

Digital Library Management System

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Abstract:

With technology advancing, it is essential to elevate all systems into a user-friendly state. A technique for converting physical libraries into digital libraries is the Library Management System (LMS). Typical libraries use the Students and users must look for books, which are a tedious process, and the database of issues and fines is not properly maintained. Overall, the job is moving slowly, making it impossible to produce a report quickly. The librarians' assigned tasks include organizing and categorizing books in the book stores. They must simultaneously check and keep an eye on the tiny print of the lend/borrow book. Working in multiple industries simultaneously is a laborious procedure. The LMS will make it easier for librarians to work. The LMS enables the librarians to address every issue at once. The users don't have to wait in queue for very long to return or check out a book from the library. All the data is contained on a single PC. The system must be evaluated by the librarians, who must also add an entry. The librarian can locate the book on the bookshelves using LMS. Basic capabilities of the LMS include the ability for a librarian to add, view, update, and delete books as well as student information. He or she can change any database data once they have gained access to the system. The entire model was created using Dot Net technology; the front end application was created using the C# language, and the database was created using the SQL server. Only those who have been given permission can connect in to the LMS system using their user name and password. The LMS is user-friendly, as said, thus the administrator may easily activate the system without professional assistance. The SQL database is used to store and retrieve all data, making it extremely secure. As a result, our solution offers a fresh perspective on how to build up a digital library.

Keywords: Management System, .Net, SQL Server, LAN, DBMS

1. Introduction

A library is a location where a sizable collection of books and other materials are available for users to access. It serves as the institutions' brain. It improves the kids' exposure to intellectual and spiritual civilization. The abundance of books and research papers is inspiring students to expand their knowledge in all directions. It teaches the kids how to advocate for their ideas in unique ways. The student's ability to succeed in academics and the development of their personal skills is enhanced by this knowledge. Technology innovation creates a need for creating a method to improve the traditional library setup to a digital one. The efficiency of the library is reduced by a number of tiresome procedures. For instance, in a traditional library, any activity requires physical assistance. For future reference, the count and specifics of the books are recorded on the paper. Each piece of information is retrieved and stored in the notebook for future citations. They must consult the notebooks in order to review any data. The student ID, distribution and renewal dates, and book id must all be represented in the notebook at the same time as the books are being distributed to the students. Each book must have a tag and an id provided by the staff or librarians. The volumes must be tagged, aligned, and arranged on the shelves.

Theft or missing books cause the librarians great problems and consternation. They must check the books' penalties before taking them from the kids. Therefore, the personnel become bored as a result.

As a result of the staff's delayed development, it causes the students to get disinterested. We presented a system called the Library Management System (LMS) to bring the library into the technology era. With just one click, it is an automatic system that lessens the workload for workers and librarians. It will control, direct, and organize the library task. The LMS assists the librarian in adding, viewing, deleting, and updating information from the library stock. Here, we integrate the SQL server with the entire library's data. The librarian must first enter student and book information into the database. After that, he or she can access such details using the Library Management system to view, remove, or change them. As a result, the user has 24/7 access to the library.

Without any uncertainty, the librarians can assist with the data. Each piece of data is obtained from the database. If the user accesses any user information, it displays the user's name, ID, book information, and punishment information. For any references, they don't need to write it down on paper. They can alter the parameter by modifying the data. Even though she is working on the instructions, the librarian finds it simple to operate the automated system. It offers numerous extra capabilities, including the ability for librarians to keep track of library records and students' histories of infractions and problems. It continuously keeps track of the number of books in the library and provides book details. This results in flexible service for both students and librarians. Because of its user-friendly interface, anyone with rudimentary computer skills can access the LMS. The system's ability to be modified and configured by the user makes it useful in a variety of organizations. We act as the LMS's administrative module. We used .Net technology, one of the newest in the IT industry, to build the learning management system. It will appear on your computer's desktop thanks to the integration of all the elements.

