

# Analysis and Design of a Library Management System



LITSELF

# Introduction

## Definition

Library Management is the systematic method of managing the whole library through a simple and interactive interface

## Functionality

Library Management Software keeps a track on all the books that are issued, returned and added to the library.

## Objective

LMS Software is important for an efficient, user-friendly, fast and secure library management be it a small size school library having limited users and books or a large size public library.



### **Book acquisition**

That is purchasing, cataloging, and processing books.



### **Book circulation and borrowing**



### *Book Management*



### **Cataloging and classification**

Organizing books by title, author, subjects, ISBN, etc.



### **Shelving and maintenance.**



### *Reports & Analytics*

# Part 1: Requirements Gathering

## Stakeholders Identification

- ❖ *Librarians (manage books and users)*
- ❖ *Patrons(Students/Members) (borrow/return books)*
- ❖ *Administrators (system maintenance and reporting)*

# Functional Requirements



- ❖ User authentication & roles
- ❖ Book search & cataloguing
- ❖ Borrowing & returning books
- ❖ Fine calculation for overdue books
- ❖ Reports generation

# Non-Functional Requirements

- ❖ Performance
- ❖ Security
- ❖ Usability
- ❖ Scalability



# Requirement Gathering Techniques



- ❖ Interviews with librarians and students
- ❖ Observation of library workflows



- ❖ Questionnaires for feedback
- ❖ Existing system analysis

## Part 2: Design

### Design Thinking

*The design thinking process for a library management system focuses on understanding the needs and pain points of the librarians, patrons and other stake holders, providing an efficient, effective and user-friendly experience.*



