Project Report

PROJECT **:** **Library Management System (SMARTLIB)**

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1. Introduction

SmartLib is a web-based Library Management System designed to automate and simplify library operations. The system allows students, faculty members, and librarians to interact with the library through a single online platform. It manages book records, issuing and returning of books, user requests, fines, and reports efficiently.

2. Objectives of the System

The main objectives of SmartLib are:

- To automate manual library processes
- To maintain accurate records of books and users
- To provide role-based access (Student, Faculty, Librarian)
- To manage book issuing, returning, and overdue tracking
- To reduce paperwork and human errors

3. Software and Tools Used

- Visual Studio Code (Code Editor)
- XAMPP (Apache Server & MySQL)
- PHP (Server-side scripting)
- MySQL / phpMyAdmin (Database)
- HTML, CSS (User Interface Design)

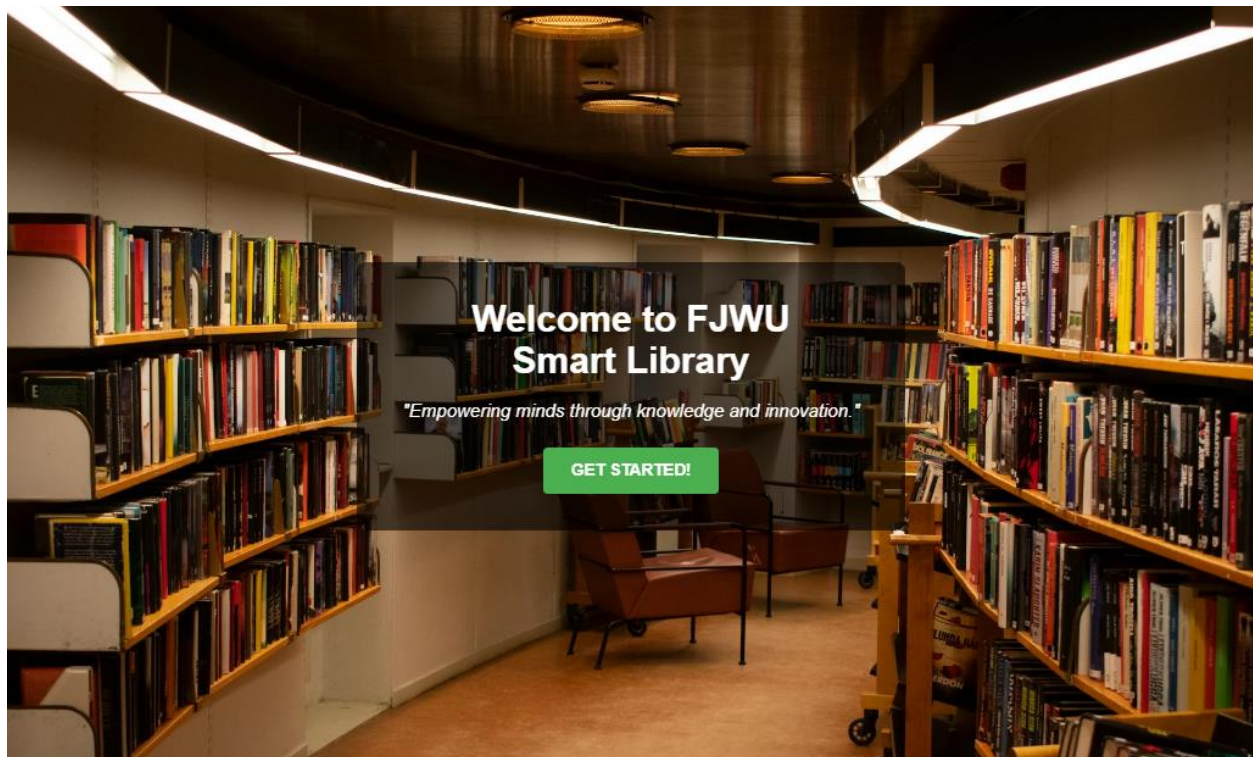# 4. User Roles in SmartLib

SmartLib supports three main user roles:

- Student
- Faculty
- Librarian

5. <u>Functional Requirements</u>

5.1 Welcome Page

The welcome page is the first interface of the system. It displays a brief introduction to SmartLib and provides a **Get Started** button that redirects users to the login page.

5.2 Login System

Users log in using their email, password, and role selection. After successful authentication, the system redirects them to their respective dashboards.
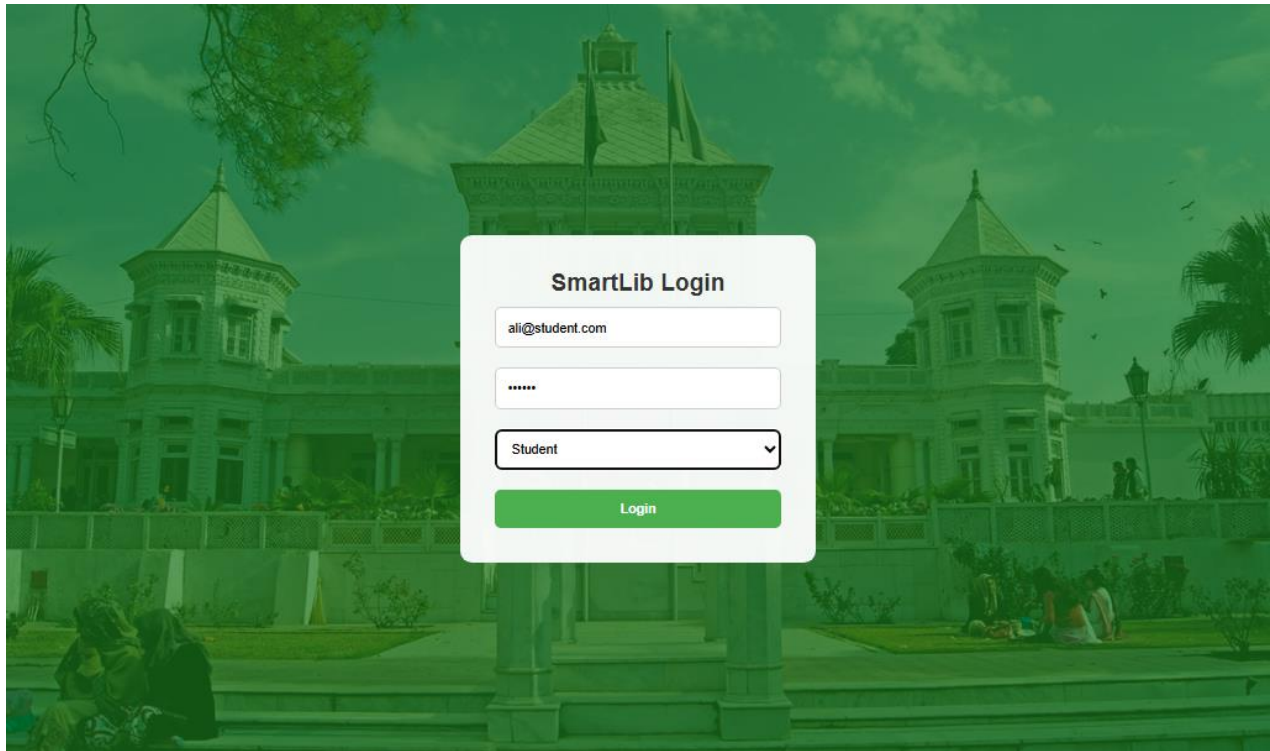
5.3 Session and Cookie Management

