Shih Chi Han

CS5010

Project 2

Financial Management Tool

Overview and Objectives

This project is dedicated to developing an innovative financial management tool that simplifies the way individuals and groups track and manage their finances. Built using the Functional Programming paradigm, the platform is designed to deliver a highly modular, maintainable, and predictable codebase, ensuring that every function is pure and every piece of data is immutable. This approach not only enhances the reliability of the application but also makes it easier to test and extend over time.

- Provide users with an intuitive interface to track daily expenses and visualize financial trends.
- Enable groups to manage shared expenses, improving budgeting for events and activities.
- Offer insights into spending habits via categorized data breakdowns.
- Support proactive financial management through goal setting and state tracking based on income and expenses.

Functionalities

- Income/Expense Tracking & Visualization
    - Daily Income/Expense Log:
      Users can view a detailed list of transactions, including dates, amounts, and categories.
    - Categorical Breakdown:
      Provide visual analytics (charts, graphs) to represent spending distribution over various categories and time periods.
    - Trend Analysis:
      Display financial trends over days, weeks, or months to highlight changes in spending behavior.
- Group Expense Sharing
    - Group Expense Management:
      Allow users to create groups, add transactions, and set budgets that are shared among members.
    - Equal and Custom Splitting:
      Provide options for equal splits or customized allocations.
- Financial Goal Setting & Tracking
    - Goal Creation:

Enable users to set financial goals (e.g., savings targets, debt reduction) with specified amounts and deadlines.

- Progress Monitoring:
  Track current contributions against targets and provide visual progress indicators.
- Automated Updates:
  Automatically update goal states based on new transactions, with statuses such as In Progress, Achieved, or Overdue.

Nouns and Verbs Extraction

Nouns:

- Users
- Income
- Expense
- Expense Log (implied as a record of daily expenses)
- Transactions
- Dates
- Amounts
- Categories
- Analytics
- Charts
- Graphs
- Spending Distribution
- Time Periods (days, weeks, months)
- Financial Trends
- Changes
- Spending Behavior
- Groups
- Members
- Options
- Equal Splits
- Percentage-based Allocations
- Financial Goals
- Savings Targets
- Debt Reduction Goals
- Deadlines
- Current Contributions
- Targets
- Visual Progress Indicators
- Goal States
- New Transactions

- Statuses

Verbs:

- Visualize
- View
- Provide
- Represent
- Display
- Highlight
- Allow
- Create
- Add
- Enable
- Set
- Track
- Update

Target Audience

- Young Professionals:
  Individuals starting their careers who need to manage personal finances while planning for future goals.
- Budget-Conscious Users:
  People looking to gain better control over their spending habits and identify opportunities to save or invest.
- Groups and Families:
  Teams, families, or friends who regularly share expenses for events, trips, or household budgeting.
- Financial Advisors & Coaches:
  Professionals seeking to provide clients with a detailed breakdown of their spending and financial habits.

Rules

- Data Integrity & Security
  - Immutability of Core Data:
    All financial transactions and goal updates must be immutable once recorded. Any changes should be appended as new records to preserve historical data.
  - Access Controls:
    Users must authenticate to access their financial data. For group expenses, proper role-based permissions should be enforced.
  - Privacy Compliance:

The platform must comply with relevant data protection regulations ensuring that user data is encrypted and securely stored.

- Expense Sharing Rules
    - Expense Splitting:
      When sharing an expense among a group, the total expense must always equal the sum of the individual contributions.
    - Expense details:
      All group expenses must be recorded each time to ensure that each expense is logged and available for comprehensive tracking and retrospective analysis.
- Financial Goal Management
    - Goal Achievement Validation:
      Goals are automatically marked as Achieved only when the cumulative transactions meet or exceed the target amount.
    - Deadline Enforcement:
      If the goal is not achieved by the deadline, its status changes to Overdue and the user is notified.

