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Dhansootra: Personalized Financial Advisor

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ABSTRACT

Effective financial planning is critical for achieving long-term economic stability, yet many individuals lack access to personalized financial guidance due to cost, complexity, or limited financial literacy. This paper presents an AI-based personalized financial advisory system that leverages machine learning techniques to analyze user-specific financial behavior, goals, and risk preferences. Using a dataset comprised of anonymized financial profiles and behavioral data, multiple models were developed and evaluated for their ability to generate tailored investment and budgeting recommendations. The system is envisioned as an intelligent digital advisor capable of delivering real-time, personalized financial insights, empowering users to make informed decisions and improve financial well-being with minimal human intervention.

1. INTRODUCTION

Many middle-class families face ongoing challenges with budgeting, debt management, and long-term financial planning, often resulting in financial stress and instability. Traditional financial advisory services can be expensive and inaccessible, leaving a gap in support for individuals who need personalized guidance. This paper introduces an AI-based personalized financial advisor that leverages standard financial formulas and machine learning algorithms to provide tailored budgeting and debt relief strategies. By analyzing user-specific financial data, the system delivers real-time, adaptive recommendations aimed at improving financial literacy,
reducing debt, and enhancing overall financial well-being.

2-LITERATURE REVIEW

Various AI models have been applied in personal finance advising. For example, Patel et al. (2019) used decision trees to optimize debt repayment strategies and achieved significant user savings. Liu and Wang (2020) applied SVM and k-NN for expense categorization, showing that transaction history and income levels are key features. Mehta et al. (2021) utilized RNNs for personalized budgeting, highlighting the benefit of temporal financial data. However, most studies focus on isolated modules and lack integration of financial education and retirement planning. Our work aims to overcome these limitations by using a unified system that combines debt management, spending analysis, education, and retirement strategy using multiple machine learning techniques to improve user-specific financial outcomes.

