Online Library Management System

Software Requirement Specification

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Software Requirements Specification

1. Introduction

Issuing books, returning books or viewing the available books at the Library of the local University is currently done manually where in the student has to go to the Library and check the available books at the Library. Students check the list of books available and issue the books otherwise it is of waste for the student to come to the library to check for the books if the student doesn't get the book. Then the librarian checks the student id and allows the member to check out the book and the librarian then updates the member database and also the books database. This takes at least one to two hours if the member is available at the nearby place otherwise it may take more time.

We have decided to investigate the use of an Online Library Management System. This system would be used by members who may be students or professors of that University to check the availability of the books and issue the books, and by the librarian to update the databases. The purpose of this document is to analyze and elaborate on the high-level needs and features of the *Online Library System***.** It focuses on the capabilities and facilities provided by a Library. The details of what all are the needs of the *Online Library System* and if it fulfils these needs are detailed in the use-case and supplementary specifications.

1.1 Purpose

The purpose of Online Library Management System is to provide a friendly environment to maintain the details books and library members. The main purpose of this project is to maintain easy Circulation system using computers and to provide different reports.

The purpose of Software Requirements Specification (SRS) document is to describe the external behavior of the Online Library Management System. Requirements Specification defines and describes the operations, interfaces, performance, and quality assurance requirements of the Online Library System. The document also describes the nonfunctional requirements such as the user interfaces. It also describes the design constraints that are to be Considered when the system is to be designed, and other factors necessary to provide a complete and comprehensive description of the requirements for the software. The Software Requirements Specification (SRS) captures the complete software requirements for the system, or a portion of the system. Requirements described in this document are derived from the Vision Document prepared for the Online Library Management System.

1.2 Scope

The Software Requirements Specification captures all the requirements in a single document. The *Online Library Management System* that is to be developed provides the members of the Library and employees of the library with books information, online reservation of books and many other facilities. The Online Library Management System is supposed to have the following features.

- There are two users of this system: Admin, Users (Members).
- Admin is authorized to add/update/delete Categories, Publications, Books, Suppliers and Users.
- Admin is also authorized to maintain Stock.
- Admin has to update database after issuing or returning books.
- The system provides the users with online reservation of books.
- The system provides password recovery to the users.
- The system provides the members with the option to check their account and/or change their options like password of the account whenever needed.
- Users can search any book. If book is not available then it can request it to Librarian via Online.
- Users can register there feedback or complaints about the system.

The features that are described in this document are used in the future phases of the software development cycle. The features described here meet the needs of all the users. The success criteria for the system are based in the level up to which the features described in this document are implemented in the system.

1.3 Definitions, Acronyms and Abbreviations

- PIN – Personal Identification Number
- JSP

  Java Server Pages: It is used to create dynamic web content.
- J2EE

  Java 2 Enterprise Edition: A programming platform which is a part of java platform for developing and running distributed java.
- UML

  Unified Modeling Language: UML is a standard language for writing software blueprints. The UML may be used to visualize, specify, construct and document.
- XML

  Extensible Markup Language: it is a text based format that let developers describe, deliver and exchange structured data between a range of applications to client for display and manipulation.
- HTTP

  Hypertext Transfer Protocol: It's a service protocol.
- RSA

  RSA Rational Software Architect: Rational software Architect, (RSA) made by IBM's Rational Software division, is a modeling and development environment that uses the Unified Modeling Language (UML) for designing architecture for C++ and Java 2 Enterprise Edition (J2EE) applications and web services.
- AJAX

  Asynchronous Java Script and XML: It is a technique used in JavaScript to create dynamic web pages.

1.4 References

- Object Oriented Modeling and Design with UML-Michael Blaha, James Rambaugh.
- Software Engineering, Seventh Edition, Ian Somerville.
- IBM Red Books.
- IBM – www.ibm.in/developerworks.
- Java - www.sun.com
- Wikipedia - www.wikipedia.com
- Database Management Systems - Navathe.
- Complete Reference - J2EE - Keogh.

1.5 Overview

The SRS will provide a detailed description of the Online Library Management System. This document will provide the outline of the requirements, overview of the characteristics and constraints of the system.

This section of the SRS will provide the general factors that affect the product and its requirements. It provides the background for those requirements. The items such as product perspective, product function, user characteristics, constraints, assumptions and dependencies and requirements subsets are described in this section.

2. Overall Description

2.1 Product Perspective

The Online Library System is a package to be used by Libraries to improve the efficiency of Librarians, Library employees and Users. The Online Library System to be developed benefits greatly the members and the Librarian of University of Houston-Clearlake. 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.

The product to be developed has interactions with the users: Librarian, Members who are the students and professors.

