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**CERTIFICATE**

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## **ABSTRACT**

Library management system is a project which aims in developing a computerized system to maintain all the daily work of library. This project has many features which are generally not available in normal library management systems like user can login and issue, re-issue and return the book online. The librarian after logging into his account can generate various options such as insert new book, confirm issue book, re-issue book and return book. The librarian can also generate a report on number of issued book and on number of available books in the library. The system will also automatically generate a fine for the late return of the book. Overall this project of ours is being developed to help staff of library to maintain the library in the best way possible and also reduce the human efforts for all the users of visits library.

This document provides a detailed overview of our software product, its scope functionalities and limitations.

# Chapter 1

## Introduction

---

## **1.1 Problem Definition**

Nowadays people don't have much time to spend in library just to issue a book and return book, Many students visit library in their free time and it is very tedious for them to make a long queue and wait for their turn, so to maintain the efficiency and to save student's time this software helps them to issue a book online. Software also helps librarian to keep record of books and generate report.

## **1.2 Goal**

The main goal of this system is to save the time of students as well as library, and to allow librarian to update the books at any time and also keep various information of various books. Librarian can issue, re-issue book online. This system also generates fine for any late returns. User will be notified when he/she request for any particular book which is currently not available and later it is available.

## **1.3 Scope**

The software is compatible with PCs and mobile phones, but the requirements can be fulfilled within the budget of the project.

## **1.4 Features**

- Login and Registration.

- Classification of book category-wise

- Admin can update book and also maintain various information about book

- System provides different criteria for searching any particular book.

- User can issue and Re-issue book online.

- Automatic fine calculation for late returns.

- System also generates different kind of report as per user need.

- System also shows how many book allocated to any particular student.

- System also show status of any book.

- System also provide online access for registered user to show status of their book

- User will be notified when he/she request for any particular book which is currently not available and later it is available.



## **1.5 Technologies Used**

For the implementation, we have used php language and XAMPP server as our backend. In XAMPP server we have used MySQL Database, Which is very easy for developers to create a local web server for testing and deployment purpose.

For the front end development, we have used HTML, CSS, Materialized CSS, JavaScript and Bootstrap.

Development Tools used during complete implementation of the project is php, MySQL database, HTML, CSS, JavaScript, Bootstrap and Umlet.

### **1.5.1 Database:**

The system database consists of following tables with their intents:

- I. User: To store the details of the customer like name, email-id, mobile no, password, etc.
- II. Book: To store the information about the book like book-id, book name, author name, edition, category, quantity.
- III. RequestBook: To store the requests which made for issue, re-issue, return with request-id, user-id, book-id, request date, return date, reissue date.
- IV. IssueBook: To store the details of issue book with user-id and book details.

### **1.5.2 Front End Interface:**

There are 2 separate front end interfaces, one for each role of users that are: Librarian and Customer.

Librarian interface has contained home page to confirm issue, re-issue and return of the book. The interface also includes the page for the book management to do operations like add, update and delete. It also includes the report generation page.

Customer interface contained home page with navigation bar to find the book. The customer can view the books according to category and also see the book detailed description. Customer can request for the issue of the book and receive the mail. Additionally customer can update the profile and view the issued book.

### **1.5.3 Validations:**

- I. Validations are performed each time user (customer/librarian) tries to login to the portal with registered database.
- II. Also validations are performed during the request for the issue of the book to check the book is available in the library.

## Chapter 2

### Software Requirements Specification

---

## **2.1 Overall Description**

### **2.1.1 Product Perspective**

Library Management system software is used for people who don't have much time to spend in library just to search the book and wait to get the book , Many students visit library in their break time and it is very tedious for them to make a long queue and wait for their turn, so this software helps them to search the book online.

### **2.1.2 Product Functions**

This system has main function like login and sign up, search book online, issue book online , generate fine, manage book, generate report, notifying user.

### **2.1.3 User Classes and Characteristics**

This system can be used by the student, Faculty and Librarian. Student and Faculty can login, search the book and request it. Librarian can manage the stock of book, issue or re-issue book online and generate automatic fine for late returns. Librarian can also generate report and also notify the student and Faculty.

### **2.1.4 Operating Environment**

This system can work on the all latest system like windows, Linux etc. This system can also work with the chrome, Firefox, macOS, Microsoft edge Brower. This system cannot work with the internet explorer browser.

### **2.1.5 User Documentation**

There will be no user manuals, online helps or tutorials as it is made as simple as web beginners can also use it easily with best web GUI functionality.

### **2.1.6 Assumptions and Dependencies**

Each center user has account created and authenticated by admin. This website can be accessible by Library's intranet and other user can see details about Library . Each user has to first login itself to present him/her after entry in Library No user can share their username and password to each other.

