
Requirements Collection and Analysis Documentation

Project: Library Management System

Document: SRS

Author: Shahibul Hasan

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Library Management System Requirement specification

This document holds the requirement collections and analysis data's collected for the project

Welcome to the Software Requirements Specification (SRS) document for the Library Management System (LMS), published by Shahibul Hasan. This document serves as a comprehensive guide outlining the functional and non-functional requirements of the proposed system. The Library Management System is designed to revolutionize the way libraries operate by providing an efficient and user-friendly platform accessible via web browsers.

The primary objective of the LMS is to automate and streamline various library processes, including cataloging, circulation, and patron management. By leveraging modern web technologies, the system aims to offer librarians and patrons a seamless experience for accessing, managing, and utilizing library resources.

This document outlines the scope of the LMS, including its features, functionalities, and constraints, to provide a clear understanding of the system's purpose and capabilities. Additionally, it defines the roles and responsibilities of stakeholders involved in the development, deployment, and maintenance of the system.

Throughout this document, we will delve into the specific requirements of the LMS, covering aspects such as user interfaces, system interactions, data management, security measures, and performance criteria. By adhering to these requirements, we aim to deliver a robust and reliable solution that meets the needs and expectations of library administrators, staff, and patrons.

Your input and feedback are invaluable in shaping the LMS to align with your vision and requirements, Shahibul Hasan. Please feel free to provide any additional insights, suggestions, or clarifications to ensure that this document accurately reflects the desired functionality and characteristics of the system.

Before proceeding further, do you have any specific preferences or additional details you would like to incorporate into the introduction of the SRS document for the Library Management System?

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Revision History

Name	Date	Reason of change	Version
Shahibul hasan	03-04-2024 to 05-04-2024	Creation of the srs for the LMS	1.0

1. Introduction

1.1 Purpose

A Software Requirements Specification (SRS) is a crucial document in software development, outlining detailed requirements for a project. For a library management system website, the SRS serves as a guide for developers, stakeholders, and other involved parties, ensuring alignment on project goals and functionalities.

The document is intended to serve several groups of audiences:

1. Development Team:

- Provides a blueprint for implementation, including technical specifications and system behaviors.

2. Stakeholders and Clients:

- Establishes a documented agreement on project scope, objectives, and deliverables.

3. Quality Assurance (QA) Team:

- Guides the design of test cases and validation criteria for functionality, performance, and usability.

4. Future Maintenance and Enhancement Teams:

- Facilitates efficient troubleshooting, updates, and feature expansions by documenting system design and dependencies.

5. Regulatory Authorities and Compliance Officers:

- Demonstrates adherence to legal and industry standards through documentation of security protocols and compliance measures.

Overall, the SRS ensures clarity, alignment, and compliance throughout the development and maintenance lifecycle of the library management system website.

1.2 Scope of Product

The goal of this software development project is to create a fully functional Library Management System website. The client intends to establish an online platform accessible via web browsers, catering to various users and roles. The Library Management System website will be entirely web-based, with no reliance on LAN infrastructure. Key features of the website include:

- Accessibility through web browsers on any internet-enabled device.
- User registration and authentication system, allowing different users to have distinct access levels.
- User-friendly interfaces for managing library resources, including books and user accounts.
- Administrative functionalities for staff members to oversee user accounts and the book inventory database.
- Implementation of robust backend systems to ensure smooth data management and system operation.
- Focus on both frontend and backend development to deliver a seamless user experience and efficient system functionality.
- Library staff will be able to manage library user accounts including remove, change, and add.
- Library staff will be able to manage the book inventory database including remove, change, and add.
- The application will record all books that are checked out, checked in, and recalled.
- The application will generate reports for administrative purposes.
- The application will provide search function on books based on subject, title, or author.

This web-based approach enhances accessibility, scalability, and flexibility, enabling users to interact with the Library Management System from anywhere with internet connectivity. The website will incorporate modern web development practices to provide a responsive and intuitive interface while also prioritizing backend performance and security.

