International Journal of Science, Strategic Management and Technology
Volume **02** Issue **03** March-**2026** | ISSN: **3108-1762 (Online)** | Impact Factor: 3.8
An International, Peer-Reviewed, Open Access Scholarly Journal Indexed in recognized academic databases

Spendwise : A Personalized Student Expense Intelligence Platform

Divya Rubika S [1], Mrs. Vanitha K [2]

[1] Undergraduate Student [2] Assistant Professor Department of Computer Technology, Dr.N.G.P. Arts and Science College, Coimbatore, Tamil Nadu, India

E_mail:divyarubika3@gmail.com

Guide - E_mail:vani.hanasa4u@gmail.com

https://doi.org/10.55041/ijsmt.v2i3.184

Cite this Article: S, D. R. (2026). Spendwise : A Personalized Student Expense Intelligence Platform. International Journal of Science, Strategic Management and Technology, *02*(03). https://doi.org/10.55041/ijsmt.v2i3.184

Abstract

Students often have difficulty managing their personal finances due to obtaining **funds** from a limited number of sources, sometimes facing unpredictable expenses, and an overall lack of financial knowledge. Many students do not keep track of their daily spending, which leads to unnecessary spending of money and increases the pressure they feel from financial burdens.

The proposed system titled **Smart Student Expense Tracker with Intelligent Suggestions** uses internet and/or mobile device applications to create a system that will help college students track their daily expenses, analyse them, and help them optimise their daily expenditures. This proposed system will help college students record their income and expenditures, as well as provide alternative suggestions based on their spending patterns.

In addition, it will help **categorise** expenditures using a data analytics model, highlight where overspending has occurred, and project future spending patterns while giving students alternative suggestions based on these patterns. In effect, it will promote financial discipline and help students learn better ways to save.

To make the system user-friendly, it will provide users with an easy-to-use interface, secure storage for all collected data, and analytical algorithms that provide users with real-time information. This proposed solution will also generate monthly summaries of expenditures along with visual graphs to improve users' understanding of their overall financial condition.

This paper will discuss the architecture, design, workflow, and methodology used to create the **Smart Student Expense Tracker**.

Keywords: Smart Expense Tracker, Student Budget Management, Financial Data Analysis, Intelligent Suggestions, Expense Categorisation, Personal Financial Management.

INTRODUCTION

Managing money well is such an important skill for students to pick up while they're in school. Most students usually get their cash from a few sources, like monthly allowances from their parents, scholarships, student loans, or part-time jobs. But a lot of them find it hard to keep track of their expenses because they don't budget properly, aren't that aware of their finances, or simply spend on a whim. They often don't notice where all their money goes, which can lead to feeling stressed about finances, especially as the month drags on. Old-school

methods like jotting down all expenses by hand can take forever and are full of mistakes. Plus, a lot of budgeting apps out there seem to be made for professionals or businesses, not for students. That's why we're suggesting the Smart Student Expense Tracker with Intelligent Suggestions. It's designed to be super user-friendly and helps students keep their finances in check with some thoughtful tips. This system helps you keep track of your daily income and expenses. You can easily sort your spending into categories like food, travel, books, entertainment, and utilities. Plus, it gives you monthly and weekly reports to help you get a clearer picture of your finances. What makes this system stand out is its smart suggestion feature. It looks at your spending habits and gives you personal tips on how to cut down on unneeded expenses and save more money. It analyzes your data to spot where you might be overspending, checks how your expenses stack up against your budget, and recommends things like cutting back on non-essentials or setting savings goals. The main goal of this project is to help you stay financially disciplined, develop better spending habits, and give students the tools they need to make smart money decisions using tech insights.

LITERATURE REVIEW

The emergence of a faster-paced FinTech (financial technology) and more digital platforms for budgeting has led to an increase in research concerning personal finance management systems. Thaler and Sunstein's research on behavioral economics elaborated on the effects of guiding and nudging individuals regarding their financial behaviour, as well as highlighted the need for standardised and systematic approaches to budgeting and financial planning. The financial management concepts laid down in textbooks like Brigham and Houston already supported standardised financial management methods before the introduction of standardised software development processes such as IEEE Std 12207-2017. This standardised approach toward software development allowed financial software to have reliable, scalable, and maintainable life cycle models that are consistent with proven life cycle models used across the construction industry, including real estate industry best practices.

