International Journal of
DATA SCIENCE AND IOT MANAGEMENT SYSTEM
Peer Reviewed, Referred & Indexed Journal
ISSN: 3068-272X www.ijdim.com Original Research Paper

Artificial Intelligence Driven Financial Planning and Decision Support Framework

Navtesh Ojha[1], Turaka Ram Mohan Rao[2], K Mahesh[3], Rokkam Dinesh Reddy[4], Mr. S. Bavankumar[5]

[1,2,3,4]Students, Department of Computer Science and Engineering, Sree Dattha Group of Institutions, Sheriguda, Ibrahimpatnam, Telangana, India

[5]Assistant Professor, Department of Computer Science and Engineering, Sree Dattha Group of Institutions, Sheriguda, Ibrahimpatnam, Telangana, India

***Abstract*— Financial planning plays a crucial role in managing personal expenses and ensuring long-term financial stability. Traditional systems used for budgeting mainly depend on basic tools that record past transactions and categorize expenses. However, these methods often lack the ability to provide meaningful insights into future spending patterns or assist users in making informed financial decisions. As a result, users are required to rely on manual calculations and static budgeting approaches, which may not effectively adapt to changing financial behaviours. The proposed system introduces a more advanced approach to financial planning by utilizing modern computational techniques to analyse historical expense data and identify patterns. By applying multiple analytical models, the system improves the accuracy of expense estimation and provides users with helpful suggestions for better budget management. It also evaluates model performance using standard metrics to ensure reliability and consistency in results. Unlike traditional methods, this system adapts to individual user behaviour, offering a more personalized experience. Overall, the system aims to enhance financial awareness, support smarter decision-making, and provide a flexible and efficient solution for managing personal finances.**

***Keywords*— Financial Planning, Expense Management, Data Analysis, Machine Learning Algorithms, Budget Forecasting, Personalized Recommendations, Decision Support System, Performance Evaluation Metrics.**

I. INTRODUCTION

Financial management has undergone a significant transformation over the past two decades, primarily due to the integration of information technology within organizational processes. Enterprise Resource Planning (ERP) systems have become central to this evolution, providing organizations with tools to streamline financial operations, enhance data accuracy, and support effective decision-making [1]. By integrating disparate business functions, ERP systems ensure a unified platform for resource allocation, financial tracking, and departmental coordination. The implementation of ERP involves multiple stages, including planning, system configuration, testing, and continuous improvement, each critical for achieving operational efficiency and minimizing implementation failures [1][2]. As organizations increasingly adopt ERP systems, understanding the implementation lifecycle and its managerial implications becomes essential to realize the full potential of these platforms.

The adoption of ERP systems not only affects operational processes but also introduces managerial considerations that influence the system's overall success. Factors such as adaptability to organizational structure, cost control, and user acceptance play a decisive role in determining the efficiency of ERP deployment [2]. Effective managerial oversight ensures that ERP modules align with enterprise objectives, financial reporting standards, and compliance requirements. Furthermore, researchers have emphasized the importance of risk management during implementation, highlighting strategies to anticipate and mitigate potential disruptions in financial operations [3]. Risk assessment frameworks are especially crucial for large enterprises where the scale of financial transactions

Received: 14-03-2026 | Accepted: 21-04-2026 | Published: 27-04-2026

International Journal of
DATA SCIENCE AND IOT MANAGEMENT SYSTEM
Peer Reviewed, Referred & Indexed Journal
ISSN: 3068-272X www.ijdim.com Original Research Paper

and system complexity increases the likelihood of errors and operational bottlenecks.

The rise of IT-enabled financial innovation has further transformed traditional accounting and management practices. Advanced ERP systems enable real-time financial monitoring, automated transaction recording, and improved reporting accuracy [4]. These systems allow organizations to manage cash flow, accounts payable and receivable, and budgeting processes with greater precision, reducing the dependency on manual interventions. However, the integration of ERP systems across multi-departmental and multi-location enterprise groups presents significant challenges. Issues such as data synchronization, inter-departmental coordination, and compatibility of legacy systems require careful planning and technical expertise [5]. Addressing these challenges ensures that the ERP system provides a coherent and comprehensive overview of the organization's financial health.