The database is where the data are kept and kept secure, as specified. Related data are correctly preserved and stored together. It enables the user to design their database in accordance with their needs. Programs that offer an interface between databases can manipulate the database. After receiving an order from the administrator, the database management system (DBMS) modifies the database's data in accordance with the directive. The existing database may be loaded, retrieved, or modified using this operation. A centralized DBMS is preferable because it enables numerous users to access the database in a regulated manner from various locations. The system can assign a view mode for each user based on the DBMS scheme, such that some users can see only a subset of the data while authorized users can see the entire database's contents. It gives independent logical and physical facts. A client-side program can call the DBMS on the server-side via the application programming interface provided by the Open Database Connectivity (ODBC).

1.1 SQL DATABASE

Standard Query Language, or SQL, is another name for the language that is used to communicate with databases. To run queries on the database and get data from the database, SQL statements are used. We can construct new databases, tables, stored procedures, as well as update, remove, and add table elements. We can configure permissions for the view, process, and table as well as examine the data.

2. RELATED WORK

Shasha et al [1], To improve management and meet student demand, research is being done on the library management system. Honghai et al [2], proposed a paper in which he illustrates the loss of investment in the CD that is included with the books. He offered cloud computing for data transfer in order to reduce the cost of the library. Bao et al [3] presented a paper on developing the library's prediction model. He introduced the t-test and the co-efficient of simple determination as two models for predicting the process. This analysis reveals the significant correlation between lending and readership. When planning and building the model library, they mostly focus on lending libraries. Eraxiang et al [4], published a study in which he outlined the drawbacks of the conventional library administration systems. He addressed the drawback by integrating the MVC design with the struts and hibernate frameworks. A multilayer tier, which includes a presentation, business, data persistence, and database layer, is another name for the MVC design. The system's maintainability and reusability are enhanced by these added features. Zheng et al [5], introduced a paper on the Library Management system based on UML. Because UML has a wide range of applications, the LMS is modeled and designed using this idea. After analyzing the simple LMS, a case diagram and analysis diagram are created. Hitchense et al [6], a work on flexible class usage was suggested. He suggested reusing classes for some related circumstances. Yang et al [7], explained a laborious task on the librarians' manual process. He therefore introduced an LMS using VB. Bretthauer et al [8] disclosed details regarding the open-source library software. He also discussed open-source software's disadvantages. Brave et al [9], provided a variety of open-source technologies including journal management software, citation and knowledge management tools, digital library software, and LMS. Albee et al [10], studied the open-source library's impact on the staff's attitude and contentment.

We created an LMS in .Net technology that librarians may readily access to improve the layout and development of the library management system. It eliminates the shortcomings of the current approaches. The system is extremely safe and gives users a successful outcome.

The remainder of the essay is illustrated as follows. In Section 3, the architecture of the suggested system is briefly described. In Section 4, describe the system's conclusion component.