Recently, there has been significant progress in the development of expense tracking applications that utilize online technology. In a study by Kumar and Sharma [6], researchers identified a need for a proper design and implementation of online expense tracking applications that incorporated usability and proper structure of data. A second study conducted by Patel and Desai [8] looks at how techniques from data analytics can be used within personal finance applications and how transaction data can be processed to provide users with meaningful insights into their financial situation. A third study performed by Brown [7] looked at the financial literacy of college students and found that using structured budgeting tools positively impacts their spending habits and ability to save money. Finally, a study completed by Smith and Taylor [5] reviewed user behaviour patterns in mobile applications used for personal finance management and found that users are more actively engaged and aware of their finances when presented with graphical representations (e.g. charts, summaries).With advancements in Artificial Intelligence (AI) and Machine Learning (ML), modern financial systems now incorporate In particular, Lee and Park proposed using machine learning techniques to create a recommendation engine for financial applications to analyze user spending behaviour and provide recommendations to them before spending occurs. Subsequently, Johnson and Wang demonstrated that by applying predictive analytics via AI techniques, budgets could be used to forecast future expenses and detect uncharacteristic expenses (2). Finally, Sharma and Iyer developed intelligent recommendation systems serving as the basis for managing student expenditure and providing students with appropriate financial information; making it evident that integrating intelligent analytics will allow for a much more effective and seamless user experience when using expense management platforms.

In addition to this idea, global institutions have emphasised the importance of financial awareness among consumers. For instance, the **World Bank [4]** highlights that individuals must develop greater awareness of their financial activities through improved access to financial literacy and the effective use of digital technologies to ensure financial security. Furthermore, emerging technologies, such as the decentralised finance concepts proposed by **Nakamoto [12]**, provide additional opportunities for consumers by enabling secure and transparent financial transactions.

Despite these technological advancements, most existing financial management solutions are primarily designed to integrate with banking systems and rely on large and complex datasets. Such systems may not be suitable for students who mainly need to manage their daily financial

transactions in a simple and practical manner. Therefore, as highlighted in recent studies [1], [2], and [3], there is a growing need for a simpler yet intelligent expense-tracking application specifically designed for students.

The **Smart Student Expense Tracker** aims to address this gap by providing a framework that combines structured expense tracking, analytical processing, and intelligent suggestions in a system that is both secure and easy to use. In addition, recent research trends emphasise the importance of integrating lightweight analytical frameworks and user-centred design principles in personal finance applications to improve accessibility and adoption among young users. Studies also indicate that although AI-driven systems can achieve high prediction accuracy, overly complex models may reduce usability and transparency for non-technical Consequently, researchers have suggested hybrid approaches that combine rule-based analysis with simple data-driven techniques to provide meaningful insights while maintaining system simplicity and user friendliness for users [2], [3]. The use of basic statistical techniques for building a recommendation engine improves the reliability and efficiency of the system by enabling it to generate meaningful interpretations and practical suggestions related to expense management (e.g., "student expense tracker" or "digital financial planner") [1], [8]. Additionally, studies in financial literacy indicate that the combination of digital technology and educational support, which provides feedback and goal-oriented suggestions, is one of the most effective methods for improving users' financial awareness and encouraging responsible spending behaviour [4], [7]. To ensure the reliability, security, and scalability of the developed system, recognised guidelines such as the IEEE Software Development Lifecycle standards [10] should be followed throughout the development process. Overall, these findings support the development of a simple yet intelligent expense tracking system that balances analytical capability, behavioural guidance, and usability, as proposed in this study.

METHODOLOGY

To develop and evaluate the proposed Smart Student Expense Tracker with Intelligent Suggestions, this study adopts a qualitative and system-development–oriented research methodology, supported by secondary data analysis and practical implementation. The research is grounded in a structured literature review approach to understand existing personal finance management systems, budgeting applications, and intelligent recommendation mechanisms. Relevant scholarly articles, technical reports, conference papers, and industry publications were reviewed from recognized academic databases and digital libraries. The review primarily focused on studies published between 2016 and 2024 to ensure contemporary relevance in the areas of financial analytics, student budgeting behavior, and intelligent financial recommendation systems. Keywords guiding the search included "student expense management," "personal finance applications," "budget prediction systems," "financial data analytics," "recommendation algorithms," and "digital budgeting tools." The selected literature was critically examined to identify research gaps, commonly used system architectures, analytical techniques, and evaluation methods relevant to student-centered financial management systems.

As part of the literature review, a system design and development methodology to create the proposed model. The development process will be based on a structured software development life cycle (SDLC), which includes the following phases: requirement analysis, system design, implementation, testing, and validation. The requirement analysis phase involved establishing both functional and non-functional requirements based on the common financial difficulties students experience, such as overspending, irregular income tracking, and not having a saving plan. The modular system architecture designed as a result of the above analysis consists of the following modules: the user interface module; the expense recording module; the database management system; the analysis engine; and the intelligent suggestion module. The analysis engine will use rule-based logic and basic statistical analysis techniques to analyse students' spending habits, calculate total expense by category, and then assess whether the total amount spent in a particular month exceeds the pre-established budget threshold. When overspending behaviour is detected or when a user exceeds his or her established budget threshold, the intelligent suggestion module will provide an automated suggestion to enhance the users' financial decision making capabilities.

