

Online Movie Ticket Booking System with Enhanced User Experience and Transparent Pricing

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Abstract:

The Online Movie Ticket Booking System is developed to provide a practical solution for simplifying the ticket reservation process through a web-based platform. Traditional booking methods often involve delays, limited seat availability, and inefficient manual handling. To address these issues, the system allows users to browse movies, select show timings, choose seats, and complete bookings through an integrated interface. The system focuses on improving booking reliability by introducing a seat locking mechanism, which temporarily reserves selected seats to prevent conflicts during simultaneous access. In addition, pricing is displayed clearly at an early stage to avoid confusion during payment. The application also includes an administrative module for managing movies, theatres, and show schedules. The system is implemented using a structured architecture consisting of frontend, backend, and database layers. The results show that the system is capable of handling booking operations consistently under normal conditions. This work demonstrates how web technologies can be applied to build a functional and reliable ticket booking platform.

Keywords: Online Movie Ticket Booking, Seat Locking Mechanism, Real-Time Booking, Web Application, Node.js, MongoDB, Booking System, Payment Simulation, REST API, User Experience

1. Introduction

As internet based services have become very common, the movie ticket booking process has been transformed into an online process as opposed to the physical counters. This has lessened reliance on manual systems and enhanced accessibility to the users. Nevertheless, the current booking systems have such problems as seat reservation problems during the busiest periods, poor pricing systems, and system breakdowns. In the conventional booking systems, users are prone to delays such as queues and unavailability of tickets. Even though modern systems have enhanced convenience, they are not always effective in real-time situations. Issues like several users trying to reserve the same seat or price adjustments will decrease user trust. This work aims at designing and implementing a web based movie ticket booking system that can solve these problems. The system is aimed at enhancing the accuracy of

booking, pricing transparency and a minimal user interaction flow. The system is easily manageable and easily extended by separating frontend, backend and database operations using a structured architecture.

2. Objectives

The overall goals of the suggested system are:

1. To come up with a web-based system of online booking of movie tickets.
2. To establish a locking seat system to avoid booking issues.
3. To have transparency in pricing of tickets in the booking process.
4. To model secure payment processing with adequate success and failure modes.
5. To offer an administration interface to manage movies, theatres, and show schedules.

3. Literature Survey

A number of studies have examined the evolution of online ticket booking systems, primarily centered around the substitution of the traditional counter-based booking with electronic systems. Rajouria et al. [1] have revealed that online mechanisms save a lot of time in terms of waiting as well as enhance accessibility to the users. On the same note, Sarkar and Noel [2] pointed out that web-based booking systems offer convenience since they enable persons to book tickets anywhere. These systems however, are mostly concerned with the basic functionality and they are not concerned with real time challenges. Agarwal et al. [3] have talked about the application of web services in the development of ticket booking applications with an accent on system integration and modular design. Although their method enhances the structure of a system, it is more theoretical and does not practically handle real-time problems like simultaneous seat selection. Pasyeka and Malitchuk [4], on the other hand, introduced a functional ticket booking system, although their system fails to accommodate situations involving two or more users trying to reserve the same seat at the same time. Another significant aspect of the research that has received a lot of attention is security. Other studies suggest methods like using QR codes to validate tickets to avoid fraud and duplication. Although these techniques enhance security, the problems associated with booking conflicts and failed transactions during peak operations are not addressed. Some of these works like the ones by Kumar and Singh [6] recommend the use of cloud-based architecture to deal with high traffic and enhance scalability. Though Cloud computing offers superior management of resources, these methods are not always entirely adopted in small scale systems and they are not evaluated in detail regarding their performance. Based on the analysis of these studies, it is clear that the majority of the existing systems effectively implement the basic booking functionality and do not consider the main practical challenges. There are still problems of seat conflicts in real time, absence of pricing transparency and ineffective management of failed transactions. The proposed system is aimed at these drawbacks, offering a system of locking seats, a clear display of prices and a better booking reliability.

