Software Requirements Specification
for
Library Management System
LibMS

Prepared by:

Bhavya Kakwani 101903365

Ananya Agarwal 102083036

Anmol Arora 101903358

Kunal Kashyap 101903357

Organization:

Team 3

BE 3rd Year (COE-14)

LibMS

Table of Contents

1. Introduction

1.1 Purpose

The purpose of this SRS document is to provide a detailed overview of our software product Library Management System, its parameters and goals. This document describes that the project's targeted audience will be students, faculty and all the other people who are interested in reading books and how these stakeholders see the product and its functionality. It also describes our software product's user interface, hardware and software requirements. The aim of this document is to gather and analyze and give an in-depth insight of the Library Management System by defining the problem statement in detail. Nevertheless, it also concentrates on the capabilities required by stakeholders and their needs while defining high-level product features.

1.2 Document Conventions

This document follows MLA Format. Bold-faced text has been used to emphasize section and subsection headings. Highlighting is to point out words in the glossary and italicized text is used to label and recognize diagrams.

1.3 Intended Audience and Reading Suggestions

This will provide a general description, including characteristics of the users of this product, the data requirements and the functional requirements of the product for the development team, the project managers, marketing staff, testers, documentation writers. Our stakeholders and distributors who market the finished product, may review the document to learn about the project and to understand the requirements. It will also serve as a reference for college students. The SRS has been organized approximately in order of increasing specificity. General description of the project is discussed in section 2 of the document. Section 2 describes the constraints and assumptions made while designing the product. Section 3 contains all the specific requirements of the product and use case scenarios in the form of a model. The intended audience will be the students and faculty of any university and which will be able to access the product in the form of a dashboard via their internet browsers.

1.4 Project Scope

The goal of this product is to design a website named "LibMS" for Library Management. It is mainly to provide automation to the libraries. Due to the increasing use of online services during pandemic (COVID-19), there has been an increase in the demand for e-books which is exactly

what our website is designed to deliver. The application is wide and can be used by any education institute and also can be used in offices with the necessary modifications done. Its main stakeholders are the librarian, who can read or write the information about any user and can update, delete user's fine, update book details and reviews the fine of the individual users.

1.5   References

- IEEE. IEEE Std. 830-1998 IEEE Recommended Practice for Software:
https://standards.ieee.org/standard/830-1998.html

2. Overall Description

2.1 Product Perspective

As we are aware of the fact that our life is becoming very fast day by day. Here the computer is the most important thing that helps us to make human life fast. One computer can do the work of hundreds or thousands of people alone. At the same time a computer does the computational work efficiently and correctly. The Library Management system can be brought under a computerized system. Library Management System is a menu driven software package. It is a computerized system of the manual job to perform the transactions of a Library.
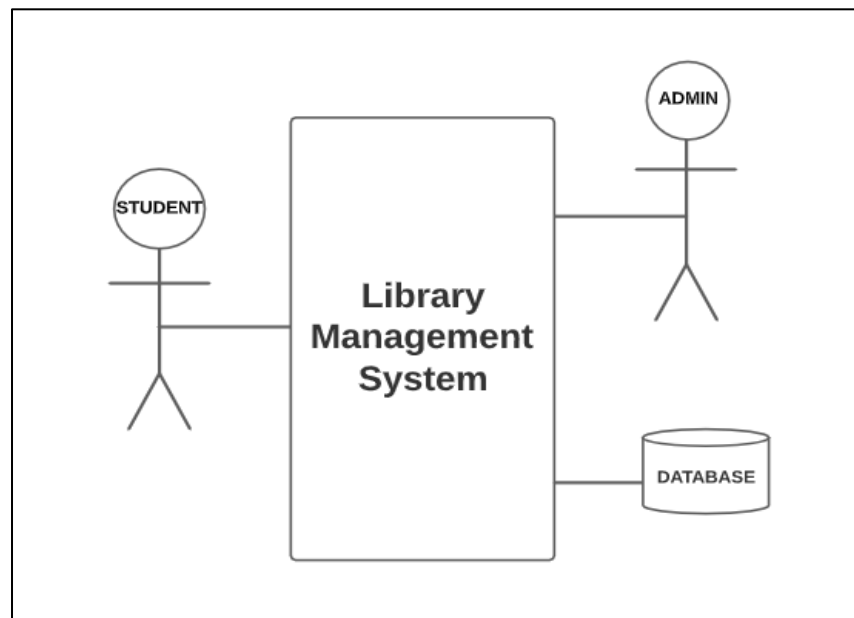

Fig 1. Product perspective of LibMS

Modules:

1. Login/Sign up
2. Add/Update/Remove books
3. Search option
4. View details/issues
5. Reserve a book
6. Fine payment

Upon clicking the **Web App** link, the **Login/sign up** window will appear and there will be options for logging in and signing up. Login option is used by the existing users and admins. Under the

login option there is an option for admin login and user login. Sign up option is used by new users and new admins and Under Sign up option there is an option for admin sign up and user sign up. Django python framework will check the following login/signup credentials from the backend and approve the status. There is an option for 'Forgot Password' if required.

