

IN2901 - Software Development Project Proposal

Level 02

Web Based Library Management System

Innovate Coders



Faculty of Information Technology

University of Moratuwa

2023

Group Name	Innovate Coders	
Project Name	Library management System	
Client's name and address	Alpha Codes (PVT) LTD Kilinochchi, Northern Province.	
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	214134H	Mihunan V.
	214116F	Lathisana T.
	214197C	Shobikan V.
	214240E	Yasothan R
Supervisors' names	1.Ms. R.G.C. Upeksha 2. CM - Dr. Thanuja A.L.A.R.R.	

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1.Introduction

In today's digital age, the management of school libraries is no longer confined to traditional manual methods. As educational institutions strive to provide students with access to a diverse range of resources, the need for an efficient and modern Library Management System (LMS) becomes paramount. This 2nd-year software project aims to address the pressing issue of outdated library management practices in schools and offers a cutting-edge solution.

The problem we are tackling is the inefficient and time-consuming management of library resources, which includes cataloging books, tracking borrowings, and maintaining an up-to-date inventory. This problem is of utmost importance because a well-organized library is an indispensable resource for fostering academic excellence and a love for reading among students.

Our proposed solution leverages advanced technologies such as database management, web development, and data analytics to create an intuitive and user-friendly LMS. This system will streamline library operations, enhance resource accessibility, and provide insightful analytics for better decision-making. By offering a digital platform that automates routine tasks and facilitates seamless access to educational materials, our solution will empower both librarians and students, ultimately contributing to a more efficient and enriched learning environment.

2.Background and motivation

In today's educational landscape, the role of libraries has evolved to include a wide range of digital and multimedia resources. This shift necessitates the implementation of modern Library Management Systems (LMS) to efficiently manage these resources. We are motivated by the belief that a modern LMS can significantly enhance the educational experience. Libraries are not just repositories but active learning hubs, and we aim to bridge the gap between traditional library management and the dynamic needs of today's students. Our team is inspired by the opportunity to create a more efficient and accessible learning environment, benefiting both librarians and students, and fostering a culture of knowledge acquisition and exploration.

Our motivation is rooted in the profound impact a modern LMS can have on the educational journey of students, providing them with streamlined access to resources, real-time engagement tracking, and data-driven decision-making. We are driven by the vision of contributing to the transformation of libraries in educational institutions, harnessing technology to make them vibrant centers of learning, and supporting the growth and success of students in the digital age.

3. Problem in brief

3.1. Fragmented Library Management.

The current library management system lacks a unified and standardized approach to handling the various tasks involved. This fragmentation can lead to inefficiencies, such as multiple versions of the same book entry, difficulty in tracking borrowing histories, and missed opportunities for resource management. Moreover, the absence of a common registration structure for different users, including teachers, students, and librarians, can result in inaccuracies and potential data omissions, impacting the overall functionality of the system.

3.2. Lack of Efficient Invoicing

While the system primarily focuses on library resource management, it is not equipped to handle additional functions, like efficient article publishing. This gap can lead to challenges in invoicing, specifically for users who wish to publish, edit, and rate and review articles. The absence of a standardized invoicing procedure may result in inconsistent billing schedules and difficulties in tracking payments and resources used. This lack of structure can affect the financial health of the system and erode the trust of its users.

3.3. Lack of Interactivity

While the system provides users with the ability to publish, edit, and review articles, there might be a lack of interactive features that promote engagement and knowledge sharing among students and teachers. Enhancing user interactions and fostering a dynamic learning environment is crucial for making the library more than just a repository of resources but a hub for collaborative learning.

3.4. Inadequate Resource Categorization

The system's resource catalog and search functionality may face challenges in effectively categorizing and organizing library resources. Without standardized categorization criteria, users might encounter difficulties in locating specific resources, leading to frustration, and decreased overall satisfaction. An organized and intuitive classification system is essential for an efficient library management system.

3.5. Absence of Fine Management

The current system might lack a fine management feature, making it challenging to handle fines for late returns or other infringements. The absence of an automated system to calculate, manage, and enforce fines can lead to inconsistencies, disputes, and potential revenue loss. Implementing fine management is essential to ensure a fair and efficient penalty system.