Challenge Questions

- Can this system provide real-time spending tracking and analysis, so that users can understand in which category their money is spent?
- Can the system accurately manage group shared expense tracking to ensure fair cost sharing?
- Can the system provide users with assistance in setting, monitoring, and achieving financial goals within target timeframes through continuous status tracking?

Dimensions

- Personal or Group: Primarily managing personal finances or tracking shared expenses for groups.
- Financial Objectives: what they aim to achieve financially.

User Personas

- Emily Roberts
    - Age: 30
    - Occupation: Freelance Graphic Designer
    - Background: Emily manages her finances on her own and is detail-oriented when it comes to budgeting. As a freelancer, she needs to monitor her cash flow closely and analyze her spending patterns to optimize her business and personal expenses.
    - Financial Behavior:

        - Uses a financial management tool for personal income/expense tracking, management, and analytics.
        - Regularly categorizes transactions to identify areas for savings.
        - Reviews visual charts and graphs to understand her monthly spending trends.
    - Dimensions:
        - Personal
        - Personal Income/Expense Tracking, Management, and Analytics
- Carlos Martinez
    - Age: 28
    - Occupation: Event Planner
    - Background: Carlos coordinates events and trips with friends and colleagues, which often involves managing shared expenses. He values clarity and efficiency in splitting costs to keep everyone on the same page.
    - Financial Behavior:
        - Uses a financial management tool specifically for group expense management.
        - Creates groups for events and adds shared transactions.
        - Utilizes expense splitting features (equal or custom percentage-based) to ensure fair cost distribution.
    - Dimensions:
        - Group
        - Group Expense Management
- Liam Patel
    - Age: 33
    - Occupation: Accountant
    - Background: Liam is experienced in managing finances and is focused on long-term financial planning. He uses financial tools to set, monitor, and achieve specific financial goals such as retirement savings, debt reduction, and funding his children's education.
    - Financial Behavior:
        - Uses the tool for financial goal setting & tracking.
        - Sets clear savings targets and deadlines, and monitors progress through automated updates.
        - Adjusts spending habits based on goal progress and financial state analysis.
    - Dimensions:
        - Primarily Personal
        - Financial Goal Setting & Tracking

User Stories

Income/Expense Tracking, Management, and Analytics

- As a user, I want to add a transaction to my expense log so that I can record my spending accurately.
- As a user, I want to see my daily expenses so that I can track where my money goes.
- As a user, I want to filter my transactions by date so that I can focus on specific periods.
- As a user, I want to categorize my transactions and view a breakdown so that I can analyze my spending habits and identify areas to cut back.
- As a user, I want to view visual charts and graphs of my expenses so that I can easily understand financial trends and patterns.
- As a user, I want to see the distribution of my spending over different time periods or categories so that I can identify changes in my spending behavior.

