Digital Library (DL)

CMSC-4900

Fall 2025

Project Requirements

October 19th, 2025

Instructor Comments/Evaluation

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Abstract

The Digital Library is a project designed to allow users to track and organize books that they have read or want to read. The intention of this application is to give users a free, easy option to track their books. While there are other applications that serve this purpose, they often hide basic features behind a paywall. Our goal is to provide a fully free and functional option for users to track their books. We will allow users to add books that they have read, books that they want to read, and books they are currently reading. With this document, we seek to better define the Digital Library application and develop a plan for the rest of the project.

Introduction

Background:

Book tracking is an important aspect for any fan of literature. The quantity of books available to the public can be quite overwhelming, both for people on the surface and for People who are deeply invested in literature. The Digital Library aims to address this problem by making the process of tracking books much simpler. One issue that is specific to books that the Digital Library will help users solve is books they want to read in the future. The nature of books is that they can have a vast range of sizes. Simultaneous reading is difficult to keep track of, so the Digital Library will allow users to keep a list of books they are currently reading, ones they have already read, as well as books they want to read in the future. The Digital Library provides a simple way for users to keep track of all of their book needs.

Objective & Overview of Project:

The objective of the Digital Library application is to create an open platform for users to store and keep track of their books. This application is designed to allow users to log books they have read or are currently reading, organize them into categories, and write notes/reflections for each book. This software system will consist of mobile and web-based applications that will

provide users access to their digital libraries across multiple devices. This application will be developed with a cross-platform framework that allows a consistent user interface on both mobile and web platforms. An SQL database will serve as the backend to store user information, including book details, reading progress, and notes/reflections. The system will also integrate a recommendation engine, a machine learning model that analyzes the users' reading history and suggests books that are similar. This application aims to encourage reading and engagement with all kinds of books by providing a space for users to manage their books and reading progress. Potential users include students, teachers, book clubs, and casual or avid readers who want to track their reading history.

Team Details & Dynamics:

In order to ensure a high-quality and successful application, team members have decided to elect a leader for each phase of the project. Leadership roles have been decided to best fit each team member's strengths and experience in software development, design, and presentation, with collaboration at the center of the project.

Team Member:	Major:	Leadership Phase:
Camron Mellott	CS	Specs & Implementation / Analysis
Josh Watson	CS	Design
Luke Joseph	CS	Presentation/User manual

To best facilitate the timely completion of the project, the team will be meeting regularly both in person and virtually using services like Discord and Google Drive. This will ensure that progress

can constantly be made on the project if one or more team members are unable to meet in person. Each team member is responsible for reviewing and verifying the accuracy of their assigned work as well as providing feedback to other team members. The workflow leader coordinates weekly check-ins where tasks are assigned, issues are discussed, and development milestones are decided on. The team members will collaborate in all phases of the workflow, ensuring that every aspect of the project meets the outlined objectives.

Application Domain

Project Context:

Many applications allow users to review and purchase books, while a few allow users to store and keep track of books they have read, are currently reading, or want to read. The Digital Library application is intended to fill that role and allow users to have a personalized organization for their reading activity. This application aims to assist users in their reading habits by allowing them to store, track, and review their books. The Digital Library would be beneficial to students, teachers, book clubs, and the casual or avid reader.

Initial Business Model

Operational Environment:

The Digital Library will be designed for the casual or avid reader, but could also be beneficial in schools among the students and teachers. This system aims to be user-friendly for everyday use while also allowing more advanced users to personalize and organize their digital library according to their preferences. Since the digital library will operate across both mobile and web platforms, it must perform reliably in a variety of digital environments. Users will be

able to access the application on smartphones, tablets, and laptop/desktop computers, which requires a responsive design that changes and adapts to different screen sizes and operating systems. The syste will be developed with a focus on stability, accessibility, and performance. It will be lightweight enough to run smoothly on any device, while maintaining robust functionality for tasks such as searching and tracking books. This ensures that the digital library is effective in the diverse environments where all kinds of readers will engage with the application.