The SmartLib system uses **PHP Sessions** and **Cookies** to manage user authentication and improve user experience.
Sessions are used to store secure information such as member_id and user role after login. This ensures that only authorized users can access their respective dashboards. Session data is stored on the server and is destroyed on logout or browser close.

Cookies are used for non-sensitive purposes such as remembering the user's email address and storing last visit information. Cookies remain stored on the user's browser for a limited time to improve usability without compromising security.

5.4 <u>Student Module</u>

5.4.1 Student Dashboard

The Student Dashboard is the main screen after login. It provides an overview of the student's library activity.

Features shown on dashboard:

- Welcome message with last login time
- Total Books Borrowed
- Overdue Books Count
- Total Fine Amount

This dashboard helps students quickly understand their current library status.

5.4.2 Browse Books

The Browse Books page allows students to:

- Search books by title, author, or ISBN
- Filter books by category and availability
- View book details such as title, author, category, ISBN, copies, and status
- Submit a request for available books

5.4.3 My Books

This section displays the complete book history of the student, including:

- Issued books
- Returned books
- Due dates
- Status (Issued / Returned / Overdue)
- Fine (if applicable)

5.4.4 Request Book

Students can submit a book request by providing:

- Book title
- Author name
- Category

After submission, the request appears in **My Previous Requests** with status **Pending** until approved by the librarian. If both a student and a faculty request the same book, the faculty request is given priority.

5.4.5 Return Book

Students can return issued books from this section.

Functions:

- Select issued book from dropdown
- Submit return request
- Automatically update return date and status
- View return history

5.4.6 Profile Management

Students can:

- Update personal information (name, email, phone, address)
- Change password
- Delete account permanently

5.5 Faculty Module

Faculty members have similar features to students but with additional privileges:

- Priority access in book requests
- Extended issue duration (up to 30 days)
- No overdue fine policy
- Book recommendation feature

5.5.1 Faculty Dashboard

After successful login, faculty members are redirected to the **Faculty Dashboard**.
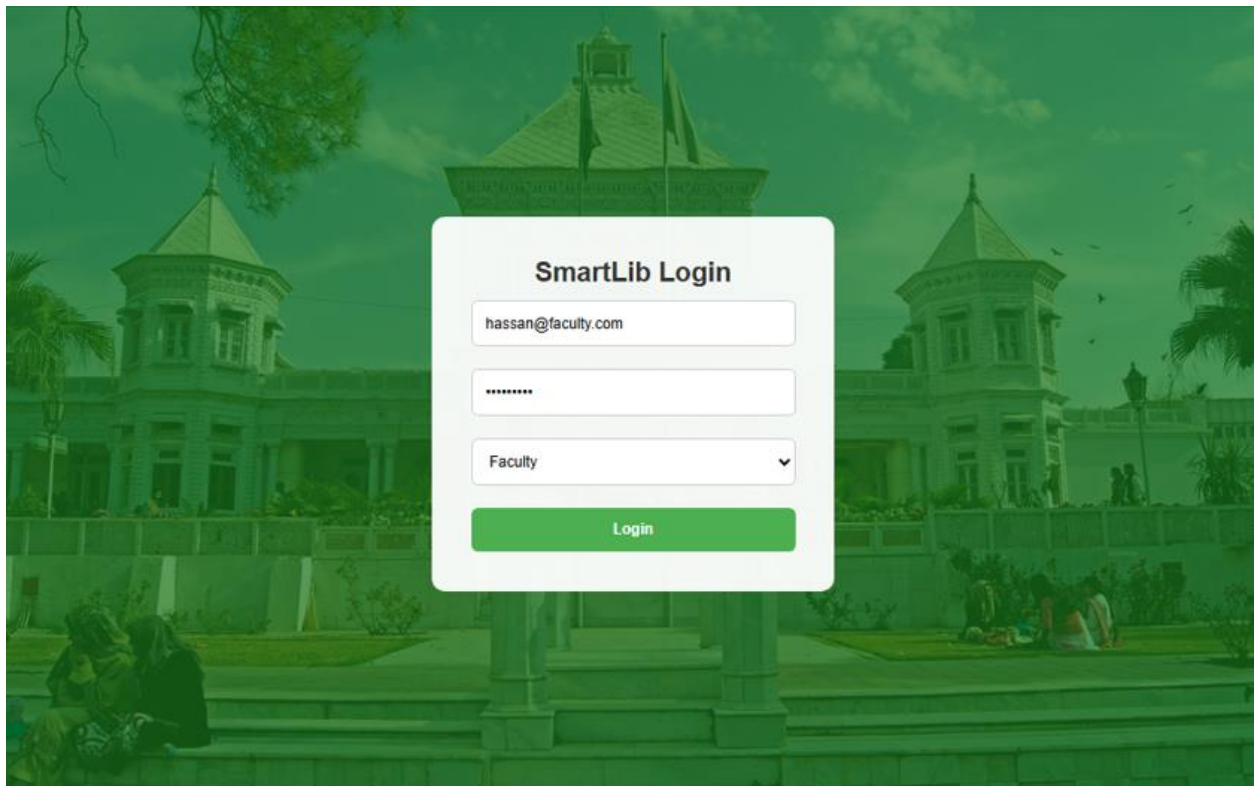
Dashboard Features:

- Welcome message with last login time
- Quick access buttons for:
    - Issue Books
    - Return Books
    - Recommended Books
    - Priority Requests

