

## Campus Scholarship and Management Portal

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**Abstract:** *The Campus Scholarship and Management Portal is a unified digital platform designed to streamline the end-to-end process of scholarship discovery, application, verification, and allocation within educational institutions. The system aims to eliminate the challenges of manual processing such as paperwork, delays, data inconsistencies, and lack of transparency by providing an automated, user-friendly, and secure portal for students, administrators, and scholarship committees. The portal enables students to create profiles, explore eligible scholarships, upload required documents, and track application status in real time. Administrators can efficiently verify documents, evaluate applications, manage scholarship policies, and publish results through an intuitive dashboard. Advanced features like rule-based eligibility filtering, automated notifications, real-time status updates, and secure data handling improve the reliability and efficiency of the scholarship workflow. By integrating digital verification, centralized data storage, and role-based access control, the system ensures transparency, reduces processing time, and supports equitable distribution of financial aid. Overall, the Campus Scholarship and Management Portal enhances accessibility, operational efficiency, and decision-making in campus-based scholarship management.*

**Keywords:** Scholarship Management System, Web-Based Application, Role-Based Access Control (RBAC), Workflow Automation, JWT Authentication, Data Security, Multi-Level Approval System

### I. INTRODUCTION

In modern educational institutions, scholarship programs play a crucial role in supporting students financially and promoting academic excellence. However, traditional scholarship management systems are largely manual and paper-based, leading to inefficiencies such as delays in processing, data mismanagement, lack of transparency, and increased administrative workload. These limitations create challenges for both students and administrators, particularly when handling large volumes of applications.

To address these issues, a web-based Scholarship Management Portal is proposed to automate and streamline the entire scholarship lifecycle. The system provides a centralized digital platform that enables students to apply for scholarships online, upload necessary documents, and track application status in real time. At the same time, administrators, coordinators, and finance officers can efficiently manage verification, approval, and fund disbursement processes.

The proposed system incorporates modern web technologies to ensure scalability, security, and performance. Features such as role-based access control (RBAC), secure authentication using JSON Web Tokens (JWT), and structured multi-level approval workflows enhance data security and accountability. Automated notifications and real-time monitoring further improve communication and transparency among stakeholders.

By digitizing the scholarship process, the system significantly reduces manual effort, minimizes errors, and accelerates decision-making. Overall, the Scholarship Management Portal provides an efficient, secure, and scalable solution for managing scholarship programs in educational institutions.

### II. LITERATURE SURVEY

A comprehensive review of related works was carried out to understand existing scholarship management systems and web-based academic portals used in educational institutions. The studies examined focus on system automation, database management, security mechanisms, and user-interface design for efficient handling of scholarship applications. While many systems successfully digitize the application process, limitations still exist in areas such as multi-level verification, real-time tracking, data security, and integration of advanced analytics.

#### [1] (2020) “Digital Scholarship Management Systems in Higher Education”

This study explored centralized digital platforms for managing scholarship processes in universities. The system improved transparency, reduced manual workload, and enhanced accessibility for students. However, it lacked advanced workflow automation and did not provide detailed tracking mechanisms for application status across multiple verification stages.

#### [2] (2021) “Web-Based Solutions for Institutional Scholarship and Grant Management”

This work focused on web-based applications for handling scholarships and grants with real-time data processing. It improved communication between stakeholders and streamlined administrative tasks. However, the system had limited support for role-based access control and lacked strong security features for handling sensitive student data.

#### [3] (2019) “Automated Student Scholarship Portal Using Web Technologies”

This paper presented an automated scholarship portal that reduced manual errors and improved application processing speed. It demonstrated efficient data handling and online form submission. However, the system did not include a structured multi-level approval workflow and lacked comprehensive reporting and analytics features.

#### [4] (2022) “Design and Implementation of a Web-Based Scholarship Management System”

The study described a full-stack web application with database integration and authentication mechanisms. It ensured efficient data storage and retrieval. Despite its strong architecture, the system provided limited scalability features and did not emphasize real-time notifications or user-friendly dashboards.

