Software Requirements Specification

For

LIBRARY MANAGEMENT SYSTEM

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1. Introduction

Currently, the student must visit the library to view the books that are available before they can borrow them, return them, or view the books that are currently available. The books are checked out if they are on the list of books that are available for checkout; otherwise, it is a waste of time for the student to visit the library to check out the books. The librarian then verifies the student ID, authorises the member to check out the book, and updates both the member and the book databases. Depending on whether the member is available, this takes at least one to two hours.

The usage of an online library management system is something we have decided to research. Members of that University, who may be students or professors, would use this system to verify the availability of the books, borrow them, and for the librarian to update the databases. This document's goal is to analyze and go into detail about the fundamental requirements and characteristics of the online library system. It focuses on the resources and services that a library offers. The use-case and supplemental specifications provide particular information about the Online Library System's requirements and if it meets them.

1.1 Purpose

The Library Management System's goals are to give users rapid and simple access to library resources, automate and make simpler the process of managing library resources, and provide a centralized platform for managing library duties.

1.2 Document Conventions

The following conventions will be used throughout this document:

- Headings and subheadings will be numbered
- Bold text will be used to highlight key terms and headings
- Abbreviations and acronyms will be defined in the glossary

1.3 Definitions, Acronyms and Abbreviations

MERN stack: (MongoDB, Express.js, React.js, and Node.js)
NO SQL: Not only SQL
SQL: Structured query language.

1.4 Product Scope

The Library Management System is the system that maintains member data, staff data, the registration procedure for members, and the creation of receipts for fines paid by members.
This technology is designed to benefit library administration by allowing them to save records of member transactions. It relieves them of physical labour, which makes it difficult to locate records of books and member transactions, as well as information about those who have membership in the Library.
We created this system in response to a request from the Library's administration. This system computes all books and issued books transactions automatically. This allows you to view the personal profiles of all current members inside the organization.

2. Overall Description

2.1 Product Perspective

The Online Library System is a software package that libraries can use to increase the productivity of librarians, library personnel, and users. The upcoming Online Library System will tremendously assist the members and Librarian of **RGUKT IIIT SRIKAKULAM**. The system gives members with a book catalogue and information, assisting them in deciding which books to borrow from the library. The Librarian can keep the books catalogue up to date so that the members (students and professors) always have the most up-to-date information.

2.2 Product Functions

- The member should be given the most recent book catalogue information.
- Provisions allowing members to borrow books providing all other rules are followed.
- The user is given the option to review and amend his account details at any moment within the validity period.
- Members are given a list of available books and are permitted to choose whatever books they want to use in the coming days.
- The librarian can find out who has borrowed and returned books.
- The librarian is given interfaces to add/remove books from the book catalogue.
- When members finish the book borrowing or returning process, the due to be paid by the member must be computed, and information about the member and the due amount is communicated to the university billing system.

- The system provides users with the login facility by utilising the University's information security criteria.

2.3 User Classes and Characteristics

The system's users are university members, librarians, and system administrators. Members and the librarian are assumed to have a basic understanding of computers and Internet navigation. The system administrators should have a better understanding of the system's internals and be able to troubleshoot minor issues that may develop due to disc crashes, power outages, and other disasters in order to keep the system running. The suitable user interface, user manual, online assistance, and installation and maintenance guide must be adequate to educate people on how to operate the system without issues..

2.4 Constraints

- All user information must be maintained in a database accessible via the Online Library System, and the university's information security system must be compatible with Internet applications.
- The Online Library System is linked to the university computer and is available 24 hours a day, seven days a week.
- Users can access the Online Library System from any computer with Internet browsing capabilities and an Internet connection. • The billing system is linked to the Online Library System, and the billing system's database must be compatible with the Online Library System's interface.
- To access the Online Library System, users must provide their correct usernames and passwords.

