Automated Movie Rating System

Based on User Reviews

By

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A project submitted for subject of

System Design Practices

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April 2024

CERTIFICATE

This is to certify that the project work titled

Automated Movie Rating System Based on User Reviews

is the bonafide work of
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Faculty of Technology
Department of Computer Engineering
Dharmsinh Desai University
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1.Introduction

1.1Purpose

This document specifies the software requirements for the **Automated Movie Rating System**. It serves as a reference for the development team, stakeholders, and testers to understand the features and functionalities of the system.

The primary objective of this system is to provide an interactive platform for users, producers, and administrators to engage in reviewing, rating, and managing movies efficiently. The scope of this product covers user account management, movie review and rating functionalities, producer-driven movie uploads, and administrative oversight of users and producers.

1.2 Product Scope

The **Automated Movie Rating System** is designed to provide a streamlined platform where users, producers, and administrators can interact around movie reviews and ratings. Its core purpose is to ensure fair, reliable, and user-driven movie ratings based on authentic reviews while maintaining administrative oversight to moderate content.

1.3 Project Description

The **Automated Movie Rating System** is an easy-to-use platform where movie lovers can share their opinions and rate films. The app serves three main groups: users, producers, and admins.

- **Users** can sign up, log in, write reviews, manage their profiles, keep track of what movies they've watched, search and filter movies, and like or dislike other reviews.
- **Producers** can add, update, and manage movie details, respond to user reviews, and see all the movies they've uploaded.
- **Admins** oversee user and producer registrations, approve new members, moderate reviews, and make sure everything on the platform runs smoothly.

The system is built with modern technologies to ensure it's secure, scalable, and easy to use.

1.4 References

https://www.imdb.com/
https://www.rottentomatoes.com/

2.Overall Description

2.1 Product Perspective

It's not replacing any existing systems but aims to offer an all-in-one solution for movie reviews. The system is designed to work on its own but can be expanded with future integrations.

Major Components

1.User Interface (UI): A simple, easy-to-use design for browsing movies, writing reviews, and managing profiles.

2.Movie Catalog: A collection of movies with detailed information, including titles, genres, and user ratings. Users can search and filter movies, and producers can add or update their own.

3.Review and Rating System: Users can write reviews, rate movies, and interact with other reviews by liking or commenting. Reviews can also be edited or deleted.

4.Profile Management: Allows users and producers to create and manage their profiles and track their activity, like review history.

5.Producer Dashboard: Producers can add new movies, update existing ones, and respond to reviews about their films.

6.Admin Panel: Admins manage user and producer accounts, approve producer sign-ups, and moderate content to keep the platform safe and respectful.

7.Backend: Handles all the behind-the-scenes functions like user authentication and data processing to ensure smooth operations.

8.Database: Stores all movie data, reviews, user profiles, and system logs.

9.External Integrations (Future Use): The system may connect with external movie databases like IMDb for more movie details and discovery features.

2.2 Product Features

User Authentication and Profiles: Allows users to create an account, log in, and customize profiles with avatars and preferences.

Movie Catalog: A comprehensive library of movies that users can browse, search, and filter.

Movie Reviews and Ratings: Users can leave, edit, and delete movie reviews and ratings, as well as like or dislike others' reviews.

Producer Dashboard: Producers can manage movies they upload, including updating details and interacting with user reviews.

Admin Panel: Admins can manage user and producer accounts, moderate content, and maintain platform integrity.

History Tracking: Users can track their movie history and see previously watched films and reviews.

2.3 User Classes

1. Users

- **Description:** These are the regular consumers of the system who engage with it to rate, review, and discover movies. They may have varying technical skills and movie preferences, and they use the platform primarily for personal entertainment and movie-related engagement.
- **Requirements:**
  - Simple and user-friendly interface.
  - Ability to browse and search for movies.
  - Review and rate movies.
  - View and interact with other users' reviews (like/dislike, comments).
  - Manage personal profiles and review history.

2. Producers

- **Description:** Producers are individuals or companies who upload movies to the platform. They use the system to share their films, receive feedback, and promote their content. Producers range from independent filmmakers to larger movie studios.
- **Requirements:**
  - Ability to upload, edit, and delete movies.
  - Manage their own profile and movies.

  - Interact with user reviews (reply to comments and feedback).
  - View analytics on their movies (e.g., number of reviews, ratings, comments).
  - Moderate reviews for their content if necessary.

3. Admin

- **Description:** Admins oversee the platform to ensure smooth operations, manage users and producers, and enforce policies. They have the highest level of control within the system and ensure content integrity.
- **Requirements:**
  - Full control over user and producer accounts (approve/reject new registrations, delete inappropriate content).
  - Ability to manage, moderate, and delete inappropriate reviews or user activity.
  - Monitor the overall platform's functioning, ensuring the smooth running of all services.
  - Access to detailed analytics and logs of user and producer activities for administrative purposes

2.4 Operating Environment

The **Automated Movie Rating System** will operate in a flexible and efficient environment, ensuring compatibility across multiple platforms.

Hardware Platform

- Client Devices: Desktop/laptop computers (Windows, macOS, Linux), tablets, and smartphones (iOS, Android).
- Server Infrastructure: Cloud-based servers (AWS, Google Cloud, Azure) and optional on-premises servers.

Operating Systems

- **Client-Side**: Windows 10+, macOS Mojave (10.14)+, Linux (modern distributions), iOS 12+, Android 8.0+.
- **Server-Side:** Linux (Ubuntu Server 18.04 LTS+, CentOS 7+), Windows Server 2016+.

2.5 Design and Implementation Constraints

The development of the **Automated Movie Rating System** is guided by certain limitations and requirements that shape how the system will be built. Here's an overview:

1.Hardware Limitations

- **Memory Requirements:** Servers need enough memory to handle multiple users at the same time and ensure fast data access.
- **Performance Needs:** The system must run smoothly with minimal delays, giving users a seamless experience when browsing or rating movies.

2. Connections with Other Applications

- **Third-Party APIs:** The platform will connect with external movie databases like IMDb to fetch movie details and metadata. It may also use external services like OAuth for secure logins.
- **Payment Integration:** If premium features or subscriptions are offered, secure payment gateways like Stripe or PayPal will be used.

3. Technology Stack

- **Frontend:** Built with **React.js** to provide a fast and interactive interface for users.
- **Backend:** Developed using the **MERN stack** (MongoDB, Express.js, React, Node.js), ensuring the system is scalable and reliable.
- **Database: MongoDB** is used to store user profiles, reviews, and movie data in a flexible and efficient way.
- **Version Control:** The team will use **Git** to manage code changes and collaborate effectively.

4. Programming Languages

- **Frontend:** Uses JavaScript (React.js) to create dynamic user interfaces.
- **Backend:** Built with JavaScript (Node.js), and optionally **TypeScript** for better error checking and clean code.
- **Model:**Python
- **Development Practices:** Follows best coding practices, with regular code reviews to ensure high-quality work.

2.6 User Documentation

The user documentation for the **Automated Movie Rating System** will provide clear and accessible resources tailored to different user groups. It includes the following components:

1. User Manuals

- **General User Manual:** Explains the platform's features for all users, covering account creation, browsing movies, submitting reviews, and accessing ratings.
- **Producer Guide:** Details on adding movies, managing content, and tracking reviews.
- **Admin Guide:** Provides instructions for managing users, producers, and overall system moderation.

2. Tutorials and How-to Guides

- **Review Submission Tutorial:** Step-by-step guide on writing and submitting reviews, designed for regular users.
- **Movie Addition Tutorial:** For producers, covering how to add movies, upload metadata, and manage listings.
- **Admin Tools Tutorial:** Instructions on approving movies, managing users, and monitoring system activity.

3. Additional Resources

- **FAQs and Troubleshooting:** A section addressing common questions and issues for all user types.
- **Customer Support Details:** Contact methods and guidelines for seeking assistance with specific problems.

- **Community Forum Integration:** Links to forums or social media platforms where users can exchange tips, share insights, and provide feedback.

By offering these well-structured and detailed resources, the platform ensures that users, producers, and administrators can fully understand and utilize the system, enhancing engagement and satisfaction.

3. External Interface Requirements

3.1 User Interfaces

The **Automated Movie Rating System** will have a responsive and user-friendly interface designed for easy navigation and a modern aesthetic.

- **Dashboard:** Personalized homepage with trending movies, top reviews, and user-specific sections.
- **Movie Details:** Pages showing ratings, reviews, and metadata, with options for adding reviews or editing entries.
- **Forms:** Simple layouts for login, signup, and review submissions.
- **Navigation Bar:** Common links for Home, Profile, Library, and Logout.
- **Error Messages:** Clear formatting and helpful explanations for errors.
- **Dark Mode:** Optional for user comfort.

This design ensures accessibility, clarity, and a visually appealing experience for all users.

3.2 Hardware Interfaces

The **Automated Movie Rating System** will interact with various hardware components to ensure compatibility and optimal performance:

- **Client Devices:** Supports desktops, laptops, tablets, and smartphones running on Windows, macOS, Linux, iOS, or Android.

- **Server Infrastructure:** Operates on cloud-based servers (e.g., AWS, Azure, or Google Cloud) and optionally on-premises servers.
- **Data Transmission:** Utilizes standard protocols such as HTTPS for secure communication between devices and servers.
- **Storage:** Database hosted on cloud infrastructure for scalability and data security.

These hardware interfaces ensure seamless operation across diverse devices and reliable data handling in real-time.

3.3 Software Interfaces

- ❖ **Connections with Other Software Components:**

1.Database (MongoDB):

- **Data Items:** User profiles, movie data, reviews, ratings.
- **Purpose:** Store and manage structured data, including user-submitted reviews and aggregated ratings.

2.Operating Systems:

- **Data Items:** Device specifications, OS details.
- **Purpose:** Ensure the application runs smoothly across platforms like Windows, macOS, iOS, Android, and Linux.

3.Libraries and Tools:

- **Examples:** React, Angular, Node.js, Express.js.
- **Data Items:** UI components, backend services, and API integrations.
- **Purpose:** Facilitate front-end rendering, backend processes, and seamless communication between layers.

