

Web-based Student Expense Tracking System

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ABSTRACT Managing personal finances is a critical skill, particularly for university students who are often financially dependent or managing limited budgets. The Student Expense Tracking System (SETS) aims to provide an intuitive, accessible platform for tracking daily expenses and promoting responsible spending habits. This work involves the development of a monolithic web-based application utilizing HTML, CSS, JavaScript, and Express.js, backed by MongoDB for secure, cloud-based data storage. The application offers features such as expense categorization, analytics, and budget alerts to aid in financial planning. A hybrid methodology combining software development and user-centered design was applied, including requirement analysis, implementation, and usability testing. Evaluation results indicate that SETS improves users' financial literacy and daily spending awareness. The paper contributes to the growing intersection of education and FinTech, offering a tool tailored to the financial realities of students. Future work will explore the integration of artificial intelligence for predictive analytics and personalized recommendations.

KEYWORDS: Financial Literacy, Expense Tracking, Student Budgeting, Personal Finance Management.

I. INTRODUCTION

An expense tracking system is a device, approach, or application for one-to-one care and managing monetary expenses to produce a complete overview of spending patterns. Expense tracking means recording all your expenditures so you have a clear and detailed understanding of your budget. This is typically done for a certain project or over a certain period, so you can stay on budget and make any necessary adjustments. The schemes encompass logging income and expenses, categorizing transactions, setting budgets, and generating reports to help people and commercial organizations make informed financial decisions, improve financial awareness, and accomplish financial goals. The major features often include automated receipt scanning, bank integrations, budget tracking, and expense forecasting. In today's digital world, financial literacy remains a significant challenge among students, particularly in developing countries where educational systems often neglect practical money management skills (Apreal Marjorie Bisquera Silva et al., 2024; Mir & Bushra, 2024). University students are frequently exposed to financial responsibilities for the first time, yet many lack the tools and knowledge to budget effectively (Tatad et al., 2024; Russell et al., 2025). This gap often leads to overspending, poor saving habits, and, in severe cases, student debt. As the financial landscape becomes increasingly digital, there is a growing demand for personalized, easy-to-use tools that help individuals manage their finances (Alex et al., 2025). For students, having access to a system that not only tracks expenses but also educates and informs them about their spending behavior is invaluable. The SETS was conceived to handle these challenges by providing a digital platform specifically designed for students' use. Unlike generic expense trackers that often fail to address the unique financial conditions of students, such as irregular income, academic-related expenses, and reliance on allowances, SETS incorporates features and categories tailored to

this demographic. By empowering students with the ability to track daily expenses, categorize spending, and receive alerts when nearing budget limits, the system fosters financial discipline and awareness. This paper is not just about building software; it is a socio-technical initiative aimed at improving financial behaviour through technology. The combination of a user-friendly interface and analytical tools offers a comprehensive approach to financial education. Furthermore, the system leverages the accessibility of web technologies and the flexibility of cloud infrastructure to provide a seamless experience across devices. Students can access their financial data from any internet enabled device, making it a versatile and convenient tool for modern academic life.

II. RELATED WORKS

An expense tracker was developed by Neha Jain et al. (2025) the application helped individuals monitor and manage their financial expenditures. The system involved logging into income and expenses, categorizing transactions, setting budget limits, and generating reports. The study suggested that advanced trackers may include features such as automated expense entry via bank integrations, visualizations like charts and graphs, expense forecasting, and alerts for overspending. By offering insights into financial behaviour, an expense tracker promotes better budgeting and financial planning. Katnic et al. (2024) employed a quantitative, survey-based method to explore the association between financial literacy levels and measures of economic stability, including savings rates, active debt management, and access to financial products. Data were obtained by representing a two-stage stratified sample of 1000 Montenegrin adults aged 18–79, allowing detailed geographic coverage across all Montenegrin municipalities and balanced representation by gender and age. This stratification enables a detailed analysis of financial literacy trends across the population. Correlation analysis showed that higher levels of financial literacy were related to better financial practices, such as increased savings and responsible credit use, thereby enhancing economic resilience at the household level.

