**1. Project Title**

**College Library Management System**

**2. Project Scope**

**Overview**

The College Library Management System (CLMS) aims to automate the operations of a college library. This system will facilitate the management of book inventories, member information, and transactions such as book issue and return. The project will utilize C# .NET for backend processing, SQL Server for database management, and Windows Forms for front-end visualization. Integration of REST APIs and Git for version control will also be incorporated.

**Features**

1. Member Management:
   * This feature allows librarians and administrators to add, update, delete, and search for member information. It streamlines the process of managing library patrons, including their personal details and borrowing history.
2. Book Management:
   * Librarians and administrators can add, update, delete, and search for book records. This feature ensures efficient cataloging of library resources and easy access to book information.
3. Transaction Management:
   * Enables the issuing and returning of books, along with calculating fines for overdue books. It helps in maintaining accurate records of book transactions and ensures accountability in the borrowing process.
4. Search Functionality:
   * Allows users to search for books based on various criteria such as title, author, genre, or ISBN. This feature enhances user experience by providing quick and accurate search results.
5. Report Generation:
   * Provides the capability to generate reports on issued books, overdue books, and member activities. This feature assists administrators in analyzing library usage trends and making informed decisions.
6. User Authentication:
   * Offers secure login functionality for librarians and administrators with role-based access control. It ensures data confidentiality and restricts access to sensitive features based on user roles.

**End Users**

1. Librarians:
   * Librarians are primary users responsible for managing daily library operations, including book and member management. They rely on the system to efficiently handle tasks related to library resources and patron services.
2. Administrators:
   * Administrators oversee overall library operations, generate reports, and manage librarian accounts. They leverage the system for strategic decision-making, resource allocation, and administrative tasks.
3. Students:
   * Students utilize the system to search for books, check availability, and view their issued books and fines. They benefit from the system's user-friendly interface and self-service options, enhancing their library experience.

**Integration with End Users**

1. Librarians:
   * Librarians integrate with the system to manage book inventories and member transactions. They rely on the system to streamline workflows and ensure efficient library operations.
2. Administrators:
   * Administrators integrate with the system for higher-level management, report generation, and administrative tasks. They utilize the system's data analytics capabilities to gain insights into library performance and make informed decisions.
3. Students:
   * Students integrate with the system to search for books and check their borrowing status. They rely on the system for easy access to library resources and personalized services tailored to their needs.

**Areas Covered**

1. Library Operations:
   * The system covers various aspects of library operations, including book and member management, transaction processing, and inventory control. It aims to streamline workflows and enhance operational efficiency.
2. Administrative Tasks:
   * The system simplifies administrative tasks such as report generation, oversight, and user management. It provides administrators with the tools they need to effectively manage library resources and services.
3. User Experience:
   * The system focuses on enhancing the library experience for students through easy search and self-service options. It prioritizes user-centric design and functionality to ensure a seamless and intuitive user experience.

**3. Project Users, Actors, Vendors, Actuators**

**Beneficiaries**

1. Students:
   * Students are primary beneficiaries of the College Library Management System (CLMS). They benefit from the system's easy access to library resources and self-service functionalities. With CLMS, students can search for books, check availability, and view their borrowing history without the need for manual assistance. This enhances their overall learning experience by providing convenient access to academic materials.
2. Librarians:
   * Librarians experience significant benefits from CLMS as well. The system reduces their workload by automating routine tasks such as book and member management. With streamlined processes, librarians can focus on more critical aspects of their roles, such as providing assistance to patrons and curating library collections. CLMS enhances efficiency in library operations, leading to improved productivity and job satisfaction among librarians.
3. Administrators:
   * Administrators gain enhanced oversight and management capabilities with CLMS. The system provides administrators with comprehensive reports and analytics on library usage, inventory status, and user activities. This allows administrators to make informed decisions regarding resource allocation, budget planning, and policy development. With CLMS, administrators can optimize library operations and ensure the effective delivery of library services to the college community.

**Third-Party Actors**

1. Book Suppliers:
   * Book suppliers play a crucial role in the ecosystem of CLMS. Integrating with book suppliers allows for the seamless updating of book inventories within the system. When new books are acquired or existing titles are updated, CLMS can automatically reflect these changes, ensuring accurate and up-to-date library catalogs. This integration enhances the efficiency of library acquisitions and ensures that students have access to the latest academic materials.
2. Educational Institutions:
   * Educational institutions, such as colleges or universities, are also important stakeholders in the CLMS project. These institutions utilize the system to manage multiple libraries within a college campus or academic network. CLMS provides centralized control and oversight of library resources and services across different campus locations. By implementing CLMS, educational institutions can standardize library management practices, improve resource sharing, and enhance the overall academic experience for students and faculty members.

**4. Project Properties**

1. Functionality:
   * The system will cover all the essential features like managing members and books, handling transactions, searching, generating reports, and ensuring secure user logins.
2. Technology Stack:
   * We'll be using familiar tools like .NET Framework 4.8 and C# for the backend, SQL Server 2019 for the database, Windows Forms for the user interface, ASP.NET Core for APIs, and Git for version control hosted on GitHub.
3. Scalability:
   * The system will grow with us, handling more users and data as needed without any hiccups along the way.
4. Security:
   * Keeping your data safe is a top priority. We'll be using encryption, access controls, and regular security checks to make sure everything stays locked down tight.
5. User Experience:
   * We want the system to be easy and enjoyable to use for everyone involved. That means intuitive interfaces, smooth workflows, and personalized touches to make everyone feel right at home.
6. Integration:
   * We'll be working to seamlessly integrate with other systems and services to expand functionality and make everything work together smoothly.
7. Maintainability:
   * We're setting things up to be easy to maintain and update down the line. That means clean code, good documentation, automated testing, and tools to help us keep everything running smoothly**.**

**5. Plan Details**

**Development Plan**

| **Phase** | **Task** | **Deadline** |
| --- | --- | --- |
| Phase 1 | Requirement Analysis and Design | Week 1 |
| Phase 2 | Setup GitHub Repository and Initial Commit | Week 1 |
| Phase 3 | Database Design and Implementation | Week 2 |
| Phase 4 | Develop Member Management Module | Week 3 |
| Phase 5 | Develop Book Management Module | Week 4 |
| Phase 6 | Develop Transaction Management Module | Week 5 |
| Phase 7 | Implement Search Functionality | Week 6 |
| Phase 8 | User Authentication and Role Management | Week 7 |
| Phase 9 | Report Generation | Week 8 |
| Phase 10 | Testing and Bug Fixing | Week 9 |
| Phase 11 | Final Review and Documentation | Week 10 |

**Team Member Contributions**

* Member 1:
  + Worked on: Database design, Member Management Module, Report Generation
  + Contribution: 50%
* Member 2:
  + Worked on: Book Management Module, Transaction Management Module, User Authentication
  + Contribution: 50%