4.Integrated Commercial Components (e.g., IMDb or TMDB API):

- **Data Items:** Movie metadata, such as titles, descriptions, cast, and genres.
- **Purpose:** Fetch external data for movie information, enhancing user experience and accuracy of details.

3.4 Communications Interfaces

- ❖ **Communication Requirements:**

1.Network Protocols:

- **HTTP/HTTPS:** Used for secure data transfer between the client and server.
- **WebSocket (Optional):** Supports real-time updates for live notifications or interactions.

2.Message Formatting:

- **JSON:** Standard format for data exchange between client and server.
- **XML (Optional):** For compatibility with third-party integrations if required.

3.Communication Standards:

- **REST API:** Enables structured communication between the front-end and back-end.
- **OAuth 2.0:** For secure user authentication with external services like IMDb or TMDB.

4.Security and Encryption:

- **TLS/SSL Encryption:** Ensures secure communication over the network.
- **Data Privacy Standards:** Adheres to GDPR or equivalent regulations to protect user data.

5.Synchronization Mechanisms:

- **Caching:** Utilized to reduce redundant API calls and improve performance.
- **Polling or Push Notifications:** Used for updating user-relevant data, like new movie reviews or ratings.

4. Functional Requirements

1. User Role

R1: User Registration and Authentication:

Users should be able to register, log in, and authenticate to access the platform.

R1.1 User Registration
Input: Username, profile image, email, password.
Output: Confirmation of successful registration and verification email.
Exception: Registration fails if the email is already registered.

R1.2 User Logi
Input: Email and password.
Output: User is redirected to their personalized dashboard.
Exception: Error message if incorrect email or password is provided.

R1.3 Password Reset
Input: User provides their email for password reset.
Output: A password reset email is sent to the user.

R2: Movie Search and Filter:

Users can search and filter movies to find specific titles or genres.

R2.1 Search Movies
Input: Movie title or keyword.
Output: A list of matching movies is displayed.

R2.2 Filter Movies
Input: Filters such as genre, release year, or rating.
Output: Movies matching the selected filters are displayed.

R3: Review Management

Users can interact with movie reviews.

R3.1 Write Reviews
Input: Text review and rating.
Output: Review is added to the selected movie.

R3.2 View Reviews
Output: All reviews for a selected movie are displayed.

R3.3 Edit/Delete Reviews
Input: Review ID and updated text or delete action.
Output: Review is updated or deleted successfully.

R3.4 Like/Unlike Reviews
Input: User action (like/unlike).
Output: Review's like count is updated.

R4: User Profile Management

Users can manage their profiles.

R4.1 View Profile
Output: Displays user profile details.

R4.2 Update Profile
Input: Updated profile information (e.g., name, picture).
Output: Profile is updated successfully.

R4.3 Delete Profile
Input: Confirmation from the user.
Output: Profile is removed from the system.

R5: View Movie History

Users can view their history of visited movies.

R5.1 Display Movie History
Output: List of previously visited movies is shown.

2. Producer Role

R6: Movie Management

Producers can manage their uploaded movies.

R6.1 Add Movies
Input: Movie title, description, genre, release date, and poster.
Output: Movie is added to the platform.

R6.2 Update Movie Details
Input: Updated movie details.
Output: Movie information is updated successfully.

R6.3 Delete Movies
Input: Movie ID and delete action.
Output: Movie is removed from the platform.

R6.4 View Uploaded Movies
Output: List of all movies uploaded by the producer is displayed.

R7: Review Interactions

Producers can engage with user reviews.

R7.1 View Reviews for Uploaded Movies
Output: Reviews for movies uploaded by the producer are displayed.

3. Admin Role

R8: User and Producer Management

Admins can oversee users and producers on the platform.

R8.1 Approve Producer Signup Requests
Input: Review of producer application.
Output: Approval or rejection notification is sent.

R8.2 View All Users and Producers
Output: List of all registered users and producers.

R8.3 Delete Users
Input: User ID and delete action.
Output: User account is removed.

R9: Content Moderation:

Admins ensure content quality on the platform.

R9.1 Delete Inappropriate Reviews
Input: Flagged review details.
Output: Review is deleted, and action is logged.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- The app must handle a minimum of 10,000 concurrent users without any noticeable performance degradation.
- User registration, login, and profile updates should be completed within 2 seconds.
- Search functionality for movies should return results within 1 second of entering a query.
- Movie review actions (like, dislike, comment) should be processed with no more than a 1-second delay.
- Page loading times should be under 3 seconds for all key interactions such as viewing movie reviews or managing profiles.

5.2 Safety Requirements

- The app will have safeguards to avoid accidental data loss, such as confirming before deleting a review or removing a movie.
- It must comply with privacy laws (like GDPR, CCPA) to protect user information.
- Data backups should be done regularly to avoid losing any user data.
- Activity logs should be available to help monitor the system for any potential issues.
- All sensitive data (such as user details and reviews) will be securely encrypted.

5.3 Security Requirements

- User passwords will be stored securely with strong encryption methods like bcrypt.
- The app should support multi-factor authentication (MFA), especially for users with admin or producer roles, to increase security.
- Regular security checks will be carried out to find and fix any potential weaknesses in the system.
- Identity verification will be required for sensitive actions like password resets or changing account details.
- Access controls will ensure that users can only see and manage their own data, while producers and admins can access what they're authorized to.

6. Database Design

6.1 Overview

The database design follows a **NoSQL** approach using **MongoDB**, which is a document-oriented database. The schema is structured to efficiently store and manage movie-related data, user information, and reviews. The database consists of three primary collections: **Users**, **Movies**, and **Reviews**, with interconnections established through references using **ObjectId**.

6.2 Database Schema

6.2.1 Users Collection

This collection stores information about users, producers, and administrators. Each user has an associated role and a history of visited movies.

- **UserName** *(String, Required)* – The display name of the user.
- **Email** *(String, Required, Unique)* – The email ID of the user.
- **Password** *(String, Required)* – Hashed password for authentication.
- **Role** *(String, Enum: ['User', 'Producer', 'Admin'], Default: 'User')* – Defines the role of the user.

- **Status** *(String, Enum: ['Accepted', 'Rejected', 'Pending'], Default: 'Pending')* – Approval status of the user.
- **ProfileImage** *(String)* – URL or path of the profile image.
- **History** *(Array of objects)* – Stores recently visited movies (only for the past 7 days).
    - **movieId** *(ObjectId, Ref: 'Movie')* – References the movie.
    - **visitedAt** *(Date, Default: current timestamp)* – Stores when the user visited the movie.
- **createdAt** *(Date, Default: current timestamp)* – User creation timestamp.
- **updatedAt** *(Date, Default: current timestamp)* – Last update timestamp.

6.2.2 Movies Collection

This collection stores information about different movies and their associated metadata.

- **Name** *(String, Required)* – The title of the movie.
- **Description** *(String, Required)* – A brief summary of the movie.
- **MovieRating** *(Number)* – The average rating of the movie.
- **Type** *(String, Default: 'Romantic')* – The genre of the movie.
- **MovieImage** *(String)* – URL or path of the movie poster.
- **ReviewsCount** *(Number, Default: 0)* – Count of total reviews.
- **Producer** *(Array of ObjectId, Ref: 'User')* – References the producer(s) of the movie.
- **RealesedDate** *(Date, Default: current timestamp)* – The release date of the movie.
- **updatedAt** *(Date, Default: current timestamp)* – Last update timestamp.

6.2.3 Reviews Collection

This collection contains user reviews for movies.

- **Description** *(String, Required)* – The content of the review.
- **rating** *(Number, Default: 2)* – The rating given by the user.
- **LikeCount** *(Number, Default: 0)* – The number of likes the review has received.

- **DislikeCount** *(Number, Default: 0)* – The number of dislikes the review has received.
- **LikedUsers** *(Array of ObjectId, Ref: 'User')* – Users who liked the review.
- **DislikedUsers** *(Array of ObjectId, Ref: 'User')* – Users who disliked the review.
- **User** *(Array of ObjectId, Ref: 'User')* – The user who wrote the review.
- **Movie** *(Array of ObjectId, Ref: 'Movie')* – The movie being reviewed.
- **updatedAt** *(Date, Default: current timestamp)* – Last update timestamp.

6.3 Relationships

The collections in the database are related as follows:

- A **User** can have multiple **Movies** as a **Producer**.
- A **User** can have multiple **Reviews** for different **Movies**.
- A **Movie** can have multiple **Reviews** associated with it.
- A **Review** is linked to a **User** and a **Movie**.
- A **User's History** stores their recently visited movies.