- o Reports
- Display of faculty privileges

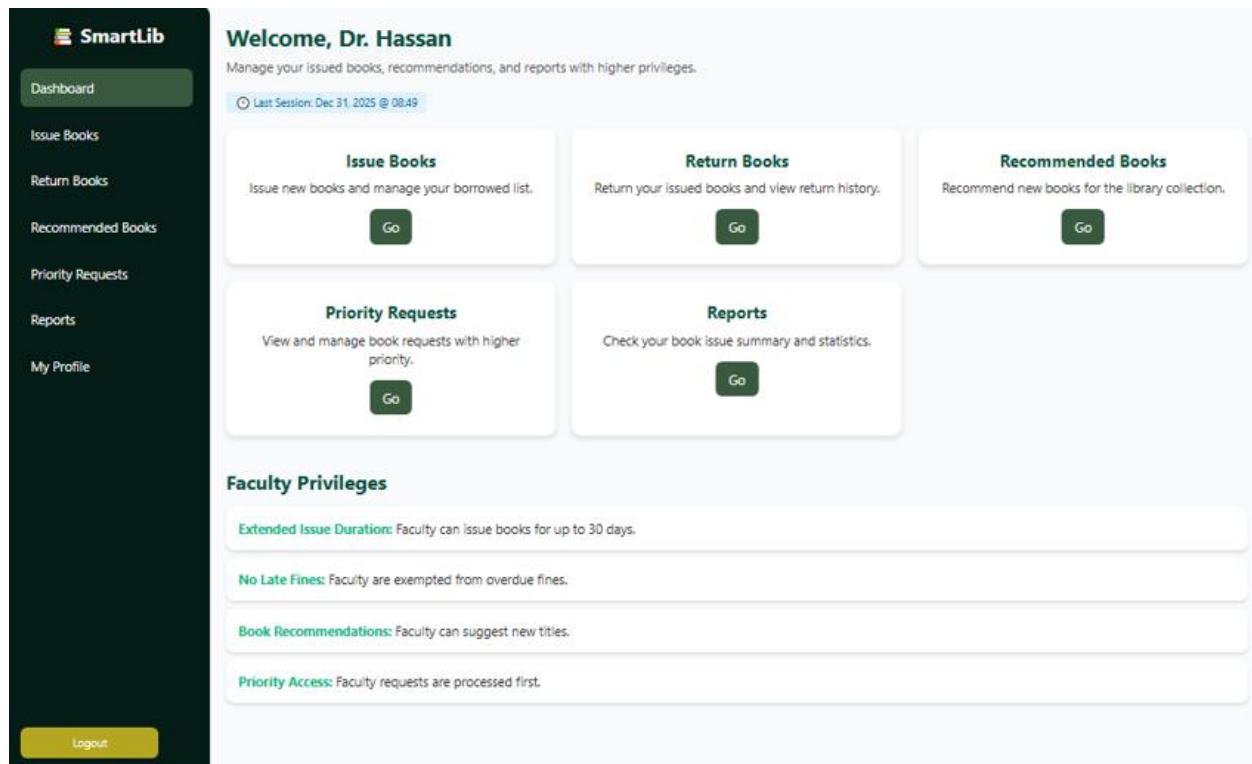The dashboard acts as a central control panel for all faculty-related operations.

5.5.2 Issue Books

Faculty members can issue books directly from the **Issue Books** section.

Functional Details:

- Faculty can issue books for **up to 30 days**
- Book selection through dropdown list
- Issue duration selectable (default: 30 days)
- Issued book appears in issued history with status **Issued**

This feature allows faculty members extended access to books compared to students.

5.5.3 Return Books

Faculty members can return issued books at any time using the **Return Books** section.

Functions:

- Select issued book from dropdown
- Submit return request
- Automatically update return date
- Book status changes to **Returned**
- Return history is updated instantly
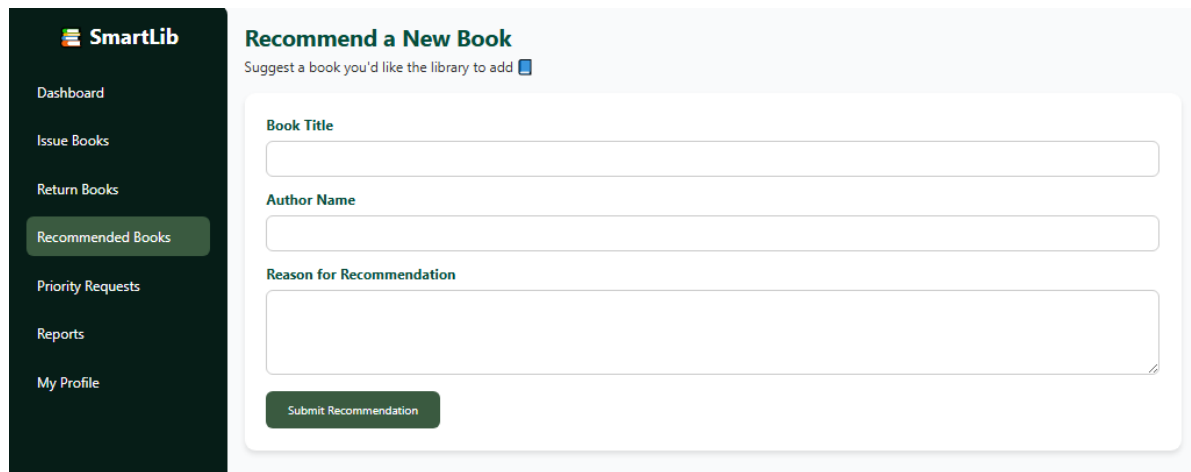
Faculty members are **exempted from late fines**, even if the book is returned after the due date.

5.5.4 Recommended Books

Faculty members can suggest new books to be added to the library collection.

Recommendation Form Includes:

- Book title
- Author name
- Reason for recommendation
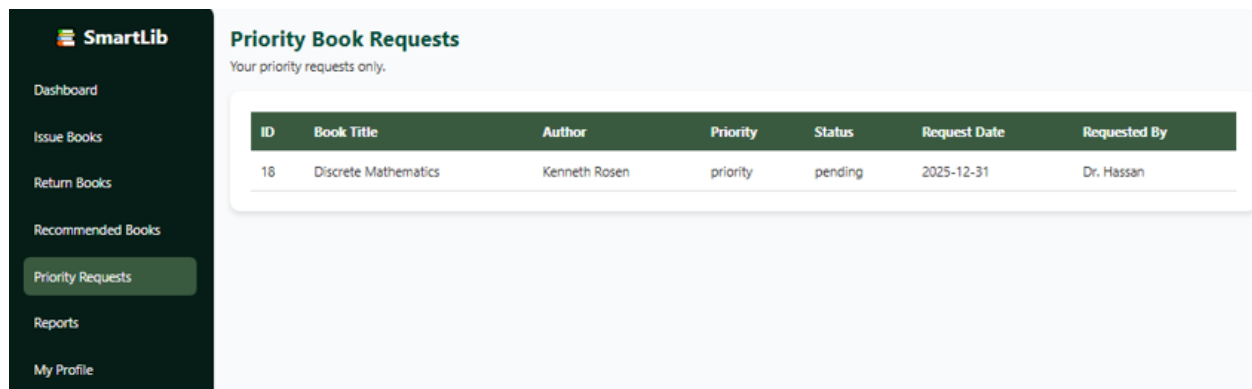
This feature helps improve the quality of the library collection.

