SOFTWARE REQUIREMENTS SPECIFICATION

LIBRARY MANAGEMENT SYSTEM

Version 1.0

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1 Introduction

1.1 Purpose

The main objective of this document is to illustrate the requirements of the project Library Management system. The document gives a detailed description of the functional and non-functional requirements proposed by the client. This project aims to provide a friendly environment to maintain the details of books and library members. The main purpose of this project is to maintain an easy circulation system using computers and to provide different reports. This project uses ER and UML diagrams to describe the hardware and software interface requirements.

1.2 Intended Audience and Reading Suggestions

This SRS is for developers, project managers, users and testers. Further, the discussion will provide all the internal, external, functional and non-functional information about the ”Library Management System ”.

1.3 Project Scope

Library Management System is basically updating the manual library system into an internet-based application so that the users can know the details of their accounts, availability of books and maximum limit for borrowing.
The project is specifically designed for the use of librarians and library users. The product will work as a complete user interface for the library management processes and library usage from ordinary users. Library Management System can be used by any existing or new library to manage its books and book borrowing, insertion and monitoring. It is especially useful for any educational institute where modifications in the content can be done easily according to requirements.
The project can be easily implemented under various situations. We can add new features as and when we require them, making reusability possible as there is flexibility in all the modules.
The language used for developing the project is JavaScript as it is quite more advantageous to other languages in terms of performance, tools available, cross-platform compatibility, libraries, cost (freely available), and development process.

2 Overall Description

2.1 Product Perspective

Use Case Diagram of Library Management System This is a broad-level diagram of the

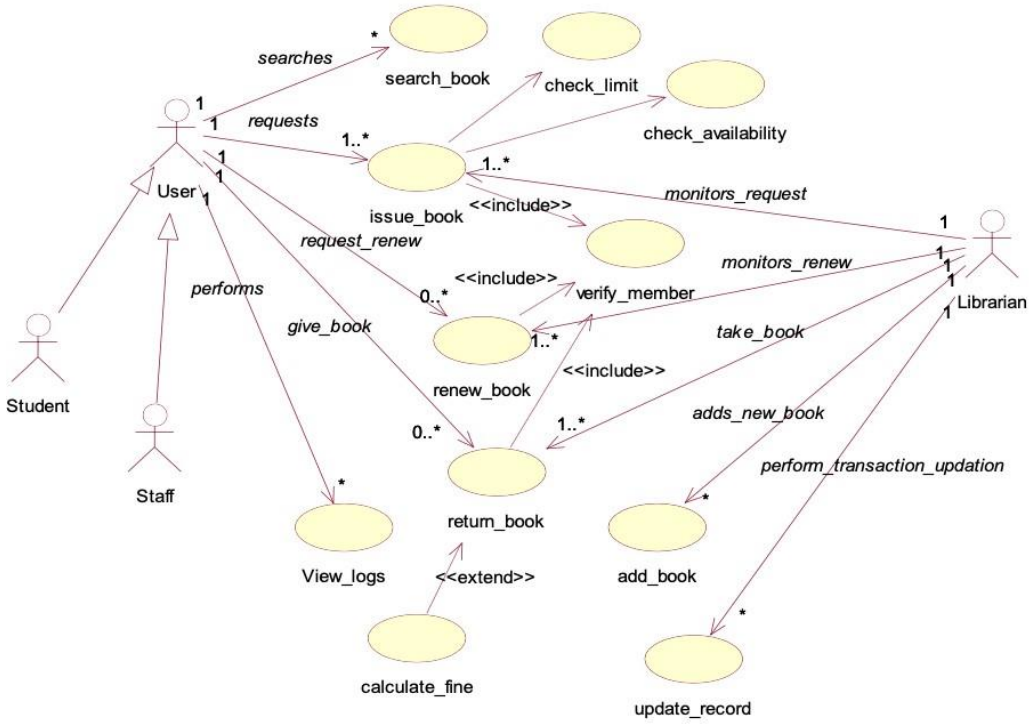

Figure 2.1: Use case diagram

project showing a basic overview. The users can be either staff or students.. This System will provide a search functionality to facilitate the search of resources. This search will be based on various categories viz. book name or the ISBN. Further the library staff personnel can add/update the resources and the resource users from the system. The users of the system can request issue/renew/return of books for which they would have to follow certain criteria.