7. Design

7.1 Usecase Diagram

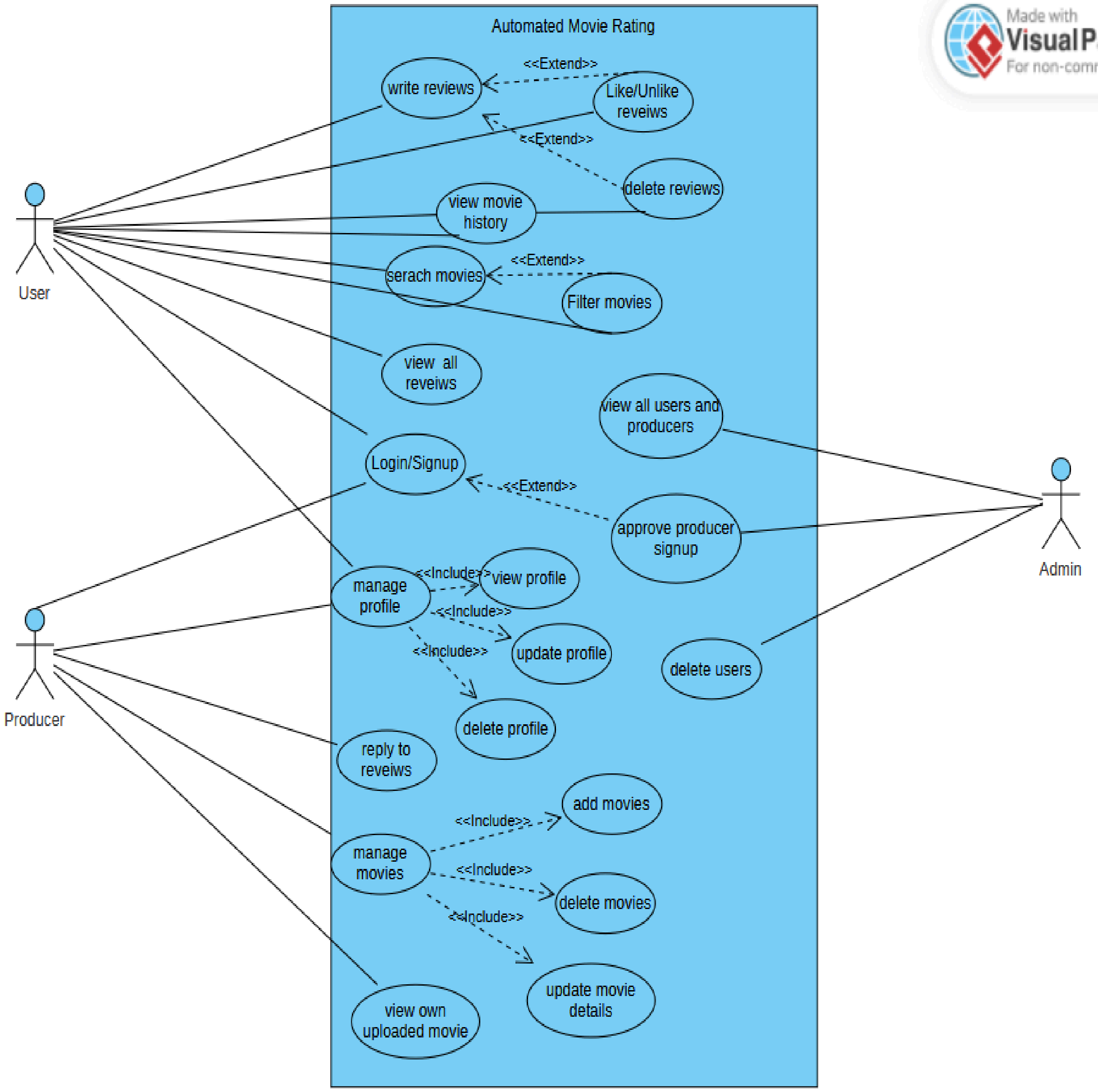


Figure 7.1

7.2 Sequence Diagrams

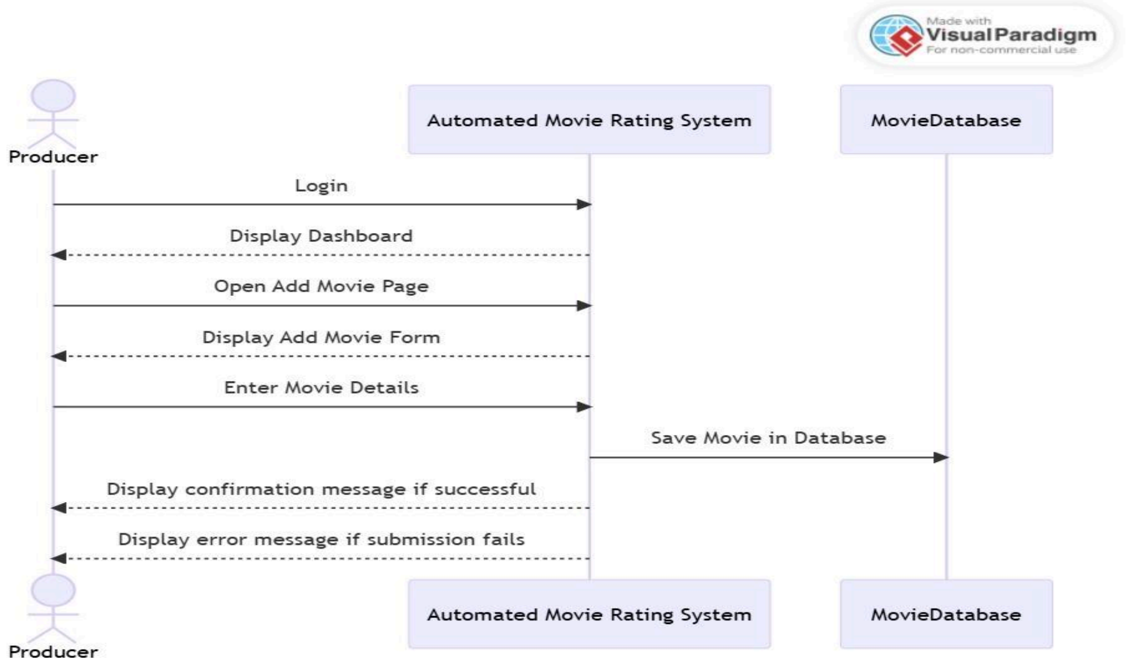

Made with Visual Paradigm For non-commercial use
Producer
Automated Movie Rating System
MovieDatabase
Login
Display Dashboard
Open Add Movie Page
Display Add Movie Form
Enter Movie Details
Save Movie in Database
Display confirmation message if successful
Display error message if submission fails
Producer
Automated Movie Rating System
MovieDatabase

Figure 7.2 : Add Movie

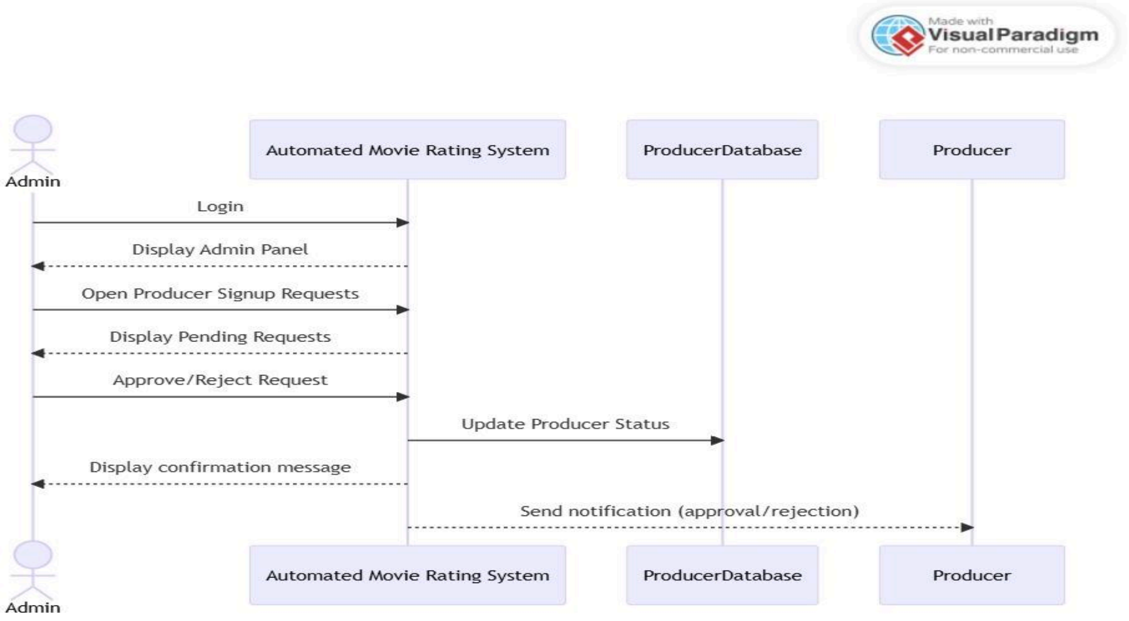

Made with Visual Paradigm For non-commercial use
Admin
Automated Movie Rating System
ProducerDatabase
Producer
Login
Display Admin Panel
Open Producer Signup Requests
Display Pending Requests
Approve/Reject Request
Update Producer Status
Display confirmation message
Send notification (approval/rejection)
Admin
Automated Movie Rating System
ProducerDatabase
Producer

Figure 7.3 : Approved Producer

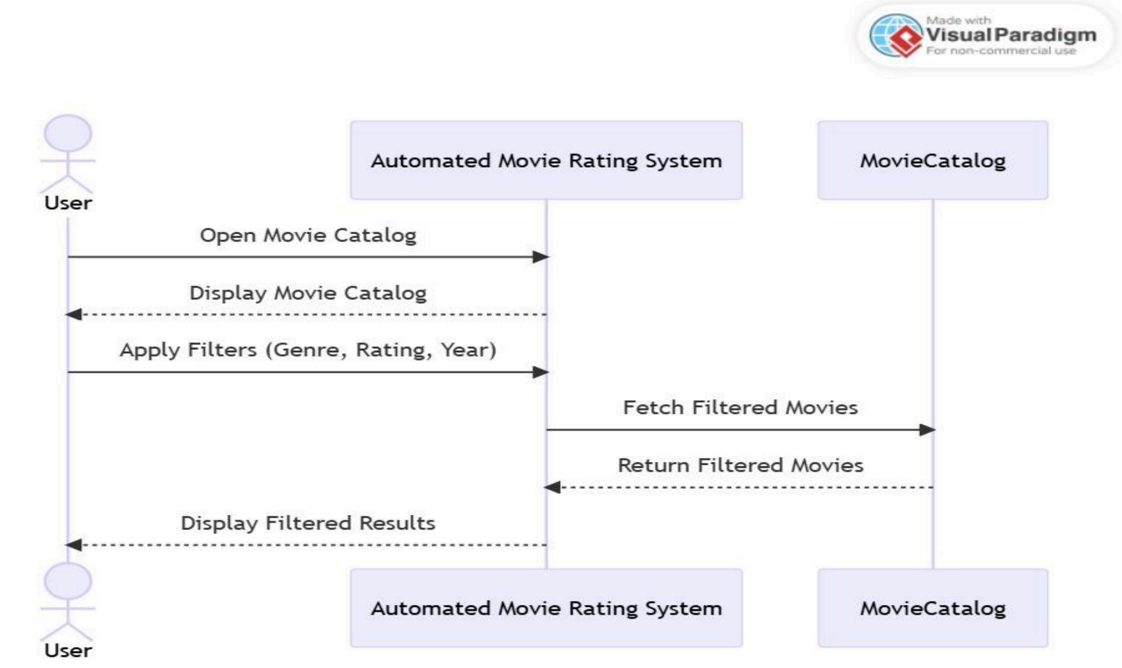

Made with Visual Paradigm For non-commercial use
User
Automated Movie Rating System
MovieCatalog
Open Movie Catalog
Display Movie Catalog
Apply Filters (Genre, Rating, Year)
Fetch Filtered Movies
Return Filtered Movies
Display Filtered Results
User
Automated Movie Rating System
MovieCatalog

