

# **Library Management System – Software Requirements Specification (SRS)**

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**Date: April 30, 2025**

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## 2. 1. Introduction

### 3. 1.1 Purpose

This document provides a detailed specification for the design, development, and deployment of a Library Management System (LMS)...

### 4. 1.2 Scope

The LMS will:

Manage books, authors, publishers, genres, vendors, and their relationships.

Track library branches, rooms, shelves, and book distributions.

Support member registration, membership types, and book club participation.

Facilitate borrowing, returns, fine calculation, and payments.

Enable staff and role management with secure, role-based access.

Provide reporting and analytics for library operations.

### **5. 1.3 Intended Audience**

Library administrators and managers

Branch managers

Library staff

Library members

System developers and maintainers

Vendors and partners

### **6. 1.4 Definitions and Acronyms**

LMS: Library Management System

ISBN: International Standard Book Number

ERD: Entity-Relationship Diagram

DFD: Data Flow Diagram

RBAC: Role-Based Access Control

## 7. 2. Overall Description

### 8. 2.1 Product Perspective

The LMS is a centralized, web-based application that integrates with existing library infrastructure and supports multiple branches...

### 9. 2.2 Product Functions

Catalog and manage books and resources

Register and manage members

Borrowing and returning of books

Fine calculation and payment processing

Staff and vendor management

Book club and activity management

Reporting and analytics

## 10.

### 11.2.3 User Classes and Characteristics

User Class	Description
Administrator	Full system access, configuration, and reporting
Branch Manager	Manages branch-specific resources and staff
Staff	Handles daily operations (borrowing, returns, registrations)
Member	Borrows books, pays fines, joins clubs, provides feedback

Vendor	Supplies books and manages contracts
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### 12.2.4 Operating Environment

Web browsers (Chrome, Firefox, Edge)

Database server (MySQL, PostgreSQL)

Application server (Windows/Linux)

Secure payment gateway integration

### 13.2.5 Assumptions and Dependencies

- Users have access to the internet and modern web browsers.
- The system will be hosted on secure, reliable infrastructure.
- All data migrations from legacy systems will be completed before launch.

### 14.3. System Features and Requirements

#### 15.3.1 Functional Requirements

#### 1. Book Management

**The system shall provide comprehensive functionality for managing book records, including:**

- **Adding, editing, and deleting book metadata such as:**
  - **ISBN (International Standard Book Number)**

- **Title**
- **Author(s)**
- **Publisher**
- **Genre(s)**
- **Vendor**
- **Shelf location**
- **Language**
- **Edition**
- **Publication year**
- **Tracking book distribution across different library branches and shelves.**
- **Linking books to related entities such as authors, publishers, genres, and vendors to maintain relational integrity.**

## **2. Membership Management**

**The system shall support the following membership-related operations:**

- **Registration of members with different membership types (e.g., standard, premium, student, senior).**
- **Tracking membership status , including active, expired, or suspended accounts.**

- **Managing membership fees , including payment records and renewal reminders.**
- **Recording preferred genres for personalized book recommendations.**
- **Enabling members to join book clubs and participate in discussions.**
- **Providing feedback mechanisms for members to rate and review books.**

### **3. Borrowing and Fines**

**The system shall facilitate the borrowing process and manage overdue items efficiently:**

- **Processing book loans and returns with an automated tracking system.**
- **Tracking due dates and loan statuses (e.g., checked out, returned, overdue).**
- **Automatically calculating fines for overdue books based on predefined rules.**
- **Supporting fine payment processing , including recording transactions and generating receipts.**

### **4. Staff and Role Management**

**The system shall manage staff members and their access levels:**

- **Maintaining staff records , including personal details, roles, and assigned branches.**
- **Implementing Role-Based Access Control (RBAC) to restrict system functionalities based on user roles (e.g., librarian, admin, manager).**
- **Assigning staff to specific library branches for operational management.**

