CS157A Project Requirement Documentation
A Book Reading and Review Web Application

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1 Project Overview
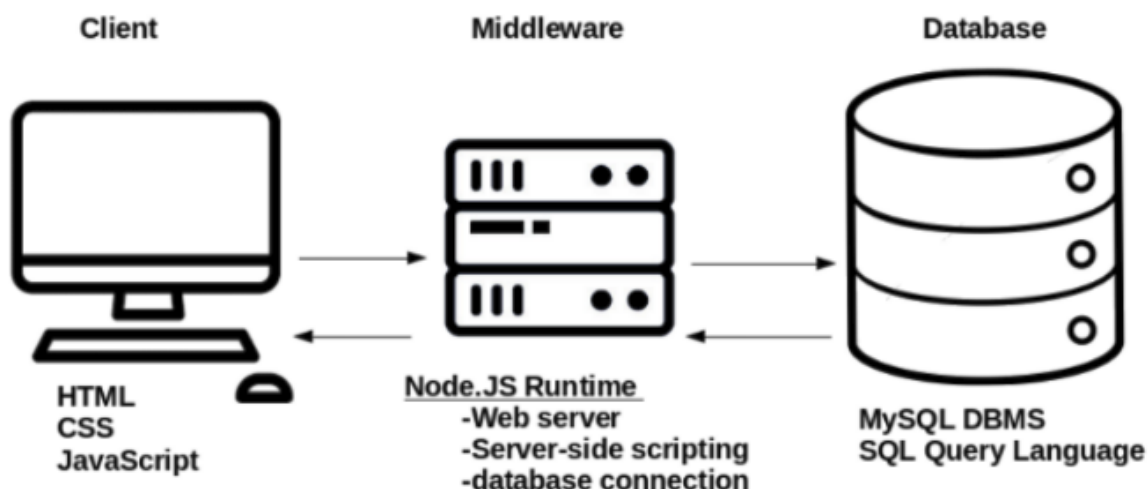
1.1 Application Overview

Our team will be developing a database application where users can find free books and are able to download them via multiple formats and leave reviews on those books for other customers to see. The books that the user can see will be ranging from textbooks to novels. A user will be given the option to create an account, or if they already registered, login to their account. After this, the user will be able to search for a specific book, whether that is by the title of the book or its ISBN number. If the user does not know the specific book they want to find, they can search for a specific author, or genre. Searches will include various filtering options such as date published, publisher, book length, user favorites, etc. Users can sort search results by the title alphabetically, the author alphabetically, or by book rating.

In our application, users will be able to leave reviews on books that they have read, which will be seen by other users and possibly influence their decision on their book. These reviews will contain both a comment section and a star rating system. Users will be able to comment how they either liked or disliked the book and give a star rating from one to five. The average star rating and total number of reviews will be displayed next to the book. Users will also be able to share the book they like with others with a shareable link that they can distribute how they please.

1.2 Stakeholders and Importance

The stakeholders of our applications will be students who want to find free textbook alternative to the paid bookstore alternative, as well as casual and dedicated book readers who can find free books online and download them for instant reading. This application is important because it provides a streamlined way for book-readers to gain easy access to the books they want and get them in a timely manner

2 System Environment

Client

Middleware

Database

HTML
CSS
JavaScript

Node.JS Runtime
-Web server
-Server-side scripting
-database connection

MySQL DBMS
SQL Query Language

2.1 Presentation Layer

- HTML

  - Purpose: HTML is the markup language supported by all major web-browsers. It allows content to be presented to a readable manner to the end-user. We will take advantage of HTML formatting tools such as hyperlinks, tables, and lists. Further, we will be using HTML forms for user input of email, username, password, search boxes, and comments.
  - Version: HTML 5

- Cascading Style Sheets (CSS)

  - Purpose: CSS will be used to improve the user experience of our web application. CSS gives us the ability to make animations, colored content, as well as more control of the appearance of our content.
  - Version: CSS 3

- JavaScript (Client Side):

  - Purpose: Provide interactivity such as collection of user input, improve visual responsiveness, and sending alerts to users.
  - Version: ECMA2016

2.2 Application Layer

- Web Server: Node.js HTTP Module

  -Version: 10.6.3 LTS

- Server Side Application Language: JavaScript

  -Purpose: Provide communition between the presentation layer and the database layer
  -Version: EMCAScript2016

- NPM Package Manger:

  -Purpose: Provide easy managment of external Node.js libraries such as express js, sql module, connect module, and http module.
  -Version: 6.9.0

2.3 Data Layer

- This web application will require the use of a relational database management system (RDBMS), the specific RDBMS we will use is MySQL.

