PES UNIVERSITY, BANGALORE

Department of Computer Science and Engineering

B. Tech (CSE) – 5th Semester – Aug-Dec 2024

UE22CS341A - Software Engineering

Synopsis / Project Proposal

EXAM CENTRE MANAGEMENT SYSTEM

AAKANKSH SEELIN	PES2UG22CS003
ADITI ROOPESH MIRJI	PES2UG22CS032

Project Description

The Exam Centre Management System is a comprehensive system that aims to streamline a university library operation, manage resources effectively and provide an interactive interface for users. This system aims to replace traditional methods with an efficient, user-friendly digital solution to simplify the day-to-day functioning of an exam centre. The Exam
Management System project is a practical integration of Database Management Systems (DBMS) and Software Engineering concepts, designed to address the real-world challenges of managing a library.

The primary focus of this project is to create a software application that manages library operations, with an emphasis on database management through CRUD (Create, Read, Update, Delete) operations. The system will be developed as a web-based application that interacts with a relational database.

The **objectives** of the project are:

- Implement and manage a relational database for storing and retrieving information related to books, members, and transactions.
- Enable seamless creation, reading, updating, and deletion of database entries directly from the application interface.
- Provide functionalities for recording, issuing, and returning books.

- Create a user-friendly interface that simplifies interactions with the database for both library staff and members.
- Ensure the integrity and security of data through verified access controls.

The **features** of the project are:

- **Verified Login** – Authorized access to the application. Admin, or existing members can seamlessly login to the application. Existing option to add a new member and create a new profile. Primary Login for Admins Only.

- **Book Management**- Operations to add, search, update, and delete book records in the database.

- **Member registration and profile management**- Features to manage member records, including registration, updating details, and deletion.

- **Book loan, return, and reservation functionality**- Track the status of each book. Note down date of borrowing and expected date of return.

- **Overdue alerts and fine calculation**- If any borrowed book is not returned within the expected date , then display an overdue alert and calculate the expected fine based on the number of exceeded days.

- **Admin dashboard for managing books and members-** Admin login provides access to status of books and members of the library system.

Plan of Work and Product Ownership

1. In the coming weeks, our focus will be on laying a strong foundation for the Exam Centre Management System (EMS) by thoroughly understanding the project's expected functionalities and ensuring that all necessary requirements are in place. This will be part of our feasibility study. We will begin by conducting a detailed analysis of the project requirements. This will involve reviewing the Software Requirements Specification (SRS) document. This will be complete by the end of August(Requirements Engineering).

2. September – Design implementation . This will involve designing the databases required and creating a blueprint/wireframe of the UI to be implemented.

3. October- Coding . To develop the Exam Centre Management System according to the design specifications.

4. November – Testing and deployment. To ensure the EMS is fully functional, free of major bugs, and ready for end-user use.

5. AAKANKSH SEELIN (PES2UG22CS003) – focus on Books table(add,view,update,delete, search) and members table(add member, view member). UI design and implementation

6. ADITI ROOPESH MIRJI(PES2UG22CS032) – focus on Members table(update member, delete member, search member) and transactions table(record borrowing, record return, view transactions). UI implementation and testing.

PES UNIVERSITY

BENGALURU

Department of Computer Science and Engineering

SRS DOCUMENT
FOR
EXAM CENTRE MANAGEMENT SYSTEM

PREPARED BY:
AAKANKSH SEELIN (PES2UG22CS003)
ADITI ROOPESH MIRJI(PES2UG22CS032)

ORGANIZATION:
PES UNIVERSITY

DATE CREATED:
31/08/2024

1.Introduction

1.1 Purpose

The purpose of this document is to define the requirements for a Exam Centre Management system (EMS) that will simplify the operations of a library, providing users with the ability to manage books, members, and transactions efficiently.

1.2 Scope

The Exam Centre Management System will provide a user-friendly interface for managing a library's book inventory, member registrations , and borrowing/returning activities. The system will allow library administrators to perform CRUD operations on the database tables that store information about books, members, and transactions. The system is a multi-user system which will be primarily used by library administrators , but can be accessed by members as well.

1.3 Definitions, Acronyms, and Abbreviations

SQL: Structured Query Language
CRUD: Create, Read, Update, Delete
EMS: Exam Centre Management System
UI: User Interface
Admin: Administrator of the EMS
Member: A registered user of the library who can borrow books
BN: Book Number

1.4 References

Database Management System principles and design .
Software Engineering concepts and practices.
SQL commands and syntax.
Github

1.5 Overview

This document is divided into the following sections:

1. System Overview
2. Functional and Non-Functional Requirements
3. System Model and Design
4. External Interface Requirements
5. System Features

2. System Overview

2.1 Product Perspective

The EMS will consist of a user interface and a backend database created using SQL. Users (library administrators) will interact with the system through the GUI to perform CRUD operations on the database.

2.2 System Functions

Authentication: Ensure that only authorized users can access the system.
Manage Books: Add, view, update, and delete book records.
Manage Members: Add, view, update, and delete member records. Manage Transactions: Record book borrowings and returns.