## **2.2 Functional Requirements**

### **R1: User Management**

#### **R1.1 Sign Up:**

**Input:** name, mobile no, email-id, password

**Output:** Failure (edit details)/ Successful (redirect to login)

**Process:** verification of user accounts

**R1.2 Login:**

**Input:** username, password

**Output:** Successfully login/incorrect username or password

**Process:** validation

**R1.3 Forget password:**

**Input:** set new password, enter OTP

**Output:** password changed successfully

**Process:** send OTP, edit database.

**R1.4 Edit Profile:**

**Input:** details which user wants to edit

**Output:** edited successfully/invalid details

**Process:** update database

**R2: Book Management:****R2.1 Display book:**

**Input:** select category

**Output:** book displayed

**Process:** showing book in selected category

**R2.2 Select particular book:**

**Input:** information about book

**Output:** book not available/redirect to book issue

**Process:** checking for selected book in database

**R2.3 issue book**

**Input:** information about book and student/faculty

**Output:** notification (if book is out of stock)/issue\_id given to student/faculty

**Process:** update the database according to request

**R2.4 re-issue book**

**Input:** information about book and student/faculty

**Output:** book re-issued message

**Process:** re-issuing book

**R2.5 return book**

**Input:** information about book and student/faculty

**Output:** notification to other user who are waiting for book which is returned

**Process:** update the database according to request

**R2.6 Add/Remove book**

**Input:** Details about Books, Magazines, etc.

**Output:** report updating

**Process:** update the database

**R2.7 Search the book**

**Input:** Information about book

**Output:** display the book according to search criteria

**Process:** Fetching book from the database

**R2.8 Status of book**

**Input:** Information about book

**Output:** showing status of book

**Process:** processing from the database

**R2.9 Status of issued book**

**Input:** Name of book

**Output:** displaying various about issued book like return date, issue date , book details and fine(if applicable)

**Process:** Fetch the book details from database.

**R2.10 Confirm book issue or return by librarian**

**Input:** unique-id(provided by user)

**Output:** Success/Failure

**Process:** Update database.

**R3: Automatic-Fine Calculation Management:****R3.1 Verification of user account:**

**Input:** username, password

**Output:** verified/incorrect username or password

**Process:** validating information

**R3.2 Make Payment:**

**Input:** select payment mode, payment details

**Output:** successful message/failure message

**Process:** transaction

**R4: Report Management****R4.1 Generate report**

**Input:** report type (like total no. of books, no. of issued books etc.)

**Output:** Generating report

**Process:** Fetch data from database

**R4.2 Display Report:**

**Input:** select report

**Output:** report displayed

**Process:** showing report from selected category

## **2.3 Non-Functional Requirements**

### **2.3.1 Response time:**

The time elapsed between the request placed by user and request served by librarian is as less as possible.

### **2.3.2 Throughput**

This system is able to allow 300 users concurrently.

### **2.3.3 Scalability:**

The database scalability is large enough to respond to increasing number of similar queries concurrently.

### **2.3.4 Capacity:**

The capacity of the system is to respond 300 customers' requests at a time.

### **2.3.5 Portability:**

The software is portable; it can be installed in windows, Linux and macOS.

### **2.3.6 Availability:**

The availability of the software is on web in any platform.

### **2.3.7 Recoverability:**

The backup of the data is taken in hard-disk on the end of the day. So any time if failure occurs the previous data will not be lost and software is restored with backup.

### **2.3.8 Maintainability:**

The changes can be made easily by admin because design part and source code are not complex, to add functionality in this software quite easy task.

### **2.3.9 Security:**

In this software any modification is done by the admin only. So admin has the rights to access the source code.



### 3.1 Use Case Diagram:

A UML use case diagram is the primary form of system/software requirements for a new software program underdeveloped. Use cases specify the expected behavior (what), and not the exact method of making it happen (how). Use cases once specified can be denoted both textual and visual representation (such as UML). A key concept of use case modeling is that it helps us design a system from the end user's perspective. It is an effective technique for communicating system behaviour in the user's terms by specifying all externally visible system behavior.

