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Research Article

Application of Cryptocurrencies using Blockchain for E-Commerce Online Payment

Prof. Dong-il Kim
Department of Business Administration, College of Business, Pusan National University, Busandaehak-ro, 63beon-gil 2, Geumjeong-gu, Busan 609-735, Busan, Korea

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ABSTRACT

This article discusses the potential benefits of using blockchain technology in e-commerce, including payment processing, data privacy, and increased security. Blockchain-based cryptocurrencies are becoming increasingly popular for e-commerce businesses due to their ability to securely and quickly transfer money between parties Cryptocurrency is an online payment method that is used as a virtual currency. This payment is using the blockchain method that is used to secure the information generated in the process. It is also mentioned that this process of payment also required data. This cryptocurrency also has the process of investment. There is network security that is required for making the payment faster.

Keywords: Virtual Currency, Cryptocurrency, Decentralized System, Bitcoin, Transaction, payment

INTRODUCTION

Cryptocurrency is a digital or virtual currency that can be prominently utilised to gather services and buy goods implying that there will be zero physical bills and coins. It is utilised for all relevant transactions permissively taking place online. This is primarily used as an online purchasing factor or exercise with solid cryptography to identify and ensure that transaction through online platforms is completely secure. It is also organised through a peer-to-peer connection or network known as blockchain, which is also a pathway to serve secure ledgers in terms of transaction procedure. Besides, it also can be said that this distinctive property in terms of blockchain that is used to record the essential transactions, the usage of cryptocurrency is an online source of the transaction. This also attributes various notable or significant characteristics like a decentralised consensus, shared and distributed ledger, source of payment, immutability, cryptocurrency, and blockchain are also prone to the fat of security attacks.

BACKGROUND

The cryptocurrency was first released as open-source software in the year 2009. The first cryptocurrency introduced was Bitcoin. At that time the value of bitcoin was very low due to the low publicity. It became more valuable as it was offered to more people subsequently. There is the process of fund transferring between two countries with the blockchain, which will be quick (Ghosh, 2019). There is also the payment system using the blockchain process, this processing system reduces the time of the payment processing. The blockchain is also an intermediary in the process of payment. Authenticity will also be ensured by the blockchain. This process will also help to make transparency higher. In the online payment method, the blockchain also ensured the safety of the payment process. All the information that has been generated due to the payment will be safe and secured with the blockchain. Some key elements have been used in the blockchain process. These elements are the technology of the Distributed ledger and the immutable records used to protect against the tampering of the transaction by the participants. Smart contracts are used for speed transactions, conditions are for insurance, etc (Goundar, 2021). With the blockchain, the whole payment method has become faster and generating a system that has been accessed by the people. In this system, people have used the proper transaction system which involves steps like first to confirm the verification of both who was sending the money and who accepted it.

LITERATURE REVIEW

According to Adewole (2020), the block chain has distinctive properties that are the ledger that has been distributed, and also it will decentralize that is used in the record transaction. Cryptocurrencies are used as the payment method that works online. This process is similar to the other payment sources that have been used online. The technology of the blockchain has faced abuse such as it has been linked to the contents of child abuse, the evasion of the tax, money laundering, and the illegal activities in the finance section. Cryptocurrencies are used by the people that have used the investment policy. Real-time security was understood by the people that were using cryptocurrency.

According to Asadova (2020**),** the factor of the digital economy and various types of technologies and methods that are commonly interconnected and related to the digital economy is rapidly involved in an individual's life. In terms of this factor, blockchain is a significant technology that permissively allows the participants to confirm the transfer of the relevant assets prominently and securely without any kind of intermediaries. This is primarily used as an online purchasing factor or exercise with solid cryptography to identify and ensure that transaction through online platforms is completely secure. It is also organized through a proper connection or network known as block chain, which is also a pathway to serve secure ledgers in terms of transaction procedure. On the other hand, cryptocurrencies in terms of the block chain are commonly utilized to accumulate and record relevant pieces of information about transactions.

