IN2901 - Software Development Project Proposal

Level 02

Web based Library Management System

Innovate Coders

Department of Information Technology

Faculty of Information Technology

University of Moratuwa

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Group Name	Innovate Coders	
Project Name	Library management System	
Client's name and address	Alpha Codes (PVT) LTD Kilinochchi, Northern Province.	
Group Members	Index No	Name
	214145R	Paranietharan P
	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 This 2nd-year software project aims to address the pressing issue of outdated library management practices in schools and offers a cutting-edge solution.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 tackle 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 & 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

The problem at the core of this project revolves around the inefficiencies and lack of transparency inherent in traditional library management systems. These outdated methods rely on manual processes for tasks such as cataloging, tracking, and lending library materials, which have become increasingly inadequate in today's fast-paced digital landscape. This problem carries significant implications:

1.Inefficient Resource Handling: Manual cataloging and tracking of library assets lead to time-consuming and error-prone procedures, diverting valuable staff resources from more patron-focused activities.
2. Limited Resource Accessibility: Library users may encounter difficulties in locating and accessing materials due to the absence of real-time availability information. This limitation can result in user frustration and reduced overall satisfaction.
3. Missed Resource Opportunities: The inadequate management of library collections can result in missed opportunities to expand and diversify holdings, potentially impacting the quality and relevance of the library's offerings.
4. User Dissatisfaction: In a world accustomed to digital convenience and instant access, patrons may become dissatisfied with the library's services, potentially leading to reduced patronage and the library's diminishing relevance in the digital era.

Addressing these issues is paramount for modern libraries to streamline operations, enhance user experiences, and remain vital hubs of knowledge and information dissemination in the digital age.

4. Aim and Objectives

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.

Objectives:

- To design and develop a user-friendly web based LMS capable of cataloging and managing library resources efficiently.
- To create a database system that allows for seamless book tracking, including acquisitions, heck-outs, and returns.
- To implement a student entrance sign-in system that utilizes school index numbers for real-time tracking of library visits.
- To integrate data analytics capabilities into the LMS, enabling administrators to generate reports and gain insights into student library usage patterns.
- To provide a responsive and intuitive user interface for both librarians and students, enhancing the overall user experience.

4. Proposed Solution

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:

Major Requirements of the System:

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.

Technologies to be Adapted:

1. Database Management: We will use a relational MySQL database management system to store and manage library resources and user data.

2. Web Development: The system will be built using react js and a backend framework like Spring boot.

3. Authentication and Security: To ensure data security, we will implement user authentication using technologies like OAuth or JWT (JSON Web Tokens).

Nature of Solution:

- Input: Users will input data such as book details, student sign-ins, and system queries through the web interface.
- Output: The system will produce reports, alerts, and notifications based on user interactions and data analysis.
- Process: The system will automate library resource management, track student visits, and generate reports. It will also provide an interface for user interactions.
- Users: The primary users will be librarians and students, with librarians having access to administrative features, and students accessing their library records.

Feasibility of Implementation:

- The proposed solution is feasible with the availability of modern web development tools and database systems.
- It aligns with the objectives of optimizing library operations and enhancing student engagement tracking.
- Our team possesses the necessary skills in web development, database management, and data analytics to successfully implement the solution.

Availability of Resources:

- We have access to local resources, including development environments, local servers, and company technical support.
- Open-source technologies and libraries will be leveraged, minimizing software costs.

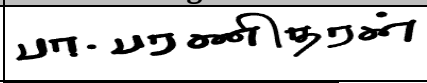
5. Timeline

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							✅

6. References

1. https://dev.mysql.com/doc/
2. https://legacy.reactjs.org/docs/getting-started.html
3. https://spring.io/projects/spring-boot
4. https://reactnative.dev/docs/getting-started

7. Signatures of the Group

Index No	Name	Signature
214145R	Paranietharan P	
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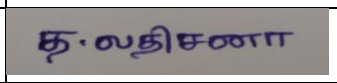
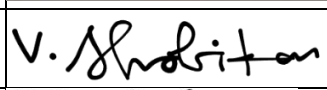
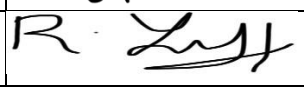
214116F	Lathisana T.	
214197C	Shobikan V.	
214240E	Yasothan R	

8. Supervisors' declaration

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

1. Name of Supervisor:
   Designation:
   Date:
   Signature:
   Any further comments:

2. Name of Supervisor:
   Designation:
   Date:
   Signature:
   Any further comments: