Financial Accounting System

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Goal

The primary objective of this project is to develop a financial accounting system that simplifies money management for individuals and groups.

By combining robust backend functionality with a user-friendly interface, the system provides tools for tracking income and expenses, managing accounts, setting budgets, visualizing data, and even accessing real-time exchange rates and stock prices.

This system aims to make financial management straightforward, efficient, and accessible to all.

Introduction

Handling finances can often be a daunting task, especially when managing multiple accounts or shared budgets. This financial accounting system provides a streamlined solution by offering tools that include:

- **User Authentication**: Securely register, log in, and access personal accounts.
- **Transaction Tracking**: Easily add, edit, or delete income and expenses, categorized by purpose (e.g., food, transportation, entertainment).
- **Shared Accounts**: Create and manage collaborative accounts for groups or families.
- **Budget Planning**: Set monthly budgets and receive alerts for overspending.
- **Data Visualization**: Understand spending trends through pie charts and bar graphs.
- **Currency Exchange**: Convert currencies manually or use APIs for real-time rates.

This project was developed by a three-member team, each focusing on specific aspects to ensure a cohesive and effective system.

Code Description

Backend Development

1. **Database Design**:
   - The system includes four key tables: `users`, `transactions`, `accounts`, and `user_accounts`.
   - Data security is prioritized with encrypted passwords and well-defined relationships using foreign keys.
2. **API Integration**:
   - Real-time exchange rates and stock prices are fetched via APIs, ensuring up-to-date information.
3. **Core Functionalities**:
   - User registration, login, and logout features are securely implemented.
   - Transactions, including transfers and notifications, are efficiently managed.

Frontend Development

1. **Dashboard Interface**:
   - A calendar-based dashboard offers a monthly overview of financial activities, with clickable dates to view transaction details.
2. **Interactive Features**:
   - User-friendly forms for adding, editing, or deleting income and expense records.
   - Dynamic visual tools like colorful pie charts and bar graphs to display financial data.
3. **Budget Alerts**:
   - Alerts notify users of overspending based on preset monthly or dynamically calculated daily budgets.

Business Logic

1. **Budget Management**:
   - Algorithms calculate daily spending limits using either fixed monthly division or dynamic adjustments based on remaining days and budgets.
2. **Shared Accounts**:
   - Features allow account owners to invite members and efficiently manage shared finances.
3. **System Testing**:
   - Comprehensive testing ensures all functionalities operate smoothly and without errors.

Results

The project delivered a fully functional financial accounting system with the following achievements:

1. **Secure User Authentication**:
   - Reliable account access and session management ensure user data safety.
2. **Transaction Management**:
   - Accurate tracking of income and expenses, with seamless handling of account transfers.
3. **Budgeting Tools**:
   - Real-time budget tracking helps users avoid overspending.
4. **Data Visualization**:
   - Clear, engaging visual representations of income and expense patterns through charts.
5. **Enhanced Usability**:
   - Intuitive design and real-time data updates improve user experience.

Feedback

Strengths

- **Comprehensive Functionality**: Integrates budgeting, tracking, and shared account management into a single system.
- **User-Friendly Design**: The interface is simple and easy to navigate for all user types.
- **Real-Time Updates**: Features like exchange rates and stock prices add dynamic value to the system.

Areas for Improvement

- **Performance Optimization**: Faster data handling and reduced load times for large datasets.
- **Feature Expansion**: Incorporating financial forecasting tools and predictive analytics.
- **Customization Options**: Allow users to tailor the interface and settings to their needs.

User Suggestions

- Users appreciated the collaborative account feature for simplifying group financial management.
- Suggestions included a mobile application and integration with digital payment platforms to enhance convenience.

Conclusion

This financial accounting system provides an effective solution for managing personal and group finances. Its well-rounded features address key challenges such as transaction tracking, budget management, and data visualization.

Also, the project showcases potential for scalability and future enhancements, making it a practical tool for real-world application.

By focusing on user needs and incorporating advanced technology, the system achieves its goal of simplifying financial management while setting a strong foundation for growth.

Future Development and Directions

Looking ahead, the financial accounting system can be enhanced by incorporating advanced features and extending its reach. Potential developments include:

Mobile Application Development: Expanding the system to mobile platforms will increase accessibility and allow users to manage their finances on the go.

AI-Powered Analytics: Integrating artificial intelligence to provide personalized financial insights, spending habit predictions, and investment suggestions.

Integration with Digital Wallets: Connecting with popular payment platforms to enable seamless transactions and automatic updates of financial data.

Enhanced Security Features: Adding multi-factor authentication and advanced encryption techniques to further protect user data.

Internationalization: Supporting multiple languages and currencies to cater to a global audience.

Financial Education Tools: Including educational content and interactive tutorials to help users improve their financial literacy.

These developments aim to make the system more comprehensive, user-centric, and adaptable to the evolving needs of its users.

Work Assignment

蔡欣憲 113550125	33.3%	Front-End Development (User Interface and Interaction Design)
汪妍 110654037	33.3%	Back-End Development (Database Design and API Integration)
許秉棋 112550081	33.3%	Business Logic and Testing (Function Implementation and Testing)

Schedule

Date	Discussion Topics	Description
11/23	Outline and Topic Discussion	Completed the initial framework and goal setting for the report and confirmed the division of tasks among team members.
11/30	Code Development Progress	Finished backend database design and the basic frontend framework and began API integration and functionality testing.
12/4	Backend and Frontend Integration	Integrated backend and frontend functionalities to ensure key features like user authentication, transaction tracking, and data visualization work smoothly.
12/11	System Testing and Feedback Collection	Completed system testing, resolved errors, and gathered user feedback for further performance and interface optimization.
12/15	Final Adjustments and Documentation	Made feature adjustments based on user suggestions, prepared the final report and presentation materials, and finalized everything for the concluding presentation.
12/19	Final Presentation and Submission	Delivered the report presentation, submitted the final version, and reviewed the entire development process.