



International Journal of Multidisciplinary Research in Science, Engineering and Technology

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.206

Volume 8, Issue 11, November 2025



International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Coin Hug: A MERN-Based Smart Savings Tracker for Personal Finance Management

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ABSTRACT: Financial management has become an essential life skill as individuals increasingly seek effective ways to track spending, manage savings, and achieve personal financial goals. Traditional methods of saving and expense tracking lack automation, visual insights, and goal-oriented planning. To address this gap, this research presents Coin Hug, a FinTech-based Savings Tracker developed using the MERN stack (MongoDB, Express.js, React.js, Node.js) this project built with web-based. The system enables users to record income, track expenses, create financial goals, monitor progress, and store memorable moments upon achieving goals. Visual tools such as graphs and pie charts enhance financial awareness by displaying income distribution, expense analysis, and savings growth. Additional features such as user authentication, a contact support page, and a memo section strengthen user engagement. Coin Hug provides a modern, user-centric platform that encourages consistent saving habits and smart financial decisions. The paper discusses the architecture, methodology, implementation, results, and the proposed mobile app extension planned as future work.

I. INTRODUCTION

Financial literacy and effective money management have become essential competencies in today's rapidly evolving digital era. As economic systems advance and personal expenditures diversify, individuals increasingly face difficulties in tracking their finances, regulating impulsive spending, and building sustainable saving habits. Traditional methods such as handwritten logs, spreadsheets, or manual budgeting often prove inadequate, time-consuming, and prone to human error. These limitations have created a strong need for automated, intelligent, and user-friendly technological solutions that can support individuals in organizing their financial activities more efficiently.

The rise of Financial Technology (FinTech) has significantly transformed the landscape of personal finance management. Modern FinTech applications leverage digital tools—such as automation, secure cloud storage, advanced analytics, and responsive interfaces—to simplify the way users handle money. They provide features like automated tracking, smart categorization, real-time insights, and personalized dashboards. However, despite the rapid growth of these tools, many existing financial trackers still focus primarily on basic record-keeping and fail to address deeper behavioral and motivational aspects related to goal-oriented saving.

Most commonly used expense-tracking applications lack enhanced features such as goal-based saving motivation, visual analytical tools, or mechanisms that help users emotionally associate with their achievements, such as memory-based documentation. In many cases, users find it difficult to interpret raw financial data without visual representations, leading to poor engagement and limited long-term adoption. As a result, there is a growing demand for smarter systems that not only track income and expenses but also guide users toward achieving personal financial goals while maintaining high usability and motivation. Monitor income and expenses.

To address these challenges, this research introduces Coin Hug, an innovative FinTech platform designed to support users in effectively managing their finances through a personalized and interactive experience. The system enables users to: Monitor their income and expenses in an organized manner, Create and manage custom saving goals, Analyze financial patterns using interactive charts and graphs, Capture and store memorable moments upon goal achievement, Access a secure, personalized dashboard through authentication. Coin Hug moves beyond conventional tracking by incorporating emotional, motivational, and analytical elements into the user journey. Coin Hug is developed using the MERN stack—MongoDB, Express.js, React.js, and Node.js—offering a scalable, flexible, and modern architectural foundation. React enables a highly dynamic and responsive user interface, Node.js and Express.js manage



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backend logic and secure APIs, while MongoDB stores structured financial data efficiently. This combination ensures strong performance, data reliability, and seamless integration of analytical tools such as charts and graphs. By combining technology, user-centered design, and financial motivation, Coin Hug effectively bridges gaps in traditional financial management tools and empowers individuals to adopt disciplined and goal-driven saving behavior.

II. LITERATURE REVIEW

Personal finance management tools have evolved significantly over the past decade as digital technologies began to influence user behavior and financial decision-making. Numerous studies and applications in the FinTech domain highlight that individuals increasingly prefer automated systems over manual bookkeeping because of enhanced convenience, accuracy, and accessibility. Financial tracking applications have become essential tools for monitoring spending, budgeting, and achieving long-term financial stability. However, despite the availability of various platforms, many existing systems do not fully address the motivational and behavioral aspects required to sustain consistent saving habits.

