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Research Paper

BUDGET MANAGEMENT SYSTEM FOR STUDENTS CLUBS

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ABSTRACT

This work presents a Budget Management System (BMS) built using the MERN stack (MongoDB, Express.js, React.js, and Node.js) to efficiently handle and monitor student club finances. Student clubs frequently encounter issues with finances, budgeting, and reporting in an organized manner. Our project centralizes the financial transaction operations resulting in transparency and less manual work process. It offers role-based access control, real-time transaction tracking, automated approval workflows and secure data transfers. This paper outlines the objectives, design, implementation, testing, and results of the developed Budget Management System.

KEYWORDS: *Role-Based Access Control, Financial Management, Expense Tracking, Transaction Records, Fund allocation.*

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I. INTRODUCTION

Student clubs play a vital role in nurturing leadership and teamwork skills through event coordination and campus engagement. During our college events, we noticed how difficult it was to maintain transparent fund records, which inspired us to create this system. However, one of the most complex and time-consuming responsibilities of any student club is managing its finances effectively. Financial activities such as collecting member contributions, allocating event budgets, recording sponsorships, processing reimbursements, and generating transparent reports are often handled manually or using simple spreadsheets. These methods are prone to errors, lack real-time visibility, and can result in financial discrepancies. The Budget Management System for Student Club is a web-based application developed using the MERN stack (MongoDB, Express.js, React.js, Node.js) that aims to streamline and automate the club's financial processes. This system ensures accurate transaction recording, transparent fund allocation, efficient reimbursement workflows, and easy generation of financial reports. It introduces role-based access to manage the varying responsibilities of Admins, Treasurers, and Members. By digitizing and centralizing financial operations, the system enhances accountability, reduces manual workload, and improves overall efficiency in managing club funds.

II. LITERATURE SURVEY

In recent years, numerous studies have explored automated budget management frameworks to improve accuracy, transparency, and efficiency in financial operations. Rong and Zhang (2018) proposed an EVA-based enterprise budgeting model that connected performance evaluation with financial planning. However, their method lacked synchronization between short- and long- term goals, leading to planning inconsistencies. Jiang (2022) developed a multimedia-enabled budget management system integrated with financial risk management, which improved reporting but faced technological and financial constraints during deployment. Collectively, these studies emphasize the growing importance of digitizing financial

workflows while highlighting persistent issues of flexibility, user accessibility, and real-time transparency. To address these challenges, the proposed Budget Management System leverages the MERN stack (MongoDB, Express.js, React.js, Node.js) to create a lightweight, secure, and interactive platform suited for academic clubs. This system focuses on simplifying fund management, ensuring data integrity, and providing clear visibility into all financial activities.

III. RELATED WORK

In recent years, financial systems improvement efforts have been aimed at decreasing the number of errors and increasing the transparency between budgets. Spreadsheets or PHP-MySQL applications were not scalable and did not provide a real-time tracking or multi-user accessibility. In order to circumvent these limitations, more recent tools leverage full- stack JavaScript frameworks such as the MERN stack (MongoDB, Express.js, React.js, Node.js). This is one of many examples how "the cloud" can cheaply be used to consolidate management of funds, automate workflow approvals in writing and assure that the handling of data collections are all secure. In this system, MongoDB is used for storing dynamic financial records, and Express.js with Node.js manages the server- side logic. React.js is a web-socket-powered interactive interface for streaming transaction tracking and report visualization. This brings improved system performance, smoother user experience and higher transparency. The resulting system provides an accessible, role-based, and automatable method for and it allows student clubs to efficiently manage their budgets.

IV. EXISTING SYSTEM

Although EVA-based budget systems were effective in enterprises, they lacked adaptability for small-scale, collaborative groups such as college clubs. Moreover, the system was designed mainly for corporate settings and lacked the flexibility needed for smaller, collaborative environments like student clubs. These limitations underline the need for a more adaptable, real-time, and role-based budget management solution that can cater to the dynamic and participatory nature of student organizations.

PROPOSED SYSTEM

The proposed Budget Management System aims to automate and streamline the financial management process within student clubs, ensuring transactions and fund usage are handled efficiently. The system follows a three-layer architecture presentation, application, and data layers to maintain modularity and simplify system development. Through a simple and intuitive interface, members and administrators can submit budget requests, record expenses, and review approvals with easeThe backend manages authentication, budget validation, and transaction processing using secure communication channels to ensure data integrity. All financial data is stored in a centralized database, ensuring accuracy, reliability, and easy access when required. Real-time updates combined with defined user roles help maintain coordination among members and promote transparency in all financial activities. This method ensures efficient fund utilization, minimizes manual work, and offers a reliable digital platform for managing club finances.