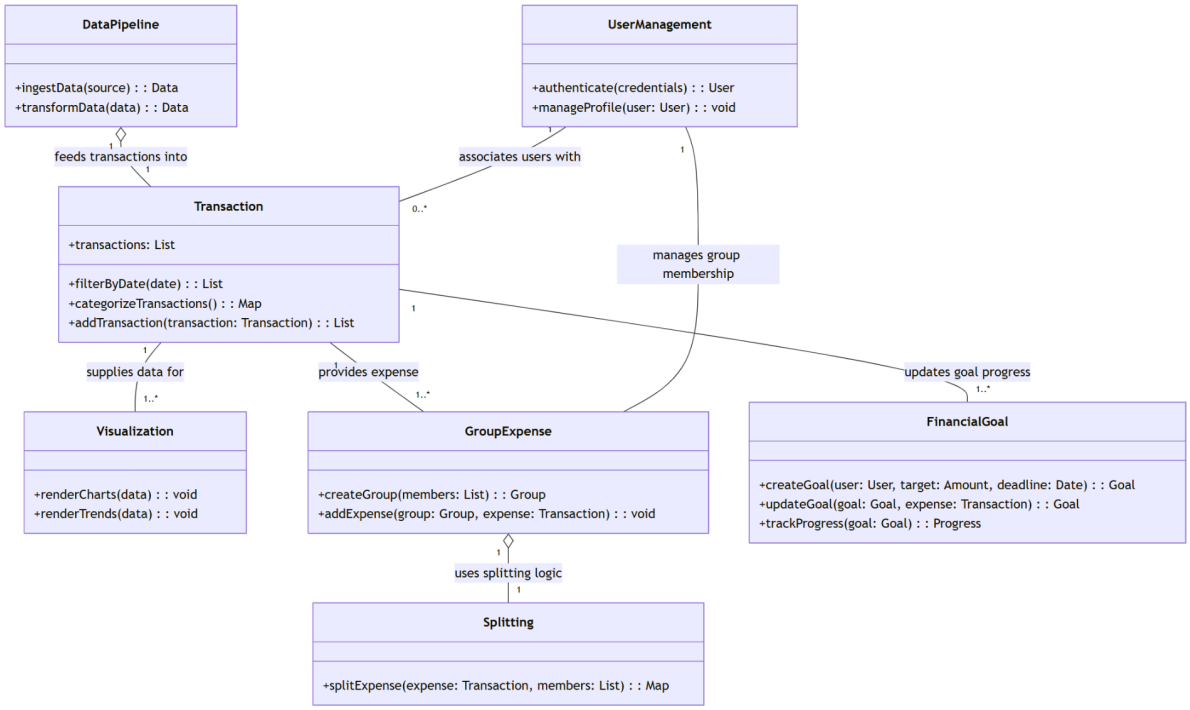
Group Expense Management

- As a group planner, I want to add an expense to the group record so that all shared costs are logged comprehensively.
- As a group planner, I want to split shared expenses equally or based on custom percentages so that each member's share is accurately calculated.

Financial Goal Setting & Tracking

- As a financially conscious user, I want to set clear financial goals (savings or debt reduction) with target amounts and deadlines so that I can focus on achieving them.
- As a financially conscious user, I want to track my progress towards my financial goals so that I can monitor my financial state in real time.
- As a financially conscious user, I want my financial goals to update automatically when I add new transactions so that my progress is always current.