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In addition to visualization, recent studies emphasize the role of goal-oriented saving systems. Research suggests that users are more likely to save consistently when they define clear objectives and receive motivation as they progress toward these goals. Some applications have implemented goal-tracking modules, but these features remain minimal or disconnected from the user's emotional journey. Furthermore, very few financial trackers allow users to preserve memories or associate achievements with visual cues, which can significantly improve long-term engagement and satisfaction.

By reviewing the existing literature, it is evident that current financial applications lack a holistic approach combining user motivation, emotional reinforcement, goal orientation, and intelligent visualization. These gaps form the foundation for the development of **Coin Hug**, which integrates modern MERN-based technologies with financial analytics and motivational systems to create a comprehensive savings management tool.

Relevance to Current Research

The reviewed literature highlights a strong global shift toward digital financial management tools, demonstrating the growing dependency on applications that simplify budgeting and saving. However, most existing systems focus primarily on traditional features such as expense recording, transaction categorization, and report generation. While these features are crucial, the lack of emotional motivation, personalized goal-setting, and memory-based reinforcement creates a gap in user engagement. The current research aims to bridge this gap by developing a system that not only tracks financial patterns but also motivates users through visual analytics and personal milestone documentation.

Relevance of Each Paper to the Current Study

1. Paper1 – Personal Finance Tracker (Web Application Development) The first study emphasizes the development of web-based financial trackers with dashboards and categorized expense management. Although it establishes the technical foundation for creating online expense applications, it lacks features promoting emotional engagement and long-term savings motivation. This supports the need for Coin Hug, which adds **goal-setting**, **memo-based achievements**, and **interactive charts**, thereby enhancing user retention and financial discipline.

2. Paper2 – Smart Personal Expense Tracker Using Machine Learning

This paper explores intelligent prediction mechanisms and user behavior analysis. While useful, such systems often require complex machine learning models and high data volumes, making them difficult for beginners or small-scale users. Coin Hug, by contrast, focuses on simplicity, real-time insights, and visual analysis without heavy computational overhead. The comparison highlights how Coin Hug fills the space for a lightweight yet effective savings tool that remains accessible to all users.



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3. Money Manager Student App – Python/Kivy Mobile App

This student-focused app demonstrates the need for a simple financial tracker that prioritizes usability. However, it is designed exclusively for mobile use and lacks web accessibility, graphical analytics, and goal-based achievement features. Coin Hug expands on this foundation by providing a web-based platform, visual graphs, goal completion tracking, and memo features, making it suitable for both young users and adults seeking structured financial management.

4. MyFitnessPal Goal-Setting & Achievement Study

Although unrelated to finance, this large-scale behavioral study is highly relevant because it emphasizes the psychological importance of goal-setting in self-tracking systems. It shows that **early engagement strongly predicts long-term success**. Coin Hug incorporates this insight by allowing users to set financial goals and visually track progress, encouraging behavior that aligns with long-term financial consistency. This connection strengthens the theoretical foundation of the Coin Hug system.

5. Next.js Personal Finance Tracker – Advanced Full-Stack Development

This research focuses on modern full-stack engineering practices and optimized data handling. While technologically advanced, it primarily emphasizes system efficiency rather than user motivation. Coin Hug extends beyond technical optimization by addressing user psychology, financial behavior, and habit formation, integrating analytics and memories into the savings experience. This comparison shows that Coin Hug contributes more on the behavioral and motivational dimension of personal finance.

6. Python/Flask Expense Tracker – Real-Time Alerts & Limits

This paper highlights the importance of alert mechanisms to prevent overspending. While useful, it focuses mainly on expenditure control and does not cover long-term savings strategy or progress visualization. Coin Hug provides a complementary approach by focusing on savings growth, goal completion, and visual trend analysis, enriching the user's financial journey with insights and emotional reinforcement. Across all reviewed works, a common theme emerges: financial applications excel at recording and organizing data, but they rarely address the behavioral aspects of saving. The current research, Coin Hug, is positioned to fill these gaps by integrating a goal-oriented savings model, graphical analytics, and a memo-based motivational system, all supported by a modern MERN architecture. This makes the current research more aligned with user psychology and long-term financial engagement.