According to Bezovski et al. (2021), the first attempt to form a digital currency commonly proceeded with bitcoin. Block chain is commonly and publicly hosted by a large and huge number of participants of nodes, that utilize the encryption and time-stamped data for historical factors commonly empower auditable, transparent, secure, and resistant to modification and trust the entire financial transactions. Apart from this factor, the procedure of the transaction involves pro-per-secure decentralization to have zero percent of a risk factor for exchanging money. On the other hand, various issues are also present in the discussed matter. Pharming and phishing are the most common and general measures for security issues along with the e-commerce method of payments. The proportion of security issues that are commonly interconnected or related to the block chain and cryptocurrency protocols is identified. Figure 1 displays the security process of blockchain.

According to (Chen and Farkas, 2019), cryptocurrency is a type of digital money that can be found in a specific way in terms of various applications that includes e-commerce and banking. Block chain is a significant fact of a building block in terms of the master ledger that commonly records the transactions of cryptocurrency. It can also be said that a block chain is a form of distributed ledger factor by all finished or completed transactions in terms of the cryptocurrencies in a network system. Block chain applications involve insurance, lending, various types of governmental benefits, financial exchange, or alternate factor, voting, real estate, and money transfers. Along with the help of spreading the relevant operation and networks through the network, the block chains permissively allow bitcoin and the various types of other cryptocurrencies to generate and operate without any kind of central authority and needs.

METHODOLOGY

The present research was conducted involves various steps and is described into various sections, including the research procedures and also the data collection method, measure, sample, work analysis, etc. The methods that have been used for the data collection methods and the methods of the data analysis (Bezovski et al., 2021). The potential risks that have been seen by the people and have shown the response that has the investment option. This research has provided a procedure that has been applied to cryptocurrency and also online payment methods for E-commerce.

Figure 1: Security process of Block chain

(***Source:*** www.leewayhertz.com)

a. Quantitative and Qualitative Research

The public who has collected the questionnaire understands the online. The security has expressed the public investment and secured the payment. The public was expressing concern that age has been making cryptocurrencies (Hollaus et al.) The options for the investment are also analyzed with the resolution and found in the literature.

b. Qualitative Method

The response of the data that had been associated with the risk was analyzed qualitatively. The resolution will be extreme literature with the concerns that have been expressed. The technology of block chain will be having value for the purpose of the research.

c. Quantitative Analysis

The records for the numerical values have interpretations that will have to identify the problems of the trends, which have been faced with cryptocurrency.

d. Data Collection Methods

The process of data collection mentions the variables, which are gathered by the study. The data that will have more questionnaires and it will have the characteristics that will analyzed the previously collected data (Ismanto et al., 2019). The source of the books is published and also involves the collection of both secondary and primary data. The methods that have been used for the blockchain will be using the nature of the response for the numbers that have been collected.

The data that is collected through the questionnaire also has the population, which has to understand the selected cryptocurrency (Kanegae et al., 2021). This would have paid the method that has the willingness to adopt the payment with the cryptocurrency and the investment. The dependent variable for the ordinal and the normal variable is called the nominal variable. The variable is ordered to level between the category that is static and equal.

This type of secondary data will be providing the supplementary necessary for the theoretical study (Mashatan et al., 2022). It will have a resolution for security, which will have the block chain, which is used for online payment that will have the source of the application in e-commerce that has focused on the resolution.

e. Research Sample

The focus of the research will have the corresponding that has responded to the questionnaires. The response has also the basic knowledge of having the basic knowledge, which is potential. The block chain is used in the ledger that has recorded the experiment, which has the technology that is having the questions, which are included (Neethidevan, 2019). The age group of 25 to 40 is interested in learning about the technologies that are being experimented.

f. Data Analysis

There is relevant information that is collected and it will have the response that has provided the resolution of the cryptocurrency (Ruslina et al., 2019). It has all the substantive interpretations. The security process will have expressed the methods, which are general and analyses the resolution that is found.

g. Ethical Consideration

Many ethical considerations are the research about people who will be familiar with cryptocurrency. The relevant trends will be related to the information that is confidential. The content will be properly authenticated with the resources. The original comments have the resources, which have been authenticated (Xhaferi et al., 2020). This research is referred to properly understanding the participant. Implementing cryptocurrency as a payment gateway is a need for online retailers.

