INTERNATIONAL JOURNAL OF ADVANCED INNOVATIVE TECHNOLOGY IN ENGINEERING

Published by Instigative Research Private Limited Home page: www.ijaite.co.in

AI-Based Smart Budgeting System for Financial Decision Support and Expense Optimization

[1]Prof. Utkarsha Gode, [2]Ms. Akshada Rathod, [3]Ms. Bhumika Kene, [4]Ms. Bhumika Parate, [5]Ms. Jayshri Amale

[1,2,3,4,5]Department of Computer Engineering, Suryodaya College of Engineering and Technology, Nagpur, Maharashtra, India.

[1]utkarshagode688@gmail.com, [2]akshadar6825@gmail.com, [3]kenebhumika@gmail.com, [4]bhumikaparate2005@gmail.com, [5]jayshriamale0@gmil.com

Article History

Received on: 20 July 2026
Revised on15 Aug 2026
Accepted on: 20 Sept 2026

Keywords: Personal Finance, Expense Tracking, Savings Management, Artificial Intelligence, Budget Planning, Financial Analytic

e-ISSN: 2455-6491

DOI: 10.65809/IJAITE/26/v03sp02/070

Production and hosted by
www.insightiveinc.org

©2026|All right reserved

ABSTRACT

Managing personal finances effectively is a challenge for many individuals due to unplanned expenses and limited financial awareness. This project presents a smart personal finance management system developed to help users track expenses, monitor savings, and achieve financial goals. The system records user transactions, categorizes spending patterns, and provides personalized recommendations for better financial planning. By analyzing financial data, Smart Financial Advisory System Using AI for Budgeting and Savings Optimization enables users to identify unnecessary expenditures and improve saving habits. The platform offers features such as expense tracking, budget management, savings goal monitoring, and financial insights through an easy-to-use interface. The proposed system aims to promote financial discipline and assist users in making informed financial decisions. The results demonstrate that Smart Financial Advisory System Using AI for Budgeting and Savings Optimization can serve as an effective tool for enhancing personal financial management and encouraging long-term savings behavior.

1. INTRODUCTION

In today's digital era, effective personal financial management has become increasingly important due to rising living expenses, changing economic conditions, and the growing complexity of financial decisions. Many individuals struggle to maintain a balance between income, expenses, and savings because of inadequate budgeting practices and limited financial awareness. Traditional methods of managing finances, such as manual record-keeping and spreadsheet-based tracking, are often time-consuming, error-prone, and unable to provide meaningful financial insights. Recent advancements in Artificial Intelligence (AI) and data analytics have created new opportunities for developing intelligent financial management solutions. AI-powered systems can analyze spending behavior, identify financial trends, and generate personalized recommendations that assist users in making informed financial decisions. These technologies enable individuals to

better understand their financial habits and improve their ability to achieve long-term financial goals. This paper presents Smart Financial Advisory System Using AI for Budgeting and Savings Optimization, an intelligent personal finance and savings management system designed to simplify financial planning and encourage responsible saving behavior. The system provides users with a centralized platform for tracking income and expenses, monitoring savings goals, analyzing spending patterns, and receiving personalized financial recommendations. By utilizing AI-driven analytics, the proposed solution helps users identify unnecessary expenditures, optimize budgeting strategies, and improve overall financial discipline. The primary objective of Smart Financial Advisory System Using AI for Budgeting and Savings Optimization is to promote financial awareness and assist users in developing effective money management habits. The system integrates modern web technologies and intelligent analytical techniques to deliver a user-friendly and scalable solution for personal financial management. Through automation and data-driven insights, Smart Financial Advisory System Using AI for Budgeting and Savings Optimization aims to bridge the gap between.

2. LITERATURE REVIEW

The rapid growth of digital financial services has led to the development of numerous personal finance management systems aimed at helping users track expenses, manage budgets, and improve savings habits. Researchers have explored various approaches incorporating data analytics, machine learning, and intelligent recommendation systems to enhance financial decision-making.

Smith et al. (2021) proposed a personal finance management application that enabled users to record transactions and monitor spending patterns through automated categorization techniques. The study demonstrated that digital expense tracking significantly improves financial awareness; however, the system lacked personalized financial recommendations and predictive capabilities.