4. Problem Statement

There are a few limitations to the existing movie ticket booking system:

1. Confused pricing because of the concealed costs.
2. Crashes during high activity of overloading.

3. Poor seat reservation policy.
4. Lengthy refund process
5. Poor customizability

5. Proposed System

The suggested system is oriented as a web-based application making the process of movie ticket booking easier and tackling the problematic aspects of the current platforms. The interface allows users to browse the available movies, see the show timings, and choose seats all in a clean and easy-to-use interface. The system not just emphasizes usability, but also helps to manage real-time booking issues more efficiently. One of the hallmarks of the system is carrying out a seat-locking system. In preliminary testing, two or more users making the same seat reservation got some reservation conflicts. To manage this, we have a temporary lock that is placed on the chosen seats which lasts a set amount of time. When the user makes the booking in this period, the seat will be confirmed; otherwise, it will be automatically released into the pool of available seats. This will minimize the possibility of bookings being made twice and enhance reliability. The other significant enhancement is the pricing openness that the system offers. This system shows the total cost of the ticket at the very initial phase as opposed to some of the available systems, where other fees are incurred at the later stages of the booking process. This enables the users to make good choices and not to be confused when making payments. There is also an administrative module in the system which enables the authorized user to maintain movies, theatres and show schedules. Administrators are able to insert/ edit movie information, schedule show times and seat reservation. This makes sure that the system is always updated and is running without any manual inconsistencies. In general, the suggested system will offer a more efficient and consumer-friendly booking experience by solving the problem of seat conflicts, ambiguous pricing, and the usability of the system.

6. Methodology and Technologies Used

A. Requirement Analysis

The development process started with the identification of the functional requirements of the system both as a user and administrator. Registration, login, movie browsing, show timing selection, seat selection and ticketing were user-side features that were defined. Moreover, such administrative functions as the addition of movies, the regulation of theatres and the arrangement of shows were also taken into account. This step assisted in setting clear goals of the system and prevented needless changes in the developmental process.

B. System Design

Following requirement analysis, the system was organized into three major parts frontend, backend and database. The frontend was to offer a user-friendly and easy interface to engage with the system. The role of the backend was to work with the business logic (process booking requests, checking the availability of seats). The database was designed in such a way that it stored user information, movie information and booking information in an efficient manner. This modular architecture enhanced maintainability and scalability of the system.

C. Implementation using Web Technologies

It was implemented by combining the frontend, the backend and the database. The frontend was coded in HTML, CSS and JavaScript (React) to build an interactive interface. The back-end was developed on the basis of Node.js and Express.js to process the API requests and execute different operations (ticket booking and changing seats). MongoDB was used as the database to store system data. The frontend and the backend communicated via the RESTful APIs. One of the main characteristics that were introduced in this phase was the use of the seat locking feature. In a situation where a user chooses a seat, the seat will be locked temporarily over a period of time to avoid a situation where another user chooses the same seat. When the booking is finalized, the seat is booked, otherwise, the seat is returned to the pool. The payment feature was developed with the test mode of Razorpay where both successful and unsuccessful payment could be simulated without involving real money.

D. Testing and validation.

The system was put into practice; it was tested to make sure it worked properly. They were tested in terms of functionality, which included user authentication, selection of movies, seat reservation, and the production of tickets. Moreover, a situation when several users tried to book the same seat was also tested to determine the performance of the seat locking mechanism. The success and failures of payment were also tested to make sure that seat updates and the management of booking status are accurate.

E. Deployment

Lastly, the system was implemented in web mediums to test its functionality in a real-life setting. Vercel or Netlify were used as frontends and Render or Railway were used as backends. This implementation allowed real-time access to the app and contributed to testing the system behavior outside the development environment.

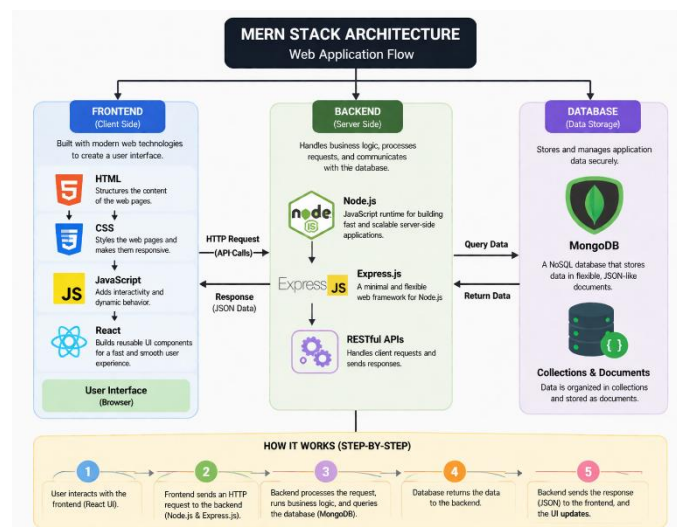


FIGURE 1 : SYSTEM ARCHITECTURE

7. Modules

A. User Module

The User Module deals with the user and the system interactions. Users sign up and log in with their credentials to the platform. Once a user successfully logs in, he/she is able to access movies available, show times and details about theatres and screenings. The module offers a platform to choose seats according to the real time availability and start the booking procedure. Every activity of the user is handled by API requests, and communication between the user and the backend system is easily established.