## **5. Vendor Management**

**The system shall maintain vendor-related data and transactions:**

- **Storing vendor profiles , including contact details and contract terms.**
- **Tracking products supplied by each vendor.**
- **Recording financial transactions related to vendor payments and procurement.**

## **6. Book Clubs and Activities**

**The system shall support book club operations and member engagement:**

- **Organizing book clubs , including scheduling meetings and setting discussion topics.**
- **Tracking member participation in book club sessions.**



- **Recording and displaying book club activities for member reference.**

## **7. Feedback and Reporting**

**The system shall provide mechanisms for feedback collection and report generation:**

- **Allowing members to submit feedback categorized by topic (e.g., book quality, service experience).**
- **Generating analytical reports on:**
  - **Borrowing trends**
  - **Fine collection statistics**
  - **Book popularity rankings**
  - **Member activity and engagement**

## **3.2 Non-Functional Requirements**

### **1. Performance**

- **The system shall support at least 100 concurrent users without significant latency.**
- **All critical transactions (e.g., book checkout, fine calculation) shall complete within 5 seconds .**

## **2. Scalability**

- **The system shall be easily expandable to accommodate:**
  - **Additional library branches**
  - **Growing book inventory**
  - **Increasing user base**

## **3. Reliability**

- **The system shall maintain 99.9% uptime to ensure continuous availability.**
- **Daily automated backups shall be performed to prevent data loss.**

## **4. Security**

- **Sensitive data (e.g., member details, payment information) shall be encrypted both in transit and at rest.**
- **Role-Based Access Control (RBAC) shall be enforced to restrict unauthorized access.**
- **The system shall comply with data protection regulations (e.g., GDPR, local privacy laws).**

## **5. Usability**

- The user interface shall be intuitive and user-friendly , minimizing the learning curve for staff and members.
- The system shall support multilingual interfaces , including English and Arabic , to cater to diverse users.

## 6. Maintainability

- The system shall follow a modular code structure for easy updates and maintenance.
- Comprehensive documentation shall be provided, including user manuals and developer guides.
- Automated testing (unit tests, integration tests) shall be implemented to ensure system stability.

### 16.3.3 External Interface Requirements

- **User Interface:** Responsive web interface for all user classes.
- **Payment Gateway:** Integration with secure online payment providers.
- **APIs:** RESTful APIs for third-party integration (e.g., mobile app, analytics).
- **Reporting Tools:** Export reports in PDF and Excel formats.

### 17.4. Stakeholders

Stakeholder	Responsibilities / Needs
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Library Management	System configuration, reporting, staff and vendor management
Branch Managers	Resource allocation, branch-level reporting, staff oversight
Members	Book discovery, borrowing, payments, club participation
Staff	Daily operations, member support, resource tracking
Vendors	Supply management, contract tracking, financial transactions
System Administrators	Security, maintenance, performance monitoring

## 18.5. Use Cases

### Use Case 1: Borrow Book

**Actor:** Member

**Preconditions:** Member is registered and logged in.

**Main Flow:**

1. Member searches for a book by title, author, or genre.
2. System displays availability across branches.
3. Member requests to borrow the book.
4. System verifies availability and member status.
5. System records borrowing transaction, updates book status, and notifies member of due date.

### Use Case 2: Pay Fine

**Actor:** Member

**Preconditions:** Member has an outstanding fine.

**Main Flow:**

1. Member reviews outstanding fines.
2. Member selects payment method and submits payment.
3. System processes payment and updates fine status.