Czech et al. (2024) identified general areas of financial knowledge crucial for adults with low financial literacy living in rural areas. The study was carried out in seven European countries as part of the Erasmus+ project “Learning by Experiencing Escape Rooms: Financial Literacy for Adults (FLER)”. Key findings from the study revealed that participants exhibited low awareness of financial fraud and expressed a necessity to protect personal information when using digital platforms. There was a clear demand for improved knowledge in certain areas, such as budgeting, emergency funds, balancing risk and reward, and planning for retirement or long-term savings. Participants consistently viewed gamification as a valuable tool for enhancing their understanding of financial topics. The input of the work is that it was narrowed down to the research gap on the needs and challenges related to financial literacy among rural residents. A growing body of literature supports the need for financial education tools that are both accessible and tailored to specific user groups. Studies show that digital financial tools can significantly impact user behavior, particularly among young adults. For instance, research conducted by Ojo & Olowookere (2020) highlighted that the majority of Nigerian students lack basic financial literacy, resulting in mismanagement of monthly allowances and overdependence on loans or peer support. A study by Adebayo et al. (2018) explored the behavioural economics behind student savings and proposed gamification and goal-setting as motivators. Their findings suggest that engagement improves when applications are tailored to reflect the socio-economic realities of the user. SETS addresses this by integrating features that reflect the financial challenges of Nigerian students, including the ability to track spending in Naira, visualize budget constraints, and tag academic related costs separately from leisure spending.

Additionally, recent developments in the FinTech sector emphasize the potential of data analytics and AI in providing predictive insights for better money management (Pattnaik et al., 2024; Harsono & Suprapti, 2024). While SETS currently focuses on real-time tracking and manual data entry, future iterations could incorporate AI-powered tools similar to Cleo, a chatbot-based budgeting assistant, or Plum, which uses

machine learning to automate savings based on behavioral patterns. Ultimately, SETS positions itself as a culturally relevant, student-centric solution in a space that is increasingly global but often Western-centric. Its hybrid approach, combining education, digital finance, and user-centered design, bridges the gap between existing tools and local needs.

III. METHODOLOGY

A. Web-Based Student Expense Tracking System

This study employed hybrid approach, blending traditional software engineering processes with user-centered research techniques. The goal is to develop a solution that not only functions well technically but also aligns closely with the actual needs and habits of student users. The process comprises four major stages: requirement analysis, system design, implementation, and testing/evaluation, as discussed in Figure 1.