Figure 7.4 : Filter Movies

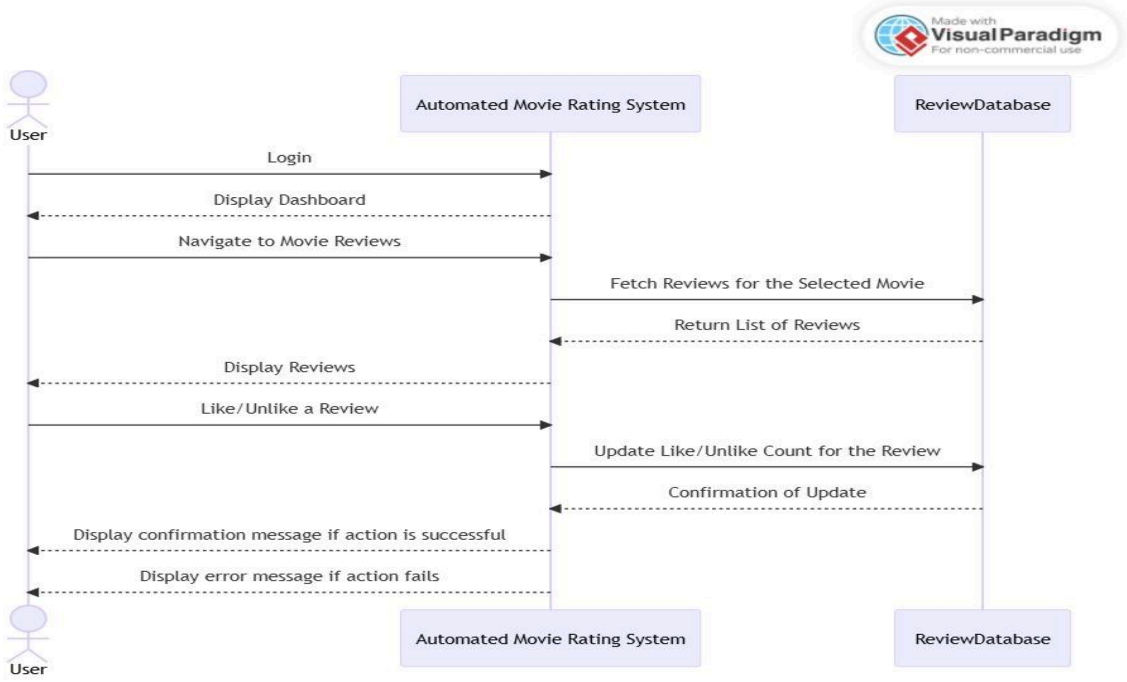

Made with Visual Paradigm For non-commercial use
User
Automated Movie Rating System
ReviewDatabase
Login
Display Dashboard
Navigate to Movie Reviews
Fetch Reviews for the Selected Movie
Return List of Reviews
Display Reviews
Like/Unlike a Review
Update Like/Unlike Count for the Review
Confirmation of Update
Display confirmation message if action is successful
Display error message if action fails
User
Automated Movie Rating System
ReviewDatabase

Figure 7.5 : Like/Unlike Reviews

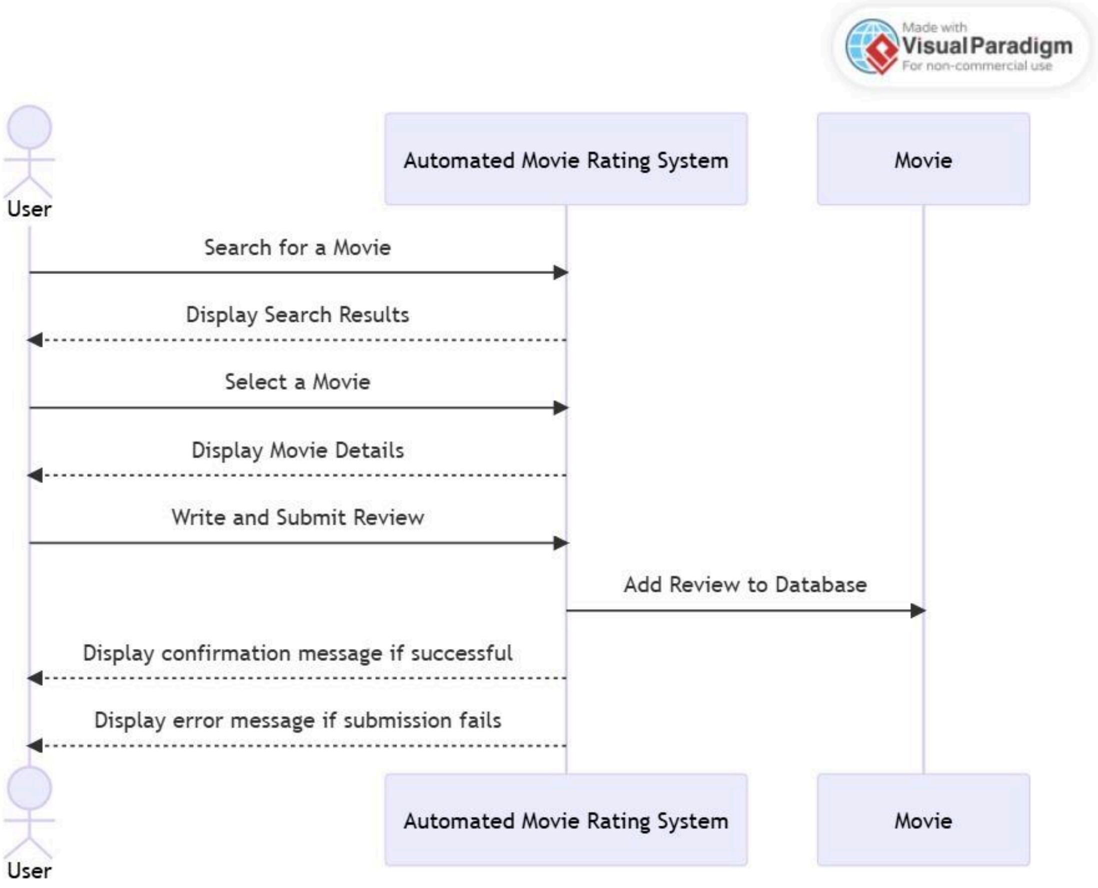

Made with Visual Paradigm For non-commercial use
User
Automated Movie Rating System
Movie
Search for a Movie
Display Search Results
Select a Movie
Display Movie Details
Write and Submit Review
Add Review to Database
Display confirmation message if successful
Display error message if submission fails
User
Automated Movie Rating System
Movie

Figure 7.6 : Write Review

8. Model Details

8.1 Introduction

The **Movie Rating Model** is a deep learning-based system that predicts movie ratings from user reviews using **NLP** and **LSTM networks**. It processes IMDB reviews by removing noise, tokenizing text, and applying stemming. The model uses an **Embedding Layer**, **LSTM layers**, and **Dense layers** for sentiment analysis and predicts ratings on a **1-5 scale**. Trained with **MSE loss** and the **Adam optimizer**, it provides an **automated, scalable, and user-friendly** solution for rating predictions. Future enhancements may include larger datasets and improved architectures for better accuracy.

8.2 Literature Review

1.Text Preprocessing & Feature Extraction:

- Uses **text vectorization** by tokenizing and stemming words from movie reviews.
- Removes stopwords and non-alphabetic characters to extract meaningful features.

2.Sentiment-Based Rating Prediction:

- Utilizes **Long Short-Term Memory (LSTM)** networks to analyze sequential patterns in reviews.
- Converts processed reviews into numerical sequences for deep learning-based sentiment analysis.

3.Regression-Based Rating Prediction:

- Uses a **Dense Neural Network** with **Mean Squared Error (MSE)** loss for rating predictions.
- Predicts a **continuous rating scale (1-5)** instead of binary sentiment classification.

4.Hybrid Learning Approach:

- Combines **word embeddings** with **LSTM layers** to enhance contextual understanding.
- Adjusts predictions dynamically based on learned sentiment patterns in text data.

5.Trend-Based Rating Adjustment:

- Can be improved by incorporating recent user trends and global movie reviews.

- Future extensions may include real-time sentiment shifts for personalized recommendations.

8.3 Implemented Algorithms

Our **movie rating prediction model** utilizes a deep learning approach with **NLP** and **LSTM networks** to analyze textual reviews and predict ratings. The model optimizes accuracy through **text preprocessing, feature extraction, and sequential learning**, ensuring robust sentiment analysis and rating predictions.

8.3.1 Text Preprocessing & Feature Extraction

1.Tokenization and Cleaning

- Converts raw movie reviews into structured text by removing non-alphabetic characters and stopwords.
- Uses word stemming to reduce words to their root forms for better analysis.

2.Text Vectorization Using Tokenizer

- A Keras Tokenizer converts cleaned reviews into sequences of word indices.
- A vocabulary of 10,000 words is maintained, with out-of-vocabulary words replaced by `<OOV>`.

3.Padding for Consistent Input Size

- Each review is padded to a fixed length (200 words) to standardize input size for the LSTM model.

8.3.2 Sentiment-Based Rating Prediction

1.LSTM-Based Deep Learning Model

- Uses **Embedding Layer** to convert words into dense vector representations.

