Darshan University

A Project Report on

"Project Title"

Under the subject

Software Engineering (2101CS503)

B. Tech, Semester – VI

Computer Science & Engineering Department

Submitted By

Student Name: Enrollment No.:

Academic Year

(2023-2024)

Internal Guide	Dean-DIET
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DECLARATION

We hereby declare that the SRS, submitted along with the **Software Engineering (2101CS503)** for entitled **"Project Title"** submitted in partial fulfilment for the Semester-5 of **Bachelor Technology (B. Tech)** in **Computer Science and Engineering (CSE)** Department to Darshan University, Rajkot, is a record of the work carried out at **Darshan University, Rajkot** under the supervision of **(Guide name)**   and that no part of any of report has been directly copied from any students' reports, without providing due reference.

(Student name)

Student's Signature

Date: _____

Computer Science & Engineering Department
Darshan University

CERTIFICATE

This is to certify that the SRS on **"Project Title" has** been satisfactorily prepared by **Student name (Enrollment)** under my guidance in the fulfillment of the course **Software Engineering (2101CS503)** work during the academic year 2023-2024.

Internal Guide

Prof., Guide Name

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Dr. Gopi Sanghani

Darshan University

ACKNOWLEDGEMENT

I wish to express my sincere gratitude to my project guide Prof. **Guide name** and all the faculty members for helping me through my project by giving me the necessary suggestions and advices along with their valuable co-ordination in completing this work.

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Thus, in conclusion to the above said, I once again thank the faculties and members of **Darshan University** for their valuable support in completion of the project.

Thanking You

Student Name

ABSTRACT

Library management system is a system which aims in developing a computerized system to maintain all the daily work of library. This system will act as a tool to transfer traditional library into digital library. This project has many features which are generally not available in general library system like facility of user login, books search on one click etc. It also has a facility of admin login through which the admin can monitor the whole system. This system will be designed with the basic features such as librarian can add/view/update/delete books and students' details in it. It has also a facility where student after logging in their accounts can see list of books issued and its issue date and return date and also they can request the librarian to add new books by filling the book request form. The librarian after logging into his account i.e. admin account can generate various reports such as student report , issue report, teacher report and book report.

Main purpose of this system is to reduce human efforts as much as possible.

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1 Introduction

1.1 Product perspective

This project is basically updating the manual library system into an internet-based application so that the users can know the details of their account, availability of books etc. It is a multi-user version and can take care of all the fundamental functions of a Library like Cataloguing, Circulation, Accessioning and Housekeeping. It can satisfactorily cater to all the basic functions of a small library.

1.2 Product features

1.2.1 There are three different users who will be using this product:
- Librarian who will be acting as the administrator.
- Member who will be accessing the library.
- Guest who will request for membership.

1.2.2 The features that are required for the Librarian are:
- Control the movement of books and other material and avoid losing the same.
- Search if you have a specific book in your collection based on the title, author etc.
- Print the spine labels for the book.
- Find what a specific person has borrowed from you. It offers the following modules Cataloguing, Circulation, and Queries.
- Can issue a book to the student.
- Can view the list of books available in each category.
- Can take the book returned from students.
- Add books and their information of the books to the database.
- Edit the information of the existing books.
- Can check the report of the issued Books.
- Can access all the accounts of the students.

1.2.3 The features that are required for the Member are:
- Can view the different categories of books available in the library.
- Can view the List of books available in each category.
- Can own an account in the library.
- Can view the books issued to him.
- Can put a request for a new book.

1.3 Functional Requirement

1.3.1 Librarian
- Add Article: New entries must be entered in database
- Update Article: Any changes in articles should be updated in case of update3.
- Delete Article: Wrong entry must be removed from system
- Membership management: To maintain a detailed database of the members. The system records the name, ID and password of each user. The system helps in ascertaining the track record of the member.
- Bar-coding: To give specific identification to each book. All books, old and new, are bar-coded on the basis of title, author, topic and date of publishing.
- Barcode scanning: To read the barcode easily using RFID sensors. The database is automatically updated when books are scanned while issuing or returning.

- Search function: to enable both the librarian and the members to search the catalog of books in the library. The search functions can be filtered to the need of each user.
- Check out Article: To issue any article must be checked out
- Check In article: After receiving any article system will renter article by Checking
- Reserve Article: This use case is used to reserve any book with the name of librarian, it can be pledged.
- Set user Permission: From this user case Librarian can give permission categorically, also enabling/disabling of user permission can be set through this use case

1.3.2 Member
- Authentication: User must be authenticated before accessing system
- Search Article: User can search any article
- Request Article: After successful searching member mark this book as requested article
- Check Account: This use case is used to check account details

1.4 Non-Functional Requirement

1.4.1 Usability:
- The UI should be simple enough for everyone to understand and get the relevant information without any special training. Different languages can be provided based on the requirements.

1.4.2 Accuracy:
- The data stored about the books and the fines calculated should be correct, consistent, and reliable.

1.4.3 Availability:
- The System should be available for the duration when the library operates and must be recovered within an hour or less if it fails. The system should respond to the requests within two seconds or less.

1.4.4 Maintainability:
- The software should be easily maintainable and adding new features and making changes to the software must be as simple as possible. In addition to this, the software must also be portable.

