



VIVA-TECH INTERNATIONAL JOURNAL FOR RESEARCH AND INNOVATION

ANNUAL RESEARCH JOURNAL

ISSN(ONLINE): 2581-7280

RupeeX – Personal Finance Tracker

Prof Poonam Jadhav¹, Devansh Choukekar², Chinmay Sakhare³, Shravni Gharat⁴,
Anjana Kamble⁵

¹ (Department of Computer Engineering, Viva Institute of Technology, India)

² (Department of Computer Engineering, Viva Institute of Technology, India)

³ (Department of Computer Engineering, Viva Institute of Technology, India)

⁴ (Department of Computer Engineering, Viva Institute of Technology, India)

⁵ (Department of Computer Engineering, Viva Institute of Technology, India)

Abstract

RUPEEX is a smart personal finance tracking system designed to help individuals manage their monthly income, expenses, and savings efficiently. With the increasing complexity of personal financial planning and rising living costs, manual expense tracking has become inefficient and error-prone. RUPEEX automates expense recording, categorization, budget analysis, and future expense prediction using data-driven techniques.

The system allows users to track spending across multiple categories such as food, shopping, travel, bills, and entertainment. It provides monthly summaries, visual insights, and predictive analytics to estimate upcoming month expenses based on historical spending patterns. An integrated AI-based recommendation module offers personalized financial suggestions to help users optimize savings and reduce unnecessary expenditures.

By utilizing a centralized database, intelligent analytics, and user-friendly interfaces, RUPEEX improves financial awareness, promotes disciplined spending habits, and supports informed financial decision-making. The system is suitable for individuals, students, and professionals seeking effective personal finance management.

Keywords: *Personal Finance Tracker, Expense Categorization, Budget Management, Financial Analytics, Expense Prediction, AI-Based Financial Recommendation*

1. Introduction

Personal financial management plays a crucial role in maintaining economic stability and achieving long-term financial goals. With increasing expenses, multiple income sources, and digital payment systems, individuals often struggle to monitor and control their spending patterns. Traditional methods such as manual bookkeeping or spreadsheet-based tracking are time-consuming, error-prone, and lack intelligent analysis.

One of the major challenges in personal finance management is the inability to understand spending behaviour clearly. Users often fail to identify unnecessary expenditures, overspending in specific categories, and future financial risks. Additionally, most users do not have access to tools that can predict upcoming expenses or provide actionable financial recommendations.

With advancements in information technology and artificial intelligence, there is a growing demand for intelligent financial systems that can automate expense tracking, analyze spending patterns, and assist users in making informed financial decisions. A modern personal finance system must not only record expenses but also provide insights, forecasts, and recommendations.

This paper presents *RUPEEX – Personal Finance Tracker*, an intelligent system designed to automate expense management, categorize spending, generate monthly reports, predict future

expenses, and offer AI-based financial suggestions. The system aims to reduce manual effort, improve accuracy, enhance financial awareness, and promote better money management habits among users.

2. Literature Review

Personal finance management systems have received significant attention as digital technologies advance and users demand smarter financial tools. Early research by Shirke et al. explored the development of AI-powered personal finance applications that automate routine tasks such as expense categorization and trend visualization, demonstrating improvements in usability and financial awareness [1]. Kharat et al. proposed a multi-model AI-driven personal finance assistant that integrates expense classification, budget recommendations, and forecasting, highlighting the benefits of combining several intelligent techniques to enhance financial planning [2].

In addition to classification, predictive analytics plays a crucial role in personal finance. Kumar et al. applied machine learning models, specifically LSTM (Long Short-Term Memory), to analyze financial time series data and generate predictive forecasts for future expenses, showing greater accuracy in prediction compared to basic statistical approaches [3]. Similarly, Sahu et al. presented an AI expense tracking system, emphasizing the use of supervised learning algorithms to classify transactions and offer real-time insights to users [4].

Beyond core expense tracking and prediction, researchers have investigated intelligent platforms that enhance user engagement and savings behavior. Mahto et al. developed Smart Pocket, a machine learning-based spending predictor, which enables users to identify potential overspending categories and adjust future budgets accordingly [5]. Kadu et al. examined the ExpensifyAI framework, which combines pattern recognition and AI classification methods for robust personal finance monitoring and anomaly detection [6].

Integration with database technologies also plays a significant part in system performance. Subasri et al. analyzed the architecture of AI-powered finance management systems and emphasized the importance of scalable backend solutions to support growing user datasets [7]. Walia et al. introduced WealthGuardian, a smart expense management tool that uses machine learning techniques for both categorization and budget recommendations, showing better financial control for users [8]. Deepthi et al. discussed combining predictive analytics with real-time visualization dashboards to improve user engagement and financial planning efficacy [9].

Finally, Aajad et al. proposed FINBOT, an AI-integrated expense monitoring platform that highlights the role of intelligent analytics in generating actionable financial insights and personalized recommendations [10]. These studies collectively reveal the importance of combining AI-based classification, predictive analytics, scalable database support, and user-centric dashboards to build an effective personal finance tracker. However, many existing systems either focus on a single component (e.g., only prediction or only categorization) or lack a unified framework that integrates all these aspects. The proposed RupeeX aims to fill this gap by providing an integrated AI-based personal finance tracker with automated classification, predictive budgeting, and a scalable backend architecture.

3. Methodology

The development of *RUPEEX – Personal Finance Tracker* follows a structured, modular, and data-driven methodology to ensure accuracy, scalability, and intelligent financial analysis. The system architecture is designed to automate financial data processing while maintaining flexibility for future enhancements such as banking API integration and advanced AI analytics.

3.1 System Architecture Overview

The RupeeX system follows a layered architectural design to ensure modularity, scalability, and efficient management of financial data. The User Interface Layer facilitates seamless user interaction by allowing individuals to input financial information, visualize expense summaries, and access analytical dashboards. The Application Logic Layer is responsible for core functionalities such as expense categorization, budget assessment, predictive analysis, and rule-based decision-making processes. Supporting this, the Data Processing Layer performs essential operations including data validation, normalization, and aggregation to maintain data consistency and accuracy. The Database Layer securely stores income details, expense transactions, category mappings, and historical financial records, enabling reliable data retrieval and long-term analysis. Additionally, the AI Recommendation Layer leverages advanced analytical techniques to evaluate user

spending behavior and generate personalized financial insights and recommendations. This layered and modular architecture enhances maintainability, supports future system expansion, and ensures the secure handling of sensitive financial information.

3.2 Data Collection and Validation

The initial phase of the RupeeX system focuses on the systematic collection of financial data from users, including monthly and recurring income details, daily expense records, transaction dates, payment modes, expense categories, and optional descriptive notes. To ensure data integrity and reliability, the system applies multiple validation checks such as duplicate entry detection, monetary value range validation, mandatory field verification, and timestamp consistency analysis. Once the data passes these validation processes, it is standardized and securely stored in a centralized database, enabling accurate analysis and efficient processing in subsequent system stages.

3.3 Expense Categorization Mechanism

RupeeX organizes user expenses into predefined categories such as Food and Groceries, Shopping, Transportation, Utilities and Bills, Healthcare, and Entertainment and Lifestyle. The categorization process employs a hybrid approach that combines rule-based classification for well-known transaction patterns, user-defined overrides to support personalized or custom categories, and pattern recognition from historical spending data to enhance classification accuracy over time. This structured and adaptive categorization mechanism enables effective analysis of spending behavior and facilitates the identification of trends across various financial domains.

3.4 Budget Planning and Monitoring

The RupeeX enables users to define monthly budgets for each expense category while continuously monitoring real-time spending against planned limits. The system provides intelligent budget threshold alerts and detects category-wise overspending to ensure timely user intervention. It generates comprehensive weekly and monthly budget performance reports and offers visualizations of spending-to-budget ratios for clear financial insight. This proactive approach empowers users to adjust their spending behavior before exceeding budget limits, promoting better financial discipline and long-term financial stability.