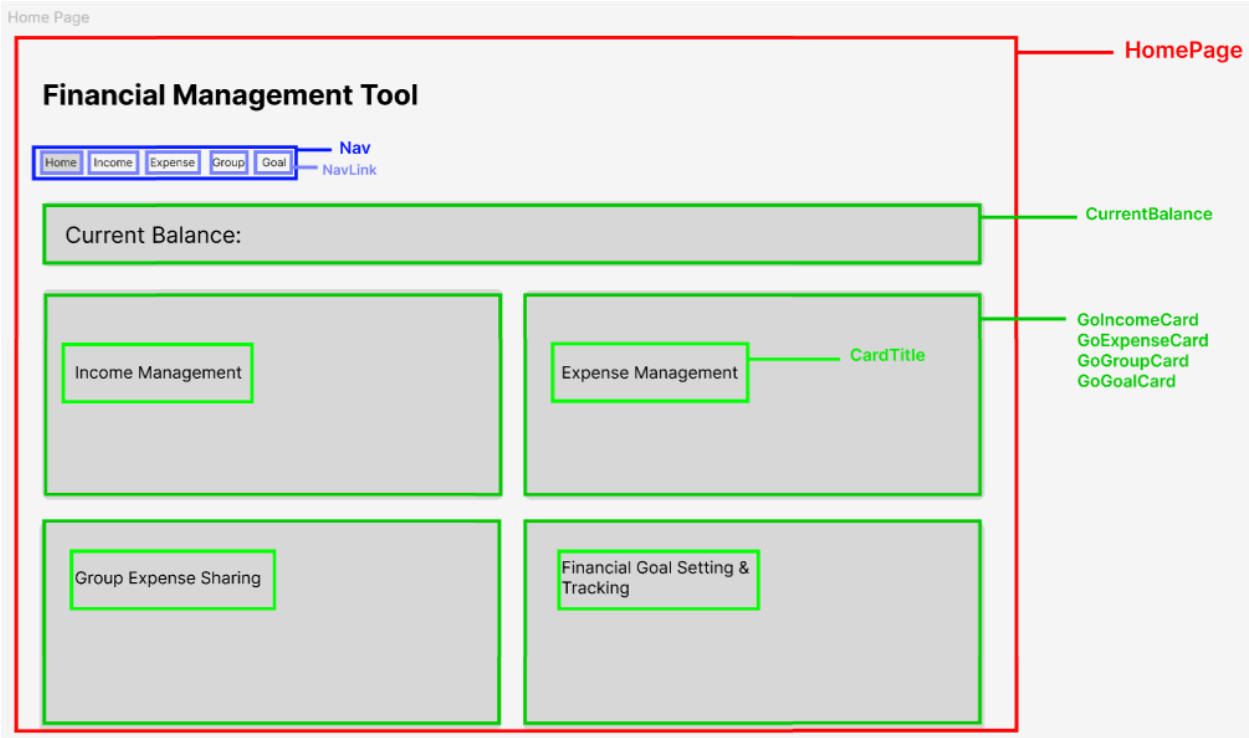
Modules Diagram



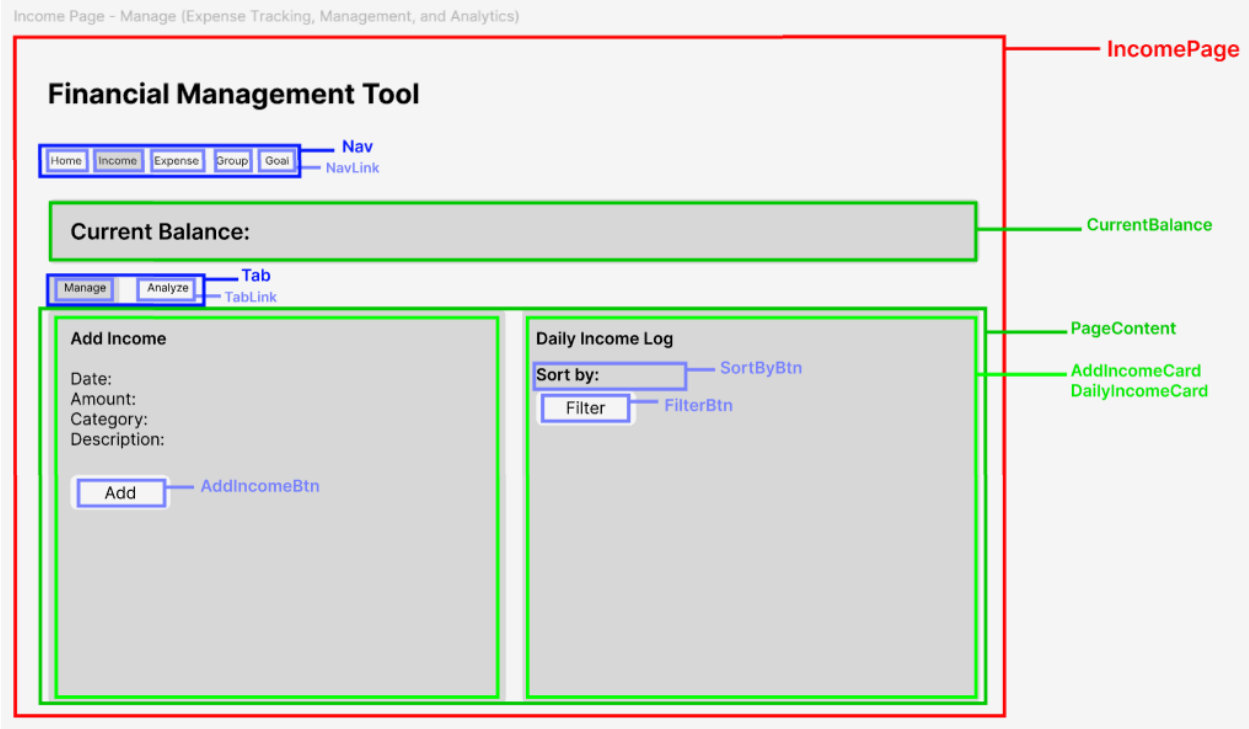