2 Design and Implementation Constraints

2.1 Use case diagram
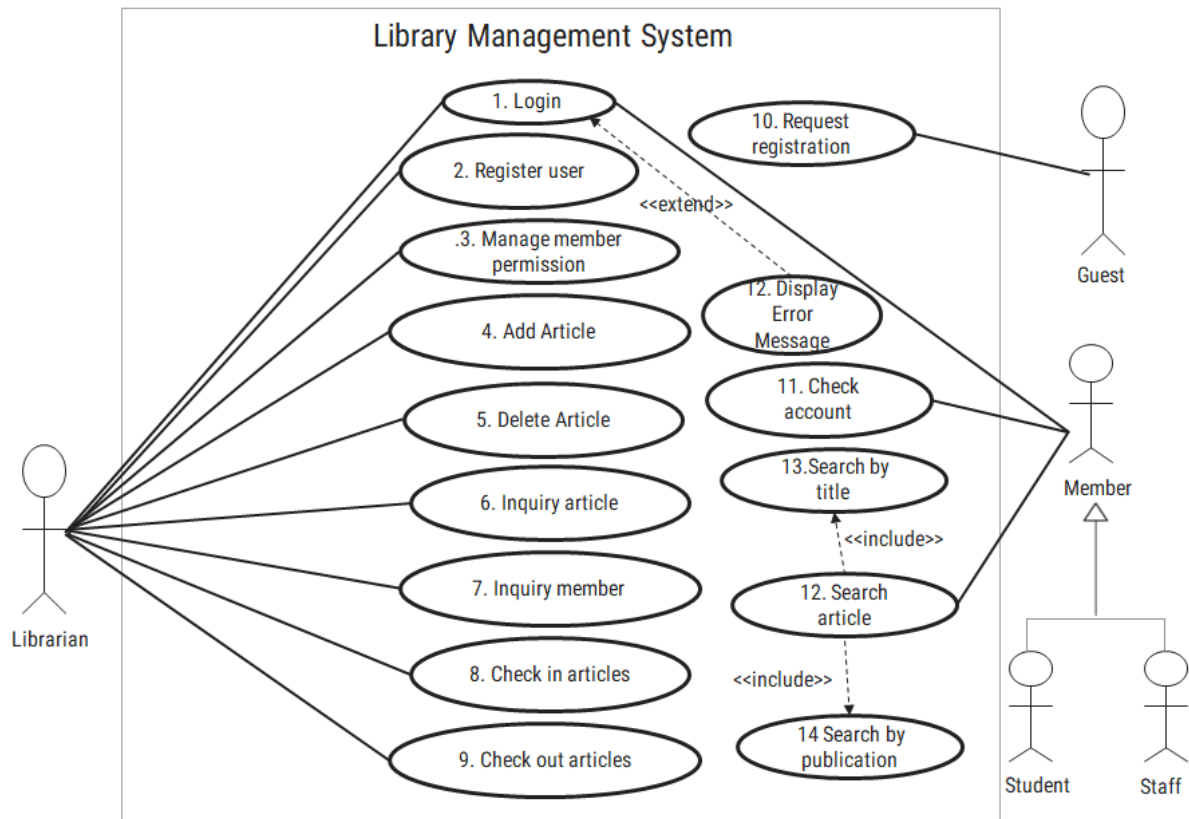
Figure 2.1-1 Use case diagram for library management system