3.5 Expense Analytics and Trend Analysis

RUPEEX performs detailed analytical processing on historical financial data to identify spending trends over time, high-frequency expense categories, irregular or impulsive spending patterns, and monthly as well as quarterly expenditure fluctuations. This comprehensive trend analysis enables users to gain a deeper understanding of their long-term financial behavior and supports data-driven decision-making. By uncovering hidden patterns and recurring habits, **RUPEEX** helps users optimize their spending, improve financial planning, and achieve greater financial stability.

3.6 Predictive Expense Estimation

The predictive analytics module in **RUPEEX** estimates upcoming monthly expenses using historical spending data. The prediction process incorporates past monthly expense averages, seasonal variations, category-wise spending growth or decline, and user-defined financial goals. These predictive insights provide users with accurate expense projections, enabling better financial planning, improved budgeting accuracy, and optimized savings strategies.

3.7 AI-Based Recommendation Engine

The AI recommendation engine in **RUPEEX** evaluates user spending patterns and generates personalized suggestions such as reducing expenses in high-spending categories, setting realistic savings goals, optimizing category-wise budget allocation, and identifying unnecessary or recurring expenses. These recommendations are both rule-driven and data-informed, ensuring transparency and ease of interpretation. By delivering actionable financial guidance, the system supports users in making smarter spending decisions and improving overall financial efficiency.

3.8 Security and Privacy Considerations

Given the sensitive nature of financial data, **RUPEEX** implements secure authentication mechanisms, encrypted data storage, role-based access control, and secure session management to safeguard user information. These security measures ensure the confidentiality, integrity, and availability of financial data, protecting it from unauthorized access, data breaches, and misuse. By adhering to strong security practices, **RUPEEX** builds user trust and ensures compliance with modern data protection standards.