2.3 User Characteristics

The primary users of the system will be library administrators who have basic knowledge of library operations and are familiar with computer usage. Secondary users are members of the library who only have limited functionalities.

2.4 Operating Environment

Hardware: Desktop or laptop computers with standard input/output devices.
Software: The system will run on Windows, macOS, or Linux operating systems.
Network: LAN or stable internet connection.

2.5 Design and Implementation Constraints

Database: The system will use a relational database (MySQL) to store all library data. Programming Language: The system will be developed using Python and its libraries for database connectivity and UI using streamlit.

User Interface: The system will use a simple, web-based UI for accessibility and ease of use.

2.6 Assumptions and Dependencies

The system is dependent on the availability of a relational database system. Users have basic computer literacy to interact with the EMS, and a stable internet connection.

3. External Interface Requirements

3.1 User Interface

1. Login Screen: Allows Admin and members to authenticate themselves.
2. Dashboard: Provides an overview of the library, and helps navigate to each functionality.
3. Book Management Screen: Interface for adding, viewing, updating, and deleting books.
4. Member Management Screen: Interface for registering new members and managing member information.
5. Transaction Management Screen: Interface for recording book borrowings and returns.

3.2 Software Interfaces

Database: The EMS will interface with a relational database system using SQL. Web Browser: The UI will be accessible via standard web browser.

4. System Features

4.1 Authentication

The EMS will include a secure login system to ensure that only authorized personnel can access the administrative features of the system.

4.2 Functional Requirements

4.2.1 Book Management

1. 4.2.1.1 Add Book: The system shall allow the admin to add a new book record to the database. The admin must provide the book's title, author, publication year, genre, and availability status.
2. 4.2.1.2 View Books: The system shall allow the admin/member to view a list of all books in the library. The user can search for books by title, author, or genre.
3. 4.2.1.3 Update Book: The system shall allow the admin to update the details of an existing book record.
4. 4.2.1.4 Delete Book: The system shall allow the admin to delete a book record from the database.

4.2.2 Member Management

1. 4.2.2.1 Add Member: The system shall allow the admin to add a new member to the library's database. The admin must provide the member's name, contact information, and membership ID.
2. 4.2.2.2 View Members: The system shall allow the admin to view a list of all library members. The admin can search for members by name or membership ID.
3. 4.2.2.3 Update Member: The system shall allow the admin to update the details of an existing member record.
4. 4.2.2.4 Delete Member: The system shall allow the admin to delete a member record from the database.

4.2.3 Transaction Management

1. 4.2.3.1 Record Borrowing: The system shall allow the admin to record the borrowing of a book by a member. The member must specify the book ID, member ID, and the borrowing date.

2. 4.2.3.2 Record Return: The system shall allow the admin to record the return of a borrowed book. The member must specify the book ID, member ID, and the return date.
3. 4.2.3.3 View Transactions: The system shall allow the admin to view a list of all borrowing and return transactions.

4. 3 Non-Functional Requirements

4.3.1 Usability

The system shall provide a simple GUI that can be easily navigated by users with basic computer skills.

4.3.2 Security

The system shall restrict access to administrative functionalities to authorized users only. User authentication will be required for access.

4.3.3 Maintainability

The system shall be designed in a modular manner, allowing easy updates and maintenance of individual components.

4.3.4 Reliability

The system shall ensure data integrity and reliability, particularly during database transactions, to prevent data loss or corruption.

5. System Model and Design

5.1 Database Design

1. The system shall use a relational database to store information about books, members, and transactions.
2. The database tables shall include:
    i. Books Table: book_id (Primary Key), title, author, publication_year, genre, availability_status.

ii. Members Table: member_id (Primary Key), name, contact_information, membership_id.
iii. Transactions Table: transaction_id (Primary Key), book_id (Foreign Key), member_id (Foreign Key), borrow_date, return_date.

5.2 User Interface Design

The GUI created using streamlit shall be designed to facilitate easy access to all CRUD functionalities.
The interface shall include options for adding and updating records, and tables for viewing lists of books, members, and transactions.

REQUIREMENTS TRACEABILITY MATRIX:

Requirement ID	*Requirement Description*	*Functional Requirement*	Design Specification	*Test Cases*
FR-1	Add Book	4.2.1.1	Books table	TC-01
FR-2	View Books	4.2.1.2	Books table	TC-02
FR-3	Update Book	4.2.1.3	Books table	TC-03
FR-4	Delete Book	4.2.1.4	Books table	TC-04
FR-5	Add Member	4.2.2.1	Members table	TC-05
FR-6	View members	4.2.2.2	Members table	TC-06
FR-7	Update members	4.2.2.3	Members table	TC-07
FR-8	Delete members	4.2.2.4	Members table	TC-08
FR-9	Record borrowing	4.2.3.1	Transactions table	TC-09
FR-10	Record Return	4.2.3.2	Transactions table	TC-10
FR-11	View Transactions	4.2.3.3	Transactions table	TC-11
NFR-1	Usability	4.3.1	User Interface	TC-12
NFR-2	Reliability	4.3.2	Data Integrity checks	TC-13
NFR-3	Security	4.3.3	User Interface	TC-14
NFR-4	Maintainability	4.3.4	Modular design	TC-15