### **Use Case 3: Add New Book**

**Actor:** Staff

**Preconditions:** Staff is authenticated and authorized.

**Main Flow:**

1. Staff enters book details (ISBN, title, author, etc.).
2. System validates and saves the new book record.

### **Use Case 4: Join Book Club**

**Actor:** Member

**Preconditions:** Member is registered.

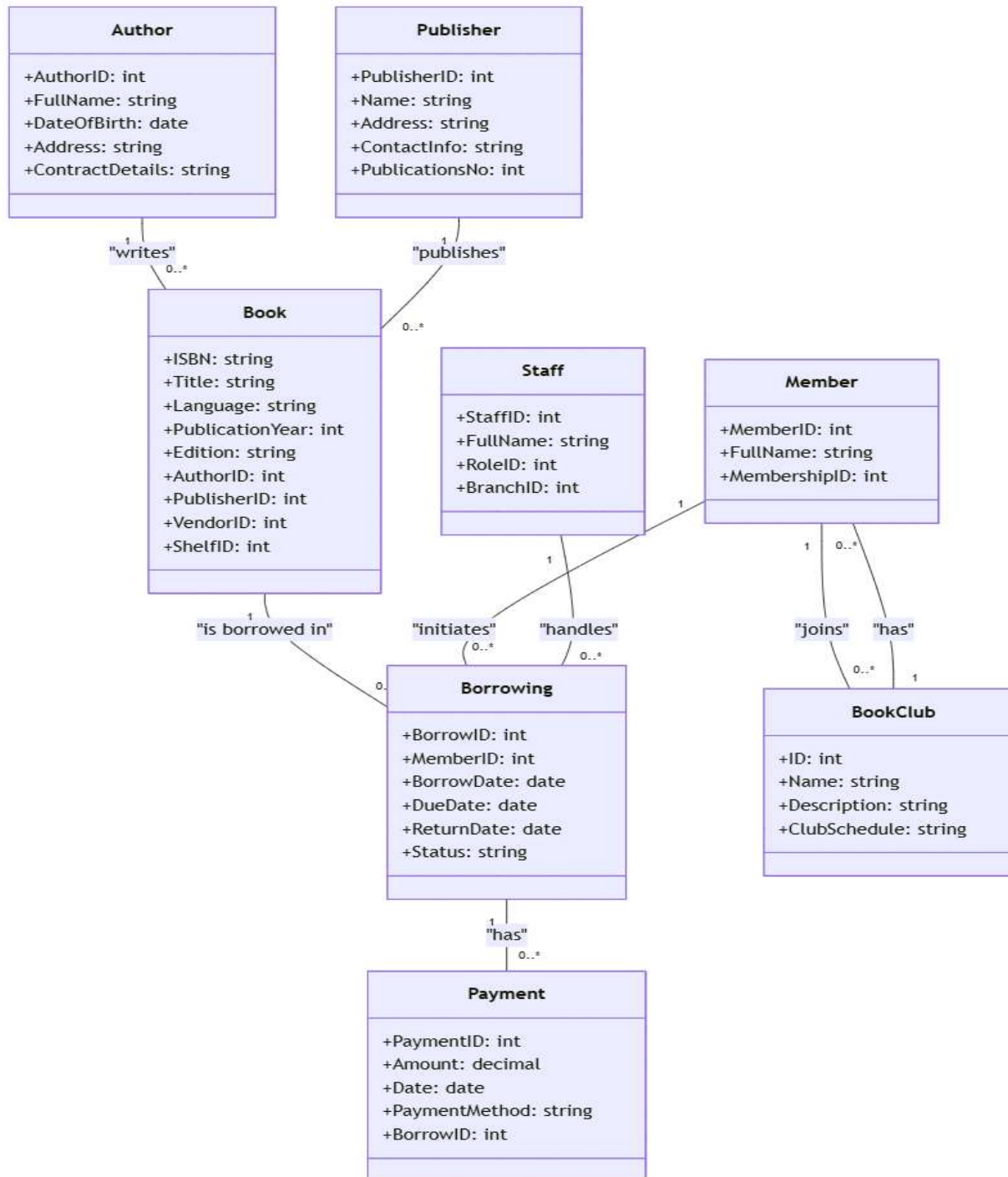
**Main Flow:**

1. Member views available book clubs.
2. Member requests to join a club.
3. System updates membership and notifies club organizer.