2.2 User Classes and Characteristics

The system provides different types of services based on the type of users [Member/Librarian]. The Librarian will be acting as the controller and he will have all the privileges of an administrator. The member can be either a student or staff of the university who will be accessing the Library online.
The features that are available to the Librarian are:-

- A librarian can issue a book to the member.
- Can view the different categories of books available in the Library
- Can view the List of books available in each category
- Can take the book returned from students
- Add books and their information to the database
- Edit the information of existing books
- Can check the report of the existing books
- Can check the report of the issued books
- Can access all the accounts of the students

The features that are available to the Members are:-

- Can view the different categories of books available in the Library
- Can view the List of books available in each category Can own an account in the library.
- Can view the books issued to him
- Can put a request for a new book
- Can view the history of books issued to him previously Can search for a particular book

2.3 Product Functions

Entity Relationship Diagram of Library Management System The Online Library System provides online real-time information about the books available in the Library and the user information. The main purpose of this project is to reduce manual work. This software is capable of managing Book Issues, Returns, Calculating/Managing Fines, and Generating various Reports for Record-Keeping according to end-user requirements. The Librarian will act as the administrator to control members and manage books. The member's status of issue/return is maintained in the library database. The member's details can be fetched by the librarian from the database as and when required. Valid members are also allowed to view their account information.

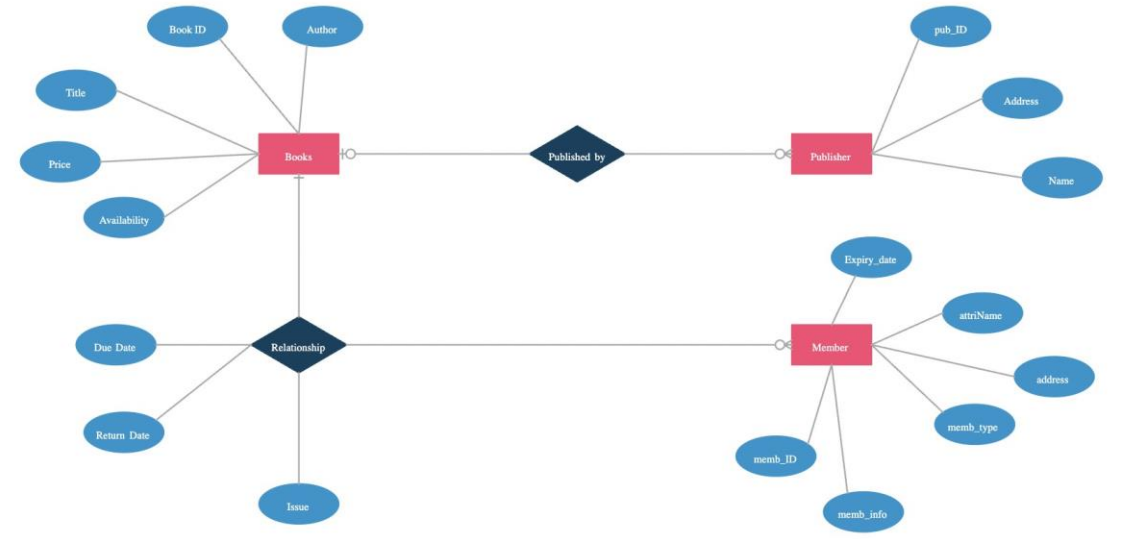

Figure 2.2: ER Diagram

2.4 Operating Environment

The product will be operating in a windows environment. The Library Management System is a website and shall operate in all famous browsers, for a model we are taking Microsoft Internet Explorer, Google Chrome, and Mozilla Firefox. Also, it will be compatible with IE 6.0. Most of the features will be compatible with Mozilla Firefox Opera 7.0 or higher versions. The only requirement to use this online product would be an internet connection. The hardware configuration includes a Hard Disk: 40 GB, Monitor: 15" Color monitor, Keyboard: 122 keys. The basic input devices required are keyboard, mouse and output devices are a monitor, printer etc.

2.5 Assumption and dependencies

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 a search facility and support quick transactions

- The Library System is running 24 hours a day
- Users may access 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

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

2.6 Requirements

Software Configuration:- This software package is developed using java as front end which is supported by sun micro system. Microsoft SQL Server as the back end to store the database.
Operating System: Windows NT, windows 98, Windows XP
Language: Java Runtime Environment, Net beans 7.0.1 (front end)
Database: MS SQL Server (back end)

Hardware Configuration:-
Processor: Pentium(R)Dual-core CPU Hard Disk: 40GB
RAM: 256 MB or more

2.7 Data Requirement

The inputs consist of the query to the database and the output consists of the solutions for the query. The output also includes the user receiving the details of their accounts. In this project the inputs will be the queries as fired by the users like create an account, selecting books and putting into account. Now the output will be visible when the user requests the server to get their account details in the form of time, date and which books are currently in the account.