3. Methodology

3.1 Block Schematic

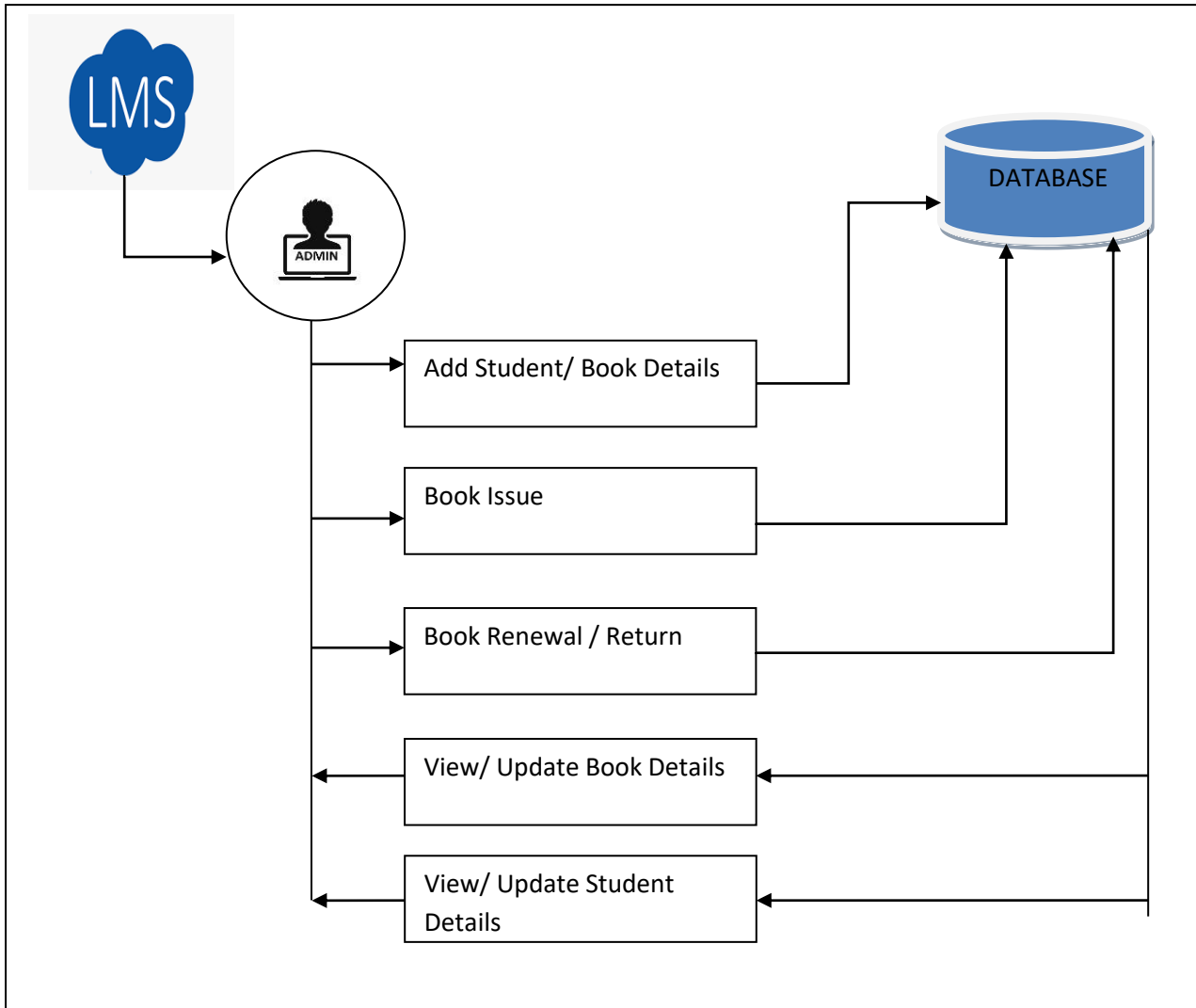




Fig 3.1: Block Diagram of Proposed system

The block diagram of the suggested Library Management system (LMS) was shown in Fig. 3.1. The LMS has an admin module that shows how to use the admin's functions.

The administrator is the only one with permission to use the LMS system. He or she can use their user ID and password to log into the LMS system. When logging in, the system loads and opens the Home page, where the user must enter their Id and password, as shown in fig. 3.2.