- We will take advantage of the SQL programming language for tasks such as data definition, manipulation, query, control,and transaction control.

- MySQL RDBMS will take care of concurrency control, and will maintain the ACID principle for our database.

- MySQL Version: 5.7.27

- Query Language: SQL

2.4 Hardware/ Software Used

- Client Software Requirements

  - A web browser supporting the following is required to run the web application:
    * ECMAScript2016
    * HTML5
    * CSS3
  - Since the 3-tier architecture will only be virtual, (no remote web server or DMBS), the client will be required to install the proper versions of Node.js as well as MySQL as specified.
  - MySQL and Node.js are available on many operating systemssuch as Linux, MacOS, Microsoft Windows, FreeBSD, and OpenBSD

- Client Hardware Requirements:

  - Any hardware with support by the above software will be sufficient to run the web application.

3 Functional Requirements

- Search Book: -Users can search for books by ISBN, author, or title

- Order Search Results: -User can order the search results based on relese date or number of favorites. Default search behavior is based on the number of favorites a book has received

- Filter Search Results: -User can filter the search reslts based on author, title, release date, publisher, or genre

- Select Book: -Once user finds the desired book, they can select the book and view its profile.

- View Book Profile: -A book's profile will consist of the following:

  - The title of the book,
  - The author,
  - the relase date,

- the publisher,
- the ISBN,
- the reviews/comments left for the book,
- the number of "favorites" the book has received

- Read/Download Book: -User can download the book and view it in their web browser.

- Add Book to Favorites: -Use can add the list to their "favorites", indicating that they enjoyed the book

- Favorites: -User can browse their list of favorited books, witht the same sorting/filtering mechanisms as noted above

- Leave Comment on Book Profile: -Users can leave comments on the profiles of certain books

- Register as User: -User can register for an account if they want to have the ability to comment and favorite books

- Login as User: -Once registered, users will have the ability to login using the credentials they have provided during registration

- Go to home page: -The homepage will have information about the website and recent news regarding the website

- View profile: -All profiles are anonymous because this is **not a social network**. Users can view their own profile if they would like to see their favorites list or their basic information such as email or username. Users are not allowed to change their username.

- Log out: -Users will be able to log out by clicking the "Log Out" button on the top right corner of the webpage.

4 Non-Functional Issues

4.1 Graphical User Interace

The Graphical interface of the sytem will have the following qualities: attractivness, usability, and responsivness

4.1.1 Attractivness

The GUI will have a color palate which makes the system attractive to users. We will use high quality fonts and images where appliciple. The GUI as a whole will have a coherent and consistent theme.

4.1.2 Usability

The GUI will be intuitive. Users will not have to read documenation on how to use the system in order to use it. Options availible to the user will be kept to a minimum as to encourage simplicity.

4.1.3 Responsiveness

Users will be aware that their requests have been recorded. For example, a user clicks a button, there will be an indication that the button has been successfully clicked, such as a change in color. We will keep bloat to a minimum, such as animations and videos, as to encourage responsiveness for older hardware.

4.2 Security

4.2.1 User Security

To protect user data and privacy, users entities will have the following attributes:

- A unique username

- A password, required to follow the minimum standards set by the system: which is a minimum of 8 characters, 1 uppercase character, 1 lowercase character, 1 numerical character, and 1 special character

4.2.2 SQL injection protection

To protect form SQL injections, we will take precautions to inspect all user input and escape any characters which could breach security.

4.3 Access Control

4.3.1 Types of Users

- **User**

  Users will only have read access to the following:

  - Their own personal data
  - Book repositories

  In addition, users will have write access to the following:

  - Their favorites list
  - Reviews left for books

- **Administrator**

  Administrators have access **all user functionality** plus extra permissions to data which is not available to the general public. DB admins have read/write access to the following:

- – User details such as name and email, and
- – Book repositories