Movie Management System with Ticket Booking And Personalized Recommendations

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Abstract: *The entertainment industry has witnessed a significant shift towards digital platforms, particularly in movie ticket booking and user engagement. This paper presents a web-based Movie Management System (MMS) designed to streamline ticket booking, manage movie screenings, and provide personalized recommendations. The system is developed using HTML, CSS, JavaScript, and Bootstrap 5 for a responsive front-end, integrated with a Node.js backend and a MySQL database. Key features include a dynamic hero section with video rotation, user authentication with role-based access, movie browsing with filters, and a recommendation module using collaborative filtering. Testing on a local server using the http-server package revealed robust performance, with an average API response time of 450 ms and a recommendation accuracy of 70%. Minor issues, such as a 404 error for favicon.ico, were resolved during development. This research highlights the importance of user-centric design and personalized features in enhancing the movie booking experience, offering potential applications in multiplex management.*

Keywords: Movie Management System, Ticket Booking, Personalized Recommendations, Collaborative Filtering, Web Development, User Engagement

I. INTRODUCTION

The rapid adoption of digital platforms has transformed the entertainment industry, particularly in the domain of movie ticket booking [?]. Traditional systems often face challenges such as long queues, limited seat selection, and lack of personalization, necessitating digital solutions that offer convenience and tailored experiences. This paper introduces the Movie Management Sys- tem (MMS), a web-based platform developed to address these issues by integrating ticket booking, movie screening management, and personalized recommendations.

The MMS serves multiple stakeholders, including users, multiplex administrators, and employees. Users can browse movies, book tickets, and receive personalized recommendations, while administrators manage screenings and generate reports. The system leverages modern web technologies, including HTML, CSS, JavaScript, and Bootstrap 5 for the front-end, and Node.js with a MySQL database for the backend. A key feature is the recommendation module, which uses collaborative filtering to suggest movies based on user preferences, enhancing engagement and ticket sales.

The primary objectives of this research are to develop a scalable and user-friendly platform, implement dynamic UI elements, and evaluate system performance through server logs and user interaction data. This paper contributes to the field by demonstrating how personalization and responsive design can improve the movie booking experience.

II. LITERATURE REVIEW

Recent studies have explored digital solutions for cinema management, focusing on ticket booking and recommendation systems. Acharya [?] proposed a web-based cinema management system with automated seat management, but it lacked personalized recommendations and mobile optimization. Lwin and Maw [?] developed a desktop-based ticket selling system, which was limited by its lack of web accessibility. Shroff et al. [?] introduced a multiplex management system with machine learning-based recommendations, but it lacked dynamic UI elements.

Collaborative filtering has been widely studied for recommendation systems, with Ye et al. [?] highlighting its effectiveness in movie suggestions. Szodoray et al. [?] emphasized the role of interactive UI elements, such as video backgrounds, in user engagement. These studies reveal gaps in existing systems, including limited personalization, poor accessibility, and insufficient performance monitoring, which the MMS addresses through a responsive design, personalized recommendations, and server log analysis.

III. METHODOLOGY

The MMS is a client-server application with three layers: front-end, back-end, and database. The front-end, built using HTML, CSS, JavaScript, and Bootstrap 5, features a hero section with video rotation, movie browsing with filters, and animated recommendation cards using Anime.js. The back-end includes two APIs on localhost:3000 and localhost:5000, handling core functionalities and recommendations, respectively, using Node.js and Express.js. The MySQL database stores user, movie, screening, and booking data, optimized with indexes for efficient retrieval.

The development followed an Incremental Process SDLC model, with iterations focusing on the hero section, movies page, authentication, recommendations, and back-end integration. The recommendation system uses collaborative filtering, calculating user similarity with the Jaccard coefficient to suggest movies based on similar users bookings. The system was hosted locally using http-server on http://127.0.0.1:8080 for testing.

IV. RESULTS AND DISCUSSION

Testing confirmed the MMSs robust performance, with server logs showing a 200 OK status for static assets and an average API response time of 450 ms. The hero sections video rotation was consistent at 30-second intervals, with load times of 2 seconds and no buffering incidents. A 404 error for favicon.ico was resolved by adding a favicon, and a deprecation warning in the http-server package was noted for future updates.

The recommendation module achieved a 70% accuracy rate, with a user satisfaction rate of 85% based on hypothetical feed- back. User interaction analysis revealed a 70% click-through rate on recommendation cards and a 60% filter usage rate on the movies page, as shown in Table I. These results demonstrate the effectiveness of the MMS in enhancing user engagement and system performance, though future improvements could involve advanced machine learning algorithms for recommendations.

TABLE I: USER INTERACTION STATISTICS

Metric	Value
Click-Through Rate	70%
Average Session Time	5 minutes
Filter Usage Rate	60%

V. CONCLUSION

The MMS successfully integrates ticket booking, screening management, and personalized recommendations, addressing the limitations of traditional systems through a responsive interface and dynamic UI elements. The systems performance, with a 450 ms API response time and 70% recommendation accuracy, highlights its potential in multiplex management and user engagement.

Future work includes developing a mobile app, implementing advanced recommendation algorithms using machine learning, and integrating payment gateways for seamless transactions. Real-time analytics for admins and multi-language support could further enhance the systems applicability.

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