Software Requirements Specification

for

ONLINE LIBRARY MANAGEMENT SYSTEM

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References:
https://github.com/hinjorr/SE-project

1. Introduction

1.1 Purpose

The purpose of the project is to maintain the details of books and library members of different libraries. The main purpose of this project is to maintain a easy circulation system between clients and the libraries, to issue books using single library card, also to search and reserve any book from different available libraries and to maintain details about the user (fine, address, phone number).Moreover, the user can check all these features from their home.

1.2 Scope

Manually updating the library system into an android based application so that the user can know the details of the books available and maximum limit on borrowing from their computer and also through their phones. The ILM System provides information's like details of the books, insertion of new books, deletion of lost books, limitation on issuing books, fine on keeping a book more than one month from the issued date. Also user can provide feedback for adding some new books to the library.

1.3 Definitions, Acronyms, and Abbreviations.

1. JAVA -> platform independence
2. SQL -> Structured query Language
3. DFD -> Data Flow Diagram
4. CFD -> Context Flow Diagram
5. ER -> Entity Relationship
6. IDE -> Integrated Development Environment
7. SRS -> Software Requirement Specification

1.5 Overview

Chapter 2 of the SRS is a brief description of the characteristics of the software to be built, its functions, its users, its constraints and its dependencies.

Chapter 3 is about specific requirements, such as functional requirements, external interface requirements, performance requirements, and also design constraints and quality characteristics.

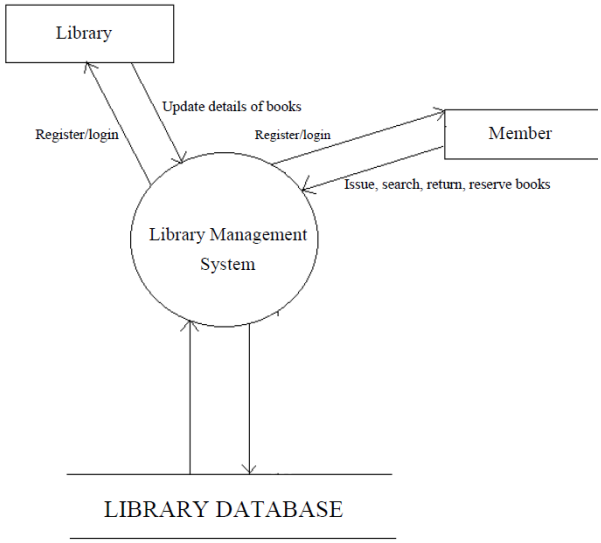
Finally, chapter 4 includes all the supporting information, such as the Table of Contents, the Appendices, and the Index.

2. The General Description

2.1 Product Perspective

• The Online Library System is a package to be used by Libraries to improve the efficiency of Librarians and Users. • The Online Library System to be developed benefits greatly the members and the Librarian of University. • The system provides books catalog and information to members and helps them decide on the books to borrow from the library. • The Librarian can keep the books catalog updated all the time so that the members (students and the professors) get the updated information all the time.

Figure 2.1 Overview/Architecture Diagram of the ARRS



Functions of System Components:

- Computer System.
- **Networking** Device.
- Software.
- Database.
- Server.

External Interfaces:

The software provides good graphical interface for the user and the administrator can operate on the system, performing the required task such as create, update, viewing the details of the book.

- It allows user to view quick reports like Book Issued/Returned in between particular time.

- § It provides stock verification and search facility based on different criteria.
- § The user interface must be customizable by the administrator
- § All the modules provided with the software must fit into this graphical user interface and accomplish to the standard defined

2.2 Product Functions

• The Online Library System provides online real time information about the books available in the Library and the user information.

• The Product functions are more or less the same as described in the product perspective. The functions of the system include the system providing different type of services based on the type of users [Member/Librarian].

• The member should be provided with the updated information about the books catalog.

• Provisions for the members to borrow the books they want, if all the other required rules hold good.

• The member is given a provision to check his account information and change the account information any time in the given valid period.

• The members should be allowed to see the status of the books/journals borrowed/reserved by him and the respective due dates and other relevant details.

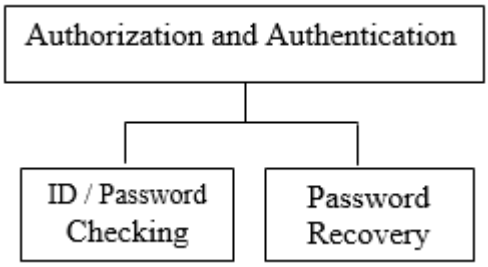
• The members should be able to place requests for purchasing new books to the library, by giving details about the name of the book, name of the author, publisher.

• The librarian is provided with interfaces to add/delete the books available in the book catalog

2.2.2 Function Descriptions (Functional Requirement Listings)

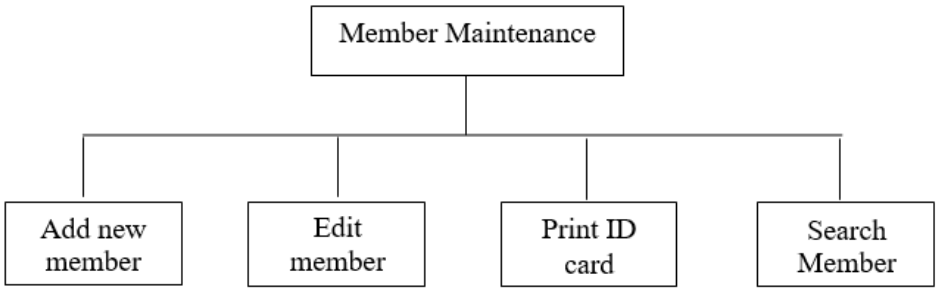
2.2.2.1 Log In Function

This module is used by user which means librarian in the library. They need to login to the system using their id and password. In order to distinguish the user's level, user can access to different module when successfully login. For example, only admin level users are able to access the report module.



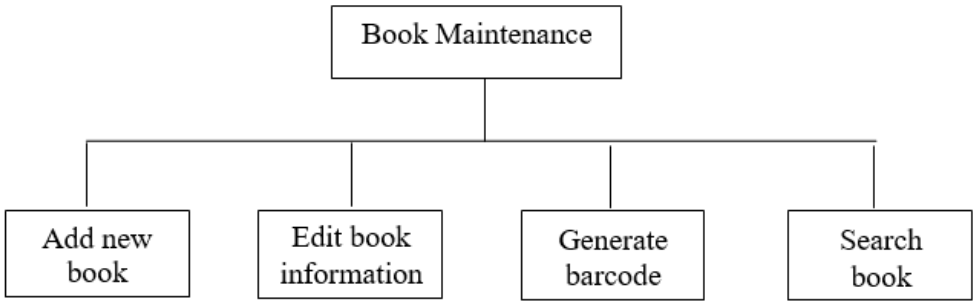
- **2.2.2 Module 1: Member Maintenance Module**

This module can be accessed by either librarian or library admin to maintain member's profile or record such as search, add, edit and print ID card.



