Blockchain Technology and Applications

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Introduction

Advertised as an innovation, blockchain technology has made inroads in other industries outside of cryptocurrencies, including healthcare, supply chain management, banking, and more (Saberi et al., 2019). By making data transparent, secure, and immutable, distributed ledger technology has the potential to revolutionise established business structures and operating norms. Agbo et al. (2019) assert that integrating blockchain into diverse applications presents a new paradigm of trust, efficiency, and collaboration in digital transactions (Zaman et al., 2022). In this literature review, we will examine the features of blockchain technology, its applications in several fields, and the opportunities and threats it faces. This review aims to highlight the innovative applications of blockchain, evaluate its impact on improving data integrity and trust in digital interactions, and investigate the technology's potential future trajectory in driving digital transformation through a thorough analysis of recent academic articles and industry reports.

Literature Review

With its fast evolution beyond its financial origins, blockchain technology offers innovative solutions across various sectors (Beck et al., 2019). Its decentralised, transparent, and secure architecture provides a fundamental technology that can transform conventional business models, improve operational efficiency, and increase trust in digital transactions (Feng et al., 2020).

Blockchain in Healthcare

Blockchain technology in healthcare can potentially improve EHR security, privacy, and interoperability (Kamilaris et al., 2022). Medhane et al. (2020) emphasise how blockchain can secure patient data while allowing authorised people fast access. Additionally, McGhin et al. (2022) present a systematic review summarising blockchain technology's potential to address persistent problems in healthcare data management, highlighting the technology's function in safeguarding data integrity and enabling patient-centred treatment.

Blockchain and the Internet of Things (IoT)

Integrating blockchain with IoT devices is a strong way to solve data privacy and security issues (Gai et al., 2021). This will secure the massive amounts of data that these devices produce (Dorri et al., 2021). Using IoT data to simplify claims processing and decrease fraud, Casino et al. (2020) investigate how blockchain can build a secure, open insurance market. Kshetri and

Loukoianova (2020) and Queiroz and Wamba (2023) agree that this confluence of technologies is crucial to the transformation of supply chain management because it provides unparalleled transparency and tracking capabilities from manufacturing to delivery.

Sustainable and smart cities

Better data sharing, infrastructure management, and resource allocation are ways blockchain may help smart cities' functions (Bibri and Krogstie, 2021). Allam and Dhunny (2023) explore the potential of blockchain technology in conjunction with AI to address urban issues sustainably and efficiently. These technologies' combined capabilities demonstrate blockchain technology's potential to improve city life by securely managing and analysing large datasets used in environmental monitoring, resource management, and urban planning (Hasan et al., 2023).

Challenges and Future Directions

Blockchain technology must overcome several obstacles before it can reach its full potential (Zheng et al., 2020). These include problems with scalability, energy consumption, and the absence of clear regulations (Hawlitschek et al., 2020). Few people know about the technology and its advantages, which slows its adoption (Nguyen, 2019). In the future, research should remove these obstacles, investigate blockchain models with improved energy efficiency, and provide transparent legal frameworks to encourage wider use (Saberi et al., 2019).

Conclusion

In conclusion, blockchain technology offers a game-changing opportunity in various industries. Its potential to improve efficiency, security, and transparency will affect sectors such as healthcare, banking, the Internet of Things (IoT), and smart cities. As the technology develops and solves current problems, it may anticipate a new age of digital innovation and cooperation, leading to a deeper integration into other sectors.

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