Software Requirements Specification for Student Life Cycle Management

Version 1.0 approved
Prepared by Vishesh Goyal
Computer Science and Engineering, Section A
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1. Introduction

1.1. Purpose

The Student Life Cycle Management (SLcM) will provide a description for the Student Information System (SIS). This SRS will provide a clear understanding of what is to be expected from the newly constructed SIS. The clear understanding and functionalities provided will allow for the correct software to be developed for the end user and also for future development of the software.

1.2. Document Conventions

SLcM: Student Lifecycle Management
SRS: Software Requirements Specification
SIS: Student Information System

1.3. Intended Audience and Reading Suggestions

The intended audience of this document are:
1. Students
2. Professors
3. Parents
4. Management
This SRS can be used in any case regarding the requirements of the project and the solutions that have been taken. The SRS will provide a clear idea about the system that is building. Brief outline of the project is:
1. Overall Description
2. System Features
3. Functional Requirements
4. Non Functional Requirements (if any)

1.4. Product Scope

1. Record Student Attendance
2. Record Students Marks and Grade Sheet
3. Display Student GPA and CGPA
4. Payment of fees

1.5. References

- SLCM Website*: https://slcm.manipal.edu/*
- IEEE Template for SRS*: https://dspmuranchi.ac.in/pdf/Blog/srs_template-ieee.pdf*

2. Overall Description

2.1. Product Perspective

All of the student's academic data, such as attendance records, grades, fee payments, courses taken, academic accomplishments, course comments, etc., is centrally accessible through the SLCM program.

2.2. Product Functions

The following features are available with SLCM software: -
1. Permit students to see their academic and attendance records
2. Permit instructors to amend students' academic and attendance records

3. Make announcements and notifications
4. Permit students to offer feedback on the course
5. Enrollment in courses and payment of fees

2.3. User Classes and Characteristics

The user classes of the SLCM program are as follows: -
1. Student Students need to have secure read-only access to their academic and attendance records. Students are able to sign up for classes and pay the associated costs. Additionally, students can offer course comments.
2. Faculty For students registered in their courses, faculty can change student attendance and marks (quizzes, assessments, midterm exams, etc.).
3. Admin Department To examine and edit student details such section, courses enrolled, etc., the admin department needs access to the SLCM software.
4. Finance Department: To compute fees and fines, the finance department needs access to student financial information.

2.4. Operating Environment

Hardware Requirements: -
1. Operating System- MacOS, Windows 7 and any other OS with a web browser
2. Computer –mnimum 1GB RAM
Software Requirements:
1. Microsoft .NET Frameworks.
2. Microsoft SQL Server.

2.5. Design and Implementation Constraints

1. Safe access to financial information for students
2. Students are unable to modify their academic and attendance records.
3. Solid database administration
4. Implementation via the web

2.6. User Documentation

The client's user manual will provide explicit instructions on how to interact with the system. It will be written in an easy-to-understand style that hides the system's internal complexity. Along with the system delivery, the client will receive a hard copy of the user handbook.

2.7. Assumptions and Dependencies

The client has agreed to modify the budget because some of the software utilized to construct the system may be expensive. During the course of the next development period, it is anticipated that the client will not change his mind. We also anticipate that Windows 7 and later versions of the program will be used. Should the client utilize an open-source operating system, the SRS documentation must be adjusted appropriately.

3. External Interface Requirements

3.1. User Interfaces

1. Student dashboard
2. Student attendance by semester
3. Student grade sheet and GPA by semester wise
4. Fee payment

3.2. Hardware Interfaces

Described in Section 2.4

3.3. Software Interfaces

Described in Section 2.4

4. System Features

1. Student Profile Show the name, address, phone number, registration and application numbers, course and section, current semester, and anticipated graduation year of the student.
Put information in a database.
2. Student attendance record Show the number of classes taken, attended, and missed for each course semester-by-semester.
Determine the attendance rate for every course.
Notify the staff and students if the attendance rate is below 75%.
3. Internal student grades
Show the course name and grades for each semester's quiz, assignment, and midterm exam for each course.
4. Student grade report
Show the course name, amount of credits, grade received in each course each semester, and semester GPA and CGPA.
Permitted enrollment for reassessment and replacement testing.
5. Cost payment: Show the history of student transactions
Show the current amount owed.
Permit the semester fees to be paid.
Permit payment for reregistered courses, make-up exams, and fines.

