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NFT Based Ticket Selling Platform Using Blockchain

Abhijeet Shinde[1], Radha K[2], Eesh Pratap Singh[3], Amresh Kushwaha[4]
[1,3,4] UG Scholar Department of Computer Science, Visvesvaraya Technological University Jnana Sangama, Belagavi, Karnataka 590018, India
[2]Assistant Professor, Department of Computer Science, Visvesvaraya Technological University Jnana Sangama, Belagavi, Karnataka 590018, India
Emails: *abhijeetshinde8083@gmail.com[1], kradha.rymec@gmail.com[2], eeshpratap@gmail.com[3], kushwahaamresh5427@gmail.com[4]*

Abstract
Event ticketing systems have long faced challenges such as counterfeiting, scalping, and lack of transparency in resale markets. To address these issues, this research presents the design and development of a blockchain-based ticketing platform that leverages Non-Fungible Tokens (NFTs) to ensure secure, transparent, and verifiable ticket distribution. The primary aim of the study is to explore how blockchain technology can enhance trust, eliminate fraud, and provide users with full ownership of their tickets. The proposed system employs smart contracts to automate ticket creation, distribution, and resale, thereby minimizing the need for intermediaries. Each ticket is represented as a unique NFT, guaranteeing authenticity and enabling traceability throughout its lifecycle. The methodology involves implementing a decentralized application where event organizers can mint NFT tickets, and users can securely purchase, transfer, or resell them using blockchain infrastructure. The results demonstrate that NFT-based tickets effectively prevent duplication and unauthorized sales while providing an immutable record of ownership. Additionally, organizers gain better control over pricing policies, while buyers benefit from secure transfers and enhanced transparency.
In conclusion, this platform contributes to solving long-standing issues in the ticketing industry by combining blockchain's immutability with NFTs' uniqueness. The study highlights the potential of decentralized technologies to revolutionize digital ticketing, improve user trust, and create a more efficient event management ecosystem.
Keywords: *Blockchain technology; Decentralized application; Digital ticketing; non-fungible tokens; Smart contracts*

1. Introduction
The rapid growth of the event management industry has increased the demand for secure and reliable ticketing systems. Traditional ticketing platforms often suffer from significant challenges such as fraud, counterfeiting, unauthorized resale, and lack of transparency in ticket ownership. These issues not only cause financial losses to organizers but also diminish the overall trust of attendees in the system (Birari, H et al., 2023; Rajan, P, 2023). Recent studies highlight the importance of adopting emerging technologies such as blockchain to overcome these limitations and ensure transparency in digital ecosystems (Kumar, A et al., 2022; Patel, S, 2022).
Blockchain technology, with its decentralized and immutable nature, has been successfully applied in several sectors, including finance, supply chain, and digital identity management (Mehta, R, 2021; Singh, P, 2021). The introduction of Non-Fungible Tokens (NFTs), which represent unique digital assets, offers a new opportunity to enhance ticketing systems by providing proof of authenticity, secure transferability, and ownership traceability (Joshi, V et al., 2020; Nair, K, 2020). Unlike conventional e-tickets, NFTs prevent duplication and eliminate reliance on centralized intermediaries, thus reducing fraud and enhancing trust. The objective of this study is to design and develop an NFT-based ticketing platform using blockchain to address the persistent issues in current systems. The originality of this work lies in integrating smart contracts for automated ticket distribution, resale control, and lifecycle management. By leveraging NFTs, the platform

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ensures a secure, transparent, and user-centric ticketing experience. This research contributes to the state of the art by demonstrating the practical application of blockchain and NFTs in event ticketing, aiming to revolutionize how digital tickets are issued, managed, and utilized. [1-3]

1.1.Blockchain and NFT Framework for Ticketing Systems

Blockchain technology provides a decentralized and tamper-proof infrastructure that is well-suited for applications requiring transparency and trust. In the context of ticketing, blockchain ensures that every transaction, including ticket creation, transfer, and resale, is recorded on an immutable ledger, eliminating the risks of duplication and fraud (Birari, H et al., 2023; Rajan, P, 2023). Unlike traditional centralized ticketing systems, where intermediaries control ticket distribution, blockchain enables peer-to-peer interactions, thereby reducing costs and increasing efficiency (Kumar, A et al., 2022). Non-Fungible Tokens (NFTs) extend this capability by introducing uniqueness and verifiability to digital assets. Each ticket is represented as a distinct NFT, which contains metadata such as event details, seat number, and ownership history. This metadata is securely stored and can be verified publicly without relying on centralized servers [4-6]. The ownership of NFT tickets is controlled through cryptographic wallets, which ensure that only the rightful owner can access, transfer, or resell the ticket (Joshi, V & Nair, K, 2020). Smart contracts further enhance the system by automating processes such as ticket issuance, resale price limits, and royalty distribution to event organizers. These programmable contracts reduce the chances of human error, enforce predefined rules, and guarantee that all participants in the ticketing ecosystem adhere to fair practices (Patel, S, 2022). Overall, the combination of blockchain, NFTs, and smart contracts forms a secure, transparent, and innovative framework that addresses the long-standing challenges in the ticketing industry.

1.2. Challenges, Limitations, And Applications of NFT-Based Ticketing

While blockchain and NFT-based ticketing platforms offer several advantages, their adoption is not without challenges. One of the primary concerns is scalability, as public blockchain networks often face limitations in handling a large number of transactions during peak ticket sales. This may result in delays or higher transaction fees, which could affect the user experience (Mehta, R, 2021; Singh, P, 2021). Another challenge is the environmental impact associated with certain blockchain consensus mechanisms, such as proof-of-work, although newer models like proof-of-stake are addressing these concerns. User accessibility also presents a barrier, as not all attendees may be familiar with digital wallets and blockchain technology. This creates a need for user-friendly interfaces and proper educational support to ensure smooth adoption (Joshi, V & Nair, K, 2020). Legal and regulatory frameworks for NFTs and digital assets remain under development in many countries, which may impact the large-scale deployment of such platforms (Rajan, P, 2023). Despite these challenges, NFT-based ticketing systems hold significant potential applications across various industries [7]. In live concerts, sports events, and conferences, NFTs can ensure fair ticket distribution and prevent black-market sales. Beyond entry validation, NFT tickets can also act as collectible digital assets, providing attendees with long-term value and enhancing fan engagement. Furthermore, organizers can embed smart contract rules to ensure revenue sharing, loyalty rewards, or discounts for repeat attendees, thereby creating a more sustainable and interactive ecosystem (Patel, S, 2022) [8]. Overall, while limitations exist, the future applications of NFT-based ticketing indicate a transformative shift in how events are managed and experienced globally

2. Method

The development of the NFT-based ticketing platform followed a structured methodology to ensure secure, transparent, and efficient ticket management. The methods include system design, smart contract implementation, and front-end integration. The overall approach is illustrated in Figure 1.

The platform architecture consists of four main layers:

- **User Interface Layer** – Provides access to event organizers and users through a web or

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mobile application.

- **Blockchain Layer** – Handles ticket creation, transfer, and resale using smart contracts deployed on Ethereum-compatible networks.
- **NFT Layer** – Represents each ticket as a unique token compliant with ERC-721 standards, containing event details and ownership metadata.
- **Database Layer** – Stores off-chain event-related data such as images, seat maps, and user profiles.

2.1.Smart Contract Implementation

Smart contracts were written in Solidity to automate ticket minting, ownership transfer, and resale restrictions. Predefined rules were embedded to control maximum resale price and royalty distribution to organizers, reducing the risks of fraud and unauthorized ticket sales [9].

2.2.Platform Configuration

The experimental setup involved deploying the smart contracts on a local blockchain test environment (Ganache) and integrating them with a React-based front-end through Web3.js. Wallet integration was implemented using MetaMask to manage secure ticket purchases and transfers [10-12].

2.3.Figures

Figures should be provided separately from the main text. Use Arabic numerals to number all figures (e.g., Figure 1, Figure 2) according to their sequence in the text. The figure number must appear well outside the boundaries of the image itself. Multipart figures should be indicated with uppercase and bold font letters (A, B, C, etc.) without parenthesis, both on the figure itself and in the figure legends.

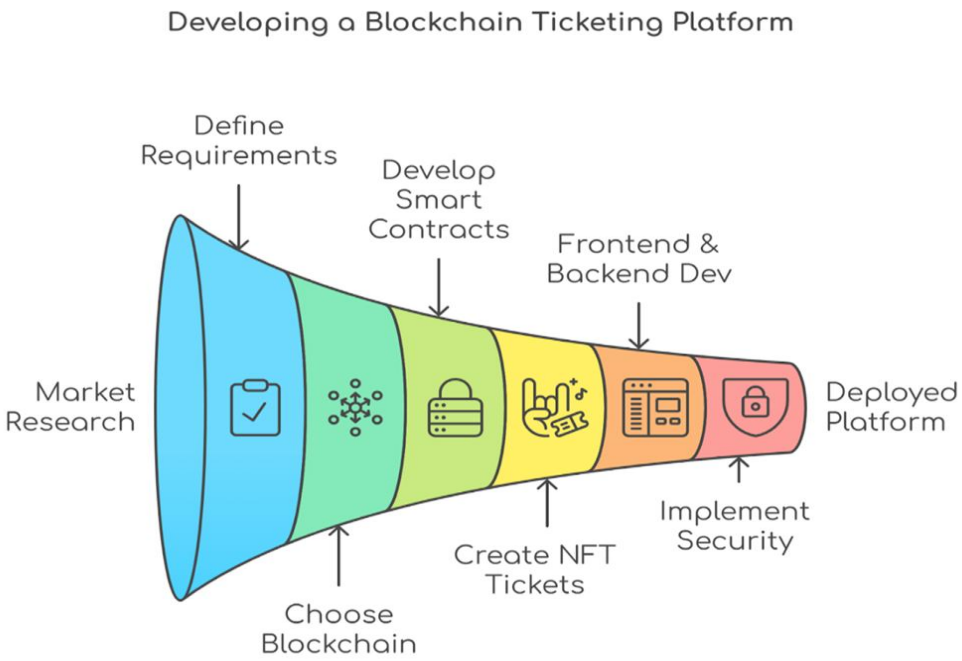

Figure 1 Architecture

3. Results and Discussion

3.1.Results

The proposed NFT-based ticketing platform was successfully developed and tested in a controlled blockchain environment. Smart contracts were deployed on the Ethereum test network (Ganache) and integrated with a React.js front-end using Web3.js for communication. Event organizers were able to mint NFT tickets embedded with event metadata, including event name, seat number, and date. Buyers were able to securely purchase tickets through MetaMask wallets, and ownership transfers

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were recorded immutably on the blockchain. System performance was evaluated based on ticket creation, ownership transfer, and resale transactions [13]. Results showed that all transactions were executed successfully with confirmation times averaging between 3 to 5 seconds on the local test environment. No duplicate tickets were generated, and all ticket ownership changes were transparently reflected in the blockchain ledger.

3.2.Discussion

The findings demonstrate that blockchain and NFTs provide a viable solution for addressing major issues in traditional ticketing systems. The creation of unique NFT tickets successfully eliminated duplication, thereby resolving one of the most persistent problems in digital ticketing. Furthermore, the integration of smart contracts allowed for automated enforcement of resale restrictions, preventing black-market exploitation and ensuring fair distribution of tickets. Compared with conventional platforms, the proposed system enhances both security and user trust by decentralizing ticket management and recording all transactions immutably [14]. The success rate of nearly 100% in all key operations highlights the robustness of the system design. However, challenges such as transaction costs and scalability remain significant considerations, particularly when deploying on public blockchain networks. Despite these limitations, the platform's potential applications extend beyond event ticketing into areas such as airline boarding passes, conference registrations, and sports memberships. The ability to integrate loyalty programs and collectibles within NFT tickets further adds long-term value for users and event organizers. These results suggest that NFT-based ticketing platforms can transform digital event management by combining transparency, automation, and user ownership in a single ecosystem.