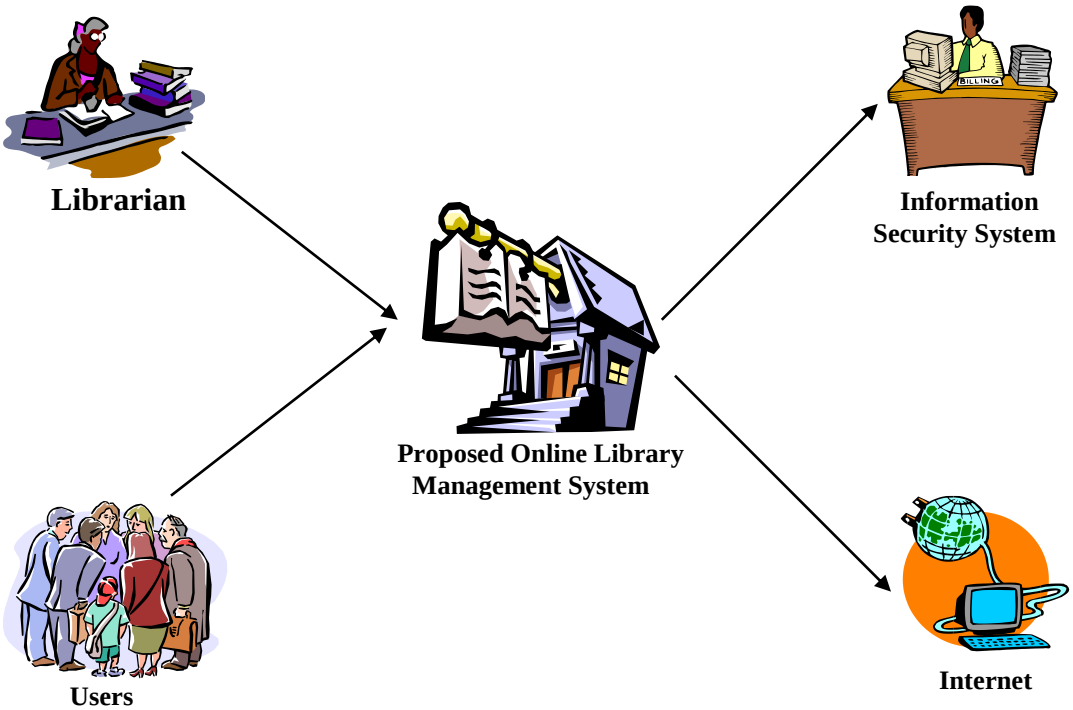

Figure 1 : Overview of the proposed system

2.2 Software Interface

- Client on Internet.
- Web Browser, Operating System (any).
- Web Server.
- Data Base Server Java - www.sun.com
- MYSQL, Operating System (any)
- RAD (J2EE, Java, Java Bean, HTML, XML, AJAX), OS (Windows).
- Development End.

2.3 Hardware Interface

Minimum Requirements:

Client Side		
Processer	RAM	Disk Space
Intel Pentium III or AMD - 800 MHz	128MB	100MB

Server Side			
	Processer	RAM	Disk Space
	All Intel Or AMD -1 GHZ	1 GB	3.5 GB
DB		256MB	500MB (Excluding Data)

Recommended Requirements:

Client Side		
Processer	RAM	Disk Space
All Intel Or AMD -1 GHZ	256MB	100MB

Server Side			
	Processer	RAM	Disk Space
	All Intel Or AMD -2 GHZ	2 GB	3.5 GB
DB		512MB	500MB (Excluding Data)

2.4 Communication Interface

- Users on Internet will be using HTTP/HTTPS protocol.

2.5 Constraints

- Client must be on Internet.
- GUI is only in English.
- Login and password is used for the identification of users.
- Only registered Users will be authorized to use the services.
- Limited to HTTP/HTTPS.
- The information of all the users must be stored in a database that is accessible by the admin or user itself.
- The university information security system must be compatible with the Internet applications.
- The Online Library Management System is connected to the university computer and is running all 24 hours a day.
- The users access the Online Library Management System from any computer that has Internet browsing capabilities and an Internet connection.
- The users must have their correct usernames and passwords to enter into the Online Library System.

3.0 Specific Requirements

3.1 Functionality

3.1.1 Mobile Devices

The Online Library System is also supported on mobile devices such as cell phones.

3.1.2 Alerts

The system can alert the Librarian or the administrator in case of any problems.

3.2 Usability

- The system shall allow the users to access the system from the Internet using HTML or its derivative technologies. The system uses a web browser as an interface.
- Since all users are familiar with the general usage of browsers, no specific training is required.
- The system is user friendly and self-explanatory.

3.3 Reliability

The system has to be very reliable due to the importance of data and the damages incorrect or incomplete data can do. The system must be flexible also.

3.4 Availability

The system is available 100% for the user and is used 24 hrs.a day and 365 days a year. The system shall be operational 24 hours a day and 7 days a week.

3.5 Performance

3.5.1 Response Time

The Home Page or Information page should be able to be downloaded within a minute using a 56K modem. The information is refreshed every two minutes. The access time for a mobile device should be less than a minute. The system shall respond to the member in

not less than two seconds from the time of the request submittal. The system shall be allowed to take more time when doing large processing jobs.

3.5.2 Administrator/Librarian Response

The system shall take as less time as possible to provide service to the administrator or the librarian.

3.5.3 Throughput

The number of transactions is directly dependent on the number of usersmay be the Librarian, employees of the Library and also the people who use the Library for checking-out books, returning books and checking online library account.

3.6 Design Constraints

3.6.1 Software Language Used

The languages that shall be used for coding the Online Library Management System are Java Server Pages (JSP), HTML, CSS, and JavaScript. For working on the coding phase of the Online Library Management System, the Apache Tomcat Server needs to be installed.

3.6.2 Development Tools

We will make use of the available Java Development Tool kits for working with Java Beans and Java Server Pages. Also we will make use of the online references available for developing programs in HTML, CSS and JavaScript.