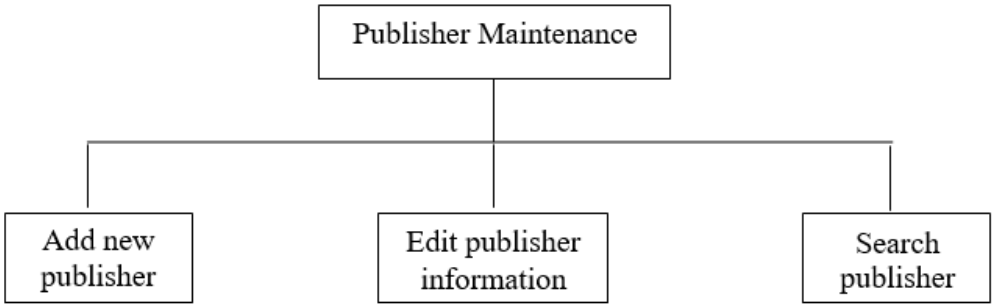
- 2.2.3 Module 2: **Book Maintenance Module**

Book Module can access by any user from all levels. This module can used to maintain the book inventory record such as search, add and edit. In addition, we can generate the barcode for particular book and print it out so that librarian can stick the barcode on the book cover.



➢ 2.2.4 Module 3: **Publisher Maintenance Module**

This module allows user to add and edit the book's publisher. Publisher is used when register a new book.

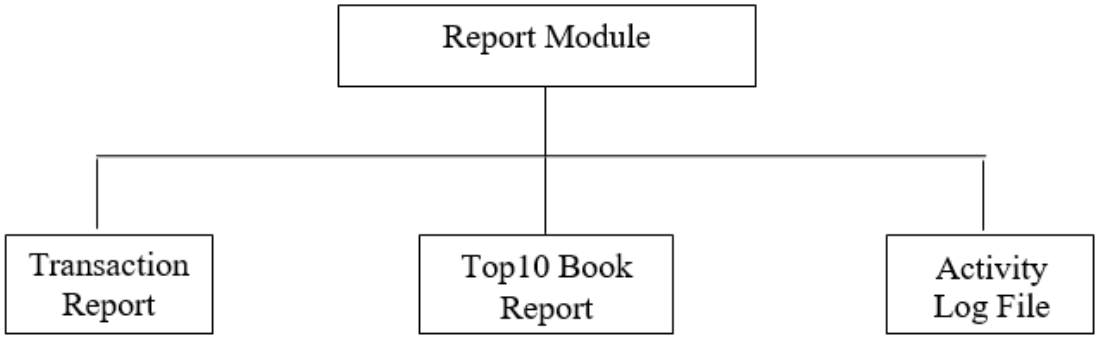


➢ 2.2.5 Module 4: **Report Module**

Report module is the main module for admin user. It is because normal user is not allowed to view the report. The report divided into 3 types. First one is transaction report which can let admin views the book transaction happen on particular date such as rental report and return report.

Top10 Report is the top rental rate's book. Admin can filter the information based on book's category and also filter by date in type of daily, monthly and yearly.

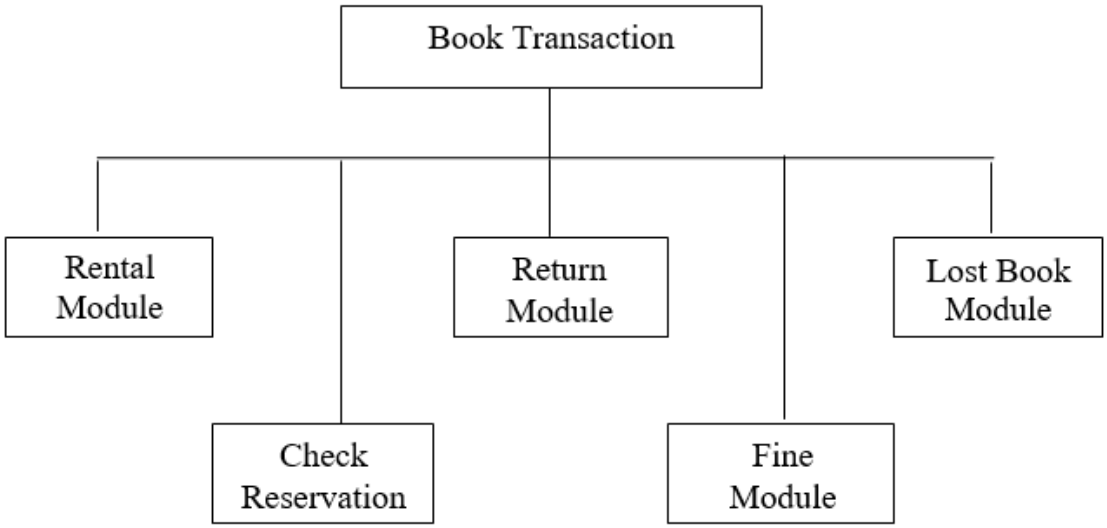
Activity Log File is a log which records every process in the Library Management System such as login / logout activity, register new book, new member or edit information or a member. All the activity done by every user will be record so that when system crash, admin or system admin are able to check the activity that may crash the system.


Report Module
Transaction Report
Top10 Book Report
Activity Log File

➢ 2.2.6 Module 5: **Book Transaction Module**

Book Transaction module is a main module in Library Management System. When member wants to borrow books, return books or they want to register lost book, it is all under book Transaction module. This module can be accessed by normal user or admin user. When member wants to borrow a book, librarian needs to scan in their member id. After that, librarian will scan their book's barcode id. If the book is under reservation, the book is not available to rent.

For return module, librarian just needs to scan the book's barcode id, and confirm the rental detail with user. If the rental detail is correct, return module can be complete if no any fine issued.



2.3 User Characteristics

Users of the website are members, librarians and the administrators who maintain the website. Members and librarians are assumed to have basic knowledge of computers and Internet browsing. Administrators of the system should have more knowledge of internal modules of the system and are able to rectify small problems that may arise due to disk crashes, power failures and other catastrophes. Friendly user interface, online help and user guide must be sufficient to educate the users on how to use this product without any problems or difficulties

2.4 General Constraints

- The information of all users, books and libraries must be stored in a database that is accessible by the website.
- MS SQL Server will be used as SQL engine and database.
- The Online Library System is running 24 hours a day.
- Users may access WLMS from any computer that has Internet browsing capabilities and an Internet connection.
- Users must have their correct usernames and passwords to enter into their online accounts and do actions.