#### [5] (2018) “Online Financial Aid and Scholarship Management Platforms”

This research focused on large-scale financial aid systems and highlighted the importance of digital record keeping and scalability. While the platform handled large volumes of data effectively, it lacked flexibility in customization and did not support detailed workflow tracking for different user roles.

#### [6] (2020) “A Secure Portal for Student Scholarship Applications and Management”

This study emphasized security features such as authentication and secure document handling. It improved data protection and user trust. However, it did not integrate advanced workflow automation or provide a comprehensive system for end-to-end scholarship lifecycle management.

From the above studies, it is evident that significant research has been carried out in automating scholarship management systems using web technologies. However, gaps still remain in integrating **multi-level verification workflows, real-time tracking, advanced analytics, and strong security mechanisms within a single unified platform**. Many existing systems either focus on automation or security but fail to provide a complete, scalable, and user-friendly solution.

The proposed Scholarship Management Portal addresses these limitations by combining **workflow automation, role-based access control, secure authentication, real-time monitoring, and centralized data management**, thereby providing an efficient and comprehensive solution for modern educational institutions.

### III. PROPOSED SYSTEM

The proposed system is a **comprehensive web-based Scholarship Management Portal** designed to automate and streamline the complete scholarship lifecycle within educational institutions. It aims to replace the traditional manual and paper-based system with a centralized digital platform that improves efficiency, transparency, and data management. The portal enables students to register and log in securely to access scholarship services. Students can apply for scholarships online by submitting their personal, academic, and financial information along with the required supporting documents such as income certificates, mark sheets, and identification proofs.

The system supports secure digital document upload and validation, thereby eliminating the need for physical paperwork, reducing administrative burden, and minimizing processing delays. Additionally, students can track their application status in real time, which enhances transparency and reduces communication gaps between stakeholders. A significant feature of the system is the **multi-level verification workflow**, which ensures structured processing of applications. Initially, applications are verified by department coordinators, followed by administrative approval and final processing by finance officers for fund disbursement. Each stage of verification is systematically recorded within the system, creating a clear audit trail and ensuring accountability.

This step-by-step validation mechanism reduces the chances of errors, fraudulent submissions, and unauthorized approvals while maintaining consistency in decision-making. To ensure secure access and data protection, the system implements **Role-Based Access Control (RBAC)** along with **JWT-based authentication**. Different users such as students, coordinators, administrators, and finance officers are assigned specific roles and permissions based on their responsibilities. Each user is provided with a customized dashboard that displays relevant functionalities and information. This structured access control mechanism prevents unauthorized access, protects sensitive data, and enhances overall system security.

The system is developed using modern web technologies to ensure scalability, performance, and maintainability. The frontend is built using React.js, providing a responsive and user-friendly interface. The backend is implemented using Node.js with Express.js, which handles business logic, authentication, and API communication. A relational database such as PostgreSQL or MySQL is used for secure and efficient storage of data. RESTful APIs facilitate seamless interaction between the frontend and backend components, ensuring smooth data flow and system integration.

Furthermore, the portal incorporates additional features such as automated email and system notifications, real-time monitoring of application progress, and analytics dashboards for administrative insights. These features improve communication among stakeholders and support data-driven decision-making. Administrators can generate reports related to application statistics, approval rates, and fund distribution, which helps in effective planning and management of scholarship programs.

The proposed system offers a **scalable, secure, and efficient solution** for managing scholarships in educational institutions. By integrating automation, structured workflows, secure authentication, and real-time tracking, the system significantly reduces manual effort, minimizes errors, improves transparency, and ensures timely distribution of financial assistance to deserving students.

### PROPOSED SOLUTION

The proposed solution aims to design and develop a **secure, scalable, and efficient web-based Scholarship Management Portal** that automates and digitizes the entire scholarship lifecycle within educational institutions. The primary objective of this solution is to replace the existing manual and paper-based processes with a centralized digital system that ensures better data management, faster processing, and improved transparency. The system provides an integrated platform where students can register, log in securely, and submit scholarship applications by entering personal, academic, and financial details along with uploading necessary supporting documents such as income certificates, mark sheets, and identity proofs. All input data is validated at both the frontend and backend levels to ensure accuracy, completeness, and consistency. The system also enforces predefined eligibility criteria such as academic performance, income limits, and document verification to filter eligible applicants efficiently. A core component of the proposed solution is the **multi-level verification and approval mechanism**, which ensures that each application is processed through a structured workflow. Initially, applications are verified by department coordinators, followed by administrative review and final approval by finance officers for fund disbursement.