3.6.3 Class Libraries

We will make use of the existing Java libraries available for JSP and Servle. Also we need to develop some new libraries for the web-based application. Also we will develop new programs using JSP and scripting languages.

4.0 Uml Diagrams

4.1 ER-Diagram

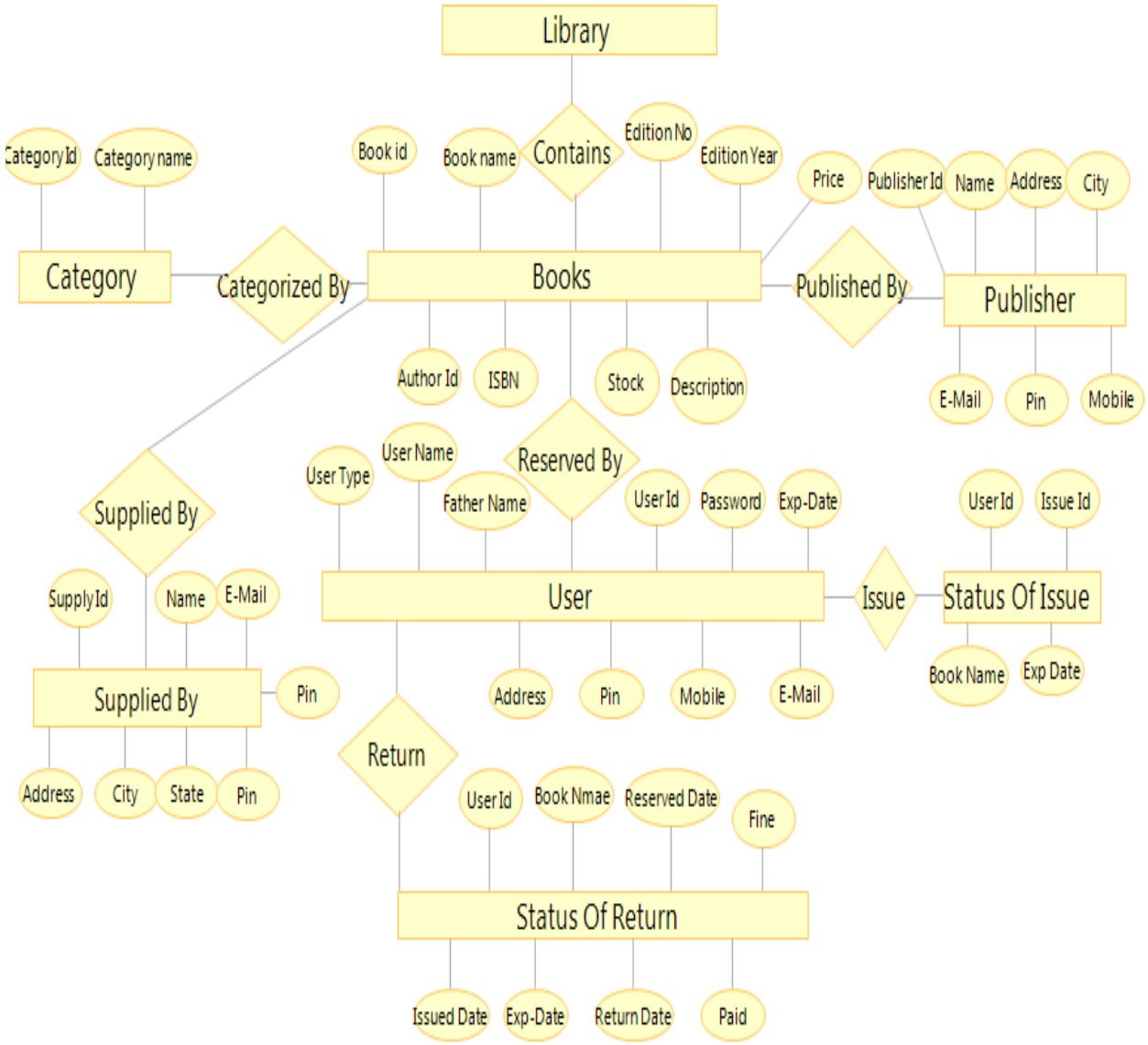

Figure 2

4.2 Use Case Diagram

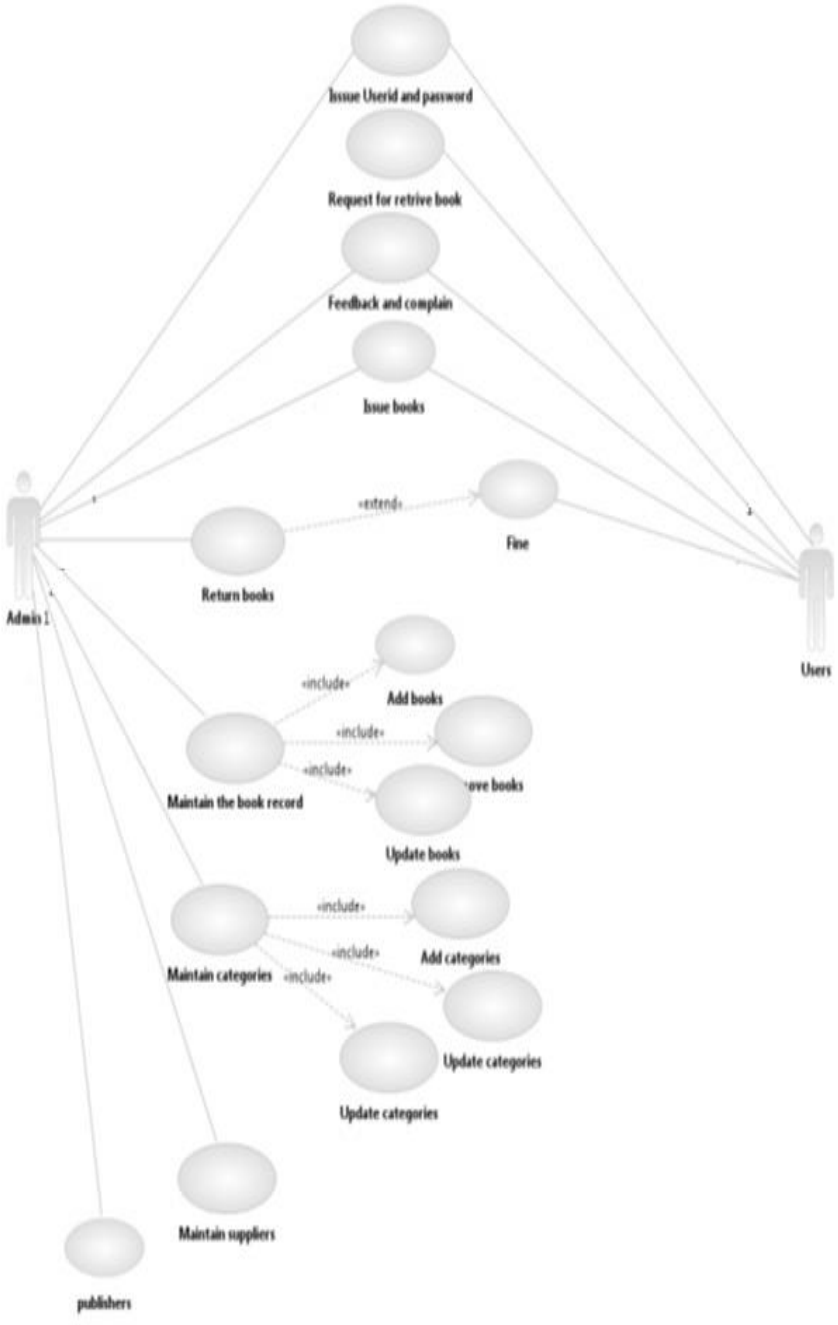

Figure 3

4.3 Activity Diagram

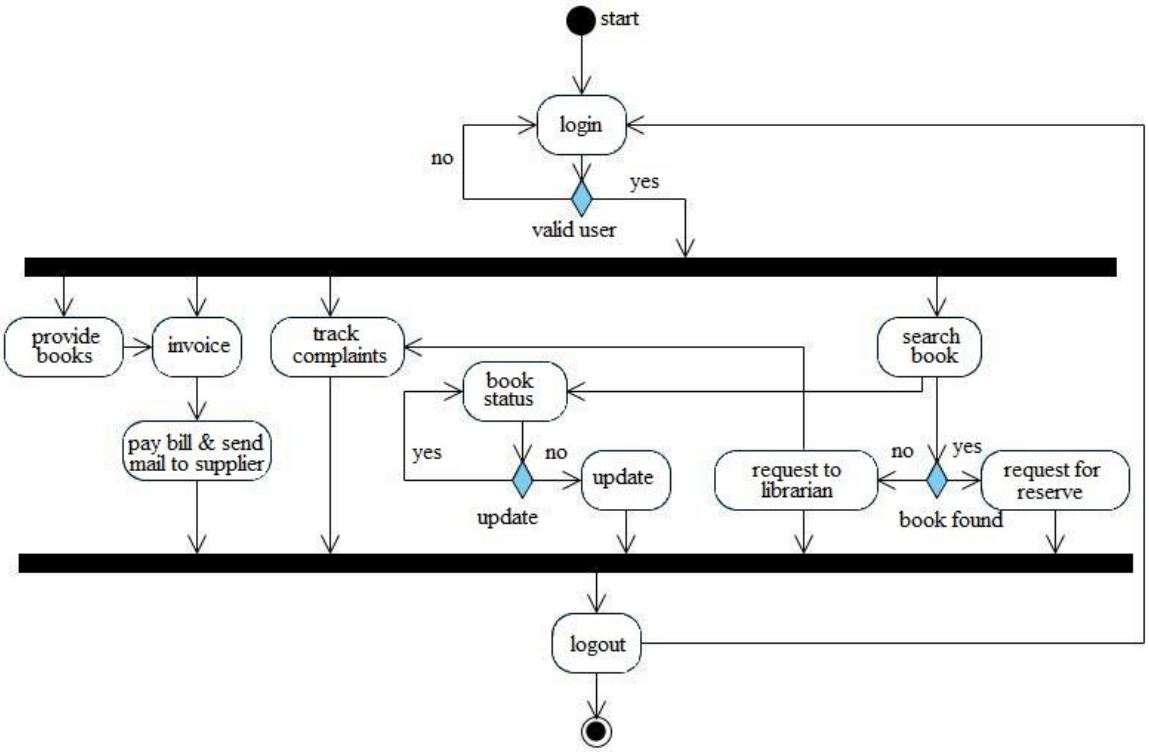

Figure 4

4.4 Data Flow Diagram

Context Level Diagram (Level 0):-

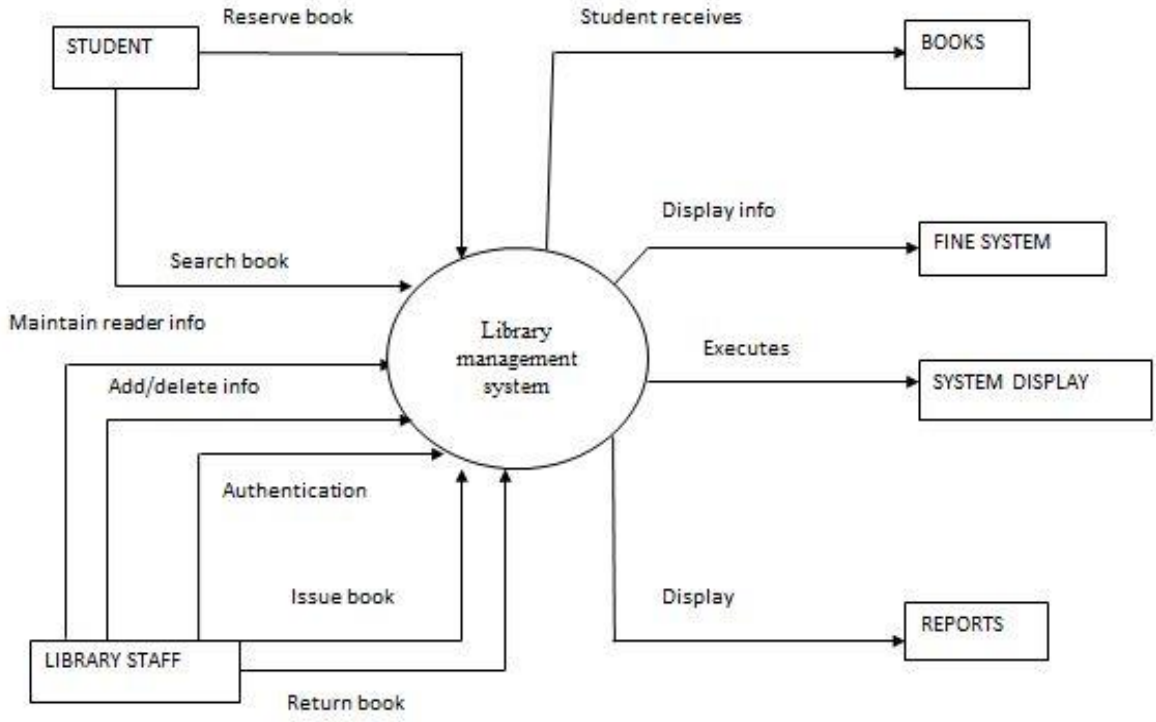

Figure 5

Level 1 DFD (For Student):-

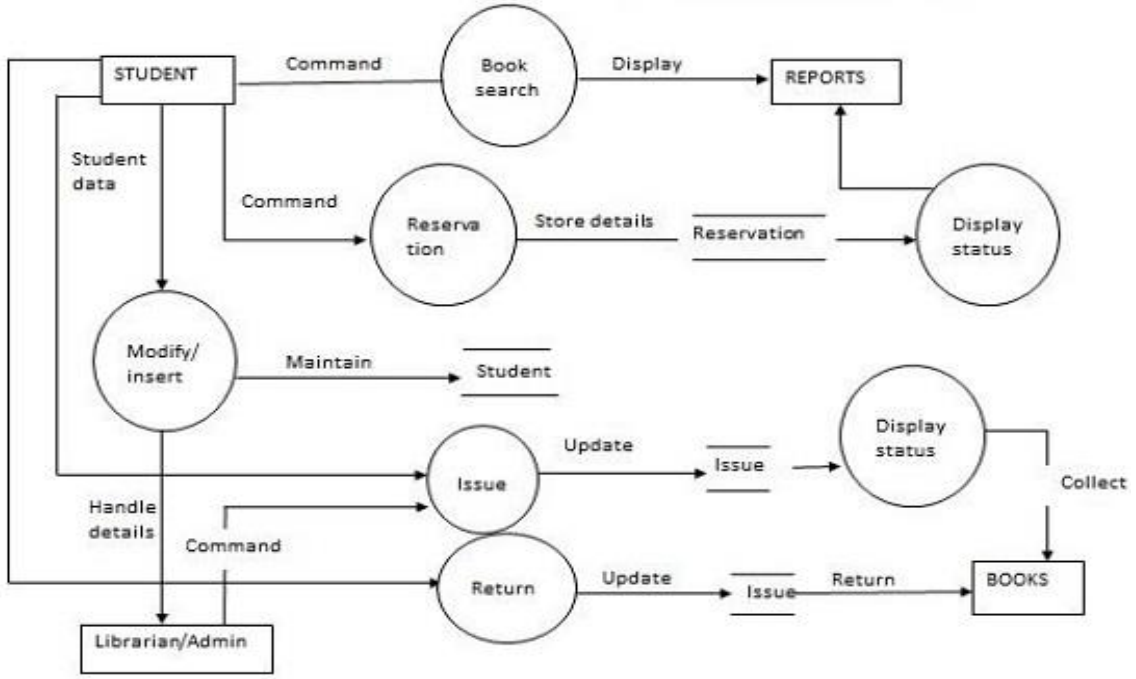

Figure 6

Level 1 DFD (For Librarian):-

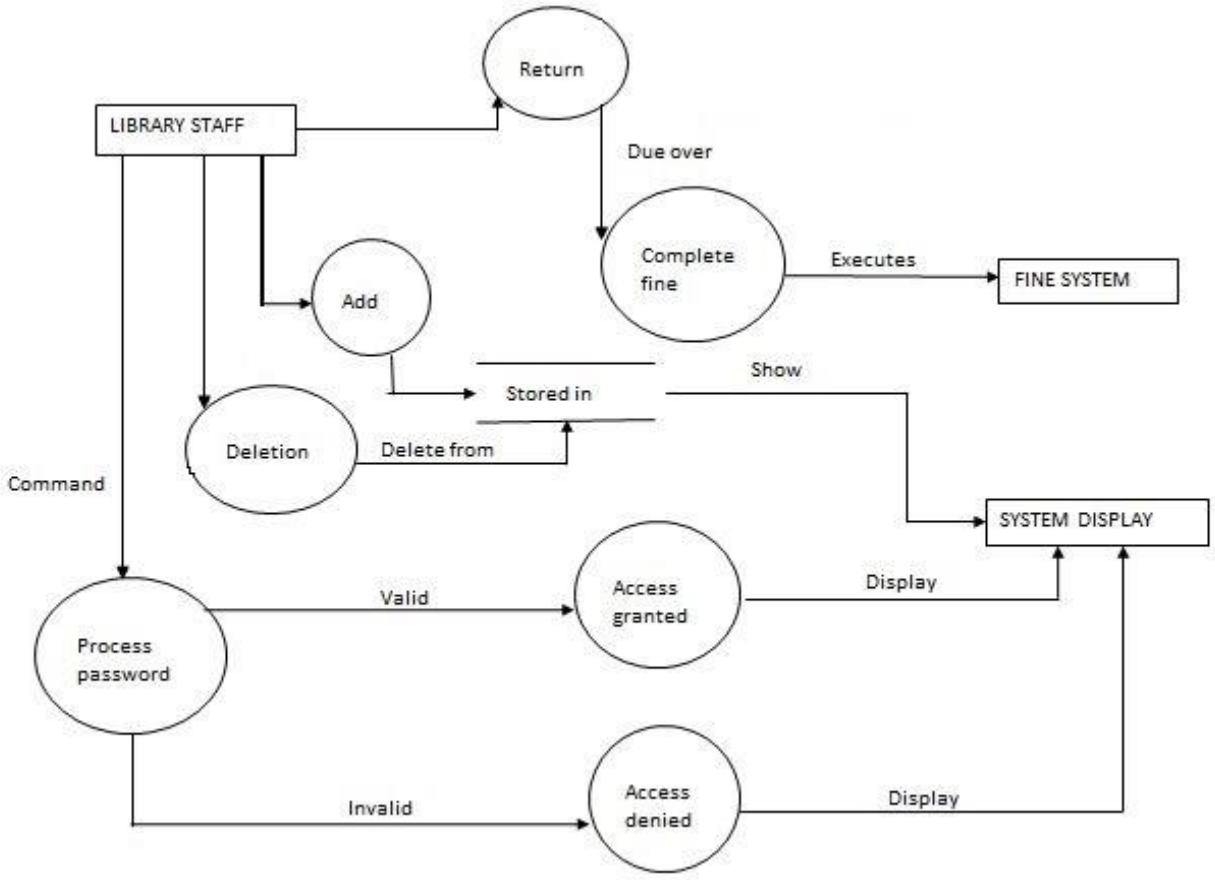

Figure 7

4.5 Sequence Diagram

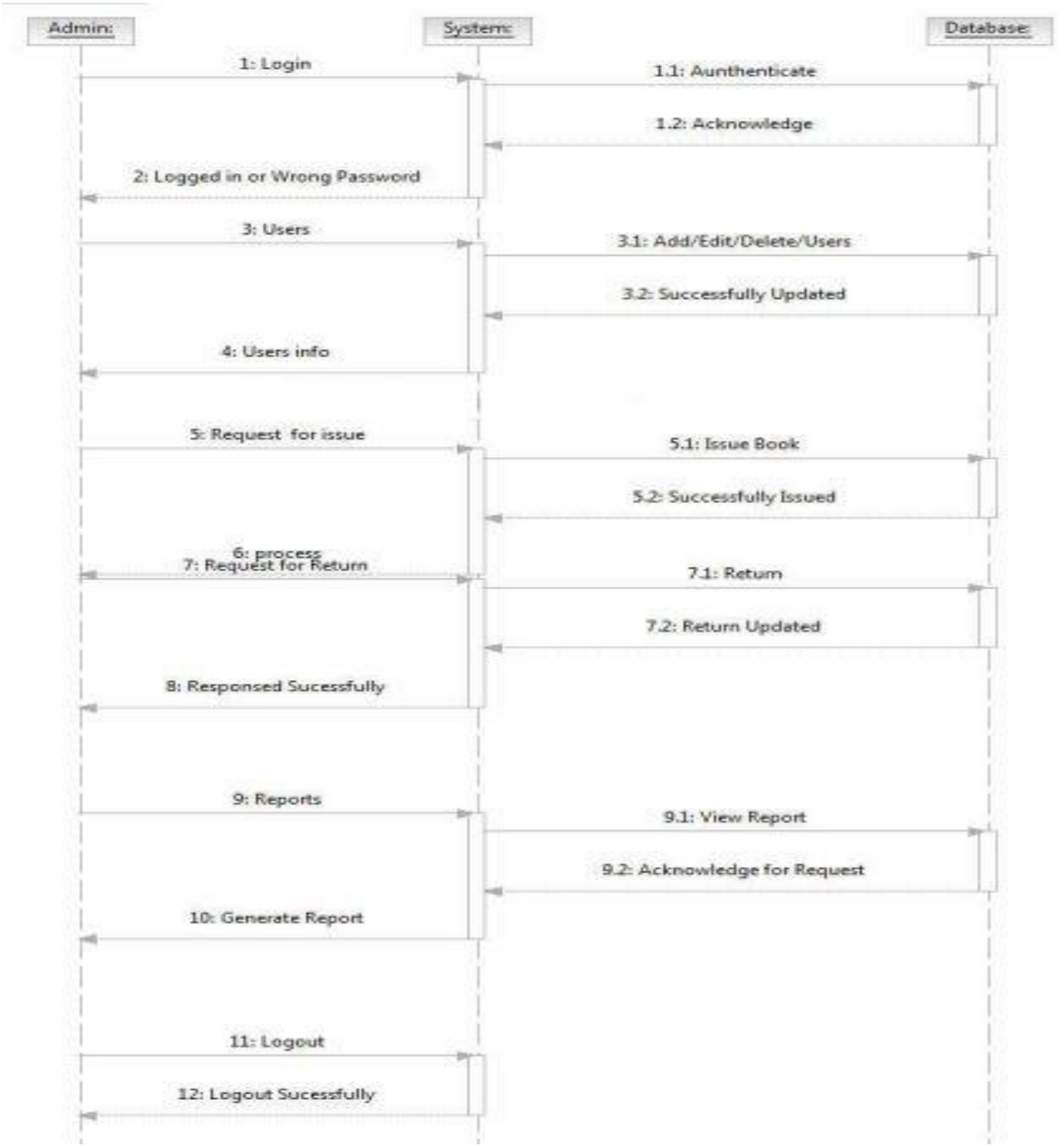

Figure 8

Sequence diagram of member searching book:-

Figure 9

4.6 Class Diagram

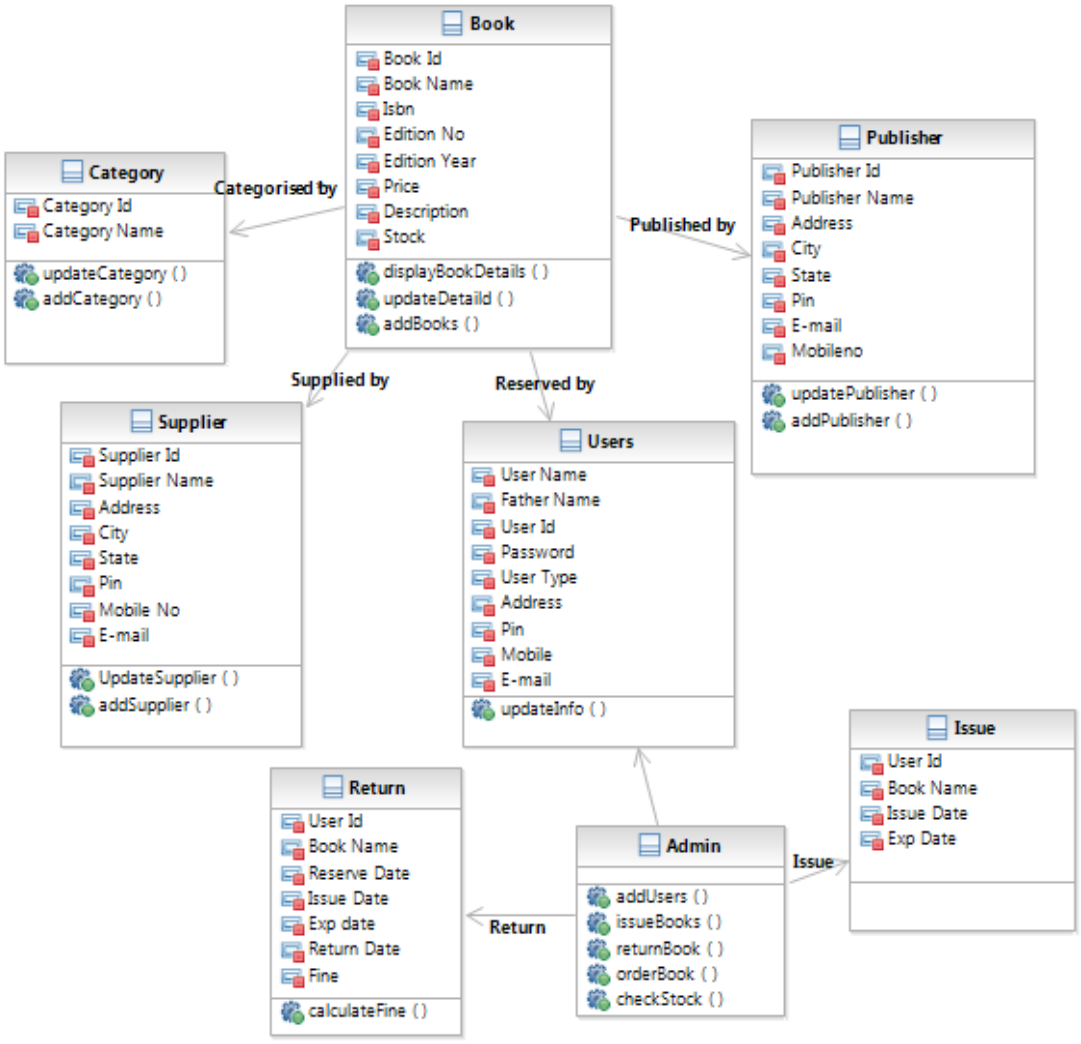

Figure 10

5.0 Database Tables

Table: category

S.No.	Field Name	Data Types	Length	Description
1.	Categoryid	Varchar	20	Unique identification id for category
2.	Categoryname	Varchar	30	Category's name

Table: users

S.No.	FieldName	Data Types	Length	Description
1.	username	varchar	20	Name of user
2.	fathername	varchar	20	Father's name
3.	Userid	varchar	20	Unique identification id
4.	password	varchar	15	Password
5.	usertype	Enum		Type of user
6.	address	varchar	255	Complete address of user
7.	Pin	varchar	10	Pin number
8.	mobileno	varchar	15	Mobile no of user
9.	e-mail	varchar	50	E-Mail of user
10.	Exp. date	Date (YYYY-MM-DD)		Registration Expiry Date

Table: logindetail

S.No.	Field Name	Data Types	Length	Description