5. Other Non-functional Requirements:

5.1 Performance requirements

The system needs to be very engaging and responsive.

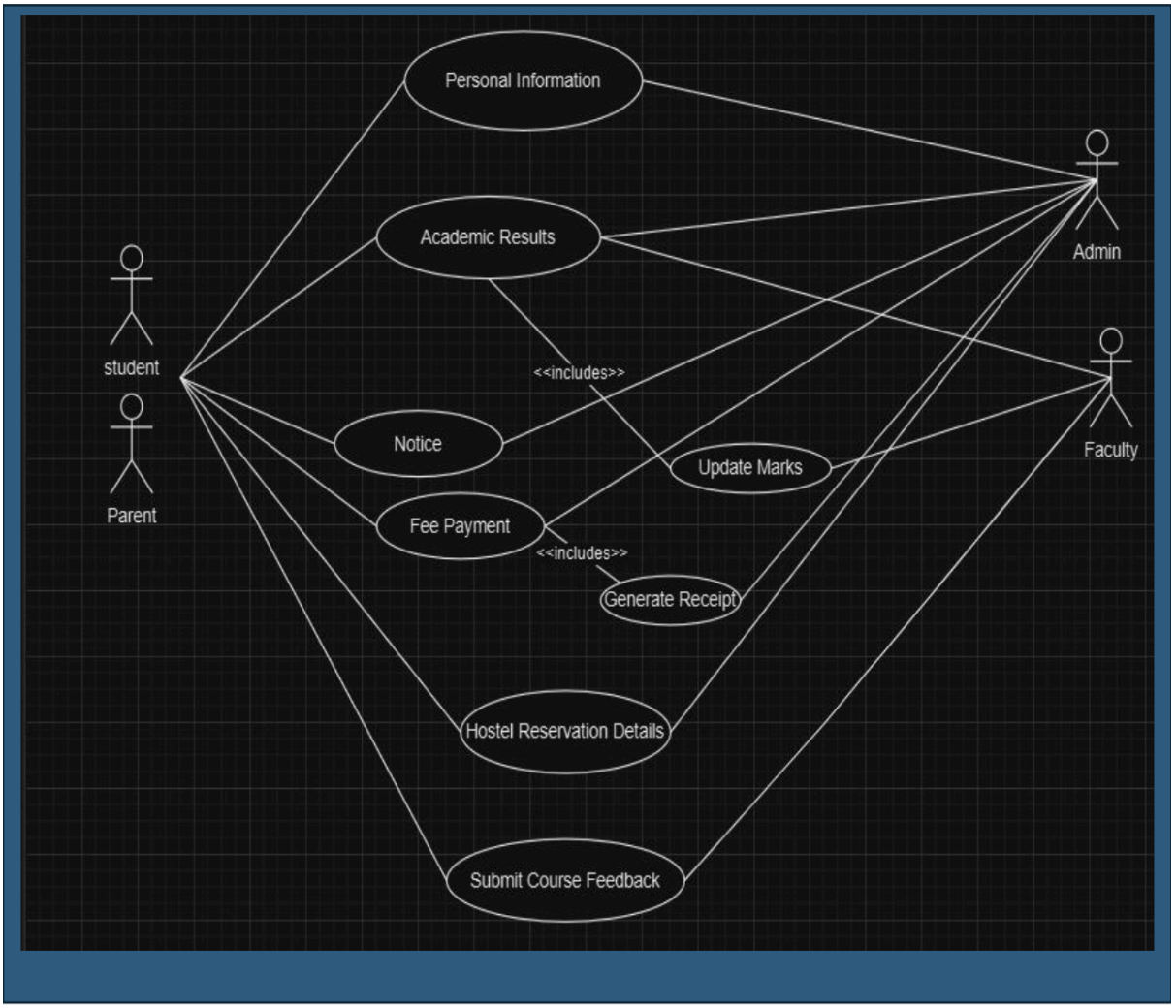
5.2 Safety Requirements

Financial information and contact details of students must be kept private.

