

In-House Library Management

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Abstract: Libraries are the great source for providing knowledge and information. Due to changes in educational environment, it is necessary to have a digital environment for libraries. This in-house Library Management website provides us the information about the books available in the library so that we can easily take the book from the library. The system would provide a basic set of features to add/update members, add/update books, and manage check-in specifications for the systems based on the client's statement of need. When logged in, we can access the e-book of the library. It really helps in now-a-days digital world. We can see what are all the books that are borrowed from library and the due dates, this information helps the user and library to have a traffic-free environment. In the Admin login we can be able to access the student details and the books they borrowed. Admin can be able to access all the books in the library and he can add or delete a particular book. It is easy for a librarian to maintain the stock in the library. We can easily have an information about what are the books that are most needed and which is frequently borrowed so that we can increase the count of the particular number of books.

Keywords: Educational Environment, Library Stock, e-book, library management model, adding and updating books.

I. INTRODUCTION

We can see all of the books that have been borrowed from the library and their due dates; this information assists both the user and the library in maintaining a traffic-free environment. We can access the student information and the books they have borrowed through the admin login. The administrator has access to all of the library's books and can add or remove any of them. Maintaining the library's stock is simple for a librarian. We can quickly find out what books are most needed and frequently borrowed so that we can enhance the number of volumes in the library. As a result, by removing the chance of errors in the details, this strategy considerably reduces manual labour and allows for a seamless flow of library activities. The system eliminates the usage of paper work by maintaining all book information electronically. Admin can maintain the system up to date by informing students of new books that have arrived in the system and their availability, eliminating the need for students to visit the library for issuing. The system has well-organized and systematically ordered books in different categories so that users may simply search for and locate books.

1.1 System Overview

The proposed system uses NodeJS for handling requests and responses which uses event-driven model and non-blocking asynchronous tasks that runs on single thread, thus making it extremely efficient and scalable. The authentication module allows the user to login or register so that they can make use of the features provided by the admin. The users are asked to register with username and password. These data are verified by authentication. The admin also has to login with their credentials to have their control over the system. After verification, the user can view the books present in the library. Also, the user can search for the specific book in the search bar. The admin can be able to modify the books present in the database by adding or deleting the books eventually according to the availability of the books in the library. Finally, the changes made by the admin will be stored in the database and will reflect on the dashboard. The users can check the dashboard to know the status of the books available in the library.

II. RELATED WORKS

Naeem Iqbal; Faisal Jamil, Shabir Ahmad & et. al., (2020) ^[1]: Large scale data and predictive analytics are the most challenging tasks in the field of academic data mining. Academic libraries are a great source of information and knowledge

to provide a wide range of services to meet end-user requirements. Due to the rapid changes in the educational environment and availability of huge library rental book data, it is required to utilize data mining and machine learning techniques in the context of the academic library to extract and analyze underlying knowledge from rental book data, which is important to facilitate library administration to drive better future decisions to improve and manage library resources effectively. These are the following resources, such as managing future demands of the library books, selection and arrangement of the books, operational efficiency, and also improve the quality of interaction between the library and end-users, etc. In this paper, we propose a novel model to analyze and predict library rental book data to facilitates library administration in order to plan and manage library resources effectively and provide better services to end-users. The proposed model consists of two different modules; library data analysis and prediction modules. Firstly, we use data mining techniques to analyze and extract useful underlying patterns from library rental book data, which can lead to plan and manage library resources effectively. Secondly, a novel prediction model is proposed based on Deep Neural Network (DNN), Support Vector Regressor (SVR), and Random Forest (RF) to predict future usage of the academic libraries rental books. The performance results of the implemented regression models are evaluated in terms of MAE, MSE, and RMSE. The experimentation results show that the proposed model improves the future usage of library books to facilitate library administration to plan and manage library resources effectively. Based on the proposed model results, the academic library administration can easily plan and manage resources effectively to provide quality services to end-users

N.R. Adam, V. Atluri & et. al., (2002) [2]: Digital libraries (DLs) introduce several challenging requirements with respect to the formulation, specification and enforcement of adequate data protection policies. Unlike conventional database environments, a DL environment is typically characterized by a dynamic user population, often making accesses from remote locations, and by an extraordinarily large amount of multimedia information, stored in a variety of formats. Moreover, in a DL environment, access policies are often specified based on user qualifications and characteristics, rather than on user identity (e.g. a user can be given access to an R-rated video only if he/ she is more than 18 years old). Another crucial requirement is the support for content-dependent authorizations on digital library objects (e.g. all documents containing discussions on how to operate guns must be made available only to users who are 18 or older). Since traditional authorization models do not adequately meet the access control requirements typical of DLs, we propose a content-based authorization model that is suitable for a DL environment. Specifically, the most innovative features of our authorization model are: (1) flexible specification of authorizations based on the qualifications and (positive and negative) characteristics of users, (2) both content-dependent and content-independent access control to digital library objects, and (3) the varying granularity of authorization objects ranging from sets of library objects to specific portions of objects.