ADMIN section: An admin can perform various tasks:

- Add or Update books: Admin can **add** new books and **update** the number of existing books.
- Delete a user: Admin can delete a user if the user is involved in unfair means or the membership is expired.
- Remove a book
- View user details
- View and close issues
- Update fine criteria

USER section: A user can perform various tasks:

- Search a book: Admin and Students can search for books by entering the name of the book.
- Reserve a book: The students can place an order for the books and simultaneously the quantity of the book ordered will be decreased.
- Pay Fine
- Report an issue

2.2 Product Features

Our website LibMS is designed to perform the following operations:

1. **Authentication:** It is able to authenticate the user or admin by matching the email id and the password against the values stored in the database.
2. **Existing User Detection:** It is able to check the customer's history or track record if he/she is already registered with the software by referring to the database for the same.
3. **Issue a Book:** It is able to provide book issuing facilities to the users.
4. **Fine Calculation:** It is able to calculate the fine of an individual.
5. **Admin Mode:** It provides the admin to update books and user's details.
6. **Reporting Issues:** It provides a 'Report Issue' feature to the user for fluent working of the system.

2.3   User Classes and Characteristics

The goal is to design software for a computerized system including Access control and book issuing for different Users. These types of users are listed below as follows:

User Classes

Access Control:
Administrator: The librarian(admin) will have administrator access to add, delete, and modify information stored in the database. The administrator can monitor the details of registered members and update the database accordingly.

Authorized Users:
1. Student
2. Staff
3. Student cum staff
4. Any individual

As one can see from the list, each user will have a different educational background and expertise level in using the system. Our goal is to develop software that should be easy to use for all types of users. Thus, while designing the software one can assume that each user type has the following characteristics:

- The user is computer-literate and has little or no difficulty in using the library management system to access information such as book status.
- In order to use the library management system, it is not required that the user is aware of the internal working of a website.

2.4   Operating Environment

The project is a website that can work on any of these devices with internet connections. Devices with the latest hardware are optimal as compared to the old hardware for better results. The device must have at least 1GB RAM and should have working internet connection. The mobile device must be compatible with android version 6.0 (Marshmallow) and above.

- Apple Safari 7+
- Google Chrome 44+
- Microsoft Internet Explorer 10+
- Mozilla Firefox 40+

2.5   General Constraints, Assumptions and Dependencies

The following list presents the constraints, assumptions, dependencies or guidelines for our website LibMS:

- The website must have a user-friendly interface that is simple enough for all types of users to understand.
- Response time for loading and for processing information should be no longer than five seconds.
- A general knowledge of basic computer skills and of basic working of functioning of libraries is required.
- The central database should be updated regularly. This updating to the central database can introduce additional latency in the working of the system.
- User has computational specs to run the website.
- The user must be registered on the website to access the portal and experience the features provided.
- There is a limited memory to store the data of the users accessing the website, the complaints registered by the students, and other details like fine etc.

3. Specific Requirements

3.1 Detailed description of Functional Requirements

There are several areas where functional requirements are needed which include the login and registration page, the page displayed to the user and the page displayed to the admin. Functional requirements are also needed in the features of 'View Book Details' after the user searches for a book in the user landing page.

● **Functional Requirements for the Login and Registration Page:**

On this page the user or admin is able to login by inputting an email address/username and password and if they match the entries in the database, they will be redirected accordingly, that is, the user to the user landing page and the admin-to-admin landing page using Django. If the user is new then he/she can fill his/her credentials accordingly on the same page in the specified boxes. The user will have to enter his/her email id, username and a password to keep their information secured.

Purpose	This page shows users the option to login into their user account and the admin to login into his/her admin account. If the user is new, he/she can register him/herself on the website and then login.
Input	On this page, in the login section the user/admin is supposed to enter his/her email id or user/admin name and password with which he/she has registered.
Processing	If a user goes to the login section and enters the asked information and the information matches to the one in the database, then, they will be taken to their respective user landing page. If the user enters the information in the registration section, then the information submitted will be added in the database and they will have the option to login on the same page with their new credentials. On entering correct credentials admins will also be redirected to the admin's landing page.
Output	If the information is correct, the logged in users/admins will be taken to their respective pages and the newly registered users will have the option to login with their credentials on the same page.

Table 1: Functional requirements for login and registration page

- **<u>Functional Requirement for the User Landing Page</u>**

On the user landing page, the user can perform the following options:

1. **Search a Book:** The user can search for any book in the search bar. After the search has been completed by matching the name of the book from the database of books, a drop-down menu appears in which the book name and its author are displayed. Beside the book name in that drop down menu, there is a button named 'View Book Details', and upon clicking on it the user is directed to a new page which is explained later.

