

Executive Summary

FinVision is an interactive budgeting and financial planning tool designed to help users take control of their personal finances. The application allows users to track income, expenses, and savings through an intuitive dashboard, scan receipts using OCR technology, and receive personalized financial suggestions from an AI-powered chatbot. Built as a web application by a team of six, FinVision aims to make everyday financial management simple, secure, and accessible — bringing clarity to every dollar.

Background

Managing personal finances remains a challenge for many people, especially young adults and students who lack access to simple, free budgeting tools. According to a 2024 Bankrate survey, more than half of Americans do not have enough savings to cover an unexpected \$1,000 expense. Existing tools like Mint and YNAB either require paid subscriptions or overwhelm users with complexity. FinVision addresses this gap by offering a straightforward, AI-assisted budgeting experience that combines expense tracking, receipt scanning, and smart insights — all in one place and at no cost to the user.

Experimental Setup

- Built using Java, Spring Boot (backend) and Thymeleaf (frontend)
- MongoDB Atlas used for storing user data
- Chart.js used for financial data visualization
- Tesseract.js used for receipt scanning (OCR)
- Claude API for AI smart responses

Fig 1: System Architecture of FinVision

Experimental Test Plan

The team evaluated FinVision across multiple dimensions to ensure reliability and usability. The AI chatbot was tested using a variety of financial scenarios, including edge cases such as negative balances and unusual spending patterns, to verify response accuracy. OCR receipt scanning was assessed using diverse input formats, including thermal receipts, digital receipts, and handwritten entries. System performance was benchmarked under concurrent user loads to ensure the dashboard and reports maintained acceptable response times. Database integrity was validated through tests for duplicate prevention, backup recovery, and input validation across all transaction entry points. Usability testing was conducted with peers to gather feedback on navigation flow and dark mode consistency.

Fig 2: System Testing Workflow

Experimental Results

The AI chatbot effectively responds to financial, account, and navigation queries beyond its predefined prompts, demonstrating contextual awareness of user spending data. OCR scanning achieves reliable text extraction across standard receipt formats, with an approximate 90% success rate; however, accuracy decreases slightly when processing low-quality or handwritten receipts. The deployed system supports multiple concurrent users without noticeable performance degradation. Dark mode and UI layout enhancements received positive feedback during peer usability testing, with users describing the interface as clean and intuitive. Database validation rules successfully prevented duplicate transaction entries during testing, and the periodic backup system operated reliably as expected.

Conclusions

FinVision successfully integrates budgeting, expense tracking, receipt scanning, and AI-powered chatbot support into a unified platform. The system achieves its goal of providing a simple, organized, and efficient way for users to manage their finances.

The design prioritizes usability, enabling users to easily monitor spending and gain insights into their financial habits through clear and intuitive visualizations. Overall, the project demonstrates a scalable, user-centric, and effective solution for everyday financial management.

References

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