

College Management System: Expense Management System

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Abstract - The Expense Management System is a key feature of the College Management System (CMS), designed to streamline financial tracking for college events. Authorized students can create events, add members, and manage expenses by uploading bills, with automated extraction of total costs and store details. The system visualizes expenses in daily, monthly, and yearly formats. Additionally, an AI model predicts event budgets based on provided details. Alongside expense management, CMS includes Attendance Management for digital record-keeping, Assignment Management for seamless submission and review, and Time Table Management for efficient scheduling. This paper explores the Expense Management System's functionalities, benefits, and impact on financial transparency within colleges.

Key Words: Expense Management, Budget Prediction, Financial Tracking, College Events, AI Model, CMS, Data Visualization, Event Planning

1. INTRODUCTION

This document is template. We ask that authors follow some simple guidelines. In essence, we ask you to make your paper look exactly like this document. The easiest way to do this is simply to download the template, and replace(copy-paste) the content with your own material. Number the reference items consecutively in square brackets (e.g. [1]). However the authors name can be used along with the reference number in the running text. The order of reference in the running text should match with the list of references at the end of the paper. In educational institutions, managing various academic and administrative tasks efficiently is crucial for smooth operations. The College Management System (CMS) is a comprehensive platform designed to streamline essential functions such as Attendance Management, Assignment Management, Time Table Management, and Expense Management. Among these, the Expense Management System plays a vital role in helping students and administrators effectively track and manage event-related expenses.

The Expense Management System allows authorized students to create events, add members, and oversee financial transactions associated with those events. Members responsible for expense management can upload bills, and the system automatically extracts key details such as total

cost and store name. These expenses are then visualized in daily, monthly, and yearly formats, providing a clear financial overview. This feature enhances transparency and accountability, ensuring that all involved members can monitor expenses efficiently.

A distinguishing feature of the Expense Management System is its AI-driven budget prediction model. By inputting key event details, the system predicts the total estimated budget, helping organizers plan effectively. This predictive capability ensures better financial planning and reduces the risk of overspending.

In addition to expense management, CMS includes other essential features. The Attendance Management System allows teachers to take attendance digitally and store records securely. The Assignment Management System enables teachers to assign, review, and manage submissions seamlessly. The Time Table Management System helps in organizing schedules efficiently. Together, these modules create an integrated solution for colleges, improving administrative efficiency and student engagement.

This paper focuses on the Expense Management System, detailing its functionality, AI-based budget estimation, and the impact it has on financial transparency in college event planning. By leveraging technology, this system enhances financial accountability, simplifies budgeting, and contributes to the overall effectiveness of campus management.

1.1 PROPOSED SYSTEM

The proposed Expense Management System is a feature within the College Management System (CMS) that streamlines financial tracking for college events. This system is designed to enhance transparency, efficiency, and ease of management for student-organized events by automating expense tracking and budget planning.

In this system, only authorized students can create an event, add members, and manage expenses. Members responsible for financial management can upload bills, and the system will automatically extract key details such as the total amount spent and the store name using Optical Character Recognition (OCR) technology. These expenses will be categorized and visualized in daily, monthly, and yearly formats, enabling

better financial oversight. Other students, who are not part of the event management team, will only receive notifications about the event without having access to financial details.

A key innovation in the Expense Management System is its AI-driven budget prediction model. When an event is created, users can input details such as event type, expected attendees, duration, and required resources. Based on this data, the AI model predicts the estimated total budget, helping organizers plan effectively. This ensures financial efficiency by preventing overspending and allowing better resource allocation.

Apart from managing expenses, the system also integrates well with other CMS features. Attendance Management allows teachers to take attendance digitally, ensuring accurate record-keeping. Assignment Management enables seamless assignment submission and review, while Time Table Management helps in scheduling academic activities efficiently.

The Expense Management System aims to simplify financial tracking, improve budget planning, and enhance transparency in college event management. By leveraging technology, this system reduces manual work, ensures accountability, and provides a user-friendly platform for managing event expenses within educational institutions.