2. **Pay Fine:** There is a button of 'Pay Fine' on the user landing page and upon hovering over it a drop-down menu appears containing the list of books issued with their respective fines and beside those books' names another button named 'Pay Now' is displayed that can be used to pay your fine (which will be paid in cash).

3. **Report an Issue:** On the user landing page there is a section with the heading 'Report an Issue'. In that section there is a text box in which the user can type any kind of complaint/issue and then submit it by clicking on the 'Submit' button.

Purpose	The purpose of the user landing page is to let the user search for any book, let him/her know of any fine on issued books and pay it and report any issue regarding the library or LibMS.
Input	The user can search for a book in the search bar, can pay any due fines and can report any issue that he/she is facing in the library or LibMS.
Processing	Whenever a user searches for a book, the book name is matched with the database. Whenever the user pays his/her pending fine, his/her record is cleared in the database. Whenever the user reports an issue, then that issue is stored in the database and it is displayed to the admin in 'View Issues'.
Output	Upon searching up a book in the search bar, that book's name and author's name are displayed. When you click on 'Pay Now' your fine is cleared and it does not show upon hovering over the 'Pay Fine' button.

Table 2: Functional Requirement for the User Landing Page

- **Functional Requirement of the Admin/Librarian Landing Page**

Upon landing on the Admin/Librarian page the admin can perform the following functions:

1. **Add a Book:** On the admin landing page there is a section named 'Add a Book'. In this section there are various fields such as Book Name, Author, Publisher, ISBN id etc. which can be filled if there is a new book that needs to be entered in the database. It has an 'Add Book' button which is used to finish the process.

2. **View All Books Details:** Upon clicking on this button all books in the database are displayed in a list. Each row has the book's name and its author with 2 buttons, 'Update Book' and 'Delete Book'. Upon clicking on the 'Update Book' button, a pop-up window appears containing that book's information such as Book Name, Author, ISBN id etc. which can be modified then and there and can be saved by clicking the 'Save' button in the pop-up window. The 'Delete Book' button deletes that book from the database along with its information.

3. **View All User Details:** Upon clicking on this button all users in the database are displayed in a list. Each row has the user's basic information and pending fine with 2 buttons 'Update User' and 'Delete User'. Upon clicking on the 'Update Book' button, a pop-up window appears containing that user's information such as Username, email id, phone number etc. which can be modified then and there and can be saved by clicking the 'Save' button in the pop-up window. The 'Delete User' button deletes that user from the database along with his/her information.

4. **View/Close Issues:** On the admin landing page, there is another button named 'View Issues'. Upon clicking on this button, a list of complaints will be displayed. Each row having the username, username's phone number and the complaint he/she issued along with another button 'Close Issue'. The admin can solve the issue and then close it by clicking on the button 'Close Issue' so that the complaint will be removed from the database and memory will be freed.

Purpose	The purpose of the Admin landing page is to let him/her add new books, update/delete users and books, and view/close issues.
Input	The admin can enter new books in the database and modify the information of users and books.
Processing	When the admin adds a book, updates a user's or book's data, everything is also modified in the database permanently. Or whenever he/she closes an issue, that issue is removed from the database and the memory is freed.
Output	The admin can open any user's details, book's details, and complaints that have been lodged, to view them.

Table 3: Functional Requirement of the Admin Landing Page

- **Functional Requirements for the View Book Details Page**

Upon landing on the View Book Details page the user can perform the following functions:

1. **View Book Details:** The full details of the book are displayed to the user such as Book Name, Author, Publisher, ISBN id, release date etc.

2. **Reserve a Book:** The user has the option of reserving that book, by clicking on the 'Reserve Book' button which is designed below the displayed full details of that book.

Purpose	The purpose of the View Book Details Page is to display the full details of that book to the user and allow him/her to reserve that book by clicking on the 'Reserve Book' button.
Input	The user clicks on the 'Reserve Book' button to reserve that book.
Processing	When the user will click on the 'Reserve Book' button, that book will be reserved for him/her and this information will be stored in the database, so that when he/she comes to issue the book from the library and that book is available, he/she will be prioritized to receive that book.
Output	The full details of the book will be displayed on the screen.

Table 4: Functional Requirements for the View Book Details Page

4. External Interface Requirements

4.1 User Interfaces

Front-end software: HTML, CSS, JavaScript and ReactJS
Back-end software: Django and Google Firebase

The user interface will work on Windows operating system and will be compatible with any browser such as Mozilla, Chrome, Microsoft Edge etc. by which users can access the system.

Logical Characteristics:

The GUI of the product shall be designed in HTML, CSS, JavaScript, ReactJS allowing a multitude of different user's access. The HTML design will remove most limits of access because every popular operating system has HTML viewing capabilities.