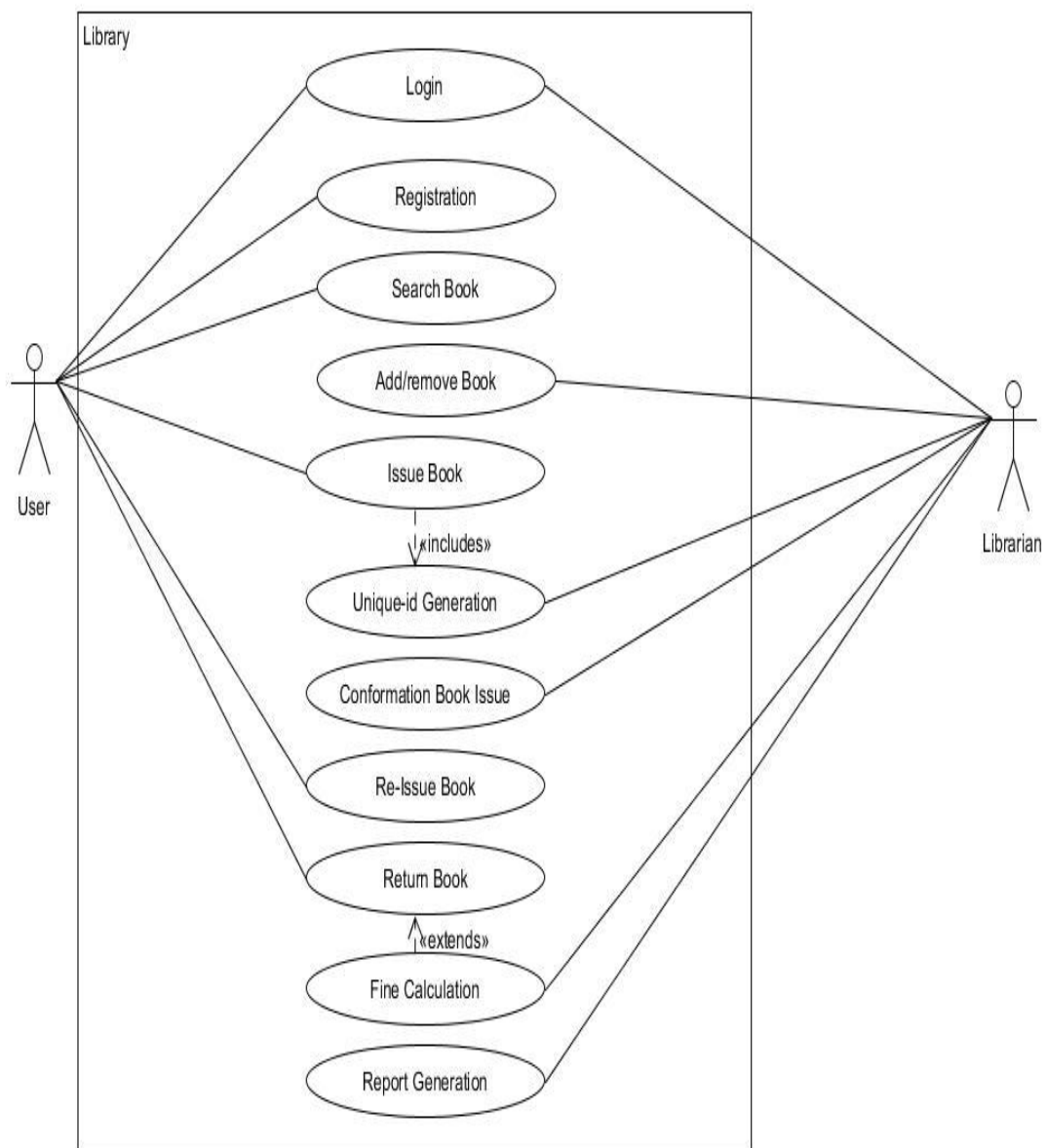


Figure 3.1 Use case Diagram



### 3.2 Sequence Diagram:

UML Sequence Diagrams are interaction diagrams that detail how operations are carried out. They capture the interaction between objects in the context of a collaboration. Sequence Diagrams are time focus and they show the order of the interaction visually by using the vertical axis of the diagram to represent time what messages are sent and when.

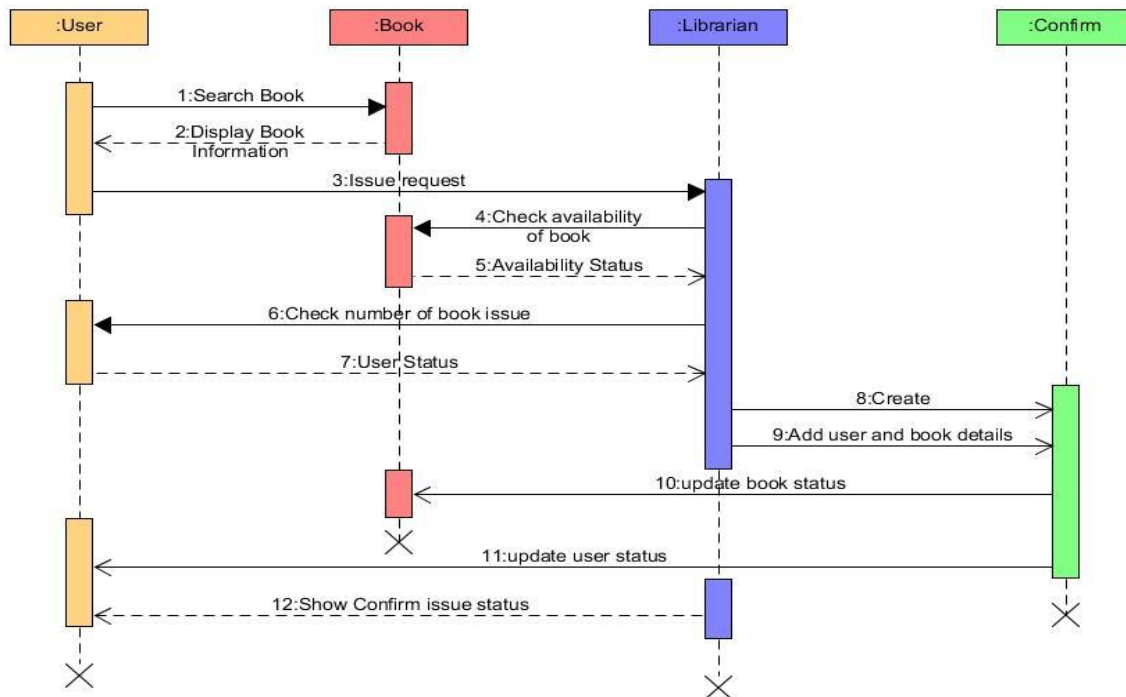


Figure 3.2 Sequence Diagram

### 3.3 Class Diagram:

In software engineering, a class diagram in the Unified Modelling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

