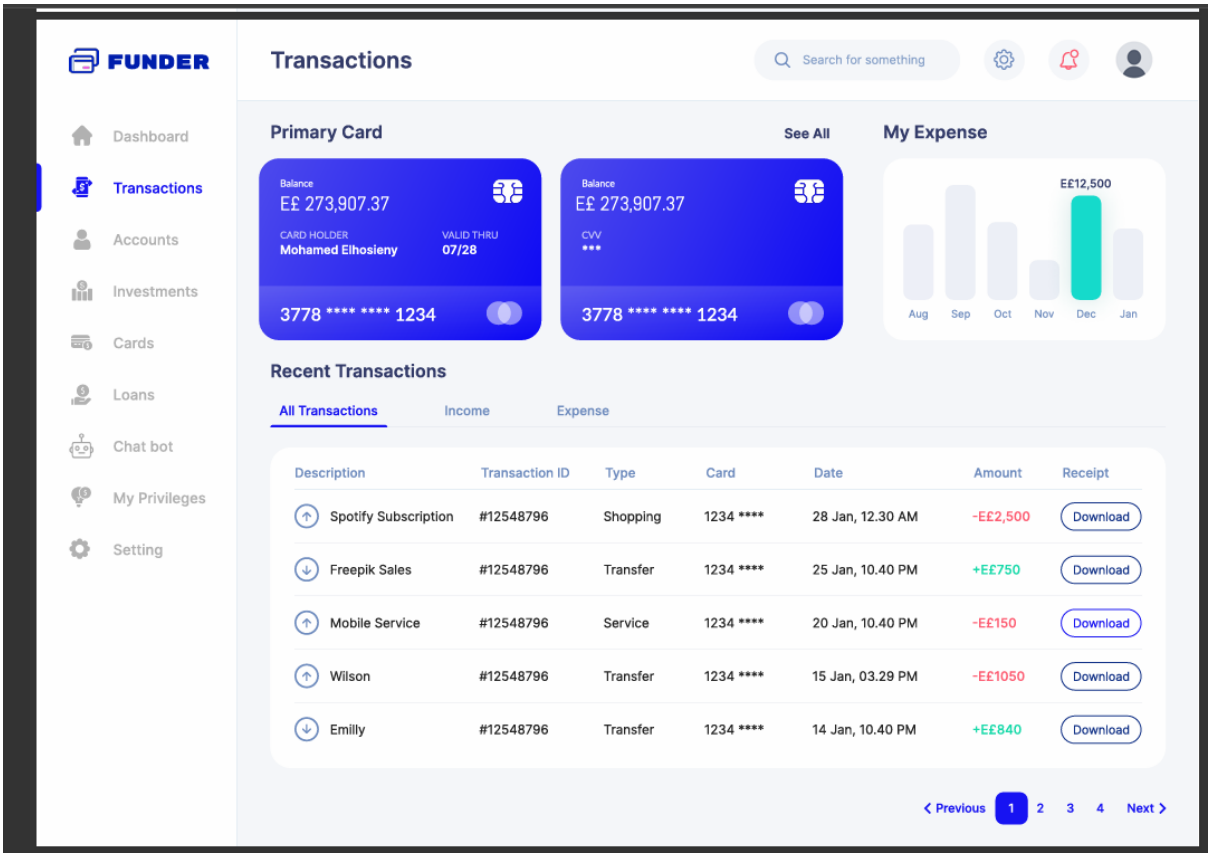
1. The admin navigates to the Transaction Monitoring dashboard.
2. The system displays recent transactions and flagged alerts.
3. The admin selects a transaction for detailed review.
4. The system shows transaction details, user information, and historical patterns.
5. The admin can mark the transaction as valid, flag it for review, or block suspicious activity.

Alternative Flow:

- If the admin flags a transaction, the system automatically notifies the user of potential issues.

Postcondition: All monitored transactions are reviewed and flagged issues are recorded for follow-up.