h. Analysis

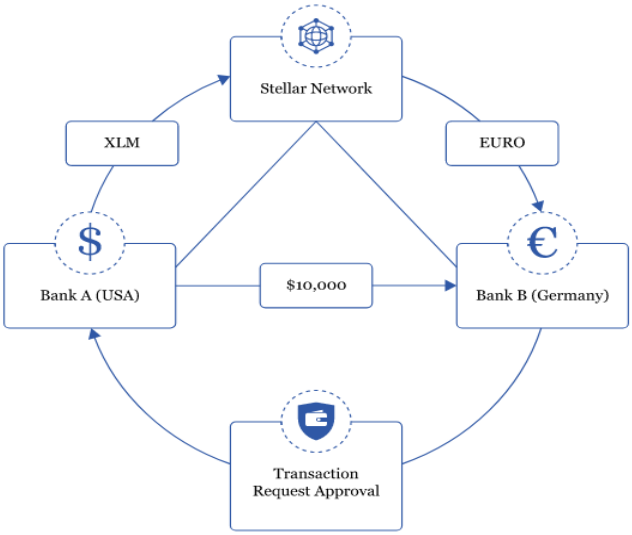

Figure 2: Work of block chain in the online payment system

(***Source:*** www.leewayhertz.com/blockchain)

Cryptocurrency block chain opens an online retailer to Bitcoin and other cryptocurrencies as a way of accepting payments. A business that supports crypto works similarly to any other payment system, but with added security and convenience. Using a payment processor such as Coin base makes it easy for businesses to accept cryptocurrency, and consumers feel more secure knowing that their data is protected (Zheng et al., 2022). E-commerce stores have added their payment options to include cryptocurrencies such as Bitcoin and Ethereum, allowing businesses, merchants, and retailers to accept multiple currencies using one processor. By accepting cryptocurrencies, businesses can expand their reach into markets that may not be accessible through more traditional payment processors.

DISCUSSION

E-commerce is conducting payments online and business over social media platforms and the internet. Cryptocurrency and e-commerce are the primary and significant developing or growing areas and it is being implemented in various applications. Block chain is the most significant and the main ledger that can identify, save, and record all the relevant and essential activities and various other information about the administrator. The payment transaction procedure can also be done sling with the help of cryptocurrency through block chain, which is completely secure as the decentralized factors. Figure 2 provides the schematic diagram of work of block chain in the online payment system

Block chain technology is the fuel behind cryptocurrency and is the public, distributed database that stores information. It is ledger of transactions that are processed and verified by decentralized networks of computers, ensuring data privacy and security (Сусленко et al., 2022; Wihardjo et al., 2024). block chain technology has been used to play an essential role in e-commerce payments, with many businesses choosing to accept crypto assets as a form of payment. A blog study recently identified major areas where block chain technology is being used for payments, such as payment processing, network security, and customer identification (Wihardjo et al., 2024). Cryptocurrencies using block chain for e-commerce online payment are fast becoming the choice of many businesses to use as a secure and reliable way to receive payments (Gotwald et al., 2012; Kusuma et al., 2023; Kim and AlZubi, 2024; Min et al., 2024; Berrada & Herrou, 2023; Rolla, 2023). This technology helps e-commerce businesses improve their online business and improve business processes by allowing customers to pay using cryptocurrencies.

Companies like Amazon, Walmart, and other commerce giants are now using this technology to secure online transactions and improve customer experience when paying for goods or services.

a. Attack on Wallet Software

Block chain technology enables block chain cryptocurrencies to be used in e-commerce online payment, reducing the need for banks, credit card companies, and other financial institutions. By enabling block chain technology for e-commerce payment, many e-commerce sellers are able to offer their customers a safer and more secure way to shop online. This technology also enables retailers to spend less money on processing fees and decrease costs associated with payment processing.

