



Library Management System

Modern Library Management Made Simple

Java-Based Solution for Academic Libraries

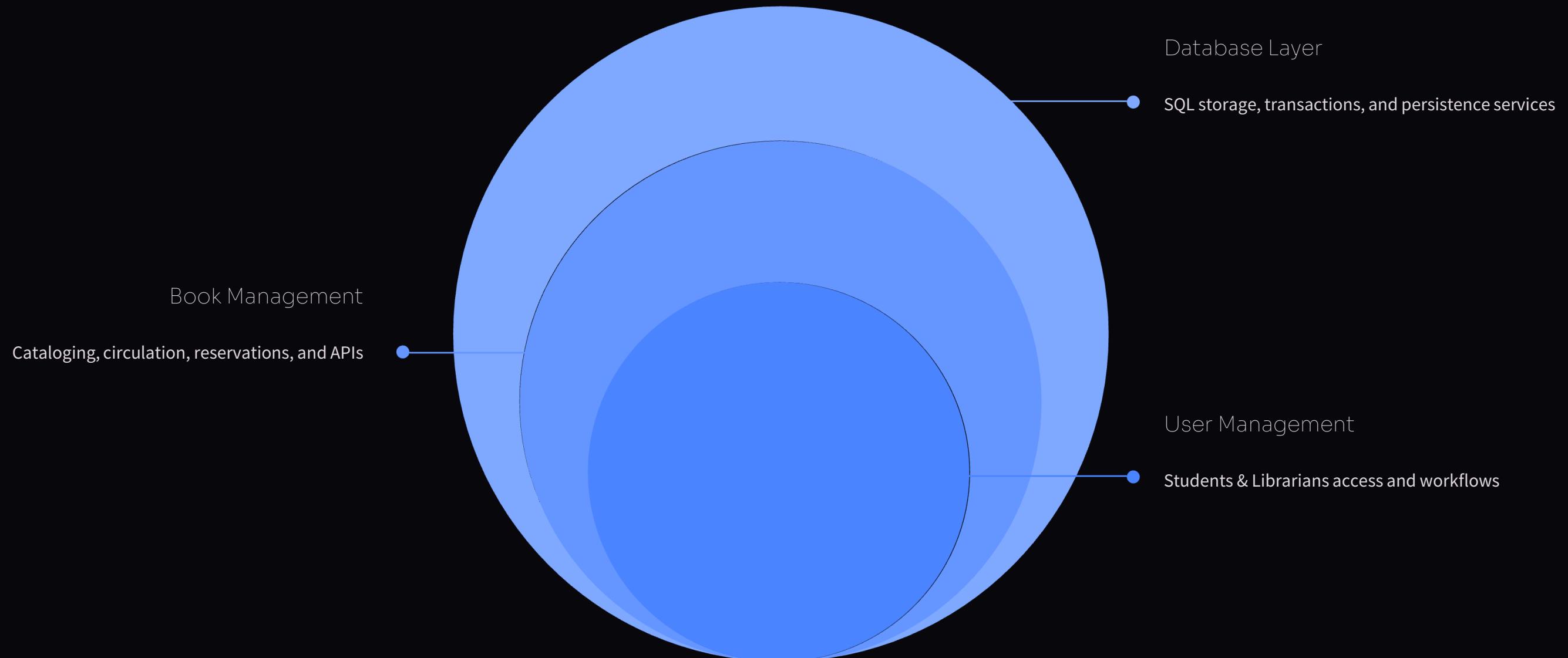
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GitHub : [Library System](#)

System Architecture

A three-tier architecture designed for scalability, security, and efficient library operations across student and librarian workflows.

Core Technologies: Java | Java FX | SQL Database | Object-Oriented Design



Key Features

Book Management

- Add and remove books from inventory
- Real-time stock updates
- Track issue and return status
- Automated fine calculation

User Management

- Separate student and librarian accounts
- Secure password authentication
- Role-based access control
- Complete user profile management



Technical Implementation

The system follows object-oriented principles with a modular structure for maintainability and extensibility.

1 Core Components

Book.java | Student.java | Librarian.java | Library.java

2

Data Persistence

DatabaseManager.java handles all SQL operations securely

3

Business Logic

Enforces 7-day issue period and ₹10/day fine system

```
1  package com.google.gson;
2  import java.util.List;
3  import java.util.ArrayList;
4
5  public class LibraryManagement {
6      public static void main(String[] args) {
7          Gson gson = new Gson();
8          Book book = gson.fromJson(args[0], Book.class);
9          Student student = gson.fromJson(args[1], Student.class);
10         Librarian librarian = gson.fromJson(args[2], Librarian.class);
11         Library library = gson.fromJson(args[3], Library.class);
12
13         book.setStudent(student);
14         book.setLibrarian(librarian);
15
16         student.setBook(book);
17         student.setLibrarian(librarian);
18
19         librarian.setBook(book);
20         librarian.setStudent(student);
21
22         library.addBook(book);
23
24         System.out.println("Book added successfully!");
25     }
26 }
```

System Workflow & Benefits

Streamlined processes ensure efficient library operations with complete transparency and real-time updates.

01

Book Issue

Students request books; system validates availability and logs the transaction

02

Return Management

System records return date and calculates applicable fines if overdue

03

Fine Settlement

Automated fine calculation at ₹10 per day over 7-day issue period

 Automated Operations

Eliminates manual tracking errors

 Real-Time Updates

Instant visibility into inventory

 Secure Access

Role-based permissions protect data

Thank You

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Simplifying library operations through technology

