INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD)
© 2026 IJNRD | Volume 11, Issue 2, February 2026 | ISSN: 2456-4184 | IJNRD.ORG

Blockchain-Driven Verification Framework for Real Estate Ownership and Interior Assets

Ms. Sayali Parab
Lecturer, Department of Information Technology
SES's L. S. Raheja College of Arts & Commerce
Mumbai, India

Mr. Chayan Bhattacharjee
Lecturer, Department of Information Technology
Chikitsak Samuha's Patkar Varde College
Mumbai, India

Abstract

The Indian real estate and interior design sectors suffer from systemic issues such as property fraud, double selling of assets, and counterfeit high-value materials. In the state of Maharashtra, initiatives like MahaRERA have improved transparency, yet centralized databases remain vulnerable to tampering and inefficiency. This research proposes a decentralized framework using Ethereum-based Smart Contracts to automate real estate transactions and authenticate luxury interior assets. By leveraging blockchain's immutable ledger, the proposed system prevents "double-spending" in flat bookings and utilizes Non-Fungible Tokens (NFTs) to track the provenance of interior materials like premium teak wood and designer furniture. The study analyses the theoretical architecture of such a system, demonstrating how cryptographic verification can replace traditional trust-based models, thereby reducing fraud and enhancing consumer confidence in the home design ecosystem.

Keywords: Blockchain Technology, Smart Contracts, Real Estate Fraud, Supply Chain Provenance, MahaRERA, Solidity, Digital Assets.

1. Introduction

The concept of "Home Design" in India extends beyond aesthetics; it encompasses the entire lifecycle of home ownership—from the initial purchase of real estate to the procurement of high-quality interior materials. In rapidly urbanizing regions like Mumbai and Pune, the demand for housing and luxury interiors is at an all-time high. However, this growth is plagued by a lack of trust.

Currently, property registration relies on paper-based deeds or centralized digital databases (like the 7/12 extract in Maharashtra). While government bodies like the Maharashtra Real Estate Regulatory Authority (MahaRERA) regulate this, the system is not tamper-proof. Similarly, the interior design market is flooded with counterfeit materials—where cheap plywood is sold as "Grade A" teak, or replica furniture is sold as original designer ware.

Blockchain technology offers a decentralized, immutable ledger system. Unlike a bank or government office where one entity controls the data, blockchain distributes the record across a network. This paper explores how this technology can be applied to create a "trustless" environment where the validity of a flat booking or the authenticity of a sofa is guaranteed by code, not by a middleman.

2. Research Methodology

This paper utilizes a mixed-method research approach, combining Secondary Research (Case Study Analysis) and Primary Research (Theoretical Framework Design). The design of a novel architectural framework specifically tailored for the Indian context, utilizing Ethereum Smart Contracts to solve the identified problems of double-selling and counterfeiting. An in-depth analysis of existing blockchain implementations in real estate (MahaRERA initiatives) and luxury goods (Aura Blockchain Consortium) to understand current utilization, benefits, and challenges.

Case Study 1: Real Estate Sector (MahaRERA & Land Records)

The Maharashtra Real Estate Regulatory Authority (MahaRERA) was established to bring transparency to the housing sector. Recently, the state government has initiated pilot projects to digitize land records (e-registration). The proposed integration involves tokenizing "Project IDs." When a builder registers a project, it is committed to a blockchain. Every flat sale is a transaction on this chain. The benefits include buyers can see the exact legal status of a project thus eliminating the risk of unauthorized changes to the property card. The Real-World Impact could be reductions of litigation related to property disputes and faster loan processing times for home buyers. The possible challenges include digitizing millions of old, handwritten paper records that are prone to human error ("Garbage In, Garbage Out") and also chances of resistance from local officials accustomed to the old system.

Case Study 2: Luxury Goods (Aura Blockchain Consortium)

A collaboration between luxury giants like LVMH (Louis Vuitton), Prada, and Cartier to let consumers trace the history of their products. The role of blockchain could ensure that each product is given a "Digital Twin" (NFT) on the blockchain. Customers scan a code to see the product's entire journey from raw material to retail. The benefits include anti-counterfeit making it Impossible to fake a product history on a public ledger and also have a resale value that Proves as authenticity for second-hand sales. The possible challenges could be Tag Tampering that ensures the physical NFC tag cannot be removed from the furniture/product. Its real-World Impact could be to restore consumer confidence in high-value markets and create a new standard for "provenance" in design.

