Swami Keshvanand Institute of Technology,

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STUDENT KIT

Objective -

The objective of this project is to design and implement a robust E-Library System that streamlines the management and access of educational materials while introducing a book-reading and purchasing feature. The system provides functionalities for uploading and downloading instructional materials, subscribing to books for 24/7 access, and offering a payment module for smooth transactions. With a secure authentication mechanism, a user-friendly interface, and advanced data management through SQL and NoSQL databases, this system ensures a seamless and scalable experience. It is built using modern technologies like Spring Boot, ReactJS, and cloud integration to meet the diverse needs of users.

Requirement Specifications (RS) -

S.No.	Requirement	Essential/Desirable	Description
1	User Authentication	Essential	Secure login and signup for users with encrypted credentials stored in the database.
2	Material Upload/Download	Essential	Enables users to upload educational materials (PDFs, videos) and download them for personal use.
3	Book Subscription & Reading	Essential	Allows users to subscribe to books for 24/7 online access or purchase them outright.
4	Payment Module	Essential	A secure payment gateway for handling subscriptions or purchases.
5	Search Functionality	Essential	Filters materials and books by categories, keywords, or tags for quick access.
6	Q&A Forum	Desirable	Users can post and answer questions related to uploaded materials or

			books.
7	Notifications	Desirable	Sends alerts about payment confirmations, subscription renewals, and material uploads.

Database Field Specification -

1. User Table

No.	Field Name	Range of Valid Values	Remarks
1	UserID	Auto-increment	Unique identifier for each user.
2	Name	Alphanumeric (max 50)	Full name of the user.
3	Email	Valid email format	Ensures unique email addresses.
4	Password	8-20 chars, must include symbols	Encrypted for secure storage.
5	Role	‘Student’, ‘Faculty’	Specifies the user type.

2. Material Table

S.No.	Field Name	Range of Valid Values	Remarks
1	MaterialID	Auto-increment	Unique identifier for each material.
2	Title	Alphanumeric (max 100)	Title or name of the material.
3	FileType	‘PDF’, ‘Video’, etc.	Specifies the type of material uploaded.
4	UploadDate	Date format	Date when the material was uploaded.
5	UserID	Reference to UserID	Links the material to the uploader.

3. Book Table

Field Name	Range of Valid Values	Remarks
BookID	Auto-increment	Unique identifier for each book.
Title	Alphanumeric (max 100 characters)	Title of the book.
Author	Alphanumeric (max 50 characters)	Author's name.
Price	Decimal (e.g., 0.00 - 9999.99)	Purchase price of the book.
Subscription Fee	Decimal (e.g., 0.00 - 999.99)	Fee for 24/7 subscription access to the book.

4. Payment Table

Field Name	Range of Valid Values	Remarks
PaymentID	Auto-increment	Unique identifier for each payment.
UserID	Reference to UserID	Links the payment to the user.
Amount	Decimal format	Total amount paid.
PaymentDate	Date format	Date when the payment was made.
PaymentStatus	'Success', 'Failure'	Indicates the status of the payment.

High-Level Design (HLD) / Detailed Design (DD) -

System Overview

The E-Library System consists of the following layers:

1. **Frontend Layer**:
    - Developed using ReactJS for a dynamic and user-friendly interface.

- Features include login, material management, book subscription, and payment gateway integration.

2. **Backend Layer**:
   - Built with Spring Boot to handle business logic and APIs for user authentication, material/book management, and payment processing.
3. **Database Layer**:
   - SQL is used for structured data like user details, payments, and subscriptions.
   - NoSQL is used to store unstructured data like materials, book metadata, and tags for efficient searching.
4. **Payment Integration**:
   - A payment gateway (e.g., Razorpay, Stripe) ensures secure online transactions for subscriptions and purchases.
5. **Cloud Services**:
   - AWS S3 is used for hosting uploaded materials.
   - EC2 is used for backend hosting, ensuring scalability and reliability.

Test Plan -

No.	Test Case Title	Description	Expected Outcome	RS Requirement Being Tested	Result
1	User Login Test	Test user login with valid credentials.	Successful login and redirection.	User Authentication	Pass
2	Material Upload Test	Upload a document to the system.	File is uploaded and accessible.	Material Upload/Download	Pass
3	Subscription Payment Test	Make a payment for book subscription.	Payment is processed successfully.	Payment Module	Pass
4	Book Access Test	Access a subscribed book.	Book content is available 24/7.	Book Subscription Functionality	Pass
5	Search Test	Search for materials using a keyword.	Relevant results are displayed.	Search Functionality	Pass

Conclusion -

The Student Kit for the E-Library System serves as a comprehensive guide to streamline the development and deployment of the platform. By outlining the objectives, requirements, and design strategies, this kit ensures a systematic approach to building a robust and user-friendly system. The inclusion of key features such as material management, secure authentication, subscription-based access, and payment integration highlights the system's focus on enhancing the learning experience for students. The use of modern technologies like Spring Boot, SQL/NoSQL databases, and ReactJS ensures scalability, security, and responsiveness.

Through the High-Level and Detailed Design, along with an organized test plan, the Student Kit ensures clarity in the implementation process. This system not only simplifies access to educational resources but also fosters engagement through interactive features and efficient functionality. With its well-defined architecture and detailed documentation, the Student Kit provides a solid foundation for successfully building and deploying the E-Library System to meet academic needs efficiently and effectively.