Project Documentation:

Library Management System

1. Project Brief

Our project is a **Library Management System** built using the **MERN stack** (MongoDB, Express, React, Node.js) to create a comprehensive, modern, and efficient library solution. The platform is designed to streamline library operations, making it easy for both library administrators and users to interact with the system. It is in a working state which is ready to install and implement .

NEED FOR THIS PROJECT:

In present there is no unified library management system in the country . Many libraries are still using the old school methods of management through pen and paper use leading to extra stationary cost and hard to manage system . The software that are currently in use are either very costly or are foreign based also some are hard to manage which is not suitable for small scale libraries. The software that are currently being used requires lot of machinery (computers) and manpower with prior knowledge of computers also it does not provide any usage for the student . To tackle this problem we proposed library management website which aims at building a cost effective and easy to use website . The website aims to make a unified library management website for the libraries which currently are not able to manage its books and users data. This website is device portable which can be used in any device the admin can access it from anywhere and can do the work on his phone as well. This website promotes **ATMA NIRBHAR BHARAT** scheme building its own version of library management system.

Core Features

-Three Level Management:

**Government management: Government body will be adding new libraries and admins there . All the libraries that will bw available in website will be directly controlled by government . The access would be with higher government body only to manage libraries.

**Staff Management: The staff at a particular library will be responsible for adding book, student and manage other library related issues. The password and id would be with the staff members only.

**Student Management: The student can see their particular history of books and other library related chores of which he is the member.

- Admin Dashboard: Admins have full control over book management, student management, fee status updates, and can send notifications or messages to students.

- User Interface: Students can view available books, check their borrowing history, search for books by title, author, or genre, and receive reminders for overdue books.

-Automated Reminders: The system sends automated emails to students about overdue books and fine details, as well as notifications upon book issuance.

- Fine Calculation: Integrated fine calculation mechanism for overdue books based on the number of days past the allowed return period.

- Data Handling: We use **MongoDB Atlas (free version)** to manage data, providing reliable storage and easy scalability.

-Easy To Use: No prior need of knowledge of coding or computer skills . Its easy to understand and implement in library.

-Device Portable: No need of suphosticated computer systems and can be easily operated through mobile phones

-Communication: A message section for both staff and government of state where government can share important information which can be availed by everyone visiting the website. The message by staff can be availed by the students enrolled in that particular library.

2.EXISTING PROBLEM(Register Based) AND OUR SOLTION

The problems that are currently faced by libraries that are using register to maintain data.

TOPIC	THE PROBLEM (Register Based)	SOLUTION
Tracking	Manual Tracking: Going through each page to identify student,book,issue details	Automatic tracking of books to students that have been alloted
Notification	Need to search manually whose issued book has not been returned within time limit	Automatic notification to staff and student regarding late in submission of book
Administrative Task	With thousand of students data its very tedious to manage each	Administration becomes easy with use of our website

Costing	Costing of maintaining thousands of libraries across the state is very costly	Signifcant reduction in cost for maintaining each library all will be connected to one server
Accessibility	Accessible only by staff members and physical presence at the library	Website allows access from anywhere and at any device

3.Existing Problem (Software Based) and Solution

The problems that are being faced by libraries that use other softwares such as KOHA, ELLIPSE,SOUL etc.

Topic	Problem (Software Based)	Solution
Notification	Manually informing to student to return the book	Automatic notification to students and staff
Costing	High setup costing as well as early maintainance costing. Buying many computers to run	One time costing by government and can be used by them for free
User Interface	No student interface to enable student interaction in library	Interface for student , staff and government of state to know the need and changes for system
Centralised System	Data is stored locally no centralised place to access the data to government	Storing of data in centalised system for easy access for reference
Maintainance	Maintainance is not easy in case of failure technician required	Maintainance is easy and many experts available to deal with any situation
Accessibility	Accessible only to computers present in library	Accessible through anywhere and any device
Understanding	Learning the software is difficult a training programme is required	Basic website only basic English is required no need of advance computer knowledge

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The Costly softwares that are currently being are used are mostly foreign based our website promotes AATMA NIRBHAR BHARAT. Also the Websites has been developed by student leading to positive culture among student to inculcate coding habits and excel INDIA in IT Sector.

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3. How Our Project Solves the Problem

Our Library Management System addresses these issues by:

- Efficiency: Automated notifications and book tracking reduce manual work and human errors.

