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Securing Academic Credentials: A Systematic Literature Review of Blockchain-Based Verification Systems

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Abstract: *In this paper, we present a blockchain-based certificate verification system for academic and professional certificates. Current methods of certificate verification are slow, centralized, and vulnerable to forgery. Utilizing blockchain technology, our system guarantees data permanence, decentralization, and openness, enabling employers, universities, and certification agencies to verify the validity of certificates in real-time. We implement a smart contract-based system on Ethereum and compare its performance. Our solution cuts verification time, does away with third-party dependencies, and provides a tamper-proof way to store digital credentials.*

Through the use of smart contracts, our solution enables trusted institutions to issue tamper-proof certificates stored on a public blockchain, allowing for instant and trustworthy verification by employers and other third parties. The system reduces the need for manual verification, greatly minimizes the risk of forgery, and maintains data integrity by storing immutable certificate records. We design and test our system based on Ethereum and smart contracts and prove that it is a highly secure, efficient, and scalable replacement for common verification procedures. The method also unveils the groundbreaking potential of blockchain in reengineering credential validation within educational, business, and government institutions.

Keywords: Block Chain, Digital Certificates, Confidentiality, Reliability, Availability

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