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Library Management System (LMS) Using JAVA

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Abstract: ***A Library Management System is a system that is used to maintain the records of the library. It contains work like the number of the available books, the number of books issued, the number of books to return or renew. It helps to maintain a database that is useful to enter new books and records of books borrowed by the members with the respective submission dates. It will reduce the manual work done by the librarian to maintain the record of the library. It allows maintaining the resources in a more operative manner that will help to save the time. It is also convenient for the librarian to manage the process of books allocation. It is useful for students as well as a librarian to keep the constant track of the availability of all books in a library.***
Keywords: Library, Java, Management, System

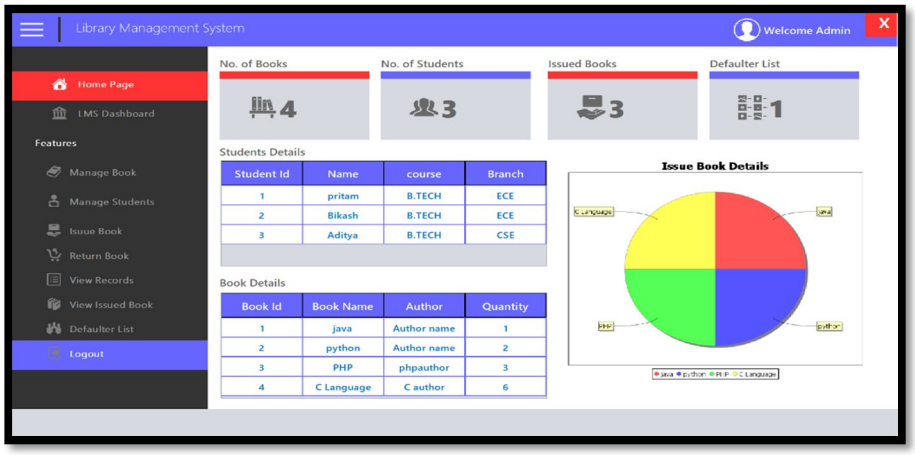


Fig 1. LMS Home Page

I. INTRODUCTION

The software whose software requirement is mentioned in the system is the Library Management System .The SRS (System Requirement Specification) covers the complete description of the Library Management System and this aims at simplifying the effort of the librarian and book lenders, thus increasing the productivity by using tools that simplify the book lending process.

This Online Library Management system will be an automated one. The users would be able to search up the book, check its availability. The admin department will be able to track the status of each user, including their details and books they have issued. So, this would increase the user's and admin's productivity by providing a better and simpler interface to manage the system. With the advent of technology, this system can be easily implemented by libraries especially in libraries of educational institutes.