Sign in to start your session





☐ Remember Me

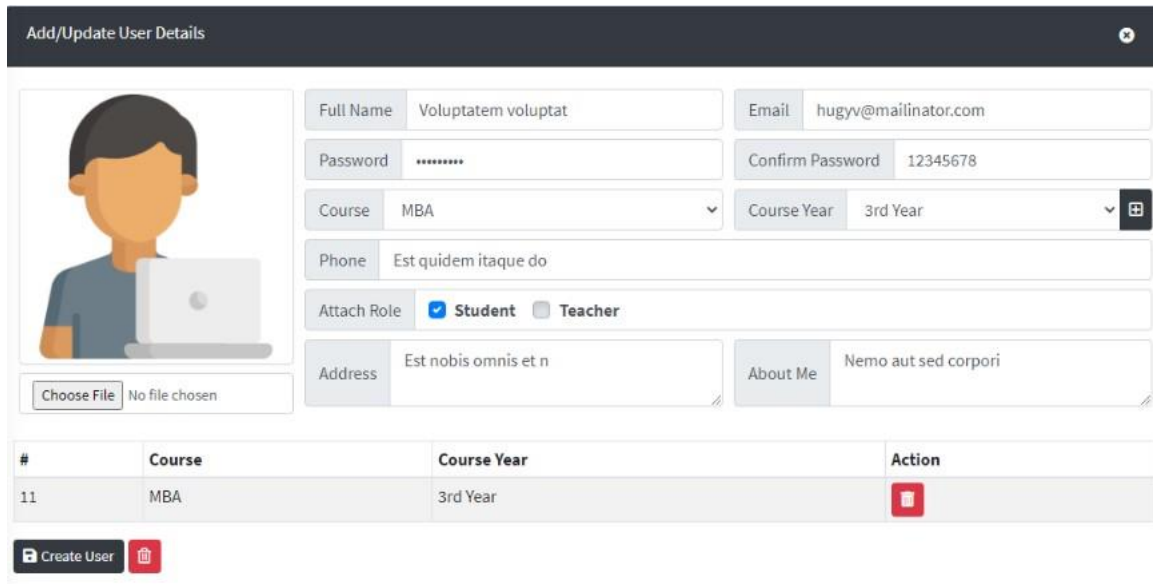
#	UserName	Password	#
Login Details			
Admin Login	admin@admin.com	12345678	<input type="button" value="Login"/>
Teacher Login	johnny@live-lib.com	12345678	<input type="button" value="Login"/>
Student Login	fedreik@live-lib.com	12345678	<input type="button" value="Login"/>
Librarian Login	ben@lib.com	12345678	<input type="button" value="Login"/>

[I forgot my password](#)

[Register](#)

Fig 3.2: Login Page of Library Management System

He or she can access and edit the system's data after logging in. The administrator can add student and book details, issue and return books, view and update books, and view and update student information.




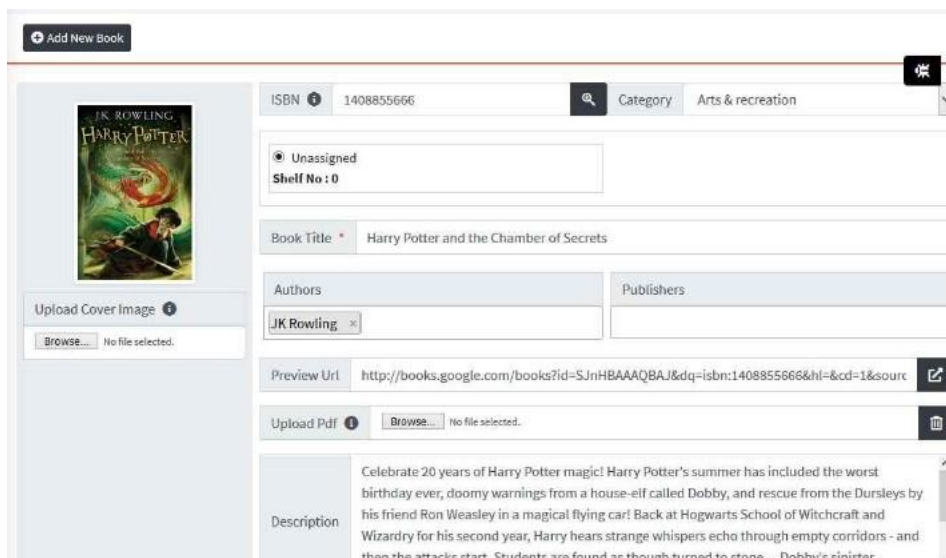
#	Course	Course Year	Action
11	MBA	3rd Year	

Fig 3.3: Adding students to LMS

When uploading a student's information to the LMS, we include the register number, name, date of birth, blood type, email address, mobile number, and gender, among other facts. Similar to that, when adding a new book, we enter the book ID, author name, number of copies, price, etc., as shown in fig. 3.4.