3 External Interface Requirement

3.1 GUI

The software provides a good graphical interface for the user, and the administrator to operate on the system, performing the required tasks such as creating, updating, and viewing the book's details.

- It allows users to view short reports like Book Issued/Returned in between particular times.
- 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 the standard defined
- The design should be simple and all the different interfaces should follow a standard template.
- The user interface should be able to interact with the user management module and a part of the interface must be dedicated to the login/logout module

Login Interface:-
In case the user is not yet registered, he can enter the details and register to create his account. Once his account is created he can 'Login' which asks the user to type his username and password. If the user entered either his username or password incorrectly, then an error message appears.
Search:-
The member or librarian can enter the type of book he is looking for and the title he is interested in; then he can search for the required book by entering the book name.
Categories View:-
Categories view shows the categories of books available and allows the librarian to add/edit or delete a category from the list. Librarian's Control Panel:- This control panel will allow the librarian to add/remove users, add, edit, or remove a resource. And manage lending options.

3.2 System Features

The users of the system should be provided the surety that their account is secure. This is possible by providing:-

- User authentication and validation of members using their unique member ID
- Proper monitoring by the administrator which includes updating account status, showing a popup if the member attempts to issue number of books that exceed the limit provided by the library policy, assigning fine to members who skip the date of return
- Proper accountability which includes not allowing a member to see other member's account. Only administrator will see and manage all member accounts

4 Other Nonfunctional Requirements

4.1 Performance Requirements

The proposed system that we will develop will be used as the Chief performance system within the different campuses of the university, which interacts with the university staff and students. Therefore, it is expected that the database would perform functionally all the requirements that the university specifies.

- The performance of the system should be fast and accurate
- Library Management System shall handle expected and non-expected errors in ways that prevent loss of information and long downtime period. Thus it should have inbuilt error testing to identify invalid username/password . The system should be able to handle large amounts of data. Thus it should accommodate the high number of books and users without any fault

The database may crash anytime due to viruses or operating system failure. Therefore, it is required to take the database backup so that the database is not lost. A proper UPS/inverter facility should be there in case of power supply failure.

4.2 Security Requirements

- System will use a secured database
- Normal users can just read information, but they cannot edit or modify anything except their personal and some other information.
- System will have different types of users, and every user has access constraints
- Proper user authentication should be provided
- No one should be able to hack users' password
- There should be separate accounts for admin and members such that no member can access the database, and only the admin has the right to update the database.

4.3 Requirement attributes

- There may be multiple admins creating the project, all of them will have the right to create changes to the system. But the members or other users cannot make changes

- The project should be open source
- The Quality of the database is maintained in such a way that it can be very user friendly to all the users of the database
- The user be able to download and install the system easily

4.4 Business Rules

A business rule is anything that captures and implements business policies and practices. A rule can enforce business policy, make decisions, or infer new data from existing data. This includes the rules and regulations that the System users should abide by. This consists of the project's cost and the discount offers provided. The users should avoid illegal regulations and protocols. Neither the admin nor the member should cross the rules and regulations.

4.5 User Requirements

The system's users are members and librarians of the university who act as administrators to maintain the system. The members are assumed to have basic knowledge of computers and internet browsing. The system administrators should have more understanding of the system's internals and be able to rectify the minor problems that may arise due to disk crashes, power failures and other catastrophes to maintain the system. The proper user interface, user manual, online help and guide to installing and maintaining the system must be sufficient to educate the users on how to use the system without any problems.
The admin provides certain facilities to the users in the form of:-

- Backup and Recovery
- Forgot Password
- Data migration, i.e. whenever the user registers for the first time, then the data is stored in the server
- Data replication, i.e. if the data is lost in one branch, it is still stored with the server
- Auto Recovery, i.e. frequently auto-saving the information
- Maintaining files, i.e. File Organization
- The server must be maintained regularly, and it has to be updated from time to time

5 Other Requirements

5.1 Data and Category Requirement

There are different categories of users, namely teaching staff, Librarian, Admin, students etc. Depending upon the category of use, the access rights are decided. It means if the user is an administrator, he can modify the data, delete, append, etc. All other users except the librarian have the right to retrieve information about the database. Similarly, there will be different categories of books available. According to the categories of books, their relevant data should be displayed. The categories and the data related to each category should be coded in a particular format.