4.2 Hardware Interfaces

The following list presents the external and Hardware interface requirements for our website LibMS:

1. The user/admin must have an active internet connection.

2. The user/admin should have a machine with a web browser installed on it to run the website with a mouse and keyboard.

4.3   Software Interfaces

Following are the software used for the library management system LibMS:

Software Interface	Description
Operating System	Windows, Linux
Database	To save the user record and manage the books in the library management system, we have chosen Google Firebase.
Front-End	Front-End is supported by HTML, CSS, JavaScript and ReactJS
Framework	Django- VER 3.2.7 (a high-level python framework)
Library	ReactJS - VER 17.0.2

Table 5: Software Used

4.4   Communications Interfaces

Web browsers such as Chrome, Mozilla etc. are required for communication with the user. Internet Protocol (IP) shall be used by the software interfaces to connect to the internet.

5.   Other Non-functional Requirements

5.1   Performance Requirements

- All pages should be loaded in a very less amount of time, assuming a broadband connection on the client side.
- The website is required to store all the user's and book's details under the respective user's and book's ids.
- The software is designed to work from a browser like google chrome, and requires a PC to run and interact with.
- User doesn't require a fast computer; he/she just needs to have a decent network connection.
- Minimum requirements for running the website are:

1. GPU: Intel HD Graphics
2. CPU: Intel Celeron
3. Operating System: Windows XP or a better version

5.2   Safety Requirements

System use shall not cause any harm to human users.

5.3   Security Requirements

- Users shall be required to log in to the system for all operations.
- The system shall permit users who want to register.
- The system shall permit project managers or administrators to view only the records of people registered under their library.

6. Change History

Version 1	03/10/21

7. Document Approvers

SRS for Library Management System LibMS website approved by:

Name: _____

Designation: _____

Date: _____

Appendix A: Glossary

Abbreviation	Expansion
VER	Version
SRS	Software Requirement Specification
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
JS	JavaScript
CPU	Control Processing Unit
GPU	Graphics Processing Unit

Table 6: Expansions of abbreviations used in the document

S.No.	Term	Definition
1.	Admin	A person who handles the application and enrolls a person's image in the database.
2.	Login Window	This component performs the function of user authentication. It checks the user details from the database and signs in the user.
3.	Web App	A web application (or web app) is application software that runs on a web server, unlike computer-based software programs that are run locally on the operating system (OS) of the device. Web applications are accessed by the user through a web browser with an active network connection. These applications are programmed using a client–server modeled structure—the user ("client") is provided services through an off-site server that is hosted by a third-party.
4.	Database	A database is a collection of information that is organized so that it can be easily accessed, managed and updated. Computer databases typically contain aggregations of data records or files, containing information about sales transactions or interactions with specific customers.

Table 7: Technical terms and their meanings
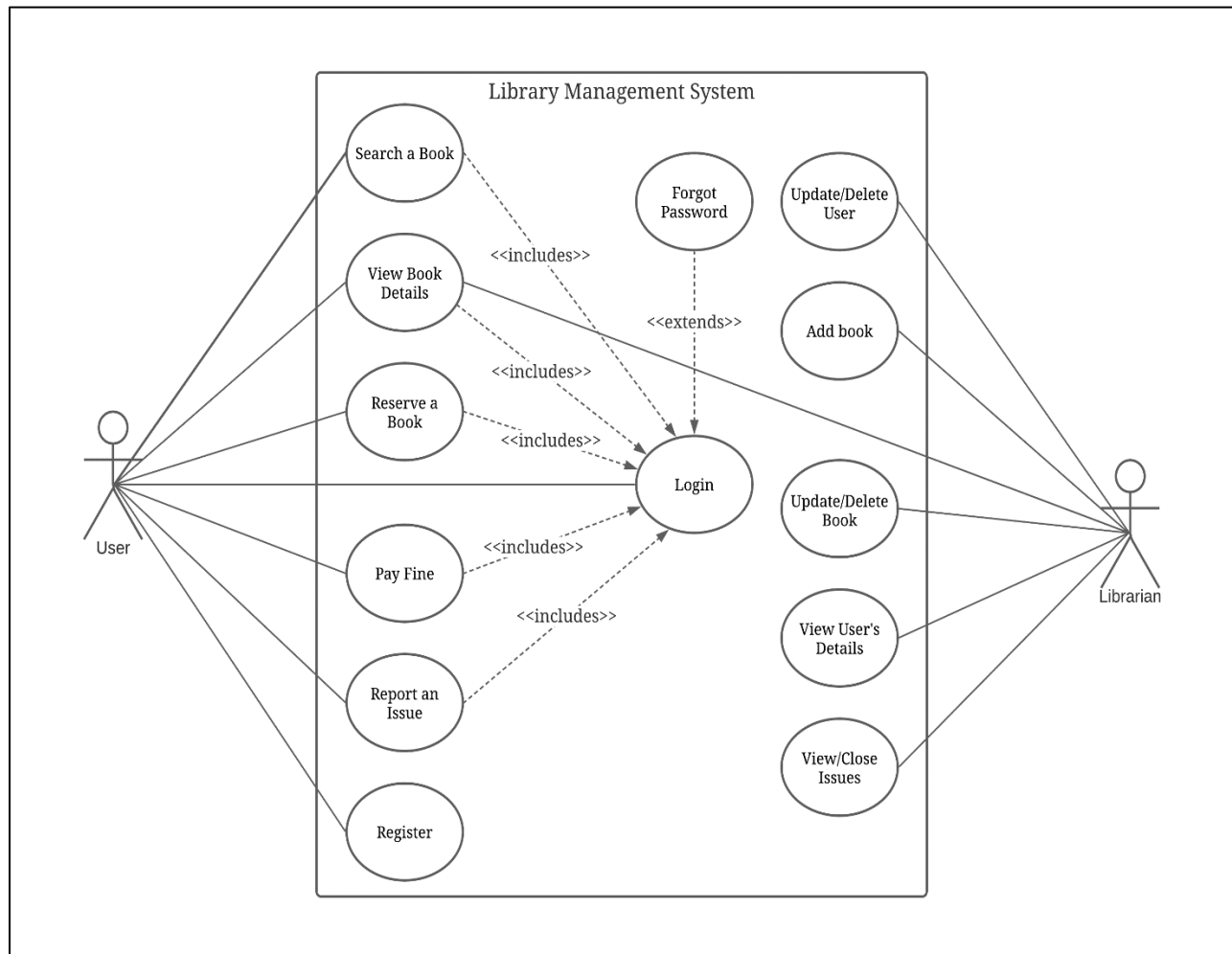
Appendix B: Analysis Models