1.3 Overview

A brief description of the content of each chapter is given below:

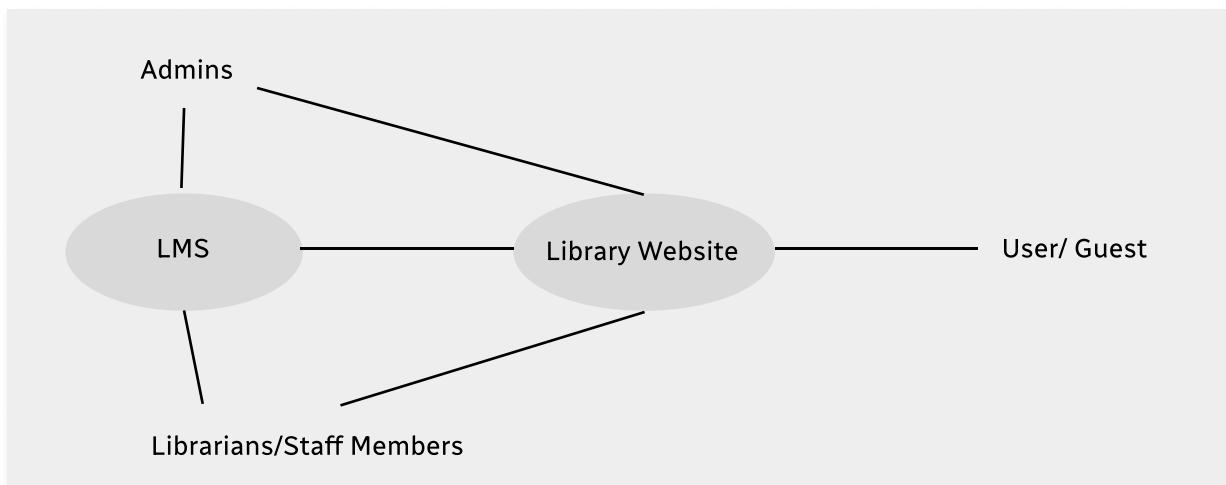
- 1.0 Introduction:
Provides an overview of the project. Summarizes the major capabilities of the product
- 2.0 General Description:
Presents the environment in which the application is expected to operate, provides an overview of the system requirements, describes assumptions about possible users of the application, possible constraints on the project, and the underlying assumptions that on which the requirements analysis is based.
- 3.0 Specific Requirements:
The specification of requirements. Contains a complete description of the application's requirements, both functional and non-functional.

References:

2. General Description

2.1 Product Prespective

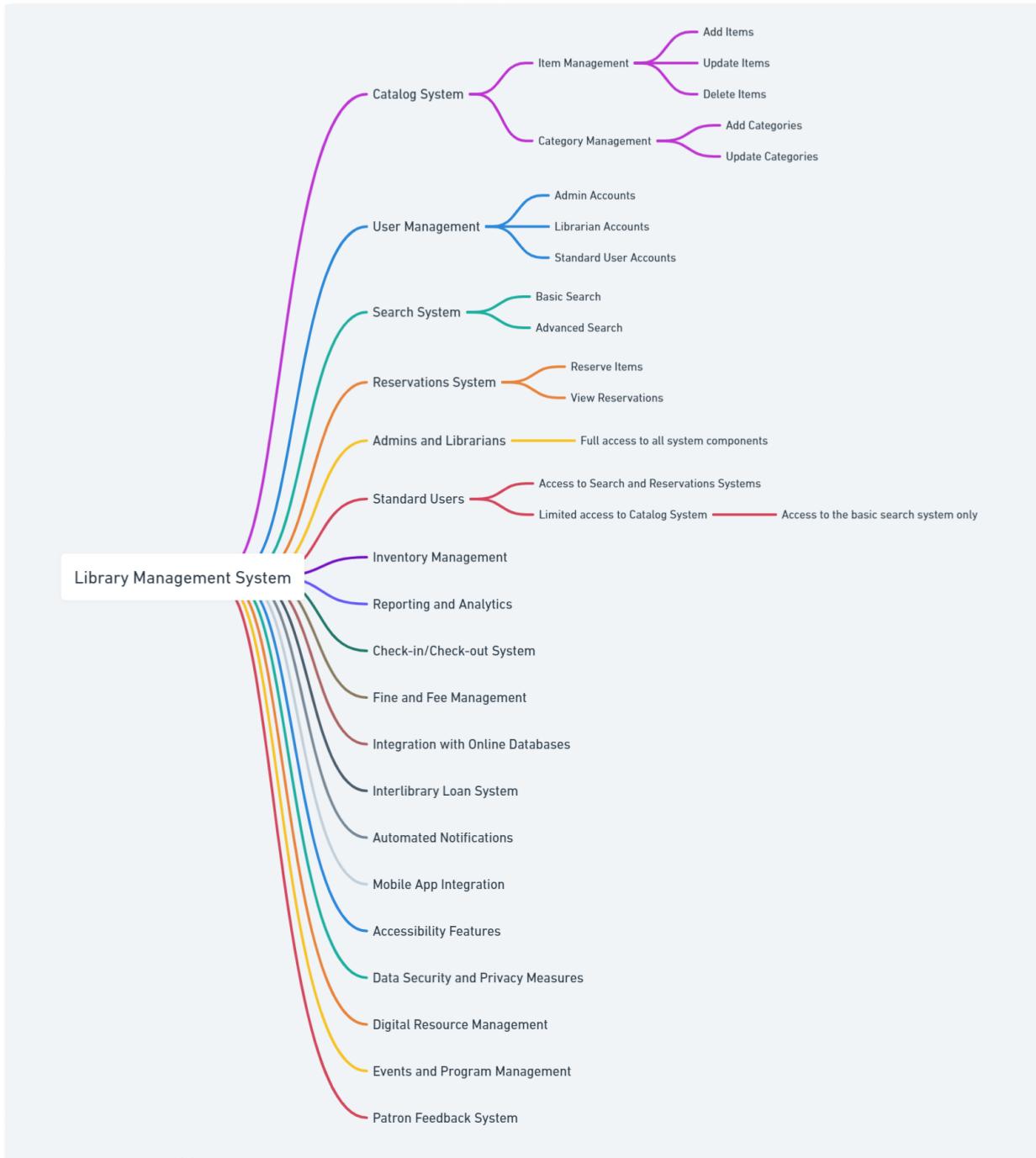
The Library Management System website is positioned as a comprehensive solution designed to revolutionize the management of library resources and streamline administrative tasks. The system is self-contained. However, the stakeholders can control, pass data and edit data if required. The following is a typical System Diagram:



2.2 Product functions

The website allows users to register securely, manage library resources efficiently, administer user accounts effectively, and generate detailed reports and analytics for informed decision-making. Functional requirements are clearly described in the following concept map:

SRS for Library Management System



2.3 User Characteristics

The types of users of the library management system are:

1. Regular Users/Students
2. Librarians/Staff Members
3. Administrators
4. Guest Users

Types of Users	User Characteristic	User Technical Expertise	Users Needs
Regular users/ Students	<ul style="list-style-type: none"> • Younger generation tends to accept and learn new thing (i.e. computer system) easier than older generation • Older generation may like the new system be similar to the old one in terms of user interfaces and functionality. • Will not have any formal training to use the system. • (Diverse user characteristic) 	<ul style="list-style-type: none"> • Older generations doesn't care about Functionalities and they wants the service faster • Younger generation cares about several stuffs and good services more. they explores more and has major information retrieval skills 	<ul style="list-style-type: none"> • Intuitive user interface design • Clear and concise search functionalities • Easily accessible help resources • Feedback mechanisms for users to suggest improvements or report issues. • Provide system help. • Provide appropriate error messages for invalid user inputs.
Guest Users	<ul style="list-style-type: none"> • Same as Regular users but they will be limited in ability since they aren't verified 	<ul style="list-style-type: none"> • Same as Regular users 	<ul style="list-style-type: none"> • Same as Regular users
Librarians/Staff Member	<ul style="list-style-type: none"> • Manages the website and the system to run by manual needs such as adding, • Good understanding of library operations 	<ul style="list-style-type: none"> • Average or better in technical proficiency 	<ul style="list-style-type: none"> • User interface with less input steps. • Easy to learn.
Library Manager/ Administrator	<ul style="list-style-type: none"> • Good understanding to library operation • Responsible for library operation as a whole. • Responsible for library staff managing • And also has control over everything in, on and above 	<ul style="list-style-type: none"> • Has maximum or average technical proficiency 	<ul style="list-style-type: none"> • User interface with less input steps. • Easy to learn. • Easy way to control everything and visually see and manage the LMS and the Library

2.4 General Constraints

General constraints for your Library Management System (LMS) website's Software Requirements Specification (SRS) include ensuring compatibility with modern web browsers and devices to accommodate a wide range of users. Additionally, considering potential limitations in terms of budget, time, and available resources is essential for realistic planning. Furthermore, adherence to industry standards and best practices, such as those related to data security, user privacy, and accessibility, should be integral to the development process. Lastly, the SRS should be structured and documented in a clear and organized manner to facilitate understanding and collaboration among stakeholders throughout the project lifecycle.

2.5 Assumptions and Dependencies

Assumptions:

1. User Familiarity: Users are assumed to have basic familiarity with web browsing and online forms.
2. Stable Internet Connection: It's assumed that users will have access to a stable internet connection for uninterrupted usage of the system.
3. Hardware Compatibility: The system assumes compatibility with standard web browsers and devices, including desktops, laptops, tablets, and smartphones.
4. Data Integrity: Assumption is made that data entered into the system by users will be accurate and valid.
5. Regulatory Compliance: It's assumed that the system will comply with relevant data protection and privacy regulations.

Dependencies:

1. Database Management System (DBMS): The system depends on a reliable DBMS for storing and managing data related to books, members, transactions, etc.
2. Third-Party APIs: Dependencies on external APIs may exist for services such as payment processing, email notifications, or book search functionalities.
3. Hosting Infrastructure: The system relies on a stable hosting infrastructure to ensure continuous availability and performance.
4. Development Frameworks and Libraries: Dependencies may exist on specific development frameworks, libraries, or programming languages used for building the website.
5. Internet Service Providers (ISPs): The system's availability is dependent on the reliability of ISPs to provide internet connectivity to users.

3. Specific Requirements:

This section contains the requirement of different users the LMS and Catalogs and Search & discovers and Reservation & Hold, Acquisition and Ordering etc.

3.1 Functional Requirements

3.1.1 User Interface

The user interface requirements are concerned with the user interface and how information is presented to the user.

Certainly, here are some professional page/system names for a library management system alongside the library website:

- | | |
|-------------------------|--------------------------------|
| 1. Home | 14. Reservation & Hold |
| 2. Catalog | 15. Borrowing Guidelines |
| 3. Search & discoveries | 16. Digital Resources |
| 4. My Account | 17. Interlibrary Loan |
| 5. Login/Register | 18. Reference Desk |
| 6. About Us | 19. Special Collections |
| 7. Contact Us | 20. Accessibility Statement |
| 8. Services | 21. Feedback |
| 9. Events | 22. Privacy Policy |
| 10. Blog/News | 23. Terms of Service |
| 11. FAQ | 24. Staff Directory |
| 12. Policies | 25. Mobile App (if applicable) |
| 13. Help/Support | |