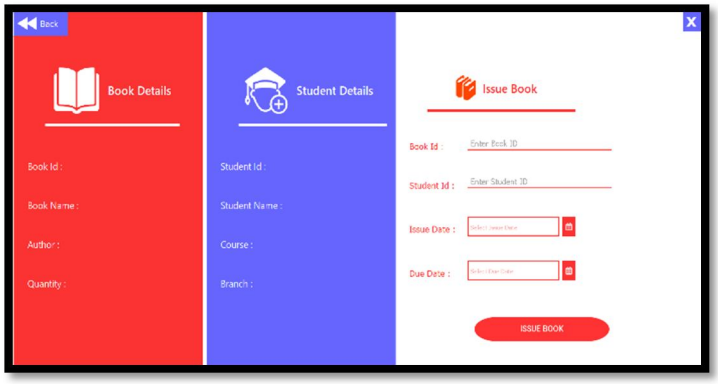


Fig 2. Issue Book Page

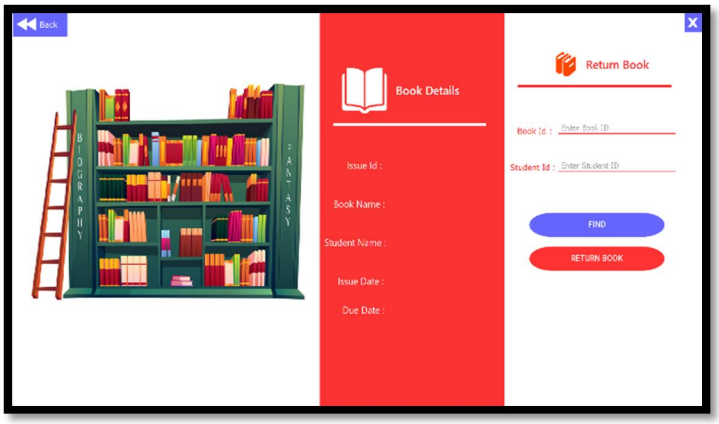


Fig 3. Return Book Page

II. RELATED WORKS

Online Library Management System is an Automated Library System that handles the various functions of the library. It is an important part of every school and college and it helps the librarian to keep records of available books as well as issued books.A. J. A. Baetiong et al. shows in [1] that mobile and web application integrates the library process such as circulation, inventory, acquisition, and cataloging into a one web application. The mobile app helps the users to uncover books for a particular topic, borrow books and receive notification regarding due date or penalty. Recently W. Zhigang in [2] designs the information infrastructure and key mechanism of library management system, and discusses the innovation of system service mode from the aspects of readers' information acquisition and modification, fast management and delivery of books. In 2012, J. Hou, Z. Zhu and J. Zong in [3] designed the network library management system operated on the company backbone network and it consists of eight subsystems of book cataloging, book acquisitioning, book circulation, periodical management, standard management, data management, system maintenance and Web query.

A. Current/Future Requirements

Currently the software is used to keep a record of books borrowed, books available, user details.
Future modifications will be made based on user feedback.

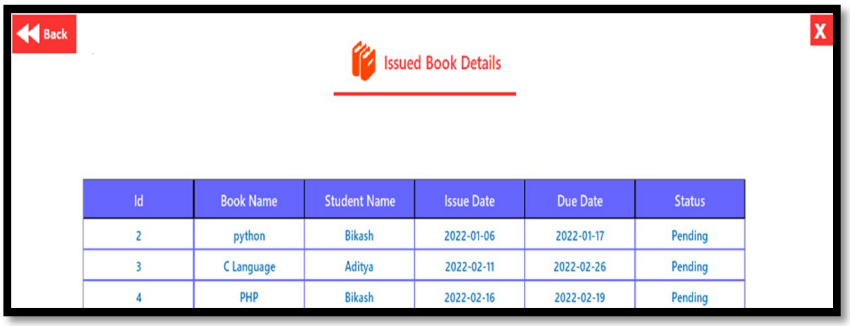


Fig 4. Issued Books Details Page

III. CONTRIBUTION

The proposed Library Management System project will help the students and librarian to maintain the details of the library. It will assist the librarian before the shortage of books while they can know the details of the number of currently available in the library according to the author by accessing the system. A student can view the details of the book issued by them, and the system will notify the students about the last date of submission of books. At the time of issue of a book, the student will get assisted by the system about different authors of a similar book so that they can get the best available book from the library.
One add-on feature for this application is the option of providing an online notice board, this feature can be used by the librarian for uploading announcements related to an event going on in the university or any book fair which is about to hold the nearby future. Also, information like the sale of old books can be shared.

Another feature can be adding lecture notes, the teacher can create some lecture notes and upload them in pdf format in the application. So as the students will find the application more interesting and beneficial. The lecture note's part will play a major role in gaining the popularization for this system.

IV. OVERALL DESCRIPTION

A. Product Functions

The Online Library System provides online real-time information about the books available in the Library and user information. The main purpose of this project is to reduce manual work. This software is capable of managing book issues, Returns etc. Here Librarian will be the administrator to control members and manage books. He can issue books and can see the dates of returning the book they have issued.

