

Online Library Management System

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Abstract:

The Online Library Management System is a web-based application designed to automate and simplify the activities involved in managing a library. Traditional library systems often depend on manual registers for maintaining information about books, members, and issue-return transactions. Such methods can be time-consuming and may lead to errors, duplicate records, and difficulty in finding information.

The proposed system provides a centralized platform for managing books, members, librarians, and borrowing transactions. It allows users to search for books and check their availability, while librarians can add, update, delete, and manage book and member records. The system also maintains issue and return information in a structured database.

The application can be developed using HTML, CSS, PHP, and MySQL with XAMPP as the local server environment. The proposed system improves the organization, accessibility, and efficiency of library operations while reducing manual work.

Keywords: Online Library Management System, Library Automation, Web Application, PHP, MySQL, XAMPP, Database Management, Book Management, DFD, ER Diagram.

1. Introduction

Libraries contain a large collection of books and information that needs to be properly organized and maintained. In a traditional library, information about books, members, and borrowing activities is often recorded manually. Managing these records manually can require considerable time and effort.

An Online Library Management System provides a computerized solution to these problems. It stores library information in a database and allows authorized users to access and manage the information through a web interface.

The system provides facilities such as user authentication, book registration, member management, book searching, book issuing, book returning, and availability checking.

The main objective of the proposed system is to make library management faster, more accurate, organized, and convenient. It also reduces the dependency on physical registers and helps maintain transaction records systematically.

2. Objectives

- To automate library management activities.
- To maintain book records digitally.
- To maintain member information.
- To provide quick book searching.
- To manage book issue and return transactions.
- To track book availability.
- To reduce manual errors.
- To provide secure access to library records.

3. Methodology

The proposed Online Library Management System follows a systematic development methodology. The major stages include requirement analysis, system design, database design, implementation, testing, and evaluation.

4. Requirement Analysis

The requirements of the system are identified according to the activities performed in a library. The major requirements include:

- User registration and login
- Book management
- Member management
- Book searching
- Book issue
- Book return

5. System Architecture

The system consists of a web interface, application layer, authentication module, and MySQL database.

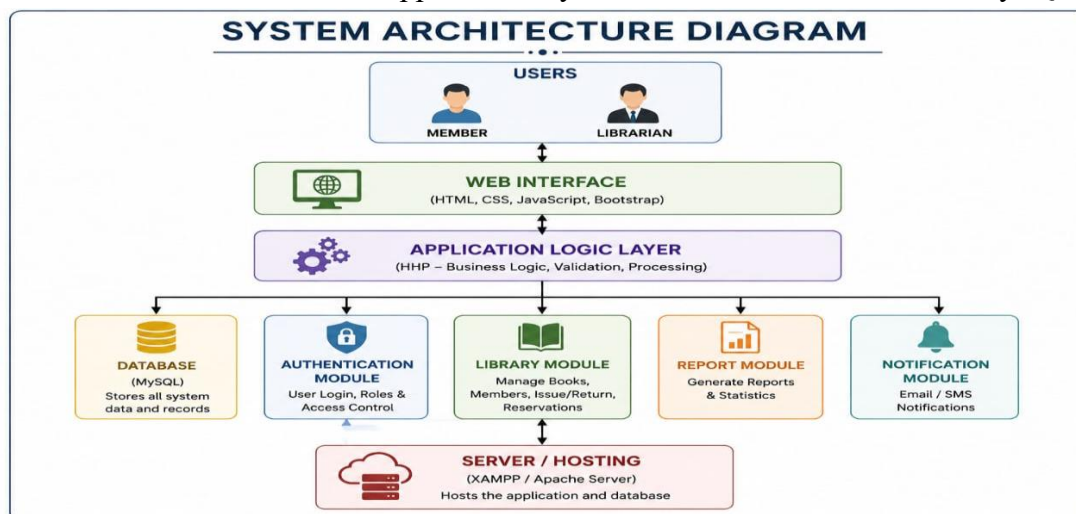


Figure 1. System Architecture of Online Library Management System

6. Database Design

The database stores information related to books, members, librarians, and transactions. Each record has a unique identifier and related tables are connected using keys.