5.5.5 Priority Book Requests

Faculty members have access to a **Priority Requests** section.

Priority Logic:

- Faculty book requests are marked as **Priority**
- If both a student and a faculty request the same book:
  - Faculty request is processed first

This ensures faculty members receive faster access to required books.

5.5.6 Reports

Faculty members can view analytical reports related to their library activity.

Reports Include:

- Total books issued
- Total books returned
- Total recommendations submitted
- Graphical representation (bar charts & pie charts)
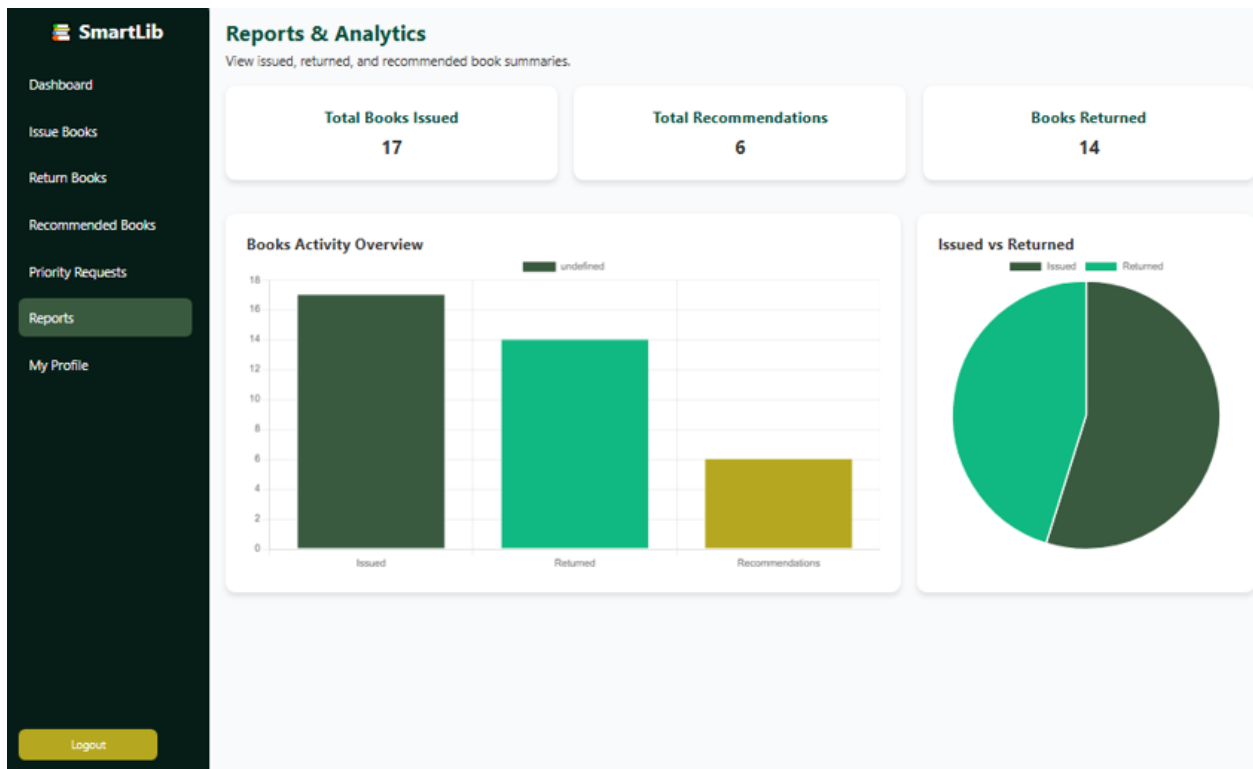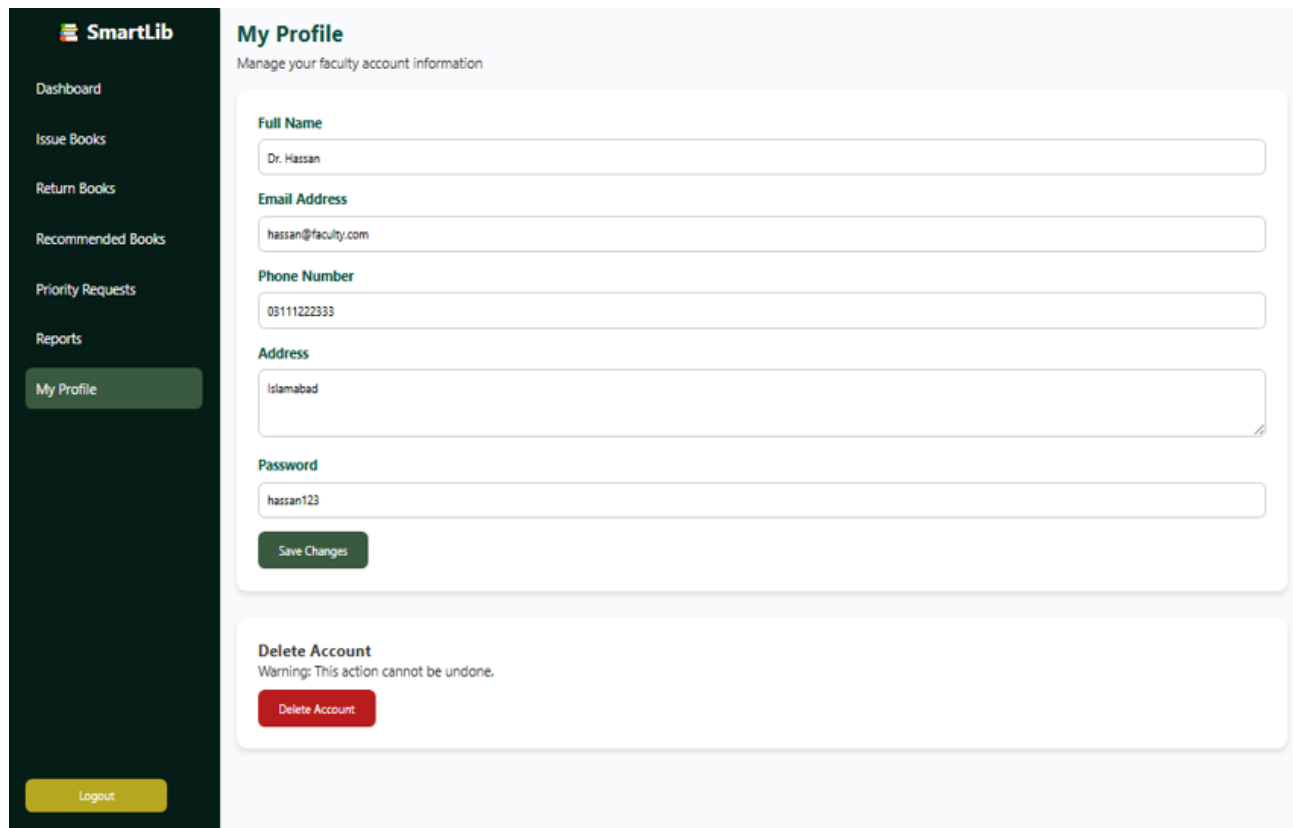
Reports help faculty track their usage and contribution to the library.