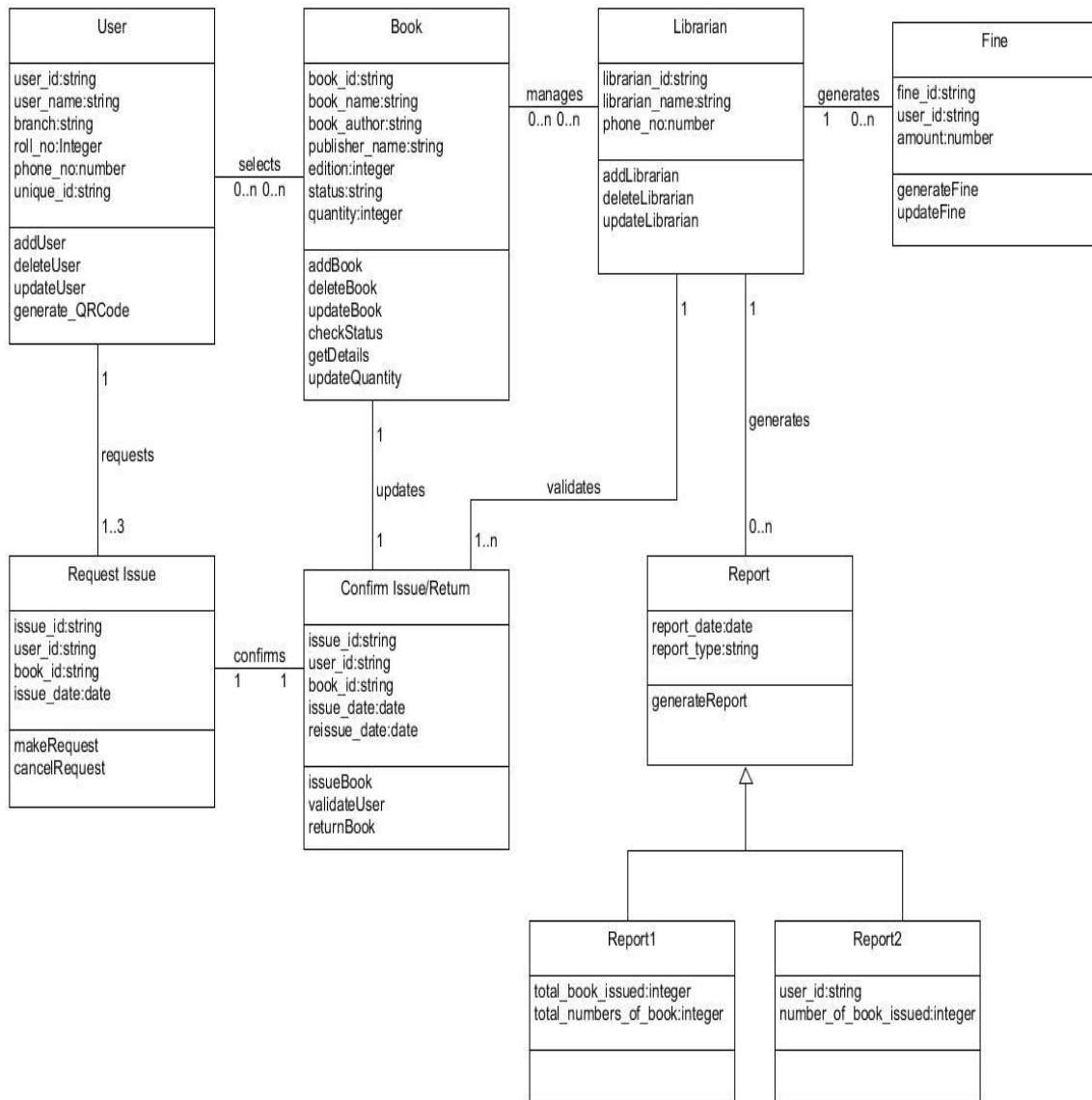


Figure 3.3 Class Diagram

### 3.4 Activity Diagram:

An activity diagram is another important behavioral diagram in UML diagram to describe dynamic aspects of the system. An activity diagram is essentially an advanced version of the flow chart that modeling the flow from one activity to another activity.

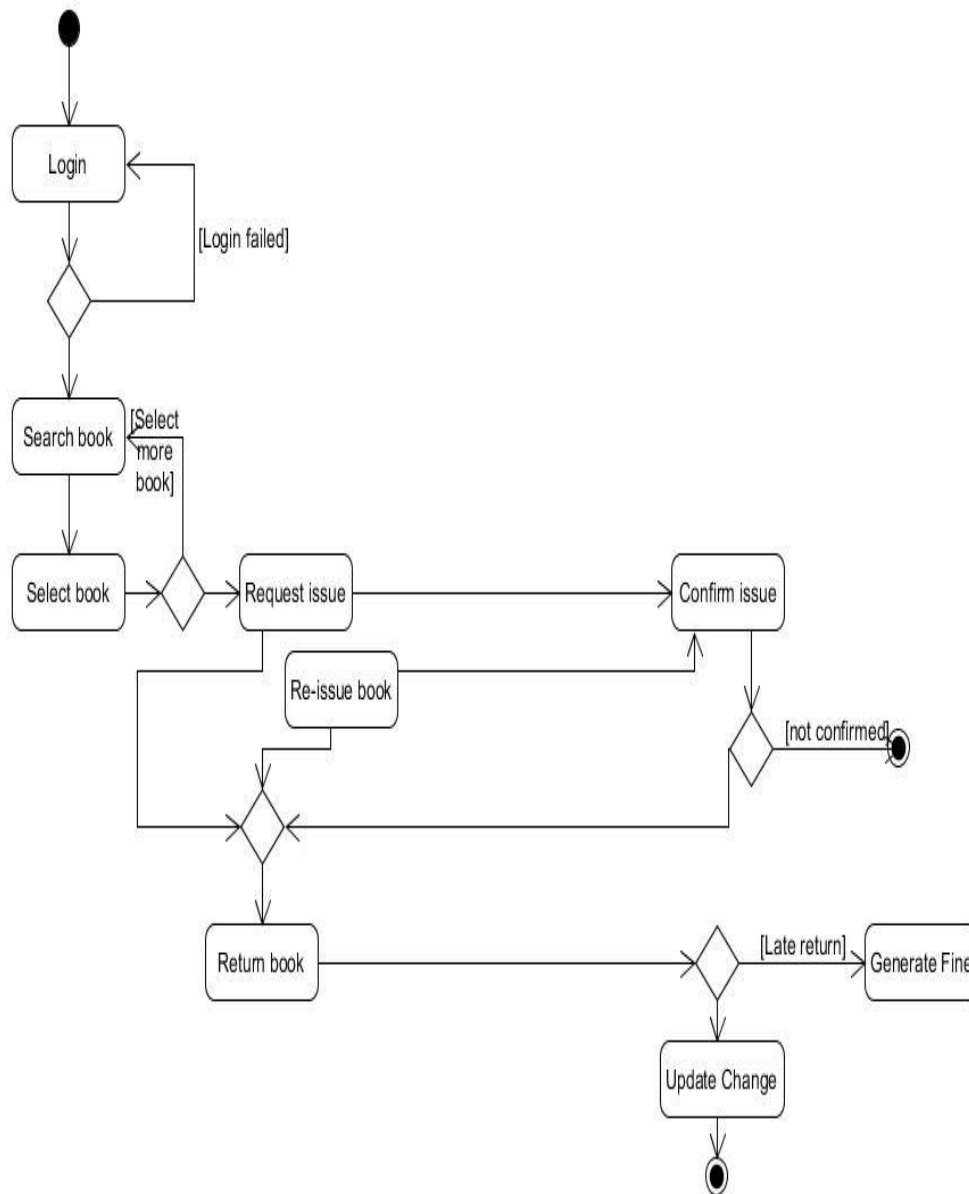


Figure 3.4 Activity Diagram

### 3.5 State Diagram:

The behaviour of an entity is not only a direct consequence of its inputs, but it also depends on its preceding state. The past history of an entity can best be modelled by a finite state machine diagram or traditionally called automata. UML State Machine Diagrams (or sometimes referred to as state diagram, state machine or state chart) show the different states of an entity. State machine diagrams can also show how an entity responds to various events by changing from one state to another. State machine diagram is a UML diagram used to model the dynamic nature of a system.