5.2 Appendix

A: Admin, Abbreviation, Acronym, Assumptions; B: Books, Business rules; C: Class, Client, Conventions; D: Data requirement, Dependencies; G: GUI; K: Key; L: Library, Librarian; M: Member; N: Non-functional Requirement; O: Operating environment; P: Performance, Perspective, Purpose; R: Requirement, Requirement attributes; S: Safety, Scope, Security, System features; U: User, User class and characteristics, User requirement;

5.3 Glossary

The following is the list of conventions and acronyms used in this document and the project as well:

- Administrator: A login id representing a user with user administration privileges to the software
- User: A general login id assigned to most users
- Client: Intended users for the software
- SQL: Structured Query Language; used to retrieve information from a
- SQL Server: A server used to store data in an organized format
- Layer: Represents a section of the project
- User Interface Layer: The section of the assignment referring to what the user interacts with directly

- Application Logic Layer: The assignment section refers to the Web Server. This is where all computations are completed
- Data Storage Layer: The section of the assignment referring to where all data is recorded
- Use Case: A broad-level diagram of the project showing a basic overview
- Class diagram: It is a type of static structure diagram that describes the structure of a system by showing the system's cases, their attributes, and the relationships between the classes
- Interface: Something used to communicate across different mediums
- Unique Key: Used to differentiate entries in a database

5.4 Class Diagram

A class is an abstract, user-defined description of a type of data. It identifies the attributes of the data and the operations that can be performed on instances (i.e. objects) of the data. A class of data has a name, a set of attributes that describe its characteristics, and a set of operations that can be performed on the objects of that class. The classes' structure and relationships to each other frozen in time represent the static model. In this project, certain main classes related to other courses are required for their work. There are different kinds of relationships between the types, as shown in the diagram, like regular association, aggregation, and generalization. The connections are depicted using a role name and multiplicities. Here 'Librarian', 'Member' and 'Books' are the most critical classes related to other courses.

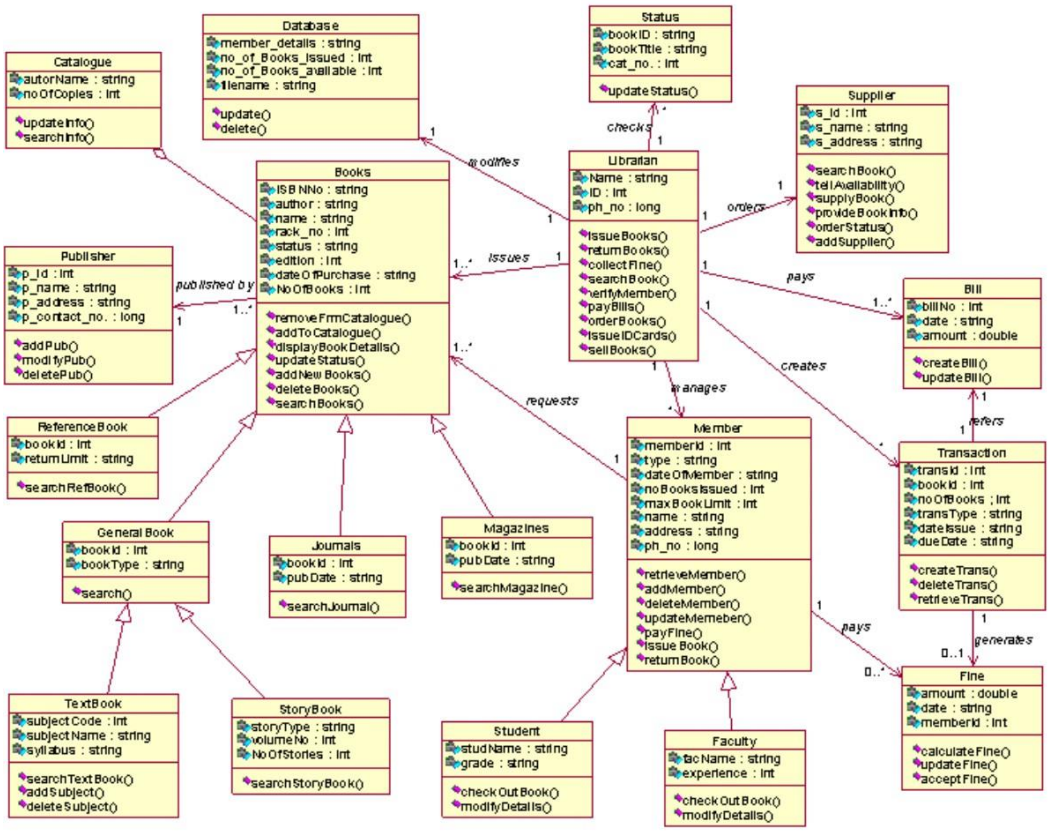

Figure 5.1: Data Flow Diagram