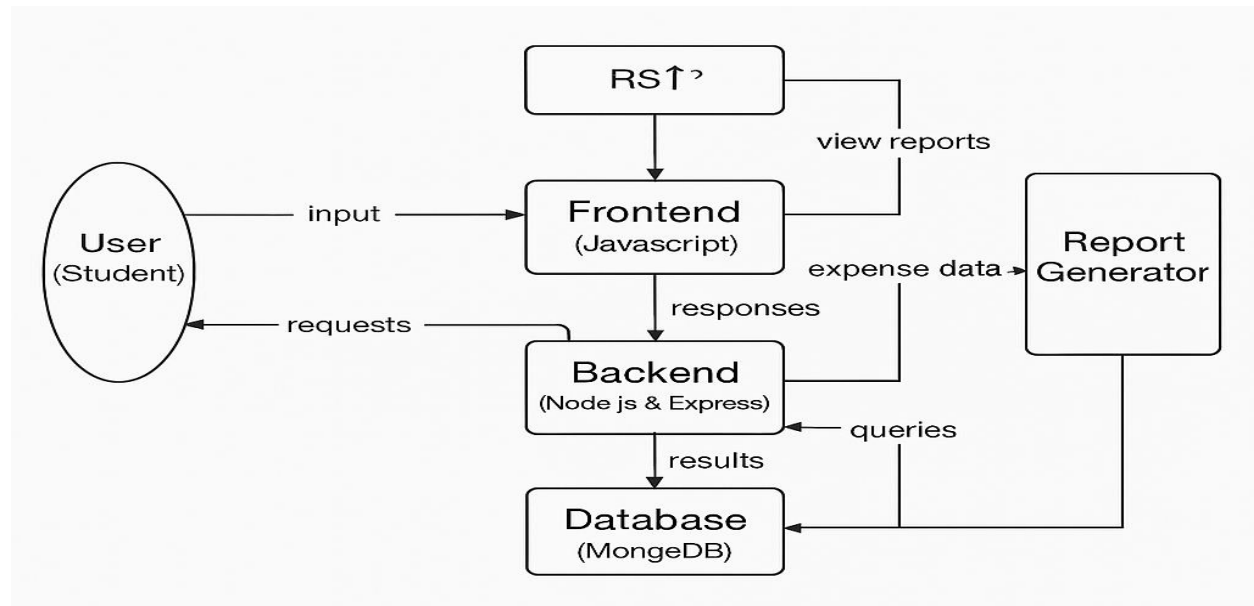


Figure 1: Block Diagram of the Developed SETS

B. Requirement Analysis

To ensure that the system addresses real user needs, a preliminary survey was conducted among 50 university students. The survey focused on:

- How students currently track expenses (if at all).
- Common categories of expenses (e.g., food, data, transport, books).
- Preferred user interface formats (mobile vs. desktop).
- Desired features in an ideal finance app (e.g., analytics, reminders).

The results revealed that 68% of students do not use any expense tracker. Among those who do, most rely on pen-and-paper or Excel sheets. Over 80% of respondents expressed interest in a simple mobile/web app with visualizations and reminders. This data shaped the functional requirements of the Student Expense Tracking System (SETS):

- Log daily expenses with description, amount, and category.
- View monthly and weekly analytics.
- Set budgets and receive alerts.
- Secure login/logout for personal data protection.

C. System Design

The architecture for SETS follows a monolithic client-server model built using web technologies:

- a) **Frontend:** Built with ReactJS, offering a responsive layout that adapts to mobile and desktop devices.
 - b) **Backend:** Powered by Node.js and Express.js, providing RESTful API endpoints for managing users, expenses, categories, and reports.
 - c) **Database:** MongoDB was chosen for its scalability and flexibility in handling semi-structured financial data.
 - d) **Authentication:** JSON Web Tokens (JWT) are implemented for secure user sessions and data privacy.
- The User Interface (UI) was designed with a minimalistic approach using clear visual hierarchies, icons for categories, and interactive charts to display analytics.

D. Implementation & Tools Technology

To build the system, the following tools were used:

- a) **Visual Studio Code:** Code editor
- b) **Postman:** API testing
- c) **MongoDB Atlas:** Cloud-hosted NoSQL database
- d) **Render:** For deployment of backend services
- e) **Chart.js:** For visualizing expenses and analytics
- f) **Git & GitHub:** Version control and collaboration

E. Testing & Evaluation

A two-phase testing process was applied:

a). Testing & Evaluation

- a). All backend routes (CRUD operations for expenses, user login, etc.) were tested using Postman.
- b). Edge cases (e.g., empty inputs, invalid tokens) were validated.

b). Testing & Evaluation

- a). Ten students participated in a two-week pilot study.
- b). Users interacted with the system to perform daily logging of expenses and viewed reports weekly. Participants were later surveyed using a System Usability Scale (SUS) and open-ended questions. Results showed an average SUS score of 82.5, indicating high usability. Most students found the app intuitive and particularly appreciated the budget warning feature.

F. System Requirements

System requirements define the functional and non-functional specifications necessary for the implementation of the Student Expense Tracking System. These requirements ensure the application meets user expectations in terms of performance, usability, and security.

a). Functional Requirements

Functional requirements outline the specific actions the system must perform. The primary functional requirements of the Student Expense Tracking System include:

- a) User authentication (registration and login)
- b) Expense entry and categorization
- c) Budget management and tracking
- d) Report generation and data visualization
- e) Email notifications and alerts

b). Non-Functional Requirements

Non-functional requirements define the quality attributes of the system. These include:

- a) **Usability:** The system must be user-friendly with an intuitive interface.