Each stage of processing is systematically recorded in the system, creating a detailed audit trail that enhances accountability and transparency. Applications that satisfy all requirements proceed to approval, while those with incomplete or invalid data are flagged for correction or rejection. To ensure robust security and controlled system access, the solution incorporates **Role-Based Access Control (RBAC)** along with **JWT-based authentication mechanisms**. Each user, including students, coordinators, administrators, and finance officers, is assigned specific roles and permissions based on their responsibilities. The proposed solution delivers a **reliable, transparent, and user-friendly scholarship management system** that significantly reduces manual effort, minimizes errors, accelerates processing time, and ensures that financial assistance is distributed efficiently and fairly to deserving students.

### MODULES

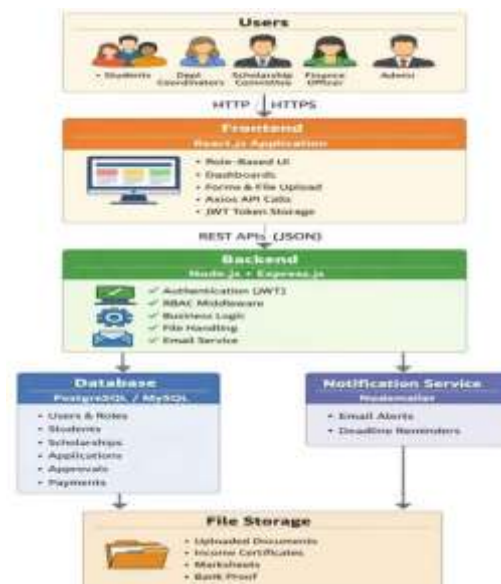


Fig 1.1 Architecture Diagram

#### IV. IMPLEMENTATION

The implementation of the **Scholarship Management Portal** is carried out using a full-stack web development approach to ensure scalability, security, and efficient performance. The system is developed based on a modular and layered architecture, integrating frontend, backend, and database components. The **frontend** is developed using React.js, which provides a responsive and user-friendly interface. It allows users such as students, administrators, coordinators, and finance officers to interact with the system through role-based dashboards. Students can apply for scholarships, upload required documents, and track their application status. The frontend communicates with the backend using REST APIs through Axios.

The **backend** is implemented using Node.js with Express.js, which handles all server-side operations and business logic. It processes user requests, validates input data, and manages the scholarship workflow, including application submission, verification, approval, and fund disbursement. The backend also implements JWT-based authentication and Role-Based Access Control (RBAC) to ensure secure access and proper authorization.

The **database** is designed using PostgreSQL or MySQL to store all scholarship-related data such as student details, scholarship schemes, applications, approval status, and payment records. The database structure is normalized to maintain data integrity and support efficient data retrieval. The implementation includes several functional modules such as user authentication, application management, document handling, verification workflow, notification system, and reporting. Secure file storage is used to manage uploaded documents, and proper validation mechanisms are applied to ensure data accuracy.

##### 1. ADMIN DASHBOARD

The Admin Dashboard acts as the central control panel of the Scholarship Management Portal, providing an overview of users, applications, approvals, rejections, and pending requests. Administrators can manage scholarship schemes by adding, updating, and defining eligibility criteria. The dashboard also provides reports and analytics for monitoring performance and fund distribution. Secure access using RBAC and JWT ensures safe. The dashboard also provides reports and analytics for monitoring performance and fund distribution. Secure access using RBAC and JWT ensures safe, real-time, and transparent system management.