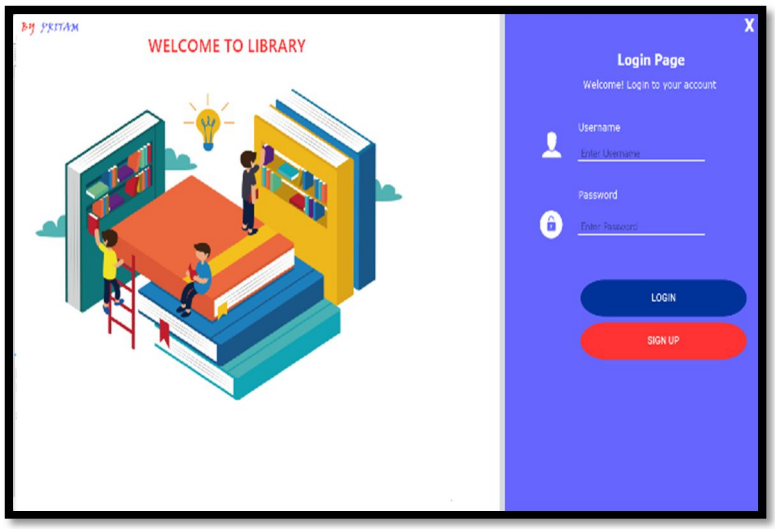


Fig 5. Login Page

B. Hardware Requirement

1) 4GB RAM
2) 1TB Hard Disk space in server machine
3) Core i3 or higher

C. Software Requirement

1) Windows 7 or above OS
2) SQL Server

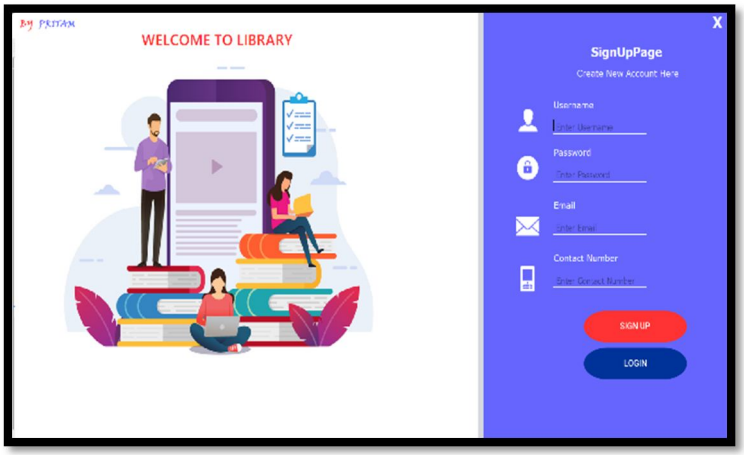


Fig 6. Signup Page

D. Functional Requirements

Signing In/Signup :.
Description (Scope) – The person has to sign in to his account, if he/she has already created an account.
The new users will have to sign up.
Login shown in Fig 5.
Input: User ID and Password.
Output: The requested page as per prior selections. Error message if wrong details are entered.
Signing up shown in Fig 6.
Input: Username, Passsword, e-mail, Contact Number.
Output: Creation of a new account, User ID and verification mail sent to the user.

E. Issuing of Books

Description (Scope) – The user searches for a particular book using the books book name and author. The book is then searched in the database and the details of the book is displayed, including the availability and duration for borrowing. The user can then issue the book accordingly.
Search by name and author.
Input: Name and/or author of the book.
Output: Displays the book, author, publisher and availability status. Displays not found message if book is not present.
Issuing the book shown in Fig 2.
Input: Select the book and enter duration of borrowing.
Output: If user has any book overdue, the user is not granted permission to issue new books and is redirected to book returning page else redirected to next page.
Selecting a suitable time-slot.
Input: Select a suitable time-slot to collect the books to avoid crowding.
Output: The book is issued to the user, displaying a receipt with the respective details book code, User ID, due date for returning.

F. Returning of Books

Description (Scope) – The user selects which books to return and select a time-slot. If there is any fine, the user pays the fine accordingly.
Selecting the book.
Input: Choice of book(s) to return from their book list.
Output: Return prompt window.
Returning the book is shown in Fig 3.
Input: Selecting the return key.
Output: Respective page showing the details including book name, code, date of issue and overdue fine (if any).
Shows penalty prompt with amount if users have any book overdue.

G. Admin Management System

Description (Scope) – The admin department uses this feature for checking availability of particular books and borrowing history for each book. It also displays which user details with options to enable, disable. The admin department can also add new books and the respective details to the database.
Check availability status.
Input: Book code.
Output: Count of books available till date.
Borrowing History for a particular book is shown in Fig 5.
Input: Book code.
Output: The book borrowing history, displaying which particular copy has been borrowed by which user.
Updating the stock count of a book is shown in Home page in Fig 1.
Input: Book code, present stock count available or increment or decrement count.
Output: Count of that books gets updated.