- Employs **stacked LSTM layers** to capture long-term dependencies in review sentiment.
- A **Dense layer with ReLU activation** refines features before output.
- **Final output layer** predicts ratings on a continuous scale (1-5).

2.Loss Function and Optimization

- Uses **Mean Squared Error (MSE)** as the loss function for numerical rating predictions.
- Optimized using **Adam Optimizer** for efficient weight updates.

8.3.3 Hybrid Learning Approach

1.Combining Sentiment and Regression-Based Prediction

- The model integrates **NLP-driven sentiment analysis** with **regression-based rating prediction**.
- Instead of a **binary classification** (positive/negative), it predicts a **continuous rating**.

2.Dynamic Scaling Based on Review Length & Sentiment Strength

- Longer reviews contribute **higher weights** in rating predictions.
- Strong sentiment polarity (highly positive or negative) adjusts the predicted rating accordingly.

3.Adaptive Learning for Improved Accuracy

- The model refines predictions with additional training, improving its understanding of user sentiment over time.
- Future enhancements can include **transfer learning** and **pre-trained embeddings (e.g., GloVe, BERT)** for better contextual understanding.

8.4 Datasets, Tools, and Technologies

8.4.1 Deployment & API Integration

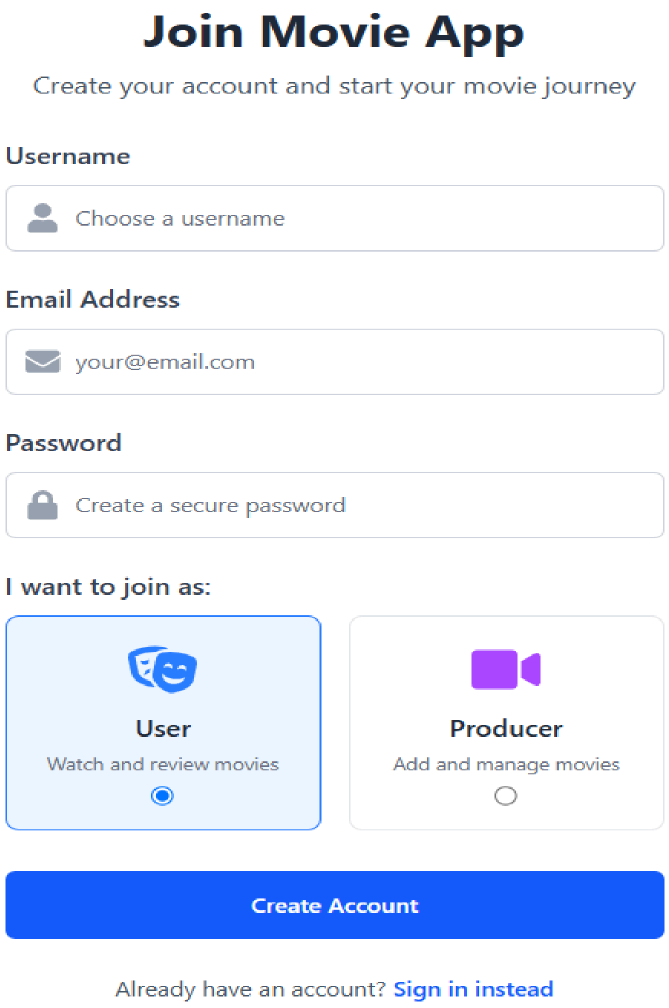
- **Deployment Platform:** Hugging Face Spaces

- **Containerization:** Docker
  - **Dockerfile:** Defines dependencies, environment setup, and API server
  - **Base Image:** `python:9.x`
  - **Dependencies Management:** `requirements.txt`
- **Backend Framework:** FastAPI (for API handling)
- **API Endpoints:**
  - `POST /predict` – Accepts a movie review and returns a predicted rating
- **Inference Pipeline:**
  - Load `model.h5` and `tokenizer.pkl`
  - Preprocess incoming review
  - Tokenize, pad, and pass through LSTM model
  - Return predicted rating in JSON response
- **Backend Integration:** API is consumed by the main backend for rating predictions

8.4.2 Infrastructure & Hosting

- **Version Control:** Git & GitHub (cloned repo from Hugging Face)
- **Hosting:** Hugging Face Spaces (runs Docker containers)
- **Scalability:** Supports multiple requests for real-time predictions
- **Security Considerations:**
  - API endpoints secured against unauthorized access
  - Rate limiting and input validation to prevent abuse

9. GUI DEMO



Join Movie App

Create your account and start your movie journey

Username

Choose a username

Email Address

your@email.com

Password

Create a secure password

I want to join as:

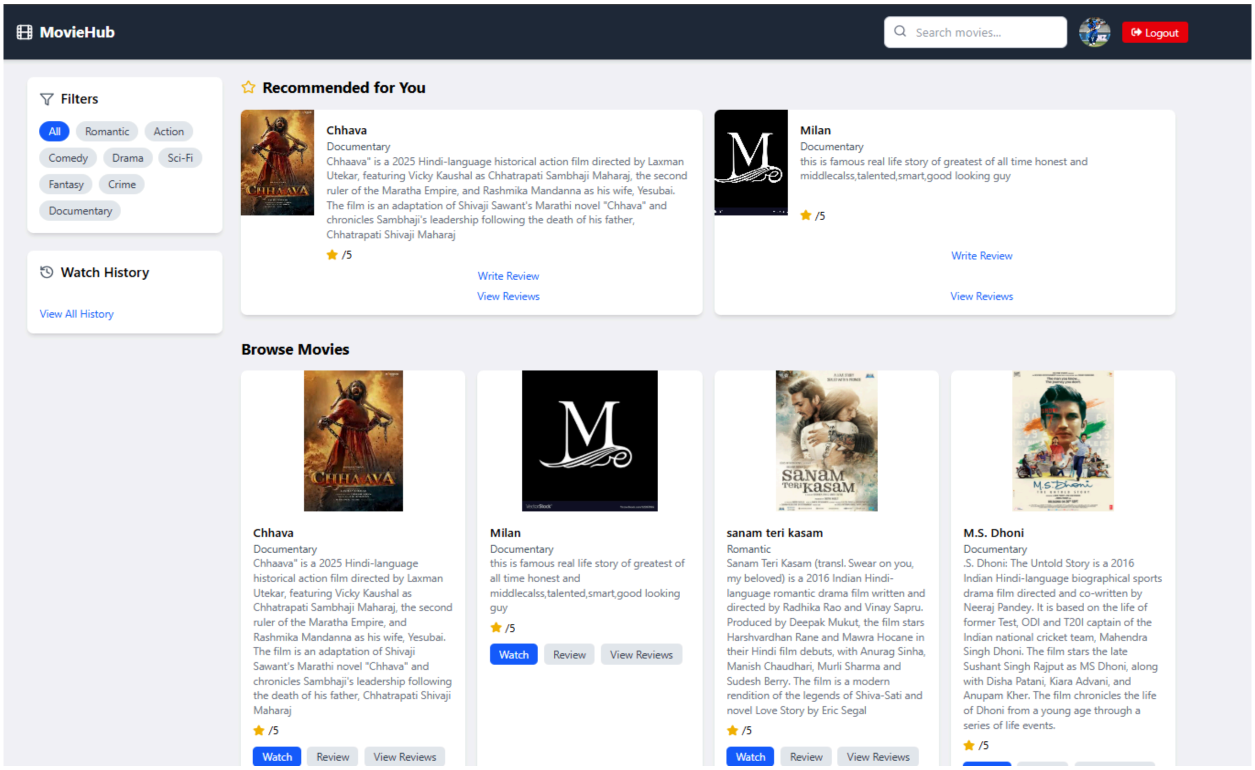
User
Watch and review movies
●

Producer
Add and manage movies
○

Create Account

Already have an account? Sign in instead

Figure 8.1:Sign up



Recommended for You

Chhava
Documentary
Chhaava" is a 2025 Hindi-language historical action film directed by Laxman Utekar, featuring Vicky Kaushal as Chhatrapati Sambhaji Maharaj, the second ruler of the Maratha Empire, and Rashmika Mandanna as his wife, Yesubai. The film is an adaptation of Shivaji Sawant's Marathi novel "Chhava" and chronicles Sambhaji's leadership following the death of his father, Chhatrapati Shivaji Maharaj
★ /5

Milan
Documentary
this is famous real life story of greatest of all time honest and middlecalss,talented,smart,good looking guy
★ /5