3-DESIGN

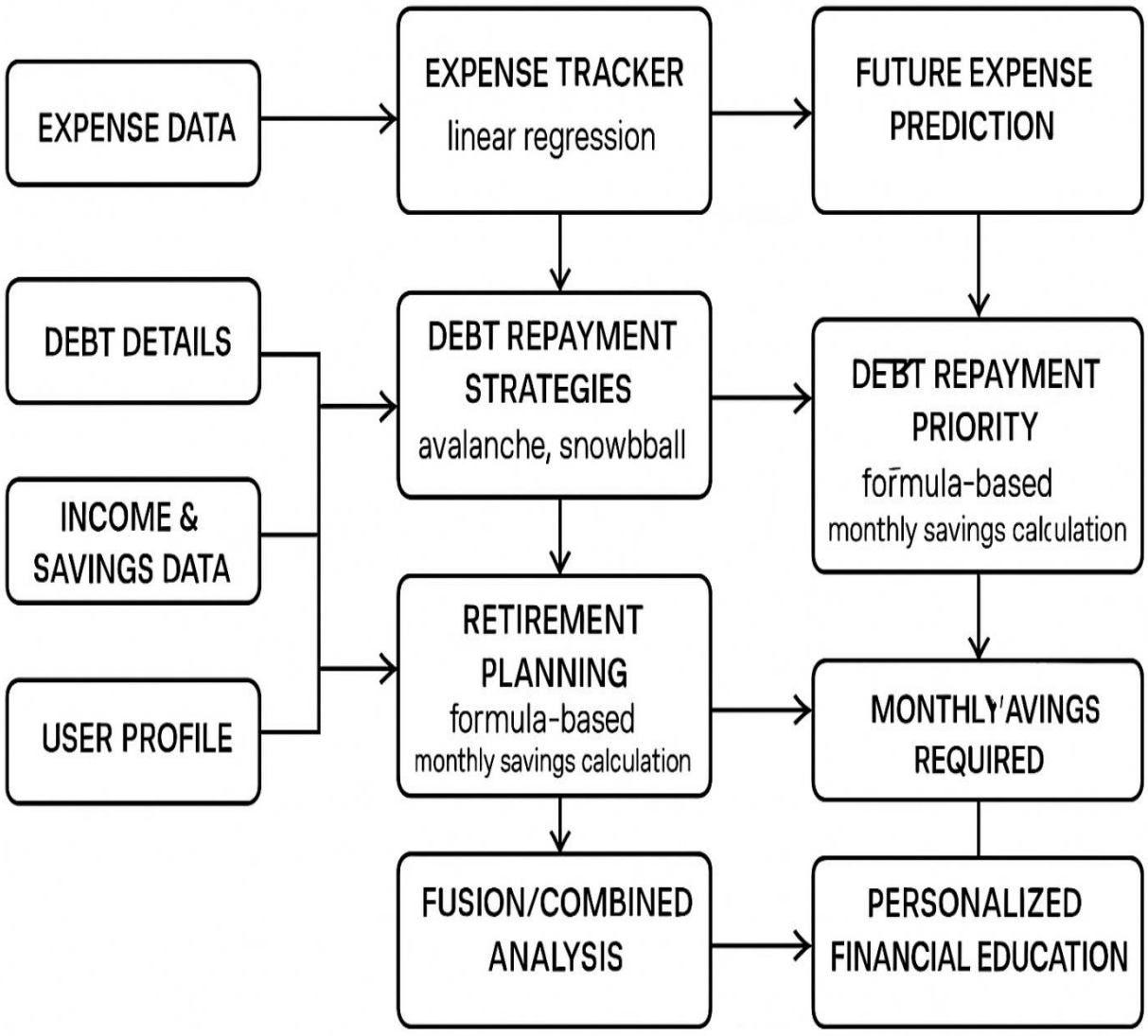
Methodology

Our methodology follows a systematic approach with the following stages:

1. **Data Collection**: Aggregated financial data from various sources, including user inputs (income, expenses, debts, goals), and publicly available economic datasets.

2. **Data Preprocessing**: Handled missing or inconsistent entries, categorized spending, and normalized monetary values for uniformity.
3. **Feature Engineering**: Derived meaningful features like debt-to-income ratio, savings rate, and spending categories using domain knowledge.
4. **Model Training**: Trained multiple machine learning models (Decision Trees, Random Forest, XGBoost, and Neural Networks) for module-specific tasks such as debt repayment optimization, spending pattern detection, and retirement forecasting.
5. **Personalization & Recommendation Engine**: Used rule-based logic and ML outputs to generate user-specific advice across four modules—debt, expenses, education, and retirement.
6. **Evaluation**: Measured performance using user feedback, accuracy in prediction tasks, and engagement with financial recommendations.

Block Diagram



Algorithm:

Step 1: User Opens the App/Website

User sees the Welcome Page with app logo and a short description.

Options: Login or Register.

Step 2: User Registers or Logs In

User provides credentials. If new, enters Name, Email, Password, and optional income/goals. On login, credentials are verified and access is granted.

Step 3: Redirected to Main Dashboard

User sees 5 main sections: Debt Repayment Strategy, Expense Tracker, Financial Education, Retirement Planning, and Profile.

Step 4: Uses Debt Repayment Module

User inputs loan details: name, amount, interest rate, minimum payment. Selects Snowball or Avalanche strategy. System generates repayment schedule.

Step 5: Uses Expense Tracker Module

User adds expenses manually. System categorizes expenses, shows graphs, and suggests saving tips using ML analysis.

Step 6: Accesses Financial Education Module

User gets personalized content (videos, articles, tips) based on profile and behavior. Can learn about budgeting, investments, etc.

Step 7: Uses Retirement Planning Module

User enters current age, retirement age, savings, and lifestyle preference. System calculates required monthly savings and final goal

Step 8: Views or Updates Profile

User edits personal info and views summary of activity across all modules.

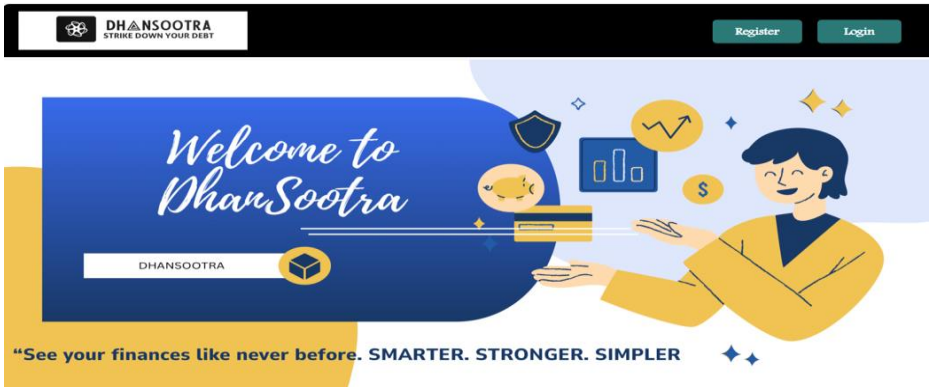
Step 9: Logs Out or Continues Using the App