2.5 Assumptions and Dependencies or Business Logic

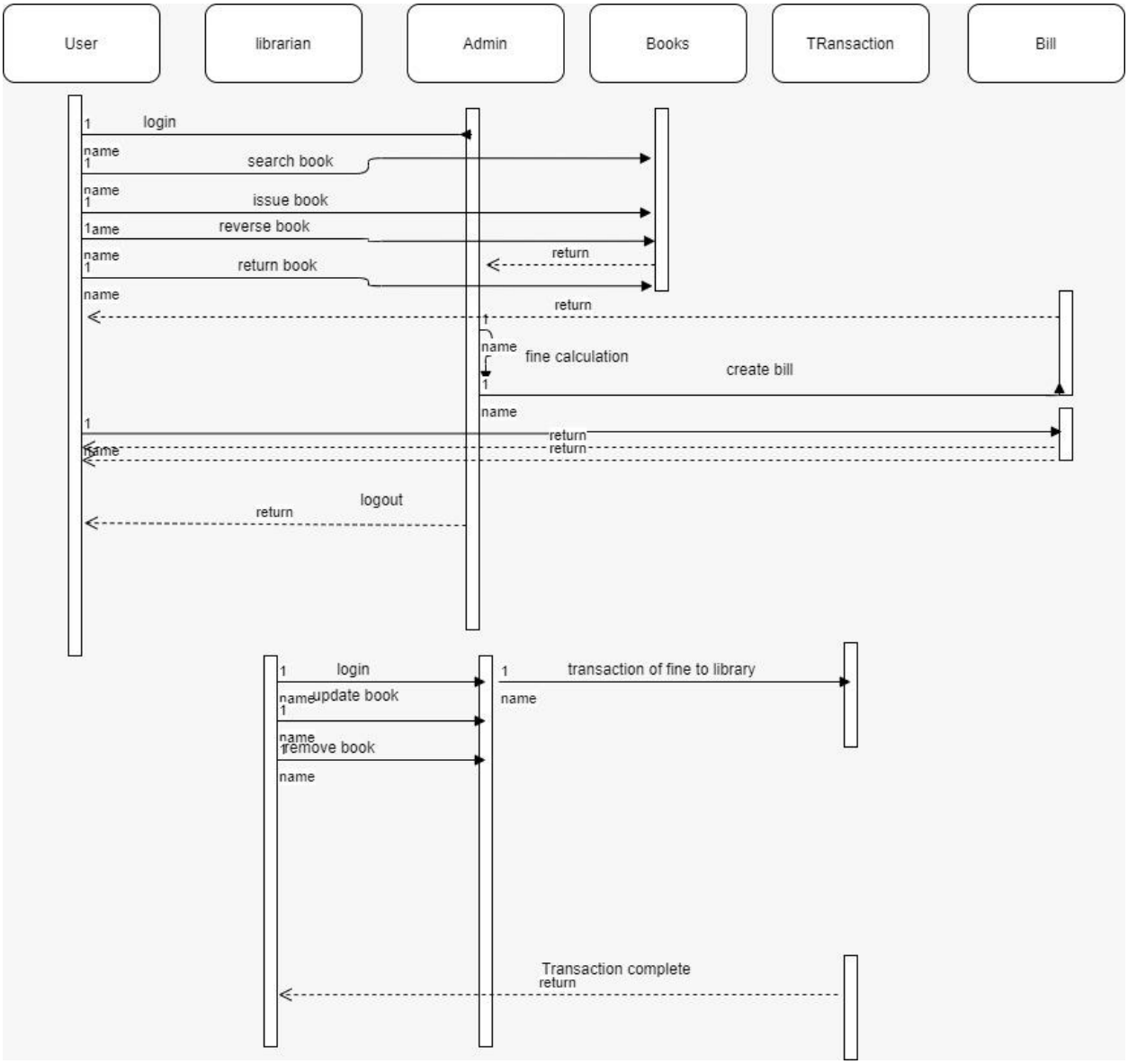
The assumptions are:-

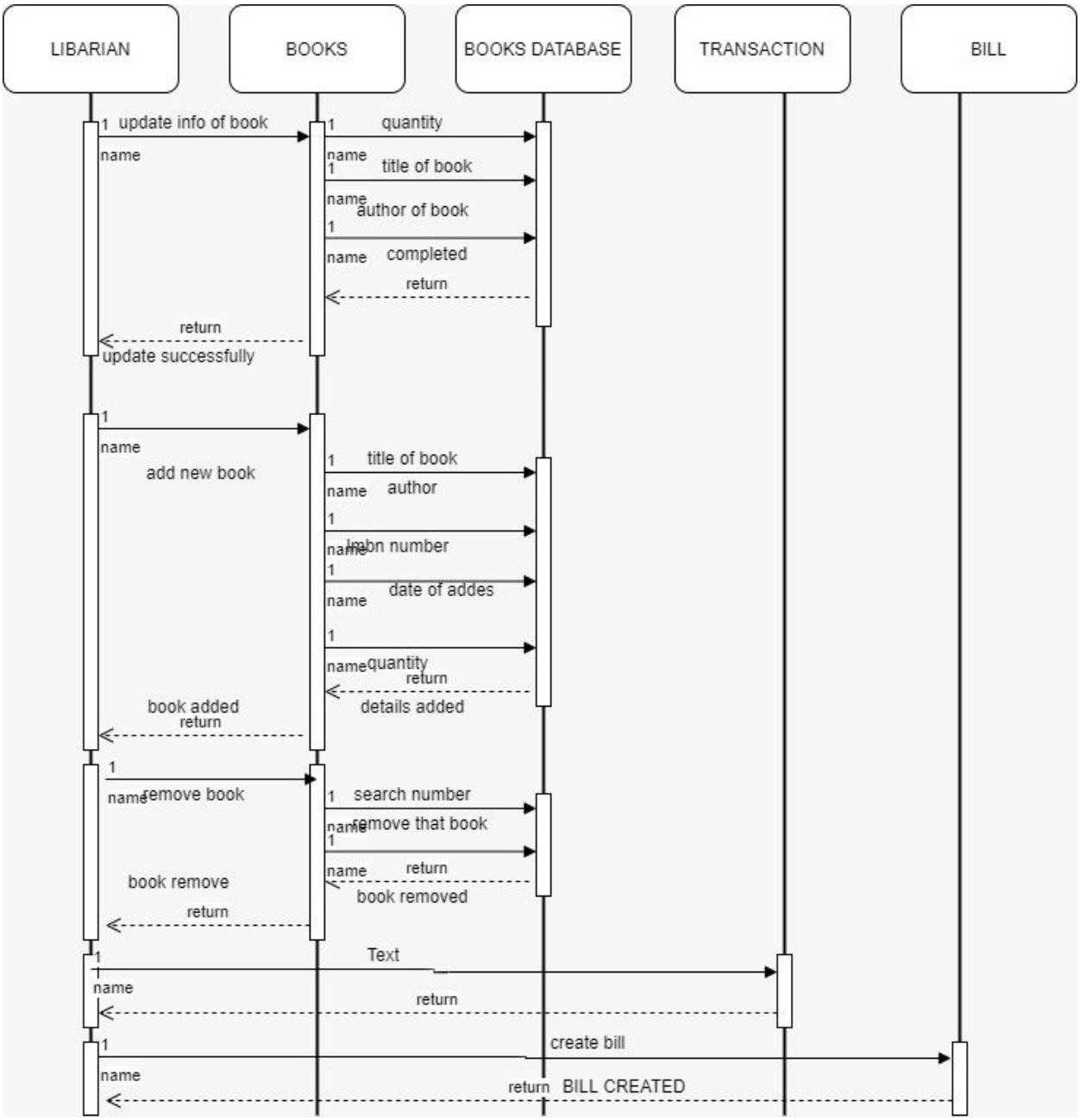
- The coding should be error free
- The system should be user-friendly so that it is easy to use for the users
- The information of all users, books and libraries must be stored in a database that is accessible by the website
- The system should have more storage capacity and provide fast access to the database
- The system should provide search facility and support quick transactions
- The Library System is running 24 hours a day
- Users must have their correct usernames and passwords to enter into their online accounts and do actions