Relevance to current Research

Paper Title	Author Name	Key Points	Remark
Personal Finance Tracker (Web Application)	Samarjeet Singh Kheda, Samarth Agrawal, Sanidhya Neema, Shubham Gangwane	Expense tracking, CSV import, dashboards	Covers basic tracking; lacks motivation features
Smart Personal Expense Tracker (ML-based)	Dr. Nidhi Sharma, Dr. Alok Sharma	ML analysis, spending prediction, personalized insights	Advanced analytics; complex for simple users
Money Manager Student App	Mr.Y. D. Nagvekar, Bhosale Maithili, Bogati Jayanti	Simple mobile app, budget limits, alerts	Focus on students; lacks charts and goals
Goal-Setting in Tracking Apps (MyFitnessPal)	Mitchell L. Gordon, Tim Althoff	Early behavior predicts long-term success	Relevant to savings motivation and habits
Personal Finance Tracker (Next.js)	Samar Verma, Samarjeet Singh Kheda, Shivam Kuwale	Next.js front-end, PostgreSQL, structured data	Emphasizes system architecture, not motivation
Personal Expense Tracker (Python/Flask)	Sakthivel M., Roshini P., Roja K., Maha Lakshmi P., Keerthi V	Saving/expense logs, alerts, reports	Useful features but lacks goal & memo integration

III. METHODOLOGY

The methodology adopted for the development of *Coin Hug* focuses on creating a user-centric, responsive, and scalable FinTech web application that simplifies personal finance management. The system is engineered using the MERN stack, a widely preferred architecture for full-stack development due to its flexibility, efficiency, and unified JavaScript environment. The methodology involves a structured approach that includes requirement analysis, architectural



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design, module development, data modeling, user interface creation, and system integration, ensuring a seamless workflow and optimized performance.

A. System Architecture

The system architecture is based on the MERN stack—**MongoDB, Express.js, React.js, and Node.js**—selected for its robust performance, component reusability, and scalability. MongoDB serves as the NoSQL database for storing user details, income entries, expenses, goals, and memo information in a flexible document-oriented structure. Express.js is utilized to build the server-side framework and manage backend API routing. Node.js handles the backend runtime environment, enabling fast and non-blocking server execution. React.js powers the frontend interface, offering dynamic rendering, modular components, and a smooth user experience. Together, this architecture supports real-time updates, responsive display elements, and secure management of financial data.

B. System Modules

To ensure clarity, maintainability, and scalability, the Coin Hug system is divided into multiple core modules, each addressing a specific functionality within the application.

1. User Authentication Module

This module manages secure login and user session handling. It uses encrypted password storage and session validation to ensure that financial data remains accessible only to authorized users. The authentication flow includes login validation, error handling, and redirection to the user dashboard.

2. Dashboard Module

The dashboard serves as the central hub where users can view a summary of their financial status. It displays essential parameters including total income, total expenses, total savings, and goal progress. Interactive visualizations—such as bar graphs and pie charts—help users interpret their financial behavior at a glance.

3. Add Goal Module

This module allows users to create personalized savings goals by inputting a target amount and periodically adding saved money toward the goal. Progress is visualized through dynamic indicators that reflect how close the user is to completion.

4. Memo Module

The memo feature is designed to provide emotional reinforcement by letting users upload a photo or memory each time a goal is achieved. This helps users connect emotionally with their financial milestones, promoting long-term savings motivation.

5. Contact/Support Module

This section enables users to submit issues, concerns, or feedback directly through the application, ensuring smoother communication and enhancing usability.

C. Data Flow and Visualization

The system follows a clear data flow, starting from user input to backend processing and frontend visualization. Income and expense entries are stored in MongoDB and retrieved through secure APIs developed in Express.js. The data is then processed and passed to React components, where charts and graphs visualize spending and saving trends. Data visualization libraries enhance user understanding by representing financial metrics through visually appealing and easy-to-interpret formats. This structured flow ensures accuracy, real-time updates, and better decision-making.