5.5.7 Faculty Profile Management

Faculty members can manage their personal profile information.

Profile Features:

- Update name, email, phone number, and address
- Change password
- Delete account permanently (irreversible action)

5.6 Librarian Module

The librarian dashboard provides complete control over the system

The librarian accesses the system through the SmartLib Login page by selecting the **Librarian** role and entering valid credentials.
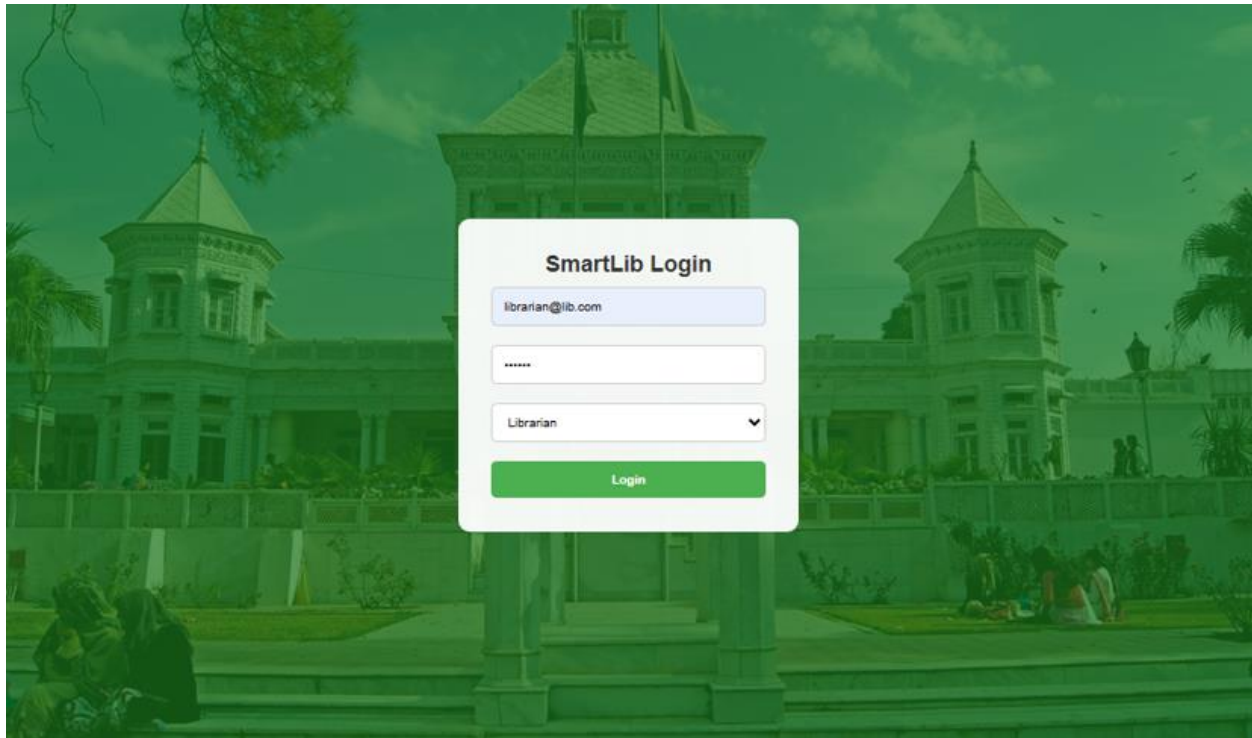
5.6.1 Librarian Dashboard

The Librarian Dashboard provides a real-time overview of library activity.

Dashboard Information Cards:

- Welcome message with last login time
- Total Books
- Total Members
- Active Loans
- Overdue Items
- Quick access buttons for Reservations and Book Stock
- Recent Activity table showing issued, returned, and requested books
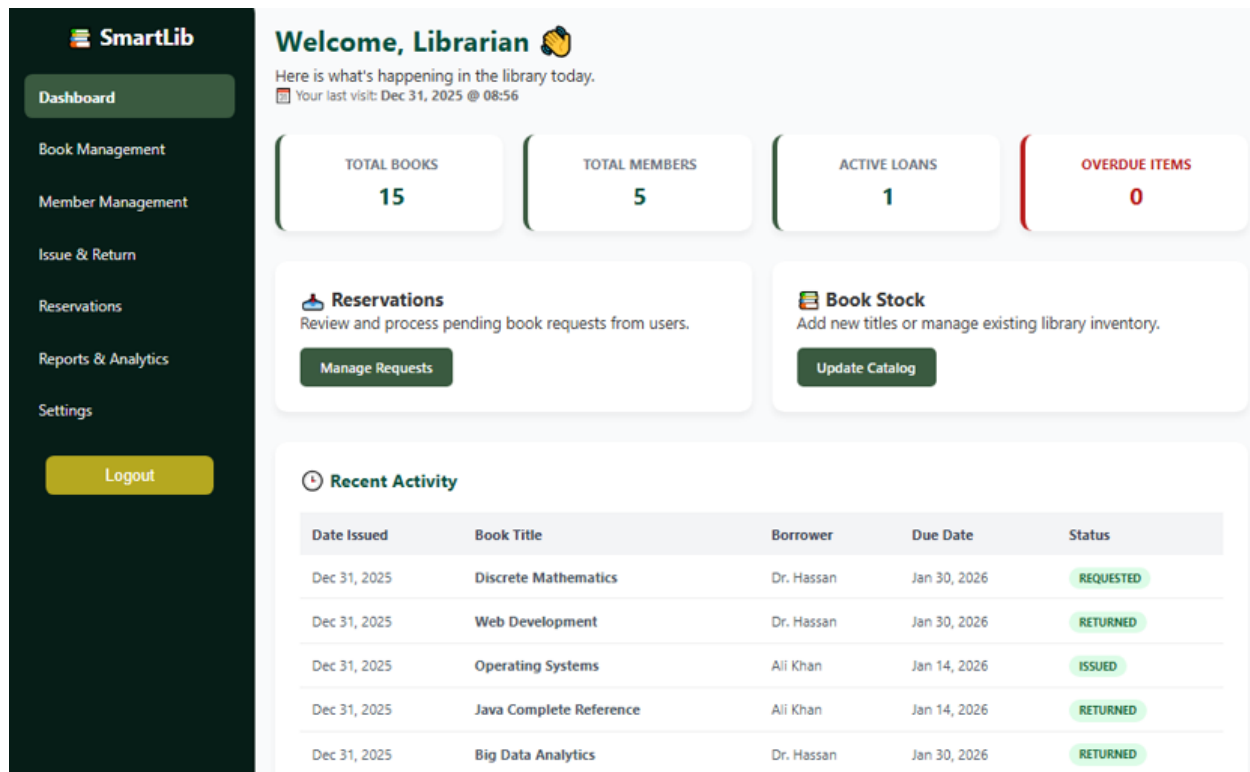
This dashboard helps the librarian monitor library status at a glance.

5.6.2 Book Management

The Book Management module allows librarians to manage the library inventory.

Functions:

- Add new books (Title, Author, Category, ISBN, Copies)
- Modify existing book details
- Delete books from the catalog
- Search books by Title, Author, or ISBN
- View availability status (Available / Requested)

SmartLib — Book Management

Dashboard
Book Management
Member Management
Issue & Return
Reservations
Reports & Analytics
Settings

Logout

📖 Book Management
Add, Modify, or Delete books from the system.

[+ Add Book] [✏ Modify Book] [🗑 Delete Book]

Search by Title, Author, or ISBN...   [Search]

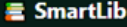| ID	Title	Author	Category	ISBN	Copies	Status
1	Database Systems	Elmasri	Computer Science	ISBN001	5	Requested
2	Operating Systems	Silberschatz	Computer Science	ISBN002	4	Requested
3	Computer Networks	Andrew Tanenbaum	Networking	ISBN003	3	Available
4	Artificial Intelligence	Stuart Russell	AI	ISBN004	0	Available
5	Machine Learning	Tom Mitchell	AI	ISBN005	2	Available
6	Web Development	Jon Duckett	Web	ISBN006	5	Available
7	Software Engineering	Ian Sommerville	SE	ISBN007	3	Available
8	Cyber Security	William Stallings	Security	ISBN008	3	Available
9	Cloud Computing	Rajkumar Buyya	Cloud	ISBN009	3	Available
10	Data Mining	Han & Kamber	Data Science	ISBN010	2	Requested
11	Big Data Analytics	Viktor Mayer	Data Science	ISBN011	1	Available

5.6.3 Member Management

The Member Management module is used to manage users of the system.

Functions:

- Add new members
- Modify member details (Name, Email, Role)
- Delete members from the system
- View complete member registry
- Search members by Name, Email, or ID

This module helps librarians control access and maintain user records.

5.6.4 Issue & Return Books

This module handles book issuing and returning operations.

Issue Books:

- View currently issued books
- Track borrower details
- Monitor issue date and due date

Return Books:

- Process book returns
- Automatically update book status to Available
- Update return history
- Display success confirmation messages
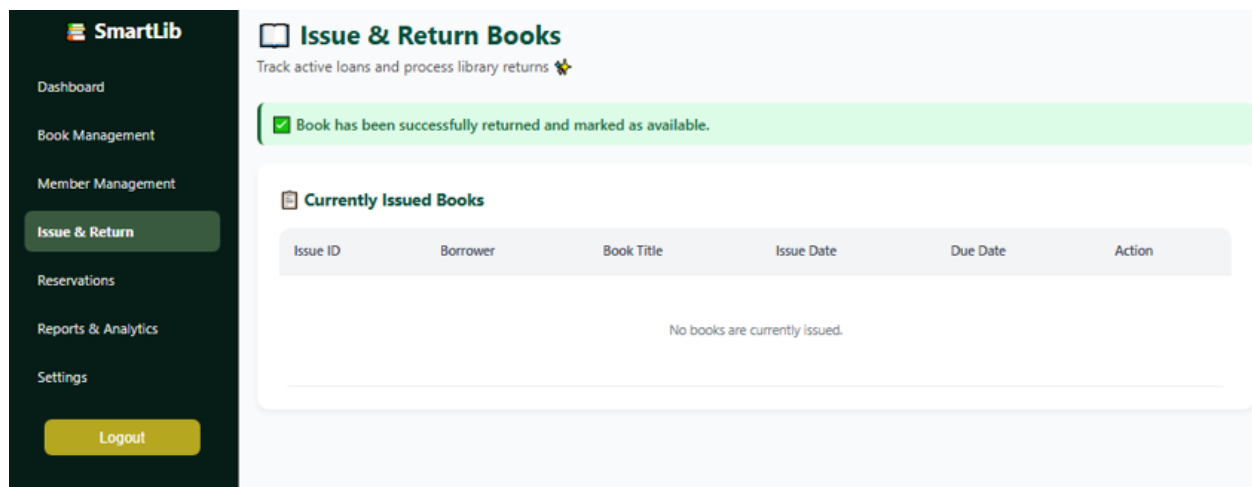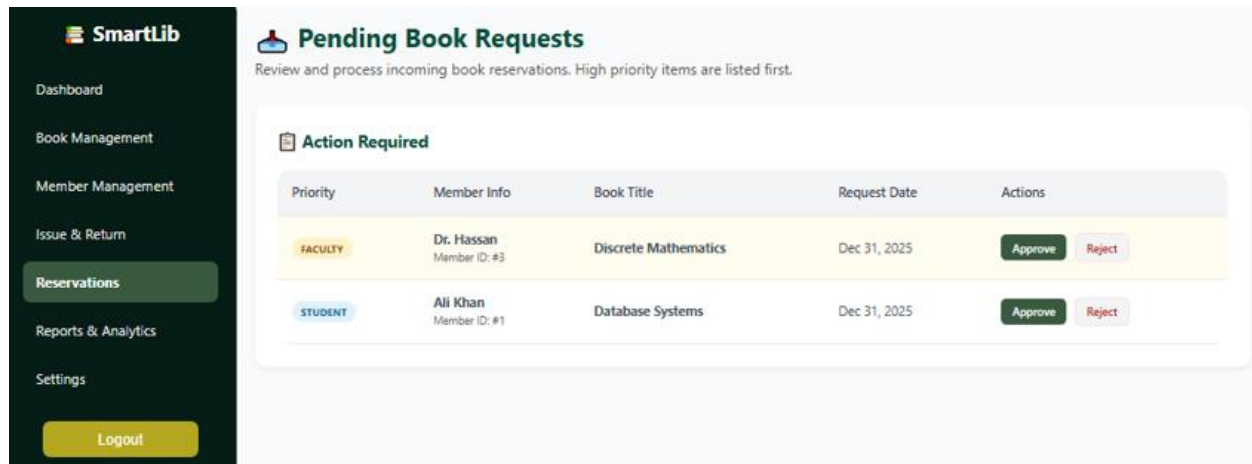
5.6.5 Reservations (Book Requests)

