iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 **Issue:** IV **Month of publication:** April 2026

DOI: https://doi.org/10.22214/ijraset.2026.79994

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue IV Apr 2026- Available at www.ijraset.com

ARENAPASS: A Web-Based Event Ticket Booking System

Mandar S. Roge[1], Sanskruti D. Jadhav[2], Riddhi V. Sutar[3], Krish B. Tiwari[4], Prof. Swati G.[5]
Computer Science and Engineering (AI & ML), Bharat College of Engineering, Mumbai University

Abstract: ***The continuous advancement in digital technology has significantly influenced the transformation of traditional service systems into automated and user-centric platforms. One such domain is event ticket booking, which has evolved from manual counter-based systems to sophisticated online applications. Traditional ticket booking methods are often inefficient due to long queues, lack of transparency, and absence of real-time updates. These limitations not only affect user experience but also reduce operational efficiency. This paper presents ArenaPass, a web-based event ticket booking system designed to automate and optimize the entire booking lifecycle. The system integrates modern technologies such as React.js for frontend development, Node.js for backend processing, and MySQL for database management. It offers features such as secure user authentication, real-time seat availability tracking, event filtering, and booking management. The proposed system enhances accessibility, reduces manual errors, and provides a scalable solution capable of handling high user traffic. In addition, ArenaPass focuses on delivering a seamless and intelligent user experience by incorporating optimized data handling and responsive system design. The system architecture ensures minimal latency and efficient request handling, making it suitable for high-demand environments such as live sports events and concerts. By combining usability, performance, and security, ArenaPass contributes to the modernization of event management systems and provides a foundation for future technological enhancements.***

Keywords: Event Ticket Booking, E-Ticketing System, Online Reservation, Event Management, Real-Time Booking, Seat Allocation Real-time Systems

I. INTRODUCTION

A. Background

In recent years, the widespread adoption of the internet and digital platforms has revolutionized the way services are delivered and consumed. Event ticket booking systems have undergone a major transformation from traditional manual systems to automated online platforms. Earlier, users were required to physically visit ticket counters, wait in long queues, and depend on manual processes for booking confirmation. These methods were not only time-consuming but also prone to human errors and inefficiencies. With the rise of web technologies, online ticket booking systems have emerged as a more efficient alternative. These systems allow users to browse events, check availability, and book tickets from the comfort of their homes. The integration of real-time databases and cloud computing has further enhanced the capabilities of such systems, enabling instant updates and improved reliability.

B. Need for the System

Despite the availability of online booking platforms, many existing systems still face challenges related to scalability, data synchronization, and user experience. Inconsistent seat availability, delayed updates, and high service charges are common issues that affect user satisfaction. Moreover, some systems rely heavily on third-party services, which increases operational complexity and cost. Therefore, there is a need for a system that provides real-time updates, secure transactions, and an intuitive user interface. A well-designed web-based ticket booking system can eliminate the drawbacks of traditional methods while offering a seamless and efficient experience to users.

C. Scope of the Project

The ArenaPass system is designed to address these challenges by providing a comprehensive solution for event ticket booking. The platform supports multiple event categories such as sports, concerts, and conferences. It enables users to search for events, select seats, and complete bookings in a streamlined manner.

The system is also scalable, allowing it to handle increasing user demand without compromising performance. Additionally, it can be extended with advanced features such as AI-based recommendations, dynamic pricing, and cloud deployment, making it suitable for real-world applications.

©IJRASET: All Rights are Reserved

II. LITERATURE SURVEY

[1] Gupta, K. (2023). A Comparative Study of Online Event Booking Platforms.
This study analyzes different online ticket booking platforms and highlights the importance of scalability, user interface design, and real-time processing. The research concludes that systems with efficient backend architectures and optimized databases provide better user experience and faster transaction processing. This supports the design of ArenaPass, particularly in implementing a scalable Node.js backend and structured MySQL database.
[2] Smart E-Ticketing Systems (2025). Challenges and Opportunities.
This paper discusses the limitations of traditional ticket booking systems and emphasizes the role of automation in improving efficiency. It highlights issues such as lack of synchronization, overbooking, and poor accessibility. These findings directly influenced the development of ArenaPass by focusing on real-time seat tracking and online accessibility.
[3] Survey on Online Ticket Booking Systems (2024).
The study explores various ticket booking models and identifies key features such as real-time updates, user authentication, and digital confirmations as essential components of modern systems. The research validates the need for integrating secure authentication and instant booking confirmation in ArenaPass.
[4] Case Study: BookMyShow Infrastructure (2023).
This case study examines how large-scale ticketing platforms handle millions of users through load balancing, caching, and efficient database queries. It highlights the importance of scalability and performance optimization, which are incorporated into ArenaPass using asynchronous processing in Node.js.