SYSTEM ARCHITECTURE

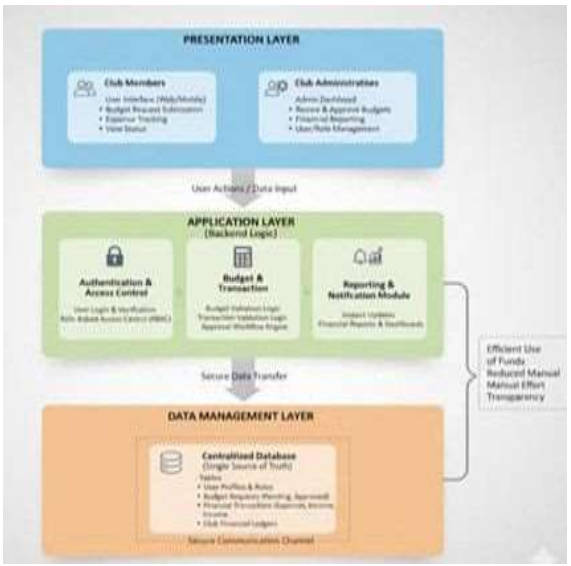


Fig:1 Budget Management System

METHODOLOGY DESCRIPTION

The methodology adopted for the Budget Management System focuses on achieving transparency, accountability, and proper

organization in the financial operations of student clubs.

The process is divided into two major phases: planning and monitoring.

Planning Phase:

At the start of each academic year, the club leadership defines clear financial objectives aligned with upcoming events and activities. A projected budget is created, listing expected income sources such as member contributions or sponsorships, and anticipated expenses for each event. The proposed system allows this data to be entered digitally, removing the need for manual spreadsheets.

Execution and Monitoring Phase:

During this phase, designated roles such as the treasurer and admin manage financial records through the web application. Every income and expense entry is securely stored in the system's database, supported by digital receipts for verification. The application also tracks ongoing expenditures and automatically compares them with the approved budget in real time. This ensures early detection of any budget deviation and improves the accuracy of financial management throughout the year. By following this methodology, the system promotes financial transparency, reduces manual errors, and simplifies reporting for club administrators and members.

V. RESULTS AND DISCUSSION



Fig :2 Power shell terminal using command



Fig :3 Budget management portal Home page



Fig 4: Budget management portal for Admin login page.

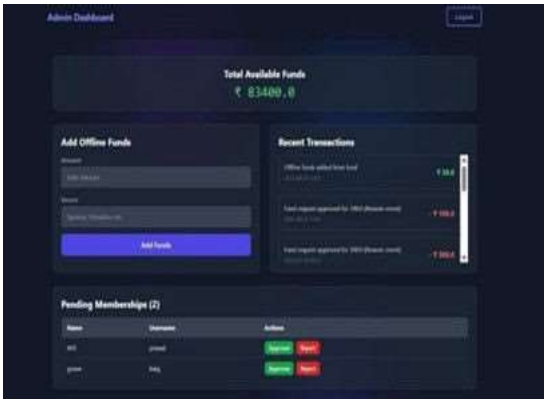


Fig 5: In this figure admin can add funds and approve / reject the rejects of members and transactions list also we can see here.

VI. CONCLUSION

The proposed Budget Management System successfully provides a secure, efficient, and user-friendly platform for managing student club finances. Developed using the MERN stack

(MongoDB, Express.js, React.js, and Node.js), the system ensures scalability, real-time updates, and smooth integration between frontend and backend operations. Its features, such as role-based access control, automatic expense tracking, and real-time budget monitoring, enhance transparency and minimize human error. By digitizing the budget management process, it empowers club administrators and members to make informed financial decisions while maintaining accountability and operational efficiency. Overall, the system demonstrates a practical and modern approach to digital financial management in educational organizations.

FUTURE SCOPE

In the future, the system can be expanded by developing a mobile application for greater accessibility and convenience. Integration with secure payment gateways can enable direct transactions and automated fund transfers. Incorporating AI- driven analytics will provide predictive financial insights, helping clubs optimize their spending and forecast future budgets. Additionally, the use of blockchain technology can further enhance security, transparency, and immutability of financial records. These advancements will transform the system into a comprehensive, intelligent, and trustworthy financial management platform for student organizations.

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