Add new books to the database.
Input: Book details, including name, author, code, ISBN number and publisher, as well as the number of copies of each book.
Output: The page displaying the new list of books available.

H. Non-Functional Requirements

Correctness Requirement: This software performs accurately as intended and in no other way.
Portability requirement: This software provides a system-based interface to the user. Any device with Windows 7 or above can use it.
Efficiency Requirement: The software is highly efficient and various tasks in its various modules and sub-modules can be performed simultaneously.
Usability Requirement: The software has a simple but efficient user interface, which can be used by all types of users, both technically sound as well as people not having so much knowledge about technology. So, any user can use its functionalities without any sort of complications.
Availability Requirement: The software will be available at any time of the day. However, the physically collecting or returning of books can be done at working hours only.
Performance Requirement: The database can accommodate high number of articles and users without any fault. As the latest technologies have been used, so the system would be very responsive and the response would be extremely fast.
Reliability Requirement: The system is extremely reliable as there are proper measures to protect the data of the users, reviewers and the authors. Proper firewall and other security measures have been used to prevent any kind of breaching.

I. User Characteristics: The system will provide different types of services based on the user. The Admin department will be working like the controller and can administer the database of various users.

The features available to Admin –

1) Can see list of books available.
2) Can update existing list of books.
3) Can view user details and update user status.

J. Design & Implementation Constraints : The information of all users and resources must be stored in a database that is easily accessible by the website.

1) Users can access from any computer that has a stable internet connection and proper browsing capabilities.
2) MySQL Server is used as SQL engine and database.

K. Assumptions & Dependencies

1) Assumption

- Coding is error free.
- System has specified hardware and software requirements.
- Fast access to database.
- User does not provide any incorrect information.

2) Dependencies

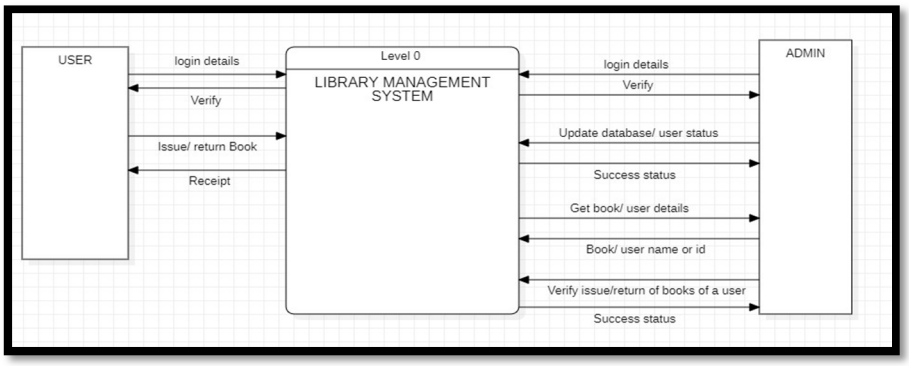
- Depends on third party app MySQL for database.
- Hardware and software specifications of the running environment.
- Correct data entered by all users.

V. INTERFACE REQUIREMENTS

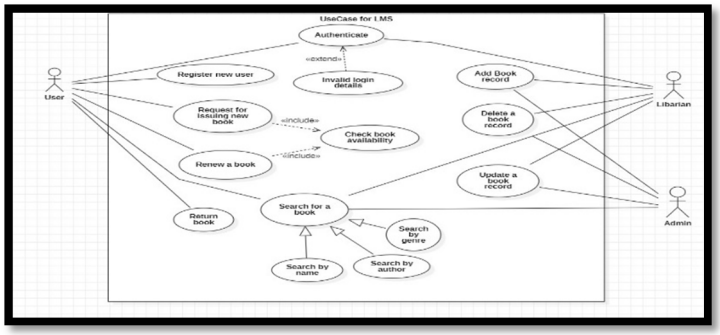
1) Interface Requirements: Register/Sign in Interface: If user is not yet registered, sign up is required by providing necessary details, else the user logs in by entering required details. Error prompt is displayed if there is any wrong input provided.
2) Hardware Interfaces: No other special interface required other than the recommended configuration.
3) Software Requirements: Specified browser and operating system version. No additional requirements.