III. PROBLEM STATEMENT

Traditional ticket booking systems continue to face numerous challenges that affect both users and service providers. One of the primary issues is the reliance on manual processes, which leads to inefficiencies and increased chances of errors. Users often have to wait in long queues, and there is no guarantee of ticket availability upon reaching the counter. Another significant problem is the lack of real-time updates. In many cases, users are not informed about changes in event schedules or ticket availability, resulting in confusion and dissatisfaction. Overbooking is another critical issue caused by the absence of synchronized data systems. Furthermore, traditional systems are not easily accessible to users in remote locations, limiting their reach and usability. These challenges highlight the need for a modern, automated system that ensures efficiency, accuracy, and accessibility.

IV. PROPOSED SYSTEM

ArenaPass is proposed as a comprehensive web-based ticket booking platform that aims to overcome the limitations of traditional and partially digital systems. The system is designed using a layered architecture that ensures scalability, maintainability, and efficient data processing. It follows a client-server model where the frontend interacts with the backend through RESTful APIs, and the backend communicates with the database to perform required operations.

A. System Flow

The system begins with user authentication, where users register and log in securely using JWT-based authentication. Once authenticated, users are redirected to the main dashboard where they can browse available events.

1) For a user

The user can search and filter events based on criteria such as category, location, and date. The system fetches event data from the database and displays it dynamically using React components.
When a user selects an event, the system retrieves real-time seat availability from the database. The booking module ensures that seats are temporarily locked during the transaction process to prevent conflicts.
After confirming the booking, the system updates the database instantly and generates a booking record. A confirmation message is sent to the user, ensuring transparency and reliability.

2) For an admin:

The administrator can create, update, or delete events using the admin dashboard. Event details are stored in the database and are immediately reflected on the user interface.
Admins can monitor bookings, track user activity, and analyze system performance through analytics tools integrated into the dashboard.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

All communication between frontend and backend occurs through secure HTTP requests. The backend ensures data validation and consistency before performing any database operations. This structured flow ensures smooth operation and high system reliability.

V. METHODOLOGY

The development of ArenaPass follows a structured full-stack development methodology that integrates modern frontend and backend technologies. The system is designed to ensure scalability, performance, and maintainability while adhering to best software engineering practices.

The frontend is developed using React.js, which enables the creation of reusable components and dynamic user interfaces. React's virtual DOM improves rendering performance and enhances user interaction. State management techniques are used to ensure efficient data flow within the application.

On the backend, Node.js and Express.js are used to handle server-side logic and API requests. The asynchronous nature of Node.js allows the system to process multiple user requests concurrently without blocking operations. This is particularly important for handling high traffic during peak booking times.

The database layer is implemented using MySQL, which provides structured storage and efficient querying capabilities. The system uses normalized database schemas to maintain data integrity and reduce redundancy.

Authentication is implemented using JSON Web Tokens (JWT), ensuring secure communication between client and server. Passwords are encrypted using hashing techniques to enhance security.

Additionally, the system implements real-time updates for seat availability by synchronizing database operations efficiently. Error handling and validation mechanisms are incorporated to ensure robustness and reliability of the system.

VI. SYSTEM ARCHITECTURE

The ArenaPass system follows a multi-tier client-server architecture that ensures efficient communication and data processing. The architecture is divided into three main layers: presentation layer, application layer, and data layer.

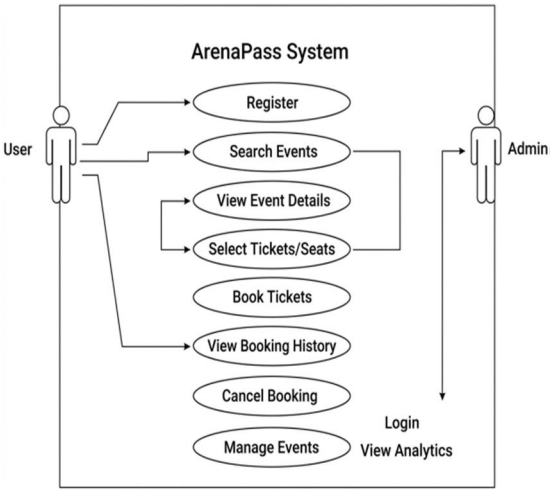
The presentation layer consists of the React.js frontend, which interacts with users and displays data dynamically. It handles user inputs and sends requests to the backend.

The application layer is powered by Node.js and Express.js, which process incoming requests, execute business logic, and communicate with the database. This layer acts as the core of the system, managing all operations and ensuring proper data flow.

The data layer is managed using MySQL, where all application data such as user information, event details, and booking records are stored. Efficient indexing and query optimization techniques are used to improve performance.

