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Library Management System

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Abstract: *The majority of universities still operate their libraries primarily by hand at the moment. This study suggests a library management system that is created and executed based on a web service to address the issue of the time-consuming and inconvenient traditional manual operation. It provides an easy-to-use interface that enables users to explore and filter the entries that are available, which can be retrieved or uploaded by copying them from one of the Storage Elements into the user's local system or vice versa. This study develops the information architecture and key mechanisms of the library management system and examines the invention of system service mode from the viewpoints of readers' information acquisition and modification, quick management, and delivery of books. The conventional library management technique, with its poor efficiency and single operation mode, is considered, along with its low efficiency and single operation mode. Finally, we employ stored procedures and trigger technologies to enhance database performance in order to increase the database's operational efficiency. We fix the system problem and enhance system performance through actual testing.*

Keywords: Library Management, Database Optimization, Web Development

I. INTRODUCTION

1.1 Image Processing

A college library management system is one that organizes and maintains books information electronically based on the demands of students. The method assists both students and the library manager in keeping track of all the books accessible in the library. It enables both the administrator and the student to search for the necessary book. Colleges must maintain a constant watch on the books given and returned and even compute fines. This task, if done manually, will be time-consuming and prone to errors. These mistakes are prevented by allowing the system to maintain track of information such as the issuance date, the final day to return the book, and even fine details, eliminating the need for manual tracking. This information eliminates the possibility of errors. Thus, this approach greatly lowers human effort and allows for the smooth flow of library operations by eliminating the possibility of mistakes in the details. The development and transition of the library management system from the old traditional to the contemporary and intelligent library procedure is possible to achieve through the modernized technology.

In order to create and optimize the administration of numerous student users through the multi-equipped web service, we need an advanced technology. Many of the technologies can provide great library management services. The users which is being the students can acquire the information how books are collected, borrowed or contributed to the library. The alumni contribution module helps the admin by keep a proper track of the books which were contributed either by the alumni or bought by the department. There is also an issue book module where the admin has the authority to issue, renew or reject the book request made by the student. The admin can also fine the student if the return date of the book is more than the due date. Due to which they are time saving and help increase correctness in the system. They also highlight the need to replace the manual library system.

Analog and digital image processing are the two types of image processing methods employed. Hard copies, such as prints and photographs, can benefit from analogue image processing. When employing these visual tools, image analysts employ a variety of interpretive fundamentals. Digital image processing techniques allow for computer-assisted alteration of digital images. Pre-processing, augmentation, and presentation, as well as information extraction, are the three general processes that all sorts of data must go through when using digital techniques.

II. PROBLEM STATEMENT

Many library systems are manually operated by a group of individuals. In such cases, several individuals working

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in library administration must maintain track of books and students (borrowers), manually inspect books, keep track of published books, and so on. This is also a concern if the library's content processing is extensive. On the other hand, keeping a large number of maintenance employees might be costly and inefficient for the library. Manual recording is also unreliable since individuals tend to forget things.

From the borrower's point of view, the borrower cannot find the book accurately at one time with the manual system because the books are not properly classified. From time to time, users are looking for books that are not available in the library. Therefore, you need a reliable way to manage your library.

III. REQUIREMENT SPECIFICATION

The System Requirement Specification (SRS) is a document that defines the external behaviour of both the hardware and the software. Before beginning the design phase, a developer must first examine the system to be produced and establish the user requirements. The paper shows how the system will act and respond. The requirements phase's primary purpose is to create the software requirements specification, which specifies the whole external behaviour of the proposed system. The comprehensive description of the behaviour of a developed system is provided below. It contains the system's functional needs. In addition to the functional requirements, the non-functional requirements and user interface requirements are discussed. Requirement analysis is performed to comprehend the problem to be solved by human mistakes. The issue might be solved by removing an existing manual procedure, building a new system, or a combination of the two. Understanding the needs of a system is a key challenge for larger systems with numerous features and the need to execute a variety of functions.

The program should be simple and easy to use, with an interactive interface. Standard compliances define the requirements for the standards that the system must adhere to. To specify requirements completely, requirement specification documents should specify the certain properties of the software. Some of them are:

- The SRS must specify all of the software's functionalities that it will support.
- The SRS should include performance criteria.
- The design limitations should be specified by the SRS.

3.1 Functional Requirements

The system being developed requires preliminary data. They are student data, teacher data, and departmental subjects. These data are necessary at the start of the system construction process because all other modules will require them.

A. User Login

This feature used by the user to login into system. They are required to enter user id and password before they are allowed to enter the system. The user id and password will be verified and if invalid id is their user is allowed to not enter the system.