SRS for Library Management System

We will now see which pages are important and will we will prioritize them

Name of directories	Usage case	Exceptions or addition	Priority
Home	<ul style="list-style-type: none"> The main / index page of the library which exists for all users to enter the library 		★ ★ ★ ★ ★
Catalog	<ul style="list-style-type: none"> A catalog system is must to keep things arranged and easier 		★ ★ ★ ★ ★
Search & Discoveries	<ul style="list-style-type: none"> Search & discover system is also another must required since a library is a big collection. 		★ ★ ★ ★ ★
User account	<ul style="list-style-type: none"> Must for user and user and the LMS 		★ ★ ★ ★ ★
Login / Register	<ul style="list-style-type: none"> Since User account is a must this is also as important as User Acc 		★ ★ ★ ★ ★
About us & Contact us & Services & FAQ & Help/ Support & Accessibility Statement	<ul style="list-style-type: none"> This this system holds stakeholders and is user prioritized system, This must be the way to connect 		★ ★ ★ ★ ★
Policies & Privacy Policy & Terms of service	<ul style="list-style-type: none"> Since this is an online system and under user rights and rules and laws, there must be limitations and terms and policies 		★ ★ ★ ★ ★
Blog/News & Events	<ul style="list-style-type: none"> This is a good way to keep connected with the regular users but its not a must to have such a system in early development process 		★ ★ ★ ★ ○ ○
Reservation & Hold	<ul style="list-style-type: none"> Reservation and hold is a client must system which is required in this system 	<ul style="list-style-type: none"> Renew system can also be a part of it 	★ ★ ★ ★ ★
Borrowing & Borrowing Guide	<ul style="list-style-type: none"> Borrowing books are a common concept which is also why a library system should be great 	<ul style="list-style-type: none"> Reservation system can be a replacement of it, this is not as important as reservation, but is great 	★ ★ ★ ★ ○

Name of directories	Usage case	Exceptions or addition	Priority
Digital resources	<ul style="list-style-type: none"> This is not a must but a good thing to do so 		
Interlibrary Loan	<ul style="list-style-type: none"> Controlled by Upper level users, this is pretty much of an important for tracking library books loans 		
Reference Desk	<ul style="list-style-type: none"> Reference is a late development of mid development topic 		
Special Collection	<ul style="list-style-type: none"> This can be a section for users to have access of more possibilities 		
Feedback	<ul style="list-style-type: none"> Feedback is a great way to put a connection between books and users to pull them off 	<ul style="list-style-type: none"> The good thing is it doesn't have to be a page, it can stick to each book section 	
Staff directory	<ul style="list-style-type: none"> This is page to control staff and user priority 		
Mobile Application / Download App	<ul style="list-style-type: none"> This is gonna be a late development process if later on any app really is made 		

3.1.1.1 Library user account manage system

We have 4 user catagories and each of them has different responsibilities and abilities and dependencies over each users. all of them are connected to each other in a logical way. and the LMS user management (User Account management system) depends on this connection as well as its individual reasons. Now we will focus on the Library User Account Manage system.

ADMINISTRATORS :

Admins are the most prioritized user/users in this system and they have the highest abilities and has control over any system/page controls. they are usually responsible to control and manage the system single handed.

LIBRARIANS/STUFF MEMBERS :

This kind of users are the second or mid level users that controls the library and manages the books and they can edit/delete/create/add books and more. They can slightly interact with users and suggest them or create blogs/discoveries/special collections etc.

NORMAL USERS / STUDENTS:

These are the most basic users that usually comes in the library to get the service. can only read,

have access to their personal wishlist and bookmarks, and functionalites that the system provides and librarian prepares for them.