## 19.6. Data Dictionary

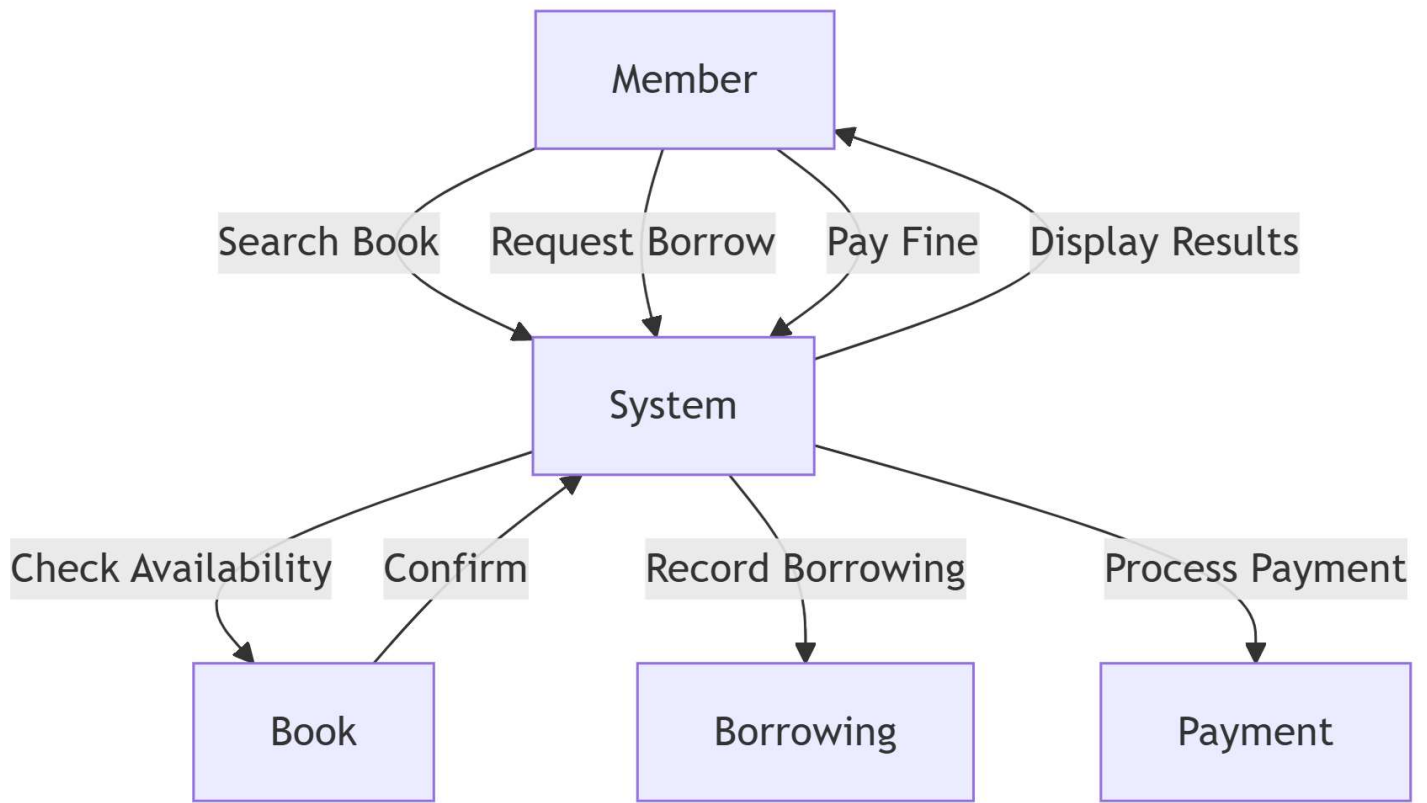
See the attached data dictionary for detailed attribute definitions for each entity, including Author, Publisher, Genre, Vendor, Book, Shelf, Borrowing, Payment, Feedback, Member, Membership, Role, Staff, Branch, Room\_Category, BookClub, BookGenre, BookBranch,

## 20.7.1 Class Diagram



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## 22.7.2 Data Flow Diagram (DFD)





### 23.7.3 State Diagram