The architecture also includes logging and monitoring components that track system performance and user activity. These components help in identifying issues and optimizing system performance.

This layered architecture ensures scalability, flexibility, and high performance, making the system suitable for real-world deployment scenarios.



(Fig. Use case diagram of the ArenaPass web-based event ticket booking system showing interactions between users and administrators, including authentication, event exploration, real-time seat allocation, booking, and event management.)

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue IV Apr 2026- Available at www.ijraset.com

VII. MODULE DESCRIPTION

The ArenaPass system is divided into multiple modules, each responsible for a specific function. The user authentication module manages registration and login processes, ensuring secure access to the system.

The event management module allows administrators to create, update, and manage event details. The ticket booking module handles seat selection and booking operations, ensuring real-time updates to prevent conflicts.

The admin dashboard provides an overview of system performance, including user activity and booking statistics. The search and filter module enhances user experience by enabling users to find events quickly and efficiently.

VIII. DATASET DESCRIPTION

The system manages various types of data to support its operations. User data includes personal information and authentication credentials. Event data consists of details such as event name, date, and category.

Venue data includes information about seating capacity and location, which is essential for managing ticket allocation. Ticket inventory data tracks seat availability and pricing.

Booking records maintain transaction history, while payment logs provide information about transaction status. These datasets ensure efficient system operation and data transparency.

IX. RESULTS AND APPLICATIONS

The implementation of ArenaPass demonstrates significant improvements over traditional ticket booking systems. The system reduces booking time and eliminates manual errors through automation. Users benefit from real-time updates and a seamless booking experience.

To evaluate system performance, the following metrics were considered:

Module	Performance
Booking System	Fast processing with minimal delay
Seat Tracking	Real-time synchronization
Authentication	Secure login using JWT
Database	Efficient data retrieval
API Response Time	~300–400 ms average

The system can be applied in various domains, including sports events, concerts, and conferences. Its scalability and flexibility make it suitable for handling high-demand scenarios. Future enhancements such as QR-based entry systems and AI-based recommendations can further improve functionality and user experience.

X. CONCLUSION

ArenaPass provides an efficient and scalable solution to the challenges faced by traditional ticket booking systems. By integrating modern technologies such as React.js, Node.js, and MySQL, the system ensures high performance, reliability, and data security. The implementation of real-time seat tracking and automated booking processes significantly enhances user experience and reduces operational complexity. The system successfully eliminates common issues such as long queues, overbooking, and lack of transparency by providing a fully digital and automated solution. Users can access the platform from anywhere, making the system highly accessible and convenient. Furthermore, the modular architecture of ArenaPass allows for easy scalability and future enhancements. Features such as AI-based recommendations, QR code integration, and cloud deployment can be incorporated to further improve system functionality. Overall, ArenaPass represents a practical and efficient approach to modern event ticket booking, providing benefits to both users and administrators. The system not only improves efficiency but also sets a foundation for future innovations in the domain of event management systems.

XI. FUTURE SCOPE

The system can be further enhanced by integrating advanced technologies such as artificial intelligence and cloud computing. AI can be used to provide personalized event recommendations based on user preferences.

