Library Inventory System

Team 9

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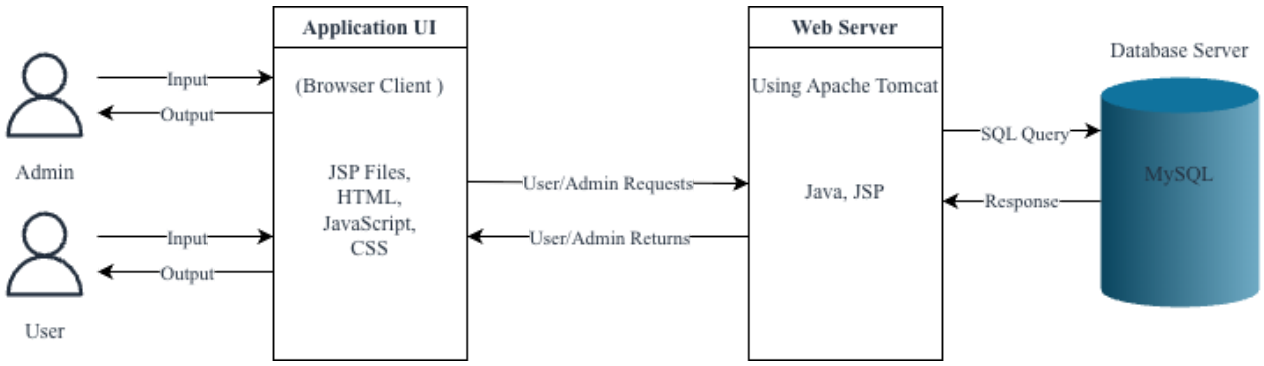
Project Description

The Library Inventory System is a website that allows Library Administrators and Borrowers to view and manage library books, as new books arrive to the library system and are then brought into circulation. Library Administrators have access to managing the inventory. Borrowers can view the inventory and each item's availability, which they can then request to borrow, among other functionalities. Its application domain lies in library management and cataloguing, and its major stakeholders are librarians and library goers. The Library Inventory System is an effective tool used to streamline the lending and returning process of library books to save time and effort for all parties.

System Environment



System Structure

Front end: HTML, CSS

Middleware: JSP

Backend: Java

Hardware & Software

Laptop using Windows 11/Mac Sequoia 15.7.2, Apache Tomcat 9.0.115, MySQL Workbench 8.0.46

RDBMS

MySQL Community Server 8.0.45

Application Languages

Java, SQL, JSP

Functional Requirements

Below is a list of the Library Inventory System's core features, broken down by who has access to which feature.

1. Borrow and Librarian
    a. Create account (username, password)
        i. Users should also be able to give their first name, last name, phone number, address, age, and so on to create their very own library account.
    b. Book search (potential filters - genre)
        i. Admin should be able to view a database of all the current books in the system
        ii. To search for books, buyers/borrowers should be able to search a book by title, publication and potentially even by adding publication date filters.
    c. Login

i. In addition to this, the buyer should also be able to login to their existing library account

2. Borrower View
    a. View book description
        i. After searching for a book, borrowers may select a book to view its description
        ii. Descriptions include title, author, publication date, condition, availability, and synopsis
    b. Borrow book
        i. Upon selecting a book, if it is available, the borrower may choose to borrow the book
        ii. Borrowed books will have a given return date before late fees are placed, which can be extended by renewing
    c. Return book
        i. Borrowers may return any books they have borrowed
        ii. Returned books will removed from the borrower's account once an admin has checked the book in
    d. Renew book
        i. Borrowers should be able to renew a book they have currently borrowed
        ii. These books could be renewed unless they are not already on hold for someone else
3. Library view (Admin related functionalities):
    a. Adding new books, Books: title, author

i. Administrators should be able to take the book title, author, publication, and other details and seamlessly add it to the system so that other users can borrow it.

ii. After reloading the page, these changes should persist in the view.

b. Deleting a book entirely from system

i. Admin should be able to delete a book from the library such that it will no longer be available to borrow.

ii. Changes should persist after committing in the admin view.

c. Add hold

i. Administrators may add a hold to a book that a borrower has requested to borrow

ii. The book will be exclusively available to the borrower for a set period of time before it goes to the next borrower

iii. Borrowers will be notified of the book's hold duration and pickup location

d. Set borrow time

i. Upon creating an administrator account, the user will be able to input the length of time, in days, books are able to be borrowed. If they choose not to manually input a time, the default borrow time will be 21 days.

e. Renew book/hold

i. The administrator can renew a borrower's time with a book.

ii. The borrower's time will be reset to the borrow time set by the library admin, or default if no borrow time was set.

f. Check in book after its return

i. When the borrower returns a book, the system will flag that the book is available again for the borrower.

g. Lend book

i. This functionality allows the librarian to mark when books have been borrowed. This makes them unavailable to borrow, but a hold can be added.

Non-Functional Issues

GUI

The graphical user interface will be developed using HTML with CSS styling. The GUI will let users (both Library Administrators and Borrowers) create and log in to their accounts. Once logged in, users can move to an accounts settings page, where there will be a menu of account settings to view or modify.

In the home page, users will see a view of all the books in the library's database and be able to click on each to view more information. Here, Librarian Administrators can check the status of each book (borrowed / available / on hold) and renew any hold requests, whereas Borrowers will be able to check wait times for a book and request a hold.

Security

To ensure that borrowers are held accountable for the books they have borrowed, every borrowed book and login details should be kept for a user to resolve any issues down the line. In addition to this, it is essential that admins and users only login once they have entered their correct username and password. Unique usernames should also be enforced such that there are no duplicate account creations. Passwords should be strong, and have some basic requirements

to ensure better security. For instance, having at least one capital letter, numbers, special characters, and so on. This password must be required to do any major updates, such as borrowing books by the user, adding books to the library, deleting books by the admin and even account deletion. In addition to this, change of password can only be done once the old password is entered correctly.

All the information regarding books borrowed by other users can only be accessed by the admin, and not other regular users. All commits in the database should follow ACID protocols. Each transaction should be a singular unit, datatypes should remain the same throughout, concurrency control, and transactions once committed should persist.

Access Control

Borrowers are library users accessing the website. Borrowers are able create their own account, search for books depending on their query, and view the book's description, which includes but is not limited to:

- Book title
- Book author
- Publication date
- Book condition
- Book availability
- Book synopsis

Borrowers also have the ability to borrow books, as well as renew and return any book they have borrowed.

Librarians are library workers that have access to administrative privileges. Librarians have the following privileges:

- Add new books to the database
- Set borrow times for books
- Remove books from the database
- Add holds to a book
- Renew a book or a hold
- Check in returned books
- Check out borrowed books

Developers have the following privileges:

- Add, remove, or modify a book in the database
- Add, remove, or modify a hold on a book
- Reset password of account upon request
- Delete account upon request

Stretch Goals

If time permits, we will try and implement the following features,

1. Expanding the database application for items beyond books.
2. The ability for users and admins to have a drop down feature to search for books by author, publication, date published, and availability.
3. Implementing a marketplace feature where users can auction/sell books, CDs, textbooks, notebooks, lab manuals, and so on (similar to FaceBook Marketplace).

References

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Project Proposal & Functional Requirements Document- Example.pdf. *CS 157A: Introduction to Database Management Systems*, Spring 2026, *San Jose State University*, sjsu.instructure.com.