Interface Mockups

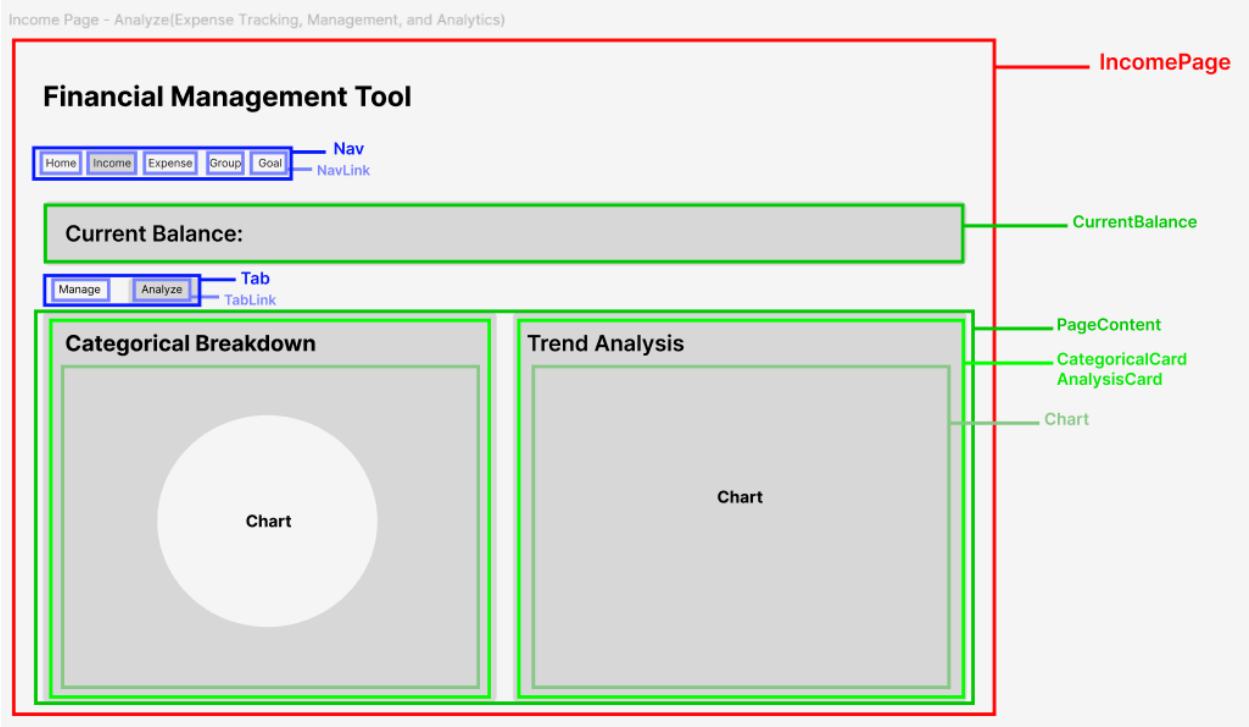
[Link]

