Database Team

Library Management System
Database Requirements Specifications

Version <1.0>

Revision History

Date	Version	Description	Author
25/09/2025	1.1	Defined stakeholders, database requirements, and hardware/software requirements.	James Hanselman, Lilly Kounkel, Edbert Jensen, Jay Chung, Connor Williamson

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Software Requirements Specifications

1. Introduction

1.1 Project overview

This database is used in the management of a library system. It will be used by librarians to manage their library and for library members to search for, reserve, renew, return, or check out pieces of media. The system will also be used for fine tracking and management.

1.2 Scope

The system needs to be able to allow two main types of users, librarians and users, to perform various actions within the library system. These include checking out, holding, renewing, and returning books. The system needs to keep track of books, digital media and magazines. It also needs to have notification systems in place for reminding members of due dates and reservations. The system must also track checked out media and assign fines to member accounts for overdue media. The members must be able to generate reports about their usage history, and be able to search for specific pieces of media to place a hold or check out that item.

2. Stakeholders

2.1 Library Staff
    2.1.1   Librarian
    2.1.2   Library manager

2.2 Library Members
    2.2.1   Regular
    2.2.2   Student
    2.2.3   Senior
    2.2.4   Child

3.   Specific Requirements

3.1   Functionality

3.1.1   User Administration

Administrators must be able to add, remove, and update users (library members, librarians, venders, publishers)

3.1.2   Media Administration

Administrators must be able to add, remove, and update media. Librarians must be able to purchase media from Vendors.

3.1.3   Member Checkout, Renewal, and Return

Library Members must be able to check out and return media. A timestamp of when a piece of media is checked out must be recorded and a return date must be generated. A member who does not return a piece of media before or on the return date will incur late fees, unless the member renews their media.

3.1.4   Media Holds

Library Members must be able to request a hold on a piece of media that is currently checked out. If a hold is placed on a piece of media, that media cannot be renewed, and must be returned.

3.1.5   Fine Payment

Library Members must be able to pay late fines they have incurred.

3.1.6   Media Queries (Public)

Members and non-members must be able to search for media by title, author, ISBN, issue, publication date, …, and get a list of available and non-available media that matches the search.

3.1.7   Media Queries (Private)

Members should be able to view what media they have currently or previously checked out, have on hold, or fees they have incurred.

3.1.8   Administrator-Customer Queries

Library Staff should be able to look up members and view what media they have currently or previously checked out, have on hold, or fees they have incurred.

3.1.9   Notification System

The system must be able to notify users about upcoming due dates, overdue items, and available reserved items.

3.1.10   Operational Efficiency Report Generation

The system should be able to generate a report to assess the library's operational effectiveness by analyzing key metrics like book loan and return processing times, overdue book rates, and fine collection trends.

3.2   Data Entities

3.2.1   Media

Attributes:

- Media ID   [uint]
- Publishing Date   [Date]
- Title   [String]

-　Availability Status　　　[available, checked_out, reserved, restricted]
-　Genre　　　　　　　　　[String]

3.2.2　Book

Attributes:

-　Book ID　　　　　[uint]
-　Author　　　　　　[String]
-　ISBN　　　　　　　[String]
-　Publication Year　[uint]
-　Shelf Location　　[String]

3.2.3　DVD

Attributes:

-　DVD ID　　　　　　　[uint]
-　Creator　　　　　　　[String]
-　Publication Year　　[uint]
-　Genre　　　　　　　[String]
-　ISBN / Media Code　[String]
-　Location　　　　　　[String]
-　Subtitle　　　　　　[String]
-　Cast(s)　　　　　　[String]
-　Rating System　　　[String]

3.2.4　Magazines

Attributes:

-　Magazine ID　　　　[uint]
-　Author　　　　　　　[String]
-　Genre　　　　　　　[String]
-　Shelf Location　　　[double]
-　Publication Year　　[uint]
-　ISSN　　　　　　　[String]
-　Volume number　　[String]
-　Issue Number　　　[String]
-

3.2.5　Librarian

Attributes:

-　Librarian ID　[uint]
-　First name　　[String]
-　Last name　　[String]
-　Address　　　[String]
-　Birth date　　[Date]
-　Salary　　　　[double]
-　Phone number　[String]
-　E-mail address　[string]
-　SSN　　　　　[String]

3.2.6　Member

Attributes:

-　Member ID　　　　[uint]
-　First Name　　　　[String]

- Last Name	[String]
- Address	[String]
- Date of Birth	[Date]
- Member Type	[Standard, Student, Child, Senior]
- Outstanding Fees	[double, (min: 0, max: none)]

3.2.7 Loan

Attributes:

- Media ID	[uint]
- Member ID	[uint]
- Checkout Date	[Date]
- Return Date	[Date]
- Overdue	[bool]
- Fee	[double, (min: 0, max: None)]

3.3 Hardware requirements

The database system does not need very powerful hardware because it will manage a small library. A normal modern computer or EECS remote server is enough. The expected hardware is:

CPU: Intel or AMD processor with at least 2 cores, 2.0 GHz speed.
Memory (RAM): Minimum 4 GB, recommended 8 GB.
Storage: At least 50 GB of free hard disk space.
Network: Ethernet connection with internet access.
Backup storage: External hard drive or cloud storage.

3.4 Software requirements

The database system can run on open-source or commercial software. The expected software is:
Operating System: Windows, Linux, or macOS
Database Management: phpMyAdmin or MySQL Workbench
Database Management System (DBMS): MySQL or MariaDB 10.6.22(EECS remote server version) or higher.
Server Software: Apache or Nginx if a web interface is used.
Programming Language: Python, Java, or PHP.
Client Software: Any web browser (Chrome, Firefox, Edge, Safari) for users to access the system.