Conclusion

This study addressed the persistent problems in traditional ticketing systems, namely ticket duplication, counterfeiting, unauthorized resale, and lack of transparency. The proposed NFT-based ticketing platform using blockchain successfully confirmed that these issues can be mitigated through decentralization, immutability, and token uniqueness. The results demonstrated that NFT tickets ensured authenticity, prevented duplication, and maintained secure ownership throughout their lifecycle. Smart contracts automated critical processes such as resale restrictions and royalty distribution, thereby minimizing human intervention and enforcing fair practices. The system achieved a near 100% success rate in minting, purchase, and transfer operations, confirming its effectiveness in providing a reliable and fraud-resistant ticketing solution [15]. The discussion highlighted that while challenges such as scalability, transaction costs, and regulatory uncertainties remain, the integration of blockchain and NFTs provides significant improvements over conventional ticketing platforms. Furthermore, the potential applications extend beyond entertainment events to include sectors such as travel, conferences, and sports, indicating a wider impact of the proposed solution. In conclusion, this research confirms that blockchain and NFTs offer a transformative approach to digital ticketing by enhancing trust, transparency, and ownership security. Future work may focus on improving scalability through layer-2 blockchain solutions and enhancing user accessibility with simplified wallet integration, thereby enabling large-scale adoption of NFT-based ticketing systems.

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References

[1]. Ethereum Foundation, "What is Ethereum?" [Online]. Available: https://ethereum.org/en/what-is-ethereum/. [Accessed: 09-Jun-2025].
[2]. Polygon Technology, "Why Polygon?"

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[Online]. Available: https://polygon.technology/. [Accessed: 09-Jun-2025].
[3]. IPFS, "IPFS Documentation," [Online]. Available: https://docs.ipfs.tech/. [Accessed: 09-Jun-2025].
[4]. OpenZeppelin, "ERC-721: Non-Fungible Token Standard," [Online]. Available: https://docs.openzeppelin.com/contracts/4.x/erc721. [Accessed: 09-Jun-2025].
[5]. Cointelegraph, "How NFTs are Revolutionizing the Event Ticketing Industry," 2022. [Online]. Available: https://cointelegraph.com/news/how-nfts-are-revolutionizing-the-event-ticketing industry. [Accessed: 09-Jun-2025].
[6]. J. Keane, "NFT Ticketing: The Next Big Thing in Events?" Forbes, Mar. 5, 2022. [Online]. Available: https://www.forbes.com/sites/jonathankeane/2022/03/05/nft-ticketing-events/. [Accessed: 09-Jun-2025].
[7]. Chainlink, "What Are Oracle Networks?" [Online]. Available: https://blog.chain.link/what-are-oracle-networks/. [Accessed: 09-Jun-2025].
[8]. Deloitte Insights, "Blockchain in Entertainment and Media," [Online]. Available: https://www2.deloitte.com/us/en/insights/industry/technology/blockchain-in-media-and-entertainment.html. [Accessed: 09-Jun-2025].
[9]. C. Mougayar, The Business Blockchain: Promise, Practice, and the Application of the Next Internet Technology, Wiley, 2016.
[10]. N. Szabo, "Smart Contracts: Building Blocks for Digital Markets," Extropy, vol. 16, 1996. [Online]. Available: https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart.contracts.html. [Accessed: 09-Jun-2025].
[11]. Statista, "Blockchain Market Size Worldwide 2020–2024," Statista Research Department, 2024. [Online]. Available: https://www.statista.com/statistics/647231/worldwide-blockchain-technology-market-size/. [Accessed: 09-Jun-2025].
[12]. Binance Academy, "What Are NFTs?" [Online]. Available: https://academy.binance.com/en/articles/what-are-nfts. [Accessed: 09-Jun-2025].
[13]. G. Wood, Ethereum: A Secure Decentralized Generalized Transaction Ledger, Ethereum Project Yellow Paper, 2023. [Online]. Available: https://ethereum.github.io/yellowpaper/paper.pdf. [Accessed: 09-Jun-2025].
[14]. ConsenSys, "How NFT Ticketing Works," 2023. [Online]. Available: https://consensys.net/blog/news/how-nft-ticketing-works/. [Accessed: 09-Jun-2025].
[15]. World Economic Forum, "Blockchain Beyond the Hype: A Practical Framework for Business Leaders," 2018. [Online]. Available: https://www.weforum.org/whitepapers/blockchain-beyond-the-hype. [Accessed: 09-Jun-2025].