GUEST USERS:

This kind of users are as the same level as the Normal/Regular users, the main difference of them are that they aren't verified users. and so these kind of users are limited with the services. they doesn't have a personal database or access and wishlist or bookmark system. and mostly they can't borrow a book nor ask for a reservation. What a guest user can do is only explore and read books

ACCOUNT CREATION AND MANAGEMENT:

The process to creating an account should be simple and mustn't take much time to create one all the other information must be available to edit and basic informations must be easy to update and delete. but account creation is the most important part to give access to a guest/unverified user to have the services and join the library system. So judging by, the process of creating account should be following:

Navigate to the Library Website > Locate Registration Option > Click on "Register" or "Create Account" > Fill out Registration Form > Choose Username and Password > Agree to Terms and Conditions > Submit Registration > Receive Confirmation > Log In

3.1.1.2 Book reservation and hold system

Search for Item > Select Desired Item > Check Availability > Choose Reservation or Hold Option > Provide User Details (First and Last Name, Library Card Number, Expiry Date, Penalty Status, Number of Unreturned Books) > Confirm Reservation/Hold > Receive Confirmation > Manage Reservations/Holds if Necessary

3.1.1.3 Book borrow and recall system

When check out the books, the system shall show all the book borrowing information about a particular user including:

Enter User Information > Find Available Resources > Select Desired Resource > Check Availability > Choose Date and Time > Confirm Booking > Receive Confirmation > Manage Bookings if Necessary > Provide User Details (First and Last Name, Library Card Number, Expiry Date, Penalty Status, Number of Unreturned Books)

RECALL:

When recalling the book, the system shall display a list of all the copies of the book which is borrowed out ordered by book lend out time.

When the recalled book is arrived, the system shall display the last and first name, the recall date and the arriving date of the book. If only one copy of book is arrived and more than one user are waiting, users shall be displayed ordered by recalling time. When check in recall book is finished, a "check in recall" stamp shall be seen.

3.1.1.4 Search and discovery

This is an important part of the face of the library for all users especially the normal users. to find a book they will simply follow some simple steps.

Navigate to the Library Catalog > Enter Book Title, Author, or Keywords in Search Bar > Review Search Results > Refine Search if Necessary > Click on Desired Book Title > View Book Details (e.g.,

Author, Publisher, Publication Year, Availability) > Check Location and Availability > Note Call Number or Location > Retrieve Book from Shelf if Available > Check Out Book if Desired

Search should be a different page since Discovery is a thing that we want to suggest to our users

The concept of discovery is that whenever we click search or anyhow we switch to “Search” page it will automatically show some of good books that user may will like. which makes a positive vibe and helps user to have a good suggestion.

3.1.1.4 Acquisition and Ordering

Ordering process should be as simple as it is supposed to be. we can get a brief capture of what it should be like:

Identify Needs > Set Budget > Research Suppliers > Request Quotations > Evaluate Quotations > Select Suppliers > Place Orders > Monitor Orders > Receive Materials > Process Invoices > Catalog and Process Materials > Update Inventory > Evaluate Acquisition Process > Adjust Policies and Procedures

3.1.2 High end users

3.1.2.1 Book Upload System

This is the top role of a staff / librarian, The library gets updated by the librarian as whenever they want. it can also be done by the admin.

The process are similar or as is to the following:

Log In > Navigate to Upload Section > Select Files > Enter Metadata > Add Cover Image > Review Information > Submit Upload > Monitor Progress > Confirmation > Test Access

3.1.2.2 Catalog Management System

Catalogs are important in this library and as well as managing books. this slightly increases the management and gives a boost to the staff/librarians . this is how it is supposed to be done:

Access Catalog Management System > Add New Items > Edit Existing Entries > Delete Outdated Items > Categorize Items > Update Availability Status > Manage Copies > Handle Special Collections > Conduct Regular Maintenance > Backup Data

3.1.2.3 Book recall system

For high end users recalling books should be easier since they have inner access of the system. for admins and staffs/librarians that's how it should be done:

The system shall allow the user to specify a recalled book by book ISBN >
The system shall allow the user to choose one copy of book to recall from a list of copies which are borrowed out. >
The system shall allow the user to record the record notification send out date, the book arrive date, the pick-up notification send out date.