The dependencies are:-

- The specific hardware and software due to which the product will be run
- On the basis of listing requirements and specification the project will be developed and run
- The end users (admin) should have proper understanding of the product
- The system should have the general report stored
- The information of all the users must be stored in a database that is accessible by the Library System

- Any update regarding the book from the library is to be recorded to the database and the data entered should be correct

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TRANSACTION
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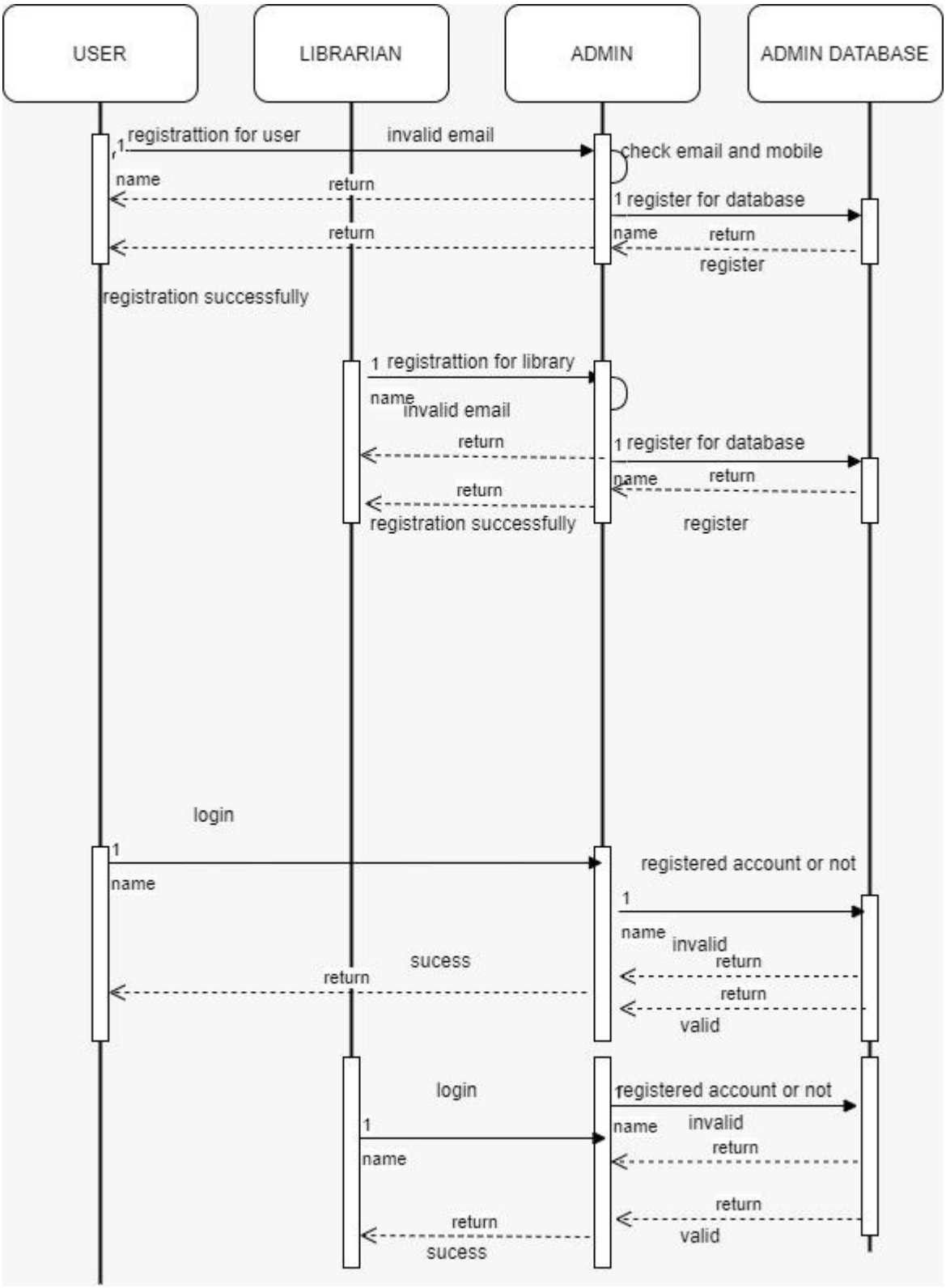
