

Category	Information
Customer	AIR UNIVERSITY, ISLAMABAD.
Project	Library Management System
Document	Requirement Specifications
Document Version	1.0
Identifier	A36-2024
Status	Draft
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Approver(s)	PM
Due Date	Dec. 30, 2025
Document Location	
Distribution	1. Advisor 2. PM 3. Project Office

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1. Introduction

The LMS will combine the strengths of these systems while introducing a unique feature set tailored to the client's specific needs, including integration with a LAN-based environment.

: Set up the LMS in the client's LAN environment.

The project's timeline is realistic, with sufficient resources allocated for each phase to ensure

The system's design incorporates secure data handling practices, ensuring the integrity and

The project aligns with the client's goal of modernizing operations, motivating all stakeholders to

2. Functional and Non-Functional Requirements

- **2.1.1.1 User Registration**

The system must allow users to register by providing personal details such as name, email, and library card number.

- **2.1.1.2 User Login**

Users should be able to log in securely using a username and password.

- **2.1.1.3 Profile Management**

Users can update their profile details, including username, avatar, and contact information.

- **2.1.1.4 Access Control**

System administrators must assign role-based access permissions for users.

2.1.2 Book Management

3. Design Considerations

3.1 Assumptions and Dependencies

4. System Architecture

4.1 System Level Architecture

4.2 Sub-System / Component / Module Level Architecture

4.2.1 User Management Module

4.2.2 Catalog Management Module

4.3 Sub-Component / Sub-Module Level Architecture

4.3.1 User Management Module

4.3.1.2 Search and Retrieval

4.3.1.3 Inventory Management

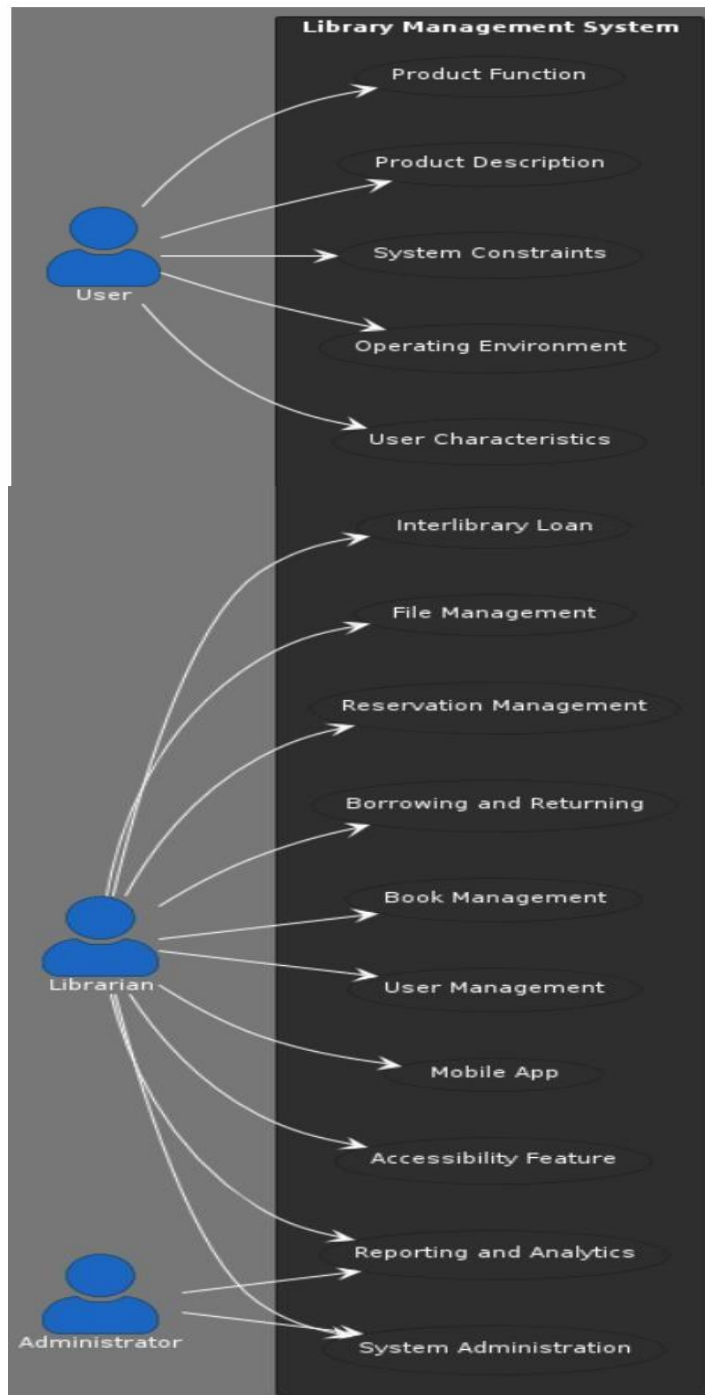
4.3.1.4 Book Status Tracking

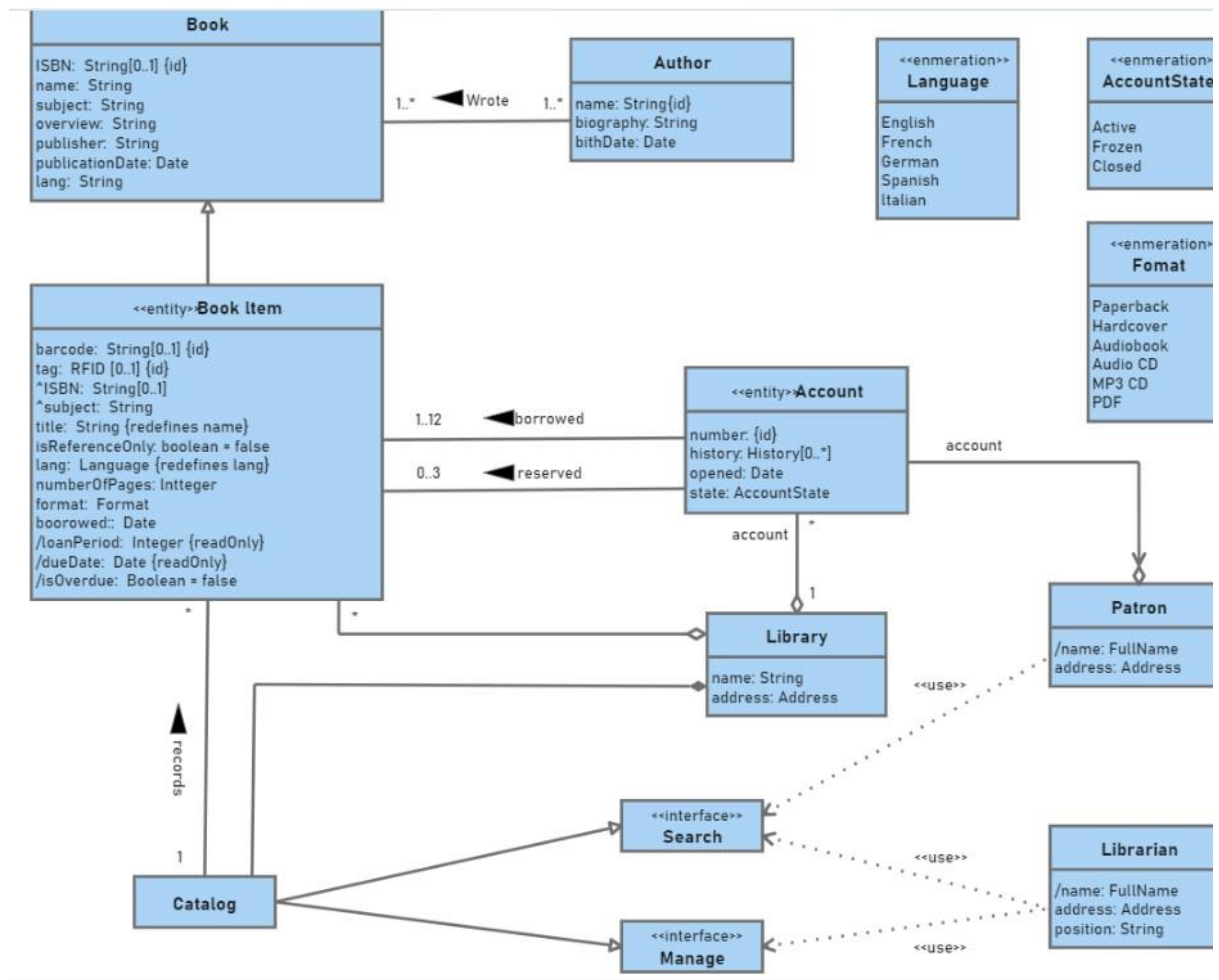
□ On Loan

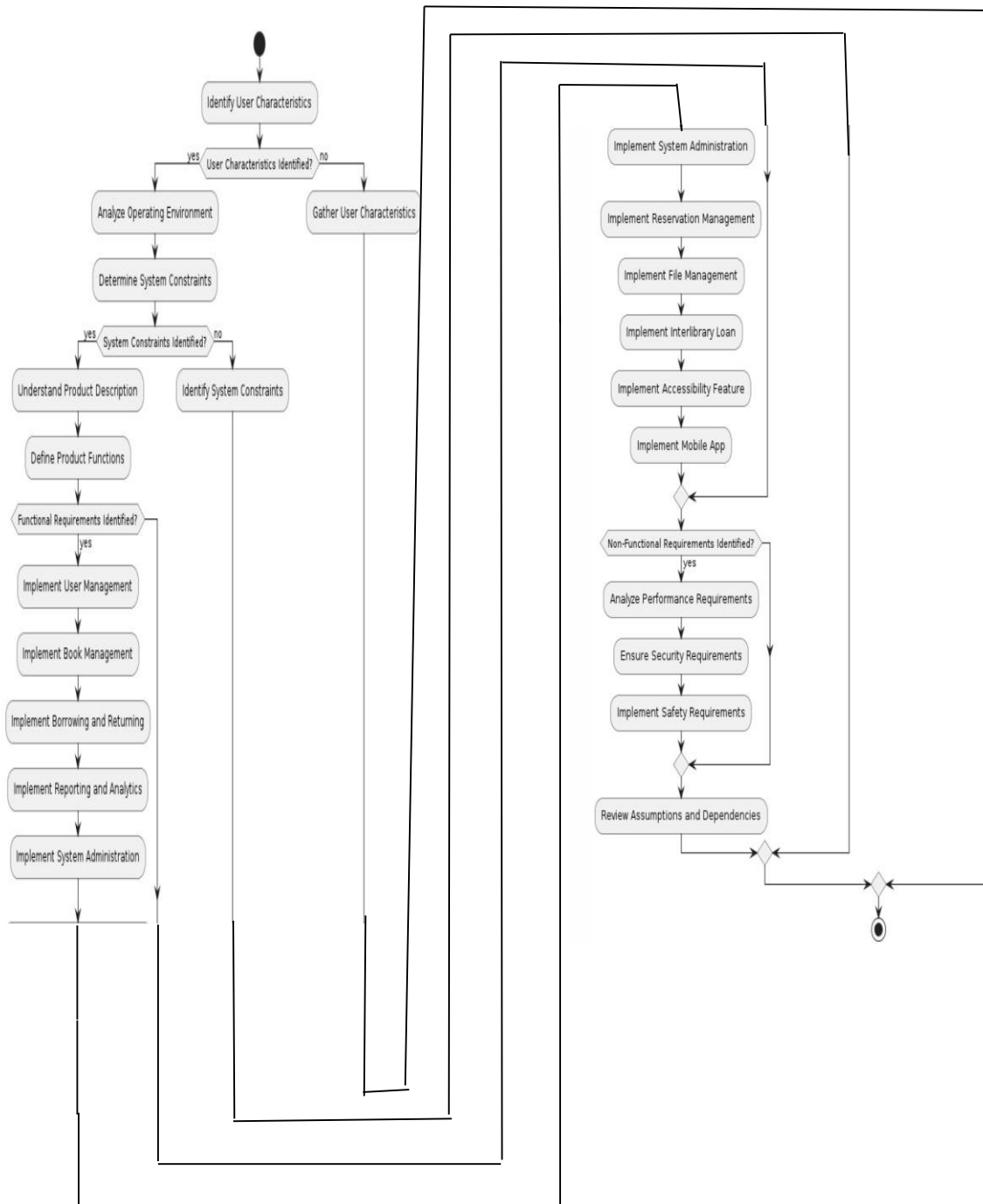
5. Design Strategies

Structured design is mostly based on 'divide and conquer' strategy where a problem is