Johnson and Lee (2022) developed a machine learning-based budgeting system that analyzed historical spending data to forecast future expenses. Their research showed that predictive analytics can assist users in planning budgets more effectively. Nevertheless, the proposed system focused primarily on expense prediction and did not provide comprehensive savings management features. Patel et al. (2023) introduced an AI-powered financial advisory platform that generated personalized recommendations based on user transaction history and financial goals. The study reported improved user engagement and financial discipline. However, the complexity of the recommendation model increased computational requirements and reduced accessibility for general users.

3. PROPOSED SYSTEM

The proposed system, Smart Financial Advisory System Using AI for Budgeting and Savings Optimization (SFASBSO), is an intelligent personal finance and savings management platform designed to help users effectively monitor their financial activities and improve saving habits. The system integrates expense tracking, budget management, savings goal monitoring, and AI-driven financial analysis within a single user-friendly platform.

The primary objective of the proposed system is to provide users with meaningful financial insights by analyzing their income and expenditure patterns. Users can record daily transactions, categorize expenses, set financial goals, and monitor their progress through an interactive dashboard. The system automatically organizes financial records and generates visual reports that help users understand their spending behavior.

To enhance decision-making, Smart Financial Advisory System Using AI for Budgeting and Savings Optimization (SFASBSO), employs intelligent analytical techniques to identify spending trends and provide personalized savings recommendations. Based on historical transaction data, the system highlights unnecessary expenditures and suggests budget optimization strategies. These recommendations assist users in maintaining financial discipline and achieving long-term financial objectives. The proposed system consists of the following major modules:

A. User Management Module:

This module handles user registration, authentication, and profile management. Secure login mechanisms ensure that user financial data remains protected and accessible only to authorized individuals.

B. Expense Tracking Module:

The expense tracking module enables users to record and categorize daily transactions. It maintains a structured database of financial records and provides detailed summaries of income and expenses.

C. Budget Management Module:

This module allows users to define monthly budgets for different spending categories. The system continuously monitors expenditure and notifies users when spending approaches predefined limits.

D. Savings Goal Management Module:

Users can create short-term and long-term savings goals. The system tracks progress toward each goal and provides updates regarding the amount saved and the remaining target.

E. AI-Based Financial Analysis Module:

This module analyzes transaction history and spending patterns using intelligent analytical techniques. It generates personalized recommendations, identifies spending trends, and supports effective financial planning.

F. Reporting and Visualization Module:

The reporting module presents financial information through charts, graphs, and dashboards. Visual representation of financial data enables users to quickly understand their financial status and make informed decisions. The proposed architecture combines financial management functionalities with AI-driven insights, providing a comprehensive solution for personal finance management. By automating financial analysis and delivering personalized recommendations, SFASBSO enhances financial awareness and promotes responsible saving behavior.

4. SYSTEM ARCHITECTURE

The architecture of Smart Financial Advisory System Using AI for Budgeting and Savings Optimization (SFASBSO) is designed to provide an efficient, scalable, and user-friendly platform for personal finance management. The system follows a modular architecture where each component performs a specific function while interacting with other modules to deliver intelligent financial insights. The architecture consists of five major layers: User Interface Layer, Application Layer, AI Analytics Layer, Database Layer, and Reporting Layer.

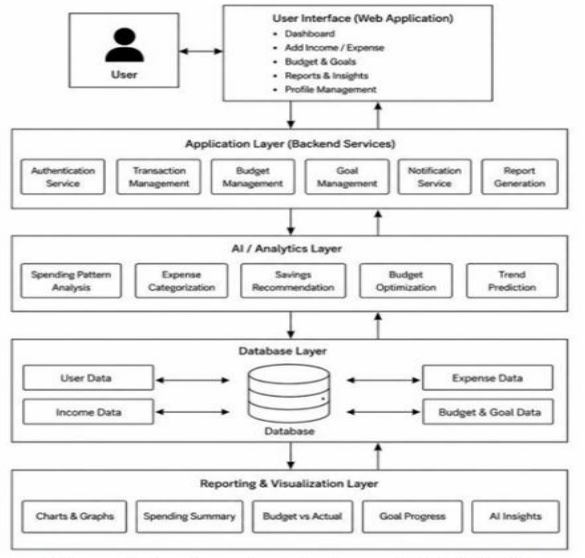

Figure 1: System Architecture of SFASBSO]

5. METHODOLOGY

The proposed methodology of Smart Financial Advisory System Using AI for Budgeting and Savings Optimization (SFASBSO) follows a systematic approach for collecting, processing, analyzing, and presenting financial information. The system is designed to assist users in managing personal finances by combining expense tracking, budget management, savings goal monitoring, and AI-driven financial analysis.