2. LITERATURE SURVEY

The development of the Expense Management System within the College Management System (CMS) is influenced by various research areas, including data flow in educational systems, Optical Character Recognition (OCR) for automated data extraction, and chatbot-based management for enhanced user interactions. This section reviews relevant literature that contributes to the system's design and functionality.

A study on data flow within a College Management System emphasizes the importance of seamless data exchange between different components such as attendance, assignments, timetables, and expense management. The research highlights how an interconnected architecture improves administrative efficiency, student performance tracking, and financial transparency. Furthermore, the study introduces a Student Result Management System, addressing challenges in maintaining academic records and minimizing discrepancies through automated result processing. This structured approach serves as a foundation for our Expense Management System by ensuring secure data handling, role-based access, and efficient tracking of expenses in a college environment.

Another key aspect of our system is Optical Character Recognition (OCR), which enables automatic extraction of financial data from uploaded bills. Research in this domain indicates that printed text recognition achieves high accuracy, except when dealing with damaged or low-quality images. An

evaluation of OCR systems using Local Binary Pattern (LBP) with Support Vector Machine (SVM) demonstrated an accuracy of 96.5%, proving the effectiveness of OCR in text extraction. Additionally, various techniques such as region-based, edge-based, and morphological-based methods enhance text localization and extraction. These findings validate the feasibility of OCR for digitizing financial records in our system, allowing for seamless expense tracking and analysis.

Lastly, literature on Chatbot Management Processes (CMP) provides insights into optimizing AI-driven interactions within management systems. The CMP methodology consists of three phases—Manage, Build, and Analyze—which contribute to continuous chatbot improvement. Studies have shown that applying this methodology reduces hand-off rates by 14.27% and expands the knowledge base significantly. While not a primary feature of the Expense Management System, AI-driven prediction models for budgeting share similarities with chatbot learning mechanisms, where continuous refinement enhances accuracy and usability.

By integrating insights from these studies, our Expense Management System leverages structured data management, OCR for automated bill processing, and AI-driven prediction models to enhance financial tracking, transparency, and efficiency within colleges. This review highlights the relevance of existing research in shaping a robust and user-friendly system.