3.1.2.3 Update Book Database

- The system shall allow the user to add or change the record information including:
- the category
- the title
- the ISBN
- the publisher

- the brief description of the book
- the location in library
- the purchase date
- the price

3.1.3 Report Generation

the report generation requirements are concerned with the report generation capabilities of the Library system.

- The system shall have a report feature that will allow the user to generate a report showing the information of all the sign out book in a time period which is the search criteria input by user. The information includes the number of books, the time period and the information is grouped by book categories
- The system shall have a report feature that will allow the user to generate a report showing the information about all the users who have overdue books and penalty.
- The system shall have a report feature that will allow the user to generate a report showing the information of a particular patron.
- The system shall be generate those reports to the display, a file or a printer which is linked to the system.

3.2 Non functional & performance requirements

The check in and check out system shall respond to the user no more than 5 seconds. The search function shall respond to the user no more than 9 seconds.

More non functional requirements are here

3.3 Design Constraints

Hardware Constraints

- Client Devices: The LMS website should be compatible with a wide range of client devices, including desktop computers, laptops, tablets, and smartphones, with varying screen sizes and resolutions.
- Server Requirements: The web server hosting the LMS website should have sufficient processing power, memory, and storage capacity to handle concurrent user requests and serve web pages efficiently.

Software Constraints

- Cross-Browser Compatibility: The LMS website should be compatible with major web browsers, including Google Chrome, Mozilla Firefox, Microsoft Edge, Safari, and Opera, ensuring consistent user experience across different browsers.
- Should be developed in Laravel, PHP and JS and MySQL as the Database.

Performance Constraints

- Page Load Time: The website should aim to provide fast page load times, with web pages loading within a few seconds to enhance user experience and engagement.
- Optimization for Mobile Devices: The website should be optimized for mobile devices to ensure responsive design and smooth navigation on smartphones and tablets.

Security Constraints

- SSL Encryption: The website should implement SSL (Secure Sockets Layer) encryption to encrypt data transmitted between the client and server, ensuring confidentiality and integrity of user data.
- User Authentication: The website should implement secure user authentication mechanisms (e.g., username/password, OAuth) to authenticate users and protect against unauthorized access.

Legal and Compliance Constraints

- Data Privacy Regulations: The website should comply with relevant data privacy regulations (e.g., GDPR, CCPA) by implementing privacy policies, obtaining user consent for data processing activities, and providing options for users to manage their privacy settings.
- Copyright Compliance: The website should adhere to copyright laws and licensing agreements when displaying digital content (e.g., books, articles), ensuring proper attribution and permissions for copyrighted materials.

3.4 Security Requirements

- Implement User Authentication: Require users to authenticate using strong credentials (e.g., username/password) before accessing any features or resources.
- Enforce Role-Based Access Control (RBAC): Assign specific roles and privileges to users based on their responsibilities and permissions, limiting access to sensitive functionalities.
- Utilize SSL/TLS Encryption: Secure the transmission of sensitive data (e.g., login credentials, personal information) between the client and server using SSL/TLS encryption to prevent eavesdropping and interception.
- Implement Secure Session Management: Employ secure session management techniques to protect against session hijacking and unauthorized access to user accounts, including session timeouts and CSRF protection.
- Enforce Data Protection Measures: Ensure the confidentiality, integrity, and availability of user data by encrypting sensitive data at rest and in transit, implementing access controls, and performing regular data backups.
- These security requirements are essential for safeguarding the Library Management System website against various threats and vulnerabilities.

3.4 Reliability

- The system shall be recovered within 10 minutes if it is down.
- The system shall be recovered without intervention at user terminal if it is down.
- The system shall show appropriate messages at terminal when system is down.
- The system shall have 99% reliability during library operating hours.
- Scheduled down time after library operating hours shall not be more than 1 hour per day.
- The system shall generate error messages when the user attempts to enter invalid data.

Acronyms and abbreviations

LMS : Library Management System

SRS : System Requirement Specification