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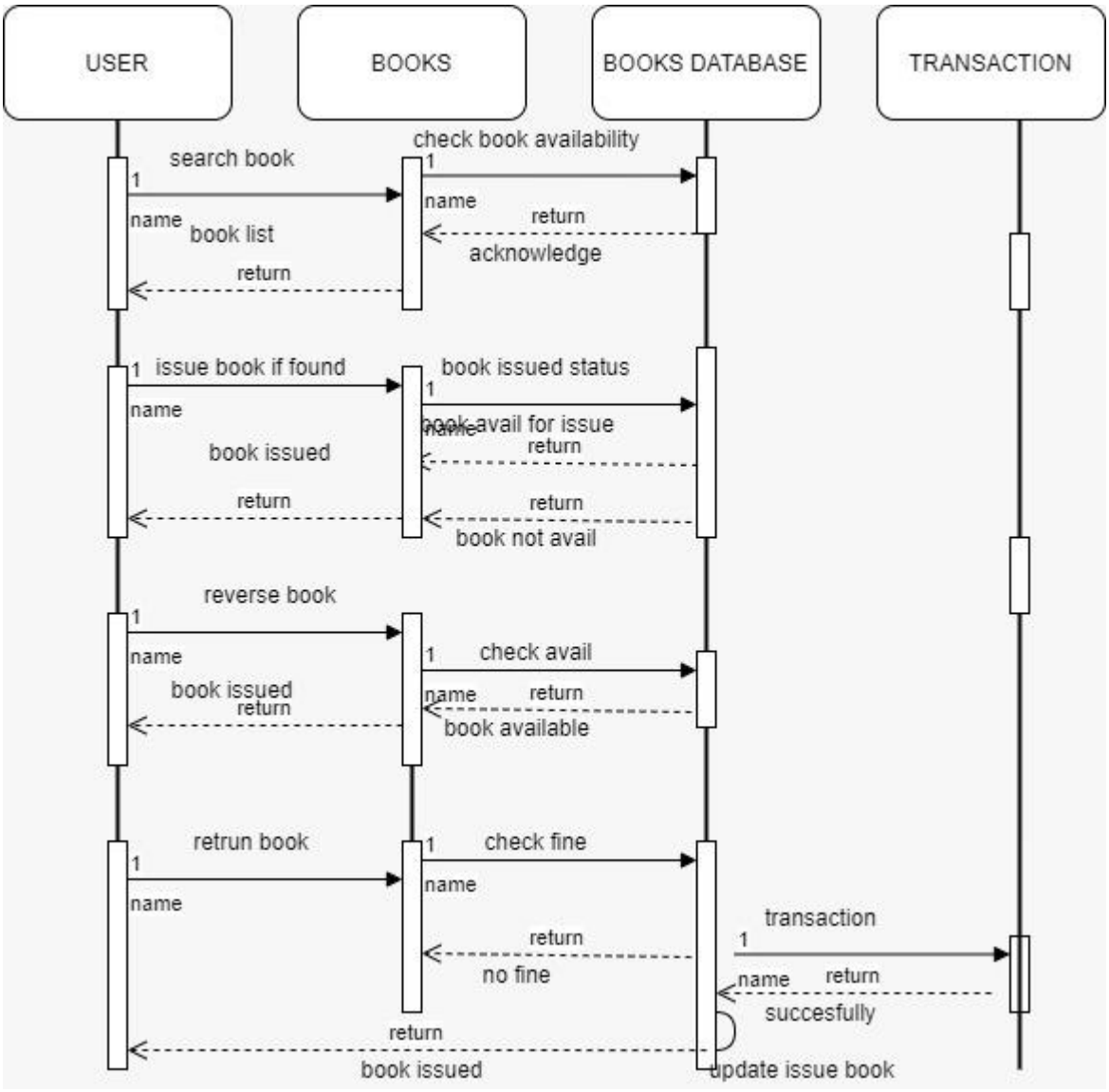
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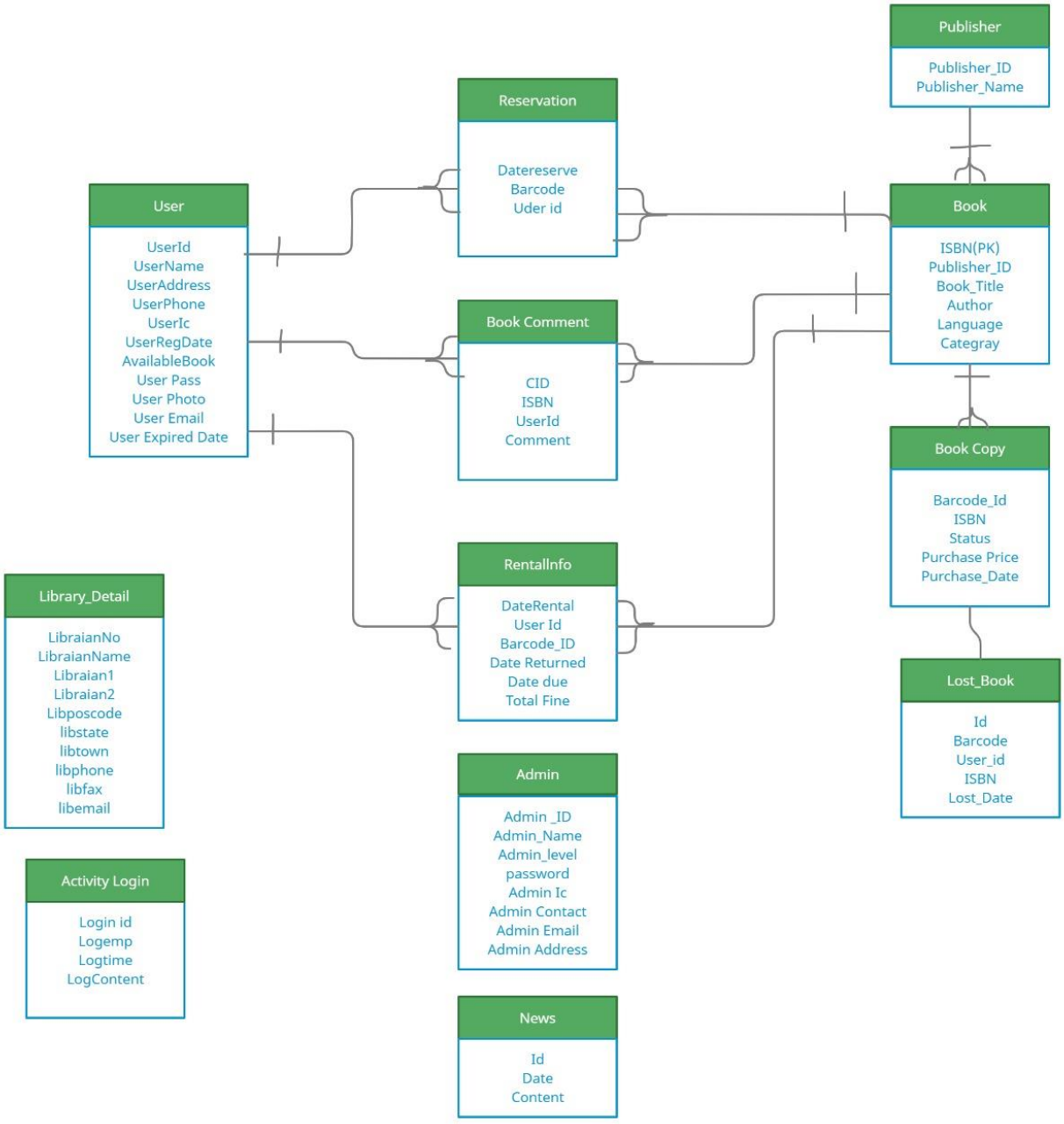
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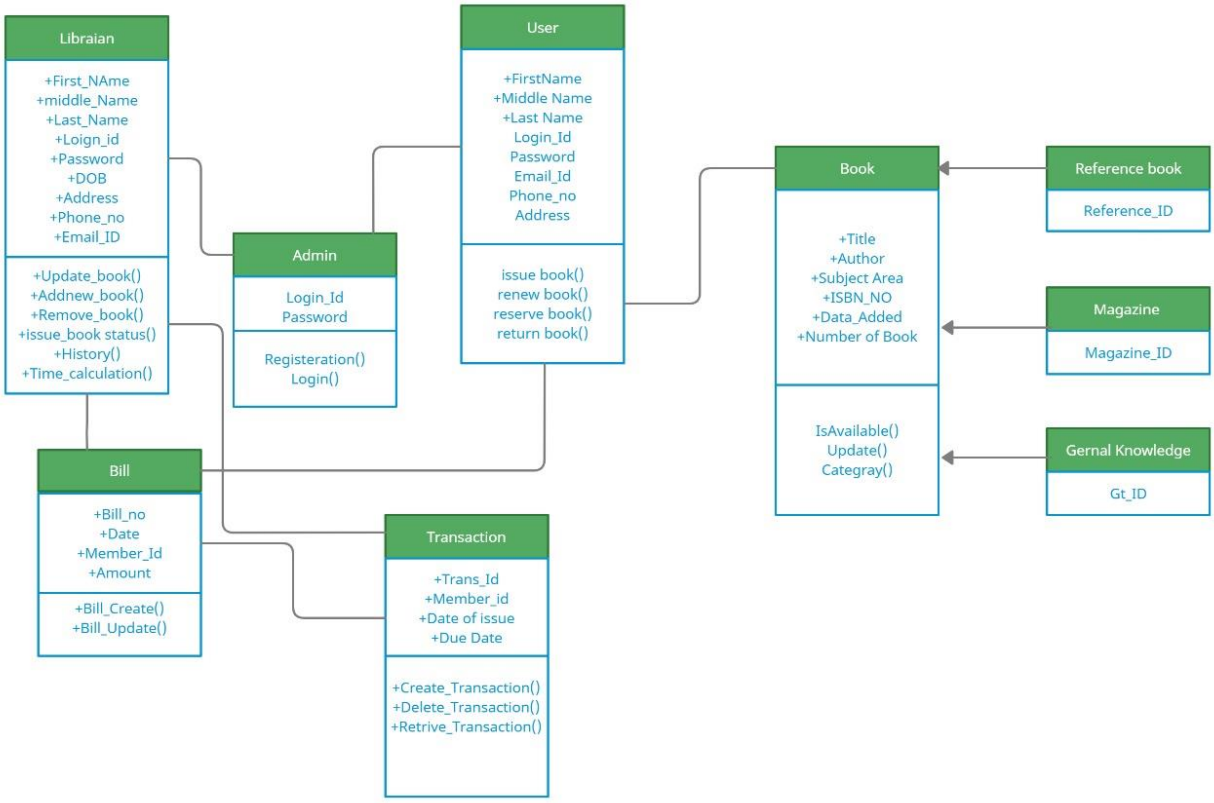
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+Update_book()
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+Remove_book()
+issue_book status()
+History()
+Time_calculation()
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Login()
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+Middle Name
+Last Name
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Phone_no