# Design Thinking Focus

## *Empathize*

- ❖ User Research
- ❖ Pain Points
- ❖ User Personas

## *Define*

- ❖ Problem Statement
- ❖ Design Principle
- ❖ System requirements

## *Ideate*

- ❖ Brainstorming
- ❖ Concept Development
- ❖ Prototyping

## *Prototype*

- ❖ Pilot Testing
- ❖ User feedback
- ❖ Evaluation Metrics

# System Design

## Use Case Diagram

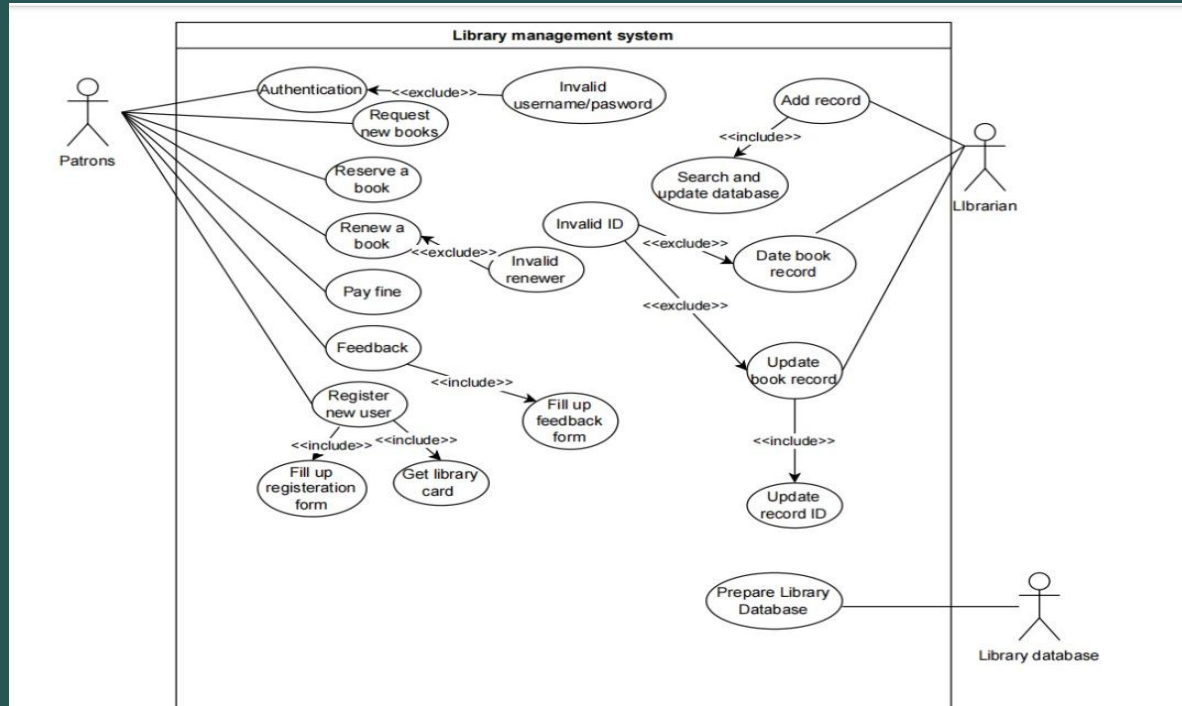
### Actors

- ❖ Librarian
- ❖ Patron (student/other member)
- ❖ Library Admin

### Use Cases

- ❖ Users borrowing/returning books
- ❖ Admin adding books
- ❖ Librarian managing users

# Use Case Diagram



# Entity-Relationship Diagram (ERD)



## Entities

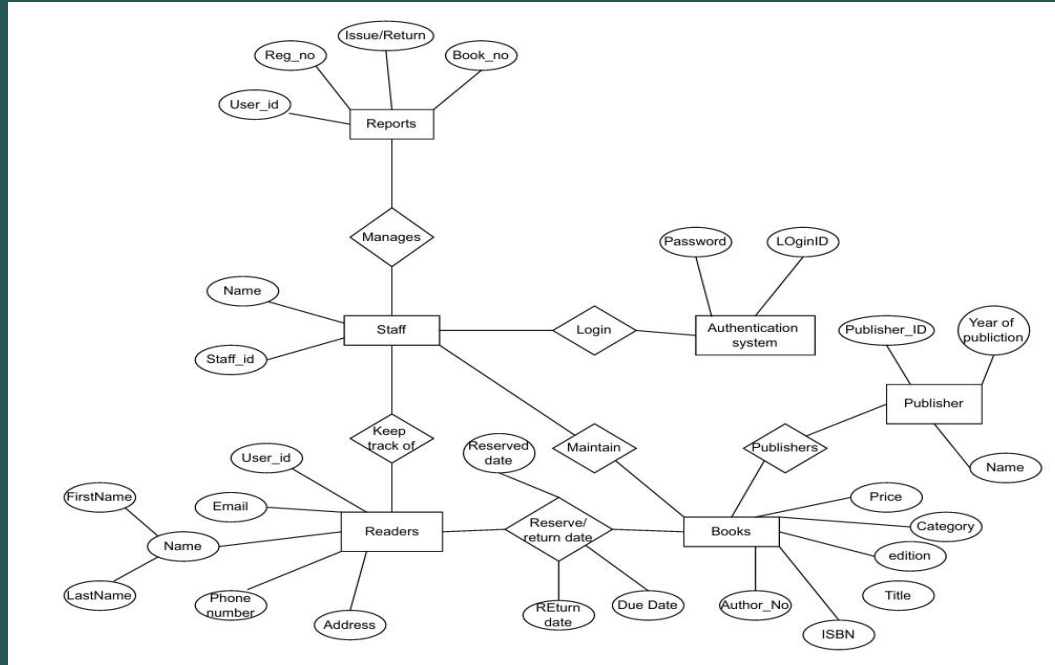
- ❖ Reports
- ❖ Staff
- ❖ Books
- ❖ Publisher
- ❖ Readers
- ❖ Authentication System



## Relationship

- ❖ Keep track of readers
- ❖ Manage staff
- ❖ Publish books
- ❖ Login
- ❖ Reserve/return date
- ❖ Maintain books