2.5 Operating Environment

To effectively run a Library management system, the following operating environment is recommended:

- Operating System: The Library management system can be installed on any popular operating system such as Windows, Linux, or macOS.
- Processor: The system should have a multi-core processor with a minimum speed of 2.0 GHz to ensure faster scanning and detection of vulnerabilities.
- Memory: The system should have a minimum of 4GB of RAM to run the Library management system effectively.
- Network Connectivity Internet access: The LMS should have internet access to enable remote access and communication between the LMS and other library systems.

- Browser: The LMS should work with the most major online browsers, including Google Chrome, Mozilla Firefox, Microsoft Edge, and Apple Safari.

2.6 Assumptions and Dependencies

- The users have adequate computer knowledge.
- The University computer should have an Internet connection and the ability to function as an Internet server.
- Users must be fluent in English because the user interface will be in English.
- The product has access to the student database at the university.

3. External Interface Requirements

3.1 User Interfaces:

Here is a list of critical factors to consider when building user interfaces for a library management system (LMS):

- **Navigation:** Intuitive and simple-to-use navigation that is logically organized.
- **Search feature:** Powerful search functionality that allows users to quickly and easily find materials.
- **User profiles:** Personal information and borrowing history are stored in user profiles, which are easily updated.
- **Checkout and returns:** Simplified checkout and returns processes that are well-explained, with fees clearly stated.
- **Reservations and hold requests:** Simple techniques for reserving and requesting material holds.
- **Accessibility features:** Keyboard navigation, screen reader compatibility, and high contrast options.
- **Responsive design:** It is one that adapts to different screen sizes and devices.

3.2 Hardware Interfaces:

Minimum hardware specifications for a computer running a library management system (LMS) are:

- Processor: Intel Core i5 or equivalent.
- RAM: 8GB or higher
- Storage: 256GB SSD or higher

- Display: 14-inch screen or larger with a resolution of at least 1366 x 768 pixels
- Input: Keyboard and mouse or touchpad.
- OS: Windows 10 or MacOS.

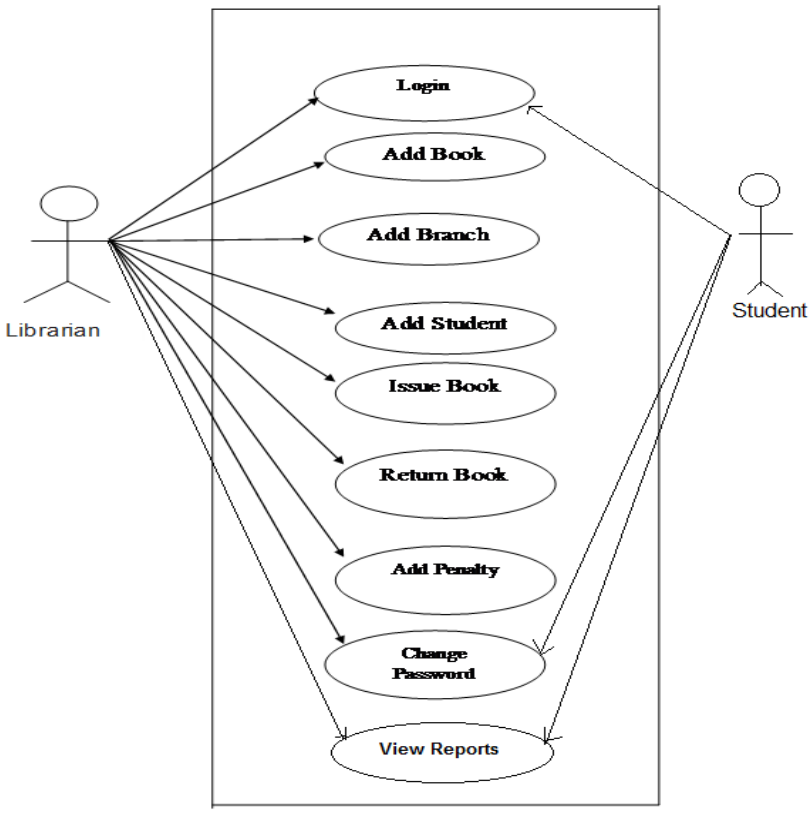
3.3 Software Interfaces:

The Library Management System will require the following software to be installed:

- MongoDB compass
- SQL
- Wordpress

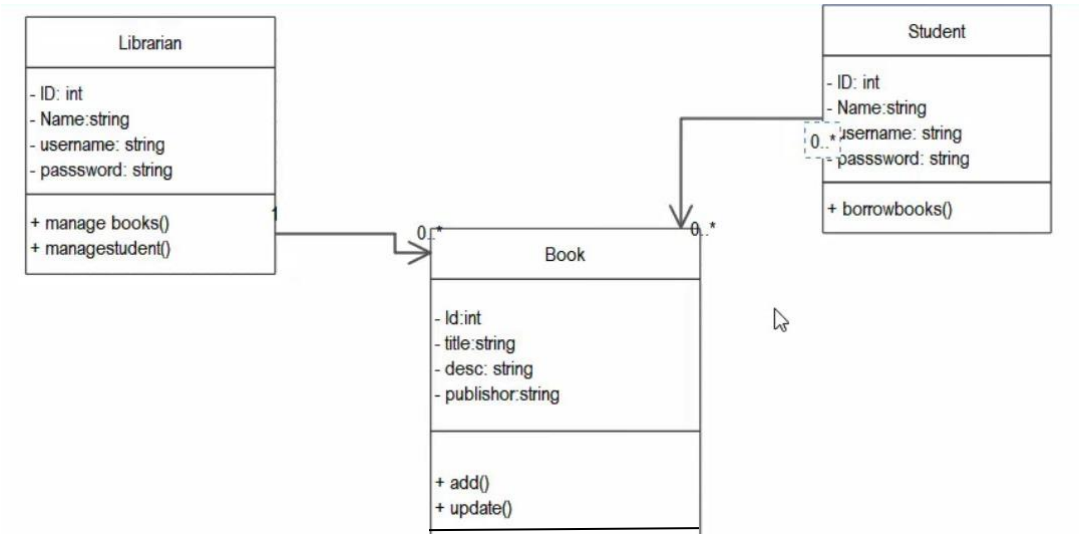
4. UML DIAGRAMS:

Use Case Diagram: The Use Case Diagram shows how the system and its actors interact. The system administrator, library employees, and readers are frequently the performers. Use cases consist of procedures like creating a new user account, borrowing and receiving books, looking for resources, creating reports, and maintaining user accounts.