6. Use Detailed System Design

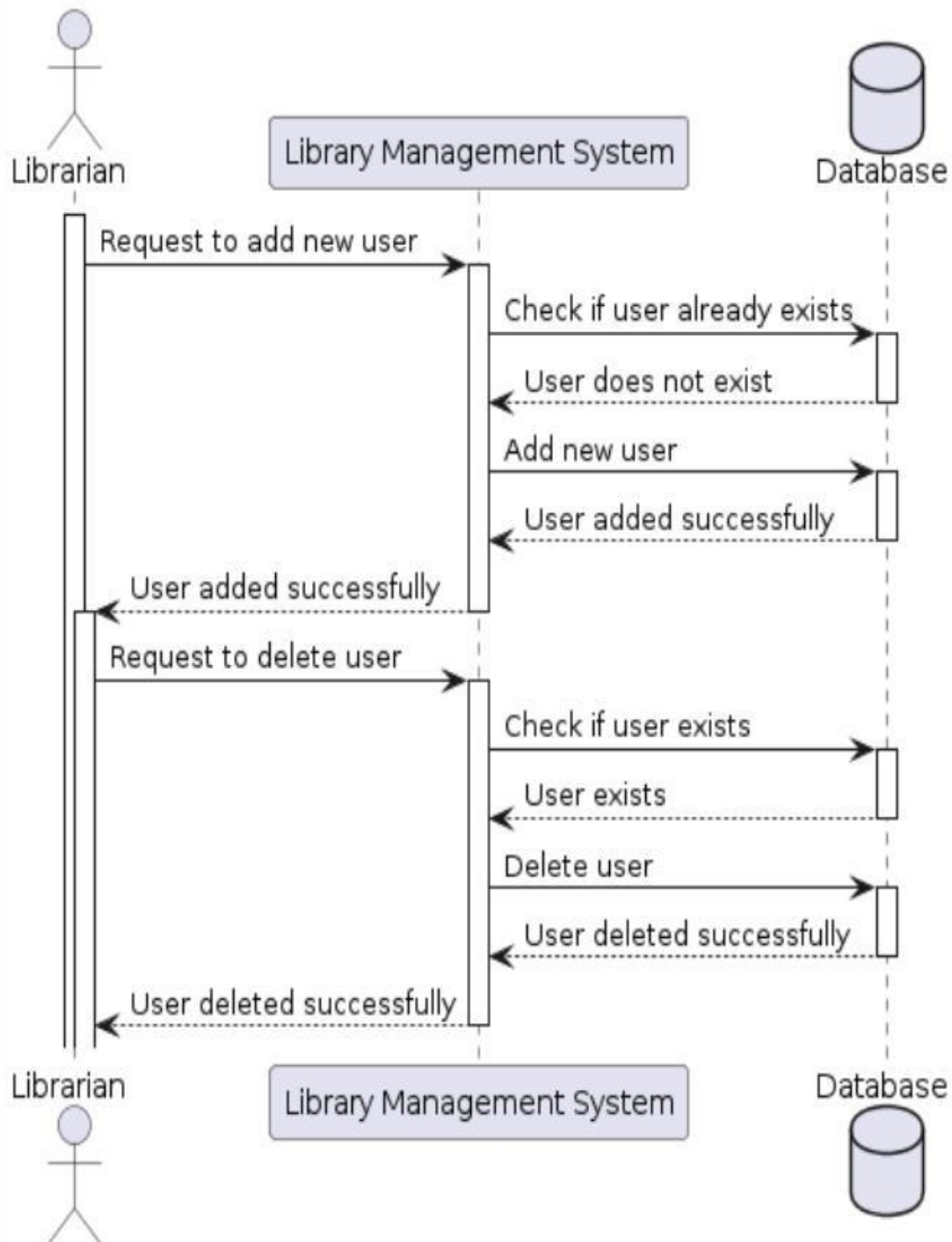






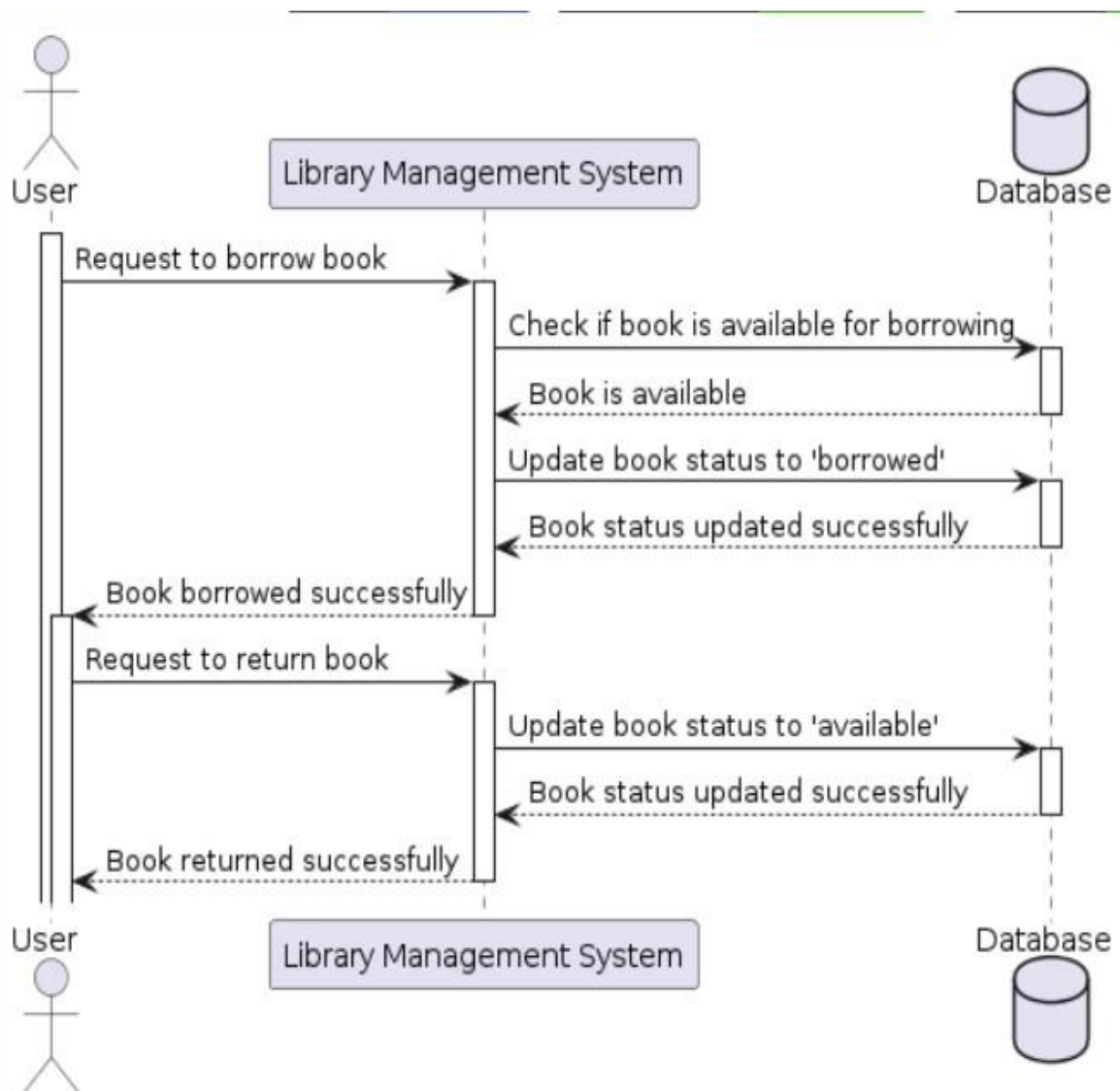
Decision-making flowchart / Process flow diagram

