

A High Security Block Chain Framework for E-Coupon Services with Reduced Performance Impact

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7
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Text Views



Abstract

Document Sections

- I. INTRODUCTION
- II. LITERATURE SURVEY
- III. PROPOSED SYSTEM
- IV. RESULTS & ANALYSIS
- V. CONCLUSION

Abstract:

Digital transactions' fast acceptance has driven up need for quick, safe e-coupon systems. This work offers a high-security blockchain framework meant to improve the integrity and confidentiality of e-coupon systems with least performance overhead. To guarantee tamper-proof coupon issuance, distribution, and redemption, the suggested framework uses sophisticated cryptographic technologies including secure hashing and digital signatures. The system increases transaction throughput and lowers computational complexity by including a lightweight consensus algorithm, therefore preserving security. To maximize resource use while preserving data privacy, a hybrid approach combining permissioned blockchain architecture with off-chain storage is used. Experimental findings show that our framework offers a 35% decrease in processing latency and a 40% increase in transaction efficiency relative to conventional blockchain systems. Moreover, the model guarantees immutability, traceability, and resistance to double-spending attacks, therefore solving important weaknesses in current e-coupon systems.

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