Despite their advantages, traditional ERP-based financial management systems often lack advanced analytical capabilities necessary for dynamic financial planning. While they efficiently manage resources and streamline operations, they are limited in predicting trends, identifying anomalies, or supporting proactive decision-making [6]. Modern financial environments demand systems capable of generating intelligent insights from large datasets, enabling executives to respond swiftly to market fluctuations and internal financial changes. Consequently, there has been a shift towards integrating data-driven approaches, including predictive analytics, machine learning, and scenario modeling, into ERP platforms [4][6]. This approach allows organizations to enhance budget forecasting, investment planning, and resource optimization.

On a personal financial management level, conventional budgeting tools primarily focus on recording past transactions and categorizing expenses [7]. These systems, while useful for tracking expenditures, are often static and require manual calculations. Users have limited ability to anticipate changes in financial behavior, adapt to unexpected expenses, or receive actionable recommendations for optimizing budgets [7][8]. The lack of analytical capabilities in these traditional systems restricts their effectiveness in long-term financial planning and wealth management. Thus, there is a growing demand for intelligent financial planning systems that can learn from historical patterns and provide personalized guidance.

The proposed system addresses these limitations by employing advanced computational techniques to analyze historical financial data and extract meaningful patterns [8]. By integrating multiple analytical models, the system can predict future expenses, identify spending trends, and offer actionable suggestions for efficient budget management [9]. Such an approach enhances the user's ability to make informed decisions, optimize savings, and plan for long-term financial stability. Additionally, integrating ERP functionalities with predictive analytics ensures that both corporate and personal financial planning processes benefit from accurate, timely, and context-aware insights, bridging the gap between traditional practices and modern requirements [6][9].

In conclusion, ERP systems have transformed financial management by providing integrated platforms for efficient resource allocation, accurate reporting, and decision support [1][2]. However, limitations in analytical capabilities and adaptability have necessitated the evolution of these systems towards data-driven, intelligent financial management solutions [4][6]. By combining ERP functionalities with modern predictive analytics and advanced computational techniques, organizations and individuals can achieve more dynamic, flexible, and user-centric financial planning [8][9][10]. This evolution not only improves operational efficiency but also enhances strategic decision-making, risk management, and long-term financial sustainability in an increasingly complex economic environment.

II. RELATED WORK

[1] Stephen Harwood "ERP: The Implementation Cycle" This work explains the complete lifecycle of ERP system implementation, focusing on planning, design, execution, and post-implementation support. Harwood emphasizes that successful ERP deployment requires careful alignment between business processes and system capabilities. The book highlights the importance of stakeholder involvement, proper resource allocation, and continuous monitoring throughout the implementation cycle. It also discusses common challenges such as resistance to change, technical complexities, and integration issues. By providing structured methodologies and practical insights, the author helps organizations understand how to minimize risks and ensure smooth transitions. This reference is particularly useful in understanding how ERP systems can improve operational efficiency and financial management when implemented effectively.

International Journal of
DATA SCIENCE AND IOT MANAGEMENT SYSTEM
Peer Reviewed, Referred & Indexed Journal
ISSN: 3068-272X www.ijdim.com Original Research Paper

[2] David L. Olson "ERP Managerial Issues of Enterprise Resource Planning System" Olson's work focuses on the managerial and organizational challenges associated with ERP systems. It explores how decision-makers must address issues such as cost control, system customization, user training, and change management. The book highlights the importance of strategic planning and leadership in ensuring ERP success. It also discusses how ERP systems impact business performance by improving coordination and information flow across departments. Olson emphasizes that managerial support and proper communication are essential for overcoming implementation barriers. This reference provides valuable insights into how ERP systems influence financial planning and organizational decision-making, making it relevant for understanding the broader impact of technology on enterprise management.