The Reservations module manages pending book requests.

Features:

- View all pending book requests
- Faculty requests are marked as **High Priority**
- Approve or reject requests

- Automatically assign due dates upon approval
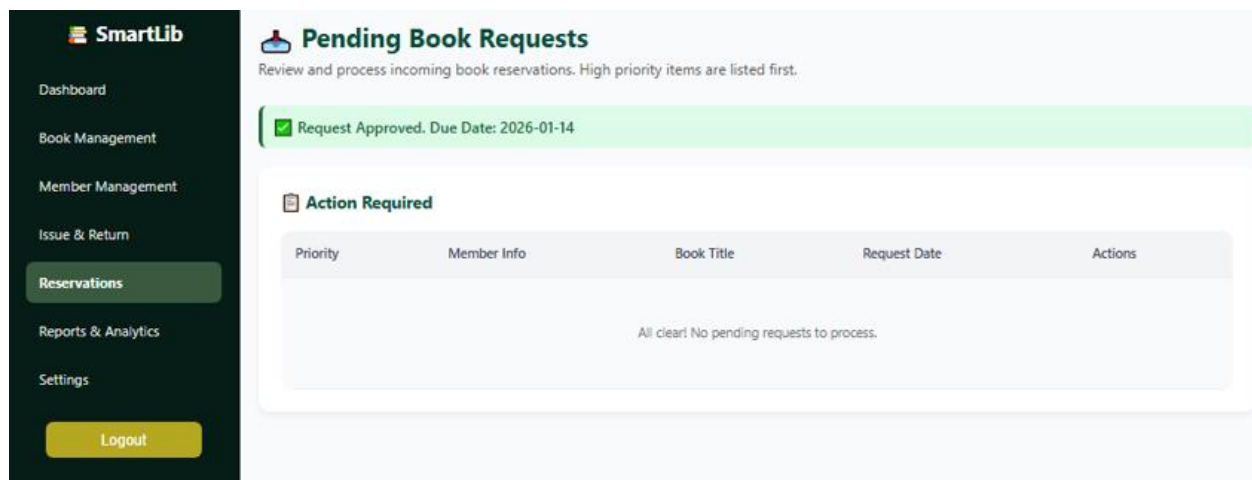
Priority Rule: If both a Student and a Faculty member request the same book, the Faculty request is processed first.

5.6.6 Reports & Analytics

The Reports & Analytics module provides insights into library performance.

Reports Include:

- Total Books
- Total Members
- Current Loans
- Overdue Items
- Category-wise book distribution (graphical view)
- Recently added books
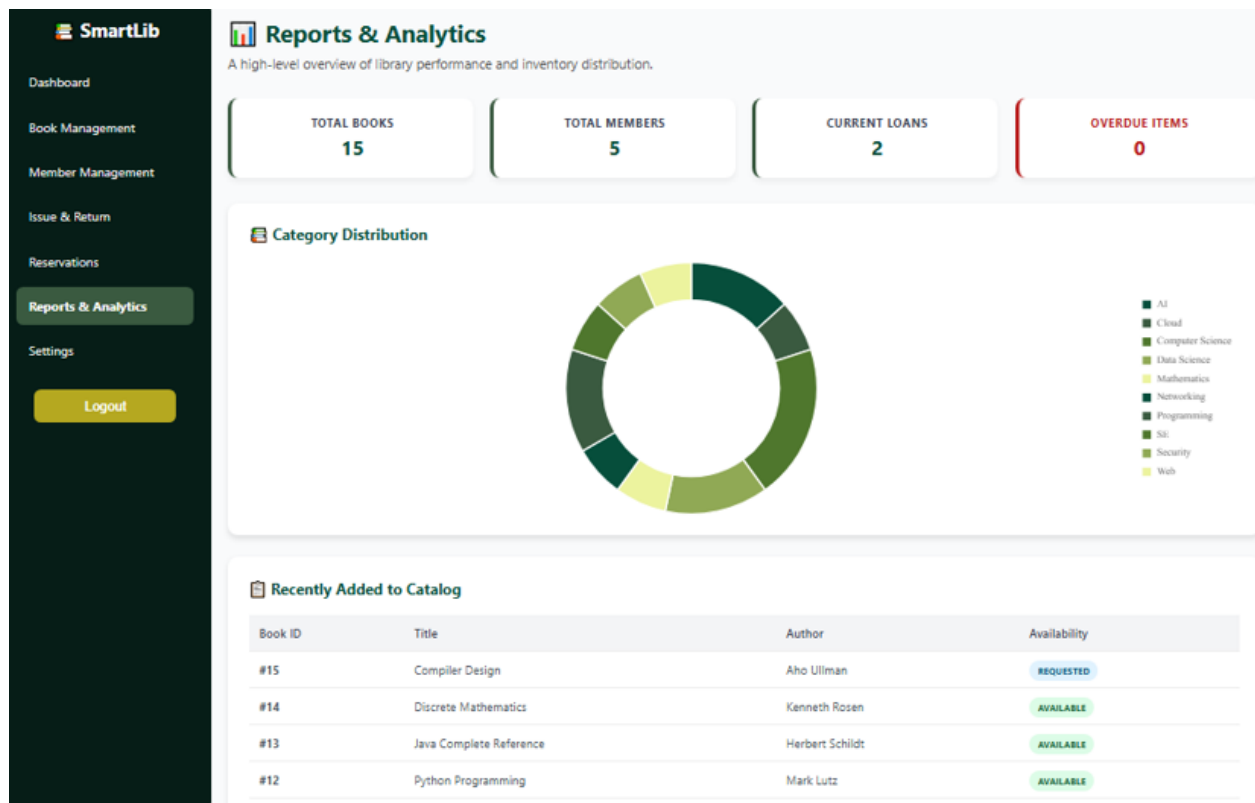
This module helps librarians analyze usage patterns and inventory distribution.

