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ENHANCING CERTIFICATE VERIFICATION SECURITY AND EFFECTIVENESS THROUGH BLOCKCHAIN TECHNOLOGY: A ROBUST APPROACH TO MITIGATE FRAUDULENT CERTIFICATES

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ABSTRACT

The rise in fraudulent certificate cases has exposed critical vulnerabilities within traditional certificate verification systems. As such, the need for secure, transparent, and efficient methods to authenticate genuine certificates has never been more pressing. In response, this paper delves into the application of blockchain technology to address the inherent challenges of certificate fraud and elevate the security and effectiveness of certificate verification processes. Blockchain, renowned for its tamper-proof nature and decentralized architecture, offers a novel solution to combat certificate fraud. This research investigates the integration of blockchain technology into a mobile certificate verification system, presenting a comprehensive framework to enhance security and effectiveness. Smart contracts will be employed to automate the verification process. When a certificate is issued, a smart contract is triggered, validating the certificate against predetermined criteria. Automation minimizes human intervention and enhances the efficiency of verification. The system will be built with a solidity programming tool and Ethereum smart contracts before being tested on the IPTMNet, a consortium of Blockchain platforms led by ten Malaysian universities and Cyber Security Malaysia. To obtain and verify the certificates, experimental certificates will be created, and mobile Android apps will be constructed. At the end of the project, actual certificates generated by UPTM and other KPTM branches will be embedded and confirmed in the Blockchain and run as a real-time system.

Keywords: block-chain, certificate, verification, smart contract

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