3.6. Resource Availability Alerts

While the system allows users to receive notifications about resource availability, there might be limitations in the types of resources covered. Expanding this feature to include various resource types and ensuring that users can specify their preferences for alert notifications is essential to improve user satisfaction and resource accessibility.

3.7. Inadequate Inventory Control

The system may encounter issues in inventory management, with limited tools for conducting periodic checks and reconciling discrepancies. A lack of efficient inventory control can result in missing or lost resources, affecting the library's ability to provide a complete and up-to-date collection. Ensuring accurate inventory management is crucial for maintaining the library's functionality.

4. Aims and Objectives

4.1. Aim

The aim of this project is to develop a comprehensive Library Management System (LMS) that addresses the challenges of traditional library management and introduces efficient student tracking using entrance sign-ins with the use of modern technology.

4.2. Objectives

- **Streamlined Resource Management:** To develop a library management system that efficiently catalogs, tracks, and manages all library resources, reducing manual effort and optimizing resource allocation.
- **Real-Time User Tracking:** To implement a system that enables real-time tracking of student library visits using entrance sign-ins linked to their school index numbers, ensuring accountability and efficient resource management.
- **Enhanced Resource Accessibility:** To provide students, teachers, and librarians with a user-friendly interface for accessing and managing library resources, minimizing barriers to resource availability and visibility.
- **User Engagement Optimization:** To develop tools and features that optimize the user experience for students and librarians, including the ability to search for resources, check borrowing history, and interact with the system seamlessly.
- **Flexibility and Adaptability:** To ensure the project team is adaptable to changes in project requirements or resource needs, allowing for swift adjustments when necessary to meet evolving user demands.
- **Inventory Accuracy:** To ensure that the system maintains an accurate and up-to-date inventory of library resources, reducing the likelihood of missing or lost items.
- **Fine Management Efficiency:** To develop features that calculate and manage fines for late returns based on predefined rules, offering flexibility for librarians to handle exceptional cases and maintain financial transparency.
- **Resource Reservation Optimization:** To improve the resource reservation system, allowing students to easily reserve items currently checked out by others, while providing librarians with tools to manage and prioritize reservations effectively.
- **User Profile Customization:** To enhance the user profile management by enabling users to customize their profiles, including contact information and privacy settings, improving their overall experience.

By achieving these objectives, the organization aims to enhance its project management capabilities, resulting in more successful and efficient project outcomes, improved decision-making, and ultimately, a competitive advantage in the marketplace.

5. Proposed Solutions

Our proposed solution for the School Library Management System is a comprehensive and innovative platform that leverages modern technology to address the challenges faced by traditional library management systems. Here, we outline the major requirements, technologies to be adapted, and the feasibility of implementing this solution:

1. User Authentication and Authorization:
 - Librarians and students should have secure login access. Librarians should have access to administrative features like adding and managing resources, viewing analytics, and user management. Students should have limited access, primarily to check their borrowing history, search for resources, and view their account status.
2. Resource Catalog and Search:
 - Librarians should be able to add, edit, and delete resources with details such as title, author, ISBN, category, and availability status. Users (both librarians and students) should be able to search for resources based on various criteria, including title, author, category, and availability.
3. Check-Out and Return Management:
 - Librarians should have the ability to check out and check in resources on behalf of students. Students should be able to self-check resources in and out using the system, which will update availability status in real-time.
4. Reservation System:
 - Students should be able to reserve resources that are currently checked out by others. Librarians should be able to manage and prioritize resource reservations.
5. User Profile Management:
 - Users should be able to update their profiles, including contact information and password changes. Librarians should be able to manage user accounts and reset passwords.
6. Security and Privacy:
 - The system should ensure data security, including encryption of sensitive data such as user credentials and transaction history. It should comply with privacy regulations and allow users to manage their data privacy settings.
7. Inventory Management:
 - Librarians should have tools to conduct periodic inventory checks and reconcile discrepancies. The system should provide reports on missing or lost resources.
8. Fine Management:
 - The system should calculate and manage fines for late returns based on predefined rules. Librarians should have the ability to waive fines in exceptional cases.
9. Resource Availability Alerts:
 - Users, particularly students, can opt to receive email notifications when specific resources become available for borrowing. The system will automatically send an email alert when a reserved item is returned, ensuring timely updates for interested users.
10. Article Publishing
 - Users have the capability to publish their articles on the school library website, allowing them to share their insights and knowledge with the school community. This feature promotes knowledge sharing and contributes to the enrichment of the learning environment.

