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DEVELOPMENT OF A MULTIFUNCTIONAL DIGITAL LIBRARY MANAGEMENT SYSTEM BASED ON THE LARAVEL FRAMEWORK

In the modern era of total digitalization, traditional methods of accessing information are undergoing significant transformations. Physical libraries are gradually being replaced or supplemented by high-performance web platforms that provide users with instant access to literary resources. The development of a digital library is not only a task of creating a storage for electronic files but also a challenge of building a complex social ecosystem where users can interact with content and each other. The relevance of this study lies in the need to create a secure, scalable, and user-friendly environment for managing digital books and fostering a community of readers.

Most existing open-source library systems either lack modern interactive features or possess outdated architectural designs that hinder performance. To address these issues, the Laravel framework was chosen as the primary development tool. Laravel provides a robust set of features, such as the Eloquent ORM for database management, the Blade engine for dynamic UI rendering, and built-in middleware for security. This allows for the creation of a system that is not only functional but also resistant to common web threats.

The backbone of the developed library system is a relational database designed with a focus on data integrity and performance. The system architecture follows the Model-View-Controller (MVC) pattern, which separates the business logic from the presentation layer. The database includes several interconnected tables to handle complex operations. For instance, the system manages a sophisticated "Books" entity that stores metadata, file paths for downloads, and excerpts for preview. The interaction between users and books is mediated through specialized tables for wishlists and a hierarchical comment system that supports nested replies.

The developed platform offers a comprehensive suite of tools designed to enhance the digital reading experience: The system implements a secure authentication mechanism where users can create personal accounts. This profile serves as a hub for personalization, allowing the system to track user activities and preferences. One of the key features is the ability to read a specific excerpt of a book directly in the browser. This is achieved through a secure file-streaming logic that prevents unauthorized access to the full document. Registered users also have the option to download the entire book for offline reading. To encourage engagement, a complex communication module was implemented. Users can leave comments under books and, more importantly, engage in discussions by replying to existing comments. This required the implementation of a recursive relationship in the database to maintain the correct nesting of threads. Personalization is further enhanced by a "Wishlist" feature. Users can mark books they are interested in, creating a curated list of future reads. This module utilizes many-to-many relationships within the Laravel framework to ensure efficient data retrieval and management. To ensure the interface remains clean and responsive, server-side pagination (paging) is applied to all major lists, including the

main library catalog and user comments. This technique significantly reduces the initial load time and improves the overall user experience.

The designed digital library system demonstrates the power of the Laravel framework in handling complex data relationships and user interactions. By integrating features such as excerpt previews, nested commenting, and personalized wishlists, the platform provides a holistic approach to digital resource management. Future development of the project will focus on implementing an AI-based recommendation engine and expanding the search capabilities using full-text indexing tools.

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