[3] Zhen Fuming "A Study of Risk Management in ERP Implementation" This study focuses on identifying and managing risks during ERP implementation. Zhen Fuming outlines various types of risks, including technical, financial, operational, and organizational risks that may arise during different stages of deployment. The book emphasizes the need for proactive risk assessment and mitigation strategies to ensure successful implementation. It also highlights the importance of proper planning, testing, and monitoring to reduce system failures and cost overruns. By analysing real-world cases, the author demonstrates how effective risk management practices can improve system reliability and organizational performance. This reference is essential for understanding how risk factors can influence ERP success and the importance of structured risk management approaches.

[4] Zhang Raijin "Financial and Accounting Management Innovation in IT Environment" Zhang Raijin discusses how advancements in information technology have transformed financial and accounting practices. The book highlights the role of ERP systems and digital tools in automating financial processes, improving accuracy, and enhancing decision-making capabilities. It explains how organizations can adopt innovative approaches to financial management by leveraging real-time data and integrated systems. The author also explores challenges such as system integration, data security, and the need for skilled professionals. This reference emphasizes the importance of adapting to technological changes to maintain competitiveness. It provides a strong foundation for understanding how IT-driven innovations contribute to modern financial management systems.

[5] Yang Xuedong "The Impact and Challenges of ERP on Enterprise Group's Financial Management" This paper examines the effects of ERP systems on financial management within large enterprise groups. Yang Xuedong highlights how ERP systems improve financial transparency, coordination, and efficiency by integrating multiple business units into a unified system. However, the study also addresses challenges such as high implementation costs, system complexity, and difficulties in standardizing financial processes across different departments. The author emphasizes the need for proper planning, training, and system customization to overcome these challenges. This reference provides valuable insights into both the benefits and limitations of ERP systems, helping organizations better understand how to leverage ERP for effective financial management.

III. PROPOSED METHODOLOGY

The proposed system focuses on improving financial planning by analysing historical expense data and generating meaningful insights for better decision-making. Initially, user data is collected and pre-processed to remove inconsistencies, missing values, and irrelevant information. The cleaned dataset is then categorized into different expense groups such as food, transportation, utilities, and others. This structured data forms the foundation for further analysis. To enhance accuracy, multiple computational models such as Decision Tree, Random Forest, and CNN-based approaches are applied. Each model processes the data differently, allowing the system to capture various patterns and trends in user spending behaviour. The outputs from these models are compared using standard evaluation metrics such as Mean Squared Error , Root Mean Squared Error , and R2 Score. Based on performance, the most suitable model is selected. In addition to forecasting, the system provides intelligent suggestions to help users manage their budgets effectively. The overall approach ensures adaptability, enabling the system to update its analysis as new data becomes available. This results in a more dynamic and user-focused financial management solution.

International Journal of
DATA SCIENCE AND IOT MANAGEMENT SYSTEM
Peer Reviewed, Referred & Indexed Journal
ISSN: 3068-272X www.ijdim.com Original Research Paper

Figure [1]: System Architecture

Figure [1] illustrate The system architecture illustrates a structured flow of data and processing layers designed to support intelligent financial planning. It begins with the data sources layer, where user inputs such as income, expenses, and budget details are collected along with transaction history and optional external data. This data is then passed to the data ingestion and preprocessing layer, where it undergoes cleaning, transformation, and categorization to ensure consistency and usability. Next, the processed data is fed into the analytical engine, where different computational models are applied to identify patterns and generate insights. The system evaluates the performance of these models using standard metrics to ensure reliability. The processed and analysed data is stored in a dedicated storage layer, which includes structured databases and data warehouses. The application layer provides user-facing features such as dashboards, expense management tools, forecasting results, and visual reports. A security layer ensures data protection through authentication, authorization, and encryption. Finally, the system delivers meaningful insights, helping users manage budgets, receive recommendations, and make informed financial decisions effectively.