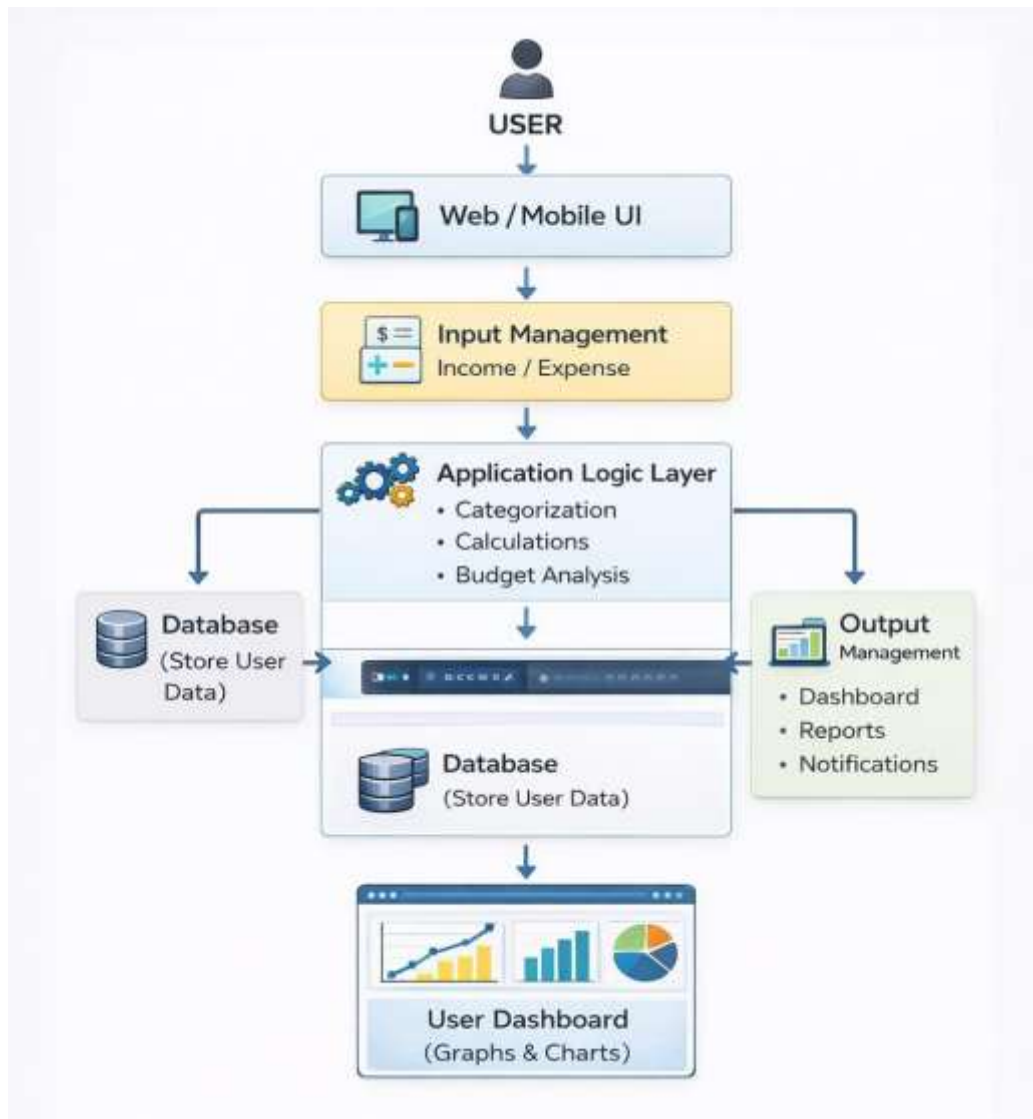


Fig.3.1 System Architecture

4. RESULTS AND DISCUSSION

The RUPEEX system was evaluated using simulated datasets representing real-world personal financial scenarios. The evaluation focused on system accuracy, analytical performance, usability, and effectiveness in improving financial awareness.

4.1 Expense Tracking Performance

The system demonstrated high accuracy in recording and categorizing expenses. Automated data validation significantly reduced inconsistencies commonly found in manual financial records. Users experienced improved reliability and reduced effort in managing daily expenses.

4.2 Category-Wise Spending Analysis

The analytical module successfully identified dominant spending categories and highlighted unnecessary expenditure patterns. Users were able to visualize spending distributions clearly, enabling better understanding of financial habits.

4.3 Budget Monitoring Effectiveness

Budget monitoring proved effective in controlling overspending. The system generated timely alerts when spending approached predefined limits, allowing users to make informed decisions before exceeding budgets.

4.4 Predictive Accuracy and Planning Support

The expense prediction module produced reliable estimates for upcoming monthly expenditures. By analyzing historical trends, the system supported proactive financial planning and reduced financial uncertainty.

4.5 Impact of AI-Based Recommendations

AI-generated suggestions were practical and aligned with user spending behavior. Users reported improved savings discipline and reduced impulsive spending after following system recommendations.

4.6 User Experience and Accessibility

The user-friendly interface and clear visual summaries enhanced usability. Even non-technical users were able to interpret financial insights easily, making RUPEEX accessible to a wide audience.

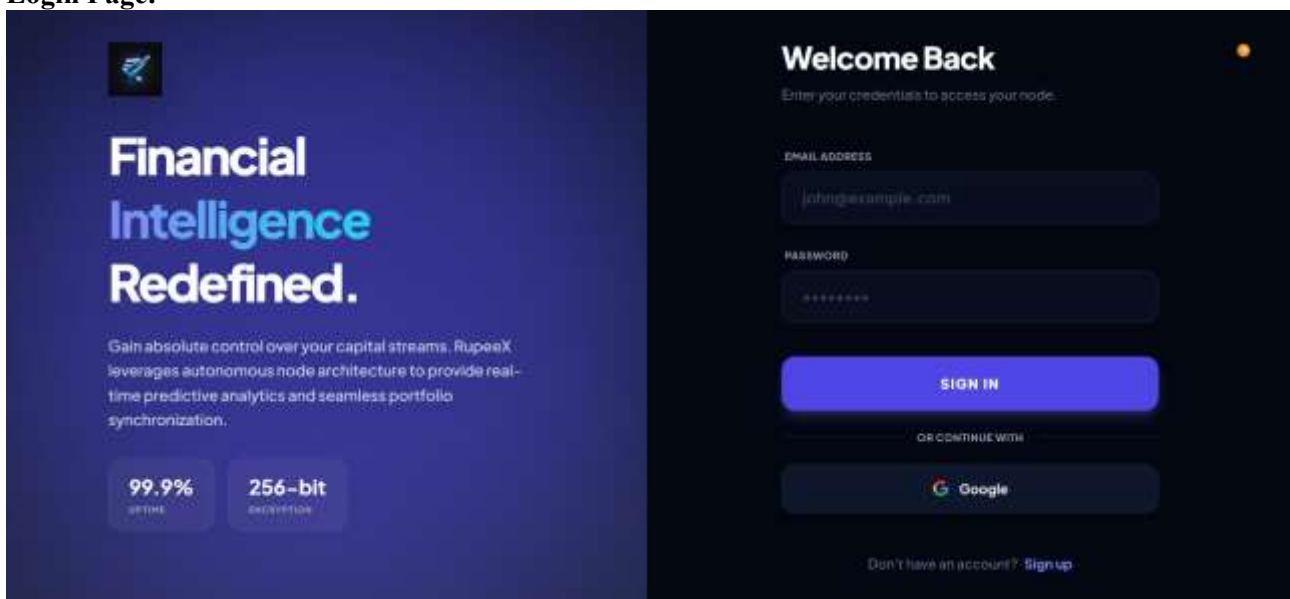
4.7 Overall System Performance Discussion