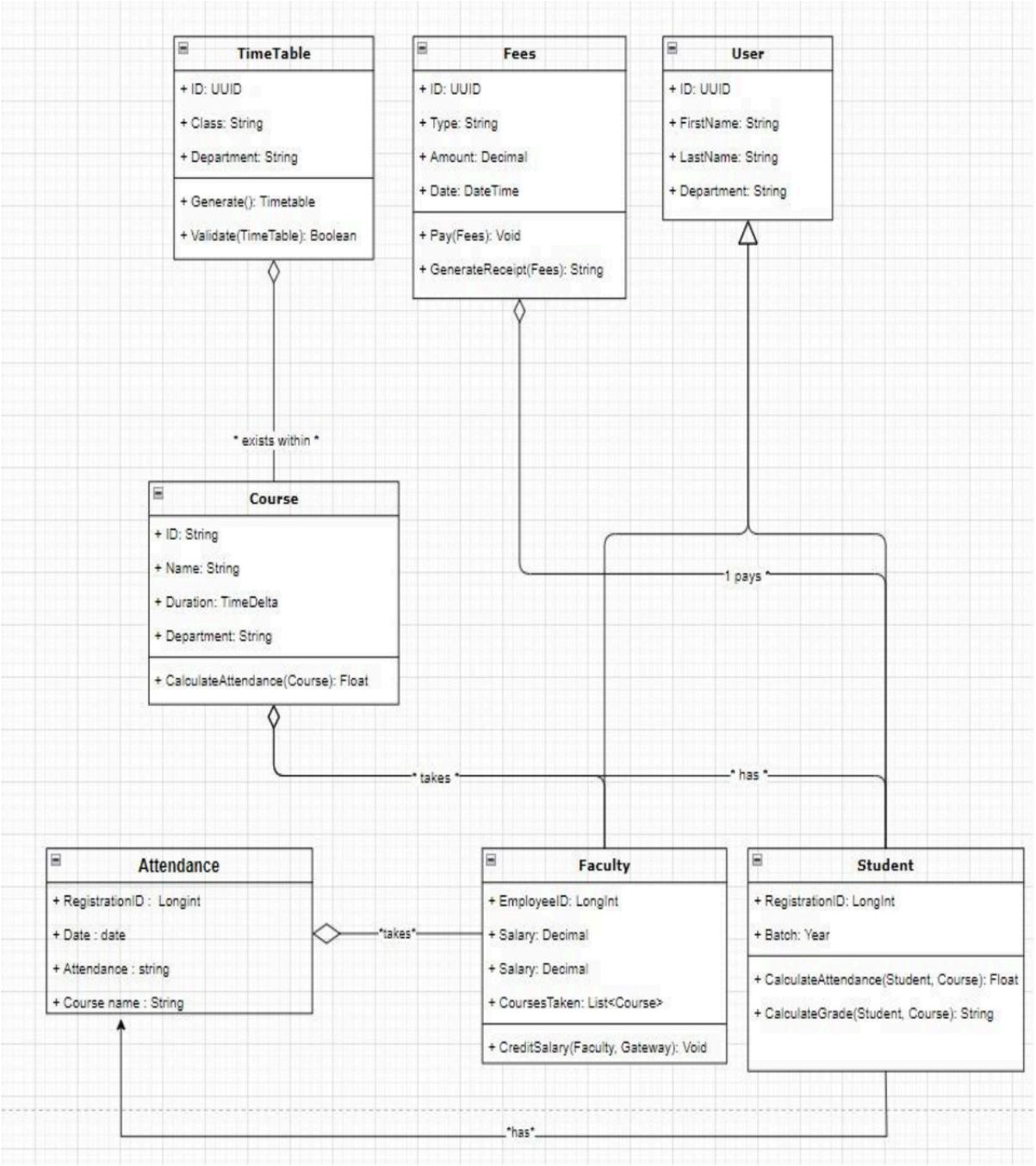
5.3 Security Requirements

Password and username authentication is required for secure access to student d

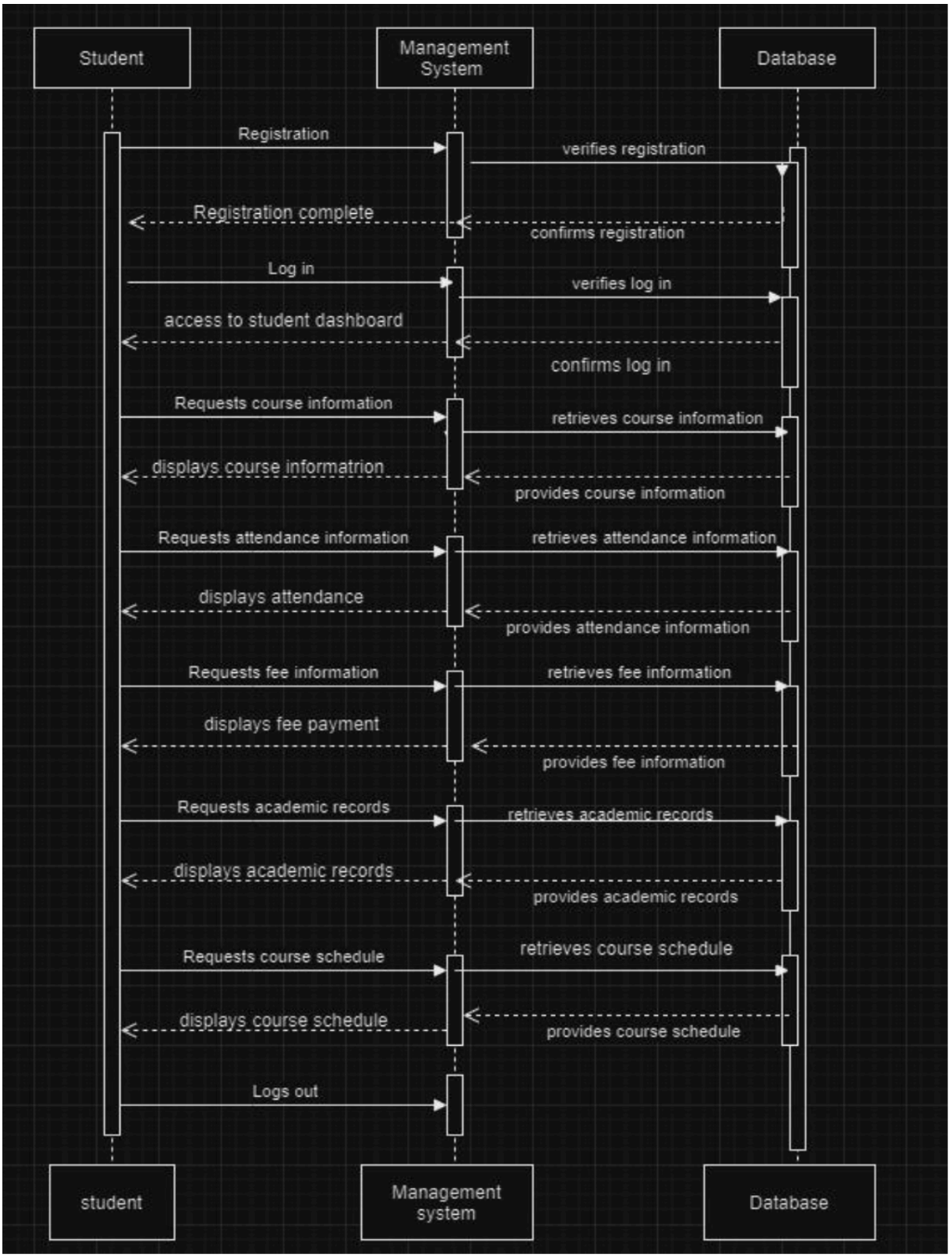
6. Use Case Diagram for SLCM



7. Class Diagram for SLCM



8. Sequence Diagram for SLCM



Software Requirements Specification For Library Management System

Version 1.0 approved
Prepared by Bicky Yadav
Manipal Institute of Technology
20 August, 2024

Table of Contents

1. Introduction

1.1 Purpose

This Software Requirements Specification (SRS) document defines the requirements for a Library Management System (LMS) designed to automate the processes of book issuance, returns, searching, and managing borrowed books. It also aims to provide statistical reports. This document includes detailed descriptions of the system's features, interfaces, and constraints to guide its development. The SRS ensures a comprehensive approach to library management.

