

Proposal for Web and App development for Library Management System of Sambalpur University Institute of Information Technology (SUIIT)



The Founder of www.aedia.in

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Library Management System project, focusing on detailed descriptions, cost estimations, and technology stacks.

1. Detailed Project Overview

The **Library Management System** is a digital platform designed to automate library tasks and create a seamless user experience for administrators, librarians, and students. This system will be built with **React** for the frontend and **Firebase** for backend operations, providing a dynamic, scalable, and secure infrastructure.

The main objective is to manage the library catalog, allow user roles to interact with the system efficiently, and automate essential tasks like book checkout, return tracking, overdue notifications, and more. This will not only streamline operations but also provide real-time insights into library utilization and trends.

2. Functional Modules and Details

Each module within the system has specific functionalities, which are outlined in detail below.

Admin Module

- **User Management**: Complete user control including adding, editing, deleting, or changing roles.

- **Library Resource Management**: Allows administrators to manage the book inventory, update book statuses, and remove or add new titles.

- **Report Generation**: Generate detailed, downloadable reports on student borrowing habits, book popularity, overdue fines, etc.

- **Fine Control & System** : Policies: Set policies for borrowing limits, overdue fines, and user access control for resources.

Librarian Module

- **Real-Time Check-Out/In System** : Barcode scanning and tracking for efficient checkouts and returns.

- **Reserve & Availability Management** : Handle reservations and notify students when books become available.

- **Overdue Tracking & Fine Collection**: Track overdue books and charge fines as per library policy. Option to collect fines online.

- **Catalog Maintenance**: Update book information, including repairs, new acquisitions, or removals.

- **Student Support Interface**: Interface for assisting students with book searches, queries, and system support.

Student Interface

- **Self-Service Portal**: Borrowing, reservation, and return tracking within the student account.

- **Catalog Search & Filter**: Advanced search functionality based on various book attributes and availability.

- **Profile Management**: View and manage borrowing history, current books, and any accrued fines.

- **Feedback & Communication**: Submit feedback, report issues, and communicate with librarians.

- **Notification System**: Receive reminders on due dates, notifications on book availability, and messages from librarians.

3. Technology Stack and Languages

The tech stack and languages selected will optimize the platform for efficiency, scalability, and user-friendliness.

Frontend

- React: Main framework for building the user interface. Known for component-based structure and fast rendering.
- React Router: For smooth navigation between pages.
- Material-UI or Tailwind CSS: For a modern and responsive design, making the application mobile-friendly.
- HTML, CSS, JavaScript: Core web languages for structuring and styling.

Backend

- Firebase Authentication: Secure login for students, librarians, and administrators, with support for Google and email-based sign-in.
- Firestore: Firebase's NoSQL database to store books, user data, and transactions in a scalable, real-time format.
- Firebase Cloud Functions: For handling backend logic such as notifications, fine calculations, and custom report generation.
- Firebase Storage: For storing additional resources like book images, student IDs, and documents.
- Firebase Hosting: Deploy the application on Firebase's secure and reliable hosting.

Optional Payment Gateway Integration

- Stripe or PayPal: For handling online payments of overdue fines or membership fees, offering secure and reliable transactions.

4. Security Measures

To ensure data privacy and secure access, the following security features will be implemented:

- Role-Based Access Control (RBAC): Role-specific access for students, librarians, and administrators to maintain data privacy.
- Data Encryption: Sensitive data such as passwords, user profiles, and transaction history are encrypted.
- Firebase Security Rules: Controls over data access at the database level to prevent unauthorized access.
- Secure Data Transfer: HTTPS for secure data transmission between frontend and backend.

5. Project Timeline and Development Phases

The project will be completed in four major phases, over an estimated period of 12-16 weeks:

- Phase 1: Planning and UI Design (Weeks 1-3)
 - Finalize requirements and design interface prototypes.
 - Set up initial Firebase and React project.
- Phase 2: Frontend Development (Weeks 4-6)
 - Develop UI components, routing, and basic user interface for each module.

- Phase 3: Backend Setup and Integration (Weeks 7-11)

- Implement Firebase Authentication, Firestore database, and backend functions.
- Integrate book inventory, check-out/check-in, user management, and notification systems.

- Phase 4: Testing and Deployment (Weeks 12-16)

- Conduct system tests, security checks, and debugging.
- Deploy on Firebase Hosting, finalize documentation, and training sessions if required.

6. Estimated Cost

As per the Request of SUIIT librarian, I am undertaking this project with a total budget of ₹30,000. The payment structure will be 50% upfront and 50% upon submission. The project will be based on the framework provided at [SUIIT Library \(https://suiitlibrary.web.app/\)](https://suiitlibrary.web.app/)

Task	Estimated Hours	Cost per Hour	Total Cost
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UI/UX Design	40	₹500	₹20,000
Frontend Development	120	₹200	₹16,000
Backend Development	140	₹250	₹25,000
Testing & Debugging	60	₹200	₹6,000
Deployment & Setup	20	₹200	₹2,000
Optional Payment Integration	30	₹250	₹3,750
Project Management & Documentation	30	₹200	₹3,000

Total Estimated Cost: ~~₹75,750 INR~~ I will manage to execute this project within the ₹30,000 budget

Payment Structure:

- 50% Upfront Payment: ₹15,000
 - 50% Upon Submission: ₹15,000
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Additional Costs:

1. Firebase Plan: The Blaze plan will incur additional monthly costs based on usage, generally ranging between ₹2,000 - ₹8,000 per month, depending on storage and real-time database needs.(Optional If you have less Data)
2. Payment Gateway Fees: Platforms like Razorpay, Stripe, or PayPal typically charge around 2% per transaction.(Optional)

Note: While the total estimated cost is ~~₹75,750 INR~~, I will manage to execute this project within the ₹30,000 budget by optimizing resources and focusing on essential features.

About Developer:

Amresh Bhuyan the founder of www.aedia.in also a Full Stack Web and App Developer. He is actively engaged in developing various web and mobile and pc applications, both as personal projects and freelance work. Amresh specializes in creating user-friendly, responsive designs that enhance user experience and functionality.

Library Management System (<https://suiitlibrary.web.app/>)

- Type: Demo Project
- This system is already indexed on Google and showcases Amresh's ability to manage library resources effectively, including search and cataloging features.

Contact Information :

For inquiries or collaboration opportunities, Amresh can be reached at:

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Thanks you & Regards,

The Founder of www.aedia.in

Developer Signature

Acceptance Signature

Director Signature