

Software Engineering Internship Assignment Report

Project Title: Library Management System

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Introduction

This report describes the design, development, and deployment of a full-stack Library Management System (LMS) built independently as part of a software engineering internship assignment. The system enables users to manage books through Create, Read, Update, and Delete (CRUD) operations. It follows modern development practices using C# with ASP.NET Core for backend services and React with TypeScript for the frontend.

Objectives

- Build a RESTful API for managing book records.
- Develop a responsive and intuitive frontend interface.
- Integrate backend and frontend using API calls.
- Utilize Entity Framework for data persistence using SQLite.
- Follow industry best practices in validation, routing, and error handling.
- Demonstrate complete ownership of the development process.

System Architecture

The project follows a layered architecture with a clear separation of concerns

- Frontend Layer: React app that interacts with users and makes HTTP requests.
- API Layer: ASP.NET Web API exposing endpoints for CRUD operations.
- Data Layer: Entity Framework with SQLite to persist data.

Integration & Communication

- The frontend calls backend endpoints hosted on localhost:5000.
- Backend returns JSON responses consumed by React.
- Axios was used to handle HTTP requests and manage asynchronous operations.
- Proper CORS policy configured in .NET for local testing.

Key Learnings

- Developed full-stack CRUD application from scratch independently.
- Understood HTTP methods and RESTful conventions.
- Improved modularity using reusable components and services.
- Learned database schema migrations and ORM (EF Core) usage.
- Strengthened TypeScript typing and React hooks understanding.

Conclusion

This internship assignment was a hands-on opportunity to independently design, build, and test a complete full-stack application. I demonstrated my ability to structure both frontend and backend components, write maintainable and modular code, and effectively utilize tools such as React, .NET, and SQLite.

The project is fully functional and adheres to software engineering principles, including separation of concerns, reusable code, and clean architecture. It is a testament to my capabilities as a full-stack developer.