- b) Performance: The application should load within 2 seconds under normal conditions.
- c) Scalability: It should support multiple users without significant performance degradation.
- d) Security: Data encryption should be implemented for sensitive information.
- e) Availability: The system should ensure 99.9% uptime for continuous accessibility.

G. Input Design

This section refers to the process of defining and structuring how data enters the system. It involves creating the methods, forms, and interfaces that users will interact with to provide the necessary information for the system to function. Input design focuses on how data is entered into the system to ensure the reduction of errors during data entry through validation checks, clear instructions, and user-friendly interfaces.

IV. RESULTS AND DISCUSSION

The results of web-based student expense tracking were displayed with various user interfaces, as shown in the following sub-sections;

A. Results of Web-Based Student Expense Tracking System

The system presents data in various formats to ensure accessibility and clarity. The Dashboard, Mobile Responsiveness, and email notification show a real-time overview of spending habits and financial status, as depicted in Figures 2 and 3.



Figure 2: Dashboard

The Mobile Responsiveness shows how the developed system was optimized for both desktop and mobile devices, as discussed in Figure 3.

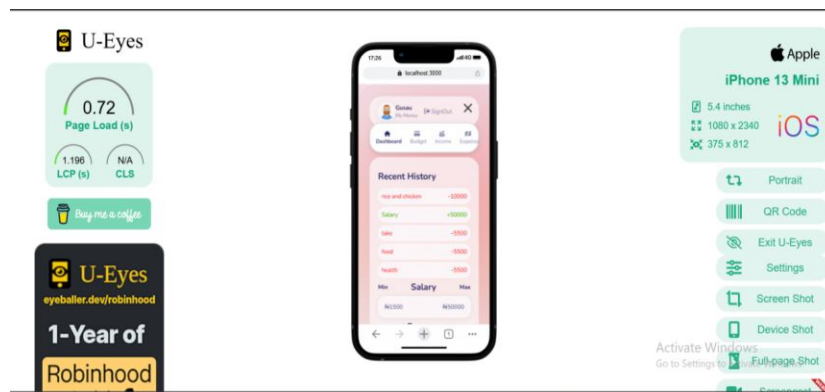


Figure 3: Mobile Responsiveness

In Figure 3, the mobile responsiveness is shown, which describes the involvement of mobile phones in the operation of SETS. The Email Notifications show automated alerts for adding Incomes and Expenses, as illustrated in Figure 4. In Figure 4, email notification shows how much spent revealing the detailed of transactions.

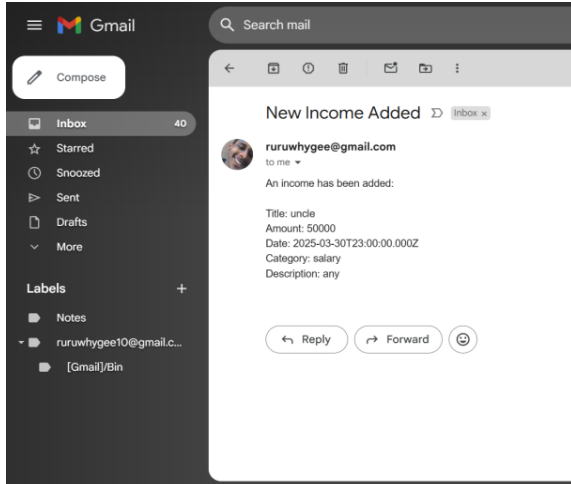


Figure 4: Email Notifications

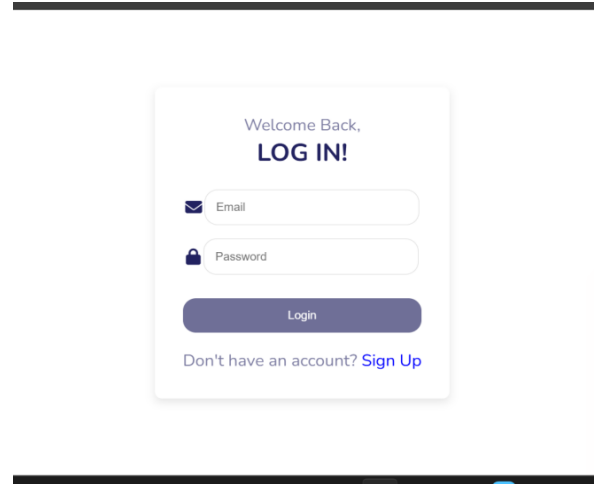


Figure 5: User Registration Form

B. User Registration Form

The user registration form requires fields such as username, email, and password, as shown in Figure 5.