3. SYSTEM ARCHITECTURE AND DESIGN

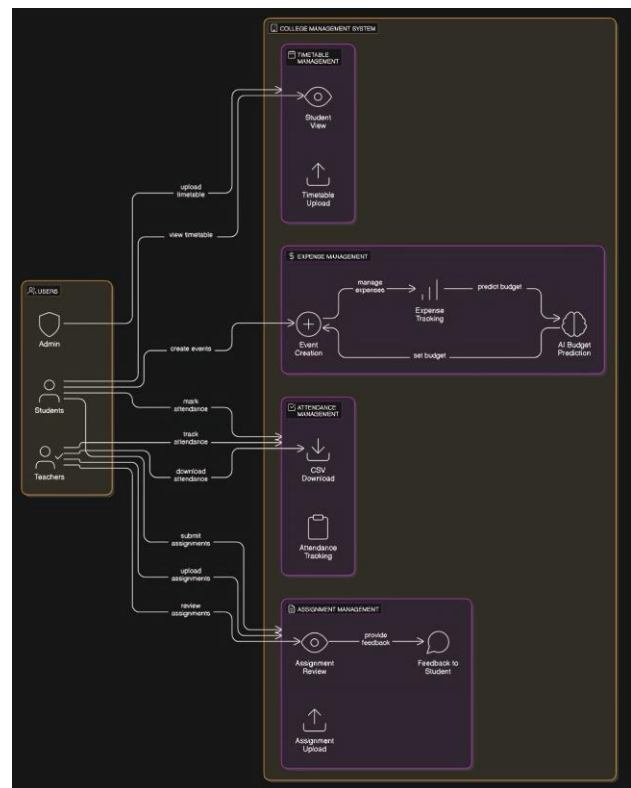


Fig.1 (College Management System) CMS System Architecture

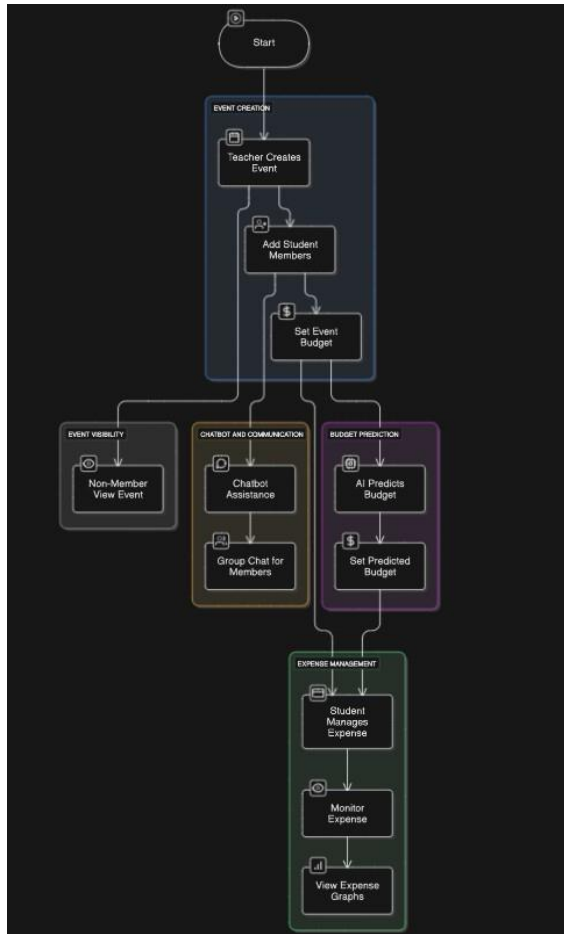


Fig.2 Expense Management System Architecture.

The architecture of the College Management System (CMS) is structured to facilitate seamless interactions among students, teachers, and administrators while ensuring efficient data flow between different modules. The system consists of multiple components, with a primary focus on the Expense Management System and its integration with other CMS functionalities.

The first diagram outlines the detailed workflow of the Expense Management System. The process begins with an authorized teacher creating an event and adding student members. Once members are added, they can set a budget for the event. The system incorporates an AI-driven budget prediction module, which suggests an estimated budget based on event details. Event members can manage expenses by uploading bills, and the system automatically extracts financial details such as the total amount and vendor name. These expenses are visualized through daily, monthly, and yearly graphs for better tracking. Additional features such as chatbot assistance and group chats enhance collaboration among members. Meanwhile, non-members can view event notifications but cannot manage expenses.

The second diagram presents the broader CMS architecture, showing how different subsystems interconnect. The users (Admins, Students, Teachers) interact with modules like Attendance Management, Assignment Management, Timetable Management, and Expense Management. Admins have control over event creation, while teachers manage attendance, assignments, and schedules. Students can view timetables, submit assignments, and track event expenses. The Expense Management System integrates seamlessly, supporting event creation, budget setting, expense tracking, and AI-based budget prediction.

This architecture ensures an organized, automated, and user-friendly approach to managing college activities, reducing manual efforts, and enhancing overall efficiency in an educational institution.