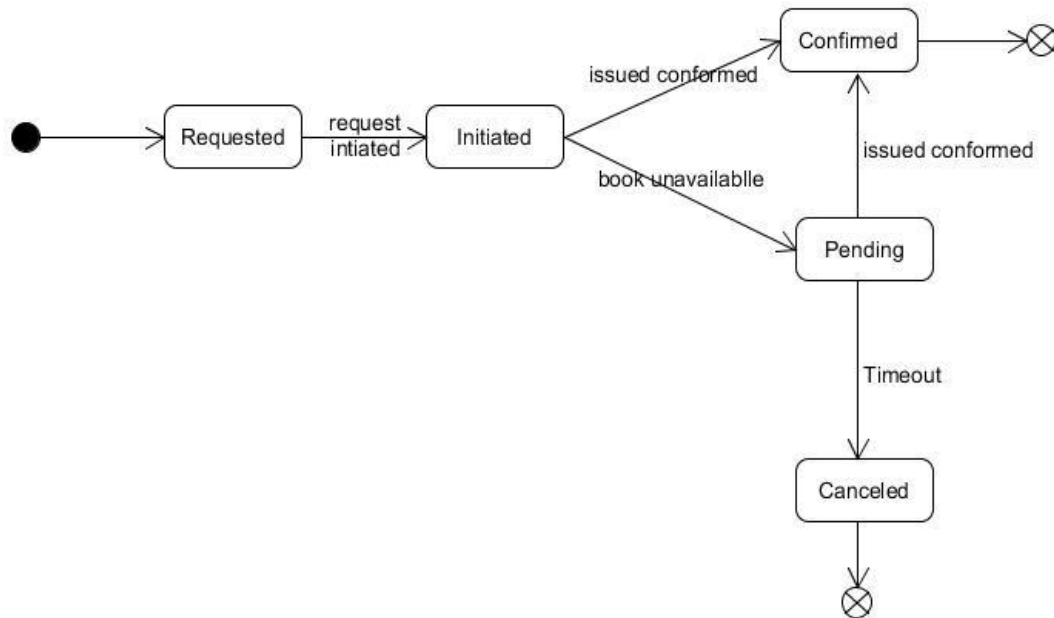


Figure 3.5.1 State Diagram for Issue Object

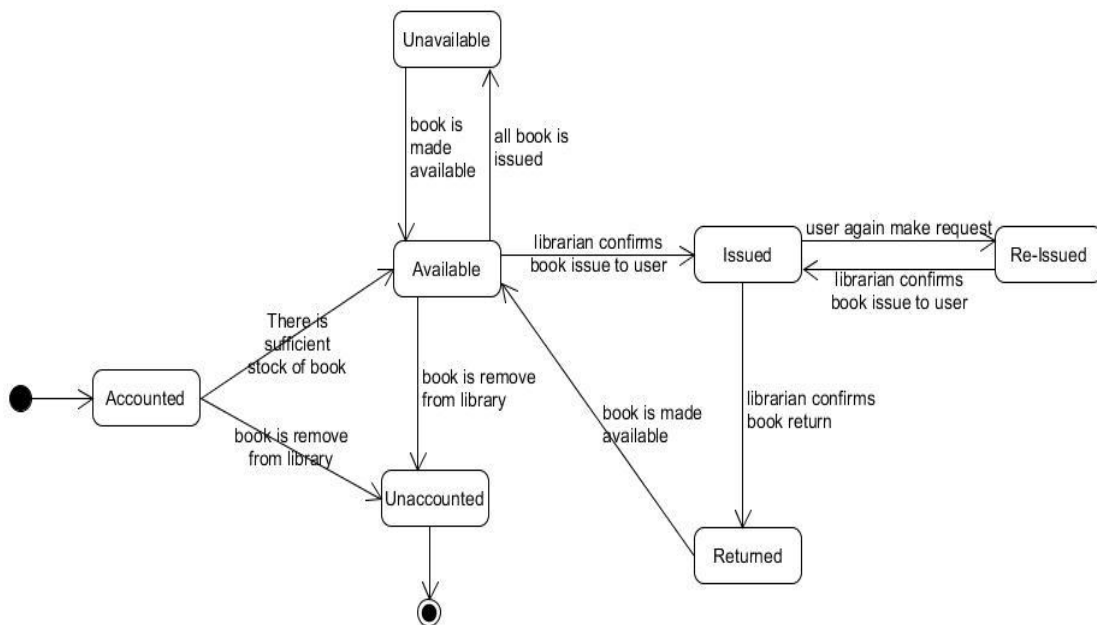


Figure 3.5.2 State Diagram for Book Object

## Chapter 4

### Implementation Detail

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#### **4.1 Sign-Up/Log-In Module**

It is used to store information of users who are new to the system for the first time. It also authenticates the users before they can explore various auctions listed in the system.

**Input:** User's information or credentials

**Output:** Stored or verified successfully

**Processing:** Check user's credentials in the database while logging in or store them in the database while registering a new user.

#### **4.2 Book Module**

This module comes into picture when librarian wants to add or remove the book or the customer wants to search the book or wants to view the particular book.

**Input:** Book's information

**Output:** Stored successfully or Book details

**Processing:** Check the searched book is available or not and if available show details or stored/delete the book from the database.

#### **4.3 Request Book Module**

This module comes into picture when customer online request for the issue, re-issue or return of the book or librarian wants to confirm the issue, re-issue or return of the book.

**Input:** Book and User information

**Output:** Generated unique request-id

**Processing:** Check the book's availability and generate unique request-id and also update the database and on confirming issue or return update the database.

#### **4.4 Fine Calculation Module**

This module comes into action in case of late return of the book. Whenever the customer return the book late then it will automatically calculate the fine.