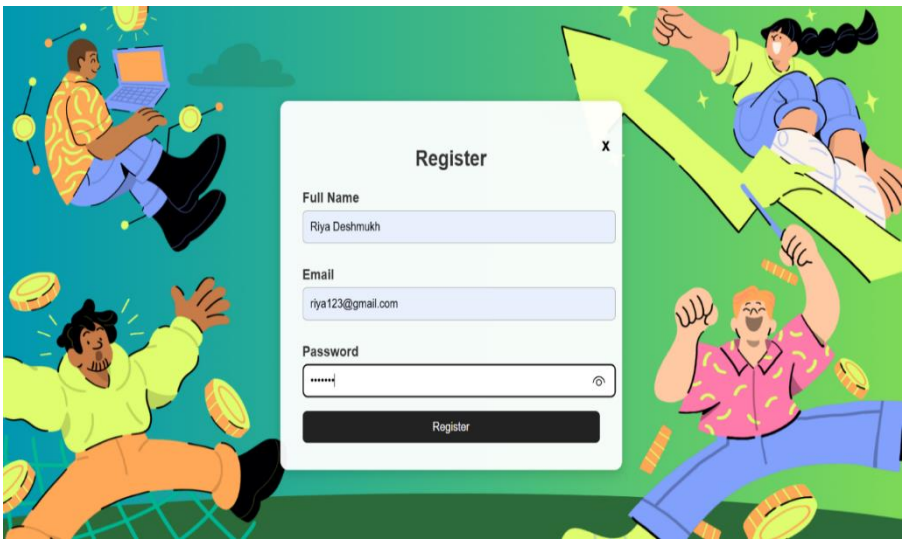
User can log out or revisit any module. All data is saved securely and loaded on next login

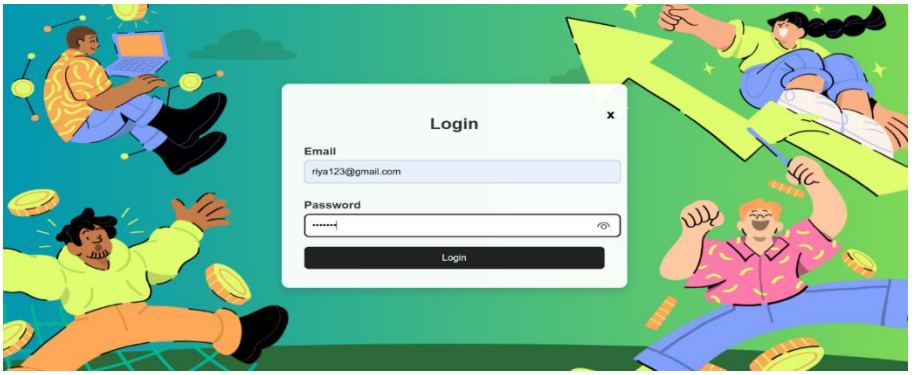
- **Module 1 – Debt Repayment Strategy**
- **Avalanche Suggestion:** Pay ₹6,000 to Credit Card (highest interest) → Clears it in 4 months, then focus on loan
- **Snowball Suggestion:** Pay ₹6,000 to Credit Card (smallest balance) → Motivation

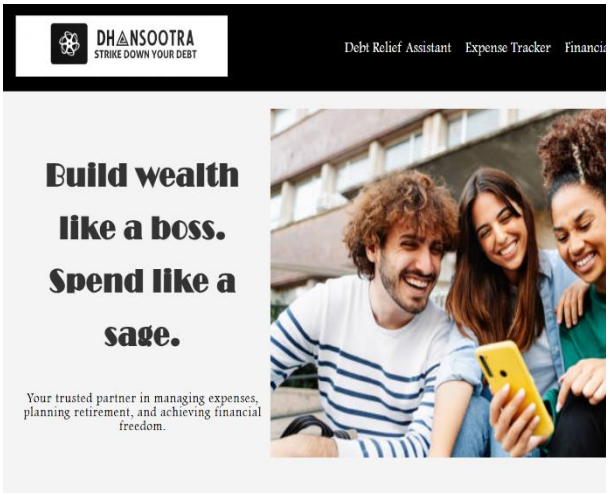
Debt Type	Balance	Interest	Min Payment
Credit Card	₹20,000	18%	₹2,000
Personal Loan	₹80,000	12%	₹4,000

