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# **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.

1. **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.

1. **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**

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| --- | --- | --- |
| 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**

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| --- | --- | --- |
| 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. |