FinGinie - AI-Powered Finance Advisory

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ABSTRACT

FinGinie is an AI-powered personal finance advisory web application that helps individuals manage income, track expenses, set financial goals, and receive intelligent financial recommendations. The platform is designed to make financial guidance simple and accessible through a secure and user-friendly web interface accessible from any modern browser. It is built using a Node.js and Express backend with a MySQL relational database. The system uses two main database schemas: finginie for user authentication and finance_db for storing financial records such as income, expenses, savings, financial goals, risk profile, and AI responses. The frontend provides interactive pages including a financial dashboard, a stock market information module, and a learning resources section to improve financial awareness. Users can register, log in securely, and interact with an AI advisor that provides personalized suggestions such as savings strategies, financial planning tips, and risk analysis. The application is designed to simplify complex financial concepts and support better money management for everyday users. The system is developed using Node.js (Express), HTML5, CSS3, JavaScript, MySQL, and integrated with the Grok AI API for advisory intelligence.

Keywords: *Personal Finance Management, AI Financial Advisor, Node.js, Express.js, MySQL, JavaScript, Web Application, Grok AI, JWT Authentication, Stock Market Module, Financial Literacy.*

I. INTRODUCTION

In the modern era of digital transformation, managing personal finances has become a major challenge for many individuals. Financial planning, investment decisions, and expense management often require professional guidance, which is not always affordable or easily accessible. Many people struggle to properly track their income, control their spending, and plan for future financial goals. To address this issue, FinGinie was developed as an AI-powered personal finance advisory web application that helps users understand and manage their finances more effectively. The name FinGinie combines the ideas of finance and genie, symbolizing an intelligent digital assistant that provides financial insights and guidance to users.

The application is built using modern web technologies with a full-stack architecture. The system includes a frontend interface with features such as a financial dashboard, stock market information page, and a learning section that provides financial education. The backend server manages user authentication, financial data processing, and AI-based financial recommendations. The system uses a MySQL relational database with two separate databases: finginie, which stores user login and authentication details, and finance_db, which stores financial records such as income, expenses, savings, financial goals, and AI-generated advisory responses.

II. LITERATURE REVIEW

Several studies in the areas of personal finance management, AI-powered advisory systems, and web-based financial applications provide the foundation for the proposed system. The following review covers key contributions relevant to automated financial advisory and goal-based financial planning.

Dhar and Stein (2022) examined the application of machine learning and natural language processing in retail finance advisory services. Their study confirmed that LLM-based advisory systems, when personalized using user financial profiles, significantly outperform generic rule-based advice in user satisfaction and actionable outcome metrics.

Cao et al. (2022) conducted a benchmarking study of AI-assisted financial planning tools across different income segments. The research found that privacy-first approaches — where users manually enter financial data rather than linking bank accounts — demonstrate higher user retention rates and trust scores, particularly among first-time users of digital financial tools.

Khandani et al. (2023) proposed a framework for integrating large language models into consumer financial advisory pipelines. Their research highlighted that structured prompt engineering using user-specific financial metrics (income, savings rate, risk tolerance, goal amount) yields significantly more relevant and actionable advice compared to generic prompting strategies.

RBI Financial Inclusion Report (2024) identified that over 60% of Indian urban youth lack access to personalized financial guidance and expressed willingness to use AI-assisted tools if available for free. This directly motivates the development of accessible, zero-cost AI advisory platforms like FinGinie that combine financial tracking with LLM-powered recommendations.

NSE Financial Literacy Initiative (2024) highlighted the importance of integrating stock market education with personal finance management tools. Their study noted that users who access stock market information alongside their personal savings data demonstrate improved investment decision-making — directly motivating FinGinie's integrated stock information module.

Collectively, the reviewed literature affirms that AI-driven personal finance advisory platforms built on lightweight web technologies, privacy-first data entry, and LLM integration represent a practical, accessible, and scalable approach to personal finance management. Existing systems are often proprietary, expensive, or require bank account linking. The proposed FinGinie system addresses these gaps by combining free access, manual data entry for privacy, AI-generated personalized advice, integrated stock information, and a financial learning module within a single, accessible web application.

III. METHODOLOGY

The methodology of the proposed system follows a structured, end-to-end pipeline from user data entry to AI-powered advisory output and visualization. The development approach is modular and iterative, enabling independent testing and enhancement of each processing stage.

A. System Architecture

The application is built on a client-server architecture. The frontend, developed with HTML5, CSS3, and JavaScript, communicates with a Node.js Express backend that handles all server-side logic. The complete technology stack is presented in Table 1.