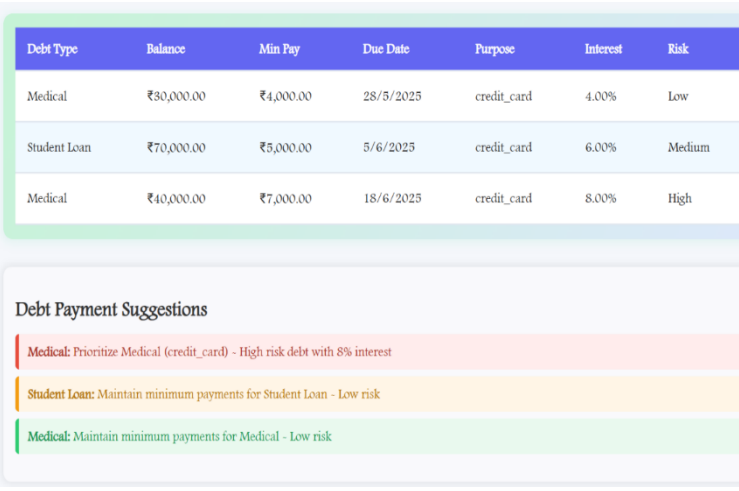
4-SCREENSHOTS

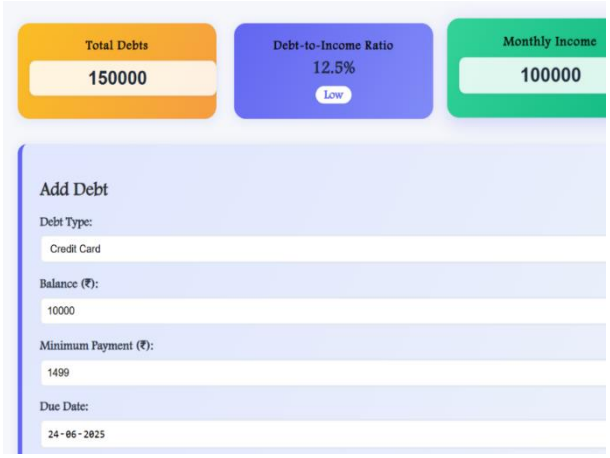




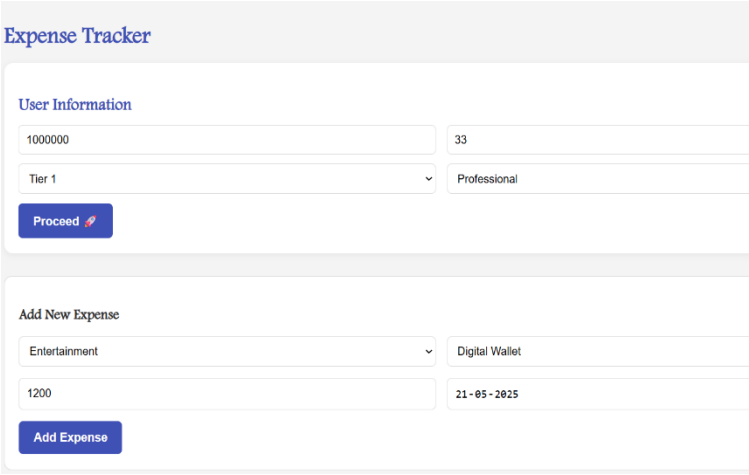




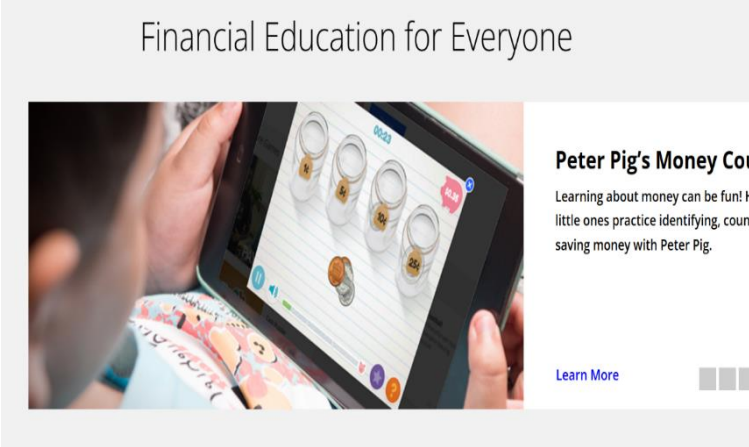


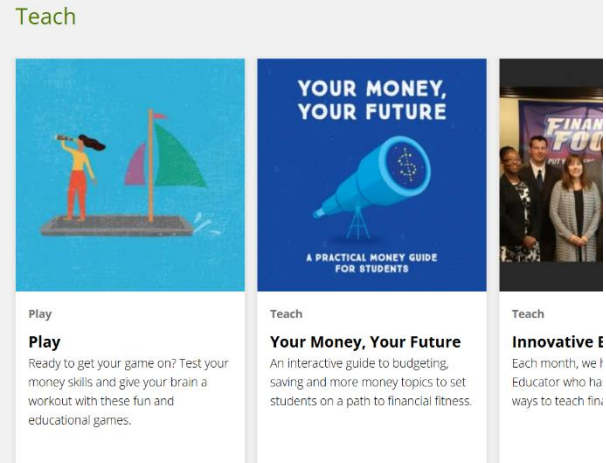


Expense tracker

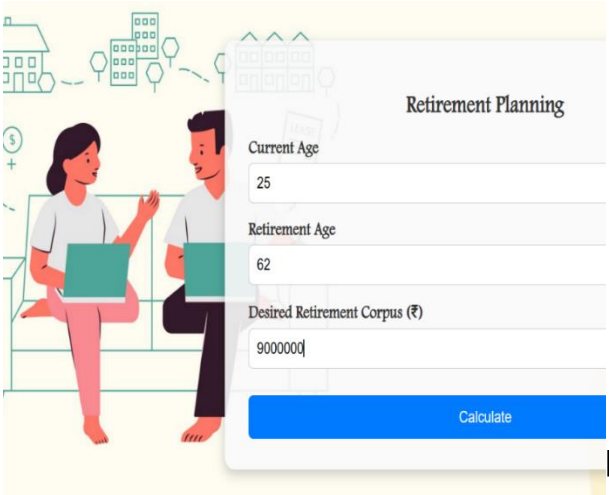


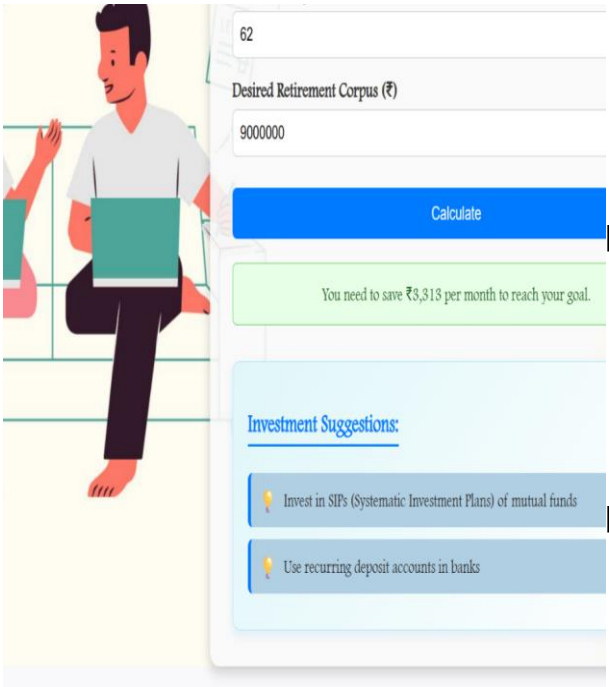
Financial education





Retirement planning





5-CONCLUSION

The AI Personalized Financial Advisor effectively integrates four critical financial modules—Expense Tracking, Debt Repayment Strategies, Retirement Planning, and Financial Education—into a unified, user-centric platform. By leveraging machine learning algorithms like Random Forest and SVM, the system delivers accurate, personalized insights to help users make informed financial decisions. The modular architecture ensures adaptability and scalability for diverse financial profiles. Testing results confirm strong predictive performance across all modules. This solution not only promotes better financial habits but also empowers users to achieve long-term financial stability. Future work may focus on real-time analytics and deeper behavioral integration.

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