User Management Sequence Diagram



Book Management Sequence Diagram

Borrowing and Returning Sequence Diagram



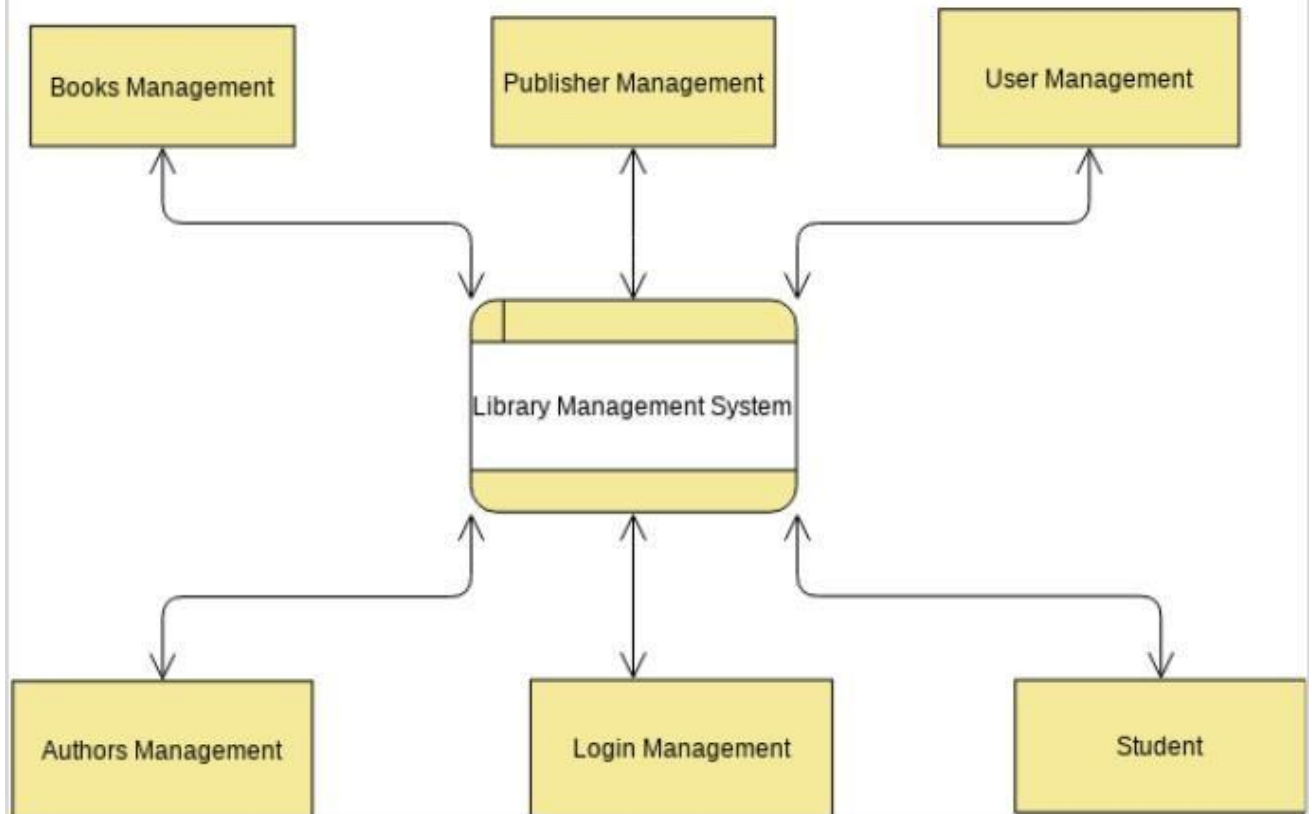
Reporting and Analytics Sequence Diagram \