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reserve book()
return book()
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+Title
+Author
+Subject Area
+ISBN_NO
+Data_Added
+Number of Book
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Update()
Categray()
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Magazine
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+Member_Id
+Amount
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+Member_id
+Date of issue
+Due Date
+Create_Transaction()
+Delete_Transaction()
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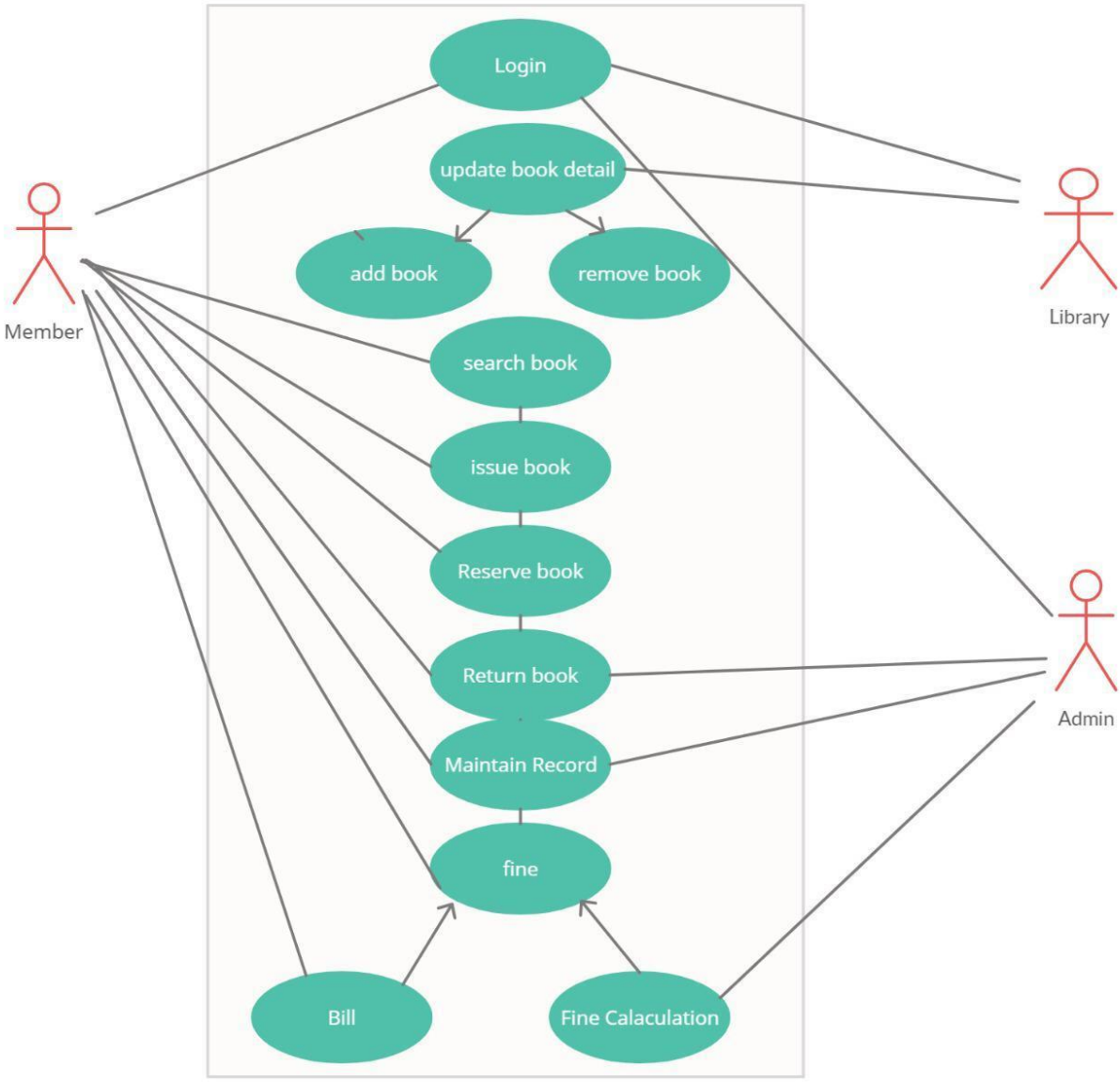
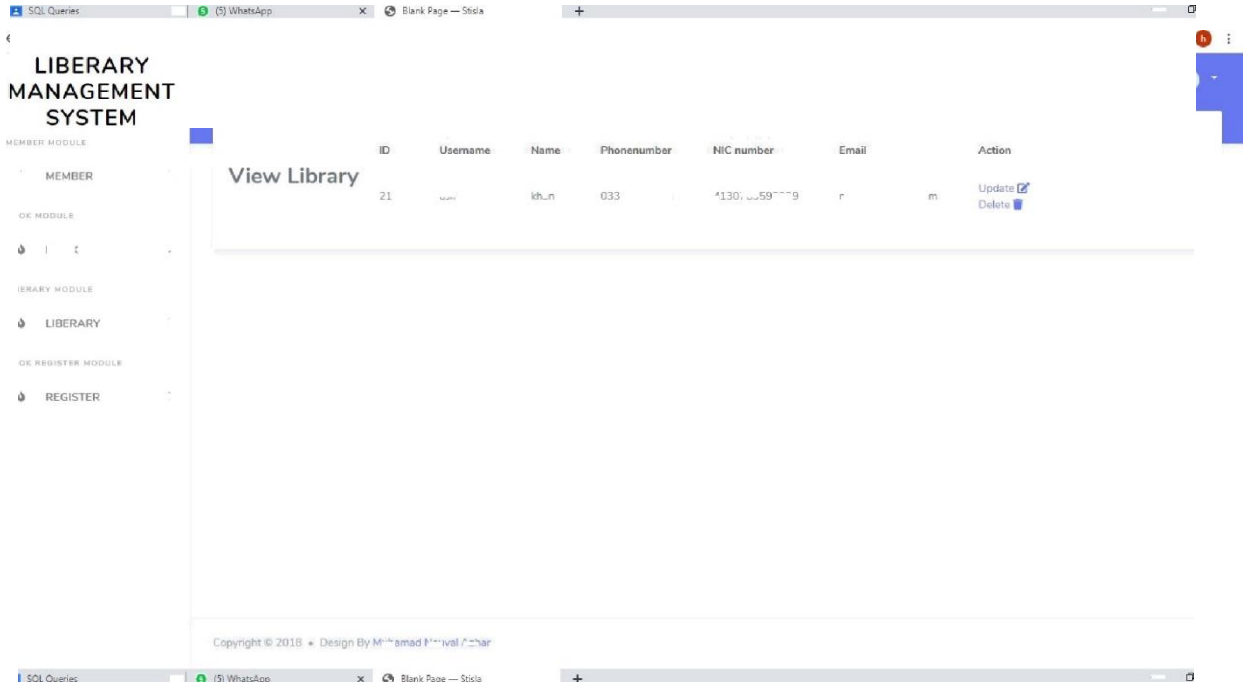