C. Expense Entry Form

Users provide details such as date, category (Food, Education, Health), the amount spent, and a brief description, as shown in Figure 6.

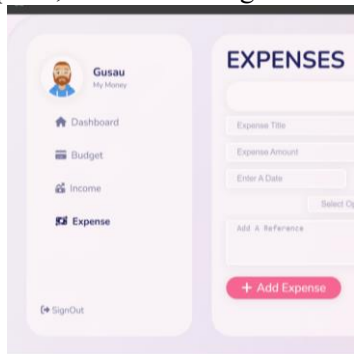


Figure 6: Expense Entry Form

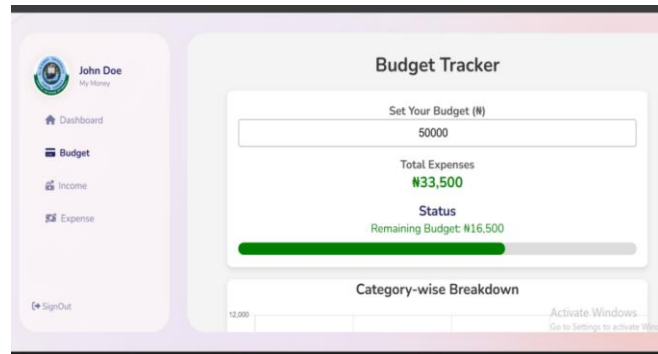


Figure 7: Budget Setup Form

D. Budget Setup Form

The interface allow users to define monthly budgets for different expense categories, as shown in Figure 7.

E. Output Design

Output design ensures that users can view, analyze & interpret system-generated results.

- 1) Expense & Income Summary Reports: Displays total expenditure and Income within a selected timeframe.
- 2) Budget vs. Actual Reports: Highlights variances between planned budgets and actual expenses.
- 3) Graphical Representations: Graphs for visualizing spending patterns as discussed in Figure 8 and Figure 9.



Figure 8: Graphical Representation showing the relationship between Income and Expense

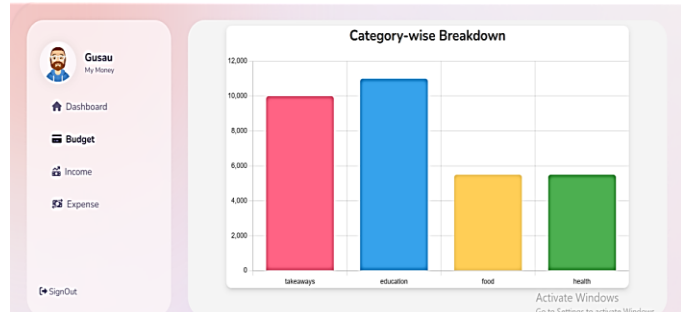


Figure 9: Colour Coding

Figure 8 shows the income and expenses graphical representation for a month in the year 2025. The colour coding shows different expense categories, which are colour-coded for the purpose of quick identification, as shown in Figure 9. In Figure 9, several colour codes for category breakdown were indicated. The different categories are on takeaways, education, food, and health. Education recorded the highest number, which is because of the priority power. The evaluation chart for the developed web-based student expenses tracking is shown in Figure 10.

