

## **1. Project Overview**

This design brief outlines the development of a dynamic and responsive Library Management System (LMS) website for university campuses. The proposed system aims to streamline book discovery, borrowing, and management processes in order to reduce manual work, overdue fines, and user frustration. The LMS focuses on usability, performance, and accessibility across devices.

## **2. Background**

Existing library websites often suffer from slow loading times, poor book categorization (such as science, biochemistry, physics), confusing navigation, and limited mobile support. These issues negatively impact user experience for both students and librarians.

The proposed LMS addresses these challenges by implementing a search-first user experience, real-time book availability updates, and efficient librarian management tools.

## **3. Problem Statement**

Students require fast and mobile-friendly search functionality to locate and borrow books efficiently, while librarians need intuitive admin dashboards to manage inventory and fines. Without proper design and seamless backend integration with databases and APIs, library systems fail to meet user expectations and operational needs.

## **4. Objectives**

- Reduce search-to-borrow time to less than 30 seconds
- Reduce overdue fines by 50% using automated alerts and reminders
- Achieve 60% or higher mobile usage through responsive design
- Deliver a functional and user-friendly website within one week

## **5. User Personas**

### **5.1 Primary Users (Approximately 80% of traffic)**

#### **Students (Age 18–24, Bengaluru campus)**

- Tech-savvy undergraduate and postgraduate students

- Primarily mobile users for quick searches and borrowing

Pain Points:

- Slow and inaccurate search results
- Difficulty finding real-time availability

Goals:

- Locate and issue books within one minute

## **5.2 Secondary Users**

### **Librarians / Admins (Age 25–45)**

- Desktop-based users managing inventory and fines

Pain Points:

- Cluttered tables and lack of inline editing features

Goals:

- Perform bulk actions efficiently
- Generate reports easily

### **Faculty Members (Age 30+)**

- Interested in reservations and book recommendations

## **6. User Needs**

- Accessibility compliance (WCAG 2.1)
- Dark mode support for late-night usage
- Simple navigation and readable interface across devices

## **7. Primary and Secondary Goals**

### **7.1 Primary Goals**

- Fast and fuzzy search with filters (Title, Author, Genre, ISBN, Availability)
- Seamless borrow and return process with real-time status indicators
- Personalized user dashboard displaying borrow history, fines, and QR-based digital library card

### **7.2 Secondary Goals**

- Improved librarian efficiency through inline editable tables and bulk email functionality

- Increased user engagement via ratings, reviews, wishlists, and recommendations
- Additional features such as QR code scanning and book previews or summaries

## 8. Competitors:

Competitor	Strengths	Weaknesses	Opportunity
GeeksforGeeks LMS	Solid database schema	No mobile UX, static	Dynamic responsive + fuzzy search
Local University Sites	Familiar	Slow, no categories	Proper science/biochem splits + alerts
Libib/Goodreads	Ratings/recs	Not admin-focused	Librarian dashboard + campus integration

## 9. Deliverables

- Deployed Website: Fully functional dynamic site with frontend (React/HTML/CSS/JS), backend (Node/Python + APIs), database (MongoDB/MySQL/ Atlas) integration. Includes all 5 core pages (Homepage, Search Results, Book Detail, My Account, Admin Dashboard).
- Source Code Repository: GitHub repo with frontend/backend folders, README (setup/deploy instructions), schema diagrams.
- Design Style: interactive: dark mode, modals, flows, style guide (colors #2C5F7C/#4A9B7F/#FF6B6B, Inter fonts, Lucide icons).
- Demo Video/Screencast: 2-3 min walkthrough (student flow → admin reports) + QR scanner extra if implemented.
- Final Report/Presentation: This includes design brief, tech stack summary presentation, team contributions.
- Testing Artifacts: Screenshots (mobile/desktop), usability feedback log, performance metrics (load times).

## 10. Success Metrics

Quantitative: 90% uptime, <2-5s search loads, 4+ usability score.

Qualitative: Team feedback, zero major UX complaints.

Business: 50% overdue reduction.

## 11. Process & Research

1. Research: Team survey, competitor analysis, feature opportunities.

2. Ideation: Suggestions and idea discussions
3. Prototyping: Design frontend and backend with database integration.
4. Testing: Usability test, backend processing tests.
5. Iteration: Feedbacks and iterations

## **12. Design Structure:**

### **12.1 Frontend Information Architecture**

Home → Search Results → Book Detail

↳ My Account (Borrowed/Fines/History)

↳ Admin Dashboard (Overview/Inventory/Overdues/Users/Reports)

#### **Core Pages:**

- Homepage: Search bar + Recently Added carousel + Popular grid
- Search Results: Filters sidebar + Book grid/list + Pagination
- Book Detail: Cover + Actions (Borrow/Reserve) + Similar books
- My Account: Borrowed (countdowns) + Fines + History
- Admin Dashboard: Metrics cards + Inline edit overdue table

### **12.2 Backend Design**

#### **Core Tables:**

- USERS: id, email, role (student/librarian)
- BOOKS: id, title, author, isbn, genre, available\_copies
- TRANSACTIONS: user\_id, book\_id, issue\_date, due\_date, fine
- WISHLIST: user\_id, book\_id
- REVIEWS: user\_id, book\_id, rating

**Key APIs:** POST /auth/login, GET /books/search?q=query, POST /transactions/issue, GET /admin/overdues

## **13. Conclusion**

The proposed Library Management System design emphasizes speed, usability, and accessibility while addressing the real-world challenges faced by students, librarians, and faculty. By combining thoughtful UI/UX design with strong backend integration, the LMS aims to provide a scalable and efficient solution for modern university libraries.