IV.RESULT AND DISCUSSION

The results demonstrate that the proposed system significantly improves financial planning by providing accurate expense estimation and meaningful insights. Compared to traditional methods, the system offers better performance through the use of advanced analytical models and evaluation metrics. Users can clearly understand their spending patterns and receive useful suggestions for managing their budgets effectively. The system also adapts to changing financial behaviour, ensuring consistent and reliable outputs over time. Overall, the results highlight enhanced decision-making, improved budgeting accuracy, and greater financial awareness, making the system a practical and efficient solution for personal expense management and planning.

```
Category ID = 1 Category Expenses Name = Apartment
Category ID = 2 Category Expenses Name = Bank fees
Category ID = 3 Category Expenses Name = Cable
Category ID = 4 Category Expenses Name = Clothing/Shoes/Personal Items
Category ID = 5 Category Expenses Name = Credit Card
Category ID = 6 Category Expenses Name = Debt repayment
Category ID = 7 Category Expenses Name = Eating/Going Out
Category ID = 8 Category Expenses Name = Electricity/Water
Category ID = 9 Category Expenses Name = Entertainment/Subscriptions
Category ID = 10 Category Expenses Name = Food/Drinks
Category ID = 11 Category Expenses Name = Garbage
Category ID = 12 Category Expenses Name = Grocery
Category ID = 13 Category Expenses Name = Hair Cut
Category ID = 14 Category Expenses Name = Health Insurance
Category ID = 15 Category Expenses Name = Healthcare
Category ID = 16 Category Expenses Name = Home
Category ID = 17 Category Expenses Name = Magazines/Newspapers/Books
Category ID = 18 Category Expenses Name = Others
Category ID = 19 Category Expenses Name = Pension Fund
Category ID = 20 Category Expenses Name = Personal care items (drugstore)
Category ID = 21 Category Expenses Name = PhilHealth
```

Figure [2]: Dataset

Figure [2] The screen displaying category Id along with expenses category names and while recommendation you can enter any category ID and then application will recommend other category. expenses names.

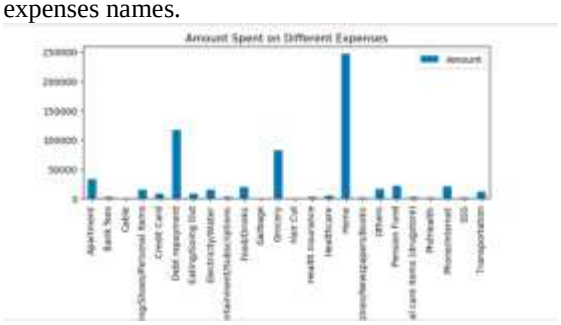

Figure [3]: Data Visualization

Figure [3] illustrates screen visualizing total amount spent on different expenses category where x-axis represents category names and y-axis represents expenses amount.

Received: 14-03-2026 | Accepted: 21-04-2026 | Published: 27-04-2026

International Journal of
DATA SCIENCE AND IOT MANAGEMENT SYSTEM
Peer Reviewed, Referred & Indexed Journal
ISSN: 3068-272X www.ijdim.com Original Research Paper

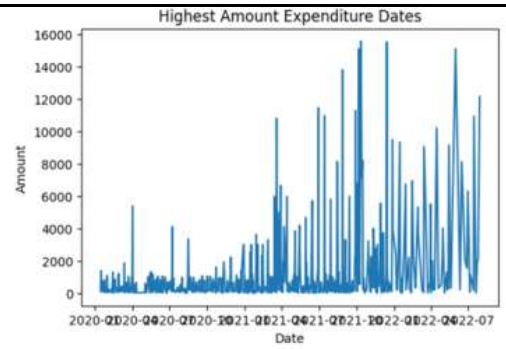

Figure [4]: Visualization Expenditure

Figure [4] illustrates screen visualizing expenditure graph based on date where x-axis represents Date and y-axis represents amount.