# Entity-Relationship Diagram (ERD)



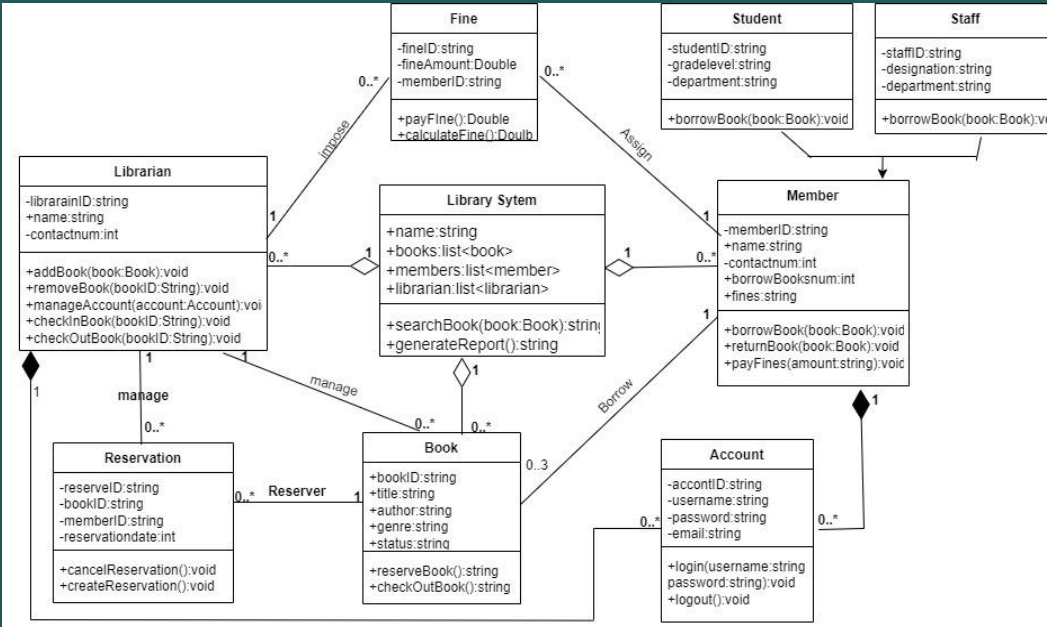
# Class Diagram

## Classes

- ❖ Librarian
- ❖ Book
- ❖ Account
- ❖ Reservation
- ❖ Member
- ❖ Library System



# Class Diagram



# Sequence Diagram

The sequence diagram of the library management system outlines the interactions between the different components of the system over time.

## Actors and Components

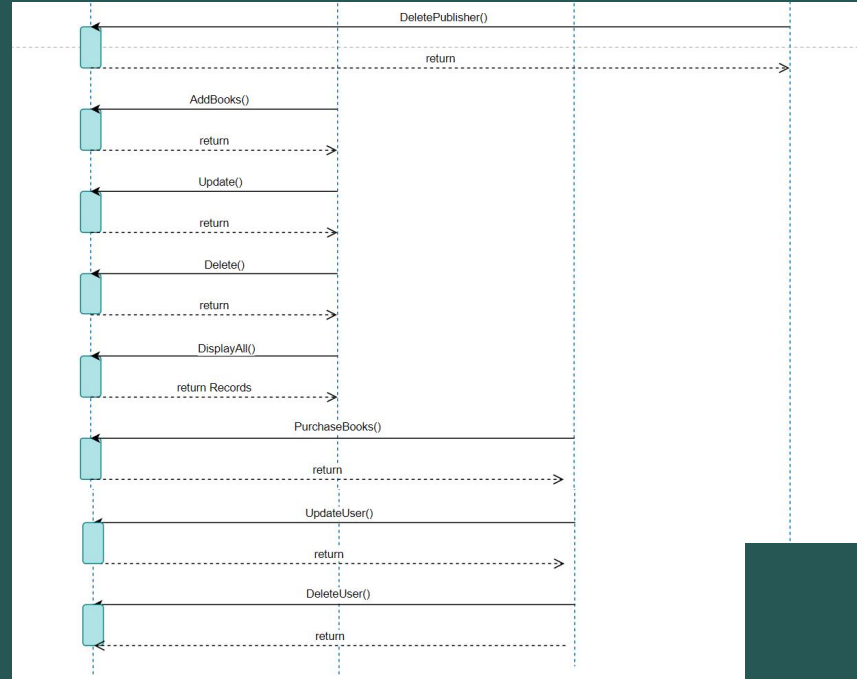
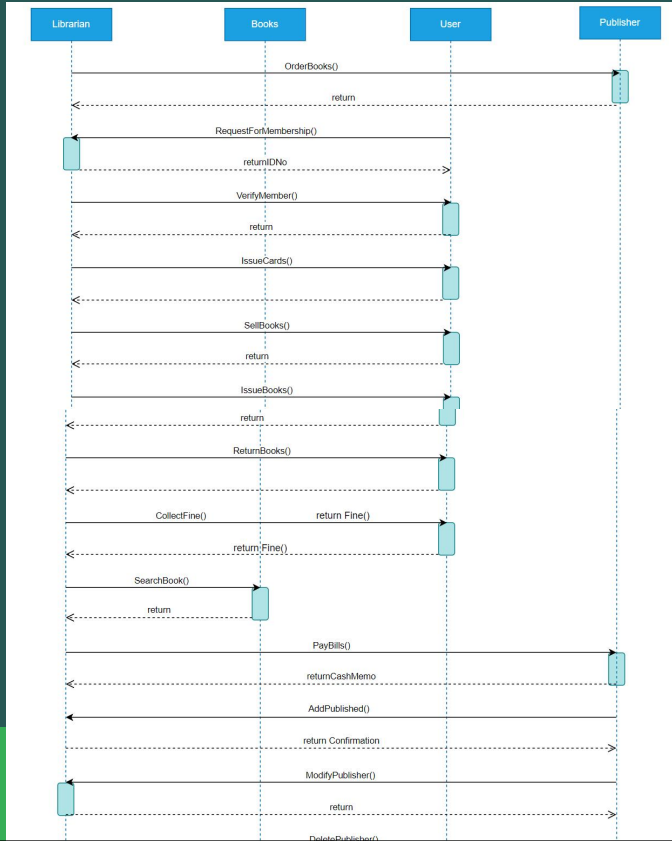
- ❖ Librarian
- ❖ Patron
- ❖ Librarian Management System
- ❖ Database