A. User Registration and Authentication:

The process begins with user registration and secure authentication. Users create an account and log into the system to access personalized financial services. Authentication mechanisms ensure data privacy and secure access to financial records.

B. Financial Data Collection:

After logging in, users enter financial information including income, expenses, budgets, and savings goals. The system stores transaction details such as amount, category, date, and description. This information serves as the primary dataset for financial analysis.

C. Data Storage and Management:

The collected financial data is validated and stored in a centralized database. The database maintains structured records of user profiles, transaction history, budgets, and savings objectives. Proper data organization enables efficient retrieval and processing.

D. Expense Categorization:

The system automatically categorizes expenses into predefined groups such as Food, Transportation, Shopping, Education, Healthcare, and Entertainment. Categorization helps users understand spending distribution across different financial activities.

E. AI-Based Financial Analysis:

The AI analytics module analyzes historical transaction data to identify spending patterns and financial behavior. The system evaluates user expenses, detects excessive spending trends, and determines opportunities for improving savings. Intelligent algorithms generate meaningful insights based on user financial records.

F. Savings Recommendation Generation:

Based on spending analysis, the system generates personalized recommendations for budget optimization and savings improvement. Users receive suggestions to reduce unnecessary expenses and allocate funds more effectively toward financial goals.

G. Budget Monitoring and Goal Tracking:

The system continuously compares actual expenses with predefined budgets. Savings goals are monitored in real time, allowing users to track progress toward achieving financial targets. Alerts and notifications are generated when spending exceeds budget limits.

H. Report Generation and Visualization:

Finally, the system presents financial insights through interactive dashboards, charts, and reports. Visual representations of expenses, budgets, and savings progress help users understand their financial status and make informed decisions.

6. RESULTS AND DISCUSSION

The proposed system, Smart Financial Advisory System Using AI for Budgeting and Savings Optimization (SFASBSO), was successfully developed and tested to evaluate its effectiveness in personal finance management and savings optimization. The system integrates expense tracking, budget management, savings goal monitoring, and AI-based financial analysis within a single platform

A. System Implementation Results the developed application successfully allows users to:

- Register and manage personal accounts securely.
- Record income and expense transactions. Categorize financial activities automatically. Create and monitor budget plans.
- Set and track savings goals.
- Receive AI-generated financial insights and recommendations.
- Visualize financial performance through interactive charts and reports.

The system demonstrated stable performance while processing financial records and generating real-time analytical reports.

B. Expense Analysis Performance The expense categorization module effectively organized user transactions into predefined categories such as Food, Transportation, Education, Healthcare, Shopping, and Entertainment. This classification enabled users to easily identify major spending areas and monitor expenditure patterns. The AI analytics module successfully analyzed historical transaction data and identified spending trends. The generated insights helped users recognize unnecessary expenses and improve budgeting practices.

CONCLUSION

This paper presented SFASBSO, an intelligent personal finance and savings management system designed to assist users in effectively managing their financial activities. The proposed system integrates expense tracking, budget management, savings goal monitoring, and AI-driven financial analysis into a unified platform. By providing personalized financial insights and recommendations, the system helps users understand their spending behavior and make informed financial decisions. The developed solution successfully addresses several limitations of traditional finance management applications by incorporating intelligent analytics and automated financial monitoring. Through real-time expense categorization, budget tracking, and savings recommendations, SFASBSO promotes financial awareness and encourages responsible saving habits. The reporting and visualization feature further enhance user understanding by presenting financial information in an interactive and easily interpretable format.

