

1. Introduction

1.1 Purpose

Our purpose is to develop a book exchange system “**BookX**” that is designed to create an efficient, community-based platform for sharing books. Our system will be built mainly using Java and Spring Boot.

1.2 Problem Statement

Traditional methods of book exchanges are manual, inefficient, and lack visibility. There is no streamlined solution to connect individuals with books they wish to exchange, leading to missed opportunities and wasted resources. This system aims to address these issues by automating the process and ensuring ease of use for all book owners.

1.3 Scope

The system will include:

- **User Features:** Registration, login, profile management, and the ability to list and search for books.
 - **Search Features:** Searching for books you want
 - **Administrative Tools:** Functions for managing users and moderating content.
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2. Functional Requirements

The following functionalities will be implemented in the Book Exchange System:

1. **User Registration and Login**
 - Users can register and log in using their email and password.
 - Password encryption and validation for secure authentication.
2. **Profile Management**
 - Users can update their personal information, including contact details and profile pictures.
3. **Book Listing**
 - Users can add books to the system with details like title, author, condition, and genre.
4. **Book Browsing**
 - Users can browse available books categorized by genre, condition, or location.
5. **Advanced Search**

- Filters include book title, author, genre, condition, and proximity to the user's location.
 - 6. **Matchmaking System**
 - Suggests potential exchanges by comparing user-uploaded books with their requested books.
 - 7. **Exchange Management**
 - Users can accept, decline, or cancel exchange requests.
 - 8. **User Ratings and Feedback**
 - Post-exchange feedback to ensure reliability and accountability.
 - 9. **Administrative Dashboard**
 - Admins can manage users, moderate content, and resolve disputes.
 - 10. **Reporting Mechanism**
 - Users can report inappropriate behavior or listings for admin review.
 - 11. **Exchange History**
 - Users can view a history of their completed exchanges.
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3. Non-Functional Requirements

The following quality attributes and constraints will guide system design:

1. **Performance**
 - The system should support 50 concurrent users with a response time of under 2 seconds for most operations.
2. **Scalability**
 - The architecture should allow easy scaling to accommodate future growth in user base and data.
3. **Security**
 - Implement encryption for sensitive data (e.g., passwords).
4. **Data Integrity**
 - Prevent duplication and loss of data through transactional consistency in the database.
5. **Usability**
 - Design a clean and intuitive user interface suitable for a wide audience.
6. **Maintainability**
 - Codebase should be modular and well-documented to simplify updates and debugging.
7. **Compliance**
 - Follow applicable data protection and privacy laws (e.g., GDPR).
8. **Accessibility**

- Ensure usability for individuals with disabilities by adhering to WCAG standards.

4. Conclusion

The **Book Exchange System** will provide a robust platform for users to exchange books seamlessly. By implementing advanced features such as matchmaking and search filters, coupled with a focus on usability and security, the system should address the challenges of traditional book exchange methods effectively.