Prototype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Deposit Paypal
25 January 2021
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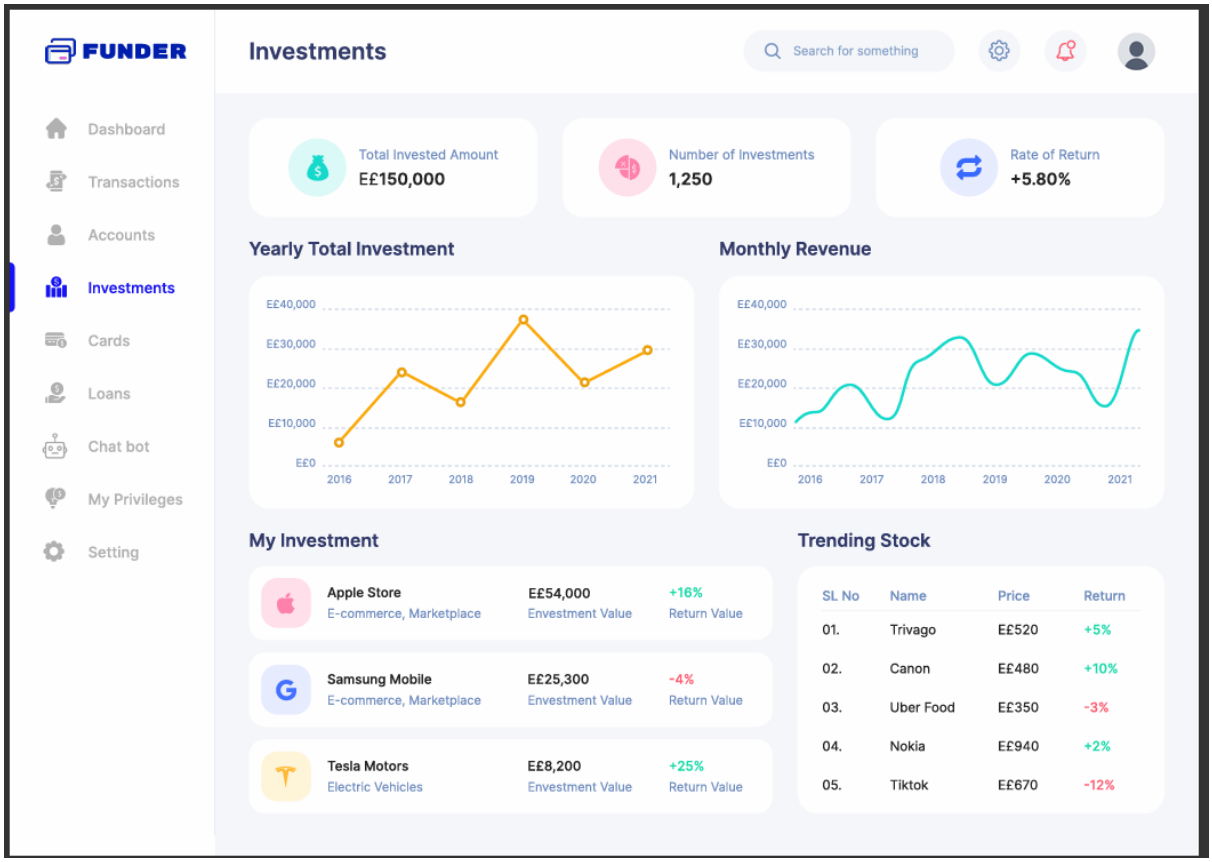
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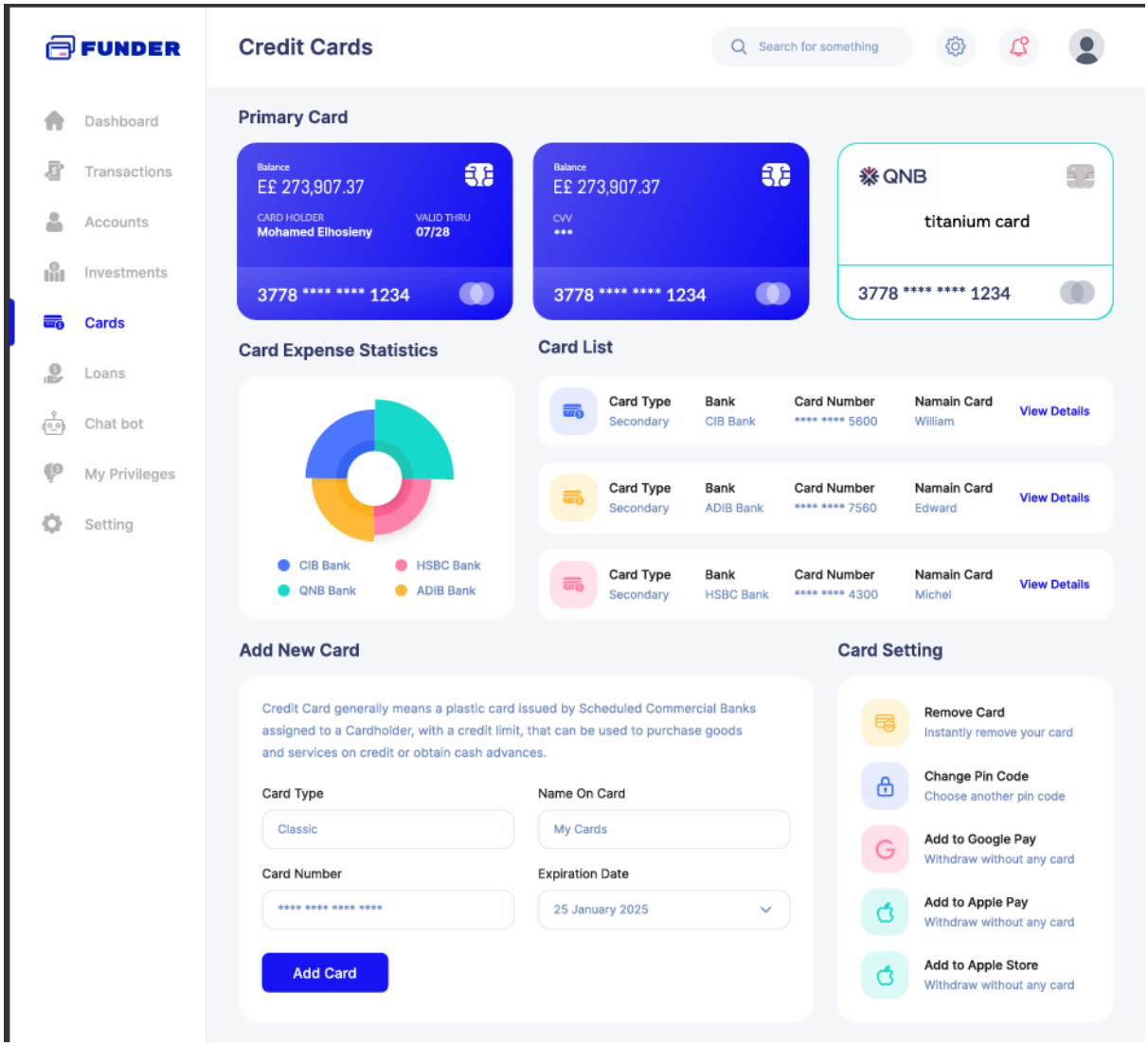
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Namain Card
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Credit Card generally means a plastic card issued by Scheduled Commercial Banks assigned to a Cardholder, with a credit limit, that can be used to purchase goods and services on credit or obtain cash advances.
Card Type
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My Cards
Card Number
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Expiration Date
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Add Card
Card Setting
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Withdraw without any card
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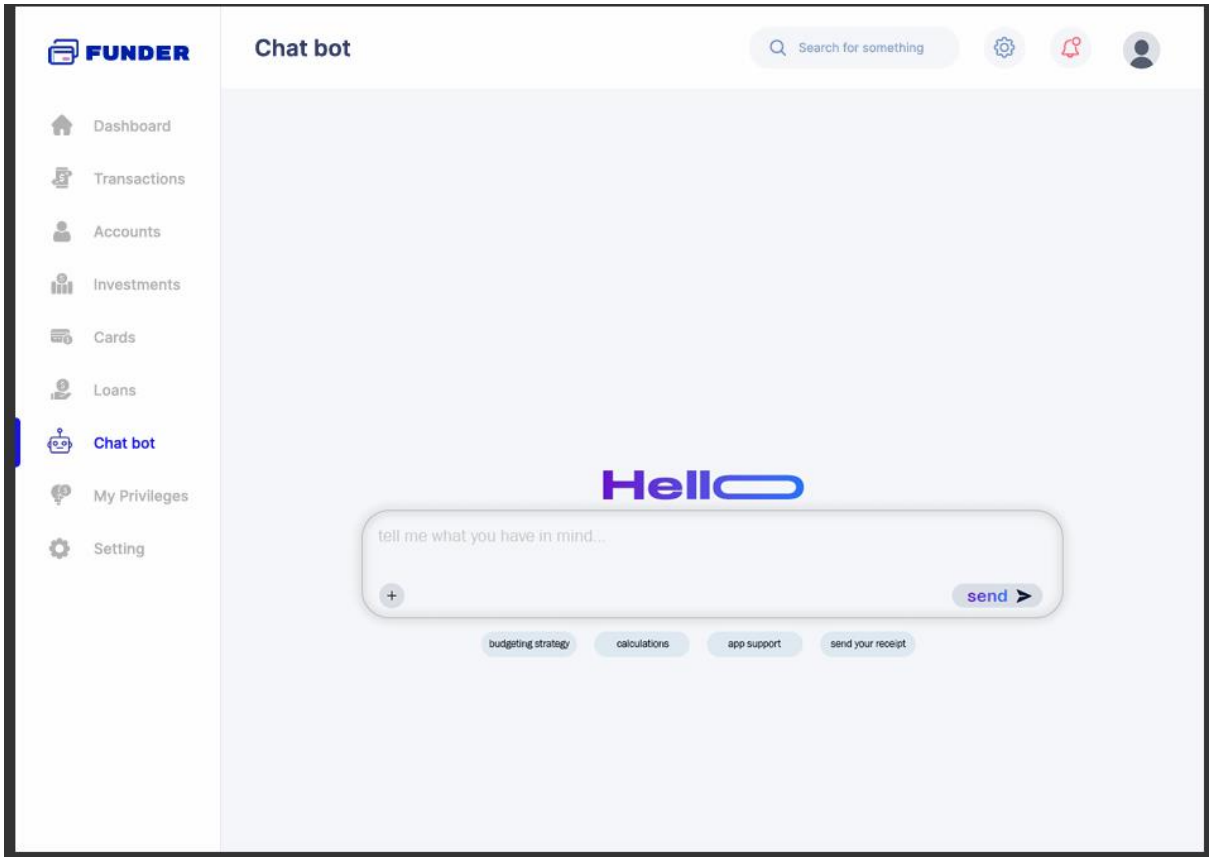