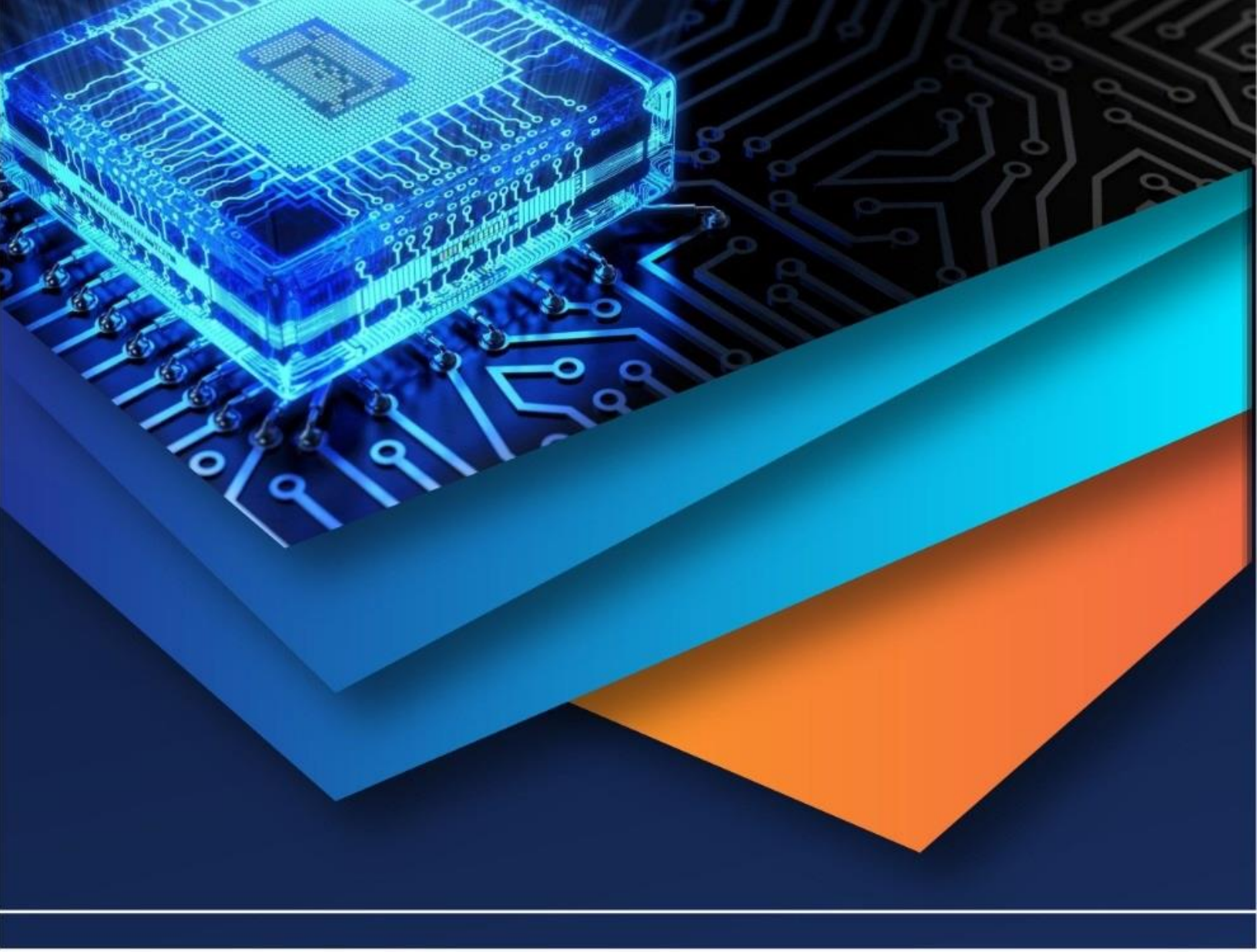
Developing mobile applications will improve accessibility, while cloud deployment will ensure scalability and high availability. Additional features such as QR code-based ticket verification and multiple payment gateway integration can further enhance system functionality. These improvements will help transform ArenaPass into a comprehensive and commercially viable platform.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

REFERENCES

[1] S. Singh and N. Kaur, "Online Event Ticket Booking System," International Journal of Computer Applications, vol. 179, no. 7, pp. 20–25, 2018. [Online]. Available: https://www.ijcaonline.org/archives/volume179/number7/28730-2018916326/
[2] A. K. Sharma and R. Gupta, "Design and Implementation of Online Ticket Reservation System," International Journal of Engineering Research & Technology (IJERT), vol. 6, no. 5, pp. 450–455, 2017. [Online]. Available: https://www.ijert.org/design-and-implementation-of-online-ticket-reservation-system
[3] P. K. Suri and M. Sharma, "E-Ticketing System for Event Management," International Journal of Advanced Research in Computer Science, vol. 9, no. 2, pp. 120–125, 2018. [Online]. Available: https://ijarcs.info/index.php/Ijarcs/article/view/5840
[4] R. T. Fielding, "Architectural Styles and the Design of Network-Based Software Architectures," Ph.D. dissertation, University of California, Irvine, 2000. [Online]. Available: https://www.ics.uci.edu/~fielding/pubs/dissertation/rest_arch_style.htm
[5] A. Banks, Learning React: Modern Patterns for Developing Applications. Sebastopol, CA, USA: O'Reilly Media, 2020. [Online]. Available: https://www.oreilly.com/library/view/learning-react-2nd/9781492051718/
[6] Oracle Corporation, "MySQL 8.0 Reference Manual: Transactional Integrity and Performance Optimization," 2024. [Online]. Available: https://dev.mysql.com/doc/refman/8.0/en/
[7] Node.js Foundation, "Node.js Documentation: Event-Driven Architecture and Asynchronous Programming," 2024. [Online]. Available: https://nodejs.org/en/docs
[8] Meta Platforms Inc., "React Official Documentation: Building Modern User Interfaces," 2024. [Online]. Available: https://react.dev
[9] M. Fowler, Patterns of Enterprise Application Architecture. Boston, MA, USA: Addison-Wesley, 2002. [Online]. Available: https://martinfowler.com/books/eaa.html
[10] J. Nielsen, "Usability Engineering Principles for Web Applications," Nielsen Norman Group, 1994. [Online]. Available: https://www.nngroup.com/articles/usability-101-introduction-to-usabiliy

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)