Browse Movies

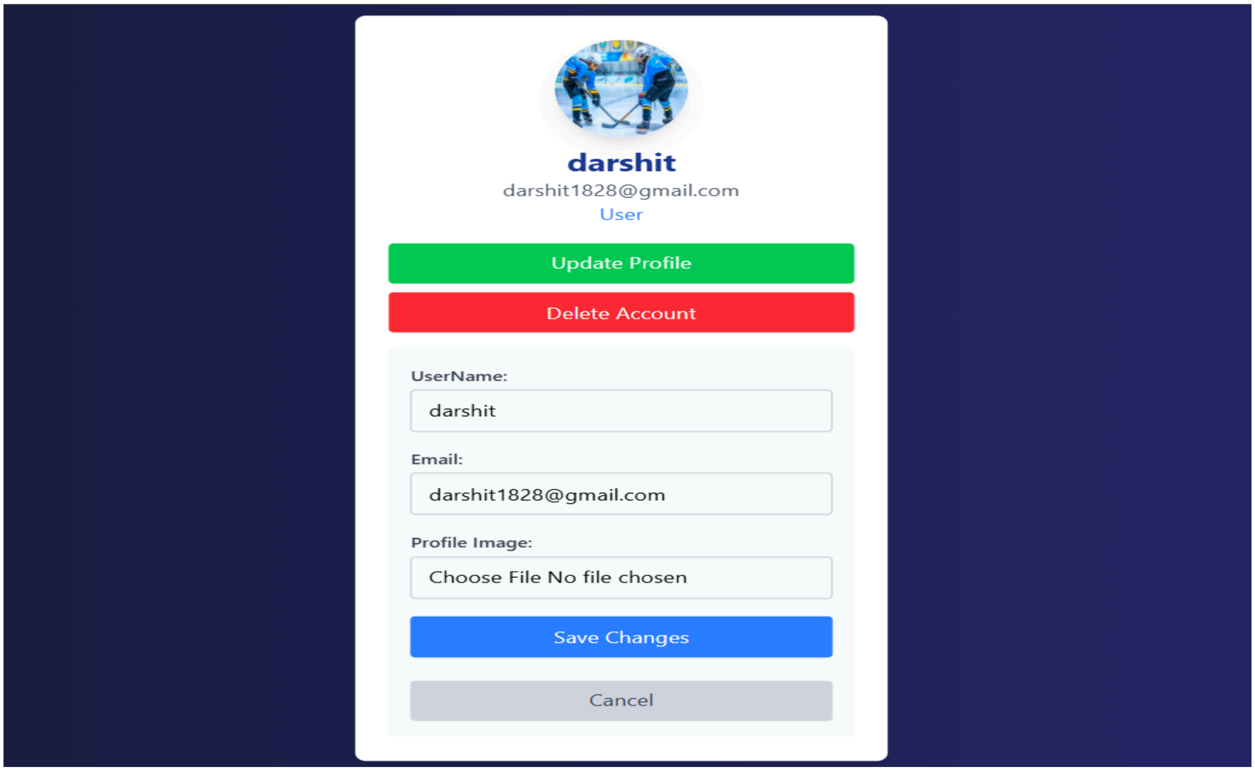
Chhava
Documentary
Chhaava" is a 2025 Hindi-language historical action film directed by Laxman Utekar, featuring Vicky Kaushal as Chhatrapati Sambhaji Maharaj, the second ruler of the Maratha Empire, and Rashmika Mandanna as his wife, Yesubai. The film is an adaptation of Shivaji Sawant's Marathi novel "Chhava" and chronicles Sambhaji's leadership following the death of his father, Chhatrapati Shivaji Maharaj
★ /5

Milan
Documentary
this is famous real life story of greatest of all time honest and middlecalss,talented,smart,good looking guy
★ /5

sanam teri kasam
Romantic
Sanam Teri Kasam (transl. Swear on you, my beloved) is a 2016 Indian Hindi-language romantic drama film written and directed by Radhika Rao and Vinay Sapru. Produced by Deepak Mukut, the film stars Harshvardhan Rane and Mawra Hocane in their Hindi film debuts, with Anurag Sinha, Manish Chaudhari, Murli Sharma and Sudesh Berry. The film is a modern rendition of the legends of Shiva-Sati and novel Love Story by Eric Segal
★ /5

M.S. Dhoni
Documentary
.S. Dhoni: The Untold Story is a 2016 Indian Hindi-language biographical sports drama film directed and co-written by Neeraj Pandey. It is based on the life of former Test, ODI and T20I captain of the Indian national cricket team, Mahendra Singh Dhoni. The film stars the late Sushant Singh Rajput as MS Dhoni, along with Disha Patani, Kiara Advani, and Anupam Kher. The film chronicles the life of Dhoni from a young age through a series of life events.
★ /5

Figure 9.2 :User Home Page



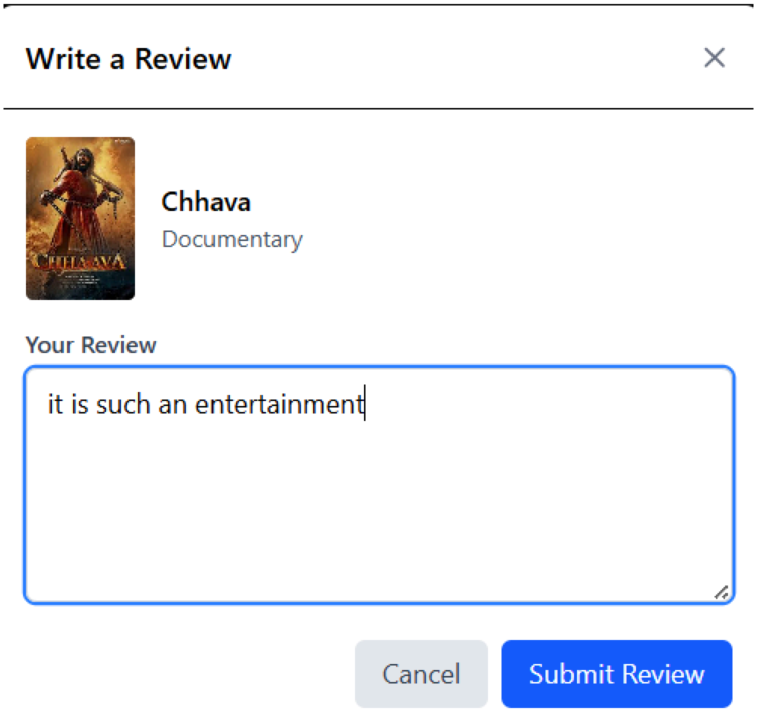
darshit
darshit1828@gmail.com
User

UserName: darshit

Email: darshit1828@gmail.com

Profile Image: Choose File No file chosen

Figure 9.3 : Profile Page



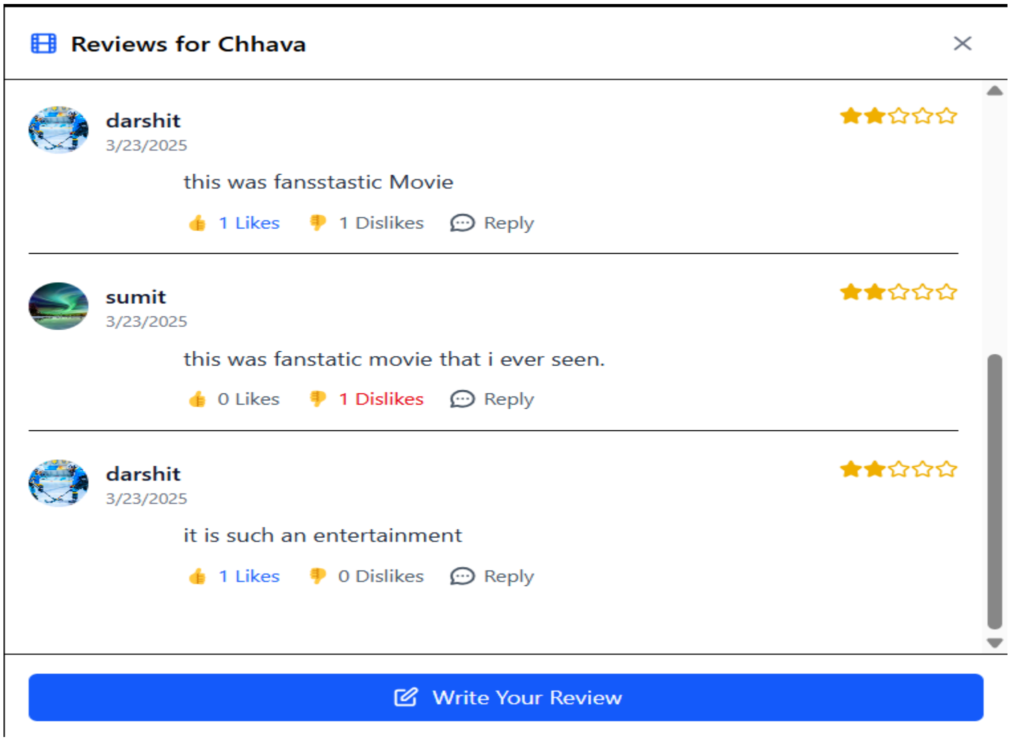
Write a Review

Chhava
Documentary

Your Review

it is such an entertainment

Figure 9.4 : Write Review



Reviews for Chhava

darshit ★★☆☆☆
3/23/2025

this was fansstatic Movie

👍 1 Likes 👎 1 Dislikes 💬 Reply

sumit ★★☆☆☆
3/23/2025

this was fanstatic movie that i ever seen.