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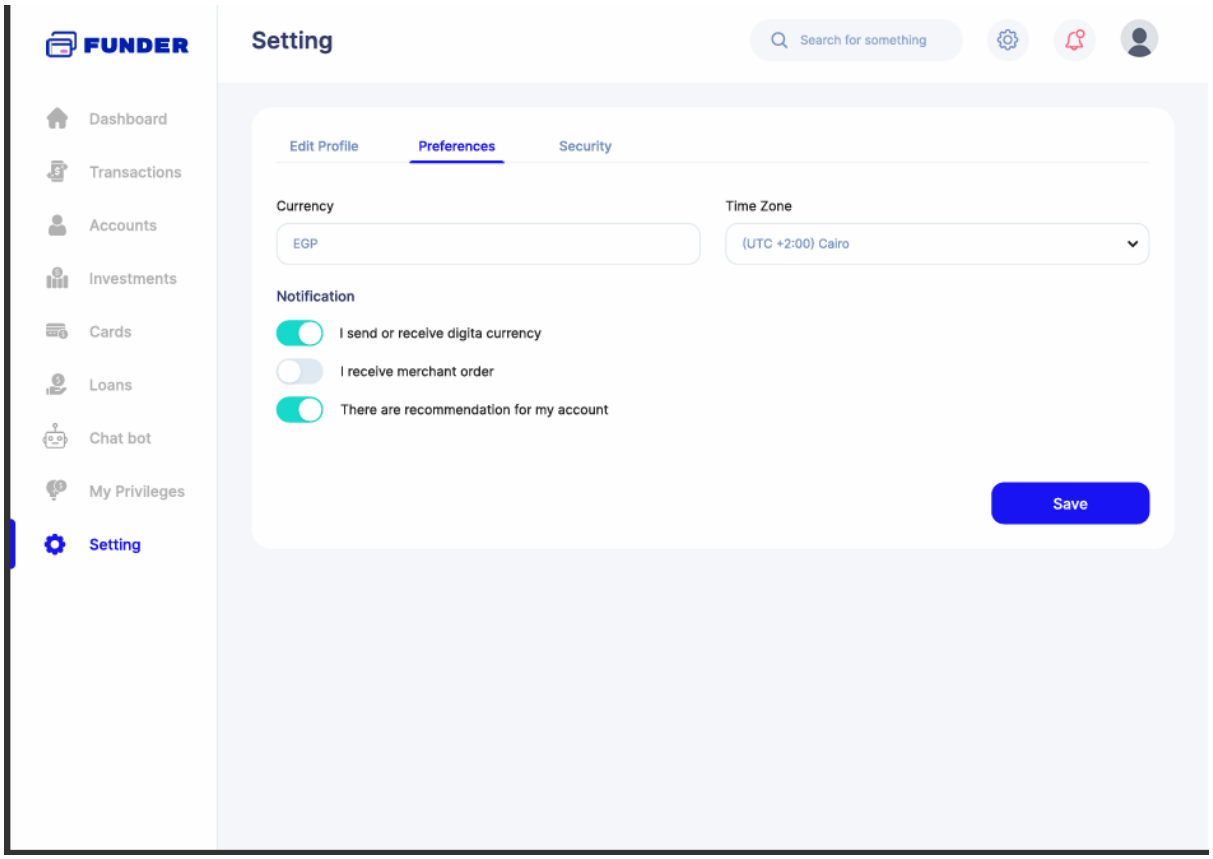
budgeting strategy
calculations
app support
send your receipt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Time Zone
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Notification
I send or receive digita currency
I receive merchant order
There are recommendation for my account
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https://www.rocketmoney.com/

https://www.honeydue.com/

https://www.creditkarma.com/

https://www.spendee.com/