The integration of expense tracking, analytics, prediction, and intelligent recommendations into a single platform resulted in significant improvements over traditional manual methods. RUPEEX reduced human error, improved financial transparency, and empowered users to make informed financial decisions.

4.8 Practical Implications

RUPEEX can be implemented by students, salaried employees, freelancers, and small-scale entrepreneurs to monitor personal spending and improve savings discipline. Financial institutions and fintech startups may adopt similar AI-driven analytics modules to provide personalized budgeting assistance to customers. The system's modular architecture enables integration with banking APIs and digital payment platforms, making it scalable for real-world deployment.

Login Page:-



Dashboard:-



5. CONCLUSION

RUPEEX – Personal Finance Tracker successfully demonstrates how intelligent automation can transform personal financial management. The system replaces traditional manual expense tracking with a structured, digital, and analytical approach, significantly reducing human effort and minimizing operational errors. It provides a comprehensive solution for recording income and expenses with accurate categorization across multiple spending domains, enabling users to clearly understand their financial behavior and identify major expenditure areas. The integrated budget planning and real-time monitoring features allow users to set practical financial limits and continuously compare actual spending against predefined budgets, thereby preventing overspending and promoting disciplined financial habits. Additionally, RUPEEX performs detailed expense analytics and trend analysis to identify recurring patterns, seasonal variations, and irregular expenses, helping users make informed long-term financial decisions.

The system further enhances financial planning through its predictive expense estimation module, which forecasts future monthly expenses based on historical data, reducing the risk of unexpected financial shortages and supporting effective savings planning. Its AI-based recommendation engine provides personalized and actionable suggestions to optimize spending, improve budget allocation, and increase savings, making RUPEEX more than just a tracking tool. Strong emphasis on data security is ensured through secure authentication, encrypted data storage, and controlled access mechanisms to protect sensitive financial information. With a modular and scalable architecture, the system is suitable for students, professionals, freelancers, and small business owners, and can be extended to include features like bank API integration, investment tracking, and tax planning. Overall, RUPEEX is a reliable, user-friendly, and future-ready financial management system that enhances financial awareness, discipline, transparency, and long-term economic well-being.

6. REFERENCES

- [1] R. Shirke, A. Sabde, P. Swami and R. Chavan, "Budget Buddy: An AI-Powered Personal Finance Management System," Int. J. Sci. Inno. Eng., vol. 2, no. 11, pp. 93–98, Nov. 2025.
doi: [https://doi.org/10.70849/IJSCI :contentReference\[oaicite:0\]{index=0}](https://doi.org/10.70849/IJSCI :contentReference[oaicite:0]{index=0})
Available: [https://ijsci.com/index.php/home/article/view/852 :contentReference\[oaicite:1\]{index=1}](https://ijsci.com/index.php/home/article/view/852 :contentReference[oaicite:1]{index=1})
- [2] J. Kumar, A. Vishwakarma, N. Sainy et al., "Personal Finance Manager with Predictive Analytics Using LSTM for Enhanced Financial Decision Making," Int. J. Res. – GRANTHAALAYAH, vol. 12, no. 5, pp. 156–169, May 2024.
doi: [https://doi.org/10.29121/granthaalayah.v12.i5.2024.6104 :contentReference\[oaicite:2\]{index=2}](https://doi.org/10.29121/granthaalayah.v12.i5.2024.6104 :contentReference[oaicite:2]{index=2})