2.2 Activity diagram and Swimlane diagram
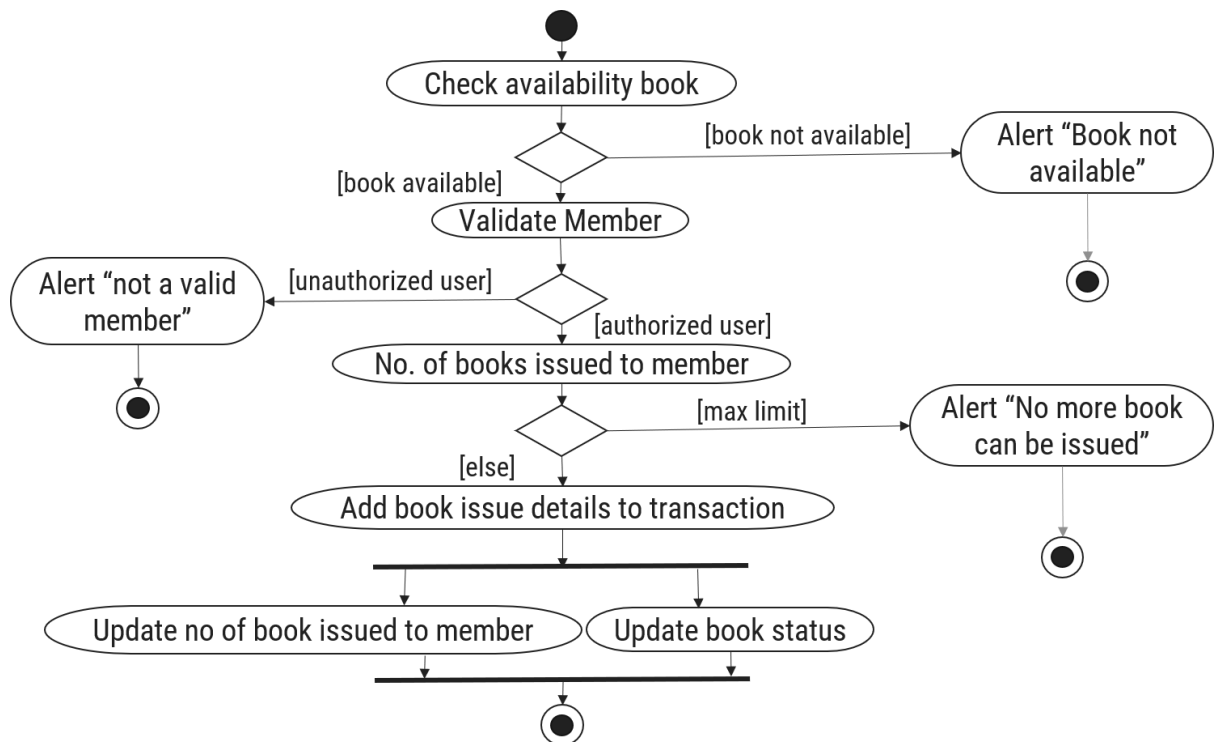
Figure 2.2-1 Activity diagram for Book Issue
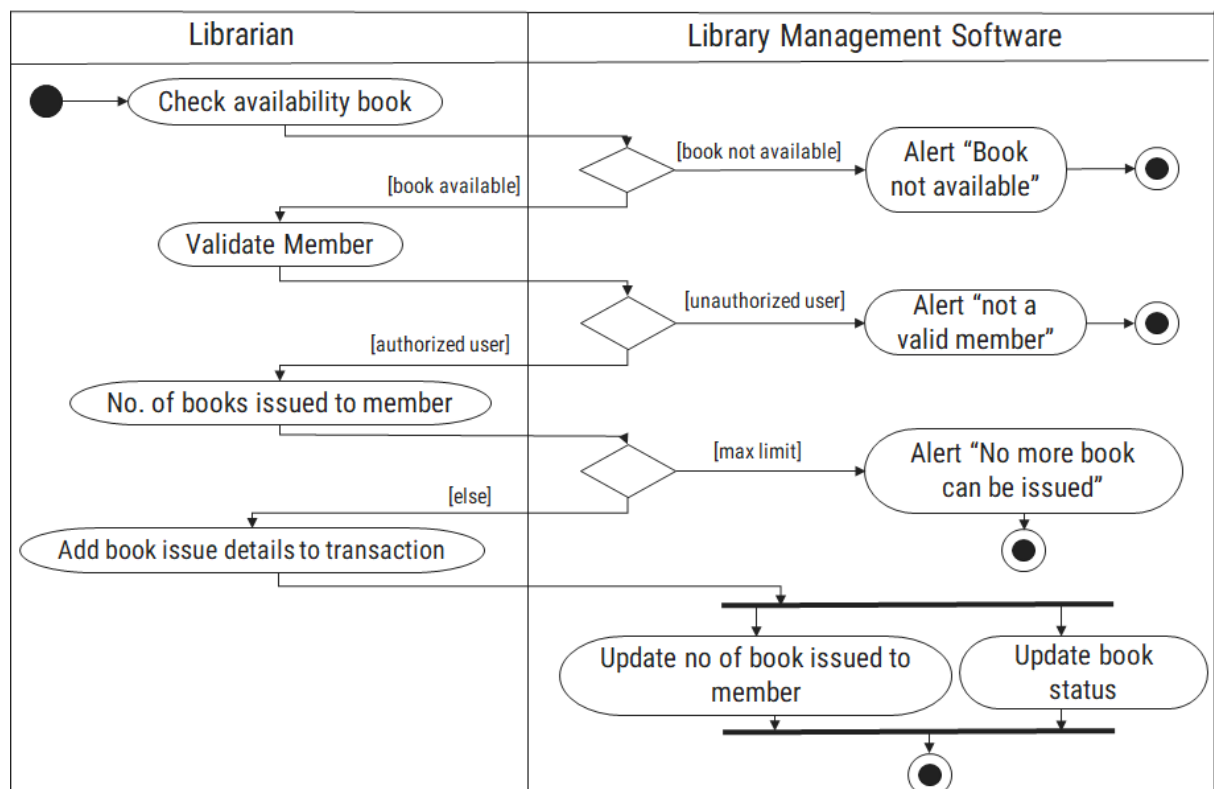
Figure 2.2-2 Swimlane diagram for Book Issue