1) Use Case Diagram

Fig 2. Use Case Diagram for LibMS
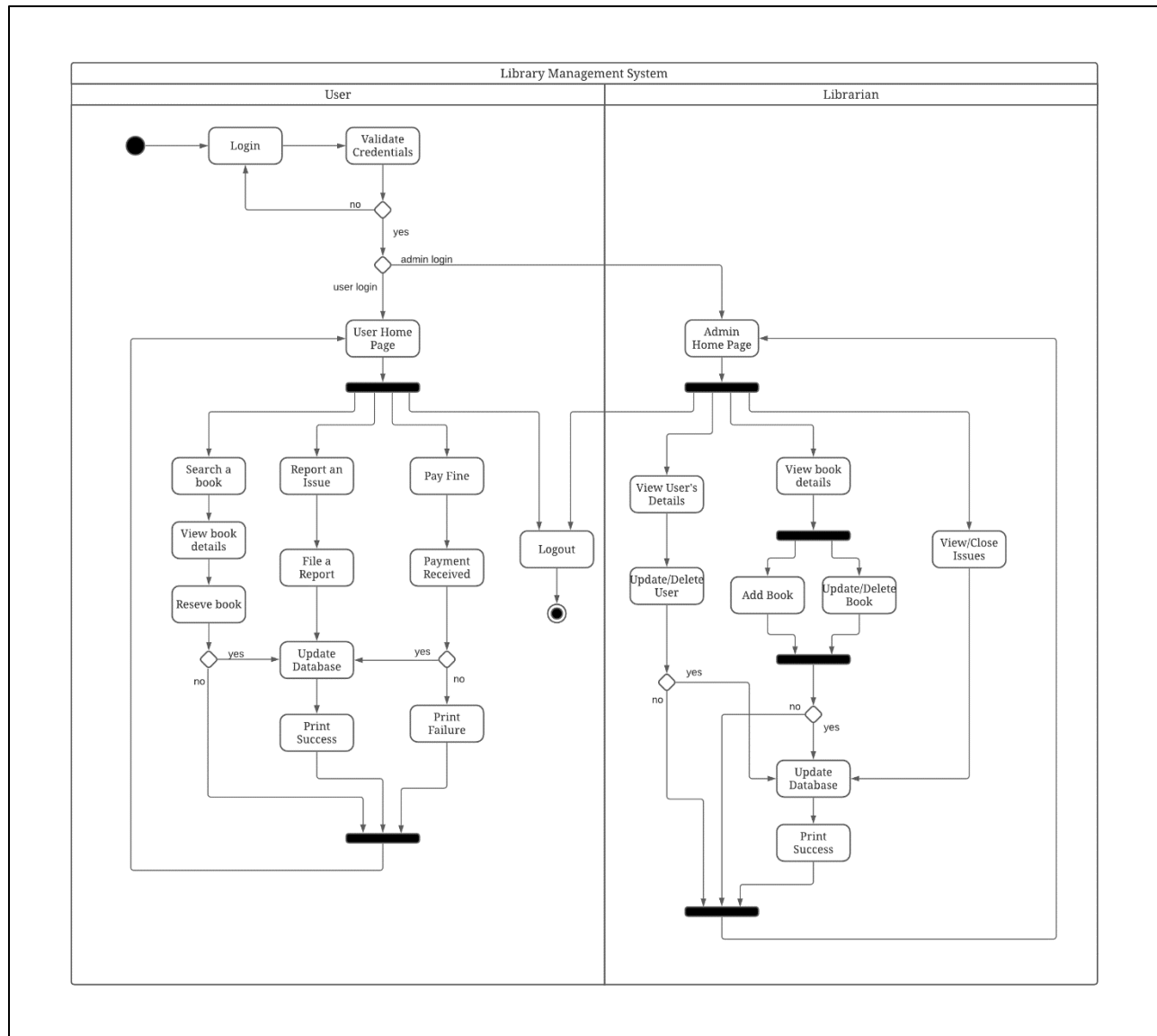
2) Activity Diagram