4. RESULT



Fig3. Estimated Budget

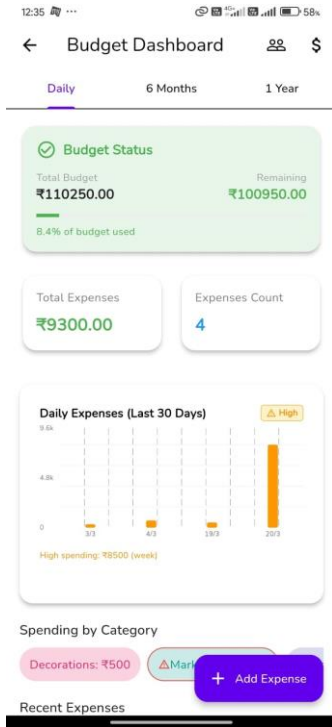


Fig4. Budget Dashboard

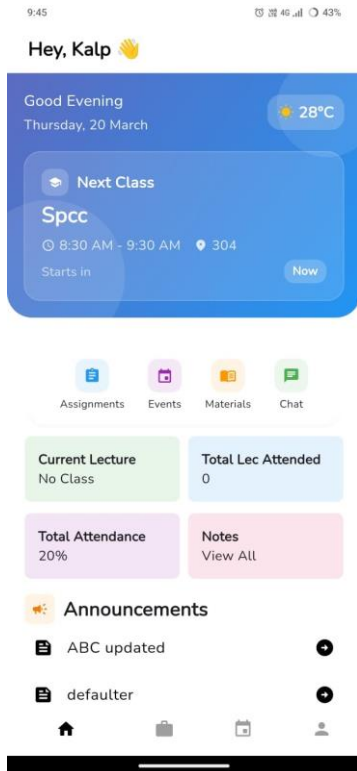


Fig.5 Home Page

5. FUTURE SCOPE

The Expense Management System within the College Management System (CMS) has significant potential for future enhancements and expansions. As technology continues to evolve, integrating advanced features will further improve the efficiency, transparency, and usability of the system.

One of the key areas for future improvement is the integration of digital payment gateways. Currently, the system allows users to track expenses and analyze budgets, but incorporating secure digital payment options will enable direct transactions within the platform. This feature will streamline event-related payments and ensure a seamless financial flow for students and faculty members.

Another potential enhancement is the implementation of blockchain technology for financial record-keeping. Blockchain can provide a decentralized and tamper-proof ledger for expense tracking, ensuring high levels of security, transparency, and data integrity. This will be particularly useful in preventing fraud, unauthorized modifications, or discrepancies in financial records.

The AI-driven budget prediction model can be further improved by incorporating machine learning algorithms that analyze historical event expenses and external financial factors. By continuously learning from past data, the system can provide more precise and adaptable budget estimations. Additionally, AI-driven insights can help students and faculty make better financial decisions by suggesting cost-saving measures.

Enhancing user engagement through mobile app development is another area of future growth. While the current system is designed for web-based access, creating a dedicated mobile application will provide users with real-time expense tracking, instant notifications, and an interactive user experience.

Finally, expanding the system to support multi-institution integration will allow for cross-college collaboration, where students from different institutions can jointly manage event expenses. This will be particularly beneficial for inter-college competitions and academic events.

By incorporating these advancements, the Expense Management System will continue to evolve into a more robust, intelligent, and efficient solution for educational institutions.

6. CONCLUSIONS

The Expense Management System within the College Management System (CMS) provides an efficient, automated, and transparent solution for managing event-related finances in educational institutions. By allowing authorized students to create events, set budgets, and track expenses through AI-driven predictions and graphical visualizations, the system streamlines financial management while

enhancing collaboration among event members. The integration of Optical Character Recognition (OCR) ensures accurate expense tracking by automatically extracting relevant details from uploaded bills, reducing manual errors, and improving record-keeping.

The CMS as a whole offers additional features such as attendance management, assignment management, and timetable management, all designed to enhance academic and administrative efficiency. Teachers can track and download attendance records, assign and review student submissions, and manage timetables seamlessly. These interconnected modules ensure a structured and user-friendly experience for students, faculty, and administrators. With potential future enhancements such as digital payment integration, blockchain-based security, and advanced AI-driven budgeting, the Expense Management System has a strong foundation for continued development. Mobile application integration and cross-institutional support can further extend the system's usability and effectiveness.

Overall, this system bridges the gap between event planning and financial tracking, reducing administrative burden and fostering a transparent, technology-driven approach to expense management. By leveraging automation, AI, and secure data handling, the Expense Management System sets a new standard for financial efficiency within educational institutions, ultimately contributing to a more organized and data-driven academic environment.

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