1.2 Document Conventions

1. Font: Arial, size 12 for body text, with headings in bold.
2. Priorities: Each requirement is assigned a priority level—High, Medium, or Low to indicate its importance.
3. Highlighting: Requirements are denoted by unique identifiers (e.g., REQ-1).

1.3 Intended Audience and Reading Suggestions

This document is meant for:

1. Developers: To understand system requirements and constraints.
2. Project Managers: For planning and resource management.
3. Testers: To create test cases based on requirements.
4. Library Staff: To understand the system's functionalities.
5. Documentation Writers: For user manuals and guides.

Reading sequence:

1. Overview: Sections 1 and 2 for a general understanding.
2. Detailed Requirements: Section 3 for developers and testers.
3. Nonfunctional Requirements: Section 5 for understanding performance, safety, and security considerations.

1.4 Product Scope

The Library Management System (LMS) is designed to automate essential library operations, including book issuance, returns, and management of borrowed items. It also provides functionality for book queries and generating library usage statistics. This system aligns with the objective of improving operational efficiency and enhancing the user experience for library staff and members.

1.5 References

1. User Interface Style Guide v1.0, 2024
2. System Requirements Specification Document, v1.1, 2024
3. Library Management System Vision Document, v2.0, 2024

2. Overall Description

2.1 Product Perspective

The LMS is a standalone solution aimed at replacing manual and semi-automated library systems. It will integrate with existing library databases to manage records and transactions efficiently. The system will feature a user-friendly interface for both library staff and members, ensuring seamless library operations.

2.2 Product Functions

The major functions of the LMS include:

1. Book Issuance: Issue books to library members.

2. Book Return: Process the return of borrowed books.
3. Query Books: Search and query the availability of books.
4. Manage Borrowed Books: Track books borrowed by members and their due dates.
5. Manage Statistics: Generate reports and statistics on library usage, such as most borrowed books, overdue books, etc.

2.3 User Classes and Characteristics

1. Library Staff: Use the system to manage book issuance, returns, and queries. Requires training on system functionalities.
2. Library Members: Use the system to search for books, request issuance, and return books.

Varying levels of technical expertise.
Administrators: Responsible for maintaining system integrity, managing user roles, and generating reports. Advanced technical expertise.

2.4 Operating Environment

1. Hardware: Server with at least 8GB RAM, 2GHz processor, and 500GB storage for the LMS database.
2. Operating System: Windows Server 2019 or Linux-based server.
3. Database: MySQL 8.0 or PostgreSQL 13.
4. Client Devices: Desktop computers and tablets running Windows 10, macOS, or Linux.

2.5 Design and Implementation Constraints

1. Regulatory Compliance: Must comply with data protection regulations for handling member information.
2. Technology Stack: Use of specific technologies such as React.js for the frontend, Django for the backend, and MySQL for the database.
3. Performance: System must support up to 500 concurrent users.
4. Security: Must implement role-based access control (RBAC) and secure authenticationmechanisms.

2.6 User Documentation

1. User Manuals for library staff and members.
2. Online Help System integrated within the LMS.
3. Tutorials for new users.

2.7 Assumptions and Dependencies

1. Availability of reliable internet connectivity.
2. Regular backups will be taken for database integrity.
3. Assumes library members have a basic understanding of computer operations.

3. External Interface Requirements

3.1 User Interfaces

1. Dashboard: Overview of system status for administrators.
2. Book Search: Interface for members and staff to search for books.
3. Issuance/Return Forms: Forms for issuing and returning books.
4. Reports: Screens for generating and viewing statistics and reports.

3.2 Hardware Interfaces

1. Barcode scanners for scanning book IDs during issuance and return processes.
2. Printers for generating receipts and reports.

3.3 Software Interfaces

1. Database: Connection to MySQL or PostgreSQL database for data storage and retrieval.
2. Library Catalog: Integration with existing library catalog systems for book data synchronization.

3.4 Communications Interfaces

1. Email Notifications: For sending reminders to members about due dates and overdue books.
2. Network: Communication over HTTP/HTTPS protocols for secure data transmission.

4. System Features

4.1 Book Issuance

4.1.1 Description and Priority

Allows library staff to issue books to members. High priority.

4.1.2 Stimulus/Response Sequences

Stimulus: Staff scans member ID and book barcode.
Response: System records the issuance and updates the database.

