Task 'Predict How AI, Blockchain, or Quantum Computing Will Shape Computing in the Next Decade' Unit 11

Research One Emerging technology: Blockchain

Introduction

Blockchain technology, which is typically managed by a peer-to-peer (P2P), was originally developed to support cryptocurrencies like Bitcoin and evolved, since its initial application far beyond. blockchain main strength resides within its decentralization, transparency, and immutable technology nature. These features have the potential to reshape business operations, enhance security systems, and influence social structures.

How Blockchain Technology Might Impact Business, Security, and Society

In business, blockchain can dramatically improve transparency and efficiency. In supply chain management, for instance, blockchain could benefit significantly. In supply chain, Blockchain could help track the journey of goods where companies could mitigate the risk of fraud, improve traceability, and enhance consumer trust. Some studies highlight how blockchain can be utilized to improve visibility and coordination in complex supply chains enabling real-time monitoring and reducing administrative costs. for instance, smart contracts and self-executing agreements enclosed on the blockchain could revolutionize contractual relationships. These contracts could automatically execute once pre-conditions are being met, therefore reducing the need

for intermediaries such as lawyers or brokers. This shift could reduce transaction costs and increase efficiency across industries ranging from finance to real estate.

(Ezeh, Ogeawuchi, Abayomi, Aderemi, 2024)

From a security standpoint, blockchain provides powerful protection against data integrity manipulation and confidentiality violation. in addition, tamper-proof features protection against unauthorized access in which each data block is cryptographically linked to its previous one, making it practically almost impossible to modify historical records without agreement across the blockchain network. Such features help to make blockchain a promising tool for securing digital identities and protecting information confidentiality and integrity, especially in sectors like healthcare and fintech. for society, blockchain can encourage greater trust in institutions. for instance, decentralized ballot systems, could provide election integrity by supplying immutable and transparent storage of voter records. Furthermore, blockchain-based identification systems could support access to essential services for individuals in underserved regions when it comes to services such as fintech and education, However, blockchain brings some challenges too. for instance, issues such as scalability, environmental impact such as energy consumption, misuse by criminals and regulatory uncertainty, effective solutions must be developed before mainstream adoption can occur. Nevertheless, its transformative potential is widely acknowledged across multiple academic institutions and industries.

(Taloba, Elhadad, Rayan, Abd El-Aziz, Salem, Alzahrani, Alharithi, Park, 2023)

Conclusion

The use of blockchain technology could bring a promising future that may significantly help business to enhance practices, enhance cybersecurity measures, practices and may empower a social shift. As research and development continues there is a need for responsible integration which could steer in a new innovative era of digital trust and confidence.

References

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