Description of Data Sources:

The Digital library will utilize data primarily entered or generated through user interaction and backend processing. The main data source will include user-provided book information, automated metadata retrieval, and system-generated recommendation data. Users will be able to enter book information such as title, author, genre, ISBN, and their progress in the book. Users will also be able to use an ISBN lookup system to retrieve metadata from publicly available online book databases. The metadata may include an image of the cover of the book, the publication date, and a summary of what the book is about. In addition to user and metadata inputs, the system will also generate internal data through its recommendation engine, which will analyze users' reading history in order to recommend books that are similar and match the users' reading patterns. All data will be stored within the SQL database, where it can be accessed, modified, and synchronized across both mobile and web platforms. Because the system operates online, user data may occasionally experience latency. In order to maintain reliability, the application will use secure data handling methods with validation and consistency checks. User credentials will be encrypted, and general book data will be stored in structured formats to allow for efficient access and analysis.

Use Case UML Diagrams and Descriptions:

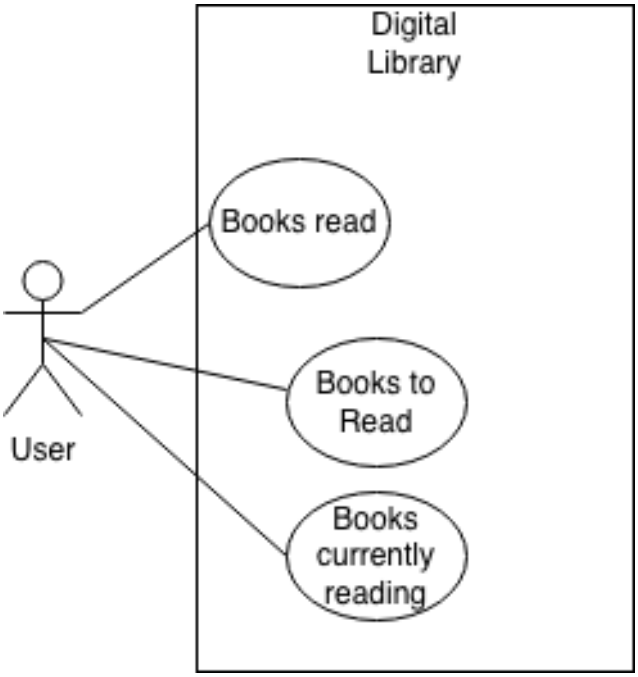

Figure 1: Use case UML diagram for a user accessing the three main features of the Digital Library

Description: When starting, the user will be presented with a list of their book data. Initially, it will be blank, but when logging in, users will be able to see their books listed in the appropriate category.

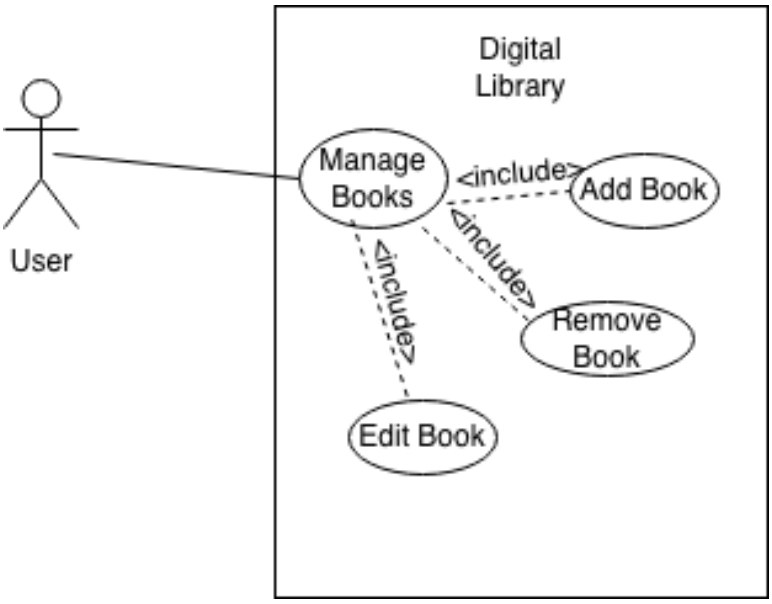

Figure 2: Use case UML Diagram for a user accessing the "Manage Books" feature of the Digital Library

Description: The user will be able to manage the books in their account. Upon clicking “Manage Books”, users can add a new book, remove a book, or edit a book that is currently in their library.