**Input:** Return request-id

**Output:** Total fine to be paid.

**Processing:** It will calculate the fine with the help of number of late return days.

#### **4.5 Report Module**

This module comes into action when the librarian wants to know the number of issued books or the number of book issued by particular student at that time librarian will generate report.

**Input:** Report type

**Output:** Generated report

**Processing:** The system will take the information from the database and will generate the report which is asked.





<b>Test Case ID</b>	<b>Test Scenario</b>	<b>Test Steps</b>	<b>Test Data</b>	<b>Expected Results</b>	<b>Pass or Fail</b>
T01	Register with valid data	Provides correct information in the form	User information	Stored Successfully	Pass
T02	Register with no data	Provides no information in the form	No information	Error message	Pass
T03	Register with invalid details	Provides incorrect information in the form	User information	Error message	Pass
T04	Login with valid data	Provides correct information	Login Credentials.	User Logged in.	Pass
T05	Login with no data	Provides no information	No Data	Error message	Pass
T06	Login with invalid details	Provides incorrect information	Login Credentials.	Error message	Pass
T07	Edit profile with valid data	Provides correct information	User information	Stored Successfully	Pass
T08	Edit profile with invalid data	Provides incorrect information	User information	Error message	Pass
T09	Edit profile with no data	Provides no information	No Data	Error message	Pass
T10	Request a book which is available	Provide correct information	Book information	Request-id generation	Pass
T11	Request a book which is not available	Provide correct information	Book information	Error Message	Pass
T12	Enter valid request-id	Provide correct information	Request-id	Success Message	Pass
T13	Enter invalid request-id	Provide incorrect information	Request-id	Error Message	Pass

T14	Enter no data in request-id field	Provide no information	No data	Error Message	Pass
T15	Select the category	Select category from the list	Category name	Show all the books of that category	Pass
T16	Issue of book within 7 days from request	Provide correct request-id	Provide correct information	Successful issue	Pass
T17	Issue of book after 7 days from request	Provide correct request-id	Request-id	Error Message	Pass
T18	Re-issue of book within 30 days from issue	Provide correct request-id	Request-id	Successful Re-issue	Pass
T19	Re-issue of book after 30 days from issue	Provide correct request-id	Request-id	Error Message	Pass
T20	Return of book within 30 days from issue	Provide correct request-id	Request-id	Successful Return	Pass
T21	Return of book after 30 days from issue	Provide correct request-id	Request-id	Show calculated fine	Pass
T22	Report Generation	Provide correct information	User information or Book information	Show the generated report	Pass

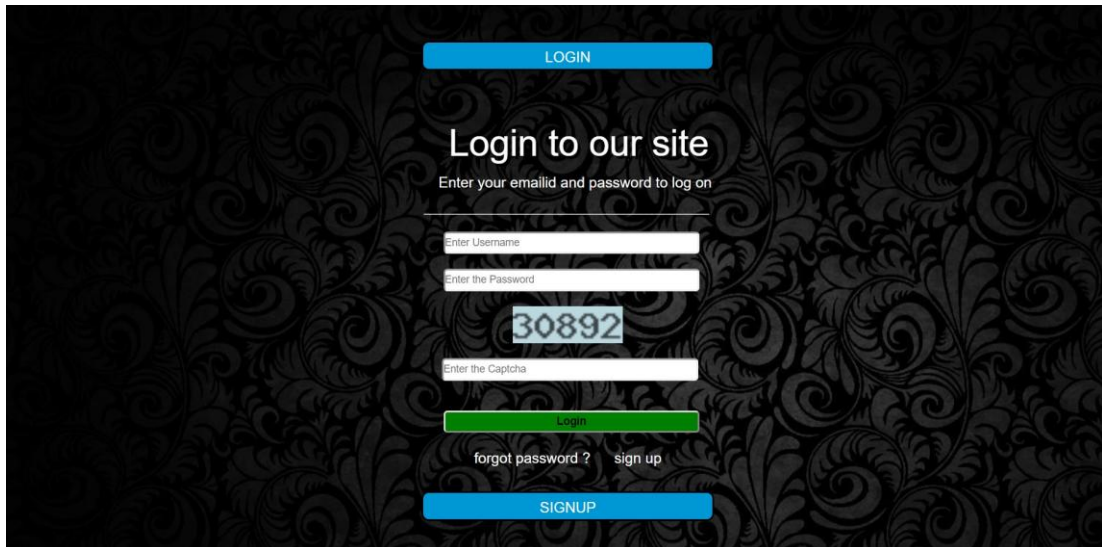
## Chapter 6

Screen Snapshot

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## 6.1 Login Page

This is login page, where the user provides credentials in order to authenticate in the system. User enter Username and password and based on this user is authenticated.