B. Search Book

This functionality may be found under the book maintenance section. We may search for books by book id, book title, publication, or author name.

- The system must be able to search the database depending on the search type selected.
- The system must be able to filter books based on the keyword input.
- The system must be able to display the filtered books in table view.

C. Student

- REQ-1: Before entering the system, the system must authenticate.
- REQ 2: The system must display Notice.
- REQ 3: The system must allow students to see books.
- REQ-4: The system should allow students to see whether or not a book is available.
- REQ-5: The system must display the student's history of supplied books.

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D. Faculty

- REQ-1: Before entering the system, the system must authenticate.
- REQ- 2: The system must display notice.
- REQ- 3: The system should allow teachers to view books.
- REQ-4: The system should allow professors to determine whether a book is available or not.
- REQ-5: The system must display the history of books issued by faculty.

E. Administrator

- REQ-1: Before connecting to the network, the system administrator must authenticate the login.
- REQ-2: The system must allow the user to manage the system's overall actions.
- REQ-3: The system must allow administrators to alter his or her account details.
- REQ-4: The system should allow users to add, remove, or update books.
- REQ-5: The system must display all of the books in the library.
- REQ-6: The system must be able to view the whole history of books provided to students and faculty.

3.2 Technical Requirements

A. Hardware Components

Hardware components that deal with basic hardware requirement to develop and to run any system. It includes processor, memory etc. Hardware constraints:

- 1.4GHz Intel Pentium IV processor or equivalent or higher
- 512 MB Ram or Higher
- 20 GB HDD or Higher
- Network Connectivity.

B. Enhancing the Resolution

The model proposed by [11] is a Generative Adversarial Network for Image Super Resolution as a paradigm (SRGAN). It recovers photo realistic textures and then enhances the resolution of the original image depending on the parameters found, resulting in a considerably improved image as the output. It is significantly more effective than the models proposed by [12] and [13].

IV. FEATURES

The library management system can be used to store, organize, search, retrieve, delete and update any kind of digital assets represented. A new library administration mode in the Internet era should be provided in the design of a smart library management system. The library may be handled effectively, in real time, and even autonomously by combining existing Internet technology.

In the first case if the alumni contribution is present then there is an import function present in the alumni contribution, the admin instead of entering the details for each book can directly import the files where the files should contain all the columns which are present in the database hence in the alumni contribution there is an option for the admin the store the data in an excel sheet and import. In the second case if the alumni contribution is no then the admin has to enter all the details of the book into the database.

Then there is Issuing of book to the borrower where only the borrower's ID and Book ID I required to issue the book. It takes the system's date as issue and returns the due date 15 days from the issue date automatically and if the return date exceeds the due date, then a certain amount of fine is calculated and the bill is generated which can be printed if any documentation is required, an option of viewing total fine collection of any month or year is also made available, so that the admin has an approximate accounting of the total revenue collected in the particular year or month.

The library system is implemented for all the departments and the admin has the option of selecting the from the drop- down menu. An Auto – incrementation has been set up for the admin to make entering of data easy and less

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time consuming, pagination has been included for the book displayed as it becomes easier for the user to access or navigate between the pages while seeking a particular book the alternate option of searching the books by using the search bar where the search is possible by inputting in the particular subject.

V. EXISTING WORK

In Library Management to handle the entire activity of a library. The student will find it simple in this digitized system rather than using the manual writing system. It will consist of database where all the details will be stored secured. The system is efficient and easy to understand, error less. If one is not very careful then there is a possibility of issuing more than one book to a user. There is a possibility of issuing a book to a user, with or without membership When a user requests for a book, one has to physically check for the presence of a book in the library. Answering management query is a time-consuming process. Daily keeping a manual record of changes taking place in the library such as book being issued, book being returned etc. can become tiresome.

VI. PROPOSED WORK

The Management System aims to offer a completely functional digital system to handle every day-to-day activity in a library. This project offers a lot of different components, such the possibility for students and teachers to login. Additionally, it appears that an admin will oversee the authentication and approval of the entire programme, ensuring that neither outsider can get in and alter the data because an admin login is also offered.
With Library Management, it is easy to oversee all of a library's operations. It preserves a record of all the details regarding the books in the library, including their costs, full descriptions, and the total number of volumes available. The automatic method will be significantly simpler for the user to utilize than the manual written tradition. The system uses a database where all information is safely stored. Utilizing the system is easy.
In fact, a recent upgrade includes a search bar that thoroughly confirms the book's accessibility on this platform. If the book is available, the user can easily borrow it and read it cover to cover.