1.	loginid	varchar	20	Unique identification id for logindeatil
2.	userid	varchar	20	Identification id for user
3.	usertype	enum		Type of user
4.	logindate	date		Date of login
5.	logintime	time		Time of login
6.	loginday	varchar	10	Day of login

Table: publisher

S.No.	Field Name	Data Types	Length	Description
1.	publisherid	varchar	20	Unique identification id for publisher
2.	publishername	varchar	20	Publisher's name
3.	address	varchar	255	Address of publisher
4.	City	varchar	30	City of publisher
5.	State	varchar	30	State of publisher
6.	Pin	varchar	10	Pin number
7.	mobileno	varchar	15	Mobile no of publisher
8.	e-mail	varchar	50	E-Mail of publisher

Table: supplier

S.No.	Field Name	Data Types	Length	Description
1.	supplierid	varchar	20	Unique identification id for supplier
2.	suppliername	varchar	20	Supplier's name
3.	publisherid	varchar	20	Publisher id
4.	address	varchar	255	Address of supplier
5.	City	varchar	30	City of supplier
6.	State	varchar	30	State of supplier
7.	Pin	varchar	10	Pin number
8.	mobileno	varchar	15	Mobile no of supplier
9.	e-mail	varchar	50	E-Mail of supplier

Table: staff

S.No.	Field Name	Data Types	Length	Description
1.	userid	varchar	20	Unique identification id for user
2.	designation	varchar	20	Designation for user
3.	salary	int		Salary of user
4.	joiningdate	date		Date of joining
5.	workedtill	time		Date of last worked day

Table: book

S.No.	Field Name	Data Types	Length	Description
1.	bookid	varchar	20	Unique identification id for book
2.	bookname	varchar	50	Book's name
3.	categoryid	varchar	20	Identification id of category
4.	supplierid	varchar	20	identification id of supplier
5.	authorname	varchar	50	Author's name of book