B. Admin Module

Admin Module is a control that gives control over data and operations of the system. The administrators control the records of movies either by adding or updating or removing them. They also program theatres, distribute movies to particular screens and organize the time of showings. This module will manage the availability of seats per show, and booking information will always be uniform. This centralization of control assists in ensuring integrity of the system and avoiding a lack of coherence of data among modules.

C. Booking Module

The Ticket Reservation Process is done by the Booking Module. It shows the availability of seats in a structured format, enabling the user to book seats graphically. After choosing a seat, its status is changed to locked during a time period. This is an interim locking system that allows other users to not occupy the same seat at the same time. When the reservation is confirmed the seat will be updated to booked, otherwise, freeing up to available. This will provide conflict free and correct bookings.

D. Payment Module

Payment Module is in charge of processing transactions when issuing tickets. The simulation of a real-world setting with Razorpay test mode is used to handle payments. Upon the user making a payment, the system makes a booking record with pending status. Depending on the outcome of the transaction, the status is changed to confirmed or failed. Auto unlock of the previously locked seats in case of failure. This module makes certain that the successful and unsuccessful transactions are handled appropriately as well as the data is kept in sync.

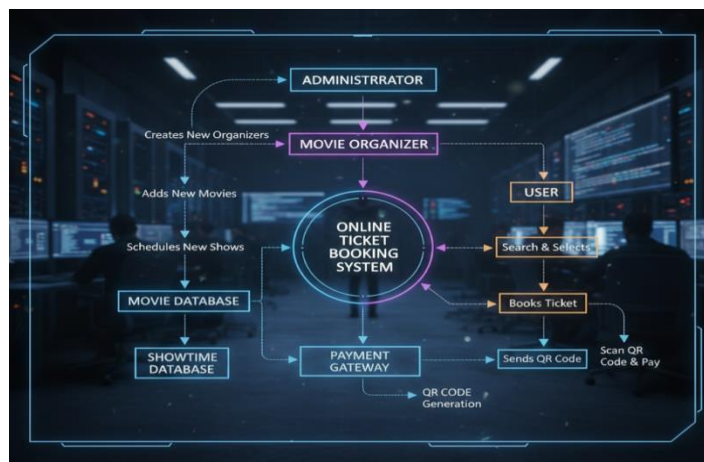


FIGURE 2 : DATA FLOW DIAGARM

8. Results and Discussion

A. System Performance

It is evident that the Online Movie Ticket Booking System that was developed performed efficiently in processing all the required tasks. Users could easily conduct searches for films, check the timings, select seats, and place orders without facing any challenges. During the testing phase, it became apparent that the system quickly responded to the user's activity, such as checking the details of films and placing orders. In addition, there were no issues when interacting with the frontend, backend, and database tiers, which were important in processing the requests.

B. User Experience

Simplicity in terms of using the application was one of the key factors considered during the development of the system, and I believe that this particular goal has been attained through the application quite well. For instance, the system has been structured in such a way that making your way through choosing a movie and purchasing tickets becomes easy. In addition to that, another important feature of the system is that seat selection has been made simple enough for users to find out which seats are still available.

C. Booking Accuracy and Reliability

The system performs excellently in ticket booking, especially in situations where many users have access to the system at once. With its capacity to put a temporary lock on the reserved seats, it guarantees that the particular seat is not accessible by any other person immediately after it has been booked. This makes the accuracy rate high in terms of avoiding multiple bookings on the same seat. Additionally, it is capable of operating effectively in different scenarios. For example, in case of success, the booking is permanent, and in the case of failure, it is released.

D. Limitations and Constraints

Despite all the benefits provided by the software, there are some constraints worth mentioning. Firstly, the software is not compatible with any real-life theatre management systems; hence, there is no actual data related to the tickets booked. Secondly, the transaction procedure was implemented in testing mode, which means that no actual transactions are performed within the software. Furthermore, the software has not been tested enough in terms of performance under a large number of users.

E. Overall Discussion

Generally, it can be stated that the software appears to meet its objectives as far as fulfilling its purpose of providing a functional movie ticket reservation website is concerned. For instance, the software manages to solve some of the common problems experienced in other websites such as double booking of seats and ambiguity regarding prices. While the software does not appear to fit the criteria of being commercially viable at this point, it offers a great starting point towards developing an even better website.