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VIII. ARCHITECTURE

The architectural design gives the description of how the overall architecture is designed. There is no unique design for any software system. Studies of different options may be necessary. The choice depends on the type of the system. The architectural design is specified by identifying the components, defining the control and data flow and stating for each of them the functions to be performed, data input, data output and resource utilization.

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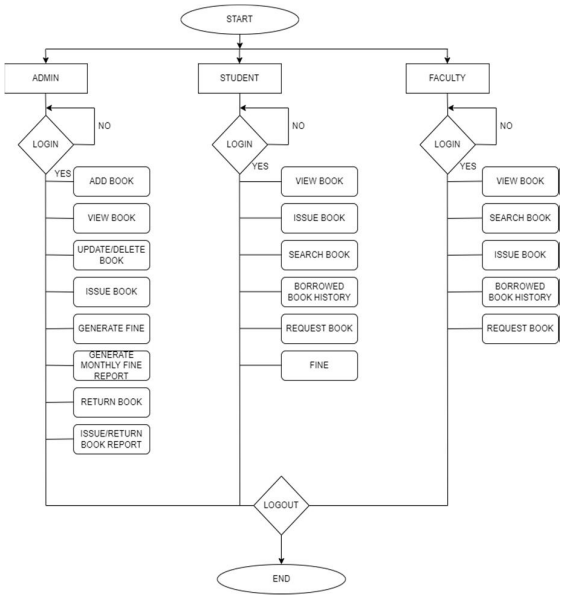

Fig 1: Architectural model

IX. FLOW DIAGRAM

The faculty logs in and view all the books available in the library to issue it. Based on the book detail the faculty can request for the book. The same kind of login is done in the student side. The admin can Add, Edit. Delete the book details using the platform of Library Management System.

The Admin has to login using his credentials. Under that he goes to the Library module where the admin can View, Add a new book and Update/Delete for an existing book. He can also Accept or Decline Requests for the book.

The admin has to login using his credentials and under the library module he can enter the details and see all the issue requests from both Faculty and Student. The admin then has the access to either accept it or reject the request. The users can opt for a renewal if they wish to. In case the student fails to submit the book on time they are charged with 5Rs fine per day. The admin can generate bill for the same and hand it over to the student.

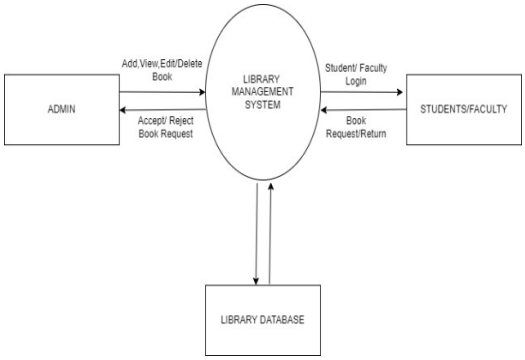

Fig 2: The Data Flow Model

X. USE CASE

Admin Use Case: The Figure depicts the Admin side use case diagram with fields like add, view, issue, delete book. If any person requests for a book then the admin can accept/reject the request. He is responsible for updating the return book and generating of Fine if any.

- **Student Use Case:** The above figure depicts the student side of the Library Management System. The students can login using their USN and password and search for the books they want. They have to Request for the book which they wish to have and can also view the fine if any.

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- **Faculty use case:** The Figure depicts the use case diagram of faculty side. The faculty has to login using their faculty id and password. They can search for the book from the list of available books and Request for the same. They have no deadline of returning the book and no fine included.

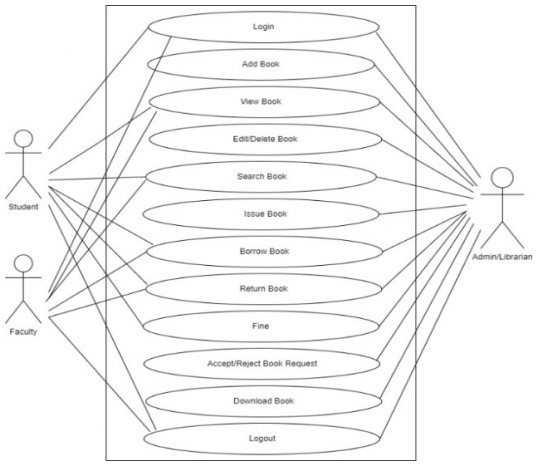

Fig3: Use Case

XI. RESULT

This website offers a digital version of the library management system that will assist both students and library employees.

It moves the entire process online, allowing students to look for books and staff to compile reports and conduct book transactions. It also features a student login feature where students can login and monitor the status of their books issued as well as make book requests. It has a teacher login feature, as well as the ability for instructors to request books.

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