Table 1: System Technology Stack

Component	Technology Used	Purpose
Frontend	HTML5, CSS3, JavaScript (ES6+), Chart.js	Web interface, form handling, dynamic rendering and charting
Backend	Node.js (Express Framework)	API routing, AI integration, business logic processing
AI Engine	Grok AI API (LLM), OpenAI-compatible SDK	Natural language financial advisory generation
Database	MySQL 8.0 (mysql2 npm client)	Structured storage of user and financial records
Authentication	bcryptjs, JSON Web Tokens (JWT)	Secure password hashing and session management
Hardware	Intel Core i3, 4GB RAM, 50GB Storage	Development and testing environment

B. User Authentication and Data Privacy

Users register and log in through a secure web interface. Registration captures username, email, and password — with passwords hashed using bcryptjs before storage. On successful login, a JSON Web Token (JWT) is issued and stored client- side. All protected API endpoints verify the JWT before processing. Critically, no bank account linking is required; all financial data is manually entered by the user, ensuring complete data privacy and control.

C. Financial Data Entry and Processing

The financial data entry form collects a comprehensive user financial profile including monthly income, expenses, savings, risk tolerance, and financial goal details (description, target amount, and timeline in months). The backend computes derived metrics including savings amount, savings rate as a percentage, expense ratio, monthly goal saving requirement, and financial health status classification (Excellent, Good, Fair, or Poor based on savings rate thresholds).

D. AI Advisory Engine — Prompt Engineering and LLM Integration

The AI Advisory Engine constructs a structured natural language prompt incorporating all collected financial metrics and submits it to the Grok AI API via a POST request using the OpenAI-compatible SDK. The prompt includes the user's name, income, expenses, savings rate, expense ratio, risk tolerance, financial goal description, goal amount, months to achieve the goal, and monthly saving requirement. The LLM generates a personalized, conversational advisory response which is stored in the aiReply field of the finance_records table and rendered in the dashboard's AI Advisor panel.

E. Database Design

All data is stored in a MySQL relational database comprising two separate databases. Table 2 summarizes the schema.

Table 2: Database Schema Summary

Database	Table Name	Primary Fields	Description
finginie	users	id, username, email, password	Stores user authentication credentials
finance_db	finance_records	id, name, income, expenses, savings, risk, goal, goalAmount, goalMonths, aiReply, createdAt	Stores all financial records and AI advisory responses

F. Dashboard and Reporting

The dashboard presents a comprehensive overview of the user's financial health through multiple components: an AI Advisor panel displaying the latest LLM-generated advice, an Expense Monitor for tracking and managing expenditures, a SIP Calculator for systematic investment planning estimates, a Latest Financial News panel, and a Stock Information module displaying current market indices and stock data. Chart.js is used for interactive financial visualizations.

IV. SYSTEM MODULES

FinGinie is organized into six primary functional modules, each serving a distinct role within the overall system.

A. User Authentication Module

The User Authentication Module is responsible for all aspects of identity management within FinGinie. It provides secure user registration, login, session management, and logout functionality backed by the finginie MySQL database. Passwords are hashed using bcryptjs and sessions are managed via JWT tokens included in the Authorization header of all protected API requests.

B. Financial Data Management Module

This module is the core data processing component of FinGinie. It handles the complete lifecycle of financial records — from form submission through data validation, computation of derived metrics, AI advisory generation, and storage in the finance_db.finance_records table. Financial status is classified based on savings rate: 30%+ as Excellent, 20–29% as Good, 10–19% as Fair, and below 10% as Poor.

C. AI Advisory Engine Module

The AI Advisory Engine is the most distinctive and innovative module of FinGinie. It bridges the gap between raw financial data and meaningful, actionable advice by leveraging the Grok AI large language model API. After financial metrics are computed, the system constructs a structured prompt and sends it to the Grok API. The returned advisory text is stored in the database and displayed on the dashboard in a dedicated AI Advisor panel.

D. Stock Information Module

The Stock Information Module provides users with current market data to support informed investment decision-making. It includes a stock search interface, display of major Indian (NIFTY 50, SENSEX) and global market indices, individual stock price data (current price, day's change, high/low, volume), and a personal watchlist persisted via browser localStorage.

E. Financial Learning Module

The Financial Learning Module addresses the financial knowledge gap by providing curated educational content across six categories: Budgeting Basics, Savings Strategies, Investment Fundamentals, Debt Management, Tax Planning, and Goal-Based Planning. Content is presented through article cards, embedded video resources, and a financial glossary.

F. Administrator Module

The Administrator Module provides system-level control through direct database access via MySQL Workbench for user account management, financial records oversight, system health monitoring, AI API key management, and database backup and recovery operations using mysqldump.

V. SYSTEM TESTING

Comprehensive testing was conducted across five levels to validate the functionality, accuracy, security, and usability of the system. Table 3 summarizes the test cases executed and their outcomes.