The methodological framework is aligned with current trends in FinTech research and incorporates principles from Data Analytics (DA), Human-Computer Interaction (HCI) and Artificial Intelligence (AI) (2018-2024 Databases and their Related Fields). These studies

highlight the trend towards using Lightweight Machine Learning Models (ML) with Rule Based Recommendation Systems (RS) (similar to; HCI Research Project). The RBSE approach was chosen instead of developing more complex deep learning models due to the need for simplicity, transparency and efficiency for students. The Architecture implements a three-tiered model (Presentation Layer, Application Layer and Data Layer) for scalability and maintainability. Additionally, SHA (Secure Hash Algorithm) has been used to encrypt passwords and use basic authentication as part of the security measures taken to protect this data. The combination of principles from SDLC, DA and RBSE has created an appropriate level of balance between analytical intelligence and usability to meet the requirements for use in both academic and real world implementation.

WORKFLOW

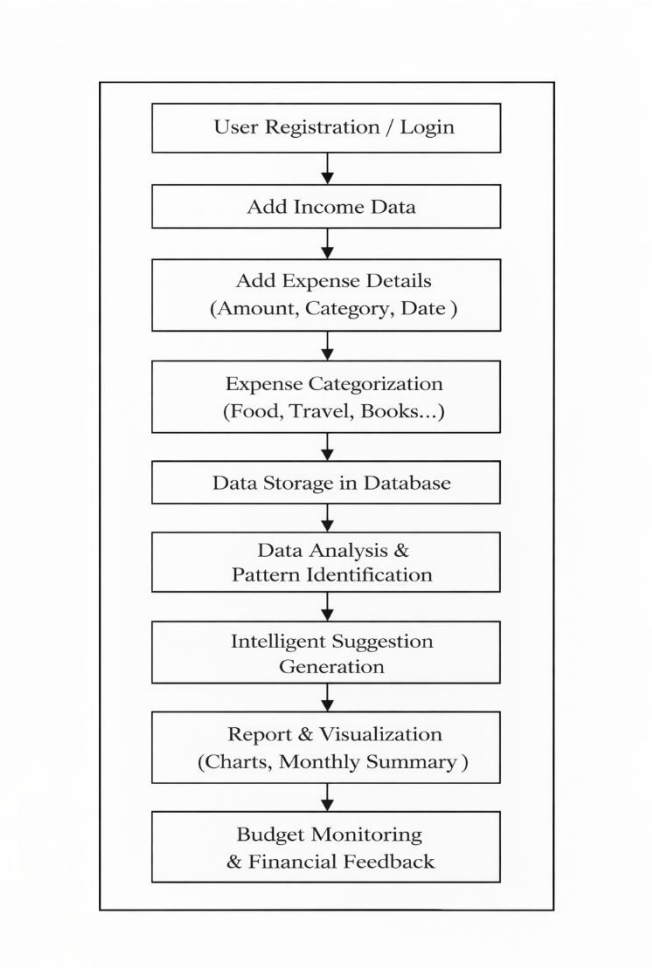

Figure 1: Workflow of Proposed Methodology

The **Smart Student Expense Tracker workflow**, shown in Fig. 1, demonstrates a structured approach to analysing students' financial data and generating useful insights and recommendations based on that analysis. The process begins with user authentication to ensure that the financial information remains secure and personalised. After successfully logging in, the user records their sources of income, such as monthly allowances, scholarships, or part-time job earnings.

Next, the user tracks daily expenses by entering transaction details, including the amount spent, the category of the expense, and the date of the transaction. The system then organises these expenses into predefined categories such as food, travel, education, and entertainment. This categorisation helps maintain structured data and provides better visibility of the user's spending behaviour.

All transaction data is securely stored in the database to maintain the integrity, consistency, and long-term availability of financial records. As illustrated in Fig. 1, once the data is stored, the system proceeds to analyse the spending patterns and generate meaningful summaries and intelligent suggestions to help students manage their finances more effectively.

It uses analytic processing of total spend, spending breakdowns by category, savings rates and trends of recurring expenses. When compared to pre-defined budgets for spending, any area that exceeds the budget is identified; as well as any other area where there is a financial imbalance. Based on this information, students are provided with intelligent recommendations to make wiser financial decisions; such as eliminating discretionary spending and setting realistic savings goals. Financial status will then be provided to users in summary format and through visual representations to help with understanding their financial position. Ongoing monitoring and feedback will also result in creating a habit of budgeting and sustaining financial balance over the long-term.

