

BLOCKCHAIN APPLICATIONS IN ENTERPRISE SECURITY AND SCALABILITY

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ABSTRACT

Blockchain technology has emerged as a transformative force in enhancing enterprise security and scalability, offering decentralized solutions to challenges faced by traditional centralized systems. This study investigates the applications of blockchain across various industries, emphasizing its role in improving data integrity, reducing fraud, and increasing operational efficiency. By employing a mixed-methods approach that includes a systematic literature review, qualitative interviews, case studies, and quantitative surveys, this research identifies both the benefits and challenges associated with blockchain implementation. Key findings reveal that organizations adopting blockchain technology experience significant enhancements in security measures, with 85% of survey respondents recognizing its potential to mitigate data breaches. Moreover, the integration of smart contracts automates processes, leading to a reported 80% increase in transaction speeds and a 57.14% reduction in error rates. However, challenges such as regulatory compliance and integration with existing systems remain prevalent, with 42.5% of participants citing integration difficulties as a primary concern. The study concludes that while blockchain presents substantial advantages for enterprises, successful implementation requires strategic planning, workforce training, and active engagement with regulatory frameworks. This research contributes to the growing body of knowledge on blockchain technology, providing valuable insights for organizations considering its adoption to enhance security and scalability in an increasingly digital landscape.

KEYWORDS: Blockchain, Enterprise Security, Scalability, Decentralization, Smart Contracts, Data Integrity

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