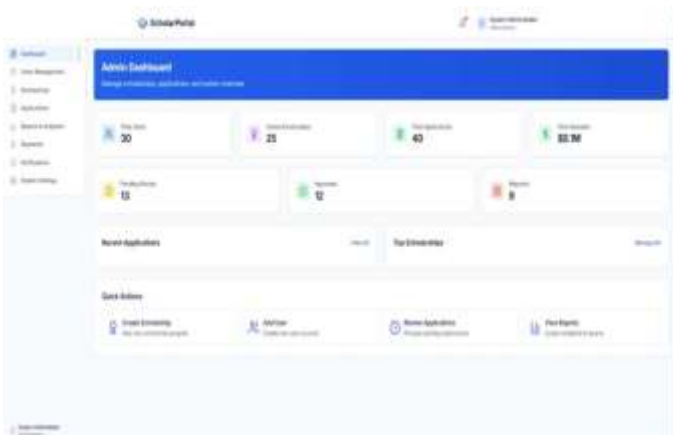


Fig 1.2 Admin Dashboard Page

##### 2. STUDENT DASHBOARD

The Student Dashboard provides a user-friendly interface for students to apply for scholarships and manage their applications. It displays available scholarships and application status such as pending, approved, or rejected. Students can upload required documents and track their application progress in real time, ensuring transparency and ease of use.

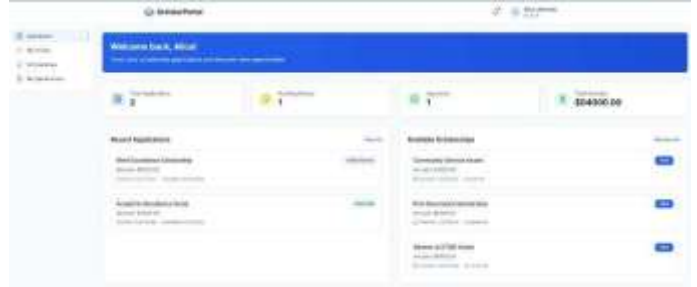


Fig 1.3 Student dashboard

##### 3. DEPARTMENT COORDINATOR DASHBOARD

The Department Coordinator Dashboard enables coordinators to review and verify student scholarship applications. It allows checking of submitted details and uploaded documents for accuracy. Coordinators can approve or forward applications to the next level for further processing. This dashboard ensures efficient verification and maintains transparency in the workflow. It also helps in reducing errors and speeding up the approval process.



Fig 1.4 Department coordinator dashboard

##### 4. SCHOLARSHIP COMMITTEE DASHBOARD

The Scholarship Committee Dashboard allows committee members to evaluate verified applications based on eligibility criteria such as academic performance and financial background. It provides access to application details and supporting documents for final decision-making. Members can approve or reject applications and update their status in the system. This dashboard ensures fair evaluation and maintains transparency in the scholarship selection process.

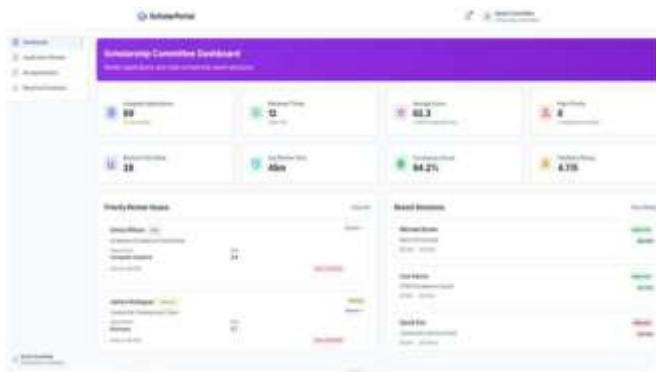


Fig 1.5 Scholarship committee dashboard

### 5. FINANCE OFFICER DASHBOARD

The Finance Officer Dashboard enables finance officers to manage and process scholarship fund disbursements. It provides access to approved applications and payment details for verification. Officers can update payment status and maintain transaction records efficiently. This dashboard ensures accurate fund distribution and improves financial transparency within the system.



Fig 1.6 Finance officer dashboard

### 6. APPLICATION PAGE

The Application Page allows students to apply for scholarships by entering their personal, academic, and financial details. It provides a structured form where users can fill in required information and upload supporting documents such as income certificates and mark sheets. The page includes validation to ensure all mandatory fields are completed before submission. Once submitted, the application is stored in the system and forwarded for verification. This page simplifies the application process and reduces manual errors.