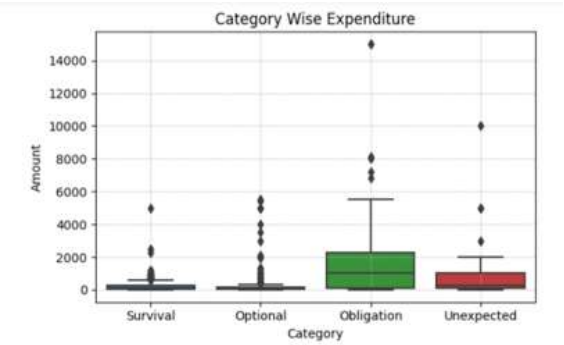

Figure [5]: Visualization Graph

Figure [5] illustrates screen visualizing graph of amount spent on different categories where x-axis represents category name and y-axis represent amount.

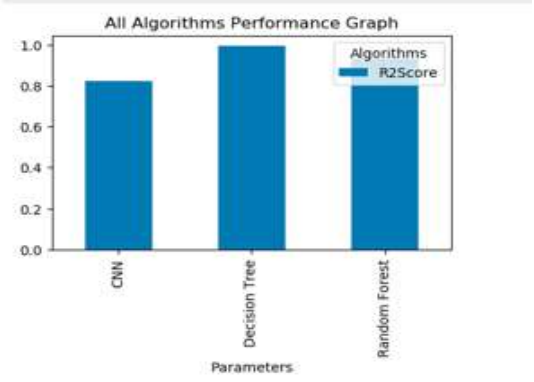

Figure [6]: Comparison Graph

Figure [6] illustrates screen visualizing R2score graph of all algorithms where x-axis represents algorithm names and y-axis represents R2score.

Figure [7]: Prediction

Figure [7] illustrates screen predicting expenses for different category expenses.

DISCUSSION

The proposed system demonstrates a significant improvement over traditional financial management methods by incorporating advanced analytical techniques. Unlike basic budgeting tools, this system not only organizes past expenses but also interprets spending patterns to provide deeper insights. The use of multiple models allows for better comparison and selection of the most effective approach, improving the reliability of results. One of the key strengths of the system is its ability to adapt to changing user behaviour. As more data is collected over time, the system refines its analysis, leading to more accurate and relevant outputs. Additionally, the inclusion of performance evaluation metrics ensures that the system maintains a high standard of accuracy and consistency. However, there are certain challenges to consider. The quality of results heavily depends on the accuracy and completeness of input data. Users must ensure regular and correct data entry for optimal performance. Furthermore, implementing multiple models may increase computational complexity. Despite these challenges, the system provides a more flexible, efficient, and user-centric approach to financial planning compared to existing solutions.
\

V. CONCLUSION

In conclusion, the proposed financial planning and decision support system offers a modern approach to managing personal expenses. By leveraging advanced computational methods and structured data analysis, the system overcomes the limitations of traditional budgeting tools. It provides not only accurate estimations of future expenses but also practical suggestions to improve financial decision-

International Journal of
DATA SCIENCE AND IOT MANAGEMENT SYSTEM
Peer Reviewed, Referred & Indexed Journal
ISSN: 3068-272X www.ijdim.com Original Research Paper

making. The integration of multiple analytical models enhances the system's reliability and allows for better performance evaluation using standard metrics. This ensures that users receive consistent and dependable results. Moreover, the system's adaptability makes it suitable for handling dynamic financial behaviours, providing a personalized experience for each user. Overall, the system contributes to improved financial awareness and smarter budgeting practices. It simplifies complex financial data into understandable insights, helping users make informed decisions. Future enhancements may include real-time data integration and further optimization of models to improve efficiency. This approach represents a step forward in developing intelligent and effective financial management solutions.

