

# Blockchain Technology for Enhancing Supply Chain Transparency: Opportunities and Challenges

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**Abstract:** *The purpose of this paper is to explore the role of blockchain technology in enhancing transparency, traceability, and trust in supply chain management. It examines how blockchain can address challenges like counterfeit products, lack of visibility, and unethical practices, providing a secure and transparent record of supplychain transactions. The study is a conceptual analysis of blockchain's capabilities and limitations in the supply chain. It investigates blockchain's features—decentralization, immutability, and consensus mechanisms—and their potential to improve supply chain transparency and traceability. The paper also addresses barriers to adoption, such as cost, scalability, and regulatory compliance. Blockchain technology can significantly improve supply chain management by enhancing transparency, traceability, fraud reduction, and consumer trust. However, widespread adoption faces challenges due to high implementation costs, scalability concerns, and regulatory compliance issues. This paper adds to the existing literature by analyzing blockchain's potential to transform supply chains into a more transparent, ethical, and consumer-friendly model. It highlights both the benefits and limitations of blockchain in supply chain management, offering insights into how it could reshape the industry by promoting transparency and accountability.*

**Keywords:** Blockchain Technology, Supply Chain Transparency, Traceability, Decentralized Ledger, Immutability, Counterfeit Prevention, Consumer Trust, Regulatory Challenges