5.6.7 Account Settings

The Settings module allows librarians to manage their account.

Profile Settings:

- Update full name
- Update email address

Security Settings:

- Change password
- Confirm password update securely

This ensures account security and updated personal information.

6. <u>Non-Functional Requirements</u>

Non-functional requirements describe how the system performs its functions rather than what functions it performs. These requirements ensure that the SmartLib system is reliable, secure, and easy to use.

6.1 User-Friendly Interface

The SmartLib system provides a clean, simple, and well-organized user interface. Dashboards are designed according to user roles (Student, Faculty, Librarian), allowing users to easily under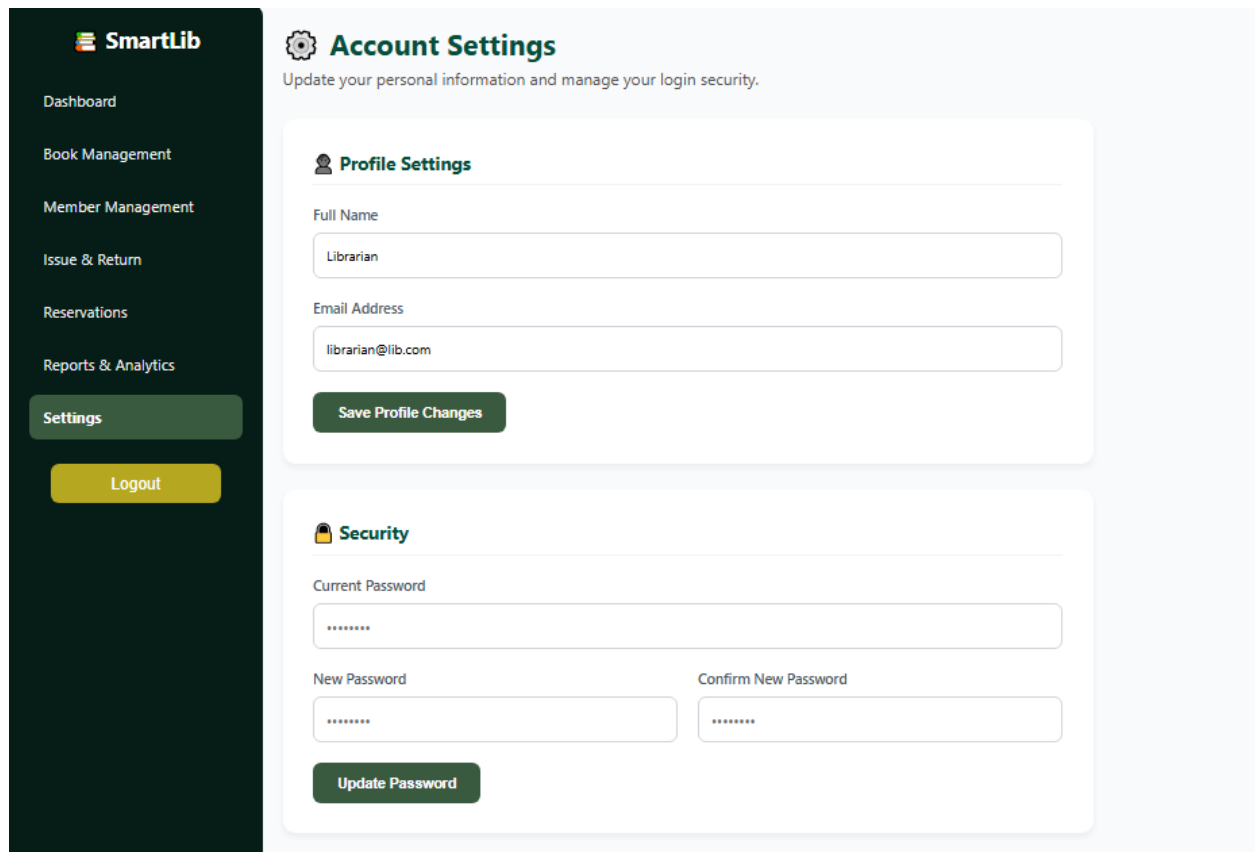stand and navigate the system. Clear buttons, readable fonts, and meaningful labels help users perform tasks without technical knowledge or training.

6.2 Secure Login and Session Management

Security is a key requirement of the SmartLib system. User authentication is handled through a secure login mechanism using email, password, and role selection. PHP sessions are used to maintain user login states and prevent

unauthorized access. Users cannot access restricted pages without proper authentication, and session termination occurs on logout to ensure safety.

In addition to sessions, cookies are used for non-sensitive data such as last login information and remembered email address. This combination of sessions and cookies ensures strong security while providing a better user experience.

6.3 Role-Based Access Control

SmartLib implements strict role-based access control to protect system data. Each user role has specific permissions:

- Students can only access student-related features.
- Faculty members have additional privileges such as priority requests and extended issue duration.
- Librarians have full administrative access.
  This separation of roles ensures data integrity and prevents misuse of system resources.

6.4 Fast Response Time

The system is designed to respond quickly to user actions such as searching books, submitting requests, and loading dashboards. Efficient database queries and optimized backend logic help reduce delays, ensuring a smooth user experience even with multiple users accessing the system simultaneously.

6.5 Data Accuracy and Consistency

SmartLib ensures accurate and consistent data by using a centralized MySQL database. All records related to books, users, issues, returns, and fines are stored and updated in real time. Validation checks are applied to avoid incorrect data entry, ensuring reliable reports and correct system behavior.

7. <u>Conclusion</u>

SmartLib is a complete and efficient web-based Library Management System designed to automate and simplify library operations. The system successfully replaces manual processes with a digital platform that improves accuracy, saves time, and reduces paperwork.

By providing role-based access for students, faculty, and librarians, SmartLib ensures secure and organized management of library activities. Features such as book requests, priority handling for faculty, issue and return management, fine calculation, and reporting make the system practical and effective for real-world use.

Overall, SmartLib enhances the productivity of librarians, improves accessibility for users, and offers a reliable solution for modern library management.