## Sequence of Events

- ❖ Book Cataloging
- ❖ Patron Registration
- ❖ Book Borrowing
- ❖ Book Returning



# Sequence Diagram



# UI/UX Design

## User Interface

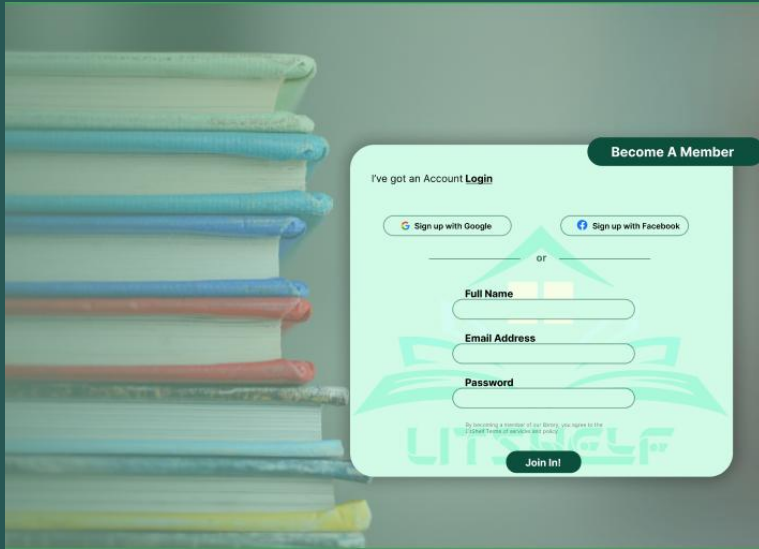
The library management system's UI design features a clean and intuitive layout.

## User Experience

Availability of features such as scroll bars and navigation panels enhance user experience through out the web application

# UI/UX Design

## User Sign Up Page



The sign-up page features a light green background with a stack of books on the left. A white rounded rectangle contains the form. At the top right is a dark green button labeled "Become A Member". The text "I've got an Account [Login](#)" is on the left. Below it are two buttons: "Sign up with Google" and "Sign up with Facebook", separated by "or". The form fields are "Full Name", "Email Address", and "Password", each with a small orange and yellow icon. At the bottom is a "Join In!" button. A faint "LITSHELFS" logo is visible in the background.

Become A Member

I've got an Account [Login](#)

[Sign up with Google](#) or [Sign up with Facebook](#)