Home

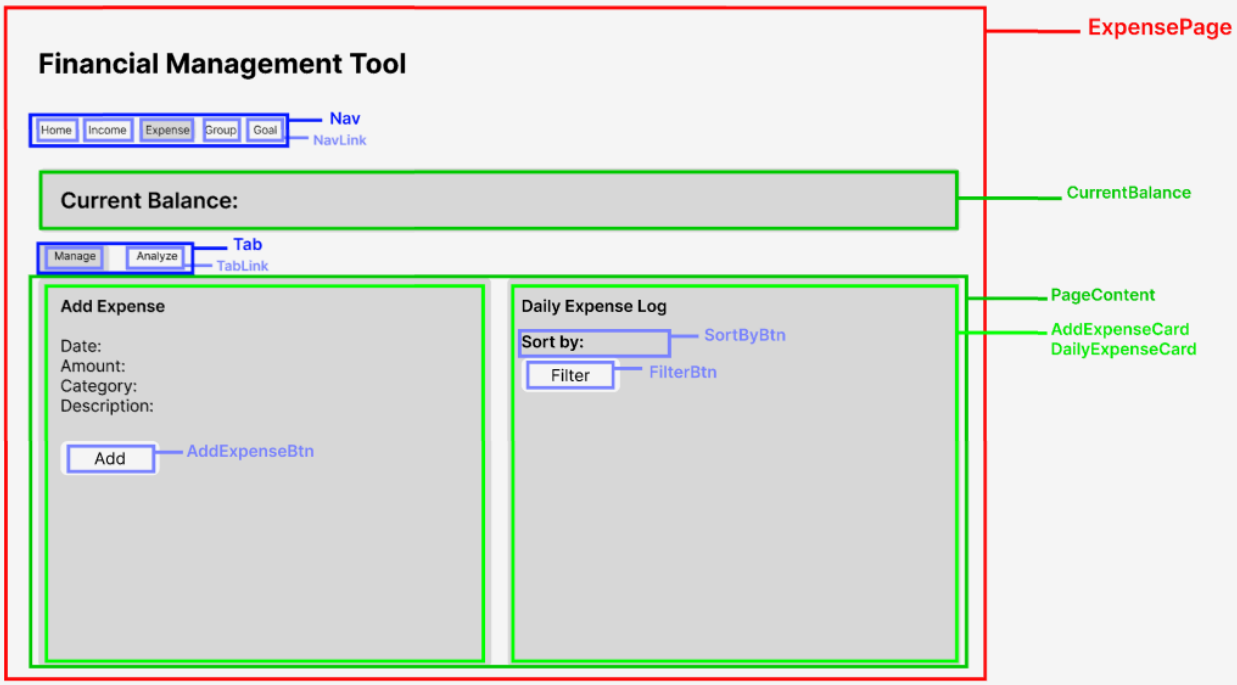


Income/Expense Tracking, Management, and Analytics

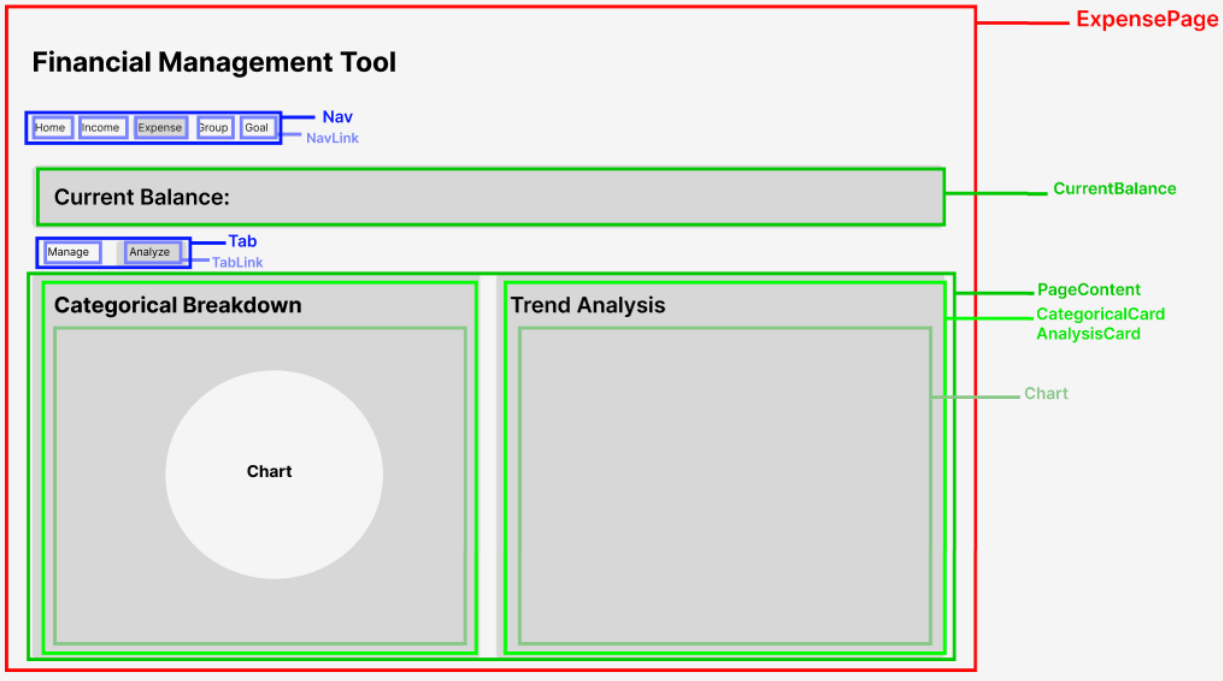




