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Q3) Library Management System

Problem Statement: Design and implement a library management system to manage library operations such as cataloging, user management and book circulation.

IRS Document

1. Introduction

1.1 Purpose of Document:

This document specifies the requirements for the Library Management System (LMS). It defines the functionality, scope, and constraints of the system to manage library operations, including cataloging, user management and circulation of books.

1.2 Scope of document:

The LMS will enable efficient management of books, journals, and digital resources. It will allow users to search, borrow and return items, while librarians can add, update, or remove records. The system will maintain logs, generate reports, and notify users about due dates.

1.3 Overview:

The LMS will:

- Provide user registration and login
- Allow search and browsing of books
- Manage borrowing, renewal and return
- Track fines for overdue items
- Generate reports on library usage

2. General Description:

The LMS serves as a centralized system for students, faculty, and librarians. It automates manual tasks like issuing and returning books, tracking availability, and maintaining records.

Users include:

- Students/Faculty: Search, borrow and reserve books.
- Librarians: manage inventory, issue/return books, update catalog.
- Admin: System performance and generate reports.

3. Functional Reports:

- FR1: User registration and login with credentials.
- FR2: Add, update, and delete book records.
- FR3: Search books by title, author, subject or ISBN.
- FR4: Borrow, Renew and Return items.
- FR5: Generate alerts for due/overdue books.
- FR6: Calculate and manage fines.
- FR7: Generate monthly/annual usage reports.

4. Interface Requirement:

- User interface: Web portal for students/faculty and dashboard for librarians.
- External interface: Barcode/RFID integration for book scanning.
- API interfaces: REST APIs for external integration with e-learning platforms.

5) Performance Requirements:

- Support up to 1000 concurrent users.
- Response time ≤ 2 seconds for book searches.
- Handle up to 100,000 book records efficiently.

6. Design Constraints:

- Must be both on-premise and cloud deployment
- Database design limited to relational models
- Should be compatible with major browsers and mobile devices

7. Non-Functional Attributes

- Security: User authentication, role based access
- Reliability: Daily backup of database
- Usability: Simple search and borrow interface
- Scalability: Expand to support larger institutions

8. Preliminary Schedule and Budget

Schedule:

Requirement Analysis - 1 week
 System Design - 2 weeks
 Development - 6 weeks
 Testing - 2 weeks
 Deployment and Training - 1 week
 Total = ~12 weeks

Budget:

Development Costs - £10,00,000
 Hardware/Infrastructure - £3,00,000
 Security/Compliance - £2,00,000
 Testing & Maintenance - £5,00,000
 Total = £20,00,000