4.1.3 Functional Requirements

REQ-1: System must validate member ID and book availability.
REQ-2: System must update the book status to "Issued" and assign it to the member's account.
REQ-3: Generate an issuance receipt for the member.

4.2 Book Return

4.2.1 Description and Priority

Manages the return of borrowed books. High priority.

4.2.2 Stimulus/Response Sequences

Stimulus: Staff scans returned book barcode.
Response: System records the return, updates book status, and calculates any late fees.

4.2.3 Functional Requirements

REQ-4: System must validate the book being returned.
REQ-5: Update the book status to "Available" and remove it from the member's account.
REQ-6: Calculate and record any late fees.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The system should process book issuance and return transactions within 2 seconds.
The search functionality should return results within 3 seconds for a query.

5.2 Safety Requirements

The system must provide regular data backups to prevent data loss.
Must have a failover mechanism to handle hardware or software failures.

5.3 Security Requirements

User authentication must be required for all staff and member actions.
Sensitive data, such as member information and transaction records, must be encrypted.

5.4 Software Quality Attributes

Reliability: System uptime of 99.5% or higher.
Usability: The interface should be intuitive and easy to navigate.
Maintainability: Code should be modular and documented to facilitate maintenance and updates.

5.5 Business Rules

Only registered members can borrow books.
A maximum of 5 books can be borrowed by a member at any time.
Books must be returned within 30 days of issuance.

6. Other Requirements

1. Support for internationalization, allowing the system to be used in multiple languages.
2. Legal compliance with copyright laws regarding digital book lending.