2.3   Sequence diagram
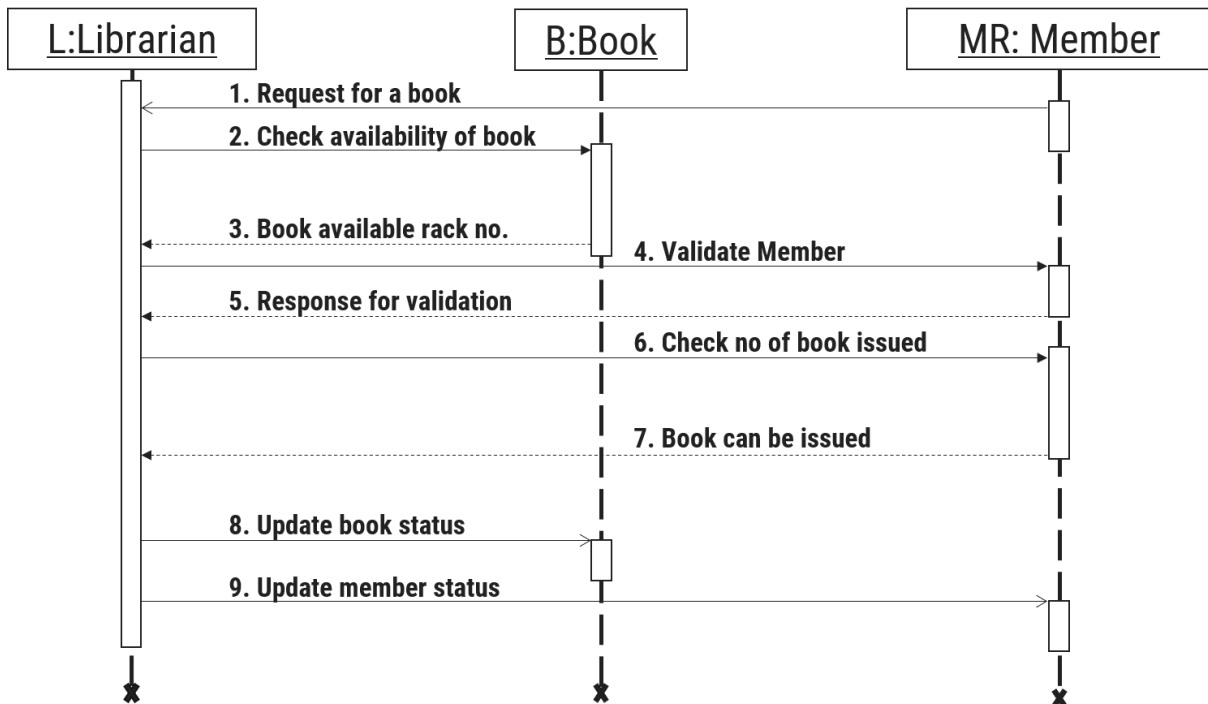
Figure 2.3-1 Sequence diagram for Book Issue

2.4 State diagram
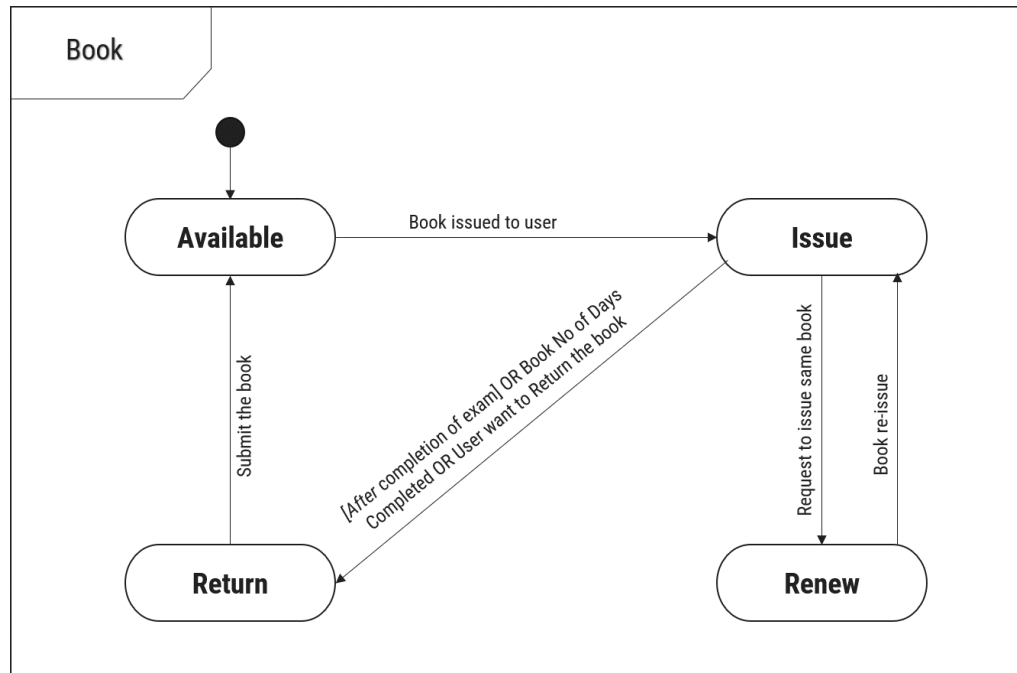
Figure 2.4-1 State diagram of Book
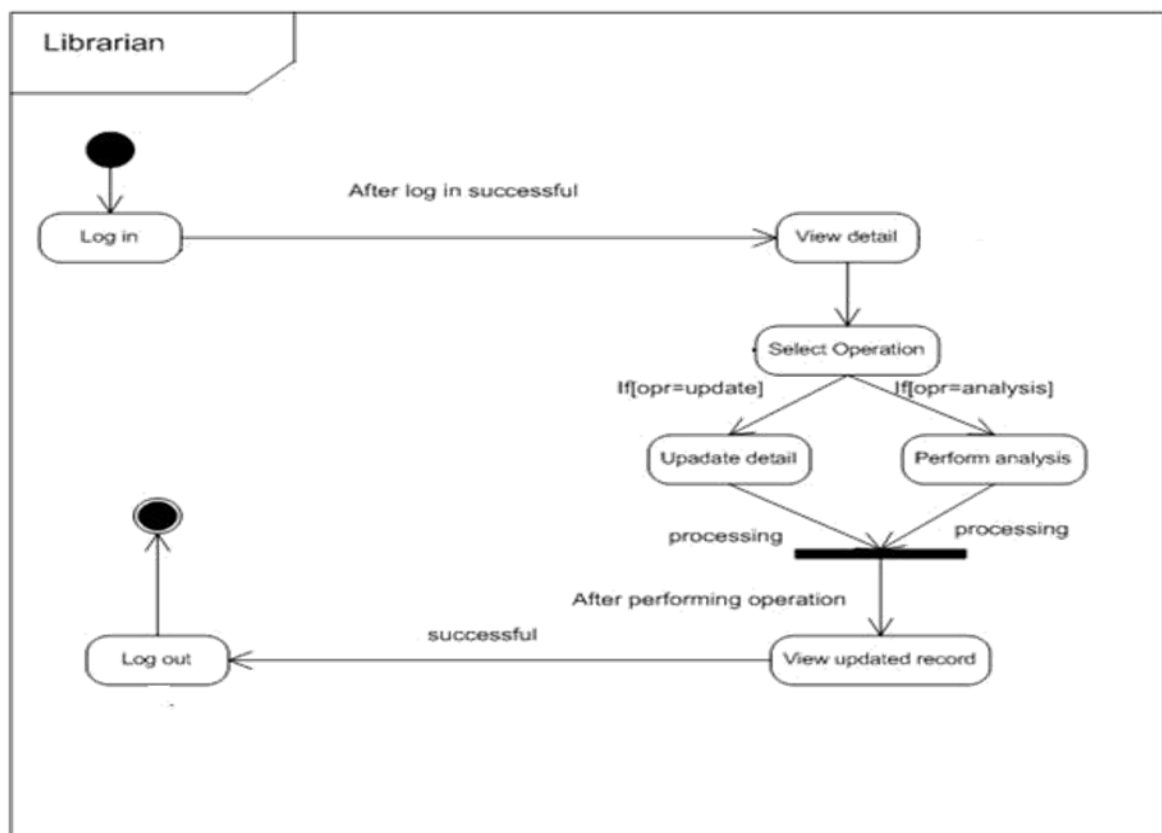
Figure 2.4-2 State diagram for Librarian

