LIBRARY MANAGEMENT SYSTEM

SOFTWARE REQUIREMENTS SPECIFICATION DOCUMENT

1 Abstract

This is the requirements document for the library management system. The system to be developed is for managing the library activities like issue of books, return of books, fine collection and report generation. This document follows the IEEE standard for a requirements specification document, with some variations.

2 Introduction

2.1 Purpose

The purpose of this document is to describe the external requirements for a library management system. It also describes the interfaces for the system.

2.2 Scope

This document is the only one that describes the requirements of the system. It is meant for use by the developers and will be the basis for validating the final delivered system. Any changes made to the requirements in the future will have to go through a formal change approval process. The developer is responsible for asking for clarifications, where necessary, and will not make any alterations without the permission of the client.

2.3 Definitions, Acronyms, Abbreviations

SRS - Software Requirements Specification.
LMS - Library Management System.

2.4 References

Not applicable.

2.5 Developer's Responsibilities

The developer is responsible for (a) developing the system, (b) installing the software on the client's hardware, (c) conducting any user training that might be needed for using the system, and (d) maintaining the system for a period of one year after installation.

3 General Description

3.1 Product Functions Overview

The college library serves as a vital resource hub for students, faculty, and staff. Manual process of keeping student records, book records, account details, and managing employees is very difficult. The LMS system provides functionalities which include issue of books, returning the books while collecting fines if not submitted within the given time and generating reports to calculate the usage of books so that the books can be bought accordingly.

3.2 User 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.

3.3 General Constraints

Security is important to library operation. Library users are allowed to use the Library Book System only for searching book records. Users should never be able to break into the system and to perform any modification.

Reliability is vital to library operation. The Library Book System should not have any unscheduled down time during library operation hours. Any down time in operation hours has a significant impact on the operation and causes inconvenience to everyone in the library.

3.4 General Assumptions 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.
- Users must have their correct usernames and passwords to enter into their online accounts and do actions.

The dependencies are:-

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

4 Specific Requirements

4.1 Inputs and Outputs

Patron database: Contains the information of patrons (student/faculty) such as the patron id where patron id are alphanumeric with 6 characters, position, patron_name and fine.

Pat_id	Position	Patron_name	Fine
p#	Student/faculty	pname	0.0

where pat_id is the id of the student or the faculty, position indicates a student or faculty, patron_name is the name and fine is the pending due amount to be paid by the patron respectively.

***Book database*:** Contains the information of books such as ISBN number, book title, author, book_code, category, availability and shelf no. Here the ISBN number is a thirteen digit number and book_code is an alphanumeric of length 2.

ISBN	Code	Category	Title	Author	Shelf_no	Availability
xxxxxxxx	C6	Library/Pardon	ABC	XYZ	s#	Yes/No

where ISBN is the ISBN number of the book, category represents whether it's a library copy or not, and shelf no represents the number of the shelf.

***Librarian database*:** Contains the details of the librarian such as librarian_id, librarian_name and password.

Librarian_id	Librarian_name	Password
xxxx	ABC	xxxxxx

where librarian_id is a four digit number and password is an alphanumeric of length 6.

***Book - Patron Relationship Table*:** Contains the information such as ISBN number of the book, patron_id, issue and return dates of the books where issue and return dates are valid dates of the form dd/mm/yyyy and fine amount for each issue of the book.

ISBN	Pat_id	Issue_date	Return_date	Fine
xxxxxxxx	p#	dd/mm/yyyy	dd/mm/yyyy	0.0

Input_form_1: Patron registration

This form is used to register a new patron. This form requires information related to the patron such as patron name and user type i.e. faculty or student. The form looks like this:

Patron_id	Patron_name	User_type
21a234	ABC	Student
22w235	XYZ	Faculty

Input_form_2: Librarian Login

This form is for the librarian to login so that they can execute the necessary functionality requested by the patron. It requires information related to the librarian such as librarian id and librarian name. It has the following structure:

Librarian_id	Password
2101	326XF0
2203	893@19

Input_form_3: Book Issue

This form is used while issuing a book to the patron. It requires information related to the book (ISBN number) and the patron (patron id) and the date of issue i.e. the current system date. The structure of the form is in the following manner:

Patron_id	ISBN	Date_of_return
21a234	9783161789021	12/11/2022
22w235	9785436272978	31/02/2023

Input_form_4: Book Return

This form is used when the patron returns the book. It requires information such as patron id, ISBN number and return date i.e. the current system date. The structure of the form is as follows:

Patron_id	ISBN	Date_of_return
21a234	9783161789021	23/11/2022
22w235	9785436272978	06/02/2023

Input_form_5: Book Search

This form is used when the patron wants to search for a particular book based on its title or author name. The structure of the form is as follows:

Book_title	(or)	author_name
ABC		XYZ

Output_1: Displays the date to be returned for the book that has been issued.

Output_2: The return_date is updated with the return date of the book for the patron and the fine is imposed accordingly if the return_date is not within 15 days from the issue_date.

Output_3: The display of the information of the requested book including its ISBN number, book id, book title, author name, category, availability and its shelf number.

Output_4: Books not available and the reason for unavailability should be stated .

Output_5:

Error messages. At the minimum, the following error messages are to be given:
e1: Invalid patron information
e1.1: Patron number has wrong format
e1.2: Patron position is invalid
e2: Invalid book information
e2.1: Invalid ISBN number
e2.2: Invalid book number
e2.3: No such book title exists
e2.4: No such author with the book title
e3: Requested book is not available for issue
e3.1: Requested book is for library use only
e3.2: Copies unavailable for the requested book
e4: Book borrow date is invalid or has wrong format

Output_6: A report is generated for each patron when they are issued a book. The report consists of the books they have borrowed along with their respective return dates.

4.2 Functional requirements

1. These are the constraints to be followed while issuing a book:
    a) Not more than 4 books can be issued to a student
    b) Not more than 6 books can be issued to a faculty
    c) The book marked as “In library use only” cannot be issued (category constraint)
    d) The book is not to be issued to the person if he has a pending fine to pay.
    e) The book should not be issued to the same person immediately after returning the book. There should be a time gap of at least one day.

    Inputs: Input_form_1
    Outputs: Output_1, Output_6

2. Constraints to be followed while returning the book:
    a. Book cannot be returned on the same day it has been borrowed.
    b. Fine should be calculated in the following manner:
        i. For a student: Free for the first 15 working days and Rs. 1 per day until the book is returned.
        ii. For a faculty member: Free for the first 15 working days and Rs. 0.50 per day until the book is returned.

    Inputs: Input_form_4
    Outputs: Output_2

3. The system should allow searching books by titles and its author’s name.
    Inputs: Input_form_5
    Outputs: Output_3

4. Produces a list of books not available because some constraints could not be satisfied and give reasons for non-availability.
    Inputs: Input_form_5
    Outputs: Output_4

5. All the input data must be checked and validated. Messages should be given for improper input data, and the invalid data item should be ignored.
    Inputs: Input_form_1, Input_form_3, Input_form_4, Input_form_5
    Outputs: Output_5

4.3 External Interface Requirements

User Interface: All the input required should be given by the user based on the functionality being used.

4.4 Performance Constraints

The Information page should be able to be downloaded within a minute. The information is refreshed every two minutes.The system shall take as less time as possible to provide service to the administrator or the librarian.The resources are modified according to the user requirements and also according to the books requested by the users.

4.5 Design Constraints

Hardware Constraints

The system is to have a minimum storage capacity of at least 2 GB RAM and a stable network infrastructure for seamless connectivity.

Software Constraints

The system must be able to run on a Windows/Unix operating system and has the ability to handle concurrent user access and transactions efficiently.

Acceptance Criteria

Before accepting the system, the developer must demonstrate that the system works in the library environment. The developer will have to show through test cases that all conditions are satisfied.

Team Members

21z225 - M Hemali
21z253 - Sathya M