System Administration Sequence Diagram

State Transaction Diagram

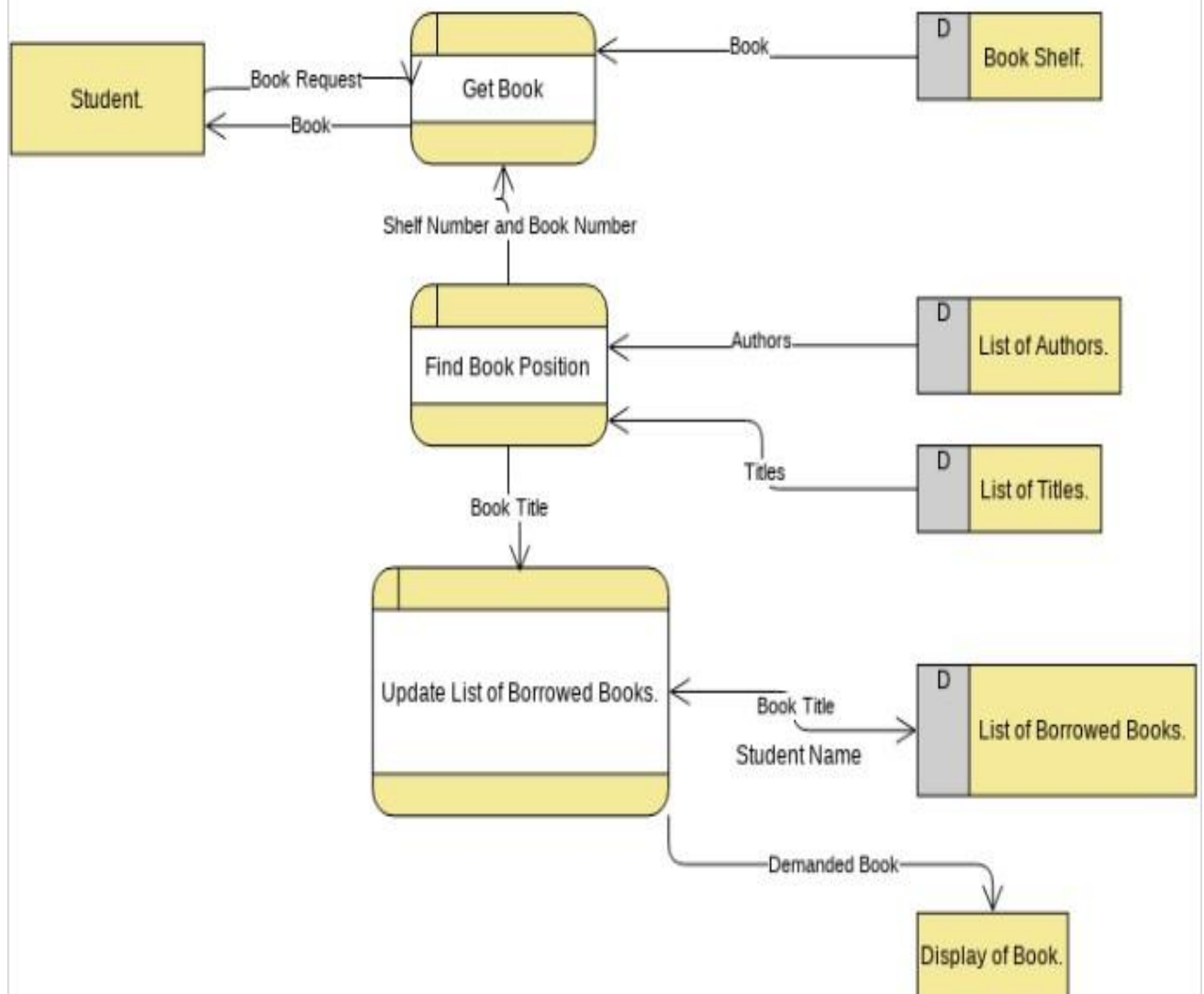
DFD Diagram Level 0

Data Flow Diagram for level 0 for Library Management System



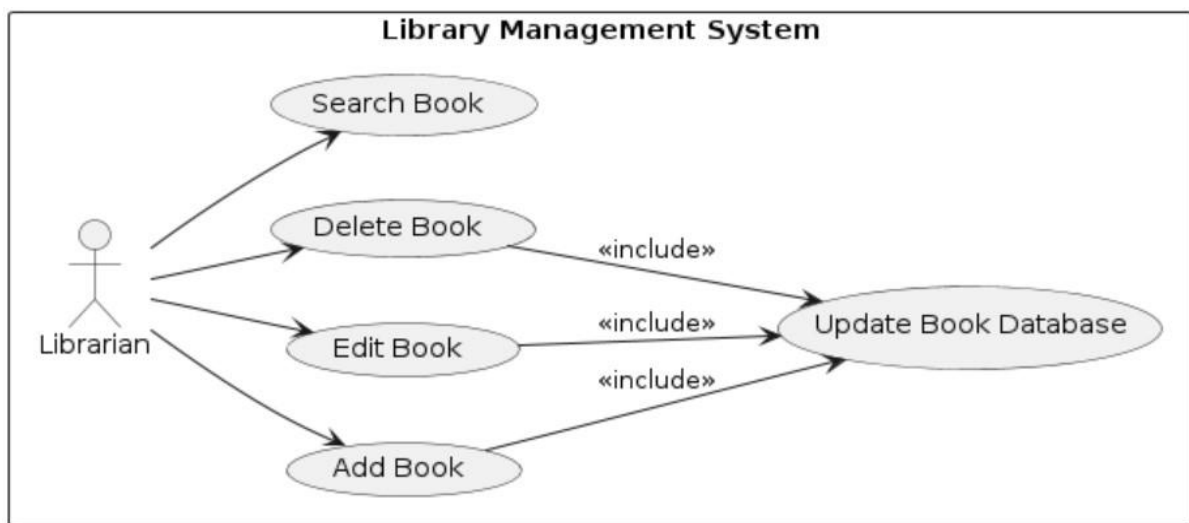
DFD Diagram Level 1

Data Flow Diagram at Level 1 for Library Management System.



DFD Diagram Level 2 and Level 3

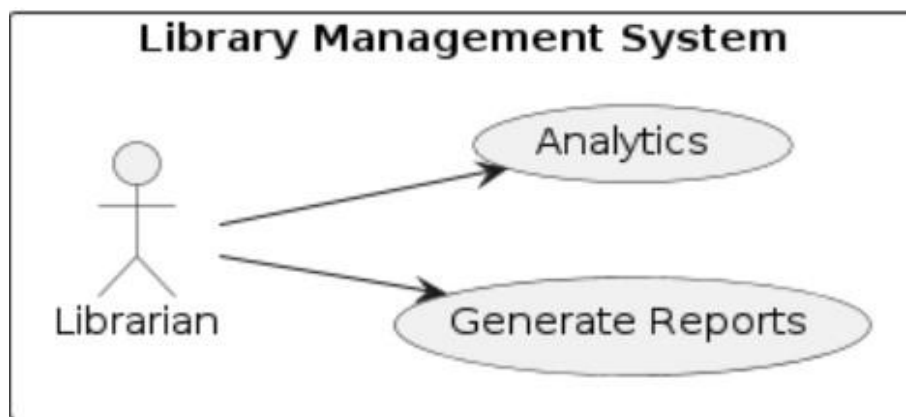
Use Cases



6.3 Borrowing and Returning



6.4 Reporting and Analytics



7. Software Testing

Test Case ID:	WA-01	QA Test Engineer:	Ghulam Qadir
Test case Version:	1.0	Reviewed By:	Dr. Arif
Test Date:	30-12-2024	Use Case Reference(s):	UC-1
Revision History:	No Previous History		
Objective:	Validate the functionality of managing user accounts within the library system, including registration, login, profile management (such as updating username and avatar), and managing contacts.		
Product/Ver/Module:	Library Management System		
Environment:	Web-based system		
Assumptions:	1. Users have appropriate permissions and access to manage user accounts. 2. The system is operational and accessible. 3. Test data for user accounts and contacts is available for testing.		
Pre-Requisite:	1. Users have access to the library management system.		
Step No.	Execution description	Procedure result	
01.	User registers a new account.	The system prompts the user to fill in required registration	
02.	User enters valid details for registration.	The user fills in the registration form with accurate and complete information	
03.	User logs in with the newly registered account.	The user enters their registered username and password in the login form.	
04.	User navigates to the profile management section.	The user clicks on the profile or settings option within the library management system interface. The system redirects the user to the profile management page or section	
Comments:			
	<input type="checkbox"/>	<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
			<input type="checkbox"/> Not Executed

Test Case ID:	WA-02	QA Test Engineer:	Noor Malik
Test case Version:	1.0	Reviewed By:	Dr. Arif
Test Date:	30-12-2024	Use Case Reference(s):	UC-2
Revision History:	No Previous History		
Objective:	Validate the functionality of managing books within the Library Management System, including adding, editing, and deleting books.		
Product/Ver/Module:	Library Management System		
Environment:	Web browser		
Assumptions:	1. Users have appropriate permissions and access. 2. The system is operational.		
	3. Test data for books is available.		
Pre-Requisite:	1. Users have access to the library management system		
Step No.	Execution description	Procedure result	
01.	User adds a new book to the system.	System prompts the user to fill in the details of the new book and adds it to the library. System allows the user to modify the book details and saves the changes. System removes the selected book from the library.	
02.	User edits the details of an existing book.		
03.	User deletes a book from the system.		
Comments:			
	<input type="checkbox"/>	<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
			<input type="checkbox"/> Not Executed