Appendix A: Glossary

1. LMS: Library Management System
2. RBAC: Role-Based Access Control

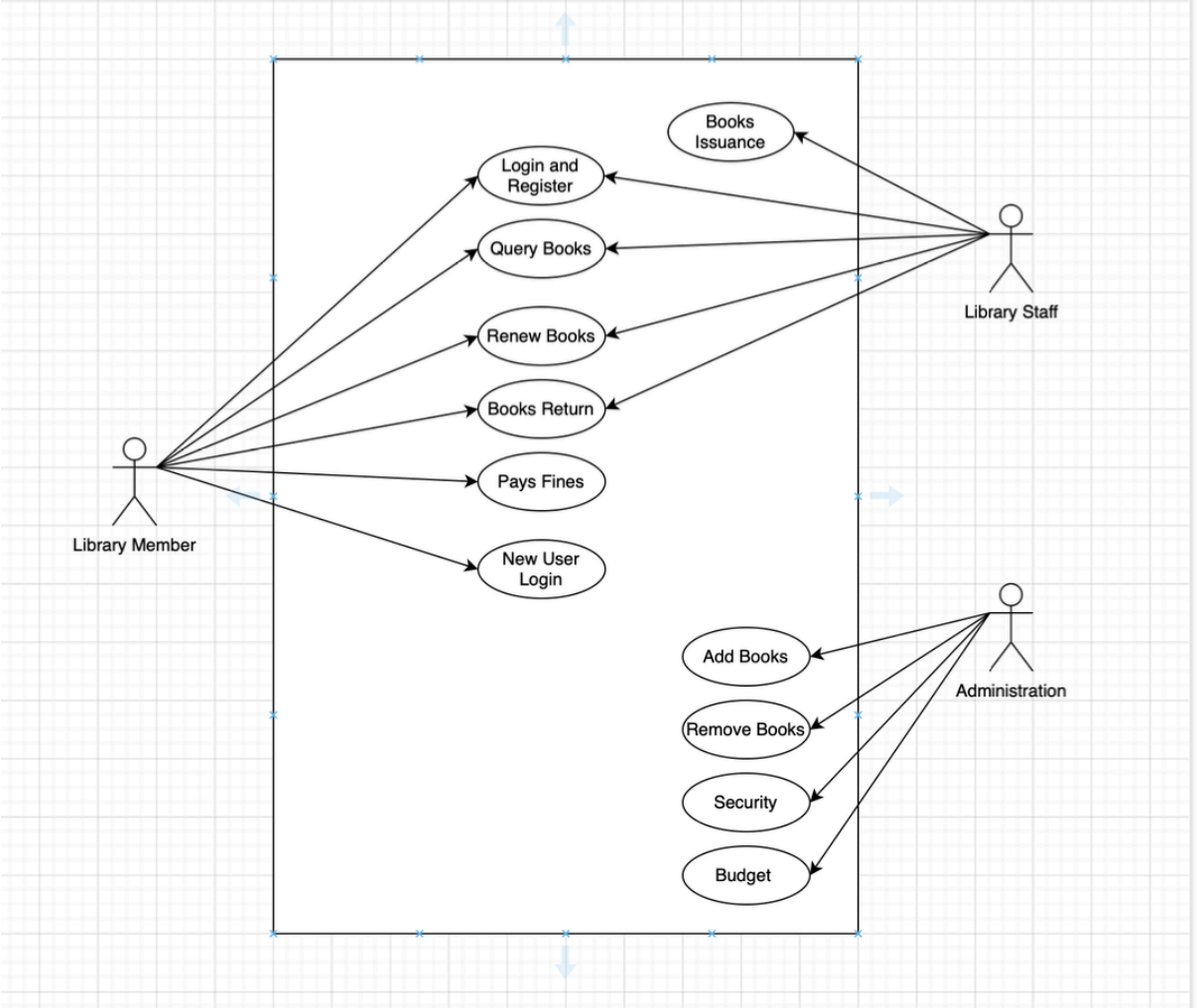
Appendix B: Analysis Models

1. Data Flow Diagram: Describing data movement within the LMS.
2. Entity-Relationship Diagram: Showing the relationship between different entities such as books, members, and transactions.

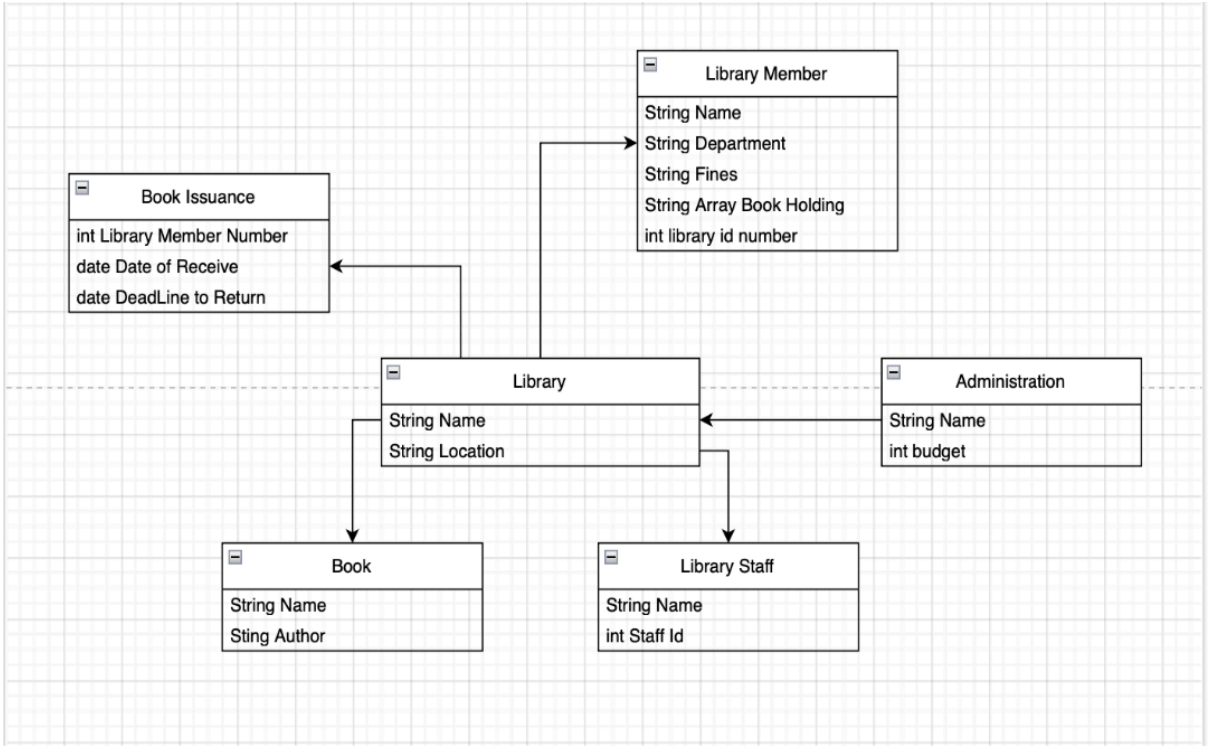
Appendix C: To Be Determined List

1. Integration details with the existing library catalog system (TBD).
2. Final selection of the third-party authentication service (TBD).