Main Entities

Member

- Member_ID
- Name
- Email
- Contact

Book

Book_ID

- Title
- Author
- Category
- Quantity
- Availability

Transaction

- Transaction_ID
- Member_ID
- Book_ID
- Issue_Date
- Return_Date

Librarian

- Librarian_ID
- Name
- Username
- Password

ER Diagram

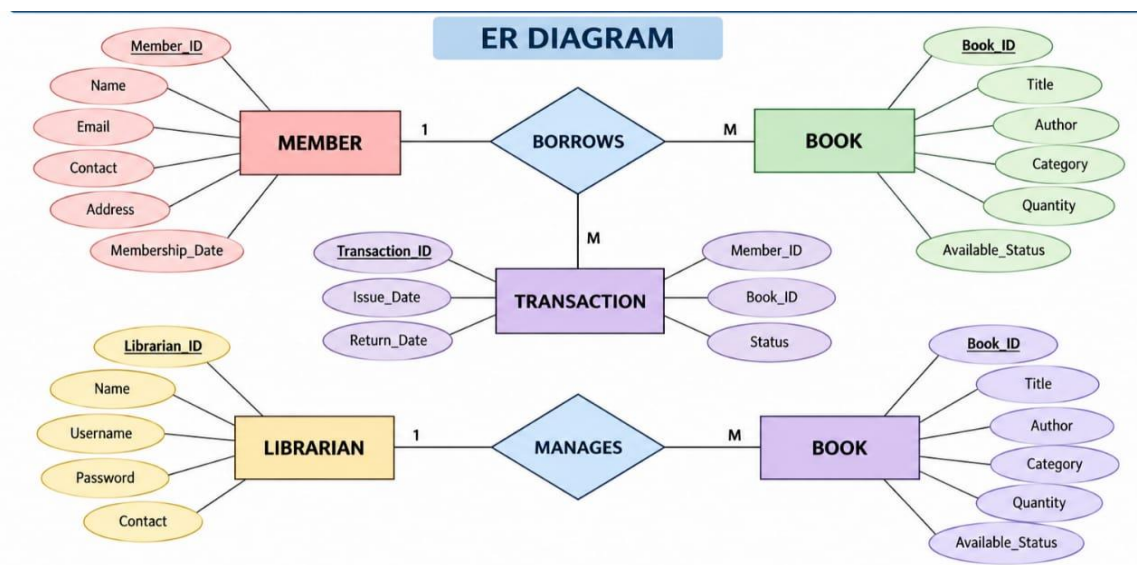


Figure 2. Entity Relationship Diagram

7. Data Flow Diagram

The DFD shows how information moves between users, librarians, the system, and the database.

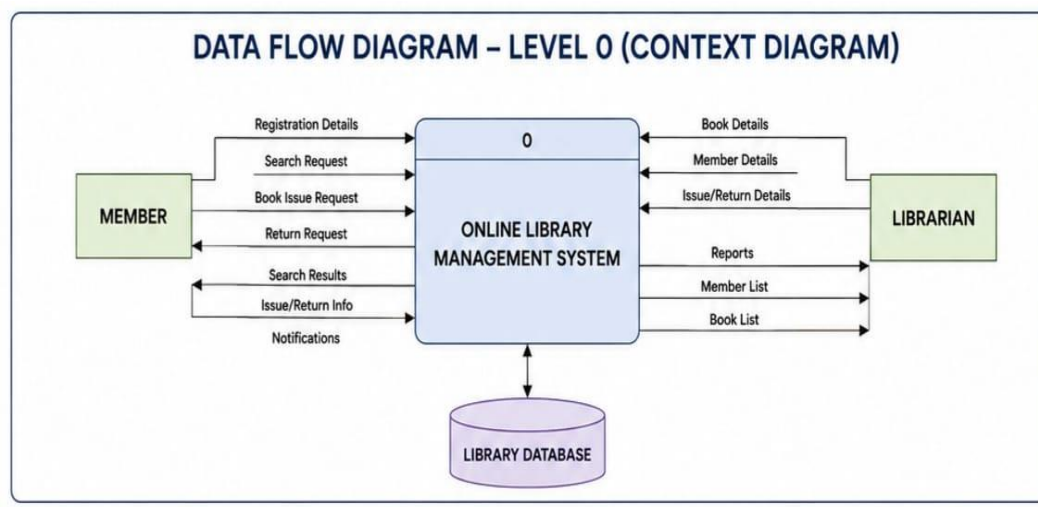


Figure 3. DFD Level 0

Implementation

The Online Library Management System can be implemented using HTML, CSS, PHP, MySQL, and XAMPP.

User Authentication

The authentication module allows registered users and librarians to log into the system. Login credentials are checked before providing access to protected functions.

Book Management

The librarian can add new books, update existing book information, delete records, and view the available books.

Book information may include:

- Book ID
- Book title
- Author
- Category
- Quantity
- Availability

Member Management

The system maintains information about registered members. The librarian can add, update, and view member information.

Book Search

Users can search for books using the title, author, category, or book ID. The system displays matching records and their availability.

Book Issue

When a member requests an available book, the librarian records the issue transaction. The database is updated to reflect the change in availability.

Book Return

When a book is returned, the return date is recorded and the availability status is updated in the database.

Implementation Flowchart

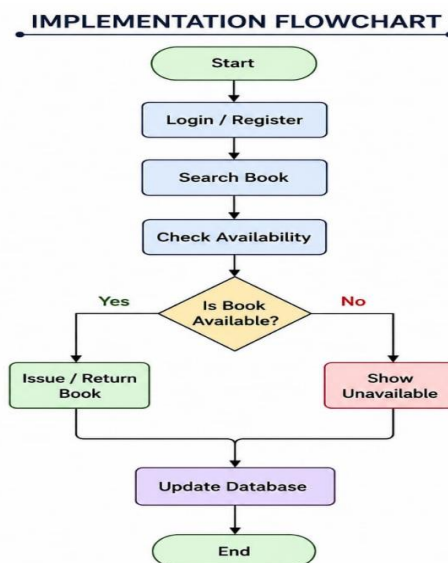


Figure 4. System Implementation Flowchart

8. Results

The proposed Online Library Management System provides a centralized method for managing library information. The system makes it easier to search for books, maintain member records, and track issue and return transactions.

The expected results of the system include:

Faster book searching.

Better organization of library records.

Reduced manual record keeping.

Improved tracking of issued books.

Easy availability checking.

Reduced chances of duplicate records.

Easier management of members and books.

Improved accessibility of information.

9. Discussion

The system demonstrates how web technologies can be used to automate common library activities. By maintaining information in a centralized database, the system reduces the need for physical registers and makes information retrieval easier.

The use of PHP provides server-side processing, while MySQL provides structured storage for library records. The modular design also makes it possible to add additional features in the future.

However, the system should be tested with realistic numbers of users and records before being deployed in a large library environment.

10. Conclusion

The Online Library Management System provides an effective computerized approach for managing library activities. It allows books, members, librarians, and transactions to be maintained in a structured database.

The proposed system reduces manual work and provides faster access to important library information. Features such as book searching, issue and return management, member management, and availability tracking make the system useful for day-to-day library operations.

The system can be further improved by adding advanced features such as online reservations, notifications, barcode scanning, dashboards, and mobile support.

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