Fig 3. Activity Diagram for LibMS
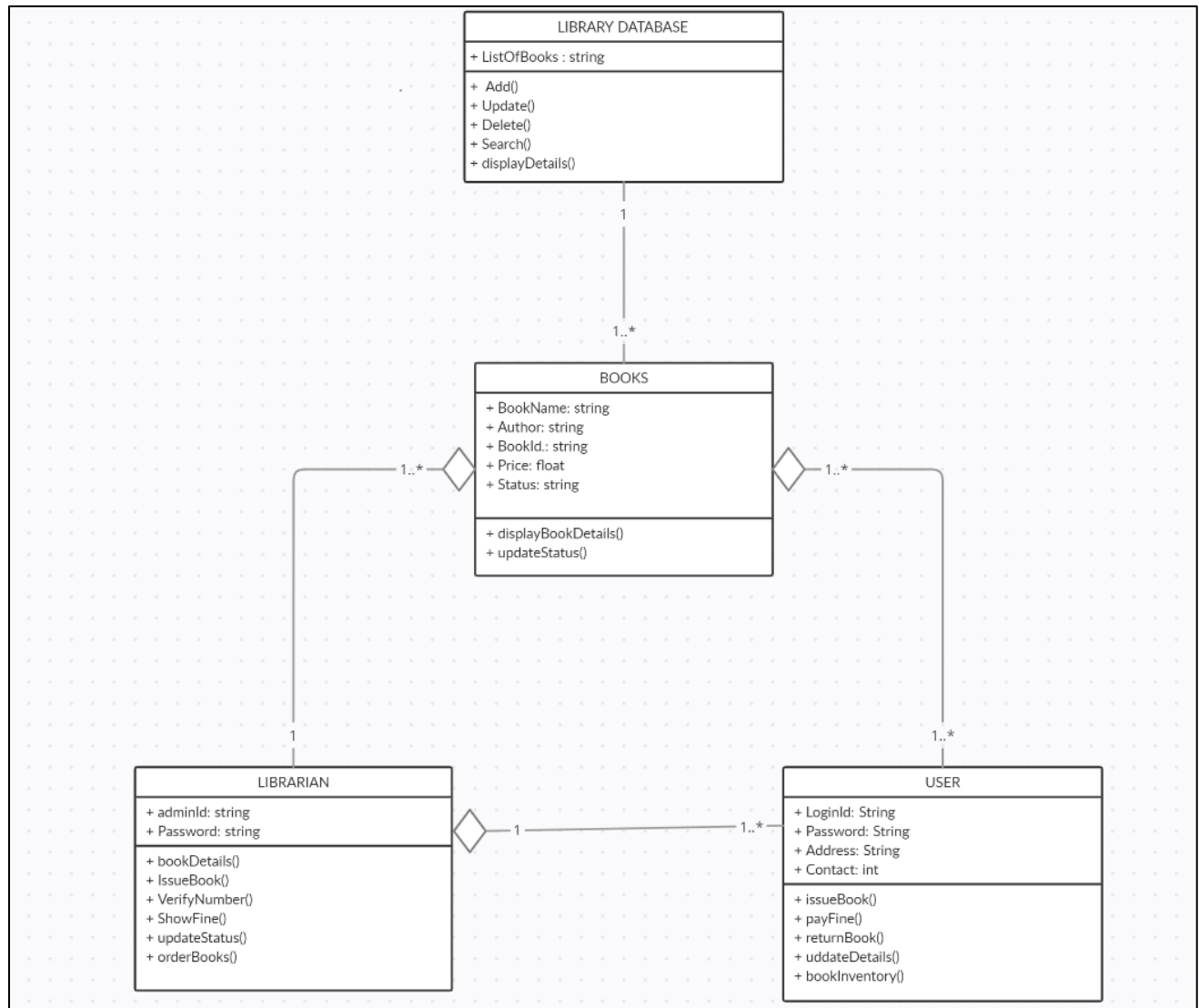
3) Class Diagram