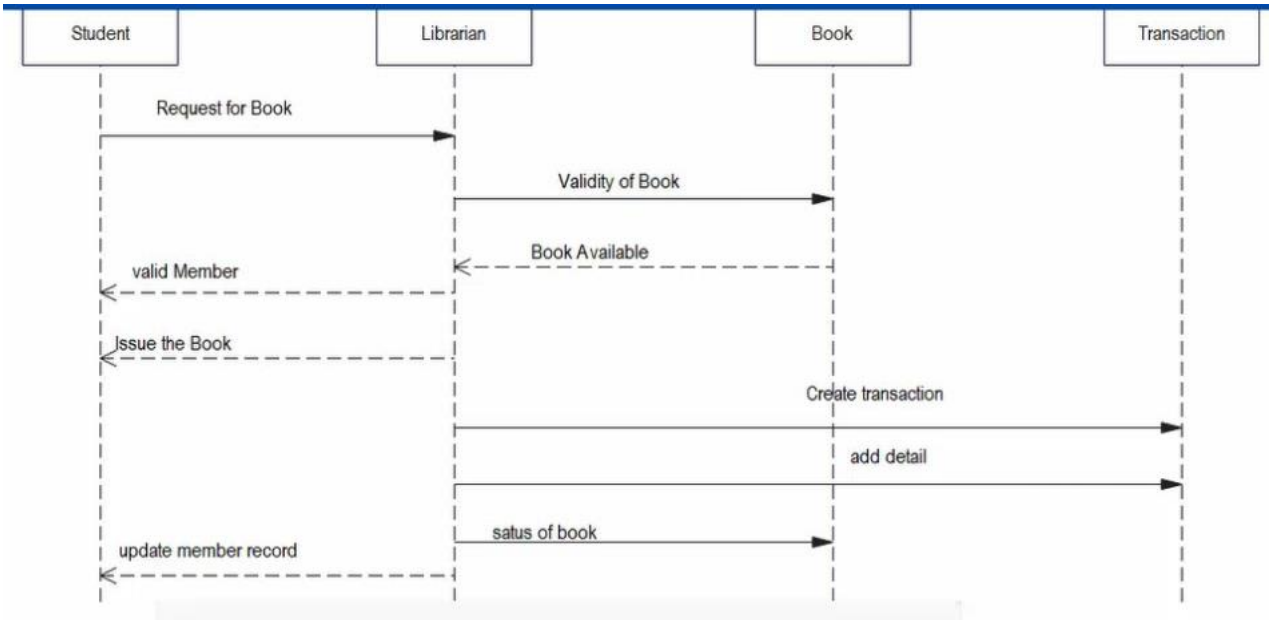
Class Diagram: The Class Diagram represents classes, their attributes, and their relationships to show how the system is arranged. Book, student, Librarian, Administrator are some examples of important classes in a library management system.

Relationships like a Member borrowing a book or a Librarian monitoring loans are defined by associations between classes.



Sequence Diagram:

The flow of interactions between items or components through time is shown in a sequence diagram. It shows how various system parts work together to carry out particular tasks. A sequence diagram, for instance, could show how a Member looks for a book, makes a reservation for it, and then borrows it from the library.



5. Functional Requirements:

5.1 User authentication: Users must be able to register for accounts and log in using secure authentication procedures. Additionally, it needs to offer email confirmation and password reset.

5.2 Search functionality: The ability to search for books using various criteria, such as author, title, and genre, should be available to users.

5.3 Book Catalog: The system needs to include a thorough catalogue of all the books that are available in the library. It needs to include details like the title, author, genre, description, level of availability.

5.4 Borrowing management: The system should enable users to manage their borrowing histories and borrow books. Additionally, it must to keep track of the book's due date and warn the user when it is approaching.

5.5 Fine management: Fines for late returns and missing books should be calculated and handled by the system. It must also inform the user of any fines they are due.

5.6 User Profile: A user's profile should allow them to manage their book reservations, examine their borrowing history, and modify their personal information.

5.7 Admin Dashboard: To manage the library resources, the system has to have an admin dashboard. The admin should have access to the dashboard to manage user accounts, view borrowing history, and add, edit, and delete books.

6. Non-functional Requirements:

6.1 Performance: The LMS should be able to handle large user loads and respond quickly. It should also be able to manage a big volume of data without degrading speed.

6.2 Scalability: Depending on the number of users and the amount of content, the LMS should be able to scale up or down. It should also be compatible with different systems and platforms.

6.3 Security: The LMS should have strong security features that protect user data privacy and confidentiality. It should also include safeguards against unauthorised access.

6.4 Reliability: The LMS should always be available and accessible to users. It should also have a backup and recovery plan in place in the event of a system malfunction or downtime.

6.5 Usability: The LMS interface should be straightforward and user-friendly, making it simple for users to explore and retrieve content.

6.6 Maintainability: The LMS should be simple to update and maintain, with a modular and extensible architecture that enables for simple customization and integration.

7. Other Requirements:

7.1 Mobile compatibility: The LMS should be mobile-friendly and responsive, adjusting to multiple screen sizes and orientations.

7.2 Support and training: The LMS should provide an extensive support and training programme to assist users and administrators in getting the most out of the system.