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VI. DFD DIAGRAM



VII. USECASE DIAGRAM



VIII. CONCLUSION

With the evolution of technology and it being so blended in our daily lives, it is imperative that we discard time-consuming laborious methods to implement something which would be so clean and compact to use through computers. This system provides efficient service to the various users. Implemented with the best technology available, this software is convenient to use and virtually fault-free, providing the users with a smooth and unique experience.

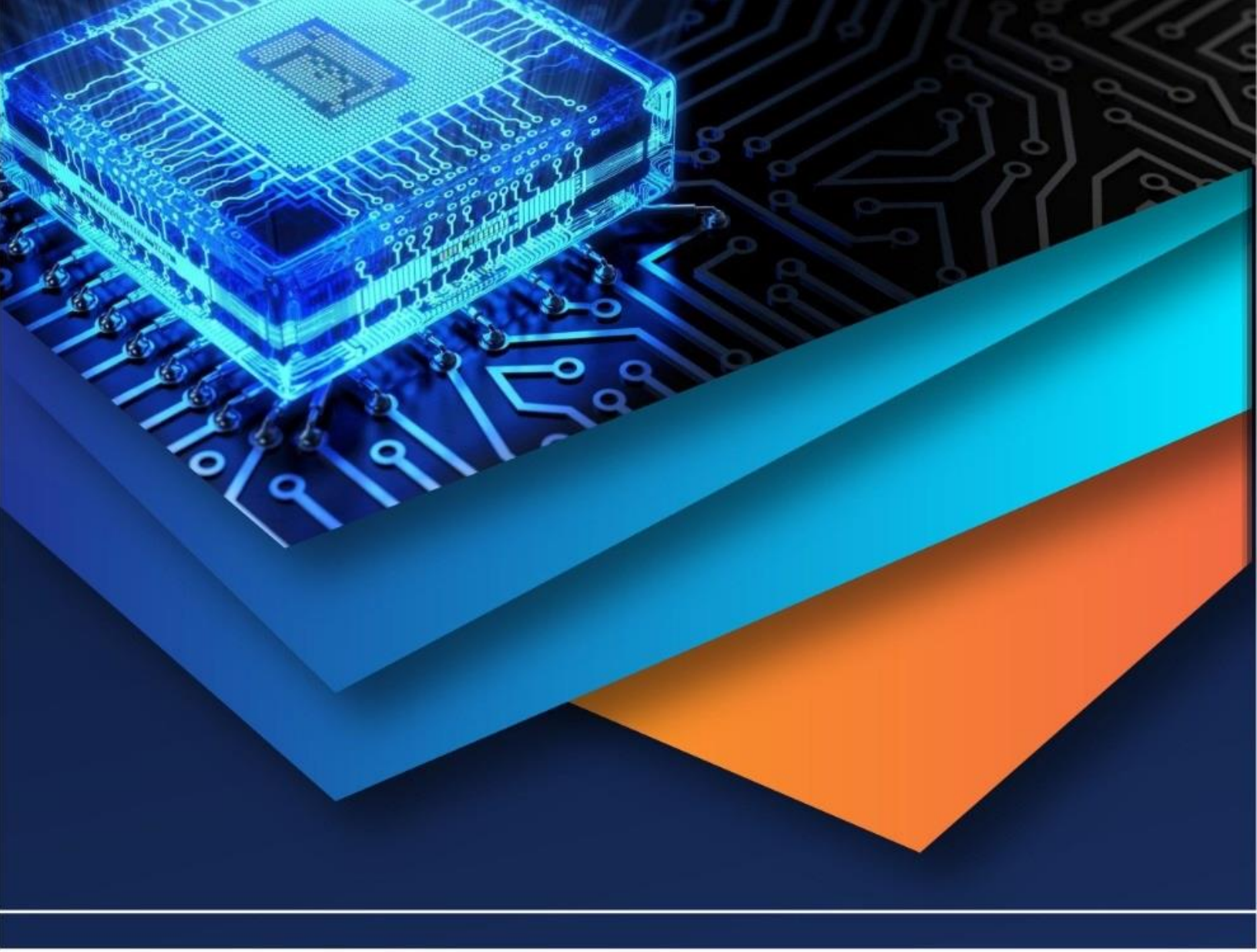
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