2.5 Class diagram
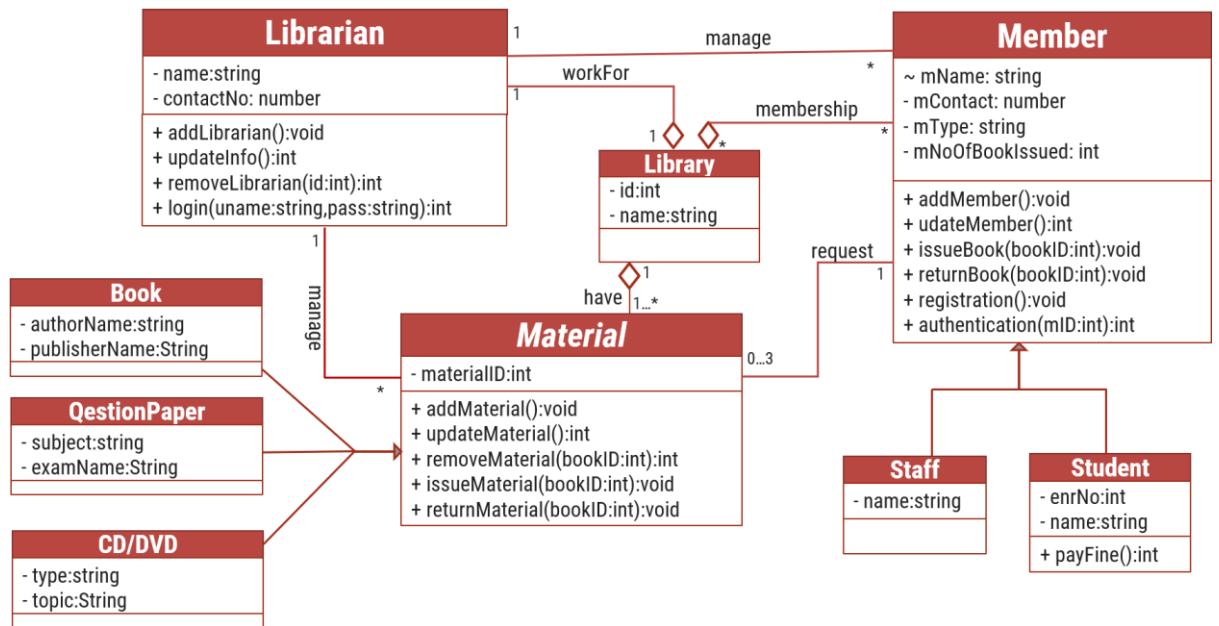
Figure 2.5-1 Class diagram for Library management system

2.6 Data flow diagram

2.6.1 Context diagram (level-0)
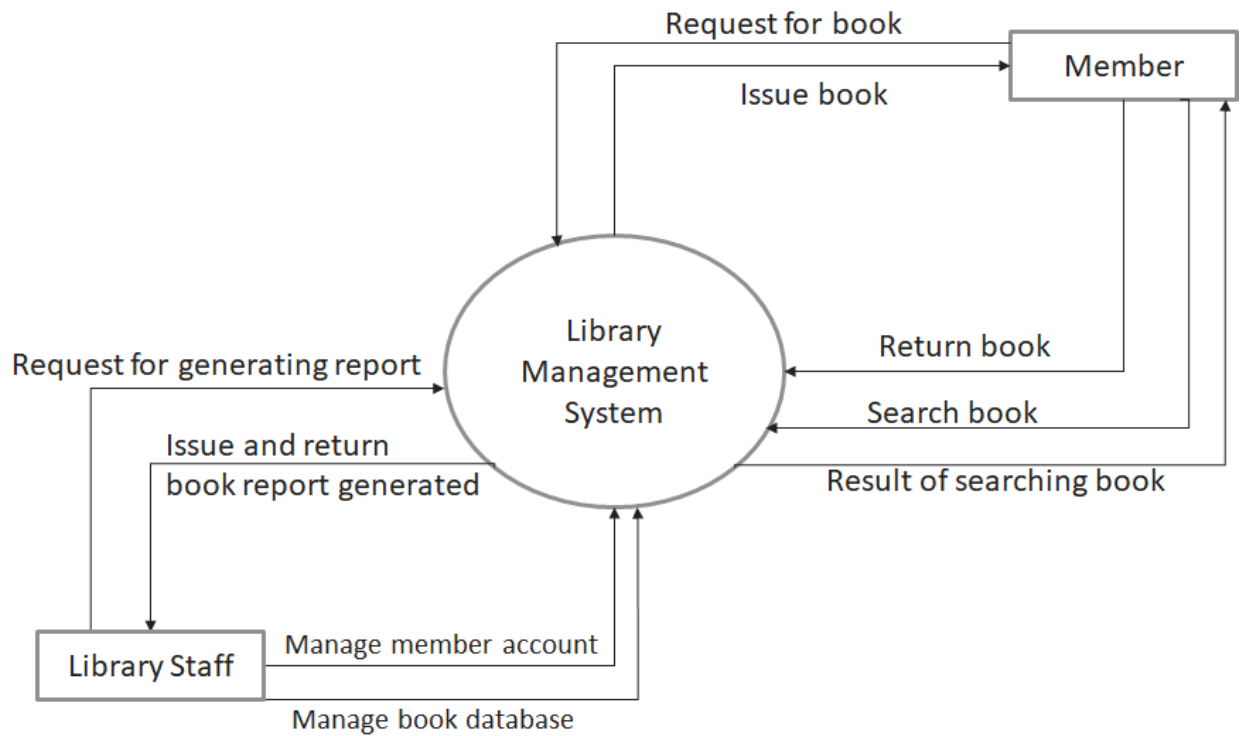
Figure 2.6-1 Context diagram for Library management system