Chunyu Wang, Zhengyu Sha & et. al., (2021) [3]: With the continuous increase in the total amount of library digital resource services, issues such as digital resources and performance evaluation have gradually attracted the attention of libraries. Traditionally, digital resource providers provide statistical data. However, due to benefits, the accuracy and authenticity of the data are open to question. Taking a particular university library as an example, the paper analyzes the information log of users accessing digital resources to obtain user information needs. It uses big data mining technology to extract user information needs and preferences, forming a trend map of user needs and digital resources matching. The study found that the system can provide an auxiliary decision-making basis for subsequent purchases, provide data support for the evaluation of digital resource management in colleges and universities, and provide a scientific management model for the digital resource construction service system close to user experience.

R.W. Moore, A. Rajasekar &et. al., (2005) [4]: The integration of grid, data grid, digital library, and preservation technology has resulted in software infrastructure that is uniquely suited to the generation and management of data. Grids provide support for the organization, management, and application of processes. Data grids manage the resulting digital entities. Digital libraries provide support for the management of information associated with the digital entities. Persistent archives provide long-term preservation. We examine the synergies between these data management systems and the future evolution that is required for the generation and management of information.

III. EXISTING SYSTEM

It's difficult to control the crowd since some of them are destroying the books, ripping the pages, and taking the books. Rather than buying many copies of the same book, we may spend that money on another book. It necessitates infrastructure and regular maintenance. Every book will be burned in the event of a fire.

IV. PROPOSED SYSTEM

We may use e books at any time and from anywhere, and they are easily updated. Books can also be searched and accessible by a larger number of people at the same time. There is a large range of content available, all of which is available on demand. There is no set time restriction. People will save time searching for books.

V. METHODOLOGY

The proposed system consists of five modules that work together to build an efficient system

1. List of books
2. Login
3. Admin panel
4. Student panel

5.1 List of Books Module

This module allows the users to know about the list of books. This module will have the book images and list of departments available so that they can search easily. It will allow the user to navigate easily and this will show the books information. This page will have the department categories. when the user click the particular department they can easily navigate to that system and see the books available in that particular department. This page will have the nav bar so the user can move to the page.

list of books

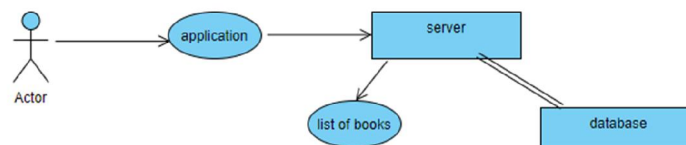


Figure 1: List of books Module

5.2 Login Module

The login page allows users to login to the student or admin dashboard. When the user is going to register for the first time he can use the register page for sign-up. This will be in drop down after clicking their respective drop down content they can navigate and login to use their webpage. In this login page when the user clicks the register hyperlink it will remain in the same page and the login form will be flipped to registration page. After registering the user can login to the portal with the same credentials provided during registration process.

login

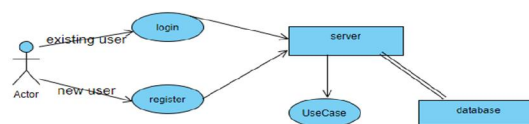
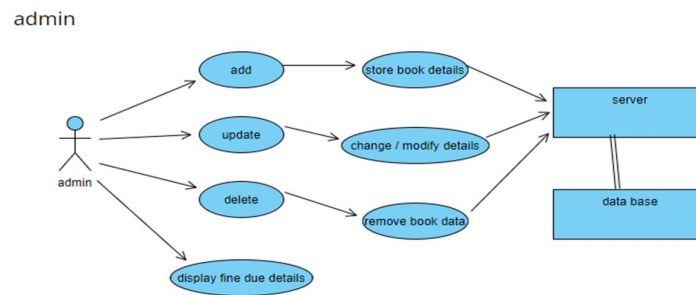


Figure 2: Login Module

5.3 Admin Panel Module

After login the admin can able to add books delete books. It will be updated in the server for the current books available. There will be button in their page for adding and deleting books. The admin can upload the book so that it can available to the students



5.4 Student Panel Module

The student after login can able to search the books available using the search bar. This module contains the e-books and the e-books can be read by the students but it is not available to download to maintain the copyrights of the books. The books available will be updated from the server. The server is to be updated by the admin.

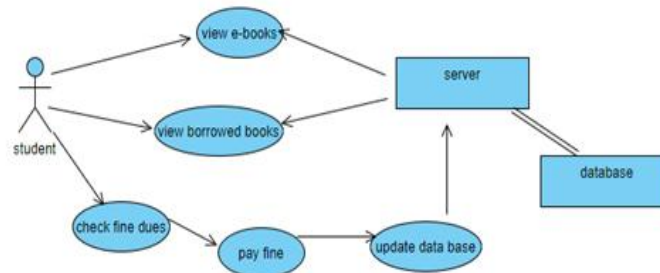


Figure 3: Student panel Module

VI. IMPLEMENTATION

The VS code editor and chrome web browser is used to implement the code. It provides millions of extensions for the developers to make the development process simple and enjoyable.