With the rise of e-commerce, users can now generate their own cryptocurrency, support cryptocurrency payments and pay with bitcoin and other cryptocurrencies. Cryptocurrency prices are much more volatile than traditional currencies, so payment processors like Bitpay and wallets like Coin base have made it easier for businesses to accept cryptocurrency payments. Using crypto wallets, customers can easily send cryptocurrency to commerce platforms like Shopify and accept cryptocurrency in their online stores. Bitpay is a popular payment processor for accepting Bitcoin, while Coin base is one of the most popular wallets for sending cryptocurrency. This technology will also be having a system that will be helpful for the online payment method that has been used with bitcoin. This process is mostly used to improve the payment system. It will also help to increase the economy with the currency-converting process.

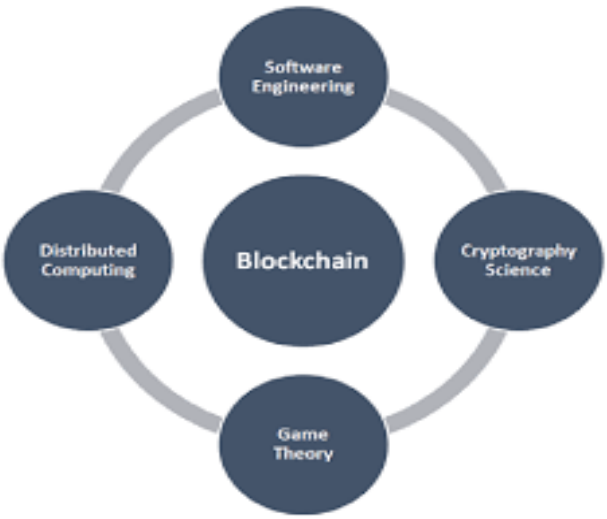

Figure 3: Element of the blockchain

(***Source:*** stevetodd.typepad.co)

b. Advantages of Blockchain

The application of blockchain technology for e-commerce online payment makes it possible to monitor the shipping process, and fleet businesses, and prevent vendors from changing products and taking risks. Figure 3 depicts different elements of the blockchain. Blockchain technology can also be used by business owners to trace the supply chain and maintain transportation data quality. This helps to reduce security risks, as well as reduce human errors in online payment mediums. By using blockchain technology, business owners can effectively track their shipments while providing a more secure online payment experience. The use of cryptocurrency among customers is growing due to its ability to provide a secure payment option. Businesses that have included cryptocurrency in their payment options are now accepting it as a form of payment, giving customers the option to pay with cryptocurrency. Using a payment processor such as Coinbase makes it easy for businesses to accept cryptocurrency, and consumers feel more secure knowing that their data is protected. E-commerce stores have added their payment options to include cryptocurrencies such as Bitcoin and Ethereum, allowing businesses, merchants, and retailers to accept multiple currencies using one processor. By accepting cryptocurrencies, businesses can expand their reach into markets that may not be accessible through more traditional payment processors.

CONCLUSION

Blockchain process is used in cryptocurrency transactions and other online payment methods. Cryptocurrency is the medium that is used for online payment methods. The article discusses various applications of blockchain technology in payment systems the security concern that is major is identifying the resolution that is using the presented study of the result. Blockchain was showing the resolution that will abuse the governance of the subside. The illegitimacy will hold the investment that is attracted with the investment. The future will also have pointed to the respondent that will have invested the digital currency. The tender legal will have overcoming the fears of the people, which should also have secured the concern that is investing in cryptocurrency. The security issues will also attack and separate the subject of the research.

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Authors' contributions
The author contributed toward data analysis, drafting and revising the paper and agreed to be responsible for all aspects of this work.

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The author declares that they have no conflict of interest.

Availability of data and materials
Not Applicable

Use of Artificial Intelligence
Not applicable

Declarations
The author declares that all works are original and this manuscript has not been published in any other journal

REFERENCE LIST

[1] Adewole, K., Saxena, N., & Bhadauria, S. (2020). Application of cryptocurrencies using blockchain for e-commerce online payment. In *Blockchain for Cybersecurity and Privacy* (pp. 263–305). CRC Press. https://doi.org/10.1201/9780429324932-16

[2] Asadova, M. S. (2020). Blockchain technologies in the digital economy of Uzbekistan. *Theoretical & Applied Science, 3*, 155–159. https://doi.org/10.15863/TAS.2020.03.83.33

[3] Berrada, K., & Herrou, B. (2023). Maturity level of predictive maintenance application in small and medium-sized industries: Case of Morocco. Metallurgical and Materials Engineering, 30(1), 45–60. https://doi.org/10.56801/MME1030.