Unit testing confirmed that individual components — including login authentication, file upload handling, financial metric computation, and AI advisory generation — performed correctly in isolation. Integration testing verified that the complete data pipeline from user registration through financial data entry, AI advisory generation, and dashboard rendering operated without errors. System testing confirmed stable multi-user handling. Security testing validated that invalid inputs were rejected, JWT authentication was enforced on all protected routes, and SQL injection prevention was effective. User acceptance testing confirmed that the interface was intuitive and that results were clearly presented to end users.

Table 3: Test Cases and Outcomes

Test Type	Module Tested	Test Case / Condition	Outcome
Unit Testing	User Registration	Valid credentials entered and stored	✓ Passed
Unit Testing	Financial Computation	Savings rate, expense ratio, monthly goal saving calculated correctly	✓ Passed
Unit Testing	Status Classification	Savings rate thresholds mapped to correct status labels	✓ Passed
Unit Testing	AI Prompt Construction	Financial fields correctly assembled into structured prompt	✓ Passed
Integration Testing	Full Pipeline	Register → Login → Enter Data → AI Response → Dashboard	✓ Passed
Integration Testing	AI Engine + DB	AI response stored and retrieved for dashboard display	✓ Passed
System Testing	Multi-User Access	Multiple users access data independently without cross-contamination	✓ Passed
Security Testing	JWT Enforcement	Protected routes reject requests without valid JWT	✓ Passed
Security Testing	Input Validation	Invalid inputs rejected with informative error messages	✓ Passed
UAT	End-to-End Flow	User completed registration-to-dashboard flow independently	✓ Passed

VI. RESULTS AND DISCUSSION

The system was evaluated through comprehensive unit, integration, system, security, and user acceptance testing. Table 4 presents the financial computation results for a sample user profile, and Table 5 provides a comparison between the proposed system and traditional manual / existing financial advisory approaches.

Table 4: Sample Financial Processing Results

Field	Sample User Data	Computed Output
Monthly Income	₹50,000	—
Monthly Expenses	₹35,000	—
Savings	—	₹15,000
Savings Rate	—	30.00% (Excellent)
Expense Ratio	—	70.00%
Goal Amount	₹2,00,000 (Emergency Fund, 12 months)	—
Monthly Goal Saving	—	₹16,666.67
Financial Status	—	Excellent
AI Advisory	—	Personalized LLM response generated ✓

All financial computations were verified manually and confirmed accurate. The AI Advisory Engine successfully generated personalized, contextually relevant financial recommendations for all test user profiles. The dashboard displayed all results in real time immediately after data submission, with Chart.js visualizations providing clear visual summaries of expense and savings trends.

Table 5: Proposed System vs. Manual / Existing Approach

Feature	Manual / Existing Approach	Proposed FinGinie System
Financial Advisory	Requires paid professional / accountant	AI-powered personalized advice at zero cost
Data Entry	Manual spreadsheets / paper records	Structured web form with real-time computation
AI Integration	None / limited rule-based tools	LLM-powered conversational advisory (Grok AI)
Data Privacy	Bank account linking required	Manual entry only — no third-party data sharing
Goal Tracking	Basic or unavailable	AI-integrated monthly goal savings roadmap
Stock Information	Separate platforms required	Integrated stock module within the same app
Financial Education	Not available	Curated learning module with articles and resources
Cost	High — subscription fees or advisor charges	Zero cost — completely free for end users
Processing Speed	Hours / days for advisor consultations	Instant — AI response within 3–5 seconds
Scalability	Limited — human advisor bottleneck	Scalable — cloud-deployable, multi-user capable

The results demonstrate that the proposed system substantially reduces the time, cost, and effort required for personal financial advisory. AI-powered analysis eliminates the need for expensive professional consultations for routine financial planning. The privacy-

first approach of manual data entry, combined with JWT-secured authentication, ensures user data remains protected. Cloud deployment capability ensures system accessibility across devices and geographic locations, extending practical applicability to students, young professionals, and individuals in rural India who previously lacked access to personalized financial guidance.

VII. CONCLUSION

This paper presented FinGinie — an AI-powered personal finance advisory web application that automates financial health assessment, goal-based planning, and personalized advisory generation using large language model technology. The system was developed using Node.js (Express), MySQL, HTML5/CSS3/JavaScript, and the Grok AI API, with bcryptjs and JWT for secure authentication. The application successfully delivers a complete personal finance management pipeline from secure user registration through financial data entry, AI advisory generation, stock market information access, financial education, and real-time dashboard visualization, demonstrating the practical feasibility of applying modern web technologies and AI-assisted

advisory to personal financial management challenges faced by students, young professionals, and everyday users in India.

Future work may include integration of bank statement parsing via OCR for automated expense entry, real-time stock data API integration with WebSocket support for live price updates, multi-currency support for international users, mobile application development using React Native, incorporation of Indian income tax computation modules, and peer-comparison financial benchmarking features to enable community-based financial goal tracking.

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