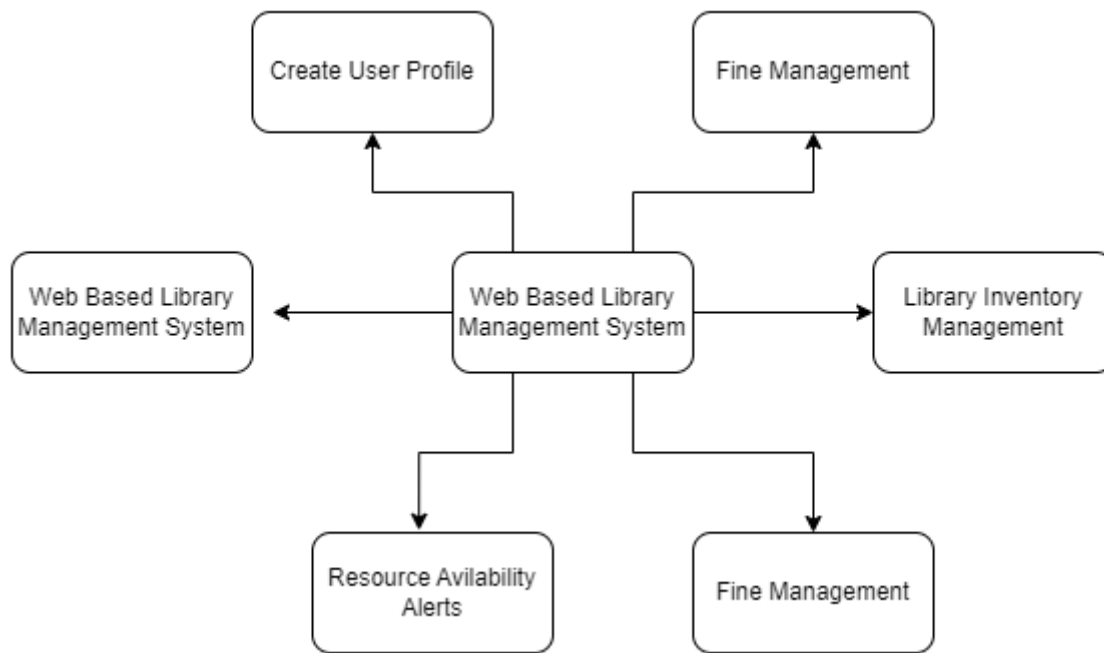


Figure 1 Functionalities of the System

6. Resource Requirements

Front End	React JS
Back End	Spring boot
Database	MySQL
UI/UX Design	Figma
Version Controlling	GitHub
Data Sources	YouTube, W3 school, Crystal Reports

Table 1

7. Timeline

Activity	October	November	December	January	February	March	April
Collect the requirements	✓						
Learn about the software practices	✓						
Make UML diagrams	✓	✓					
Do the UI/UX design		✓					
Learning required technologies		✓	✓				
Make a good plan to implement the system			✓				
Develop and Implement the System			✓	✓	✓	✓	
Testing the Application and Getting feedback					✓	✓	
Deploying the system and Preparing documentations							✓

8. References

01. MySQL Documentation: <https://dev.mysql.com/doc/>
02. ReactJS Documentation: <https://legacy.reactjs.org/docs/getting-started.html>
03. Spring boot Documentation: <https://spring.io/projects/spring-boot> <https://reactnative.dev/docs/getting-started>

9. Signatures of the Group Members

Index No	Name	Signature
214145R	Paranietharan P	பா. பரணிதரன்
214134H	Mihunan V.	V. Mihunan
214116F	Lathisana T.	த.லதிசனா
214197C	Shobikan V.	V. Shobikan
214240E	Yasothan R	R. Yasothan

Table 2

10. Supervisor's Declaration

I hereby declare that I have checked this project and this project is adequate in terms of scope and quality.

Name of Supervisor:	Ms. R.G.C. Upeksha
Designation:	
Date:	
Signature:	
Any further comments:	

Table 3

Name of Supervisor:	Dr. Thanuja A.L.A.R.R.
Designation:	
Date:	
Signature:	
Any further comments:	

Table 4