LIBRARY MANAGEMENT SYSTEM

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ABSTRACT

➢ A Library Management System (LMS) is essential for automating and streamlining library operations.

➢ Functions include cataloging, circulation, acquisition, and patron management.

➢ Cataloging features enable librarians to create, update, and maintain records of library materials.

➢ Circulation management facilitates borrowing, returning, and reservation processes.

➢ Acquisition modules manage procurement, vendor relations, ordering, invoicing, and inventory updates.

➢ User management maintains comprehensive user records, including membership details and borrowing history.

➢ An Online Public Access Catalog (OPAC) offers a user-friendly interface for remote resource access.

➢ Digital resource management ensures secure access and usage tracking of electronic materials.

➢ Reporting and analytics tools provide insights into library usage, collection performance, and financial metrics.

➢ Integration with external systems supports seamless data exchange and operational efficiency.

OBJECTIVE OF THE PROJECT

Efficiency Enhancement: Develop a system to streamline cataloging, circulation, acquisition, and patron management processes within libraries.

User-Centric Approach: Create a user-friendly interface that empowers librarians and patrons to efficiently access and manage library resources.

Integration: Ensure seamless integration with existing library infrastructure to maintain data accuracy and accessibility.

Comprehensive Management: Provide robust tools for cataloging, circulation management, acquisition tracking, and patron management to optimize library operations.

Enhanced Services: Enable personalized services through features such as personalized reading recommendations, hold requests, and resource availability notifications.
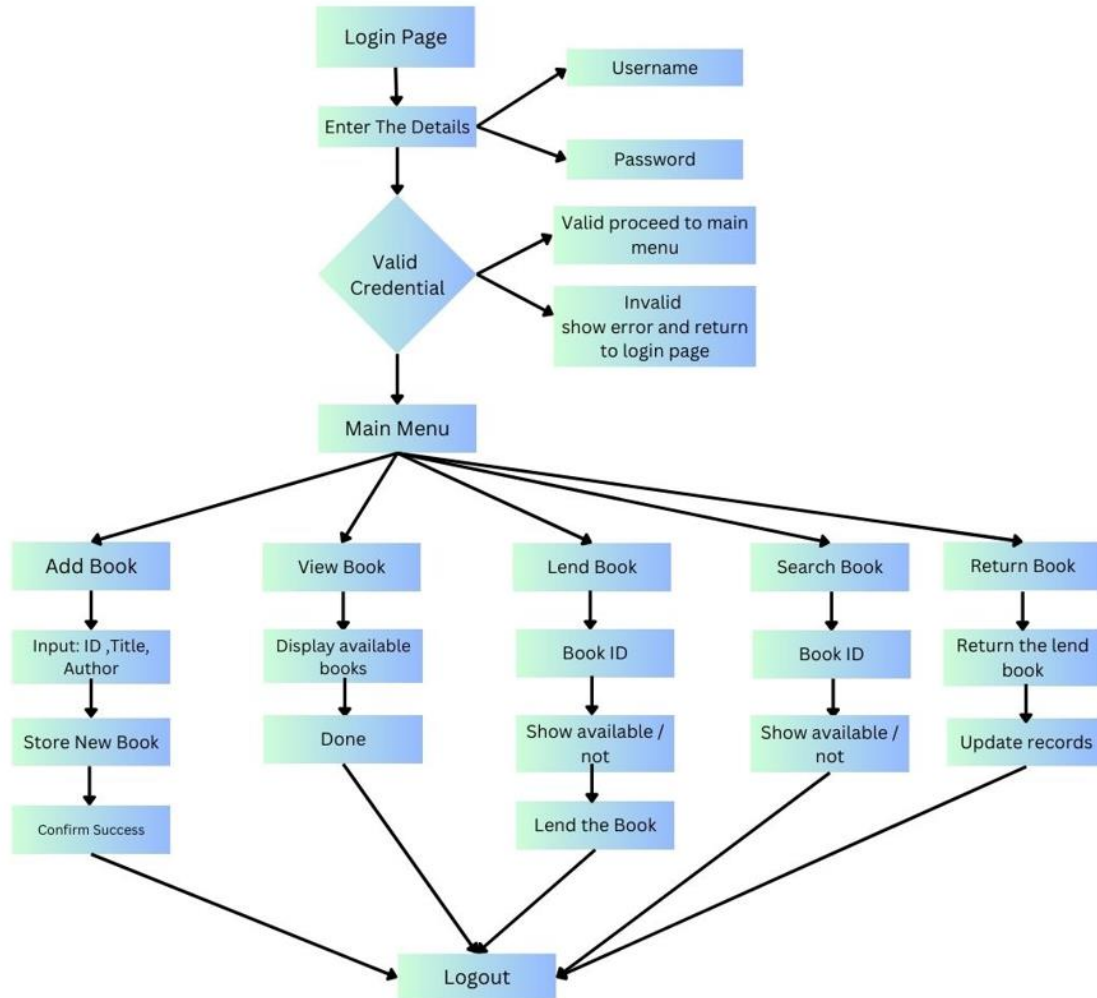
Promote Lifelong Learning: Foster a culture of continuous learning and knowledge dissemination by providing easy access to diverse resources and educational materials.

Community Engagement: Enhance community engagement by facilitating events, workshops, and educational programs through the library platform.

Operational Excellence: Improve operational efficiency through automated workflows, real-time analytics, and reporting capabilities.

Scalability: Design a scalable system that can accommodate the growth and evolving needs of libraries and their communities.

FLOWCHART

Login Page

Enter The Details → Username

Enter The Details → Password

Valid Credential → Valid proceed to main menu

Valid Credential → Invalid show error and return to login page

Main Menu

Add Book
Input: ID ,Title, Author
Store New Book
Confirm Success

View Book
Display available books
Done

Lend Book
Book ID
Show available / not
Lend the Book

Search Book
Book ID
Show available / not

Return Book
Return the lend book
Update records

Logout

ALGORITHM

1. Define User Class (Abstract)

- ➢ Constructor: Initialize user_id and name.
- ➢ Abstract Method: get_details.

2. Define Member Class (Subclass of User)

- ➢ Constructor: Initialize member_id, name, and borrowed_books.
- ➢ Method: get_details to return member details and borrowed book titles.
- ➢ Method: __str__ to return get_details output.

3. Define Book Class

- ➢ Constructor: Initialize book_id, title, author, and is_lent.
- ➢ Method: __str__ to return book details.

4. Define Library Class

- ➢ Constructor: Initialize books and members.
- ➢ Method: _load_initial_books to add initial books to the library.
- ➢ Method: add_book to add a new book to the library.
- ➢ Method: view_books to display all available books.
- ➢ Method: lend_book to lend a book to a member.
- ➢ Method: return_book to return a lent book.
- ➢ Method: search_book to search for a book by title.

5. Define Utility Functions

- ➢ Function: validate_email to validate email format using regex.
- ➢ Function: validate_password to check if password length is at least 4 characters.
- ➢ Function: login to prompt user for email and password until valid credentials are entered.

6. Main Function

- ➢ Call login function.

- If login fails, exit.
- Initialize a Library object.
- Loop to display options and execute corresponding actions:
- Display menu options.
- Get user choice.

If choice is '1':

- Prompt for book ID, title, and author.
- Add book to the library.
- Print confirmation.

If choice is '2':

- Call view_books to display all books.

If choice is '3':

- Prompt for book ID.
- Call lend_book with the given book ID.

If choice is '4':

- Prompt for book ID.
- Call return_book with the given book ID.

If choice is '5':

- Prompt for book title.
- Call search_book with the given title.

If choice is '6':

- Exit the loop and terminate the program.

OUTPUT

Login to Library Management System

Welcome

Enter email: abcd124

Invalid email format. Please enter a valid email address.

Welcome

Enter email: gabbetasangeetha@gmail.com

Enter password (at least 4 characters): 1234

Login successful!

Library Management System

1. Add Book

2. View Books

3. Lend Book

4. Return Book

5. Search Book

6. logout

Enter your choice: 1

Enter book ID: 7

Enter book title: students

Enter book author: college

Book 'students' added to the library.

Library Management System

1. Add Book

2. View Books

3. Lend Book

4. Return Book

5. Search Book

6. logout

Enter your choice: 2

Available books in the library:

ID: 1, Title: 1984, Author: George Orwell, Lent out: False

ID: 2, Title: To Kill a Mockingbird, Author: Harper Lee, Lent out: False

ID: 3, Title: The Great Gatsby, Author: F. Scott Fitzgerald, Lent out: False

ID: 4, Title: Moby Dick, Author: Herman Melville, Lent out: False

ID: 5, Title: War and Peace, Author: Leo Tolstoy, Lent out: False

ID: 7, Title: students, Author: college, Lent out: False

Library Management System

1. Add Book

2. View Books

3. Lend Book

4. Return Book

5. Search Book

6. logout

Enter your choice: 3

Enter book ID to lend: 5

Book 'War and Peace' lent out.

Library Management System

1. Add Book

2. View Books

3. Lend Book

4. Return Book

5. Search Book

6. logout

Enter your choice: 4

Enter book ID to return: 5

Book 'War and Peace' returned.

Library Management System

1. Add Book

2. View Books

3. Lend Book

4. Return Book

5. Search Book

6. logout

Enter your choice: 5

Enter book title to search: To Kill a Mockingbird

Book found: ID: 2, Title: To Kill a Mockingbird, Author: Harper Lee, Lent out: False

Library Management System

1. Add Book

2. View Books

3. Lend Book

4. Return Book

5. Search Book

6. logout

Enter your choice: 5

Enter book title to search: abcdfhei

No book found with title 'abcdfhei'.

Library Management System

1. Add Book

2. View Books

3. Lend Book

4. Return Book

5. Search Book

6. logout

Enter your choice: 6

Thank you, visit again

CONCLUSION

The Library Management System (LMS) project has been designed to revolutionize the way libraries manage their resources and serve their patrons. By automating and streamlining various library operations such as cataloging, circulation, acquisition, and patron management, the LMS enhances the efficiency and effectiveness of library services.

The Library Management System stands as a vital tool for modern libraries, supporting their mission to provide equitable access to information and knowledge, thereby promoting lifelong learning and community engagement.

REFERENCES

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