Fig 4. Class Diagram for LibMS
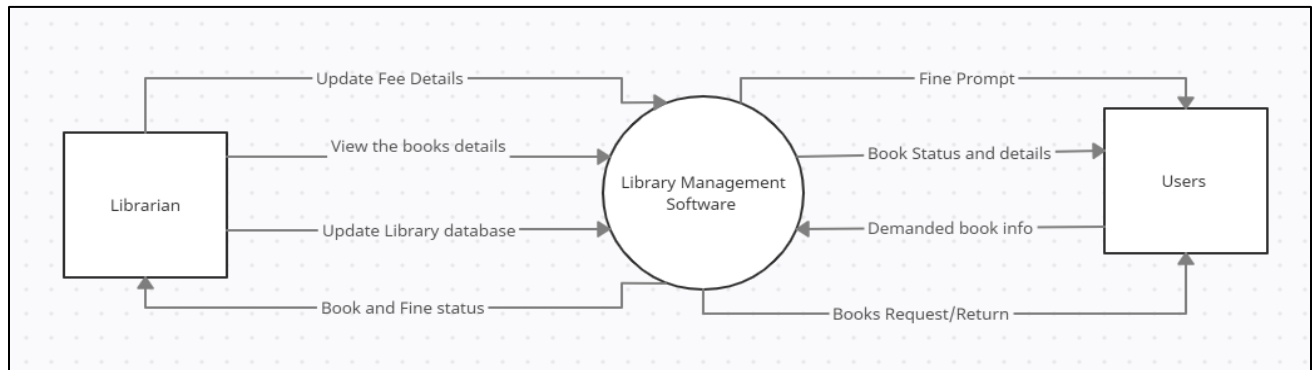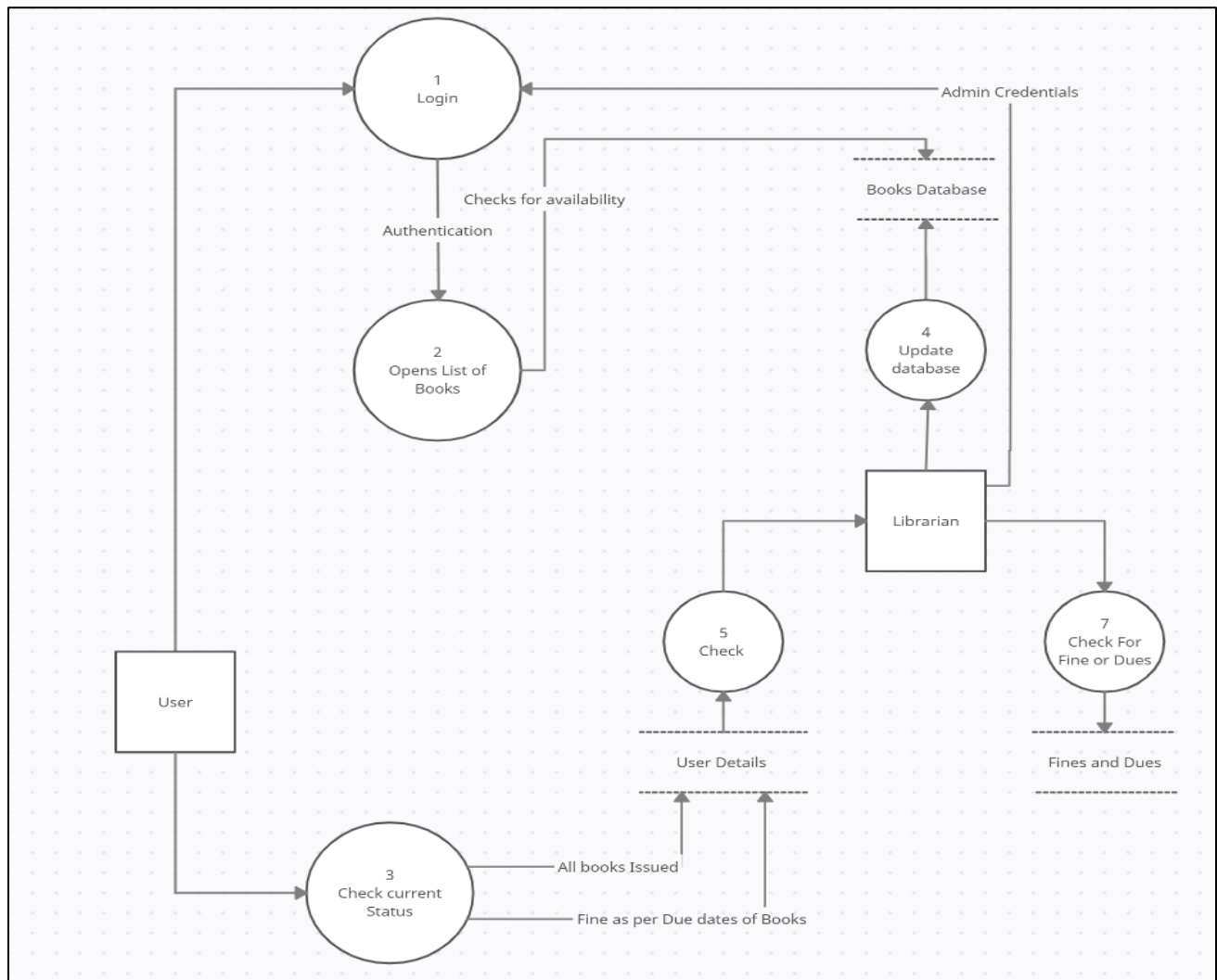