Fig 1.7 Application page



### 7. NOTIFICATION PAGE

The Notification Page displays all important updates related to scholarship applications in a centralized view. It informs users about application submission, verification status, approval, rejection, and deadlines. Notifications are updated in real time to keep users informed at every stage of the process. It improves communication between users and administrators. This page ensures transparency and helps users stay updated without missing any important information.



Fig 1.8 Notification page

### 8. APPLICATION REVIEW PAGE

The Application Review Page allows authorized users to examine submitted scholarship applications in detail. It displays student information, uploaded documents, and eligibility criteria for verification. Reviewers can approve, reject, or request corrections based on the evaluation. The page ensures a structured and transparent decision-making process. It helps maintain accuracy and accountability during the application review stage.

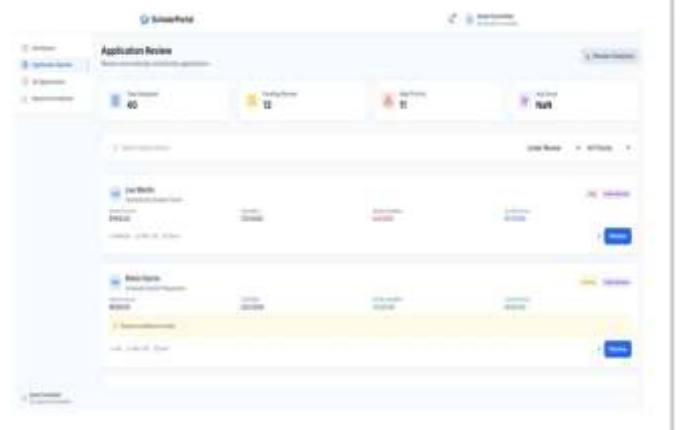


Fig 1.9 Application review page

## CONCLUSION

The Scholarship Management Portal is developed as an efficient web-based solution to automate and streamline the scholarship management process within educational institutions. It eliminates the limitations of traditional manual systems by providing a centralized platform for application submission, verification, approval, and fund disbursement. The system ensures better organization of data, reduces processing time, and minimizes human errors. By implementing features such as Role-Based Access Control (RBAC) and JWT-based authentication, the system ensures secure access and protection of sensitive information. The inclusion of real-time tracking, automated notifications, and role-based dashboards enhances transparency and improves communication among students and administrators. Overall, the system provides a scalable, reliable, and user-friendly solution that improves efficiency, supports better decision-making, and ensures timely distribution of scholarships to deserving students.

## V. REFERENCES

- [1] Anderson, P., & Miller, J. (2020). *Digital Scholarship Management Systems in Higher Education*, International Journal of Educational Technology and Systems, 2020.
- [2] Thompson, E., & Davis, M. (2021). *Web-Based Solutions for Institutional Scholarship and Grant Management*, International Journal of Information Systems and Technology, 2021.
- [3] Gupta, R., & Sharma, S. (2019). *Automated Student Scholarship Portal Using Web Technologies*, Journal of Computer Applications in Education, 2019.
- [4] Kumar, A., & Patel, N. (2022). *Design and Implementation of a Web-Based Scholarship Management System*, International Journal of Advanced Computer Science and Applications, 2022.
- [5] Johnson, L., & Carter, B. (2018). *Online Financial Aid and Scholarship Management Platforms*, Journal of Higher Education Information Systems, 2018.
- [6] Singh, V., & Verma, R. (2020). *A Secure Portal for Student Scholarship Applications and Management*, International Journal of Emerging Technologies in Education, 2020.
- [7] Lee, H., & Park, J. (2021). *Role-Based Access Control in Academic Management Systems*, International Journal of Computer Science and Security, 2021.
- [8] Ahmed, M., & Khan, S. (2020). *Secure Web Applications Using JWT Authentication*, Journal of Information Security and Applications, 2020.
- [9] Rao, V., & Mehta, N. (2019). *Database Design for Student Information Systems*, International Journal of Data Engineering, 2019.
- [10] Chen, Y., & Liu, X. (2022). *Workflow Automation in Educational Administration Systems*, International Journal of Software Engineering and Applications, 2022.