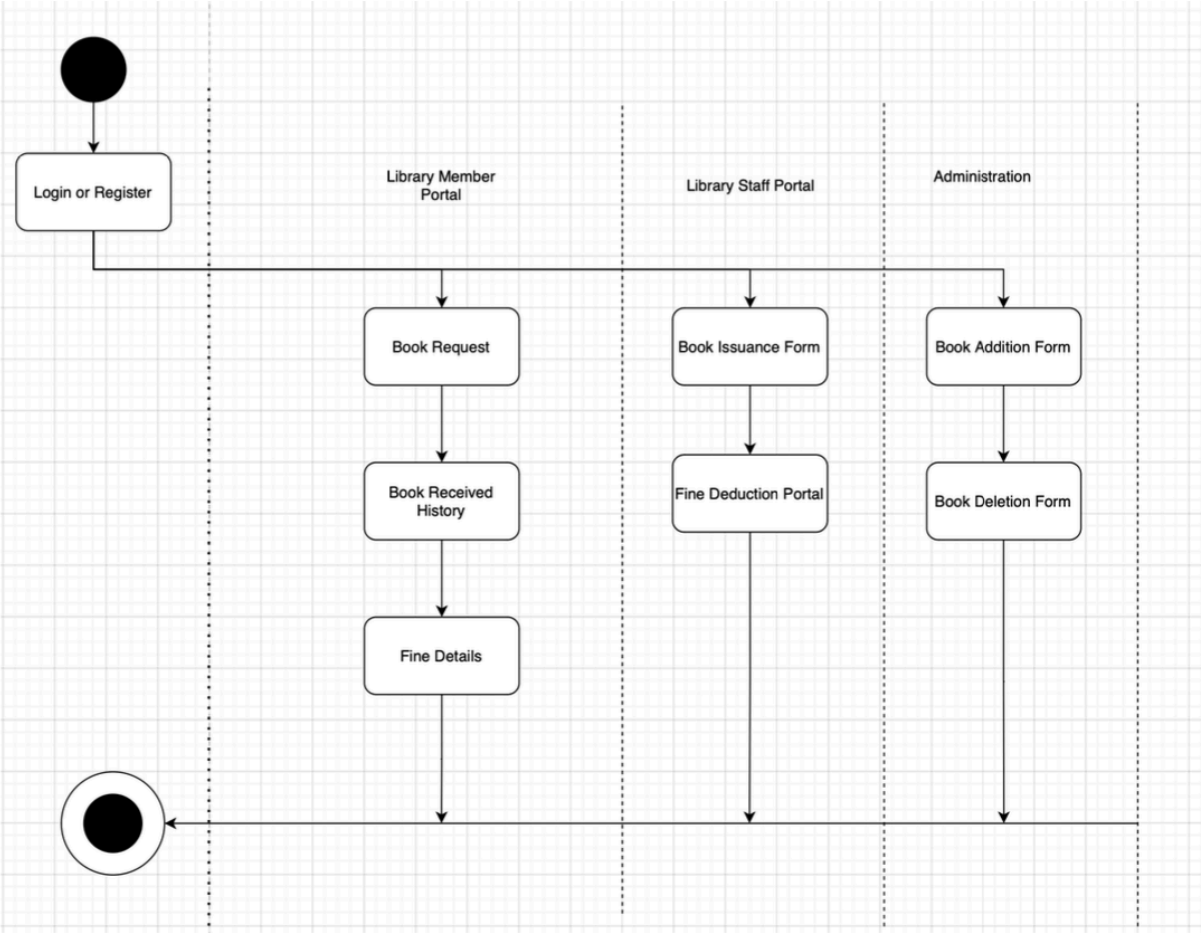
7. Use Case Diagram for Library Management System



8. Class Diagram for Library Management System



9. Activity Diagram for Library Management System



10. Sequence Diagram for Library Management System