Library Management System - Project Plan and Proposal

EECS447: Database Systems

Professor: Hossein Saiedian
Semester: Spring 2025

Revisions

Version: 1.2

Version	Date	Author	Description
1.1	02/13/25	Suhaan, Alexis, Siddh, Bhavik, Vy, Fatima	Made the initial draft, assigned roles, structured the document and wrote the crucial sections
1.2	2/16/25	Suhaan, Alexis, Siddh, Bhavik, Vy, Fatima	Made final edits, reviewed the document, confirmed that this meets project requirements

1. Vision Statement

Many libraries still rely on outdated, manual systems to keep track of books, manage loans, and enforce membership policies. This often leads to misplaced books, difficulty in tracking overdue items, and inefficiencies in handling reservations. These challenges not only create frustration for library staff but also make it harder for members to access the resources they need.

Our team, **Tech Titans**, is developing a **Library Management System (LMS)** to modernize these processes. Our system will simplify book borrowing, returning, and reservations while ensuring libraries can enforce membership policies with ease. Library staff will have access to tools that streamline record-keeping, track overdue books, and generate reports on borrowing trends.

By building a **structured relational database**, we aim to improve book circulation, reduce the need for manual tracking, and create an intuitive experience for both library staff and members. Beyond developing a functional system, this project will also help our team gain hands-on experience in **database management, SQL, and software development** while addressing real-world challenges in library operations.

2. Scope Statement

Project Scope

The **Library Management System (LMS)** will be designed to digitize and automate key library functions, making book management more efficient and user-friendly. The system will include the following core features:

- **Book Management**: Keep an updated inventory of books, digital media, and magazines, with details such as title, author, publication year, and availability status.
- **Member Management**: Store information on library members, including unique IDs, membership types (student, faculty, public, etc.), borrowing privileges, and account status.
- **Borrowing and Returns**: Implement a structured process for checking out books, logging returns, and tracking overdue items.
- **Reservations and Waitlists**: Allow members to reserve books that are currently on loan and send notifications when they become available.
- **Fine Calculation and Payments**: Automatically calculate late fees based on overdue days and borrowing limits.
- **Reporting and Analytics**: Generate reports on book circulation, popular genres, overdue items, and library revenue from fines.

Technical Scope

- **Database Management**: Use **MySQL** to build and manage a structured relational database.
- **User Interface**: Develop a **web-based** interface for both library staff and members.
- **Automation Features**: Implement triggers and constraints to manage fine calculations, borrowing limits, and availability status updates.
- **Scalability**: Ensure the system can support multiple library branches and scale for larger collections in the future.

3. Team Organization and Profiles

Team Name: Tech Titans

 Suhaan Syed *Project Manager (Team administrator)* ssuhaan@ku.edu 9137497489	**Responsibilities:** • Organize and lead team meetings, ensuring agendas align with project guidelines. • Track deadlines and ensure timely submission of deliverables. • Serve as the main point of contact between the **TA, professor, and team members**. **(Team Admin)** • Oversee project planning and documentation, keeping progress on track. • Assist in **database development and backend implementation**. **Availability:** • MW: 1-2PM, W: 3-4PM,T: 2:30-4PM, TH: 9:30-11PM **Experience:** • Python, SQL, JS, C/C++, C# • MongoDB, PostgreSQL, DBMS

Vy Luu
Business Analyst
vy.luupham@ku.edu
7857275026

Responsibilities:

- Translate **project requirements and client needs** into **technical solutions**.
- Work closely with the **Solutions Architect** to define functional and non-functional system requirements.
- Collaborate with the **Scrum Master** to ensure business objectives align with project milestones.
- Conduct research on **best practices for library management systems** to improve system design.
- Provide documentation outlining system use cases and user stories.

Availability:

- Monday, Wednesday, Friday from 1:30 - 7:00 PM

Experience:

- Tools/Technologies: Python, C/C++, MySQL, JavaScript, Haskell
- Soft Skills: Adaptability, Teamwork, Organization, Management

Responsibilities:

- Develop **the conceptual and technical architecture** of the system.
- Define data management strategies in collaboration with the **Database Designer**.
- Ensure system logic aligns with business requirements provided by the **Business Analyst**.
- Oversee backend development and maintain software design integrity.

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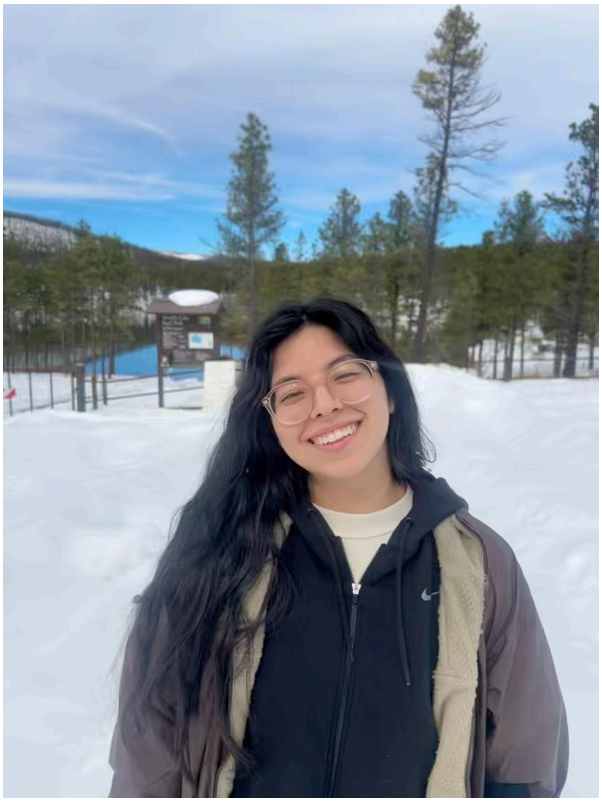
<td> 
Fatima Avila
Solutions Architect</td>
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- Work with the **QA Engineer (Scrum Master)** to validate the **usability, performance, and security** of the database.

