Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur

FACULTY KIT

Objective –

The goal of this faculty kit is to outline the roles, responsibilities, and tools necessary for the successful implementation of the **Online Ticket Reservation System for Cinema Halls** project. This system enables seamless interaction between users, including customers, cinema administrators, and technical staff, through core functionalities such as ticket booking, seat selection, payment processing, and showtime management.

Requirements Specification –

The **Online Ticket Reservation System** will include the following functionalities:

1. **User Authentication**
    - Secure user login and role management with distinct roles: **Customer**, **Cinema Admin**, and **System Admin**.
    - Multi-factor authentication (MFA) for admins to enhance security.
2. **Ticket Booking**
    - Enable customers to browse movie schedules, select preferred showtimes, and choose seats from an interactive seat map.
    - Real-time updates on seat availability to prevent double bookings.
3. **Payment Processing**
    - Integration with secure payment gateways (e.g., PayPal, Stripe) to process transactions for ticket purchases.
    - Support for various payment methods, including credit/debit cards and digital wallets.
    - Generate automated receipts and email confirmations for successful bookings.

4. **Showtime and Schedule Management**
    - Allow cinema administrators to create, update, and manage movie schedules, including show timings and hall allocations.
    - Provide visibility into upcoming shows and past schedules for record-keeping.
5. **Seat Management**
    - Dynamic seat layout customization for cinema administrators to reflect hall configurations.
    - Enable customers to view seat availability in real-time and make selections accordingly.
6. **Notification System**
    - Automated email notifications for ticket confirmations, reminders, and updates on canceled or rescheduled shows.
7. **Admin Control Panel**
    - Provide system administrators with tools to manage user accounts, oversee booking trends, and generate reports.
    - Offer detailed analytics for cinema administrators to assess occupancy rates, revenue, and booking patterns.
8. **Search and Filter Functionality**
    - Advanced search options for customers to locate movies based on title, genre, language, or rating.
    - Filters for cinema administrators to quickly navigate booking records or showtime schedules.

Technology Familiarization –

The **Online Ticket Reservation System for Cinema Halls** employs modern technologies to ensure functionality and scalability. **Spring Boot** is used for backend development, enabling RESTful APIs for user authentication, ticket booking, and email notifications. The frontend is built with **React.js**, offering a dynamic and responsive user experience, with seamless API integration via Axios. A relational **SQL database** (e.g., MySQL) securely manages data like user details and seat bookings. For secure payment processing, a gateway like **Stripe** is integrated. Additionally, **JavaMailSender** handles real-time email confirmations. These technologies ensure the system is robust, user-friendly, and adaptable to future needs.

Database Creation –

The **Online Ticket Reservation System** will utilize a combination of relational and non-relational databases to manage diverse data types and ensure scalability:

1. **SQL Database**
    - Used for structured data such as user details, movie schedules, showtimes, seating arrangements, and ticket bookings.
    - Ensures data consistency and facilitates complex queries required for real-time seat availability and booking transactions.
2. **NoSQL Database**
    - Used for unstructured or semi-structured data, such as user activity logs, transaction metadata, and system notifications.
    - Supports fast read and write operations for large-scale logging and analytics.

High-Level and Detailed Design –

System Overview:

The system consists of three layers, each designed to ensure seamless interaction, robust performance, and scalability:

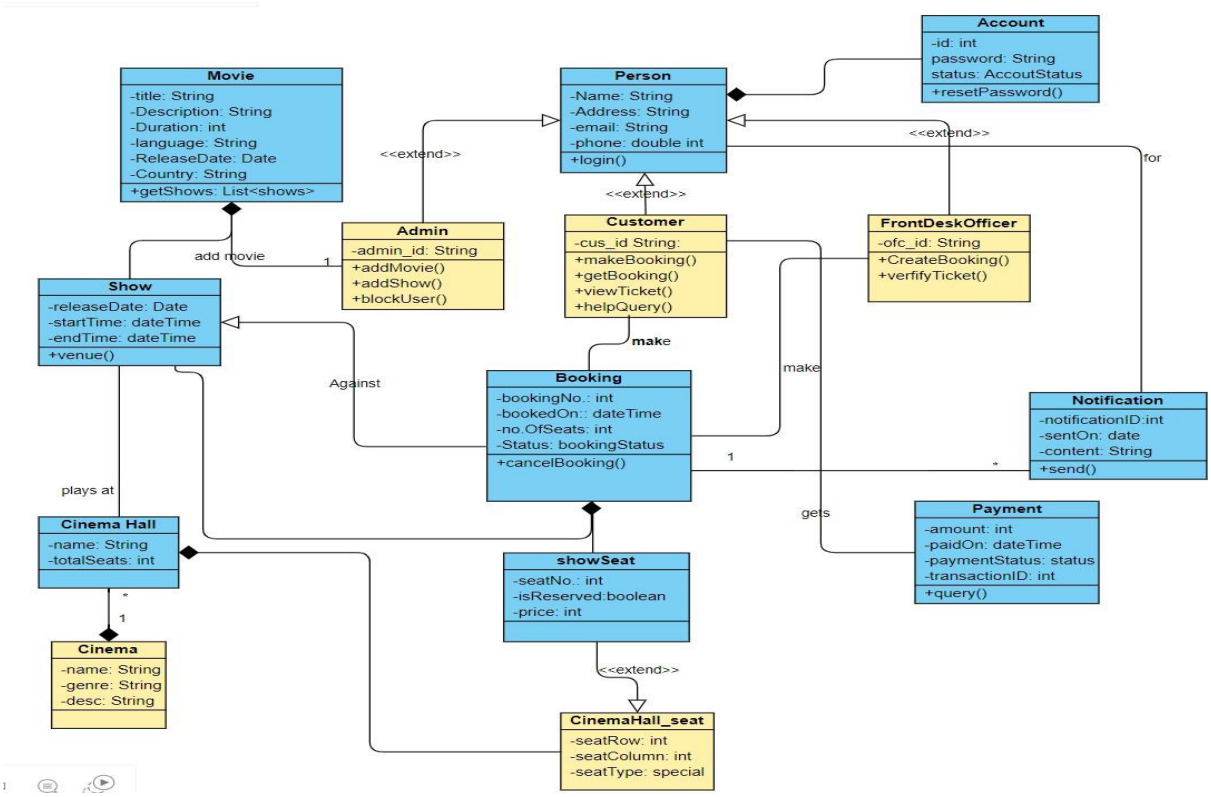
1. **Frontend**
    - A **React.js**-based user interface that provides an intuitive and responsive experience for users.
    - Key functionalities include movie browsing, seat selection, ticket booking, and payment processing.
    - Accessible on both desktop and mobile platforms, ensuring user convenience and inclusivity.
2. **Backend**
    - Built with **Spring Boot**, handling server-side logic, API endpoints, and business rules for core functionalities such as ticket reservations, user authentication, and showtime management.
    - Manages communication with third-party services like payment gateways for secure transactions and email servers for notifications.

- Ensures real-time updates for seat availability and booking statuses using WebSockets or similar technologies.

3. **Database**
   - **Relational Database (SQL)**: Manages structured data, such as user profiles, movie schedules, ticket bookings, and transaction records.
   - **NoSQL Database**: Stores unstructured or semi-structured data like log files, analytics data, or user activity streams, supporting scalability and performance optimization.

Detailed Design:

The backend will expose RESTful APIs for user authentication, material uploads, subscription management, and payment integration. The frontend will consume these APIs to render real-time data to users.



To integrate the frontend with the database, the backend will expose REST APIs using **Spring Boot**, which will handle HTTP requests. These requests will perform CRUD operations on the database, such as fetching materials, updating subscription status, and processing payments. React.js will consume these APIs

via Axios, providing dynamic content to the user interface based on the data stored in the databases.

Test Plan Review -

Testing will be conducted at various stages, ensuring all system functionalities are working as expected:

- **Unit Testing**: Backend logic for APIs will be tested for correctness.
- **Integration Testing**: Testing the interaction between frontend and backend.
- **UI/UX Testing**: Ensuring the frontend is user-friendly and functional.
- **Performance Testing**: Ensuring the system can handle high loads during usage.

Final Review -

At the conclusion of the project, a final review will be conducted to ensure that the system meets all specified requirements. This will include:

- Validating core functionalities such as user authentication, ticket reservation, and seat availability updates.
- Ensuring seamless integration and operation of the payment gateway and email confirmation module.
- Assessing system responsiveness, reliability, and performance during high-traffic scenarios.
- Gathering user feedback to identify areas for improvement and enhance the overall user experience.

Documents/References that May Aid the Process of Evaluation-

- **Spring Boot Documentation**: For backend API implementation and integration.
- **React.js Documentation**: For creating dynamic and responsive user interfaces.
- **MySQL/PostgreSQL Tutorials**: For designing and optimizing the relational database.

- **JavaMailSender Documentation**: For integrating email confirmation functionality.
- **Stripe/Payment Gateway API Docs**: For secure and reliable payment processing.
- **Performance Testing Tools (e.g., JMeter)**: For load and stress testing the system.

Conclusion –

The Faculty Kit serves as a comprehensive guide for faculty members involved in the development and evaluation of the **Online Ticket Reservation System for Cinema Halls**. This kit ensures that all aspects of the project, from the initial planning to the final review, are thoroughly addressed.

By following this structured approach, the Faculty Kit equips faculty members to guide the project effectively, ensuring it is scalable, secure, and user-friendly. The kit also facilitates a valuable learning experience for students by integrating modern technologies, collaborative methodologies, and real-world application development strategies.

The **Online Ticket Reservation System for Cinema Halls** aims to automate the ticket booking process, provide real-time seat availability updates, and ensure a smooth user experience. This project demonstrates the potential of modern technology to address common challenges in ticketing systems, setting a strong foundation for further enhancements in future iterations.