3. Specific Requirements

3.2. External Interface Requirements

3.2.1 User Interfaces


LIBERARY MANAGEMENT SYSTEM
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MEMBER
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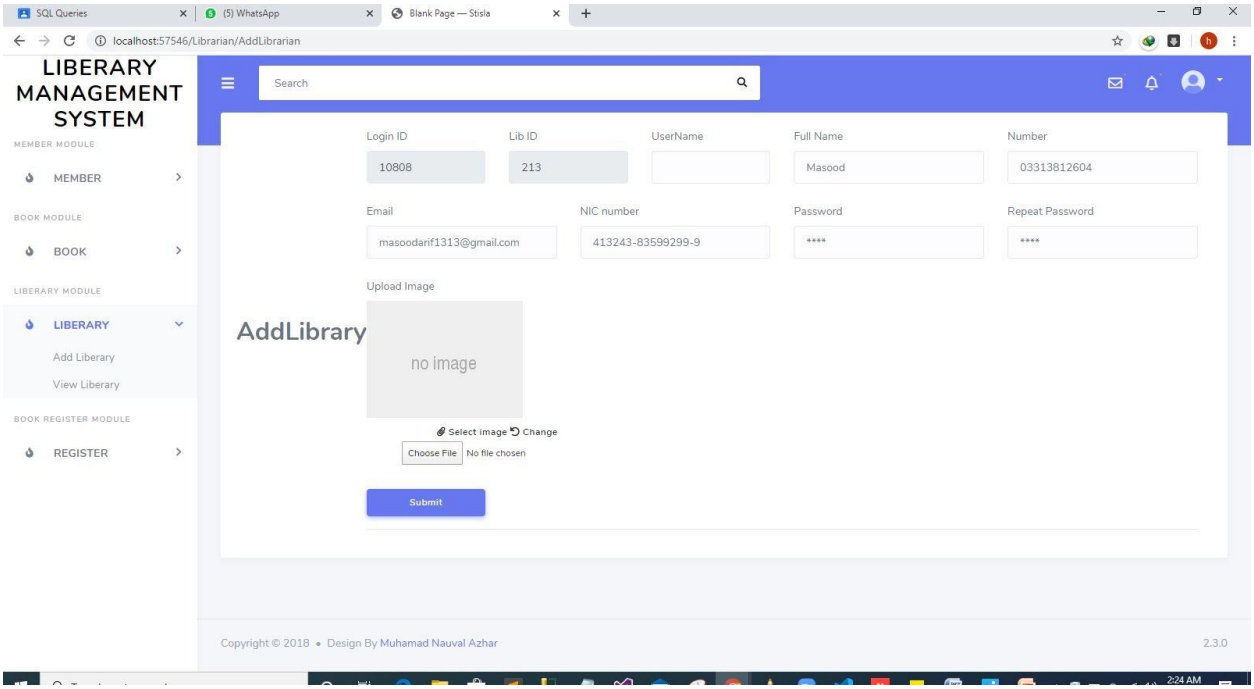

3.2.2 Hardware Interfaces

Intel core i5 2nd generation is used as a processor because it is fast than other processors an provide reliable and stable and we can run our pc for longtime. By using this processor we can keep on developing our project without any worries.