2.6.2 DFD Level-1
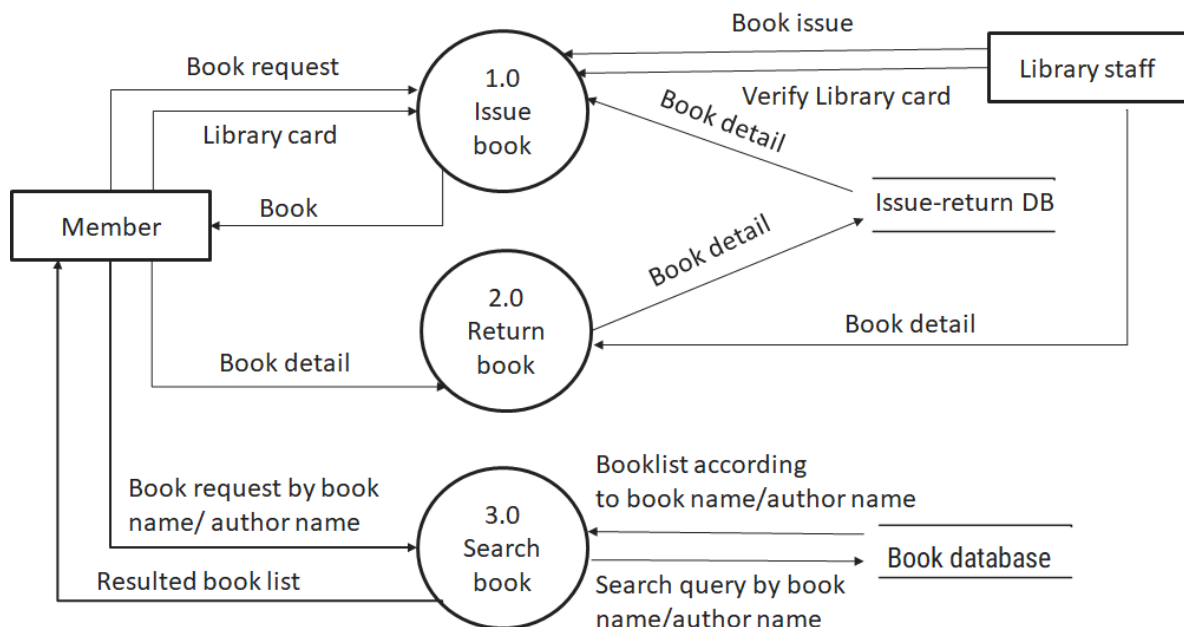
Figure 2.6-2 DFD level-1 for Library management system

2.6.3 DFD Level-2
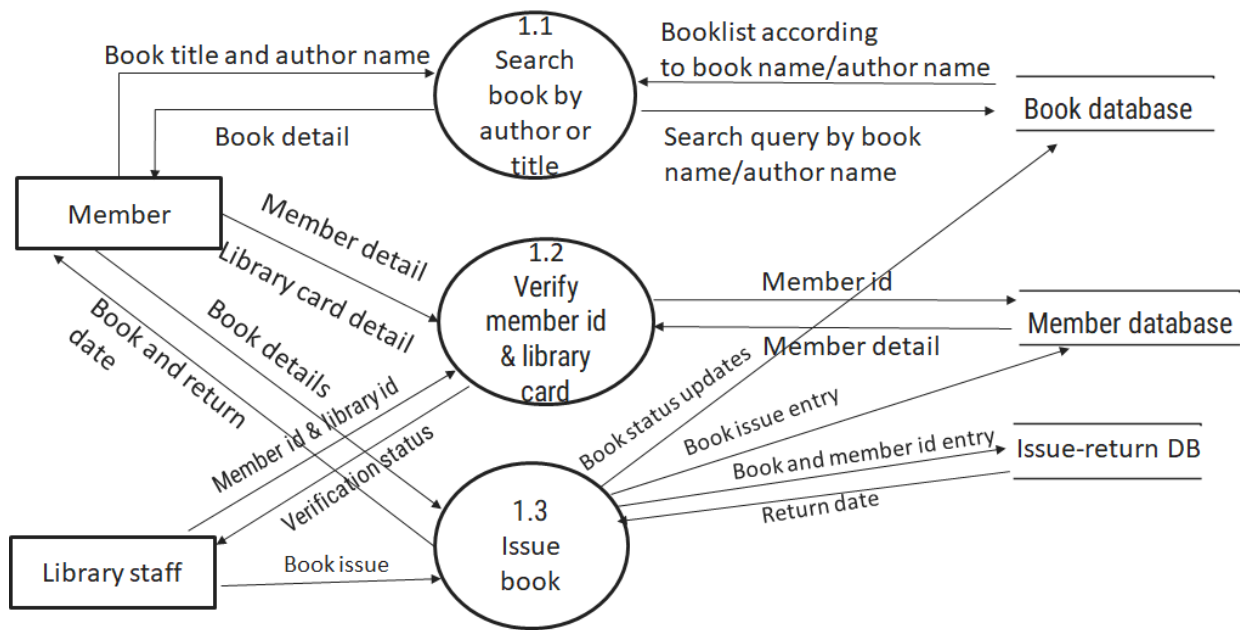
Figure 2.6-3 DFD level-2 for Issue book

3 External interface requirement (Screens)

3.1 Screen-1: Registration Form

Figure 3.1-1 Screen-1: Registration Form

Purpose: This form will allow the target end-users to register in the system. To register , the following information will be encoded in the system.