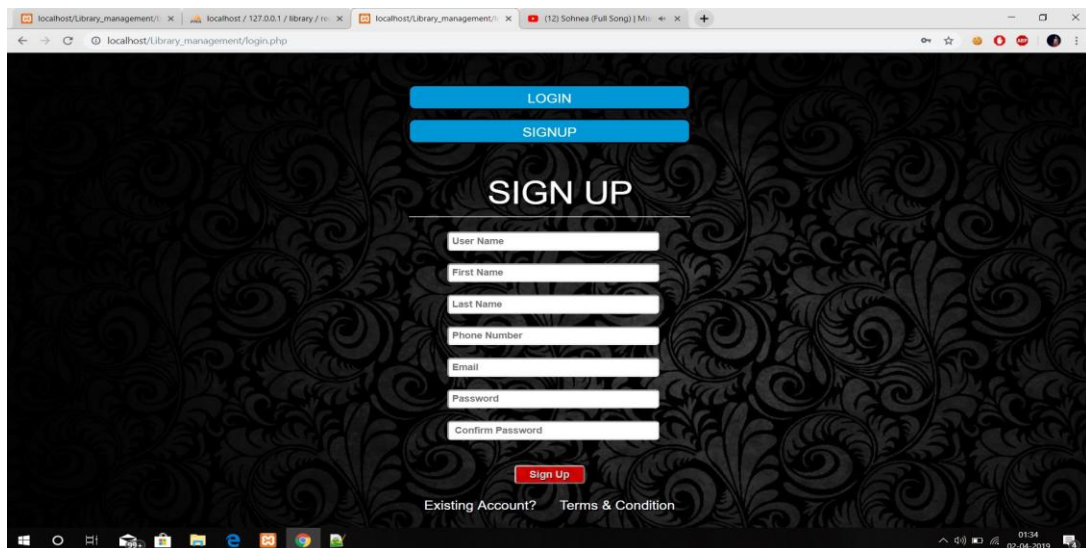


The screenshot shows a login page with a dark, ornate background. At the top, there is a blue button labeled "LOGIN". Below it, the text "Login to our site" is displayed, followed by the instruction "Enter your emailid and password to log on". There are three input fields: "Enter Username", "Enter the Password", and "Enter the Captcha". The captcha image shows the number "30892". Below the captcha field is a green button labeled "Login". Underneath the "Login" button are two links: "forgot password ?" and "sign up". At the bottom, there is a blue button labeled "SIGNUP".

Figure 6.1 Login Page

## 6.2 Sign Up Page

This is signup page for our site, here user provide their information and their password. During process of signing up entry in database is made.



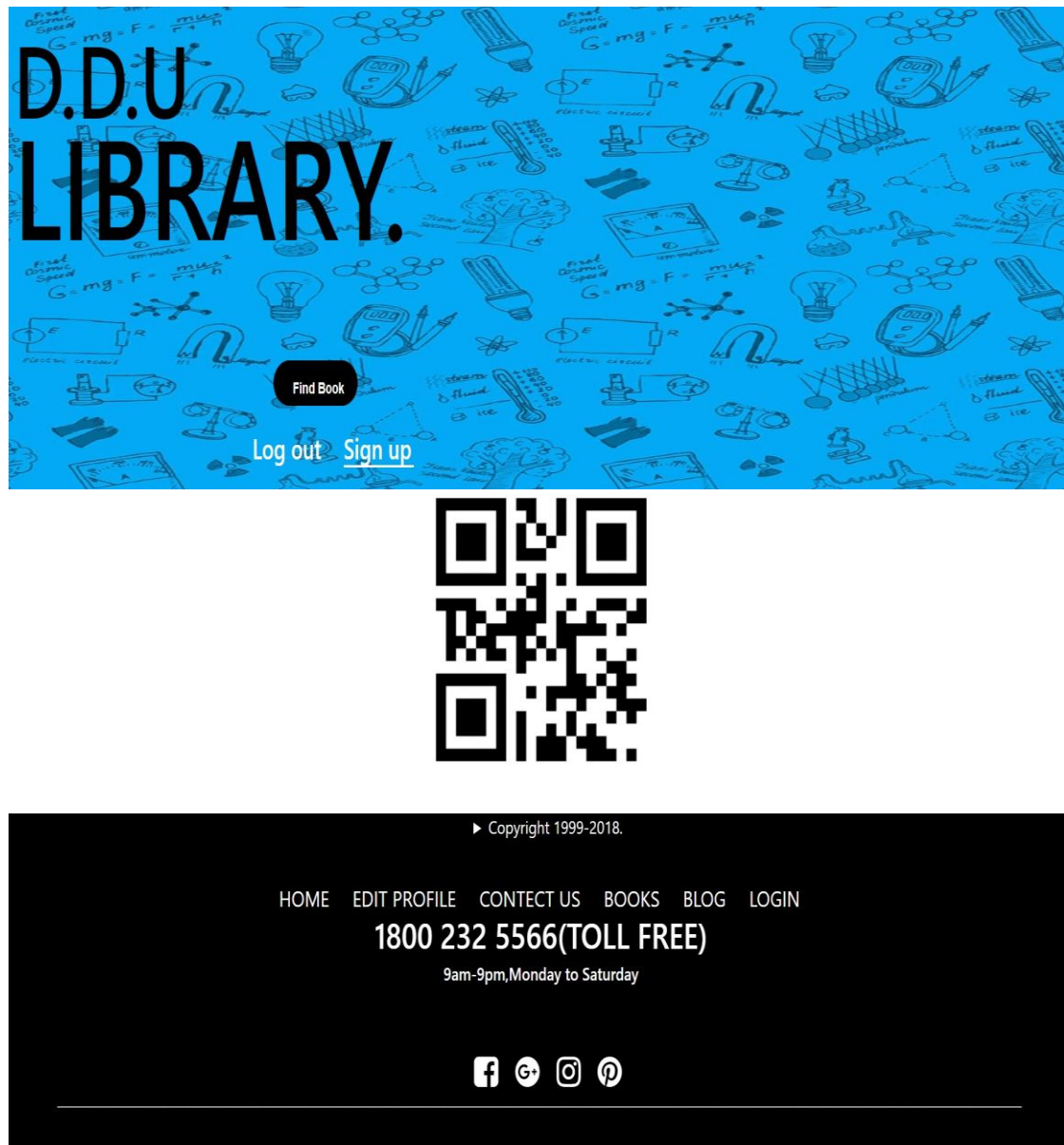
The screenshot shows a sign-up page with a dark, ornate background. At the top, there are two blue buttons labeled "LOGIN" and "SIGNUP". Below them, the text "SIGN UP" is displayed. There are six input fields: "User Name", "First Name", "Last Name", "Phone Number", "Email", and "Password". Below the "Password" field is a "Confirm Password" field. At the bottom of the form is a red button labeled "Sign Up". Below the "Sign Up" button are two links: "Existing Account?" and "Terms & Condition". The browser's address bar shows the URL "localhost/library\_management/login.php".

Figure 6.2 Sign Up Page

### 6.3 Home Page

This is home page of this system. This page also allows logged in user to search for a book. This page has log out and Signup link.

Figure 6.3 Home Page



## 6.4 Category page

This Is Category page for the system .This page shows the list of books based on the Category of the Department.