3. Research Problem

a. **Real Estate Fraud (Double Selling):** Unscrupulous developers may sell the same unit (e.g., Flat 101) to multiple buyers, collecting booking amounts from all before fleeing.
b. **Tampering of Records:** Centralized land records can be altered by corrupt officials or lost due to mismanagement.
c. **Counterfeit Interior Assets:** Consumers paying premiums for luxury furniture or specific raw materials (like Italian marble or Sagwan wood) have no reliable way to verify the origin of these goods.

4. Research Objectives

a. To design a secure, blockchain-based architectural framework for property registration that eliminates the possibility of double-selling.
b. To propose a digital verification system for tracking the supply chain of high-value interior design materials.
c. To analyze the relationship between core blockchain components (Ledgers, Peers, Consensus) and real-world implementation.

5. Relating Blockchain concepts to the Proposed System

To evaluate the feasibility of the proposed blockchain framework, it is important to understand how the core technical components of blockchain align with practical use cases in both real estate and interior design. At the transaction level, blockchain enables secure and transparent value exchange. In real estate flat booking, buyers can send booking or token amounts directly to the builder’s digital wallet, ensuring instant and traceable payments. In the context of interior assets such as furniture, ownership transfer is handled digitally, where the seller or shop transfers the item’s NFT to the customer, providing clear proof of purchase and ownership. These transactions are permanently recorded on an immutable ledger, which acts as a tamper-proof digital record. For real estate, this ledger functions like a “digital 7/12 extract,” maintaining an unalterable history of property ownership that cannot be modified or deleted by corrupt intermediaries. Similarly, for interior assets, the immutable ledger preserves the material history of items, such as the origin of wood or fabric, ensuring long-term authenticity and traceability.

The decentralized nature of blockchain further strengthens trust by removing reliance on a single controlling authority. In real estate transactions, multiple stakeholders—including banks, builders, and government bodies—can access and verify the same shared data, ensuring transparency and preventing unilateral manipulation. For interior assets, decentralization allows manufacturers, logistics providers, and retail shops to update and verify information within a common supply network, ensuring that all participants

view consistent and verified data. Encryption plays a crucial role in protecting sensitive information across both domains. Property deed details are securely encrypted to maintain privacy, while interior assets are linked to unique digital identities, often associated with NFC chips or QR codes, making counterfeiting extremely difficult.

Consensus mechanisms ensure that all participants in the blockchain network agree on the validity of records. In real estate, this guarantees that once the network confirms a flat—such as "Flat 101"—has been sold, it cannot be sold again, thereby eliminating the risk of double-selling. For interior assets, consensus confirms that the item received by the shop or customer is the same one that left the factory, preserving authenticity throughout the supply chain. Finally, smart contracts automate critical processes and reduce human intervention. In real estate, smart contracts can enforce rules such as automatically transferring property ownership once payment is received. In interior design applications, smart contracts can verify authenticity by executing conditions like, "If the NFC scan matches the blockchain record, then the item is marked as authentic." Together, these components demonstrate how blockchain can provide a secure, transparent, and automated framework for both real estate transactions and interior asset verification.