FUTURE WORK

The system can be extended by

- Integrating advanced machine learning algorithms to provide more accurate financial predictions and personalized savings recommendations.
- Predictive analytics can be utilized to forecast future expenses, identify potential financial risks, and assist users in long-term financial planning.
- Integration with banking systems, digital wallets, and UPI payment platforms to enable automatic transaction synchronization and real-time financial monitoring. Such integration would reduce manual data entry and improve the accuracy of financial records.
- The incorporation of Generative AI and conversational chat bots can further enhance user
- interaction by providing intelligent financial guidance, answering financial queries, and offering personalized budgeting strategies through natural language communication

REFERENCES

[1] C. Lesner, A. Ran, M. Rukonic, and W. Wang, "Large Scale Personalized Categorization of Financial Transactions," in Proc. AAAI Conf. Artificial Intelligence, vol. 33, no. 1, pp. 9365– 9372, 2019, doi: 10.1609/aaai. v33i01.33019365.

[2] P. K. M. Kanaujia, N. Behera, M. Pandey, and S. S. Rautaray, "Recommendation System for Financial Analytics," in Proc. Int. Conf. ICT in Business Industry &

[3] Government (ICTBIG), IEEE, 2016, doi: 10.1109/ICTBIG.2016.7892673.
[4] M. Suganya and S. Ganesh Kumar, "GenAIPowered Personal Finance Consultant: Integrating Machine Learning and Generative AI for Personalized Financial Recommendations and Literacy Enhancement," in Proc. 2025 Int. Conf. Data Science and Business Systems (ICDSBS), IEEE, 2025, doi: 10.1109/ICDSBS63635.2025.11031897.
[5] X. Zheng, M. Zhu, Q. Li, C. Chen, and Y. Tan, "FinBrain: When Finance Meets AI 2.0," arXiv preprint arXiv: 1808.08497, 2018.
[6] L. Cao, "AI in Finance: Challenges, Techniques and Opportunities," arXiv preprint arXiv: 2107.09051, 2021.
[7] W. J. Yeo, W. van der Heever, R. Mao, E. Cambria, R. Satapathy, and G. Mengaldo, "A Comprehensive Review on Financial Explainable AI," arXiv preprint arXiv: 2309.11960, 2023.
[8] V. Kanaparthi, "Transformational Application of Artificial Intelligence and Machine Learning in Financial Technologies and Financial Services: A Bibliometric Review," arXiv preprint arXiv: 2401.15710, 2024.
[9] V. Awasthi and V. Pandey, "How Reinforcement Learning Can Drive Personalized Financial Wellness," SSRN Working Paper, 2025.
[10] A. Uppal, A. Srivastava, Y. Awasthi, A. Srivastava, and B. Kakkar, "Translating Artificial Intelligence into Socio-Economic Insight: A Hybrid Deep Learning Approach to Employee Financial Well-Being," Discover Artificial Intelligence, vol. 6, 2026.
[11] M. D'Souza, P. Bhegade, P. Bhalekar, and Y. Bhavsar, "A Comprehensive Review of Machine Learning Techniques for Intelligent Personal Finance Management Systems," SSRN, 2026.
[12] A. Kumar and S. Sharma, "AI-Based Personal Finance Management and Budget Optimization Using Machine Learning Techniques," International Journal of Computer Applications, vol. 183, no. 12, pp. 15–22, 2022.
[13] M. A. Olson and K. Wolter, "Personal Financial Management Systems and Consumer Financial Behavior," Journal of Financial Services Research, vol. 58, no. 2, pp. 145–162, 2020
[14] A. K. Jain, "Data Clustering: 50 Years Beyond K-Means," Pattern Recognition Letters, vol. 31, no. 8, pp. 651–666, 2010.
[15] J. B. Heaton, N. G. Polson, and J. H. Witte, "Econometric Applications of Deep Learning," Journal of Applied Econometrics, 2017.
[16] S. K. Sharma and M. Gupta, "Smart Expense Tracking and Budgeting System Using Machine Learning," International Journal of Engineering Research, 2022.
[17] A. Gupta and R. Singh, "Personal Finance Management System Using AI," International Journal of Advanced Computer Science, 2021.
[18] N. Kumar and P. Singh, "AI-Based Budget Recommendation System," International Journal of Scientific Research, 2022.
[19] D. Mishra et al., "Smart Financial Assistant Using Machine Learning," International Journal of Innovative Technology, 2023. [20] K. Patel and S. Shah, "Automated Expense Categorization Using AI," International Journal of Data Science, 2021.