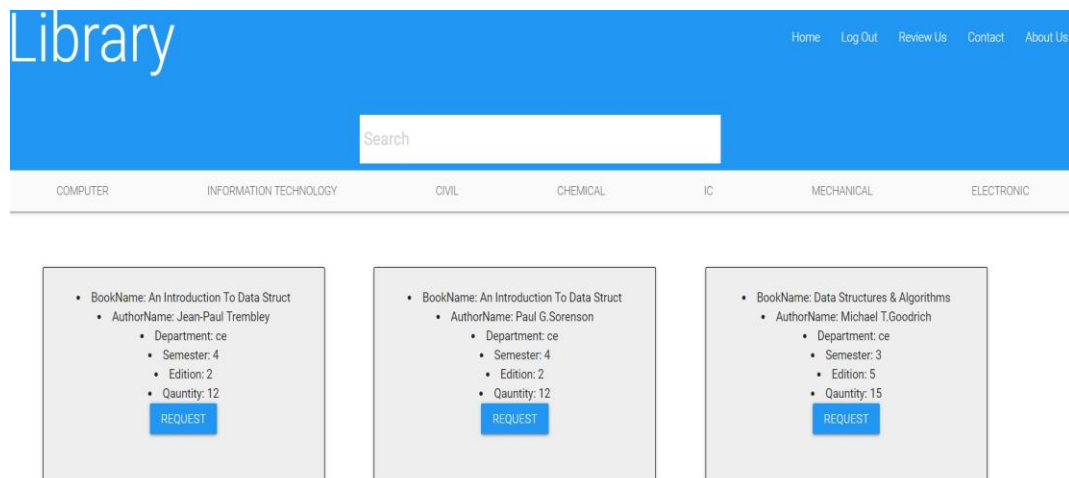
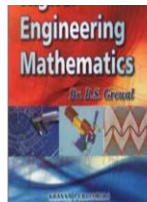


Figure 6.4 Category Page

## 6.5 Book Information Page

This page shows detail information about book, and also allow user to request for the book.



BookName: Higher Engineering  
Mathematics

AuthorName: Dr.B.S.Grewal

Department: ce

Semester: 1

Edition: 42

Qauntity: 49

REQUEST

Figure 6.5 Book Information Page

## 6.6 Update Profile Page

This page is used to update user profile.

### Profiel aanpassen

#### Personal info

Username  
DIVYANGK  
it is not possible to change your username.

Firstname  
first name

Lastname  
last name

Email  
abc123@gmail.com

Phone number  
phonenumber

#### Change password

Password\*

Repeat password\*

[Update Profile](#) [Home](#)

Figure 6.6 Update Profile Page

## 6.7 Home Page(Liberian side)

This page shoes entire admin side. This page have add, delete, update button.

Enter the requestid

[ISSUE](#) [RE-ISSUE](#) [SUBMIT](#)

[Add Book](#)

[Delete Book](#)

[Update Book](#)

[Available Books](#)

[Issued Books](#)

[SEARCH BY USER NAME](#)

[SEARCH BY FIRST NAME](#)

[DELETE REQUEST](#)

[SEARCH BY BOOK NAME](#)

[SEARCH BY AUTHOR NAME](#)

Figure 6.7 Home Page(Liberian side)

## 6.8 Available Book List

This page shows the book availability. This page shows the quantity of the book available.

### Available Books List

Total Available Books:409

Book id	Book Name	Author Name	Department	Semester	Edition	Quantity
5c973af7f1e9e	An Introduction To Data Struct	Jean-Paul Trembley	ce	4	2	12
5c973b3035d54	An Introduction To Data Struct	Paul G.Sorenson	ce	4	2	12
5c973b6a288f	Data Structures & Algorithms	Michael T.Goodrich	ce	3	5	15
5c973c4638ed2	Database System Concepts	Henry F.Korth	ce	6	6	14
5c973c7e10712	Database System Concepts	S.Sudarshan	ce	6	6	17
5c973cc9d98f1	Higher Engineering Mathematics	Dr.B.S.Grewal	ce	1	42	48
5c973d205d997	Core Java	Cay S.Horstmann	ce	4	9	25
5c973d4ec2091	Core Java	Gary Cornell	ce	4	9	25
5c973d97b0de6	Digital Logic and Computer Des	M.Moris Mano	ce	3	5	27
5c973e18411ce	Object-Oriented Programming in	Robert Lafore	it	5	6	25
5c973e7c7b595	Elements Of Discrete Mathemati	C.L.Liu	it	6	5	12
5c973ee4b1e89	Modern Digital and Analog Comm	B.P.Lathi	it	4	3	32
5c973lead3e36	Organic Chemistry	P.L.Soni	ch	4	7	11
5c97423564b05	Shreve Chemical Process Indust	George T.Austin	ch	6	7	12
5c97426ef2a67	Theory Of Machines	S S Rattan	ch	6	3	16
5c9742bb90bcc	Machine Design	J.K.Gupta	ch	5	2	19
5c9742fc12309	Physical Chemistry	Arun Bahi	ch	4	6	63

Figure 6.8 Available Book List Page

## 6.9 Issued Book Report Page

This shows the book issued to user.

### Issued Book by Library

Sort by: username

Username	First Name	Last Name	Book Name	Edition
DIVYANGK	DIVYANG	CHODVADIYA	Database System Concepts	6
PURVIL	purvil	patel	Database System Concepts	6

Figure 6.9 Issued Book Report Page



## Chapter 7

### Conclusion and Future Extensions

---

### **7.1 Conclusion:**

This system is useful for users to issue, re-issue or return the book online. Moreover the system will help librarian to add or update book and confirm the book issue, re-issue and return of the book. In addition to that, the system helps librarian to generate report of book issued and currently available books in the library.

### **7.2 Future Extension:**

This project can be extended by,

- Developing a separate android application for librarian, so they can directly scan the QR-code and confirm issue, re-issue or return.
- Adding the feature for sending unique QR-code instead of sending request-id through email.