D. Database Design

MongoDB collections are organized to store user profiles, financial entries, goals, and memo records. A schema-based design with fields such as amount, date, category, goal_target, goal_progress, and memo_image ensures efficient storage and retrieval. Unique user identifiers link all financial records to individual accounts, maintaining consistency and data integrity across the platform.

E. Technology Integration

The system integrates charts (Recharts) to enhance user experience by providing graphical insights. RESTful APIs ensure smooth communication between frontend and backend layers. The responsive UI is styled for consistency across devices, preparing the application for future mobile app integration. By adopting modular design principles, the methodology ensures that Coin Hug remains adaptable, maintainable, and scalable for further enhancements.



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IV. RESULTS AND DISCUSSION

The implementation of *Coin Hug* led to the successful development of a functional FinTech savings tracker capable of handling essential financial operations such as income management, expense logging, savings visualization, and goal tracking. The system was tested with multiple user scenarios to evaluate accuracy, responsiveness, data handling efficiency, and ease of use. Results indicated that the MERN stack architecture offered strong performance across all modules, allowing fast API responses, reliable data synchronization, and smooth interactions within the dashboard. The system consistently delivered accurate calculations for savings, expenses, and goal progress, demonstrating robustness in financial data processing. One of the most notable outcomes of the application was the effectiveness of its **interactive dashboard**. Graphs and pie charts successfully illustrated financial patterns, enabling users to intuitively understand their spending behavior and savings distribution. Users reported that visual summaries were more impactful than plain numeric data, significantly improving financial awareness. The dashboard's ability to display real-time changes—such as updates when a new expense is added or a goal contribution is made—enhanced user engagement and supported informed decision-making.

The **goal-setting module** proved to be another essential component of the system. Test results showed that users found it easier to stay committed to savings when goals were visually represented and progress was continuously displayed. Many existing financial applications focus on tracking expenses but fail to provide strong motivational reinforcement. *Coin Hug* addresses this gap by displaying progress indicators and enabling users to monitor how close they are to achieving their targets. This positively influenced user behavior by encouraging frequent savings contributions. The **memo feature** added a unique behavioral dimension to the system by connecting financial achievements with personal memories. During testing, users expressed that being able to upload a photo or note after completing a savings goal increased satisfaction and emotional attachment to the process. Overall, the results demonstrate that *Coin Hug* successfully fulfills its objective of providing a comprehensive, user-friendly savings tracker that blends financial accuracy with motivational elements. The application's integration of data visualization, goal tracking, and memory reinforcement sets it apart from conventional tracking tools. The discussion of outcomes highlights how the system can positively influence financial behavior while offering a pleasant user experience supported by scalable modern technologies.

V. CONCLUSION AND FUTURE WORK

Conclusion:

The development of *Coin Hug* successfully demonstrates how a modern FinTech application can significantly enhance personal finance management by combining intuitive design, interactive data visualization, and goal-oriented savings features. The system effectively addresses limitations observed in existing financial trackers, such as the lack of emotional engagement, weak goal reinforcement, and minimal visual interpretation of financial data. Through the MERN stack implementation, *Coin Hug* offers a responsive, scalable, and secure platform capable of supporting diverse financial activities including income tracking, expense management, goal creation, savings analysis, and personalized memory preservation. The results indicate that users benefit from the seamless integration of graphical insights, real-time calculations, and motivational features that encourage consistent savings behavior. Overall, *Coin Hug* provides a comprehensive and user-centered approach to financial management, fostering financial discipline and improving long-term saving habits.

Future Work:

Although the current system fulfills its intended goals, several opportunities exist to further enhance its capabilities and support a wider range of users. A major direction for future development is the creation of a **dedicated mobile application** for Android and iOS, enabling users to manage finances on the go with improved accessibility and convenience. Integrating **AI-based analytics** could further elevate the system by enabling predictive insights, such as forecasting expenses, identifying unusual spending patterns, and recommending personalized saving strategies. Additionally, implementing **automated notifications and reminders** would help users remain committed to their goals. Other enhancements may include budget recommendation engines, cloud-based data syncing, voice-assisted input, and advanced security features leveraging encryption and authentication frameworks. These improvements would position *Coin Hug* as a more powerful and intelligent financial assistant, capable of adapting to modern user needs and evolving financial behaviors.



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