Table 3.1-1 Screen element of Registration form

Sr.	Screen Element	Input Type	O/M	1/N	Description
1	Username	Textbox	M	1	Username field should be editable and accept the Username.
2	Email	Textbox	M	1	Email field should be editable and accept the email with proper format.
3	Password	Password	M	1	Password field should be editable and accept the password and display as star or dot.
4	Retype password	Password	M	1	Retype Password field should be editable and accept the password and display as star or dot.
5	I agree to the terms	Checkbox	M	1	Checkbox for accepting terms and condition.
6	I already have a membership	Link	------	------	Link for navigate to login page for registered user.
7	Register	Button	------	------	Register is a button for store the entered data into database.

3.2 Screen-2: Login Form

Figure 3.2-1 Screen-2: Login Form

Purpose: This form will be used by the system's users to access records and features of the system. The users will input the correct combination of their username and password to be able to login to the system.

Table 3.2-1 Screen element of Login form

Sr.	Screen Element	Input Type	O/M	1/N	Description
1	Username	Textbox	M	1	Username field should be editable and accept the Username.
2	Password	Password	M	1	Password field should be editable and accept the password and display as star or dot.
3	Remember Me	Checkbox	M	1	Saving login credentials through remember me checkbox
4	I forgot my password	Link	------	------	Link for navigate to Forgot password page for allows users to recover password.
5	Register a new membership	Link	------	------	Link for navigate to membership registration.
6	Sign in	Button	------	------	Login button navigates to another page even if valid login credentials.

3.3   Screen-3: Add borrower book

Figure 3.3-1 Screen-3: Add borrower book

Purpose: This module will allow the system administrator to add, edit, update or delete borrowers of book. The admin can add borrower information and manage it.

Table 3.3-1 Screen element of Add borrower book

Sr.	Screen Element	Input Type	O/M	1/N	Description
1	Borrower ID	Textbox	M	1	Borrower ID field should be editable and fill autogenerated Borrower ID.
2	Student ID	Textbox	M	1	Student ID field should be editable and accept Student barcode id.
3	First Name	Textbox	M	1	First Name field should be editable and accept only string as a borrower first name.
4	Middle Name	Textbox	O	1	Middle Name field should be editable and accept only string as a borrower middle name.
5	Last Name	Textbox	M	1	Last Name field should be editable and accept only string as a borrower last name.
6	Contact	Textbox	M	1	Contact field should be editable and accept only 10-digit mobile number.
7	Grade Id	Textbox	O	1	Auto fetch detail from the database if proper student id is entered.
8	Submit	Button	-----	-----	Submit is a button for store the entered data into database.
9	Cancel	Button	-----	-----	Cancel is a button for close add borrower dialog.

4 Database design

4.1 List of Tables

- Book
- Borrower
- Student
- Staff

Table 4.1-1 Table: Book

Column	Data Type	Null	Keys & Constrains	Default Value & Description
BookID	int	NN	PK (Auto Increment)	
BookName	varchar(100)	NN		
ISBN	varchar(100)	AN		
Publication_year	int	AN		
Language	varchar(50)	AN		

Table 4.1-2 Table: Borrower

Column	Data Type	Null	Keys & Constrains	Default Value & Description
BorrowerID	int	NN	PK (Auto Increment)	
BookID	varchar(100)	NN	FK	Reference of Book Table
BorrowedFromDate	DateTime	AN		
BorrowedToDate	DateTime	AN		
ActualReturnDate	DateTime	AN		
IssuedBy	int	NN	FK	Reference of Student and Staff Table

Table 4.1-3 Table: Staff

Column	Data Type	Null	Keys & Constrains	Default Value & Description
StaffID	int	NN	PK (Auto Increment)	
StaffName	varchar(100)	AN		
IsAdmin	Boolean	AN		
Designation	varchar(100)	AN		

Table 4.1-4 Table: Student

Column	Data Type	Null	Keys & Constrains	Default Value & Description
StudentID	int	NN	PK (Auto Increment)	
StudentName	varchar(100)	AN		
Gender	varchar(100)	AN		
DOB	DateTime	AN		
Department	varchar(100)	AN		
Contact	number(10,0)	AN		

5 Stories and Scenario

5.1 Story-1: Add New Book in Library Catalogue

Story # **S1**	:	**As a** Librarian, **I want to** add a new book in library catalogue **So that** everyone can easily find and borrow it.
Priority	:	High
Estimate	:	XL
Reason	:	The addition of a new book to the library catalogue is crucial for ensuring that the library's collection is up-to-date and accessible to everyone.

5.1.1 Scenario# S1.1

Scenario# **S1.1**	:	Adding a New Book with Valid Information
Prerequisite	:	Librarian is logged in to the Library management system.
Acceptance Criteria	:	**Given:** The Librarian is navigated to the library catalog management page. Valid book information, including title, author, ISBN, and other relevant details is added. **When:** The librarian selects the "Add New Book" option And The librarian enters valid book details The librarian clicks the "Save" button to add the book to the catalog. **Then t**he system successfully adds the book to the catalog and the librarian receives a confirmation message with the book's identification number.

5.1.2 Scenario# S1.2

Scenario# **S1.2**	:	Adding a New Book with Invalid Information.
Prerequisite	:	The librarian is logged into the library management system.
Acceptance Criteria	:	**Given:** The librarian is on the library catalogue management page **When:** The librarian selects the "Add New Book" option and the librarian enters an incomplete or incorrect book details and librarian clicks the "Save" button to add the book to the catalogue. **Then t**he system displays error messages for the incorrect or missing information and the book is not added to the catalogue.