Availability:

- MW: 11AM-12PM, TuTh: 11AM-1PM, 5-8PM

Experience:

- C++, Python, SQL, HTML, JavaScript
- MongoDM, DBMS

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Responsibilities:

- Serve as the **technical point of contact** for database implementation.
- Develop and optimize **SQL queries, stored procedures, and triggers** for the system.
- Work with the **Solutions Architect** to ensure efficient database structure and indexing.
- Manage **database performance, scalability, and security** considerations.
- Maintain **database integrity, backup strategies, and disaster recovery planning**.

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Bhavik Goplani
🙃
Database Engineer

Availability:

- MWF 3:30-5:30pm

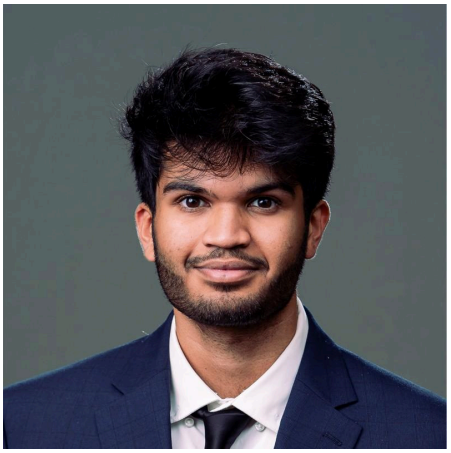
Experience:

- Assembly, OCaml, Dafny, Racket
- Learning JavaScript 🚀

Alexis Vielma (🐐)

Responsibilities:

- Design and structure the **relational database schema**.
- Define **tables, relationships, constraints, and indexing strategies**.
- Assist in software development, particularly in **backend database integration**.
- Collaborate with **Solutions Architect** and **Database Engineer** to implement optimized data storage solutions.
- Ensure database design supports **system scalability and reporting needs**.

Database Designer & Software Developer	**Availability:** ● MWF 3:30-5:30pm **Experience:** ● HTML, x86, CUDA, DBML ● Learning CSS 🚀
 Siddh Bharucha *Scrum Master & QA Lead*	**Responsibilities:** ● Ensure project **requirements are met** and deliverables adhere to quality standards. ● Monitor and track team progress, ensuring **tasks are completed on time**. ● Work closely with the **Business Analyst and Solutions Architect** to validate features. ● Conduct **QA testing on database functionalities and software components**. ● Generate **reports on project progress, risk management, and team productivity**. ● Facilitate **agile sprint planning, retrospectives, and issue resolution**. **Availability:** ● Mondays: 1:00 - 5:00 ● Tuesdays: 9:00 - 12:00, 3:00 - 5:00 ● Wednesdays: 1:00 - 5:00 ● Thursdays: 9:00 - 12:00, 3:00 - 5:00 ● Fridays: 1:00 - 3:00 **Experience**: ● Python, Java, Angular, Angular JS, React, C, C++ , C#, CSS/HTML, Kotlin, SQL

	● MongoDB, PostgreSQL

4. Project Meeting Log

Meeting Log Format

Date	Time	Location	Objective	Members Present	Tasks Allocated	Task Completion Status
02/12/2025	6:00-7:00 PM	Discord	Develop the project plan	Suhaan, Siddh, Bhavik, Vy, Alexis, Fatima	See below	Completed

Meeting Log

Date: February 13, 2025
Time: 6:00 PM
Location: Discord Call
Objective: Develop the project plan

Meeting Summary

- Reviewed **project requirements** to ensure understanding.
- Discussed **approach and strategy** for completing the project.
- Drafted the **project plan**, defining key elements and milestones.
- Established the **vision statement** and outlined the **scope** of the project.
- Assigned **roles and responsibilities** to team members.

Tasks Allocated:

- Suhaan: Refine project plan, complete meeting log
- Bhavik: Complete vision statement.
- Siddh: Revise project document and assist in writing the team section
- Alexis: Set up and configure GitHub repository.
- Vy: Research Part 1 requirements and collaborate with Fatima to understand deliverables.
- Fatima: Work with Vy to define deliverables and draft the scope statement

Follow-Up Actions:

- Next meeting is scheduled to **review updates and finalize the project plan**.
- Ensure **GitHub repository is operational** for team collaboration.
- Complete **vision and scope statements** before the next session.

5. GitHub Repository Management

To maintain version control and track development progress, our **GitHub repository** will be structured as follows:

```
📁 library-management-system
 ├── 📁 database/     # Contains SQL scripts and schema files
 ├── 📁 reports/      # Stores generated reports and analytics
 ├── 📁 docs/         # Holds project documentation
 ├── README.md        # Overview of the project
 ├── .gitignore       # Excluded files (e.g., environment variables)
 ├── LICENSE          # Open-source license file (if applicable)
```

All team members are required to:

- Commit changes with clear and descriptive messages.
- Create **feature branches** before merging into the main branch.
- Review code via pull requests to ensure quality and accuracy.