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(3) Library Management System

1. Introduction

1.1 Purpose : The purpose of this document is to define the functional & non-functional requirements of the library management system which will manage book records, user accounts, fine calculation & reporting.

1.2 Scope of this document : This document defines the overall working and main objectives of the library management system. It includes a discription of the development cost and the time required.

1.3 Overview : The Library Management System will automate the current manual system of book issuing, returning, catalogue management. The system will ensure that data integrity and security to handle large number of users & book records.

2. General discription

The library Management system will cater to the needs of library members (student, faculty), librarians and administrators. providing an interface that replaces manual record keeping with an automated digital platform.

3. Functional requirements

3.1 Book catalog management

- Add, update, delete & search book records.
- Maintain metadata(ISBN, title, author, category, availability).

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3.2. Borrowing & Returning books
- Allow members to borrow available books.
- Track due dates & calculate overdues.

3.3. User Account Management
- Register new users with unique ID.
- Maintain borrowing history for each user.
- Provide role based access.

3.4. Reports & Analytics Management
- Generate reports on most borrowed books, overdue books and user activity.
- Provide monthly/annual summaries for administrators.

4. Interface Requirements

4.1 User Interface
- Members: search, borrow, return, reserve & renew books
- Librarians: Manage inventory, issue/return books
- Admins: View analytics, manage users.

4.2 Integration Interfaces
- Barcode/QR scanner for physical books.
- Integration with email or SMS service for reminders.

5 Performance Requirements

5.1 Response Time
- Search queries should return results within 2 seconds

5.2 Scalability: System must support 500 concurrent users and must have ability to handle 100000 book records.

5.3 Data Integrity: Prevent duplicate records through unique identifiers.

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6. Design constraints.

6.1 Hardware limitations
- Requires standard systems / mobile device with internet access.
- Barcode scanners for physical book handling.

6.2. Software limitations
- Web based system must support major browsers
- Must comply with data protection regulations.

7. Non- Functional Attributes.

7.1. Security : Encrypted storage of user passwords and Role based access control for different users.

7.2. Reliability : Daily backups of database.

7.3 Scalability : Horizontal scaling supported for database and application servers.

7.4. Portability : Compatible with major OS with Responsive UI.

7.5 Usability : Intuitive UI for both members & librarians, multilingual support for accessibility

7.6 Reusability : Reusable modules for catalog management & user authentication.

7.7. Compatibility : Compatible with standard barcode scanners.

7.8 Data Integrity : All transactions are logged with timestamps and user IDs.

8. Preliminary Budget & Schedule : The development of the system is estimated to take 4 months with a budget of $90000 including deployment phases

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