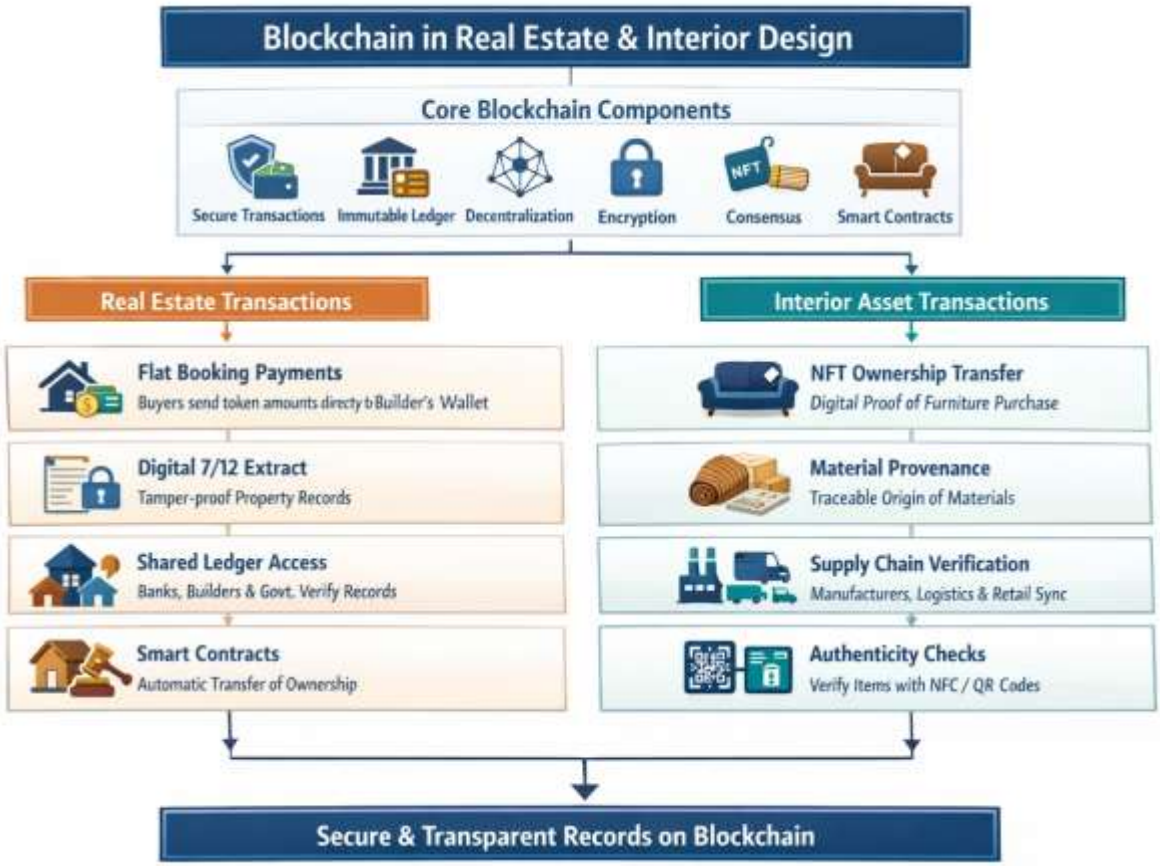

Fig 1. Blockchain concepts to the Proposed System

6. Key Findings and Insights

- **Automation Reduces Fraud:** The use of Smart Contracts removes the human element from the verification process. If the code (Smart Contract) sees that a flat is already sold, it will mathematically reject a second payment, making double-selling impossible.
- **Phygital Synchronization:** The success of verifying interior assets depends on the tight coupling of "Physical" items with "Digital" tokens (Phygital). Technologies like NFC and RFID are crucial bridges between the two.
- **Regulatory Necessity:** While the technology works, government backing (like MahaRERA adopting the standard) is essential for legal validity.

7. Future Implications

- **Tokenization of Assets:** In the future, we may see "Fractional Ownership," where expensive properties are split into digital tokens, allowing small investors to own 1% of a luxury apartment.
- **IoT Smart Homes:** Blockchain will extend beyond buying the home to *running* the home. Smart devices will use decentralized identities to prevent hacking, and "Smart Walls" could auto-report maintenance

issues to the ledger.

- **AI-Driven Valuation:** AI algorithms will read the immutable blockchain history of a property to instantly calculate its market value, automating the mortgage process.

8. Conclusion

The integration of blockchain technology into the Indian real estate and home design sectors presents a transformative solution to age-old problems of trust and fraud. By shifting from a "trust-based" model (trusting the builder/official) to a "trustless" cryptographic model (trusting the code), stakeholders can ensure the authenticity of both the property title and the materials used within the home. While implementation challenges regarding government adoption exist, the theoretical framework proves that a decentralized ledger is the most effective tool for securing the "American Dream" of Indian homeownership.

9. References

[1] S. Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System," 2008.
[2] V. Buterin, "A Next-Generation Smart Contract and Decentralized Application Platform," Ethereum White Paper, 2014.
[3] A. Iftekhar et al., "Hyperledger Fabric Access Control System for Internet of Things Layer in Blockchain Based Applications," Entropy, vol. 23, no. 8, 2021.
[4] M. Ammi, S. Alarabi, and E. Benkhelifa, "Customized blockchain-based architecture for secure smart home systems," Information Sciences, vol. 560, pp. 67-83, 2021.
[5] A. Gono, I. Pisařovic, and M. Zejda, "Improving IoT Management with Blockchain: Smart Home Access Control," IEEE Access, vol. 12, 2024.
[6] MahaRERA, "Maharashtra Real Estate Regulatory Authority Annual Report 2022-23," Government of Maharashtra, 2023.
[7] S. Thakur, M. Breslin, and L. Doyle, "Oracle-Based Smart Contracts for Valuation of Real Estate Assets," IEEE International Conference on Blockchain, 2020.
[8] K. Biswas and V. Muthukkumarasamy, "Securing Smart Cities using Blockchain Technology," IEEE 18th International Conference on High Performance Computing and Communications, 2016.
[9] R. Gupta and S. Tanwar, "Blockchain-based Land Registry System: A Case Study of India," International Journal of Web Information Systems, 2021.
[10] L. Ante, "The Non-Fungible Token (NFT) Market and its Relationship with Bitcoin and Ethereum," FinTech, vol. 1, no. 3, pp. 216-224, 2022.