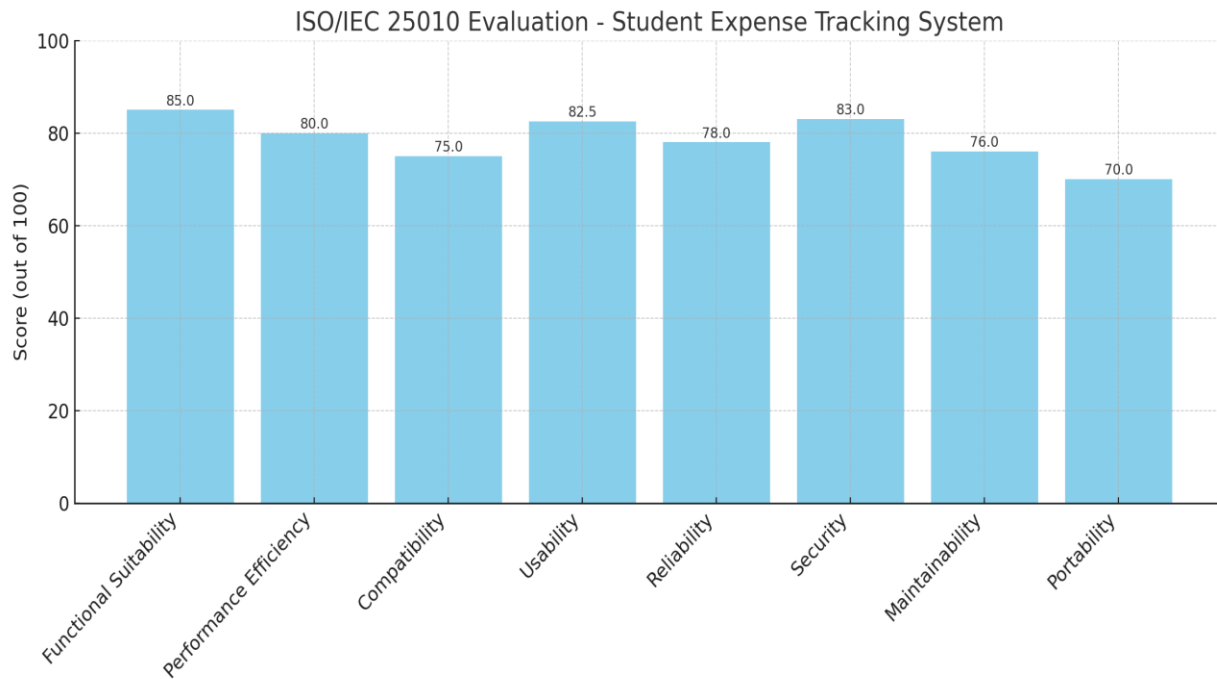


Figure 10: ISO/IEC 25010 Evaluation Bar Chart

F. Comparative Analysis of SETS and Existing Expense Tracking System (EETS)

The comparison of SETS and Existing Expense Systems (EETS) shows the differences between SETS and EETS, as discussed in Table 1.

Table 1: Comparison Between SETS and EETS

Features	SETS	EETS
Target Users	Developed explicitly for undergraduate and postgraduate students.	Developed for general users (professionals, families, businesses)
Expense Categories	Personalized to student needs such as tuition, textbooks, hostel fees, transportation, feeding, social activities, stationery	Universal categories like rent, groceries, utilities, entertainment, fuel, travel
Budgeting Focus	Emphasis on limited/allowance-based budgets (scholarships, pocket money, stipends)	focus on salaries, business income, investments, and diverse income streams

V. CONCLUSION

The development of the Web-Based Student Expense Tracking System (SETS) underscores the significance of accessible digital tools in promoting financial responsibility among university students. By tailoring features such as budget alerts, categorized expense tracking, and user-friendly interfaces to the unique financial behaviors of students, SETS addresses a significant gap left by existing finance applications. The system’s successful usability testing and positive feedback from users demonstrate its potential as both a practical solution for personal finance management and a tool for enhancing financial literacy. Moreover, SETS contributes to the broader discourse on the intersection of education and financial technology, especially within developing economies. Its web-based architecture ensures accessibility across devices, while the integration of data analytics provides users with valuable insights into their spending habits. Future iterations of the system can further benefit from incorporating AI-driven recommendations, predictive analytics, and gamified learning features to increase engagement and financial discipline. Overall, SETS exemplifies how context-aware technological interventions can have meaningful impacts on the day-to-day lives of students navigating the complexities of academic and financial independence.

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