[4] Bezovski, Z., Davcev, L., & Mitreva, M. (2021). Current adoption state of cryptocurrencies as an electronic payment method. *Management Research and Practice, 13*(1), 44–50.

[5] Chen, L. C., & Farkas, D. (2019). Individual risk perception and choice using cryptocurrency for transactions.

[6] Сусленко, В., Затонацька, Т., Длугопольський, О., & Кузнєцова, А. (2022). Use of cryptocurrencies Bitcoin and Ethereum in the field of e-commerce: Case study of Ukraine. Financial and Credit Activity: Problems of Theory and Practice, 1(42), 62–72. https://doi.org/10.55643/fcaptp.1.42.2022.3603

[7] Ghosh, J. (2019). The blockchain: Opportunities for research in information systems and information technology. *Journal of Global Information Technology Management, 22*(4), 235–242. https://doi.org/10.1080/1097198X.2019.1679954

[8] Gotwald, B., Musiaka, L. & Szymura. K. (2012). Tourism in strategic documents of local self- government bodies of the Łódź voivodeship and Norwegian good practices in tourism management. Acta Innovations, 5, 25–50.

[9] Goundar, S. (2021). Introduction to blockchains and cryptocurrencies. In *Blockchain Technologies, Applications and Cryptocurrencies: Current Practice and Future Trends* (pp. ix–xix). https://doi.org/10.1142/9789811205279_0001

[10] Hollaus, M., Lampert, L., & Urak, U. (2022). Acceptance of cryptocurrencies in e-commerce: Consumers' perspective using a proposed cryptocurrency technology acceptance model (CCTAM). In *Proceedings of the European Marketing Academy* (Vol. 51, p. 107456).

[11] Ismanto, L., Ar, H. S., Fajar, A. N., & Bachtiar, S. (2019). Blockchain as an e-commerce platform in Indonesia. *Journal of Physics: Conference Series, 1179*(1), 012114. https://doi.org/10.1088/1742-6596/1179/1/012114

[12] Kanegae, L. C., Cernev, A. K., & Diniz, E. (2021). Moeda Seeds: E-commerce and crypto solutions for development. *Revista de Administração Contemporânea, 25*. https://doi.org/10.1590/1982-7849rac2021200224.en

[13] Kim, S.Y. and AlZubi, A.A. (2024). Blockchain and Artificial Intelligence for Ensuring the Authenticity of Organic Legume Products in Supply Chains. Legume Research. https://doi.org/10.18805/LRF-786

[14] Kusuma, K. B. M., AlZubi, A. A., Viacheslav, K., & Sayyad, S. (2023). Blockchain Technology Applications and Cryptocurrencies: Current Practice and Future Trends. Pacific Business Review (International). 15(9), 142-151.

[15] Mashatan, A., Sangari, M. S., & Dehghani, M. (2022). How perceptions of information privacy and security impact consumer trust in crypto-payment: An empirical study. *IEEE Access, 10*, 69441–69454. https://doi.org/10.1109/ACCESS.2022.3186786

[16] Min, P.K., Mito, K. and Kim, T.H. (2024). The Evolving Landscape of Artificial Intelligence Applications in Animal Health. Indian Journal of Animal Research. https://doi.org/10.18805/IJAR.BF-1742

[17] Neethidevan, V. (2019). Influence of cryptocurrency in e-commerce. *GRD Journals-Global Research and Development Journal for Engineering, 4*(7), 36–38.

[18] Rolla K.J. (2023). Trends and Futuristic Applications of Big Data and Electronic Health Record Data in Empowering Constructive Clinical Decision Support Systems. Bio-Science Research Bulletin, 39(2), 78-91.