- Accessibility: Students can search for books and view their status anytime, anywhere, increasing accessibility.

- Automation: Automating overdue reminders, fine calculations, and book return processes significantly reduces administrative workload.

-Real-time Updates: Admins and students get real-time updates on book availability, borrowing history, and fee statuses.

- Efficient Data Management: Using MongoDB, we ensure that data is stored efficiently, with quick retrieval and a structured format that scales easily.

- User-Friendly Interface: The system's intuitive interface simplifies tasks for both admins and students, making library management seamless.

-Less costing: The website has minimal costing and costing depends on the the features that we are integrating.

- Scalability: The system is designed to scale as the library's needs grow, allowing easy integration of new features and handling a larger user base

4. Future Scope

As the system scales and the user base grows, we anticipate the following considerations:

- Database Upgrades: To handle more students and a higher volume of books, we would need to upgrade to a paid MongoDB plan, offering more storage and faster data access.

- Advanced Messaging Solutions: For higher user engagement and reduced costs, we may consider implementing bulk messaging or SMS features, potentially transitioning to services like Twilio or similar platforms.

- Integration with Third-Party Services: We plan to integrate analytics tools for better insights into library operations, user behaviour, and resource utilization.

-App development: Developing app to easily access the features

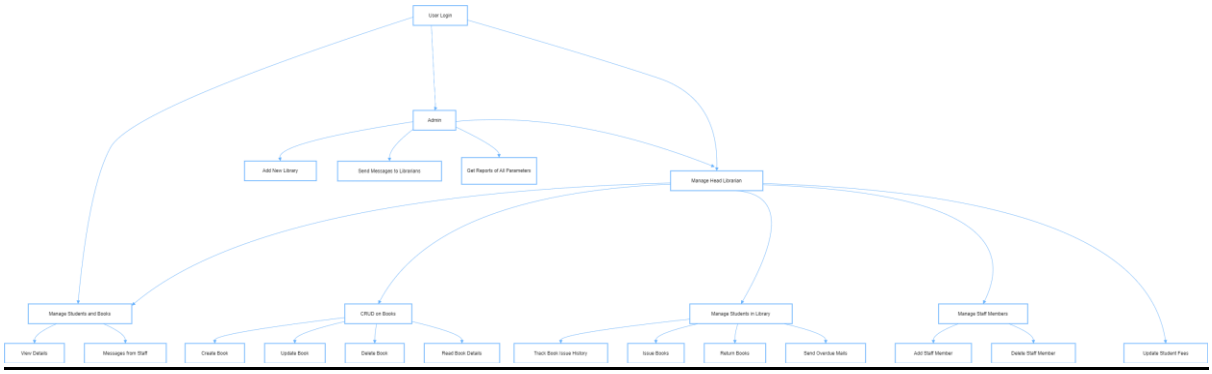
5. Scalability and User Base

Currently, with the free-tier of MongoDB, the system is best suited for handling a small to medium-sized library with up to **4000 students**, **20000 book and upto 1000 book history of each**. With future upgrades and the use of advanced tools, the system can be scaled to support thousands of users seamlessly.

6. Cost Analysis

- Database Costs: Upgrading to a paid MongoDB plan for larger data needs may range from $9/month to $25/month or more, depending on the data requirements.

7.FLOW CHART



About Us:

Our vision is to make this website accessible to all libraries of India the present libraries including the public ones are not having unified management system leading to disperencies in their working . There is no one unified system for all the libraries.

Our project aims for achieving the aim of accessibility and public convenience . The Members who are currently working on the project:

1. **INDRESH VERMA**

He is a Computer Science undergrad currently studying in the NATIONAL INSTITUTE OF TECHNOLOGY , RAIPUR . He has knowledge of different coding languages and is in the top coders at NIT RAIPUR.

He has different work experiences for different clubs and in department as well. He is an aspiring computer software engineer.

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2. **ARUN RATHAUR**

   He is a Computer Science undergrad currently studying in the NATIONAL INSTITUTE OF TECHNOLOGY , RAIPUR . He has knowledge of different coding languages and is in the top coders at NIT RAIPUR. He has won three Hackathons at different colleges .

   He has different work experiences for different clubs and in department as well.He has also done internship at finkulp where he designed website for trading company. He is an aspiring computer software engineer.

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