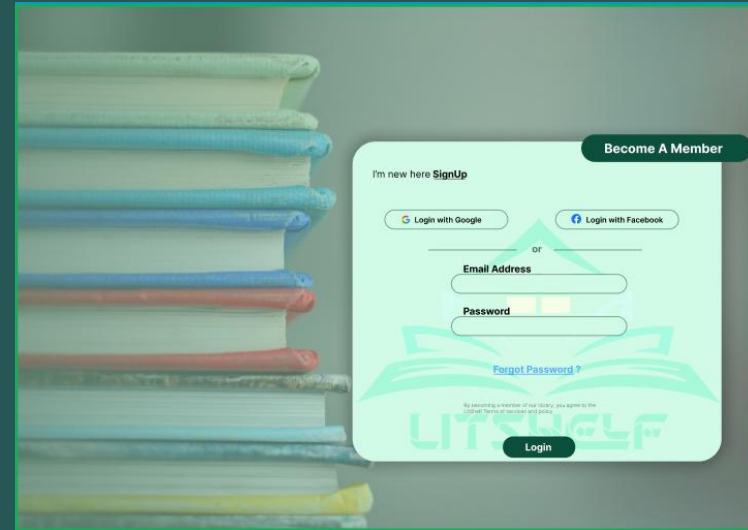
Full Name

Email Address

Password

[Join In!](#)

## User Login Page



The login page features a light green background with a stack of books on the left. A white rounded rectangle contains the form. At the top right is a dark green button labeled "Become A Member". The text "I'm new here [SignUp](#)" is on the left. Below it are two buttons: "Login with Google" and "Login with Facebook", separated by "or". The form fields are "Email Address" and "Password", each with a small orange and yellow icon. Below the password field is a link "Forgot Password?". At the bottom is a "Login" button. A faint "LITSHELFS" logo is visible in the background.

Become A Member

I'm new here [SignUp](#)

[Login with Google](#) or [Login with Facebook](#)

Email Address

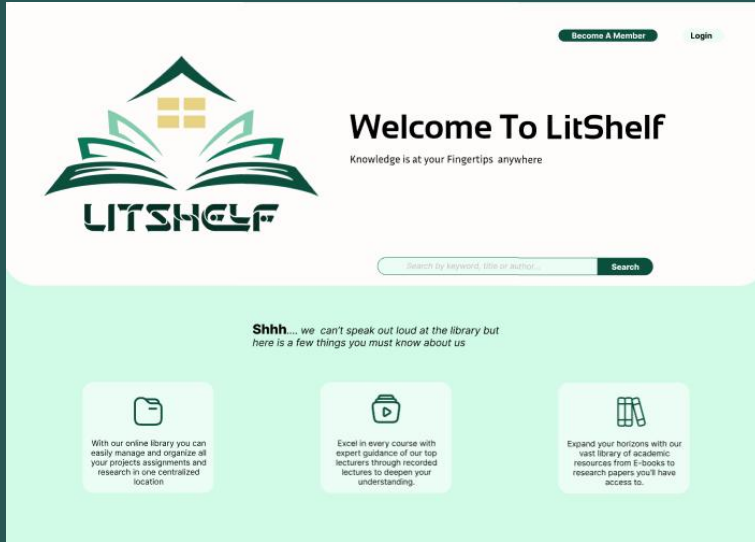
Password

[Forgot Password?](#)

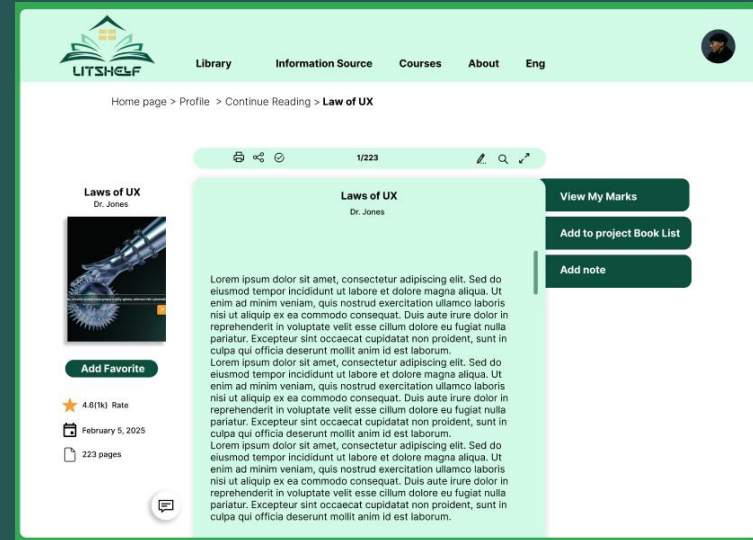
[Login](#)

# UI/UX Design

## User Home/Landing Page



## User Reading Page



# *Conclusion*

By implementing the propose library management system and continuous evaluating and refining it, the library can improve its serves, enhance the user experience, and better support the needs of the patrons