5.1.3 Scenario# S1.3

Scenario# **S1.3**	:	Attempting to Add a Duplicate Book
Prerequisite	:	The librarian is logged into the library management system and the librarian is on the library catalogue management page
Acceptance Criteria	:	**Given**: The book information, including title, author, ISBN, and other relevant details, is available and the book with the same ISBN is already in the catalogue. **When**: User Clicks on "Add book" button. Enter a number of copies with the same book detail mentioned in the field.

		Then: Generate unique book id, barcode and spine label for various book of same title.

5.2   Story-2: Search Book

Story # S2	:	**As a** Librarian or member, **I want to** search for books by title, author, or keyword, **So that** I can quickly find books that match my interests.
Priority	:	High
Estimate	:	M
Reason	:	Implementing a search functionality is essential for enhancing the user experience, as it allows librarian and member to efficiently discover and access the library's resources.

5.3   Story-3: Manage due date for borrowed book

Story # S3	:	**As** Librarian, **I want** to manage due dates for borrowed books **So that** I can ensure that books are returned on time and avoid overdue fines.
Priority	:	High
Estimate	:	M
Reason	:	Proper due date management is crucial for maintaining the library's collection and ensuring that books are available for all members.

5.4   Story-4: Renew book

Story # S3	:	**As** Librarian, **I want** to renew a book that I have borrowed **So that** I can extend my borrowing period if needed.
Priority	:	Medium
Estimate	:	M
Reason	:	Book renewal functionality is a convenience feature for librarian, allowing them to keep a book for an extended period if no one else has requested it.

5.5   Story-5: Generate a report on book usage and availability

Story # S3	:	**As** Librarian, **I want** to generate reports on library usage and book availability **So that** I can make informed decisions about library's books.
Priority	:	Medium
Estimate	:	L
Reason	:	Reporting functionality helps librarians track the usage of library resources and make data-driven decisions to improve services and collections.

6 Test cases

Project Name:	EMI Calculator	Test Designed by:	P. U. Jadeja
Module Name:	Login	Test Designed date:	01-10-2023
Release Version:	1.0	Test Executed by:	R. B. Gondaliya
		Test Execution date:	15-01-2023

Pre-condition: Web application should be accessible				
Test Case ID	**Test Title**	**Test Type**	**Description**	**Test Case ID**
TC_001	Login to web application with valid credential	Functional	Login to Library management system web application through valid credential	TC_001
TC_002	Login to web application with invalid credential	Functional	Login to Library management system web application through invalid credential	TC_002
TC_003	Varify login page elements	GUI	varify that all elements are availabe on login page	TC_003

Test Case Title	Login to web application with valid credential
Test Type	Functional
Test Priority	High
Pre-condition	Web application should be accessible

Test Step	Test Case Description	Expected Result	Actual Result	Status	Comment	Data	BUG ID
1	Access Web application URL	The site launched properly	Site launched successfully	Pass		https://accounts.google.com/ServiceLogin	
2	Enter valid Username in username field	Username field should be editable and accept the Username	Username input accepted	Pass		Username: Rbgondaliya@gmail.com	
3	Enter valid Password in Password field	Password field should be editable and accept the password and display as star or dot	Password input displayed in dot and accepted	pass		Password: rbgondaliya	
4	Enter valid captcha code in captch field	Captch field should editable and accept captcha and captcha is case sensitive	Captcha input accepted	Pass	Step required when human action validation	get captcha from image which is near by captcha field	

				perform			
5	Click on login button	User should login into site and navigated to dashboard	User navigated to dashboard and username should br display in top of the right side.	pass			

Test Case Title	Login to web application with invalid credential
Test Type	Functional
Test Priority	Medium
Pre-condition	Web application should be accessible

Test Step	Test Case Description	Expected Result	Actual Result	Status	Comment	Data	Bug ID
1	Verify that User is not able to Login with invalid Username and invalid Password	Should be display an error message enter wrong username or password	Display an error of wrong username and password	Pass			
2	Verify that User is not able to Login with Valid Username and invalid Password	Should be display an error message enter wrong password	Display an error of wrong password	Pass			
3	Verify that User is not able to Login with	Should be display an error message	Display an error Username not found	Pass			

	invalid Username and Valid Password	User not found					
4	Verify that User is not able to Login with blank Username or Password	Set required field validation message for Username and Password	Display an error of wrong username and password	Fail	Not performa a validation function fix it		Bug_002

Test Case Title	Varify login page elements
Test Type	GUI
Test Priority	Medium
Pre-condition	Web application should be accessible

Test Step	Test Case Description	Expected Result	Actual Result	Status	Comment	Data	Bug ID
1	Launch application with the given url	The site launched properly	Site launched successfully	Pass		https://accounts.google.com/ServiceLogin	
2	Verify that the login screen contains elements such as Username, Password, Sign in button, Remember password check box, Forgot password link, and Create an account link.	All listed control displayed properly on the page	Login page loaded successfully	Pass			

3	Verify that cursor is focused on "Username" text box on the page load	Cursor is focused in Username textbox	Cursor focus in Username textbox	Pass			
4	Verify that tab functionality is working properly or not	When tab pressed cursor move in next control	Cursor moving in next control	Pass			
5	Verify that all the fields such as Username, Password has a valid placeholder	All text fields have proper placeholder	All text fields have proper placeholder	Pass			
6	Verify that the labels float upward when the text field is in focus or filled (In case of floating label)	When field is focused or filled, label display on top of the filled	When field is focus or filled, label display on top of the filled	Pass	step required when fields with floating label		
7	verify that forgot password link working properly	when click on forgot password load forgot passworg page	forgot password link not working	Fail			

7 References

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- https://www.javatpoint.com/uml