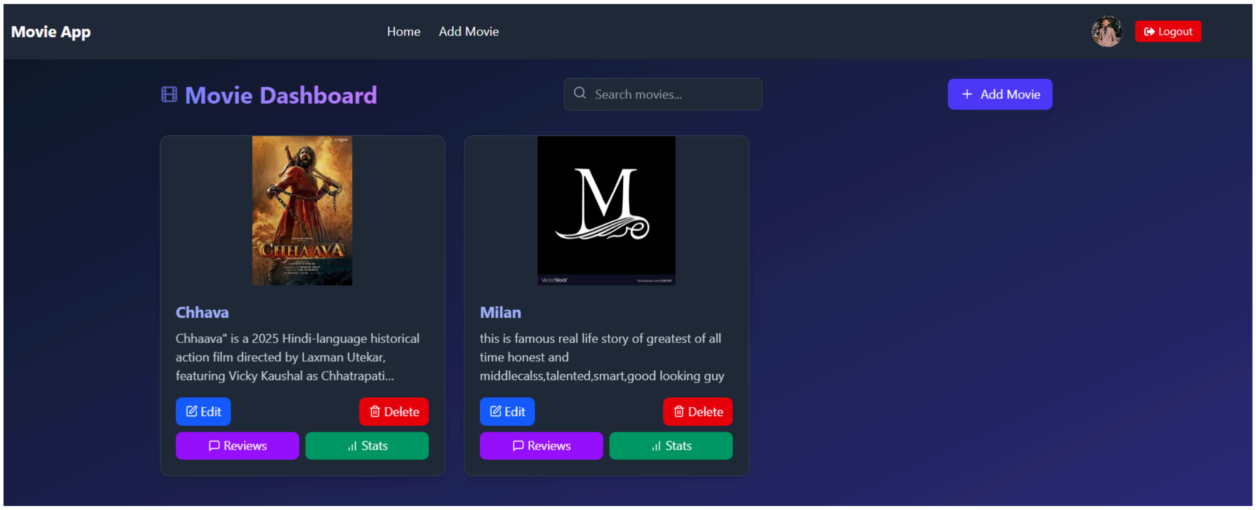
👍 0 Likes 👎 1 Dislikes 💬 Reply

darshit ★★☆☆☆
3/23/2025

it is such an entertainment

👍 1 Likes 👎 0 Dislikes 💬 Reply

Figure 9.5 : View Reviews



Movie Dashboard

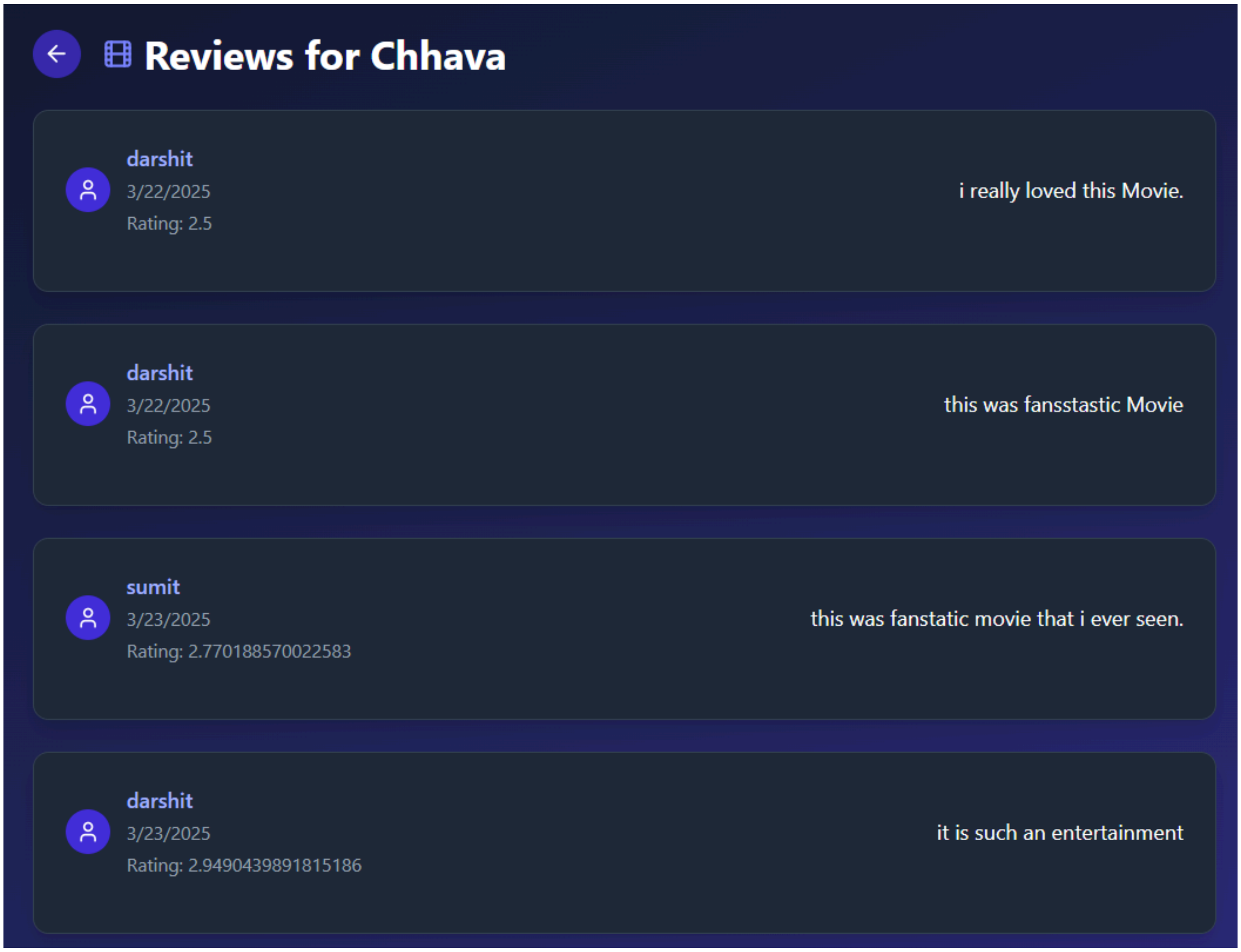
Chhava

Chhaava" is a 2025 Hindi-language historical action film directed by Laxman Utekar, featuring Vicky Kaushal as Chhatrapati...

Milan

this is famous real life story of greatest of all time honest and middlecalss,talented,smart,good looking guy

Figure 9.6 : Producer Home Page



Reviews for Chhava

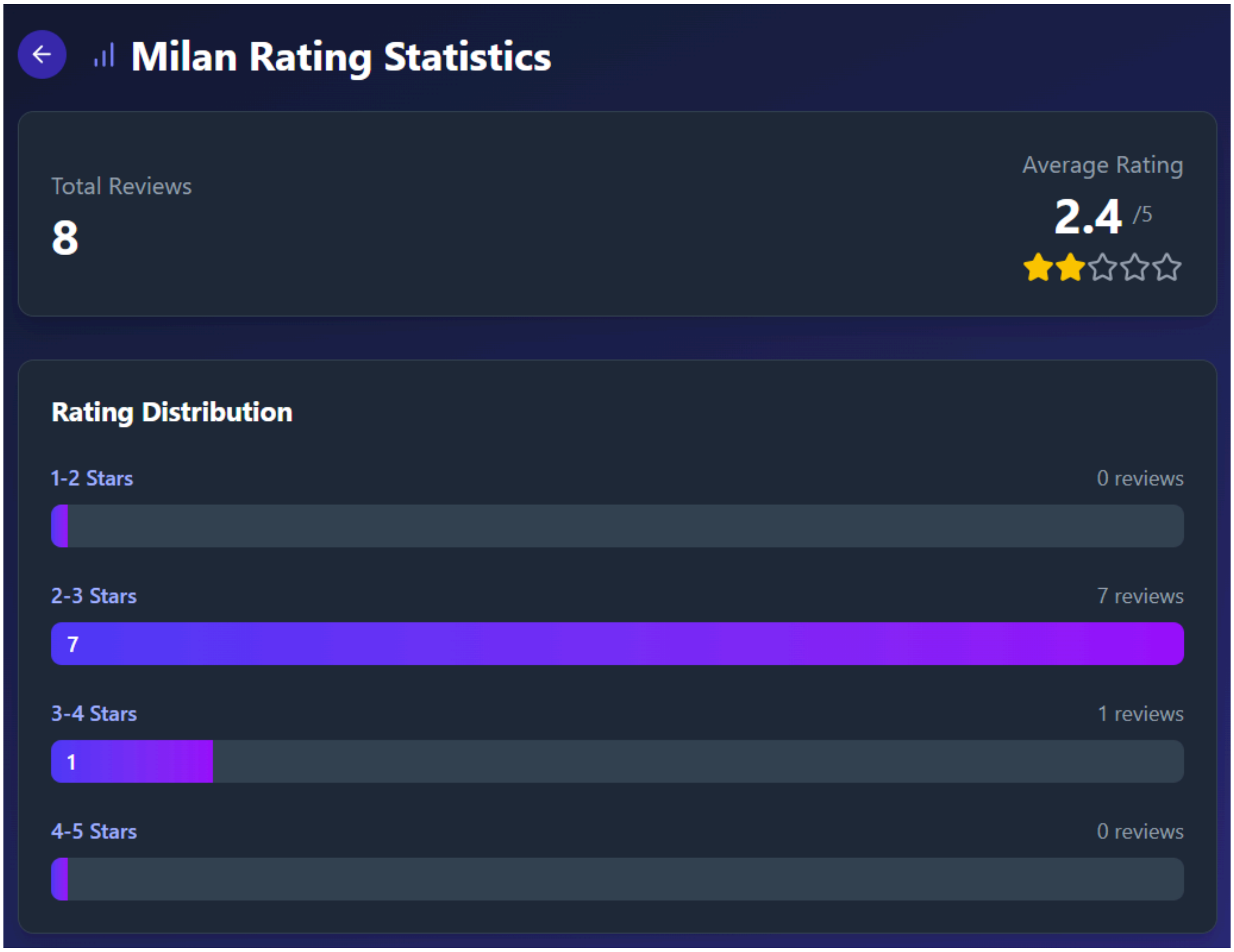
darshit
3/22/2025
Rating: 2.5
i really loved this Movie.

darshit
3/22/2025
Rating: 2.5
this was fansstastic Movie

sumit
3/23/2025
Rating: 2.770188570022583
this was fanstatic movie that i ever seen.