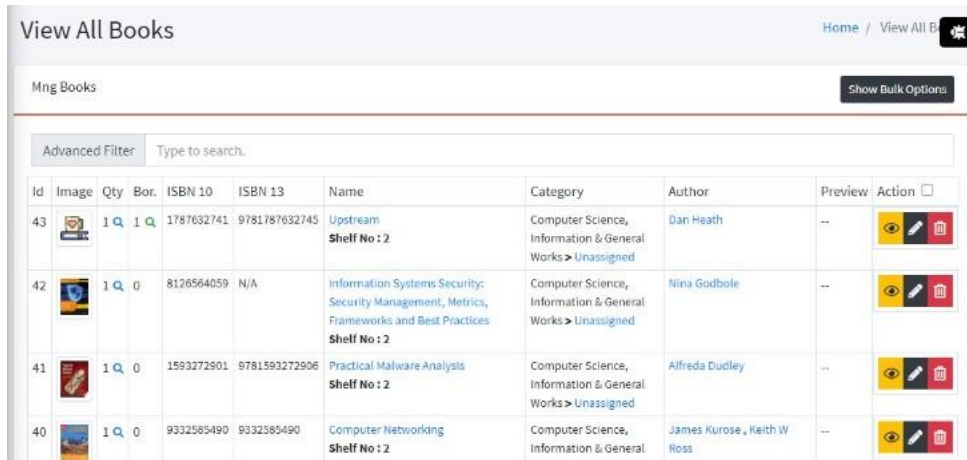


ISBN: 1408855666, Category: Arts & recreation, Shelf No: 0, Book Title: Harry Potter and the Chamber of Secrets, Authors: JK Rowling, Publishers: , Preview Url: http://books.google.com/books?id=SjnHBAAQBAJ&dq=isbn:1408855666&hl=&cd=1&source=books.google.com, Upload Pdf: No file selected.

Description: Celebrate 20 years of Harry Potter magic! Harry Potter's summer has included the worst birthday ever, doomy warnings from a house-elf called Dobby, and rescue from the Dursleys by his friend Ron Weasley in a magical flying car! Back at Hogwarts School of Witchcraft and Wizardry for his second year, Harry hears strange whispers echo through empty corridors - and then the attacks start. Students are found as though turned to stone ... Dobby's sinister

Fig 3.4: Adding new book to LMS

Through the admin, those adding data can be viewed, updated, or deleted. As shown in fig. 3.5, the administrator can access and search/view any book using the LMS's search feature.



Id	Image	Qty	Bor.	ISBN 10	ISBN 13	Name	Category	Author	Preview	Action
43		1	Q	1787632741	9781787632745	Upstream Shelf No : 2	Computer Science, Information & General Works > Unassigned	Dan Heath	--	
42		1	Q	8126564059	N/A	Information Systems Security: Security Management, Metrics, Frameworks and Best Practices Shelf No : 2	Computer Science, Information & General Works > Unassigned	Nina Godbole	--	
41		1	Q	1593272901	9781593272906	Practical Malware Analysis Shelf No : 2	Computer Science, Information & General Works > Unassigned	Alfreda Dudley	--	
40		1	Q	9332585490	9332585490	Computer Networking Shelf No : 2	Computer Science, Information & General	James Kurose, Keith W. Ross	--	

Fig 3.5: View all book details in LMS

We developed the library management system using SQL as the back end and .Net as the front end. Due to the fact that the item will be in a notebook that can be rewritten, users of the current system are able to illegally change the entry's date. The LMS system gets around these drawbacks. The librarians will be able to work quickly and effectively with the help of this system. The LMS will be updated with all the information. So, they can confirm all of the book's details. For the librarians, the existing system's awkwardness is eliminated. LMS gave them access to a user-friendly setting. As a result, the system takes library management to a new level. As a result, the library makes quick progress and sees a large increase in the number of visitors. The database can be checked to see if a book is missing, so the librarian must correctly examine and maintain the database.

4. CONCLUSION

It is promoted for libraries to have simple access by identifying the difficulties and problems with the traditional library. The librarian can add, amend, or remove student and book information from the database in the library management system. Each student has a unique ID that they can use to check out any book from the library. The librarian can check the user information, fine payment, and book information using the ID. The LMS streamlines processes and improves system performance. In our future work, we intended to improve the LMS by fusing it with the LAN, which would increase the system's effectiveness.

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