Initial Requirements:

Functional: This application will have a few functional requirements.

1. Account Creation: The system will allow users to create a username and password.
2. User Authentication: Allow users to log in using their credentials to access their personal library.
3. Personalized Lists: After a login, the appropriate list of books in each category should be displayed to the user.
4. Data storage: The system will store user book lists to maintain user information between sessions.

Nonfunctional: There will also be several nonfunctional requirements in this project.

1. Performance: The application should be responsive and perform well on all platforms
2. Session Reliability: Users should be able to maintain their user login sessions without interruptions
3. Guest Access: The system will allow users to create temporary sessions, allowing them to create and manage
4. Security: All user credentials will be encrypted and stored securely

Documentation:

I. Proposal Document
   - Outlined the initial concept and definition of the project

II. Requirements Document

- Explains the goals and plans for developing the project

III. Specifications Document

- Outlines the requirements, design standards, testing procedures, and the performance parameters that the final product must meet.

IV. Design Document

- Outlines the structure, functionality, and user interface of the system. This will guide development by outlining how each component will function within the application.

V. Project Log

- This will be used to track progress throughout the development process. It will track not only achievements but also issues and resolutions.

Testing / Revisions

All team members worked collaboratively on the revisions and testing for this project. All project documents, including this one, were shared through email, allowing simultaneous editing and review. The team used text messages as the primary communication platform and email for submitting updates and changes to the project documents. For the software development phase, GitHub will be used as the primary platform for submitting changes and revisions to the project. This will allow team members to work on parts of the project individually but also have a unified version to allow for testing everything and ensuring

proper functionality within the project. GitHub will also facilitate the testing of individual modules and ensure that all features and components merge seamlessly into a fully functional final product.

Resources:

Draw.io - free flowchart maker and diagrams online. Flowchart Maker & Online Diagram Software. (n.d.). https://app.diagrams.net/

Appendix: Technical Glossary

Application: a software program designed to perform a specific task for users. In our case, the task performed is to provide a digital library system that allows users to track and manage books.

Application Programming Interface (API): A set of defined rules and protocols that allow software applications to communicate with one another. It will likely be used for integrating book sources from external sources.

Authentication: The process of verifying a user's identity before granting access to a user account. The Digital Library will use username and password authentication.

Cloud Storage: A remote storage system accessed via the internet. It will likely be used to store user data, as well as backups of data.

Database: a structured collection of data stored electronically and accessed through a database management system. Used to store user and book information.

Data Persistence: a characteristic of data that allows information to be stored and retrieved between user sessions.

Encryption: A method of securing data by converting it into a coded format to prevent unauthorized access

Responsive Design: An approach to user interface design that ensures the application displays and functions properly across various devices

Appendix: Team Details

This document was developed with all team members in communication under the leadership of Camron Mellott. The contributions for the document go as follows:

- Camron Mellott was a major contributor to the “Introduction”, “Application Domain” , “Testing/Revisions”, “Appendix”, and “Initial Business” model sections.
- Luke Joseph was a major contributor to the “Team details” and “Appendix” sections
- Joshua Watson was a major contributor to the “Abstract”, “Introduction” “Initial Business model”, and “Appendix” sections

Additionally, all members participated in the proofreading done at the Writing Center. In the further phases, development will follow the same trend. Selected

leaders for each phase will take charge in the decisions made. However, we discussed every major decision as a group, regardless.

Appendix: Workflow Authentication

I attest that the work that has been completed on this document as well as future work on this project was done as stated in the description of this document.

Signature: Camron Mellott Date: 10/20/2025

I attest that the work that has been completed on this document as well as future work on this project was done as stated in the description of this document.

Signature: Joshua Watson Date: 10/20/2025

I attest that the work that has been completed on this document as well as future work on this project was done as stated in the description of this document.

Signature:  Date: 10/20/2025

Appendix: Report from Writing Center

See 10/20/25 email from Camron Mellott