③ Library Management System

1. Introduction

1.1. Purpose of This Document

To define the requirements for a library management system that automates book cataloging, borrowing, returning and fine collection.

1.2. Scope of this Document

The library management system will automate book cataloging, borrowing returning and fine calculation. The system will benefit librarians, students and faculty members.

1.3 Overview

The L.M.S will handle book inventory, user records, issues / return operations, overdue tracking and digital catalogue management.

2. General Description

- The library management system, will save serve librarians, library members, and administrators. It will include book management, member management, transaction tracking and reporting modules.

3. Functional Requirements

3.1: Book management

- add, update and remove books from catalog
- maintain details such as title, author, ISBN and availability.

3.2 Member Management

- register new members & maintain profiles.
- Track borrowing history and fines.

3.3 Borrowing and Returning

- Allow members to borrow available books
- Track due dates and fines for returns (late)

3.4 Reporting

- generate reports on borrowed books, overdue items and fines
- provide library usage statistics.

4. Interface Requirement

4.1 User Interface

- user friendly interface for librarians and members
- Accesible via web / desktop

4.2 Integration interface

- integration with university database for students info
- support for barcode scanners and RFID devices.

5. Performance Requirements

5.1. Response Time : The system should respond to queries within 2 seconds

5.2 Scalability : Support at least 500 concurrent users

5.3 Data Integrity : ensure accurate & real time updates.

6. Design Constraints

6.1. Hardware Limitations : compatible with standard PCs barcode scanner and printers.

6.2 Software Dependencies

- use RDBMS (eg: MySQL)
- implementation with Java / python frameworks.

7. Non-functional Attributes

7.1 Security : Role based access control for librarians / members

7.2 Reliability : ensure minimal downtime

7.3 Scalability : Allow expansion for more users & more book

7.4 Portability : Support access via multiple devices (PC, tablet, mobile)

7.5 Usability : Simple and intuitive navigation.

7.6 Data integrity : ensure accurate book & transaction records.

8. **Preliminary Schedule and Budget**
   - Estimate time for development 5 months
   - Estimated budget $80,000
   - Includes design, development, testing & deployment.