Ram 1 gb is used as it will provide fast reading and writing capabilities and will in turn support in processing.

3.2.3 Software Interfaces

Operating system- Windows 7 is used as the operating system as it is stable and supports more features and is more user friendly

Database MYSQL-MYSQL is used as database as it easy to maintain and retrieve

records by simple queries which are in English language which are easy to understand and easy to write.

Development tools and Programming language- HTML is used to write the whole code and develop webpages with css, java script for styling work and php for sever side scripting.

3.4.1 Standards Compliance

There are no design constraints that can be imposed by other standards limitations.

3.4.2 Software Limitations

- must be able to run Internet Explorer or google chrome browsers to access the system.
- must have cell-phone web based capability to access the system from a mobile phone.

3.4.3 Hardware Limitations

- Input/Output: One or two-button mouse, keyboard, cell-phone, or touch screen required.
- Network card required at thin-client terminals to make communication with server possible.

3.5 Quality Characteristics

There are a number of quality characteristics that apply to the ARRS software system.

3.5.1 Portability

The ARRS system will be developed using HTML and c# so that it can be accessed from any type of system using just a regular web browser. It will also be available to users that have web access on their cellular phones. The system will be tested on all types of hardware before being released to ensure that is it compliant with this requirement.

3.5.2 Reliability

The system should be capable of processing a given number of reservations within a give time frame with no errors and the system should be available and operational all the time. During the development of the prototype for the 3 cities, the system will be tested in its actual environment to ensure that it can handle the load of reservations that occur during a regular workday.

3.5.3 Usability

The ARRS system will be developed so that it is an easy to use system that requires the least amount of user input possible. Every input will be validated. The user should only have general computer use knowledge. Error messages will be displayed if the user enters an invalid value or tries to access a function without the required permissions. An easy and well-structured user manual will be provided to the CRM and the system will include descriptive help for all operations allowed.

3.5.4 Correctness

The ARRS system will be considered correct when the CRM approves the prototype presented and agrees that all the functions they require are implemented as stated in the Software Requirements Specification.

3.5.5 Flexibility

The ARRS system should be developed in such a way that it is easily customizable. If new functions are required by CRM, there will be little effort required to update the system to support new cities or new transactions.

3.5.6 Security

Security All the information in the library database and the transaction is secured, authentication is provided to all the users , only authenticated users can use the system.

3.5.7 Maintainability

The ARRS source code will be kept well structure and documented so that it is easier to maintain and extend the system. All changes to the system shall be documented.

3.6 Other Requirements

Certain requirements may, due to the nature of the software, the user organization, etc., be placed in separate categories such as those below.

3.6.1 Data Base

Database is the storage device, in which the application information will be stored in database. The information is normalized in the form of tables. The main entity of the storage are mentioned below

- **o Member/ Admin Information**
- **o Book Information**
- **o Book Transactions**
- **o Audit Log**

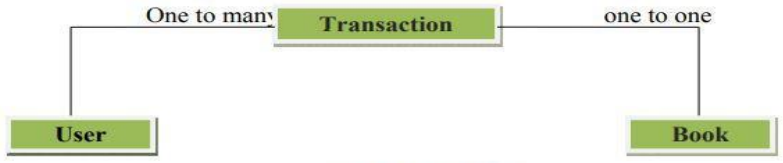

Figure 5: Entity Diagram

The following are the requirements for these databases that are to be developed as part of the product. They include:

Reservation Database

Types of information	Schedule information for the trains, including date, time, departure city, destination city, ticket cost and ticket availability for a particular train
Frequency of use	Depends on the passenger demand, which may reach 25,000 per day during peak periods
Accessing capabilities	The database should allow access to at least 1,000 people at once; the users will have a general access to the information about the train

	schedule, and a secure access to the reports (available only to CRM officials) using a username and a password
Data element and file descriptions	To be determined
Relationship of data elements, records and files	To be determined
Static and dynamic organization	To be determined
Retention requirements for data	Train schedule information will be available as long as the train for a particular route is in use and at least one year after the train has been cancelled. The reports information will be available at least for 5 years

Passenger Account Database

Types of information	Passenger account information including their name, address, phone numbers, last reservations, balance owed, credit card number (if they paid by a credit card)
Frequency of use	Depends on the passenger demand, which may reach 25,000 per day during peak periods
Accessing capabilities	The database should allow access to at least 500 people at once; the users will have a secure access to the database using a username and a password
Data element and file descriptions	To be determined
Relationship of data elements, records and files	To be determined
Static and dynamic organization	To be determined
Retention requirements for data	Passenger account will be available for as long as a passenger is using the account, and at least for 6 month since the passenger logged on last time.

3.6.2 Operations

The normal operations required by the user can be viewed as the following:

User-initiated Operations:

These operations include the login operation, which is initiated by the users. Also, the process of becoming a new user is in this category. Building, changing, and

viewing itineraries, as well as paying for the itinerary are all initiated by the users. The user initiates the report generation activity, as well as changing train schedules.

Interactive Operations and Unattended Operations:

The users initiate all the operations mentioned above, and almost all of them are somehow interactive. Displaying the train schedule is non-interactive. The report display is a non-interactive operation, although selecting the desired reports will require user input.

Data Processing Support Functions:

The user account data is used to create new accounts, as well as to validate user id's during login functions. For building itineraries, user input, user account data, and train schedule data are used, and processed. User data along with final results of user interaction (whether the user purchased a trip, number of tickets bought, etc.) are collected, and used for report generation purposes. Administrative users' inputs are collected in order to modify and present schedules.

Backup and Recovery Operations:
Both databases used (passenger account database and reservations database) are production databases. The main operation used for the backup and recovery is Oracle's built-in cold backup, which is also known as the "archive mode". Depending on the customer's needs and budget, additional redundancy can be added using systems like RAID 5 and tape backup.

3.6.3 Site Adaptation Requirements

There are no site adaptation requirements for this project.

4. Supporting Information.

There is no supporting information required for this project.