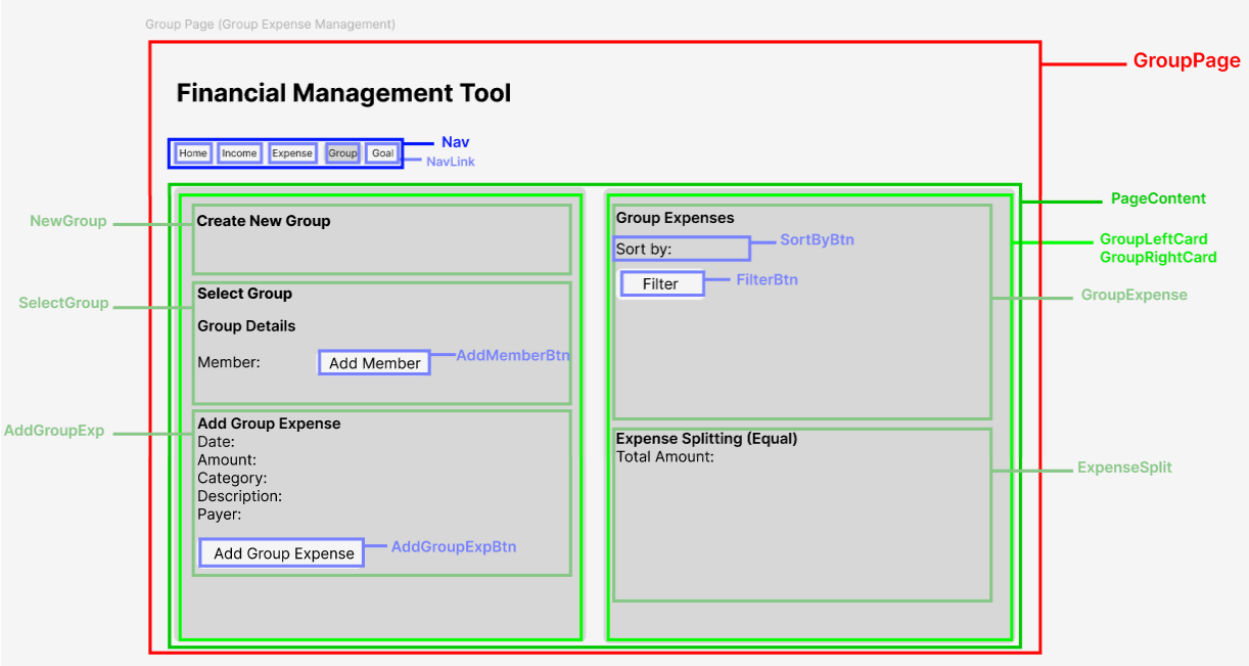
Expense Page - Manage (Expense Tracking, Management, and Analytics)



