IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Online Library System (E-Commerce)

Akhilesh Malabade, Vaishnavi Sutar, Vishwajeet Jitkar

College Of Engineering Phaltan.
Computer Engineering.

Abstract- This research paper presents the design and implementation of an online library management system with e-commerce features. The system integrates various functionalities such as Gmail OTP authentication, RazorPay payment gateway integration, advanced searching filters, automatic inventory management, and email notifications for book borrowing, return, and order cancellation. The system is built using Java Spring Boot for backend development, Angular for frontend development, and Hibernate for database interaction. Additionally, security measures including email OTP verification and personalized security questions enhance user authentication and data protection. The paper discusses the architecture, features, and implementation details of the system, along with potential future enhancements.

Index Terms- E-commerce, Online Library, OTP Authentication, Payment Gateway, RazorPay, Inventory Management, Java SpringBoot, Angular

I. INTRODUCTION

The advent of digital technologies has revolutionized the way libraries operate, shifting from traditional brick-and-mortar establishments to online platforms. Online libraries provide users with convenient access to a vast collection of digital resources, including e-books, articles, journals, and multimedia content. To enhance user experience and streamline operations, this research paper proposes the development of an online library management system with e-commerce capabilities.

II. IDENTIFY, RESEARCH AND COLLECT IDEA

Identifying and collecting ideas is a critical preliminary step in any research work. For this project, a comprehensive literature review was conducted to understand existing systems and identify areas for improvement. Analyzing successful e-commerce platforms provided insights into user experience and interface design. The technological research focused on selecting the most suitable tools, such as Java SpringBoot for server-side development, Angular for client-side applications, and Hibernate for database management. Attending conferences, workshops, and symposiums further enriched the understanding of current trends and best practices in library management and e-commerce, shaping the development of the Online Library system. The combination of theoretical research and practical insights ensured that the project was built on a solid foundation, addressing real-world challenges effectively.

III. SYSTEM DESIGN AND IMPLEMENTATION

The system architecture of the Online Library project is designed to ensure robustness and efficiency. The backend is developed using Java SpringBoot, which provides a robust framework for building RESTful APIs, handling business logic, and managing backend operations. Hibernate ORM is used to facilitate seamless interactions with the database, ensuring efficient data retrieval and storage. On the frontend, Angular is utilized to create dynamic, responsive user interfaces that enhance user interaction and experience. HTML, CSS, and TypeScript are employed to build and style the frontend components, ensuring a visually appealing and user-friendly interface. The combination of these technologies results in a comprehensive system that meets the needs of both users and administrators. This design ensures scalability, maintainability, and high performance, catering to the growing needs of users and the library's expanding collection.

IV. KEY FEATURES

The Online Library system incorporates several key features that enhance its functionality and user experience. User authentication and registration are secured through Gmail OTP authentication, ensuring that only verified users can access the system. The password recovery process is enhanced with security questions and OTP verification, adding an extra layer of security. The book borrowing process is streamlined with RazorPay payment gateway integration, facilitating secure and efficient transactions. Advanced search filters and robust search algorithms enable users to find books based on various criteria, enhancing the search experience. Inventory management is automated, providing real-time tracking of book quantities and availability. The system also includes real-time order status updates through automated email notifications, ensuring transparency and keeping users informed about their orders. Administrators benefit from robust features for managing books and users, including CRUD operations and order status management. These features collectively ensure a seamless and efficient library management experience, reducing manual effort and minimizing errors.

- **User Registration and Authentication:**

Users can register using their email IDs, which are verified through OTP sent to their Gmail accounts.
Password reset is facilitated via OTP, with an additional security question for enhanced verification.

- **Payment Gateway Integration:**

RazorPay is integrated to handle transactions, providing a secure and reliable payment method for users borrowing books.

- **Advanced Search Filters:**

Users can search for books using various filters, improving the efficiency and accuracy of the search process.

- **Inventory Management:**

Automated inventory management ensures that the availability status of books is updated in real-time.
Admins can add, delete, update, and change the quantity of books in the inventory.

- **Automated Email Notifications:**

Users receive email notifications at every stage of the borrowing process, including packaging, delivery, out for delivery, return, order cancellation, and refund processing.

- **Order Management:**

Admins can manage orders by changing their status at each stage (e.g., order in process, packaging, delivery, return, cancel order).
Users can cancel orders and receive refunds for canceled orders.

I. DEVELOPMENT AND IMPLEMENTATION

The development and implementation of the Online Library system involved several stages. The backend development was carried out using Java SpringBoot, which provided the necessary framework for building RESTful APIs and handling business logic. Hibernate ORM was configured to manage database interactions, ensuring efficient data retrieval and storage. On the frontend, Angular was used to design and develop dynamic and responsive user interfaces. HTML, CSS, and TypeScript were employed to build and style the frontend components, ensuring a visually appealing and user-friendly interface. The integration of these technologies resulted in a comprehensive system that meets the needs of both users and administrators. The development process also included rigorous testing to ensure the system's functionality and performance. Extensive unit, integration, and user acceptance testing were conducted to identify and resolve issues, ensuring a robust and reliable system. The iterative development approach allowed for continuous feedback and improvements, leading to a refined and efficient final product.

- **Java SpringBoot:** For developing the backend services.
- **Angular:** For creating a dynamic and responsive frontend interface.
- **Hibernate:** For managing database operations.
- **HTML/CSS/TypeScript:** For structuring and styling the web pages.

II. ADDITIONAL FUNCTIONALITIES AND MODULES

Beyond the core functionalities, the Online Library system includes additional features that enhance its usability and efficiency. The automated email notification system keeps users updated at every stage of their order, from packaging to delivery, return, and cancellation. This feature ensures that users are always informed about the status of their transactions, enhancing transparency and trust. The system also supports refund processing for canceled orders, ensuring a hassle-free experience for users. Advanced search filters enable users to find books quickly and easily, improving the overall search experience. The inventory management module provides real-time tracking of book quantities, ensuring that administrators always have accurate information about book availability. These additional functionalities make the Online Library system a comprehensive and user-friendly platform for both users and administrators.

III. CONCLUSION

The Online Library (E-Commerce) project effectively integrates modern technologies to create a comprehensive and efficient platform for managing library operations. By incorporating essential features such as Gmail OTP authentication, RazorPay payment gateway, advanced search filters, and automated email notifications, the system enhances user experience and operational efficiency. Administrators benefit from robust inventory and order management capabilities, ensuring smooth operation of the library system. The project demonstrates the potential of leveraging modern web technologies to transform traditional library management practices. The successful implementation of the system highlights the importance of a user-centric approach, continuous feedback, and iterative development in creating effective digital solutions..

ACKNOWLEDGMENT

We extend our heartfelt gratitude to all those who have contributed to the successful completion of this research paper on the implementation of an E-Commerce Online Library Management System.

First and foremost, we express our deepest appreciation to our supervisor Prof. S D. Patole, whose guidance, encouragement, and invaluable insights have been instrumental in shaping this project. Their expertise and unwavering support have been a constant source of inspiration throughout the research process.

We would like to thank the members of our research team for their dedication and hard work in developing the online library management system. Each team member's unique skills and contributions have played a crucial role in realizing the vision of this project.

REFERENCES

[1] Spring Framework Documentation. (https://spring.io/)
[2] Angular Documentation. (https://angular.io/)
[3] Hibernate Documentation. (https://hibernate.org/)
[4] RazorPay Documentation. (https://razorpay.com/)
[5] Java Documentation. (https://docs.oracle.com/javase/)