REFERENCES

1. Stephen, Harwood, "ERP: the implementation cycle," Oxford, Boston: Butterworth-Heinemann, 2003, PP. 93~95.
2. David L Olson, "ERP Managerial Issues Of Enterprise Resource Planning System," Zhang Xiaoyu Translation, Oriental Press, 2005, PP. 34-70.
3. Zhen Fuming, "A Study of Risk Management in ERP Implementation," Dongmei University of finance and economics Press, 2008, PP. 85-105.
4. Zhang Raijin, "Financial and Accounting management Innovation in IT Environment," CHINA CITIC PRESS, 2008, PP. 201-230.
5. Yang Xuedong, "The Impact and challenges of ERP to Enterprise Group's Financial Management," Commercial Accounting, 2008,16, PP. 47-48.
6. Xiao Hong, "Analysis of the ERP system's Financial management characteristic," Contemporary Economics, 2009, 09, PP. 138-139.
7. Yu Meilin, "Research on the ERP-based Integrated Financial Management Mode of Enterprise Groups," Wuhan University of Technology, 2008, PP. 12-17.
8. Long Zhi, "The Implementation Case of Wuhan Iron and Steel Group's Financial Management System," http: //www. enter. com. can /article /2007/0208/A20070208433476.shtml
9. Yu Hui, "The Application of ERP system in Enterprise Management," Friends of Accounting, 2009, 09, PP. 71-72.
10. Shen Kwang, "Analysis of Shandong Dong-e E-Jiao Group's ERP System Applications," http: //articles. works. net. can/ Erp/ article 10915. him.
11. Bhagwat, V. B. (2026). Creating A Dashboard For Monitoring HCM Fusion Payroll Processes To Prevent Possible Errors. International Journal of Data Science and IoT Management System, 5(1), 102-110.
12. Shashank A. (2025). Metadata-driven data integration framework: Automating enterprise data integration through declarative approaches. European Modern Studies Journal, 9(4), 9.
13. P. Venkata Ramana. (2024). AI-driven predictive analytics in ERP systems for proactive supply chain optimization. Eudoxus Press Journal.
14. Gummadi, V. P. K. (2026). Infrastructure optimization techniques for enterprise integration platforms: A comprehensive analysis. Computer Fraud & Security, 37-44. https://doi.org/10.52710/cfs.875
15. Poojari, R. Frameworks for Data Management and Lineage in Large-Scale Healthcare Data Systems.

International Journal of
DATA SCIENCE AND IOT MANAGEMENT SYSTEM
Peer Reviewed, Referred & Indexed Journal
ISSN: 3068-272X www.ijdim.com Original Research Paper

16. Maturi, S. Y. (2024). Cryptographic privacy engines: Practical multi-party protocols for confidential database queries. Nanotechnology Perceptions, 20(S13), 2770–2785

17. Maturi, S. Y. -(2024). Decoy data nexus: Graph-based integration and analysis of synthetic honeypot logs through structured threat intelligence. International Journal of Computational and Experimental Science and Engineering (IJCESEN), 10(4), 4255–4261. https://doi.org/10.22399/ijcesen.5010

18. Pavan Kumar Adabala. (2026). IoT-Driven Digital Twins for Manufacturing Optimization: Hybrid Modelling, Reinforcement Learning and Sustainable Operations. International Journal of Computational and Experimental Science and Engineering, 12(1). https://doi.org/10.22399/ijcesen.5050

19. Gummadi, V. P. K. (2020). API design and implementation: RAML and OpenAPI specification. Journal of Electrical Systems, 16(4). https://doi.org/10.52783/jes.9329

20. Akinapalli, S. (2025). Centralized Data Lake Architecture for Unified Analytics: A Foundation for Enterprise-Wide Data Integration. Journal Of Engineering And Computer Sciences, 4(8), 414-422.

21. Ghali Krishna Harshitha, Purushothamma B. N., & Anil Kumar K. C. (2022). An analysis of influence of personality on managerial effectiveness. International Journal of Mechanical Engineering, 7(3), 668–671.

22. Kandula, S. T. R., Boyapati, P. K., & Susarla, R. S. (2025, April). Optimized Cloud Resource Management Using Deep Dendritic Artificial Neural Networks Integrated with Kubernetes and Terraform. In International Conference on Computer Vision and Robotics (pp. 454-465). Cham: Springer Nature Switzerland.

23. Boyapati, P. K. Building a centralized data operations hub for healthcare enterprise integration. IJSAT-Int. J. Sci. Technol. 16 (2). https://doi.org/10.71097/IJSAT.v16.i2.3219