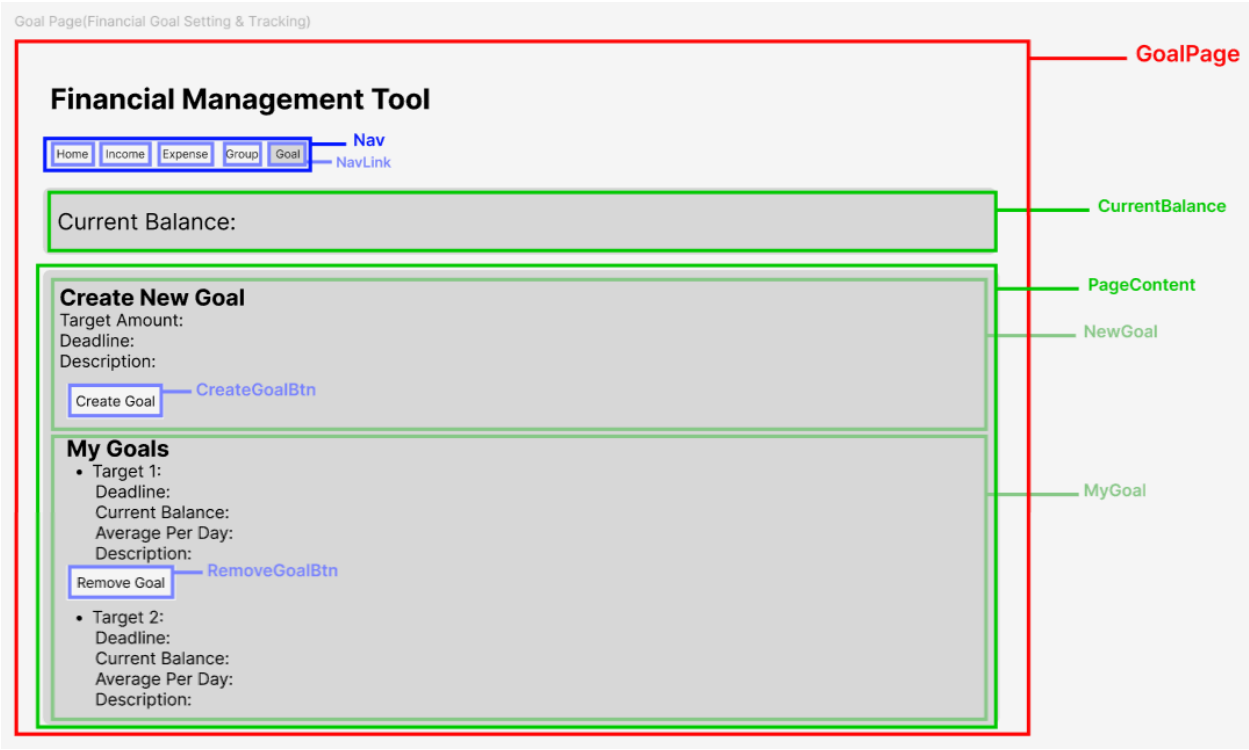
Expense Page - Analyze(Expense Tracking, Management, and Analytics)



Group Expense Management



Financial Goal Setting & Tracking



AI Usage

ChatGPT(4o/o3)

- Prompt: Based on my ideas below as a reference, write an overview and some functionalities.
  I want to create a project using the Functional Programming Paradigm.
  I want to create a financial management tool. The platform supports expense sharing and collaboration among groups, provides detailed categorical insights to help users understand their spending habits, and enables robust financial goal setting with state tracking based on income and expenses.
  Features:
  - Track expenses, categorize spending, and visualize financial trends
  - Expense Sharing and Collaboration
  - Categorical Insights
  - Financial Goal Setting and State Tracking

  User Stories:
  - As a user, I want to see my daily expenses so that I can track where my money goes.
  - As a user, I want to categorize transactions and see how my spending is distributed over different categories and time periods so that I can analyze my spending habits and identify areas to cut back.
  - As a group planner, I want to track shared expenses with my friends so that we can manage our event budgets effectively.
  - As a financially conscious user, I want to set clear savings or debt reduction goals and keep track of my financial state so that I can adjust my spending habits and achieve my targets more effectively.
    - Use for reference to write a business requirements
- Prompt: Generate some possible user stories.
  - References for writing user stories
- Prompt: Generate some possible personas.
  - References for writing personas