[19] Ruslina, E., Hernawan, D., & Rastuti, T. (2019). Legal protection for Bitcoin users in e-commerce transactions. In *Proceeding Interuniversity Forum for Strengthening Academic Competency* (Vol. 1, No. 1, pp. 311–315).

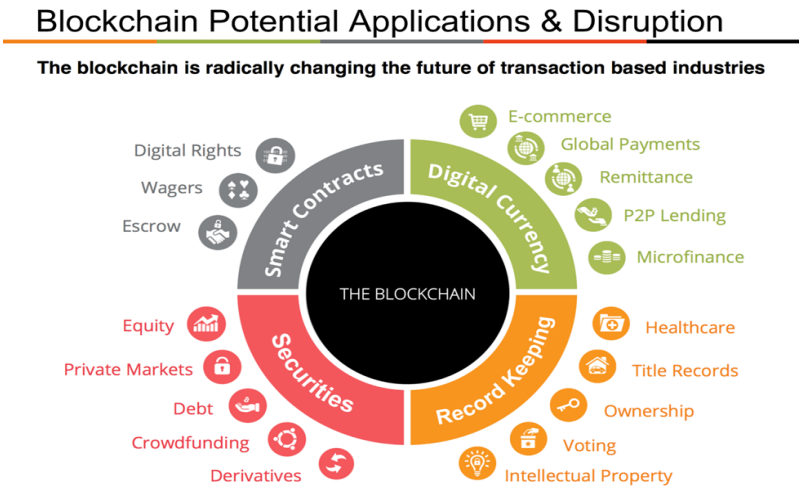
[20] Wihardjo, R. S. D., Muktiono, A., & Suwanda. (2024). Exploring critical thinking in environmental education: A PBL approach to reaction rate material at public senior high schools in Indonesia. International Journal of Environmental Sciences, 10(1), 14–25. https://www.theaspd.com/resources/2.%20Exploring%20Critical%20Thinking%20in%20Environmental%20Education.pdf

[21] Xhaferi, A., Idrizi, F., & Xhaferi, M. (2020). Online payment systems for e-banking and blockchain technology. *Economic Vision-International Scientific Journal in Economics, Finance, Business, Marketing, Management and Tourism, 7*(13-14), 63–70.

[22] Zheng, S., Luo, J., Dong, E., Chen, C., & Liu, X. (2022). SPENDER: A platform for secure and privacy-preserving decentralized P2P e-commerce. *arXiv preprint arXiv:2206.07215*.

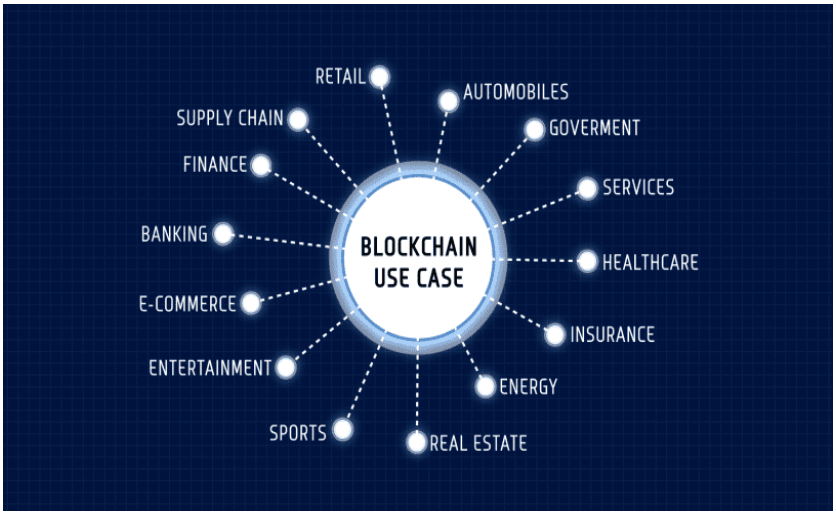
Appendices

Appendix 1: Blockchain beyond cryptocurrencies



(***Source:*** www.student.com)

Appendix 2: Blockchain Technology



(***Source:*** https://builtin.com/blockchain)