Test Case ID:	WA-03	QA Test Engineer:	Ghulam Qadir
Test case Version:	1.0	Reviewed By:	Dr. Arif
Test Date:	30-12-2024	Use Case Reference(s):	UC-3
Revision History:	No Previous History		
Objective:	Validate the functionality of borrowing and returning books within the Library Management System.		
Product/Ver/Module:	Library Management System		
Environment:	Web browser		
Assumptions:	1. Users have appropriate permissions and access. 2. The system is operational. 3. Test data for books and user accounts is available.		
Pre-Requisite:	1. Users have access to the library management system. 2. Books are available for borrowing.		
Step No.	Execution description	Procedure result	
01.	User borrows a book from the library.	System allows the user to select a book and borrow it.	
02.	User returns a borrowed book to the library.	System updates the book status to "returned" and removes it from the user's account.	
03.	User checks the status of borrowed books in their account.	System displays the list of borrowed books in the user's account.	
Comments:			
	<input type="checkbox"/>	Passed	<input type="checkbox"/> Failed <input type="checkbox"/> Not Executed

Test Case ID:		WA-04		QA Test Engineer:		Noor Malik	
Test case Version:		1.0		Reviewed By:		Dr. Arif	
Test Date:		30-12-2024		Use Case Reference(s):		UC-4	
Revision History:		No Previous History					
Objective:		Validate the functionality of requirements management and analytics features within the Library Management System.					
Product/Ver/Module:		Library Management System					
Environment:		Web browser					
Assumptions:		1. Users have appropriate permissions and access. 2. The system is operational. 3. Test data for requirements and analytics is available.					
Pre-Requisite:		1. Users have access to the library management system. 2. Requirements and analytics features are enabled.					
Step No.	Execution description				Procedure result		
01.	User creates a new requirement in the system.				System allows the user to input details and create a new requirement.		
02.	User updates an existing requirement in the system.				System updates the existing requirement with the user's modifications.		
03.	User views analytics data related to book borrowing trends.				System displays analytics data in graphical form.		
04.	User generates a report on the most borrowed books.				System generates a report listing the most borrowed books.		
05.	User analyzes the data to identify popular genres.				System presents analysis results highlighting popular genres.		
06.	User exports the analytics data for further analysis.				System allows the user to download the analytics data.		
07.	User deletes a requirement from the system.				System removes the deleted requirement from the system.		
Comments:							
				Passed		Failed	Not Executed

Test Case ID:		WA-05		QA Test Engineer:		Ghulam Qadir	
Test case Version:		1.0		Reviewed By:		Dr. Arif	
Test Date:		30-12-2024		Use Case Reference(s):		UC-5	
Revision History:		No Previous History					
Objective:		Validate the functionality of system administration features within the Library Management System.					
Product/Ver/Module:		Library Management System					
Environment:		Web browser					
Assumptions:		4. Users have appropriate permissions and access. 5. The system is operational. 6. Test data for system administration tasks is available.					
Pre-Requisite:		1. Users have access to the library management system. 2. System administration features are accessible.					
Step No.		Execution description				Procedure result	
01.		Admin creates a new user account i the 1 system.				System allows the admin to input user details and create a new user account.	
02.		Admin updates the permissions of a 1 existing user account.				System updates the permissions of the existing user account as per admin's modifications.	
03.		Admin monitors system 2 usag statistics.				System displays usage statistics in graphical form.	
04.		Admin configures system setting 3 related to borrowing limits.				System allows the admin to configure borrowing limits.	
05.		Admin generates a report on overdu 2 books.				System generates a report listing overdue books.	
06.		Admin exports user activity logs fo 1 auditing purposes.				System allows the admin to download user activity logs.	
07.		Admin deletes a user account fro the system.				System removes the deleted user account from the system.	
Comments:							
				Passed		Failed	Not Executed

8. Reference

Ref. No.	Document Title	Date of Release/ Publication	Document Source
PGBH01-2003-Proposal	Project Proposal	Sep 17, 2016	E:\Study\8th Semester\Capstone\Proposal
1	Research on Emergency Call and Location Tracking System with Enhanced Functionality for Android	Volume 3, Issue 5, May 2015	www.ijarcsms.com
2	Library Management System Using Android Application	Vol. 5 (3) , 2014, 2803-2805	www.ijcsit.com
3	Book Tracking Application-DOPE HUNT	Volume-4, Issue-ICCIN-2K14, March 2014	International Journal of Soft Computing and Engineering