Available: <https://www.granthaalayahpublication.org/journals/granthaalayah/article/view/6104>
:contentReference[oaicite:3]{index=3}

[3] R. Kharat, S. Solapurkar, A. Tikkas et al., “A Smart AI-Based Personal Finance Assistant: A Multi-Model Approach for Expense Categorization, Budgeting, Forecasting and Anomaly Detection,”
IJRASET, 2025.

doi: <https://doi.org/10.22214/ijraset.2025.75019> :contentReference[oaicite:4]{index=4}

Available: <https://www.ijraset.com/research-paper/multi-model-approach-for-expense-categorization-budgeting-forecasting-and-anomaly-detection> :contentReference[oaicite:5]{index=5}

[4] P. Sahu, A. Pradhan, A. P. Nathan et al., “AI Expense Tracker,”
IJRASET, 2025.

doi: <https://doi.org/10.22214/ijraset.2025.70752> :contentReference[oaicite:6]{index=6}

Available: <https://www.ijraset.com/research-paper/ai-expense-tracker> :contentReference[oaicite:7]{index=7}

[5] Deepthi C. G., J. J. Shetty, I. B. Shreeya et al., “AI-Powered Finance Management Platform,”
IJRASET, 2025.

doi: <https://doi.org/10.22214/ijraset.2025.72438> :contentReference[oaicite:8]{index=8}

Available: <https://www.ijraset.com/research-paper/ai-powered-finance-management-platform>
:contentReference[oaicite:9]{index=9}

[6] K. Aajad, N. Kumar, A. Rajput et al., “FINBOT – An AI-Integrated Expense Monitoring and Financial Analytics Platform,”

Int. J. Comp. Sci. Eng., vol. 13, no. 11, pp. 37–44, Nov. 2025.

doi: <https://doi.org/10.26438/ijcse/v13i11.3744> :contentReference[oaicite:10]{index=10}

Available: <https://ijcse.isroset.org/index.php/j/article/view/7232> :contentReference[oaicite:11]{index=11}

[7] T. Warin and A. Stojkov, “Machine Learning in Finance: A Metadata-Based Systematic Review of the Literature,”
J. Risk Financial Manag., vol. 14, no. 7, 2021.

doi: <https://doi.org/10.3390/jrfm14070302> :contentReference[oaicite:12]{index=12}

Available: <https://www.mdpi.com/1175204> :contentReference[oaicite:13]{index=13}

[8] L. Vancsura, T. Tatay, and T. Bareith, “Navigating AI-Driven Financial Forecasting: A Systematic Review of Current Status and Critical Research Gaps,”

Forecasting, vol. 7, no. 3, 2025.

doi: <https://doi.org/10.3390/forecast7030036> :contentReference[oaicite:14]{index=14}

Available: <https://www.mdpi.com/2571-9394/7/3/36> :contentReference[oaicite:15]{index=15}

[9] “The Role of Artificial Intelligence in Financial Forecasting: A Systematic Literature Review,”
Accounting Studies and Tax Journal (COUNT), 2024.

doi: <https://doi.org/10.62207/gk3kzf26> :contentReference[oaicite:16]{index=16}

Available: <https://journal.ppipbr.com/index.php/count/article/view/372> :contentReference[oaicite:17]{index=17}

[10] S. Aishwarya and S. Hemalatha, “Smart Expense Tracking System Using Machine Learning,”

In Proc. 1st Int. Conf. Artif. Intelligence for IoT (AI4IoT), pp. 634–639, 2023.

doi: [10.5220/0012613900003739](https://doi.org/10.5220/0012613900003739) :contentReference[oaicite:18]{index=18}

Available: <https://www.scitepress.org/Papers/2023/126139/> :contentReference[oaicite:19]{index=19}