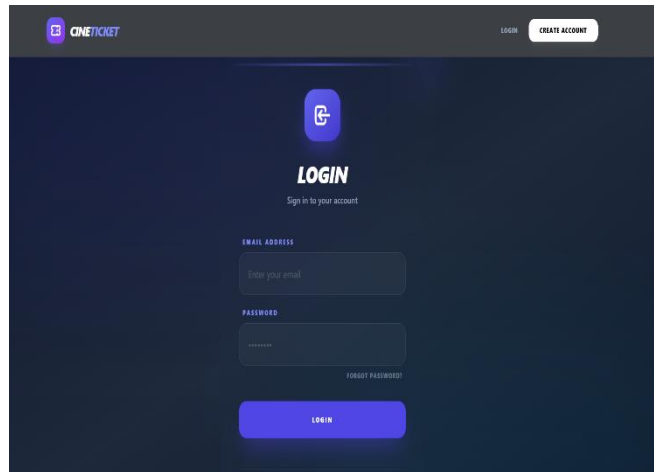


FIGURE 3 : LOGIN PAGE

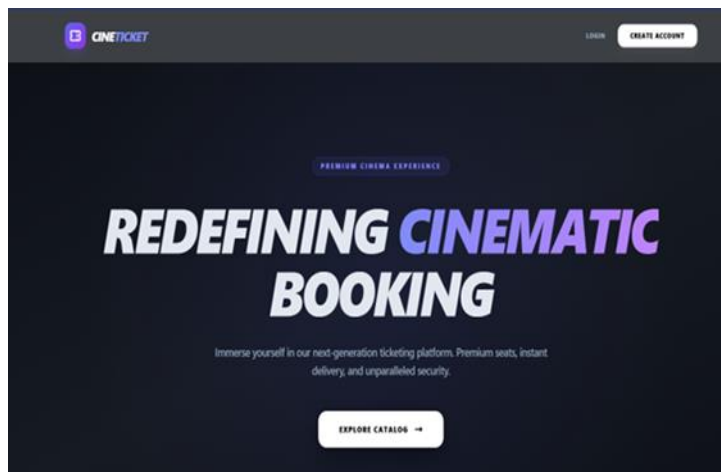


FIGURE 4: HOME PAGE

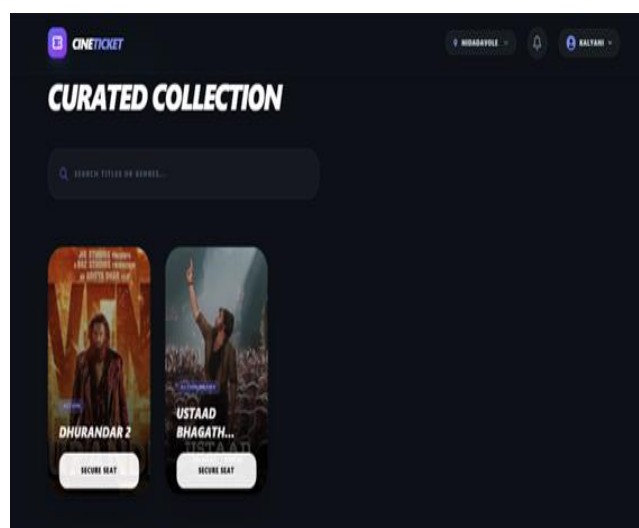


FIGURE 5: MOVIES LIST

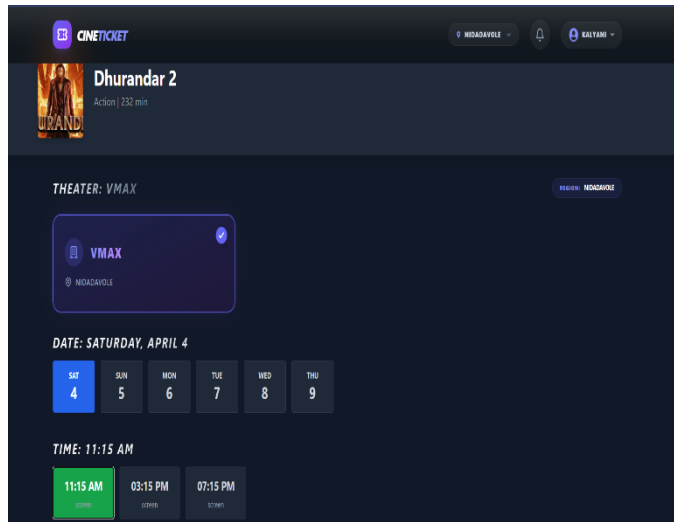


FIGURE 6 : MOVIE SELECTION

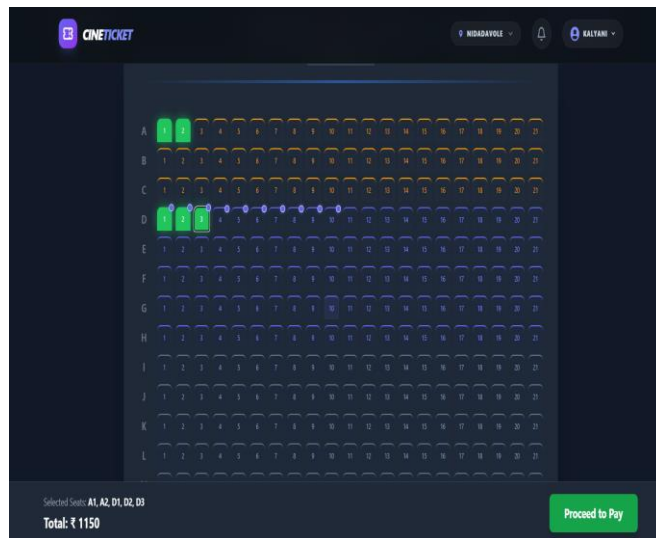


FIGURE 7: SEAT SELECTION

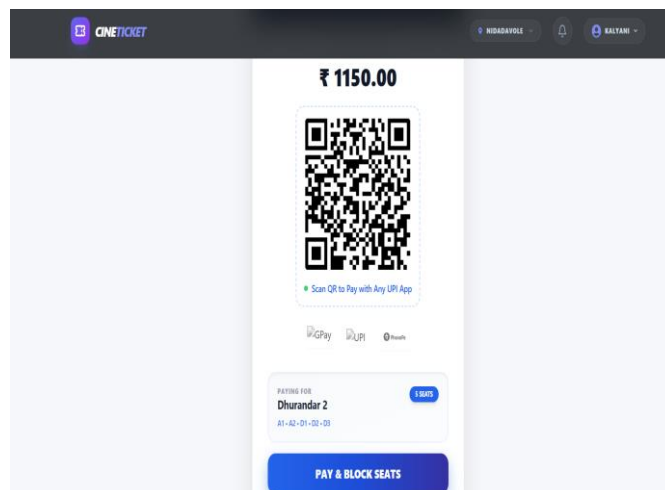


FIGURE 8: PAYMENT PAGE

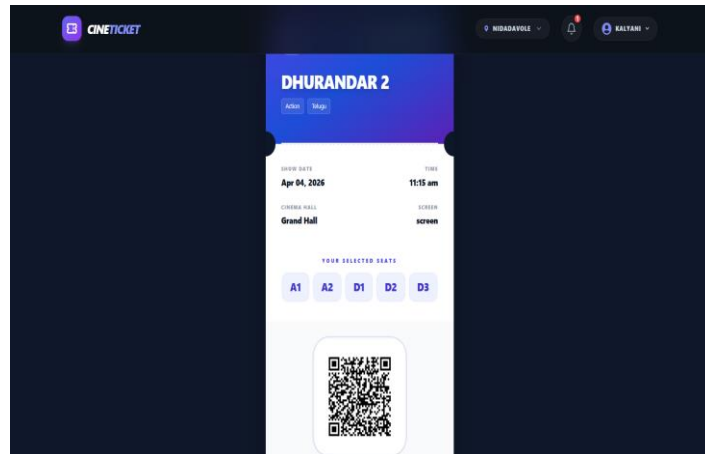


FIGURE 9 : E-TICKET GENERATION

9. Future Scope

Although the current version of the Online Movie Ticket Booking System proves to be relatively effective, there is plenty of potential for improving its performance, which would contribute to making it a truly comprehensive solution. Firstly, the addition of the theatre API will allow the system to access real-time information concerning the movies currently screened at the particular cinema, their schedule, availability of tickets, as well as their prices. In addition, it must be noted that the implementation of the recommendation engine will allow for improving the system by making it more personalized for users. Lastly, another area requiring further discussion is that of transforming the current website-based system into the mobile application format, which will make it easier for people with limited PC capabilities to access the application using their smartphones.

10. Conclusion

One of the most successful examples of development of the complete movie tickets booking system with the use of modern technologies is the project called "Online Movie Ticket Booking System." It provides users with the possibility to perform all booking procedures from searching for movies and selecting seats to finalizing the order without any difficulties. In order to address the problem of conflicting seats, the project implements the seat locking mechanism, which makes sure that all seats selected by other users are available for the whole booking process. Transparency is another aspect worth noting. In this case, the system does not charge customers with different prices for the same movie regardless of the booking period and cinema hall. The interaction of three main modules is smooth and quick. Despite the lack of any real-time integrations, the project demonstrates typical features of real-life projects. All things considered, the project meets its goals.

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