darshit
3/23/2025
Rating: 2.9490439891815186
it is such an entertainment

Figure 9.7 : Producer side Reviews



Milan Rating Statistics

Total Reviews

8

Average Rating

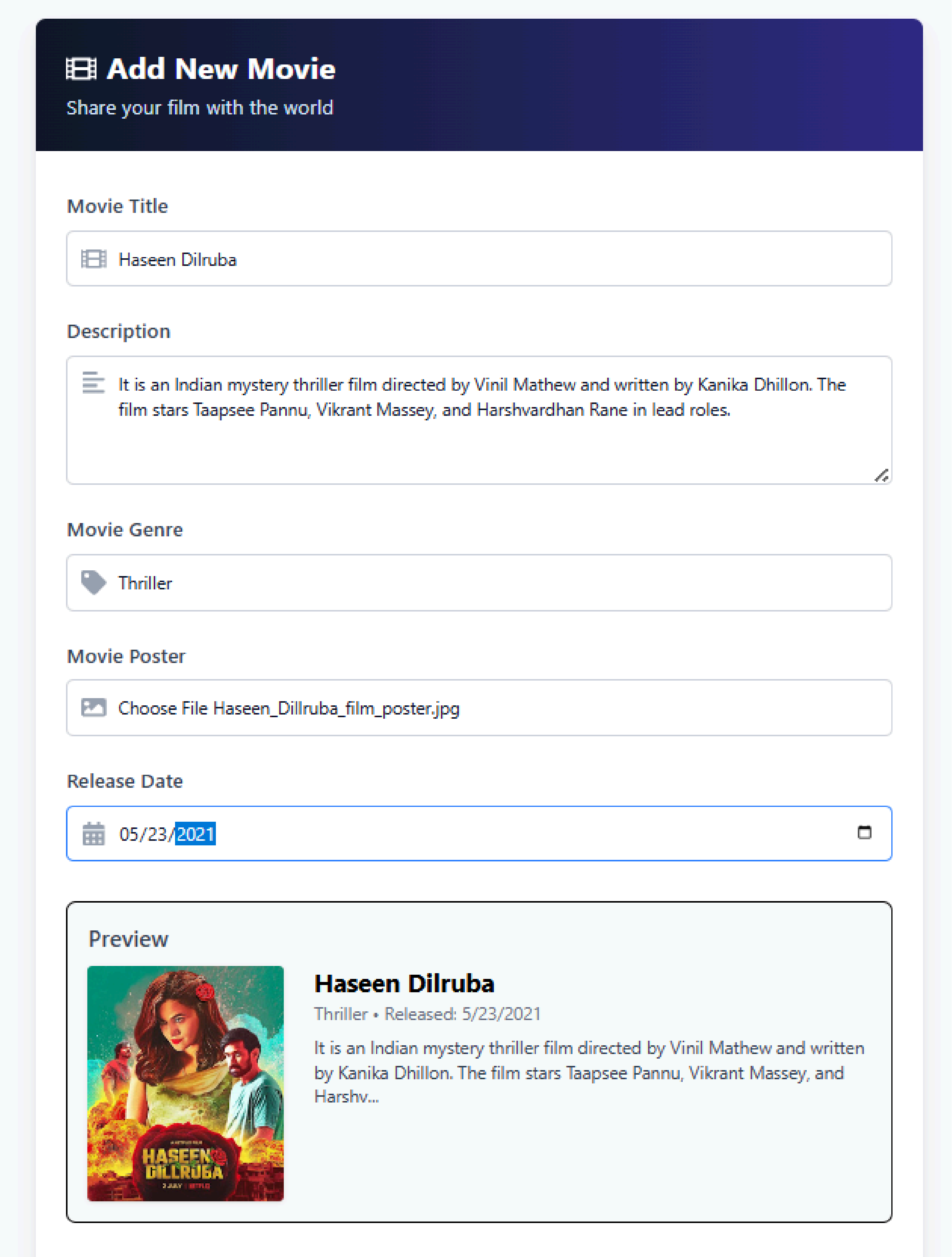
2.4 /5

★★☆☆☆

Rating Distribution

1-2 Stars	0 reviews
2-3 Stars	7 reviews
3-4 Stars	1 reviews
4-5 Stars	0 reviews

Figure 9.8 : Movie Stats



🎞 Add New Movie

Share your film with the world

Movie Title

🎞 Haseen Dilruba

Description

≡ It is an Indian mystery thriller film directed by Vinil Mathew and written by Kanika Dhillon. The film stars Taapsee Pannu, Vikrant Massey, and Harshvardhan Rane in lead roles.

Movie Genre

🏷 Thriller

Movie Poster

🖼 Choose File Haseen_Dillruba_film_poster.jpg

Release Date

📅 05/23/2021

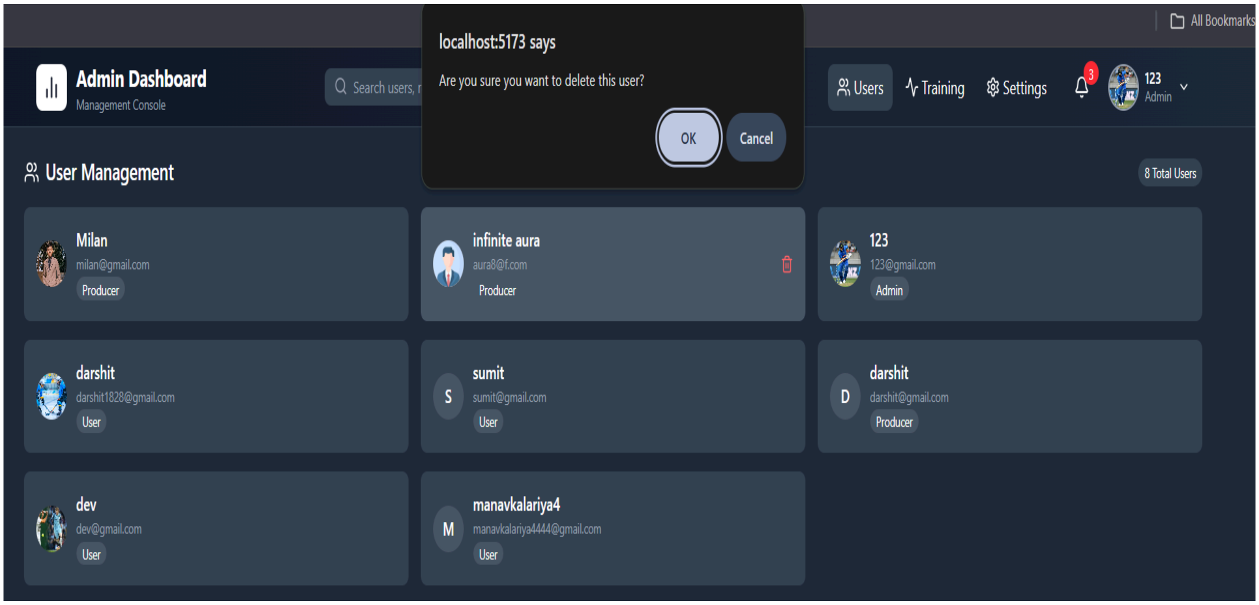
Preview

Haseen Dilruba

Thriller • Released: 5/23/2021

It is an Indian mystery thriller film directed by Vinil Mathew and written by Kanika Dhillon. The film stars Taapsee Pannu, Vikrant Massey, and Harshv...

Figure 9.9 : Add Movie



localhost:5173 says

Are you sure you want to delete this user?

Milan
milan@gmail.com
Producer

infinite aura
aura8@f.com
Producer

123
123@gmail.com
Admin

darshit
darshit1828@gmail.com
User

sumit
sumit@gmail.com
User

darshit
darshit@gmail.com
Producer

dev
dev@gmail.com
User

manavkalariya4
manavkalariya4444@gmail.com
User

Figure 9.10 : Admin Dashboard

10.Test

Test case ID	Test case description	Test steps	Test data	Expected output
TC01	User Registration with valid data	1. Navigate to registration page 2. Enter required details 3. Click Submit button	Username: darshit123<br> Email: darshit@example.com<br>Password: Pass@123<br>	User account should be created successfully and verification email sent
TC02	User Registration with existing email	1. Navigate to registration page<br>2. Enter details with email already in system<br>3.	Username: milan123<br>Email: darshit@example.com<br>Password: Milan@123	Error message: "Email already registered"

		Click Submit button		
TC03	User Login with invalid credentials	1. Navigate to login page 2. Enter incorrect email or password 3. Click Login button	Email: darshit@example.com Password: wrongpass	Error message: "Invalid email or password"
TC04	Search movie by title	1. Navigate to search bar 2. Enter movie title 3. Click Search	Search term: "Inception"	List of movies containing "Inception" in their titles
TC05	Filter movies by genre	1. Navigate to filter section 2. Select genre from dropdown 3. Apply filter	Genre: "Action"	List of Action movies should be displayed
TC06	Write a review for a movie	1. Navigate to movie details page 2. Click "Write Review" 3. Enter review text and rating 4. Submit review	Movie: "Inception" Review: "Great movie with mind-bending plot" Rating: 4.5	Review should be added to the movie

TC07	Like another user's review	1. Browse movie reviews 2. Find a review 3. Click "Like" button	Review ID: R12346	Like count should increase by 1
TC08	Unlike a previously liked review	1. Go to a review you've liked 2. Click "Unlike" button	Review ID: R12346	Like count should decrease by 1
TC09	Update profile information	1. Go to profile page 2. Click "Edit Profile" 3. Update information 4. Save changes	Updated username: "darshit_m" New profile image: profile2.jpg	Profile should be updated successfully
TC10	Add new movie	1. Log in as producer 2. Go to producer dashboard 3. Click "Add Movie" 4. Fill movie details 5. Submit	Title: "Space Odyssey" Description:"Sci-fi adventure" Genre:"Science Fiction" Release date: "2024-03-15" Poster:poster.jg	Movie should be added to the platform
TC11	View reviews for uploaded movies	1. Log in as producer 2. Go to producer dashboard 3. Select a	Movie: "Space Odyssey"	All reviews for the selected movie should be displayed

		movie 4. Click "View Reviews"		
TC12	Approve producer signup request	1. Log in as admin 2. Go to admin dashboard 3. View pending producer requests 4. Select a request 5. Click "Approve"	Producer ID: P12345 Status: "Pending"	Producer account should be activated with status "Accepted"
TC13	View all users	1. Log in as admin 2. Go to admin dashboard 3. Click "User Management"		List of all users should be displayed
TC14	Test LSTM model prediction	1. Submit review text to API 2. Wait for prediction	Review: "This movie was absolutely fantastic with great acting and storyline"	Rating prediction between 4-5
TC15	Test LSTM model with negative review	1. Submit negative review text to API 2. Wait for prediction	Review: "Terrible movie with poor acting and confusing plot"	Rating prediction between 1-2

11. Conclusion

The movie review platform we've developed represents a comprehensive solution that brings together users, producers, and administrators in a cohesive ecosystem. With robust user features for registration, authentication, content discovery, and review management, the platform successfully enables movie enthusiasts to engage with content and share their opinions. For producers, specialized tools facilitate movie management and feedback collection, while administrators benefit from comprehensive oversight capabilities including user management, producer approval workflows, and content moderation tools.

From a technical perspective, the project demonstrates significant achievements through its integration of advanced search and filtering capabilities, LSTM-based sentiment analysis for rating prediction, and security measures including multi-factor authentication. The platform's performance optimization ensures it can handle substantial user loads, while our extensive testing confirms the reliability and robustness of all critical user flows. This project successfully meets its primary goal of creating an interactive environment for movie discovery and discussion, establishing a solid foundation for future enhancements such as recommendation systems or expanded social features.