This system uses 5 modules.

1. List of books
2. Login
3. Admin panel
4. Student panel

These modules collaborate together and makes the system work efficiently. Each module does a significant job to ensure the perfect data flow and user experience.

6.1 HTML

HTML or Hypertext Markup Language defines the structure of a webpage with the use of various tags. A hypertext is a piece of text that contains a hyperlink. HyperText is a method of linking two or more web pages together. A markup language is a computer language that allows you to format and arrange text documents. It also enhances the dynamic and interactive nature of text. Some of the basic tags used in HTML is mention below, in the table 1

Tags	Description
<html>	Defines an HTML document
<head>	Contains metadata for the document
<title>	Defines a title for the document
<body>	Defines the document body
<h1>...<h6>	Defines HTML headings
<p>	Defines the paragraph

<input>	Defines an input control
<button>	Defines a clickable button
<select>	Define a drop-down list

Table 1. Basic HTML tags

6.2 CSS

CSS (Cascading Style Sheets) is a simple design language designed to make the process of making web pages presentable easier. The style and feel of a web page is handled by CSS. You can use CSS to change the text colour, font style, paragraph spacing, how columns are scaled and laid out, what background pictures or colours are used, layout designs, display variants for different devices and screen sizes, and a range of other effects. HTML and CSS design is a must-have talent if you wish to pursue a career as a professional web designer. CSS is simple to learn and understand, but it gives you a lot of power over how an HTML document looks. CSS is frequently used in conjunction with the markup languages HTML or XHTML.

- CSS saves time - Since it allows you to code CSS once and then reuse it across various HTML pages. Each HTML element has its own style that you can apply to as many Web pages as you desire.
- Pages load faster - Since you don't have to write HTML tag attributes every time you use CSS. Simply write a single CSS rule for a tag and apply it to all instances of that tag. As a result, less code implies faster downloads.
- Simple to maintain - To make a global change, simply alter the style, and all elements across all web pages will be immediately updated.

6.3 JavaScript

JavaScript is considered to be the world's most popular programming language, which is considered as easy to understand and learn. It is a lightweight and interpreted language. The single most important feature of JavaScript is that the functions are objects. Understanding this feature will open up a whole new understanding of this programming language. Because a JavaScript program is built using functions. This is why JavaScript is called as Functional Language.

It was developed primarily as a client-side language that can only run on a browser because of the inbuilt existence of JavaScript V8 engine. The community of developers grew big and the idea to implement JavaScript not only in a browser but in every platform that is available is born. As a result, Nodejs is created

6.4 NodeJS

Node.js can be defined as an open-source server environment for JavaScript. Which means, any system with node.js will have the ability to execute a JavaScript code. Node.js is primarily used for non-blocking, event-driven servers due to its single thread nature. It can be used in traditional websites and to create backend API services. Node.js is not a framework or library, but a runtime environment based on Chrome's V8 engine.

NPM or Node Package Manager is considered to be the largest Open-Source Software Registry. It is a vital part of the NodeJS as it contains over 800,000 code packages. Open-source developers use NPM to develop, install or manage the node packages. The NPM has a huge community where developers discover, publish and develop node packages.

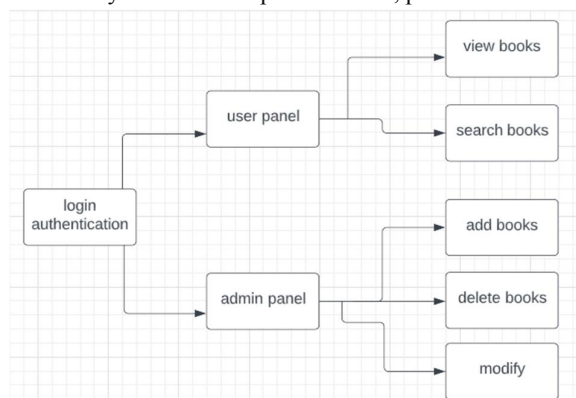


Figure 5: Structure of Library Management

VII. CONCLUSION

As a conclusion, this website offers a computerised library management system that will assist both students and library employees. It puts the entire process online, allowing students to look for books, and staff can also search the books and can add or delete books. It also has a facility for student login where student can login and can see status of books issued. The students can easily view e-books so that they save time and can refer more number of books at a time.

A. Future Scope

Many more elements, such as online lectures video tutorials and online assignment submission, can be added to this project in the future, making it more dynamic and user friendly. A feature of group chat where students may debate various engineering challenges could be added to this project, making it more engaging and user pleasant, and ensuring that it meets each user's needs to the best of its ability.

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