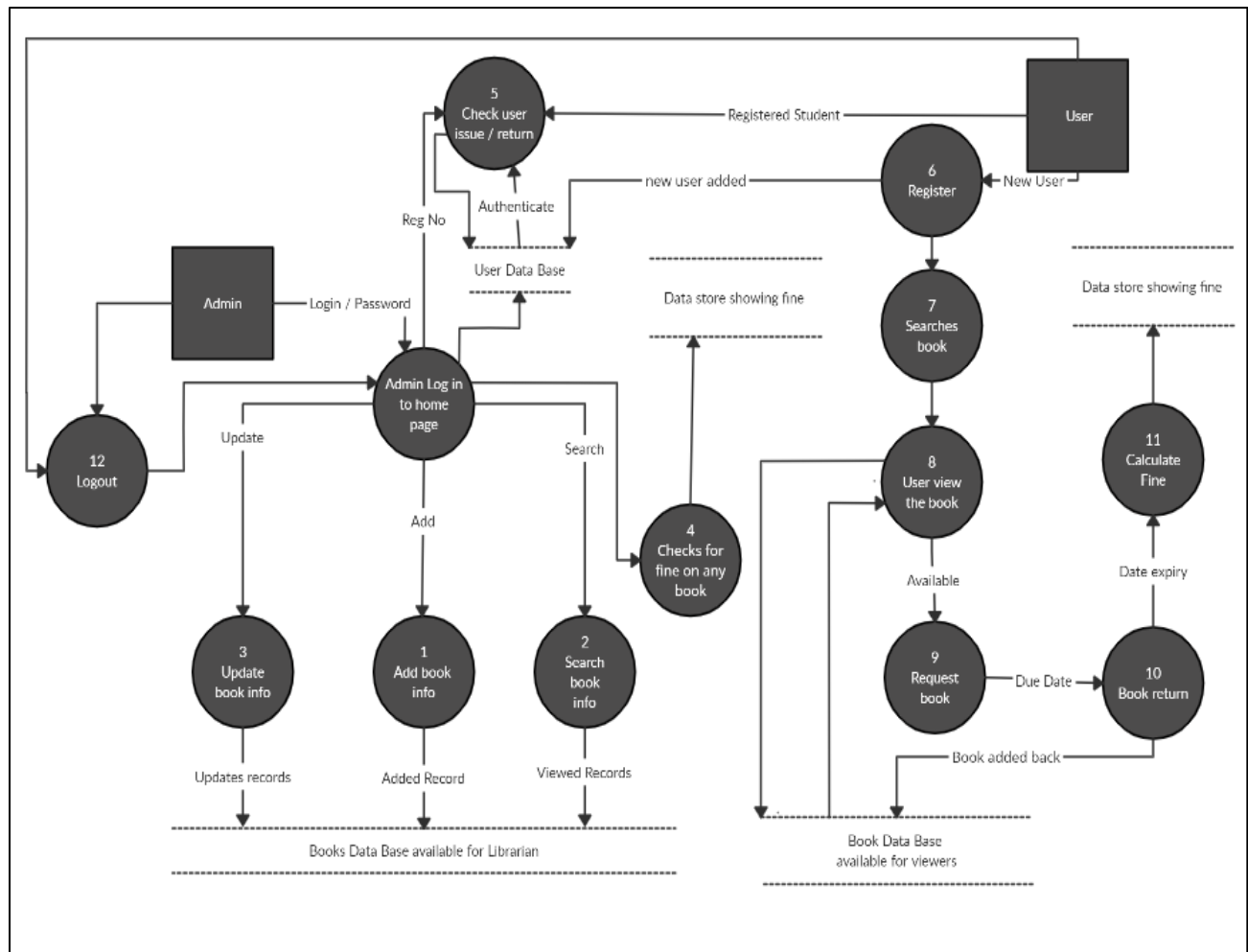
4) Data Flow Diagram

Fig 5. DFD Level 0 for LibMS

Fig 6. DFD Level 1 for LibMS

Fig 7. DFD Level 2 for LibMS