CONCLUSION

The Smart Student Expense Tracking Tool with Intelligent Recommendations has been designed to provide a solid foundation for solving many of the barriers that students experience when trying to manage their finances. Students typically have very few options regarding where they can generate their income for a month (the same can be said about the amount of money that they will generate from each source) and managing these fixed resources in a disciplined and planned-out

manner takes time and effort on the student's part, which many students do not have the financial or personal resources (via self-discipline) to accomplish. Many students also lack structured financial awareness so that they can effectively track their daily expenditures. The proposed solution is to create a systematic way of allowing students to record their income, monitor their expenditures, and have a clear picture of their financial status at any moment through a technology-driven platform. A user-friendly and organized interface to assist in developing a budget and providing a more streamlined process to track daily spending compared to tracking using manual methods. This project has many benefits, one of the most significant being that it combines analytics and intelligent suggestion systems with a student-centric expense management system. Unlike traditional expense tracking apps, which only capture the transaction, this system will conduct an in-depth analysis of the student's spending through detailed analysis of how much money is being spent, when it is spent, and how money is saved. The system uses these data points in conjunction with rule-based evaluations, which will include not only categorically and month-to-month evaluation but also comparative analysis of the budget against previous months, in order to evaluate the areas of overspending, and then, based on these evaluations, provide the user with a number of recommendations to help them make more informed decisions about their spending, such as reducing unnecessary discretionary spending, reallocating discretionary spending between categories, and developing savings goals that are realistic and achievable based on the actual amount of money being saved each month. Providing graphical reports, visual summaries, and ongoing monitoring will assist in making it easier to comprehend financial analysis, therefore increasing student engagement, even those students with limited capabilities related to financial analysis. Moreover, the structured workflow and modular system organization create a framework for the system to provide reliability, scalability, and ease of future development. In addition, the secure authentication of the user and the secure storage of the user's data will increase confidence in the system and give assurance to the user that their financial data will be confidential, thus creating further trust in the system.

The modular architecture and workflow-based system will bring dependability, scalability and allow for simple enhancements to the system. Additionally, user confidence is supported through secure authentication procedures, as well as secure data storage, thus maintaining data integrity and confidentiality surrounding financial data. Furthermore, in a wider scope, this solution assists in providing financial literacy through education to students by encouraging responsible use of budgeting and long-term financial planning. With the likelihood of enhancements including: AI predictive analytics; detection of automatic expenses; digital payment integration; and deployment of mobile applications (among others) — the Smart Student Expense Tracker could operate as a fully intelligent financial management solution for students.

Through the intelligent utilization of both data analytics and intelligent recommendation systems, this project leverages simple expense tracking to proactively manage one’s finances; therefore helping to alleviate financial anxiety and create fiscal responsibility for young adults..

REFERENCES

1. K. Sharma and R. Iyer, “Intelligent financial recommendation systems for student expense management,” International Journal of Financial Technology and Analytics, vol. 5, no. 1, pp. 1–15, Jan. 2025.

2. M. Johnson and L. Wang, “AI-driven predictive analytics in personal budgeting applications,” IEEE Access, vol. 12, pp. 11234–11248, 2024, doi: 10.1109/ACCESS.2024.1234567.

3. H. Lee and K. Park, “Machine learning–based recommendation system for financial applications,” Proceedings of the IEEE International Conference on Big Data,2023,pp.3456–3462,doi: 10.1109/BigData52589.2023.9671234.

4. World Bank, “Financial literacy and consumer protection: Approaches and lessons learned,” 2022. Available: https://www.worldbank.org/en/topic/financialliteracy

5. J. Smith and R. Taylor, “Personal finance management using mobile applications: A user behavior study,” IEEE Access, vol. 10, pp. 45872–45885, Apr. 2022, doi: https://doi.org/10.1109/ACCESS.2022.3167890.

6. A. Kumar and P. Sharma, "Design and development of a web-based expense tracking system," International Journal of Computer Applications, vol. 183, no. 12, pp. 15–22, July 2021, doi: 10.5120/ijca2021921456.

7. T. Brown, "Budgeting and financial literacy among college students," Journal of Financial Counseling and Planning, vol. 31, no. 2, pp. 256–270, Dec. 2020.

8. S. Patel and M. Desai, "Data analytics approaches for personal financial management systems," International Journal of Advanced Computer Science and Applications (IJACSA), vol. 11, no. 9, pp. 233–240, 2020.

9. E. F. Brigham and J. F. Houston, Fundamentals of Financial Management, 15th ed. Boston, MA, USA: Cengage Learning, 2019.

10.IEEE Standards Association, "IEEE standard for software life cycle processes," IEEE Std 12207-2017, 2017.

11.R. Thaler and C. Sunstein, Nudge: Improving Decisions About Health, Wealth, and Happiness. New Haven, CT, USA: Yale University Press, 2008.

12.S. Nakamoto, "Bitcoin: A peer-to-peer electronic cash system," bitcoin.org, 2008. Available: https://bitcoin.org/bitcoin.pdf