6.	Isbn	varchar	20	ISBN number
7.	editionno	int	05	Edition no of book
8.	editionyear	int	05	Edition year of book
9.	price	int	05	Price of book
10.	description	varchar	255	Description about book
11.	stock	int	10	No of books for this id

Table: query

S.No.	Field Name	Data Types	Length	Description
1.	queryid	varchar	20	Unique identification id for query
2.	userid	varchar	20	Identification id for user
3.	subject	varchar	255	Subject for query
4.	query	Text	65535	Query details
5.	response	Text	65535	Response of query

Table: reservedbook

S.No.	Field Name	Data Types	Length	Description
1.	reserveid	varchar	20	Unique identification id for reserved book
2.	userid	varchar	20	Identification id for user
3.	bookid	varchar	20	Identification id for book
4.	reserveddate	date	20	Reserve date of book

Table: issuedbook

S.No.	Field Name	Data Types	Length	Description
1.	issueid	varchar	20	Unique identification id for issuedbook
2.	userid	varchar	20	Identification id for user
3.	bookid	varchar	20	Identification id for book
4.	reserveddate	date	20	Reserve date of book
5.	issueddate	date	255	Issue date of book
6.	tentative_return date	date	30	Tentative return date of book

Table: returnedbook

S.No.	Field Name	Data Types	Length	Description
1.	returnid	varchar	20	Unique identification id for returnedbook
2.	userid	varchar	20	Identification id for user
3.	bookid	varchar	20	Identification id for book
4.	reserveddate	date	20	Reserve date of book
5.	issueddate	date	255	Issue date of book
6.	tentative_return date	date	30	Tentative return date of book
7.	actual_return date	date	30	Actual return date of book
8.	Fine	int	10	Total fine on issued books
9.	paidstatus	enum	15	Status of fine payment